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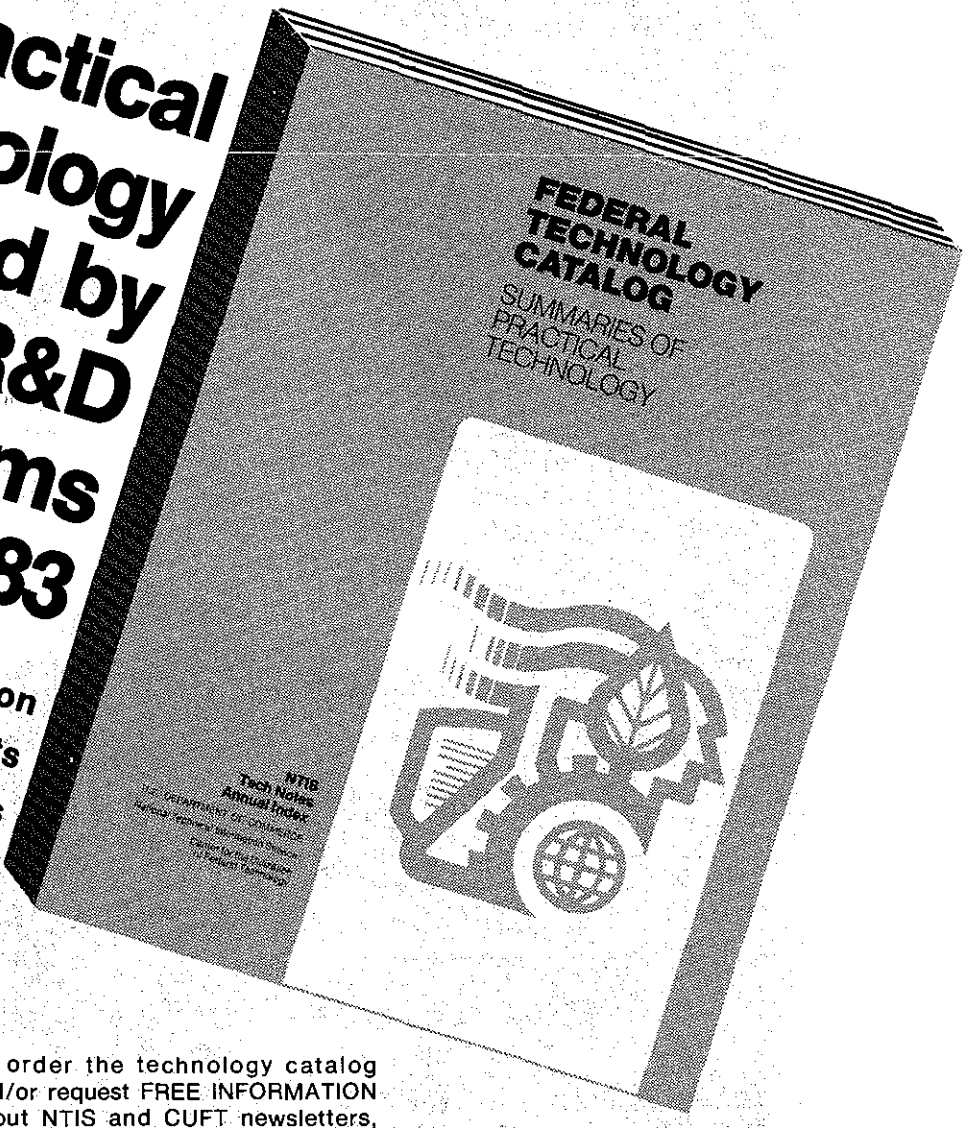

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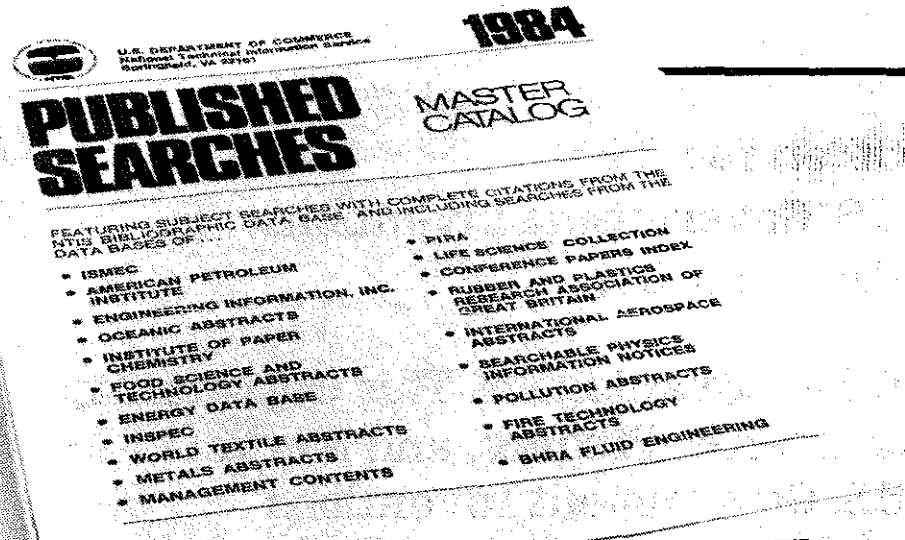

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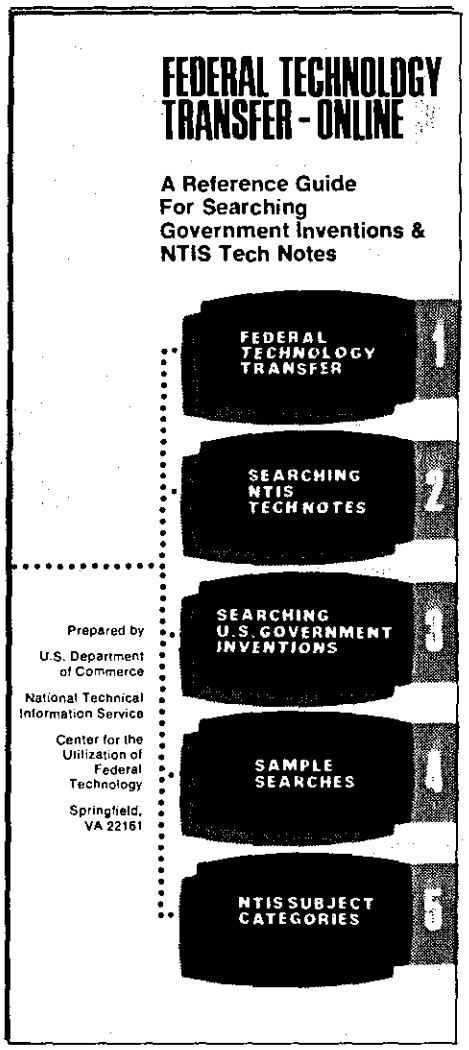

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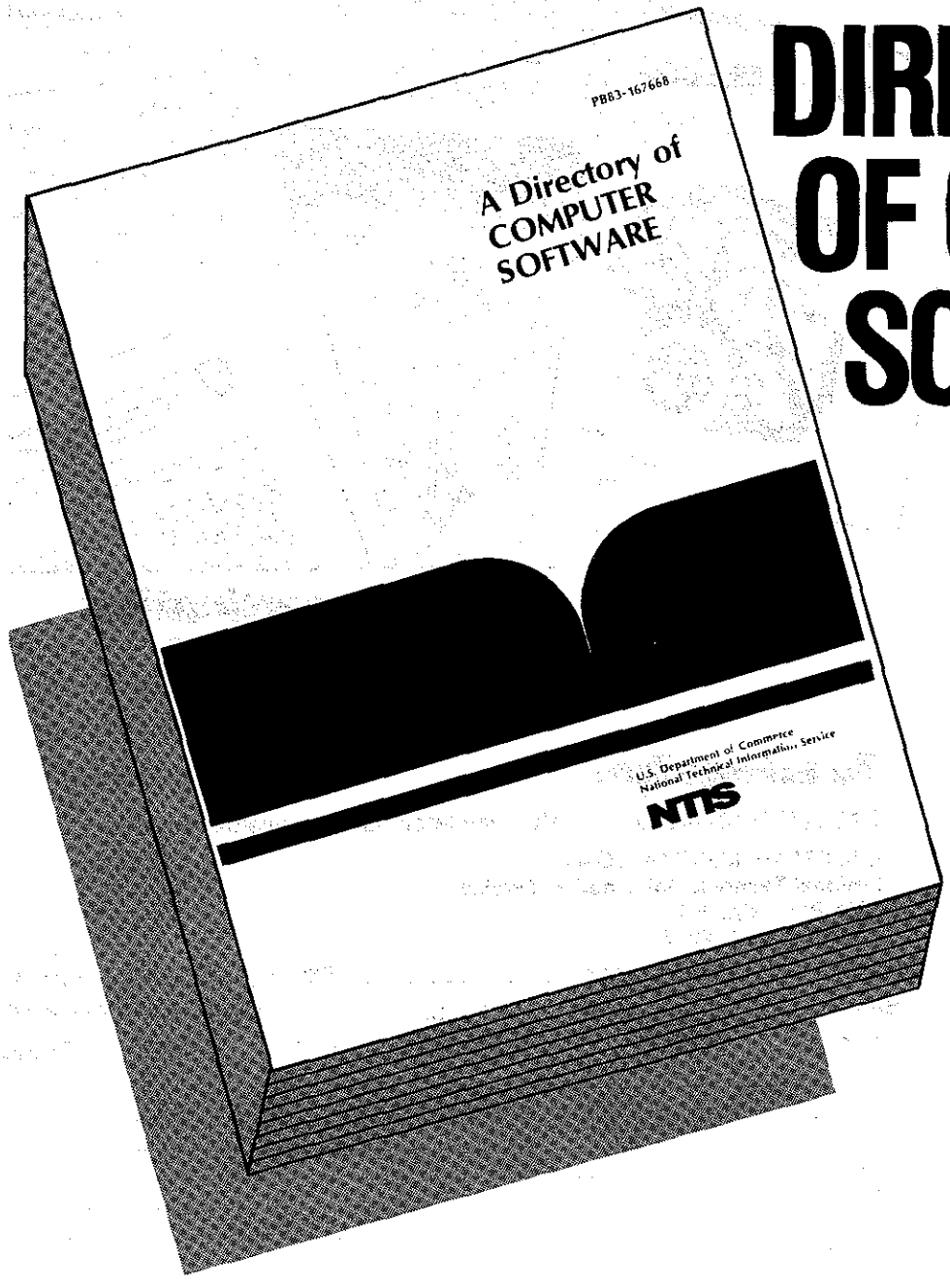

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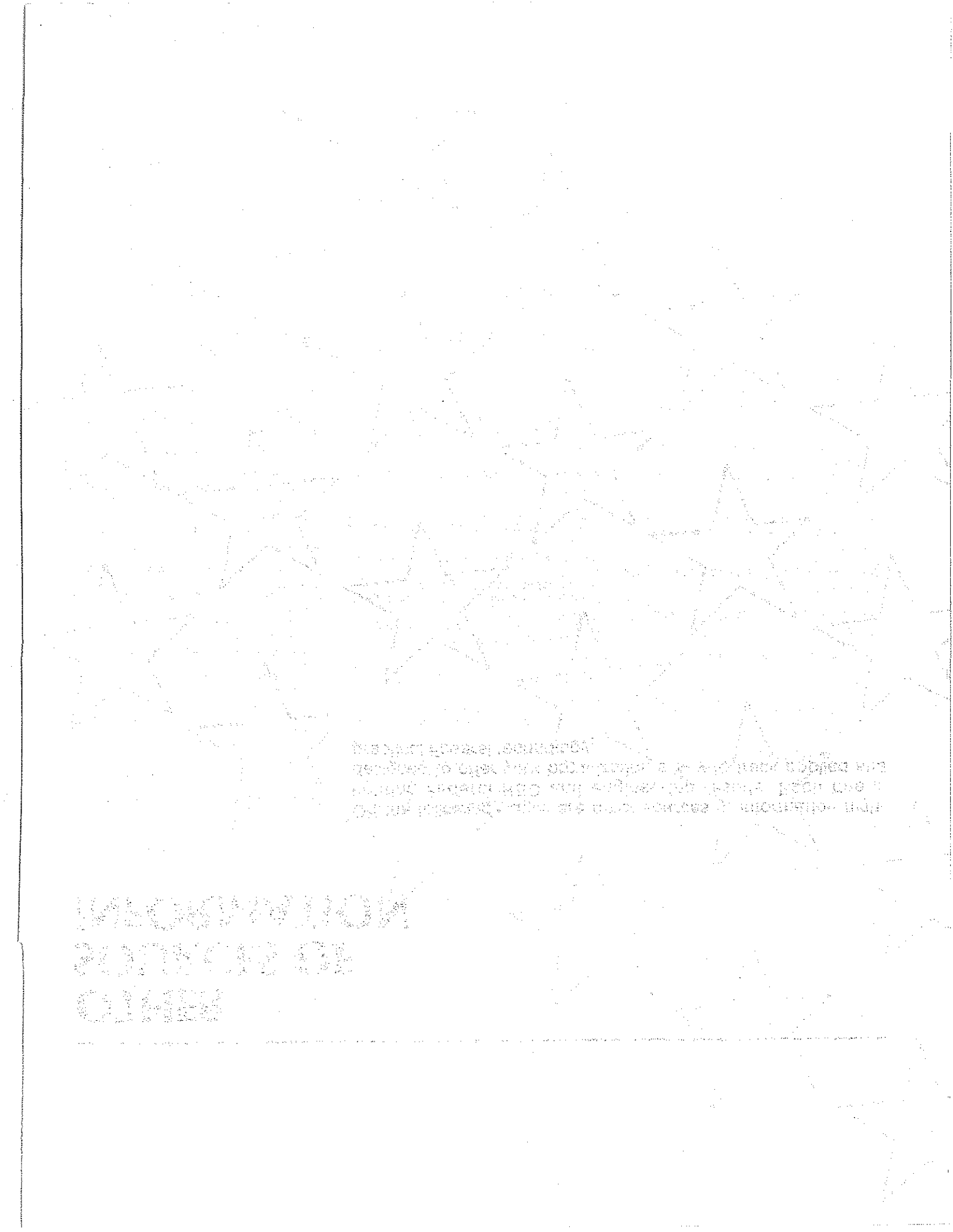

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Peridontal Diseases Centers, National Institute of Dental Research, Bethesda, MD
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Pharmacology-Toxicology Center Program, National Institute of General Medical Sciences, Bethesda, MD
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Toxicology Information Response Center, Oak Ridge National Laboratory, Oak Ridge, TN
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Interregional Registry of Cytogenetic Disorders and Phenylketonuria, National Institute of Child Health and Human Development, Bethesda, MD
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Pulsed Photoelectron Spectroscopy, Naval Research Laboratory, Washington, DC
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Stanford Synchrotron Radiation Laboratory (SSRL), Stanford Linear Accelerator Center, Menlo Park, CA
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Plant Physiology and Photosynthesis Research Unit, Raleigh, NC
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Plant Physiology Institute, Beltsville Agricultural Research Center, Beltsville, MD
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Plant Physiology Research Unit, Richard B. Russell Agricultural Research Center, Athens, GA
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Photovoltaic Devices and Measurements Laboratory, Solar Energy Research Institute, Golden, CO
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Solar Energy Research Institute, Golden, CO
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Center for Chemical Physics, National Bureau of Standards, Washington, DC
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Physical Chemistry and Instrumentation Laboratory, Eastern Regional Research Center, Philadelphia, PA
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Standard Reference Data Centers, National Bureau of Standards, Washington, DC
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Mechanical Engineering Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
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Plumbing Research Facility, National Bureau of Standards, Washington, DC
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National Hormone and Pituitary Program, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Baltimore, MD
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Neutron Radiography Facility, Hanford Engineering Development Laboratory, Richland, WA
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Neutron Radiography Facility, National Bureau of Standards, Washington, DC
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Nondestructive Engineering Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
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Nondestructive Testing Information Analysis Center (NTIAC), San Antonio, TX
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Nondestructive Testing, Hanford Engineering Development Laboratory, Richland, WA
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Ultrasonic Fuel Scanner, Idaho National Engineering Laboratory, Idaho Falls, ID
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Welding Diagnostics Laboratory, Idaho National Engineering Laboratory, Idaho Falls, ID
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Advanced Reactivity Measurement Facility (ARMF), Idaho National Engineering Laboratory, Idaho Falls, ID
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Fast Flux Test Facility, Hanford Engineering Development Laboratory, Richland, WA
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Hot Cell Facilities, Hanford Engineering Development Laboratory, Richland, WA
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Hot Cell Facilities, Idaho National Engineering Laboratory, Idaho Falls, ID
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Materials Sciences Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
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Neutron Radiography Facility, Hanford Engineering Development Laboratory, Richland, WA
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Nuclear Fuel Properties, Hanford Engineering Development Laboratory, Richland, WA
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Nuclear Fuels Laboratory, Pacific Northwest Laboratory, Richland, WA
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Nuclear Material Measurement and Standards Laboratory, New Brunswick Laboratory, Argonne, IL
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Power Burst Facility Reactor, Idaho National Engineering Laboratory, Idaho Falls, ID
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Mechanical Engineering Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
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Aquatic Research Laboratory, Savannah River Laboratory, Aiken, SC
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Energy Technology Engineering Center (ETEC), Canoga Park, CA
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Hanford Engineering Development Laboratory, Richland, WA
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Hanford Thermal Hydraulics Laboratory, Pacific Northwest Laboratory, Richland, WA
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Savannah River Ecology Laboratory, Aiken, SC
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Surface Science Center, Pacific Northwest Laboratory, Richland, WA
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Hanford - Critical Mass Laboratory, Pacific Northwest Laboratory, Richland, WA
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Nuclear Reactor Safety Research Data Bank, Idaho National Engineering Laboratory, Idaho Falls, ID
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Nuclear Safety Information Center, Oak Ridge National Laboratory, Oak Ridge, TN
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Physics Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
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Radiation Emergency Assistance Center Training Site (REACT/TS), Oak Ridge Associated Universities, Oak Ridge, TN
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Nursery Crops Research Laboratory, Delaware, OH
See 0073

Ohio Agricultural Research and Development Center, Wooster, OH
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Animal Science Institute, Beltsville Agricultural Research Center, Beltsville, MD
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Cereal and Food Biochemistry Research, Northern Regional Research Center, Peoria, IL
See 0112

Cereal Products Research Llaboratory, Western Regional Research Center, Berkely, CA
See 0054

Engineering and Food Sciences Research Unit, Western Regional Research Center, Berkely, CA
See 0114

Engineering Science Laboratory, Eastern Regional Research Center, Philadelphia, PA
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Food Proteins Research Unit, Western Regional Research Center, Berkely, CA
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Food Science Laboratory, Eastern Regional Research Center, Philadelphia, PA
See 0120

Fruit Research Laboratory, Wenatchee, WA
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Nutrients Research Unit, Western Regional Research Center, Berkely, CA
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Ohio Agricultural Research and Development Center, Wooster, OH
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U. S. Plant, Soil, and Nutrition Laboratory, Ithaca, NY
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U. S. Regional Pasture Research Laboratory, University Park, PA
See 0049

U.S. Grain Marketing Research Laboratory, Manhattan, KS
See 0125

U.S. Vegetable Laboratory, Charleston, SC
See 0096

Urban Food Marketing Center, New Brunswick, NJ
See 0126

NUTRITION(ANIMALS)

Animal Science Institute, Beltsville Agricultural Research Center, Beltsville, MD
See 0101

NUTRITION(HUMAN)

Beltsville Human Nutrition Research Center, Beltsville Agricultural Research Center, Beltsville, MD
See 0503

Children's Nutrition Research Center, Houston, TX
See 0514

Clinical Nutrition Research Units, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Bethesda, MD
See 0515

Food and Nutrition Information Center, Beltsville, MD
See 0115

Food Engineering Laboratory, Army Natick Research and Development Laboratories, Natick, MA
See 0116

Gerontology Research Center, National Institute on Aging, Baltimore, MD
See 0530

Human Nutrition Research Center on Aging, Boston, MA
See 0536

Human Nutrition Research Center, Grand Forks, ND
See 0537

Science and Advanced Technology Laboratory, Army Natick Research and Development Laboratories, Natrick, MA
See 0804

U. S. Plant, Soil, and Nutrition Laboratory, Ithaca, NY
See 0048

MICE

Physics Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
See 0767

Weights and Measures Program, National Bureau of Standards, Wahington, DC
See 0805

MICE

Animal Models for Trisomy 21, National Institute of Child Health and Human Development, Bethesda, MD
See 0494

Collaborating Center for Defined Laboratory Animals, Bethesda, MD
See 0516

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Peridontal Diseases Centers, National Institute of Dental Research, Bethesda, MD
See 0571

Science and Advanced Technology Laboratory, Army Natick Research and Development Laboratories, Natrick, MA
See 0804

Soybean and Nitrogen Fixation Research Unit, Raleigh, NC
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MICROORGANISMS

Biological Control of Insects Research Laboratory, Columbia, MO
See 0130

Biological-Materials Growth Center, Argonne National Laboratory, Argonne, IL
See 0192

Microbiological Test Facility, Army Materials Test & Evaluation Command, White Sands Missle Range, NM
See 0203

MICROSCOPY

CAMECA Ion Microscope, Naval Research Laboratory, Washington, DC
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High Voltage Electron Microscope - Tandem Facility (HVEM), Argonne National Laboratory, Argonne, IL
See 0750

National Center for Electron Microscopy, Lawrence Berkeley Laboratory, Berkeley, CA
See 0762

Scanning Transmission Electron Microscope (STEM), Naval Research Laboratory, Washington, DC
See 0771

Scanning Transmission Electron Microscopy Facility, Brookhaven National Laboratory, Upton, NY
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SHARE Microanalysis Facility, Oak Ridge National Laboratory, Oak Ridge, TN
See 0773

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High Voltage Electron Microscope - Tandem Facility (HVEM), Argonne National Laboratory, Argonne, IL
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National Center for Electron Microscopy, Lawrence Berkeley Laboratory, Berkeley, CA
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SHARE Microanalysis Facility, Oak Ridge National Laboratory, Oak Ridge, TN
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Antenna Measurement Facilities, National Bureau of Standards, Boulder, CO
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Microwave Space Research Facility, Naval Research Laboratory, Washington, DC
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MILITARY MEDICINE

Naval Blood Research Laboratory, Boston, MA
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Army Aeromedical Research Laboratory, Fort Rucker, AL
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MINE ACID DRAINAGE

Pittsburgh Research Center, Pittsburgh, PA
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MINE HAULAGE

Mining Research Facilities, Pittsburgh Energy Technology Center, Pittsburgh, PA
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MINE SAFETY

Pittsburgh Research Center, Pittsburgh, PA
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Appalachian Soil and Water Conservation Research Laboratory, Beckley, WV
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Albany Research Center, Albany, OR
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Human Nutrition Research Center, Grand Forks, ND
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Materials Resources Data System, Reston, VA
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Mineralogical Services, Minerals and Materials Research, Bureau of Mines, Washington, DC
See 0609

National Center for the Thermodynamic Data of Minerals, Reston, VA
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Office of Ocean and Coastal Resource Management, Washington, DC
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Albany Research Center, Albany, OR
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Denver Research Center, Denver, CO
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Mining Research Facilities, Pittsburgh Energy Technology Center, Pittsburgh, PA
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See 0616

MIRRORS

Mirror Coating and Diffraction Grating Ruling Services, Kitt Peak National Observatory, Tucson, AZ
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MITES

Insect Identification and Beneficial Insect Introduction Institute, Beltsville Agricultural Research Center, Beltsville, MD
See 0136

U.S. Livestock Insects Laboratory, Kerrville, TX
See 0147

Yakima Agricultural Research Laboratory, Yakima, WA
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MOISTURE CONTENT

Precision Humidity Measurement, National Bureau of Standards, Washington, DC
See 0179

MOLDS

Culture Collection Bank, Northern Regional Research Center, Peoria, IL
See 0519

Plant Protection Institute, Beltsville Agricultural Research Center, Beltsville, MD
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MOLECULAR BIOLOGY

Biomedical Research and Clinical Medicine Program, National Institute on Aging, Bethesda, MD
See 0193

Frederick Cancer Research Facility, Frederick, MD
See 0527

Genetic and Cellular Resources Program, Gerontology Research Center, National Institute on Aging, Baltimore, MD
See 0199

Gerontology Research Center, National Institute on Aging, Baltimore, MD
See 0530

National Flow Cytometry and Sorting Research Resource, Los Alamos National Laboratory, Los Alamos, NM
See 0559

National Genetic Sequence Data Bank, Los Alamos National Laboratory, Los Alamos, NM
See 0560

MOLECULAR PATHOLOGY

Molecular Pathology Center Program, National Institute of General Medical Sciences, Bethesda, MD
See 0552

MONOCLONAL ANTIBODIES

Walter Reed Army Institute of Research, Washington, DC
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MORTALITY

Resources for Population Research, National Institute of Child Health and Human Development, Bethesda, MD
See 0585

MUSCULOSKELETAL DISORDERS

Arthritis Information Clearinghouse, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Arlington, VA
See 0498

Multipurpose Arthritis Centers Program, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Bethesda, MD
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MUTATIONS

Human Genetic Mutant Cell Respository, National Institute of General Medical Sciences, Bethesda, MD
See 0534

Huntington's Disease Cell Repository, National Institute of Neurological and Communicative Disorders and Stroke, Bethesda, MD
See 0538

MYCOTIC DISEASES

Reference/Diagnostic Services, Center for Infectious Diseases, Atlanta, GA
See 0581

MYCOTOXINS

Fermentation Laboratory, Northern Regional Research Center, Peoria, IL
See 0197

National Peanut Research Laboratory, Dawson, GA
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Toxicology and Biological Constituents Research Unit, Richard B. Russell Agricultural Research Center, Athens, GA
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MAINTAINABILITY

Government-Industry Data Exchange Program (GIDEP), Corona, CA
See 0433

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Human Factors Simulator, Human Engineering Laboratory, Aberdeen Proving Ground, MD
See 0533

MANPOWER

Air Force Human Resources Laboratory (AFHRL), Brooks Air Force Base, TX
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Navy Personnel Research and Development Center, San Diego, CA
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MANUFACTURING

Army Industrial Base Engineering Activity, Rock Island Arsenal, IL
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Center for Manufacturing Engineering, National Bureau of Standards, Washington, DC
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MAPPING

ALICE Group, Argonne National Laboratory, Argonne, IL
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MAPS

Army Engineer Topographic Laboratories, Ft. Belvoir, VA
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Charting and Geodetic Service, Rockville, MD
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Earth Science Information Network, Reston, VA
See 0238

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National Cartographic Information Center, Reston, VA
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Naval Ocean Research and Development Command, Bay St. Louis, MS
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Ocean Systems Applications Group Chart Facility, Naval Research Laboratory, Washington, DC
See 0447

Office of Charting and Geodetic Services, Rockville, MD
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Office of Oceanography and Marine Services, Rockville, MD
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Remote Sensing Information, Technology Application Center (TAC), Albuquerque, NM
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Environmental Research Laboratory (Gulf Breeze), Gulf Breeze, FL
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Environmental Research Laboratory (Narragansett), Narragansett, RI
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Marine Research Laboratory, Pacific Northwest Laboratory, Richland, WA
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National Sea Grant College Program, Rockville, MD
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Northeast Fisheries Center and Associated Laboratories, Woods Hole, MA
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Northwest and Alaska Fisheries Center and Associated Laboratories, Seattle, WA
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Southeast Fisheries Center and Associated Laboratories, Miami, FL
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Coast Guard Research and Development Center, Groton, CT
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Computer Aided Operations Research Facility (CAORF), National Maritime Research Center, Kings Point, NY
See 0807

David Taylor Naval Ship Research and Development Center, Bethesda, MD
See 0342

Hydrodynamic Facilities, David Taylor Naval Ship Research and Development Center, Bethesda, MD
See 0716

Marine Technical and Hazardous Materials Division, Washington, DC
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National Maritime Research Center, Kings Point, NY
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U.S. Merchant Marine Academy Facilities, National Maritime Research Center, Kings Point, NY
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Marmoset Research Center, Oak Ridge Associated Universities, Oak Ridge, TN
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Automated Mass Spectrometer for Isotopic Nitrogen Analysis, Los Alamos National Laboratory, Los Alamos, NM
See 0733

Cf-Plasma Desorption Mass Spectrometry, Argonne National Laboratory, Argonne, IL
See 0740

MASTOMYS

Collaborating Center for Defined Laboratory Animals, Bethesda, MD
See 0516

MATERIALS HANDLING EQUIPMENT

Mining Research Facilities, Pittsburgh Energy Technology Center, Pittsburgh, PA
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MATERIALS TESTING REACTORS

Advanced Test Reactor (ATR), Idaho National Engineering Laboratory, Idaho Falls, ID
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MATERNAL HEALTH CARE

Major Research Programs for Mothers and Infants, National Institute of Child Health and Human Development, Bethesda, MD
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Atmospheric Sampling Aircraft, Pacific Northwest Laboratory, Richland, WA
See 0156

Atmospheric Sciences Laboratory, White Sands Missile Range, NM
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Center for Industrial Energy Demand Forecasting, Pacific Northwest Laboratory, Richland, WA
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Center for Water Quality Modeling, Environmental Research Laboratory (Athens), Athens, GA
See 0386

Climate Analysis Center, National Meteorological Center, Camp Springs, MD
See 0159

Hydrologic Research Laboratory, Silver Spring, MD
See 0242

Mathematics and Computer Sciences Division, Argonne National Laboratory, Argonne, IL
See 0231

Meteorological Development Division, National Meteorological Center, Camp Springs, MD
See 0169

Naval Ocean Research and Development Command, Bay St. Louis, MS
See 0721

MATHEMATICS

Center for Applied Mathematics, National Bureau of Standards, Washington, DC
See 0736

Mathematics and Computer Sciences Division, Argonne National Laboratory, Argonne, IL
See 0231

MEAT

Food Protection and Processing Research Unit, Richard B. Russell Agricultural Research Center, Athens, GA
See 0117

Food Science Laboratory, Eastern Regional Research Center, Philadelphia, PA
See 0120

Meat Quality Research Unit, Richard B. Russell Agricultural Research Center, Athens, GA
See 0121

Roman L. Hruska U. S. Meat Animal Research Center, Clay Center, NE
See 0036

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Biaxial Shock Test Machine, Army Construction Engineering Research Laboratory, Champaign, IL
See 0336

Shock and Vibration Information Center, Naval Research Laboratory, Washington, DC
See 0374

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Applied Technology Laboratory, Ft. Eustis, VA
See 0002

Center for Building Technology, National Bureau of Standards, Washington, DC
See 0212

Harsh Environment Simulation Facility, Harry Diamond Laboratories, Adelphi, MD
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Liquid Metal Corrosion Laboratory, Argonne National Laboratory, Argonne, IL
See 0466

Mechanical Testing Facility, Army Materials and Mechanics Research Center, Watertown, MA
See 0469

Plate Accelerator (Gas Gun) Facility, Army Materials and Mechanics Research Center, Watertown, MA
See 0477

Rock Mechanics: Large Volume and High Pressure Creep Equipment, Los Alamos National Laboratory, Los Alamos, NM
See 0372

Tension Testing Laboratory, Army Materials and Mechanics Research Center, Watertown, MA
See 0485

Thermal Transient Facility(TTF), Energy Technology Engineering Center, Canoga Park, CA
See 0382

Viscoelactic Materials Characterization Facility, Naval Research Laboratory, Washington, DC
See 0488

MEDICAL CARE

Cancer Center Program, National Cancer Institute, Silver Spring, MD
See 0506

ION IMPLANTATION

E-N Tandem Accelerator, Oak Ridge National Laboratory, Oak Ridge, TN
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Heavy Charged-Particle Treatment Facility, Lawrence Berkeley Laboratory, Berkeley, CA
See 0659

Holifield Heavy Ion Research Facility, Oak Ridge National Laboratory, Oak Ridge, TN
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Ion Implantation and Ion Beam Analysis Facility, Naval Research Laboratory, Washington, DC
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Isotope Separator Laboratory, National Bureau of Standards, Washington, DC
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Low Energy Multiply-Charged Ion Beam Program, Oak Ridge National Laboratory, Oak Ridge, TN
See 0629

Positive-Ion Van de Graaff Accelerator, 3 MeV, National Bureau of Standards, Washington, DC
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See 0685

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See 0734

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See 0750

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Isotope Separator Laboratory, National Bureau of Standards, Washington, DC
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Surface Modification and Characterization Program, Oak Ridge National Laboratory, Oak Ridge, TN
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Center for Epidemiologic Research, Oak Ridge Associated Universities, Oak Ridge, TN
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IONOSPHERE

Arecibo Observatory, Ithaca, NY
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See 0248

Sondrestrom Radar Facility, Menlo Park, CA
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Ion Beam Research Facilities, Los Alamos National Laboratory, Los Alamos, NM
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IPNS SYNCHROTRON

Intense Pulsed Neutron Source (IPNS), Argonne National Laboratory, Argonne, IL
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Variable-Dose-Rate Irradiation Facility, Oak Ridge Associated Universities, Oak Ridge, TN
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Conservation and Production Research Laboratory, Bushland, TX
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Crops Research Laboratory, Ft. Collins, CO
See 0058

New England Plant, Soil, and Water Laboratory, Orono, ME
See 0032

Northern Great Plains Research Laboratory, Mandan, ND
See 0034

Snake River Conservation Research Center, Kimberly, ID
See 0037

Soil and Water Conservation Research Unit, Florence, SC
See 0038

U. S. Salinity Laboratory, Riverside, CA
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ISCHEMIA

Specialized Centers of Research on Ischemic Heart Disease, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0591

ISOTOPE SEPARATION

Holifield Heavy Ion Research Facility, Oak Ridge National Laboratory, Oak Ridge, TN
See 0662

Isotope Separator (On-line) for Short Lived Fission Products, Idaho National Engineering Laboratory, Idaho Falls, ID
See 0620

Isotope Separator Laboratory, National Bureau of Standards, Washington, DC
See 0621

UNISOR (University Isotope Separator at Oak Ridge), Oak Ridge Associated Universities, Oak Ridge, TN
See 0637

ISOTOPES

Radiopharmaceutical Development, Oak Ridge Associated Universities, Oak Ridge, TN
See 0578

JANUS REACTOR

JANUS Neutron Reactor and Gamma Ray Irradiation Facilities, Argonne National Laboratory, Argonne, IL
See 0666

JOB DEVELOPMENT

Air Force Human Resources Laboratory (AFHRL), Brooks Air Force Base, TX
See 0783

Energy-Related Education/Training Opportunities, Oak Ridge Associated Universities, Oak Ridge, TN
See 0302

Navy Personnel Research and Development Center, San Diego, CA
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Biological-Materials Growth Center, Argonne National Laboratory, Argonne, IL
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Scanning Transmission Electron Microscopy Facility, Brookhaven National Laboratory, Upton, NY
See 0772

LABORATORY ANIMALS

Animal Models Development Program, National Institute on Aging, Bethesda, MD
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Animal Models for Trisomy 21, National Institute of Child Health and Human Development, Bethesda, MD
See 0494

Animal Resources Program, Research Resources Information Center, Rockville, MD
See 0495

Animals with Inherited Retinal Degenerations, National Eye Institute, Bethesda, MD
See 0496

Collaborating Center for Defined Laboratory Animals, Bethesda, MD
See 0516

Marmoset Research Center, Oak Ridge Associated Universities, Oak Ridge, TN
See 0547

Radiobiology Laboratory, Salt Lake City, UT
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Walter Reed Army Institute of Research, Washington, DC
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LAMPF LINAC

Clinton P. Anderson Meson Physics Facility (LAMPF), Los Alamos National Laboratory, Los Alamos, NM
See 0647

LAND QUALITY

National Center for Toxicological Research, Jefferson, AR
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LAND RECLAMATION

Appalachian Soil and Water Conservation Research Laboratory, Beckley, WV
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Intermountain Forest and Range Experiment Station, Ogden, UT
See 0243

North Central Forest Experimental Station, St. Paul, MN
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Geographic Information Retrieval and Analysis System, Reston, VA
See 0431

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Research Materials and Assistance for Studies of Language Development in Children, National Institute of Child Health and Human Development, Bethesda, MD
See 0584

LASER APPLICATIONS

Laser and Laaer Spectroscopy Facilities, Los Alamos National Laboratory, Los Alamos, NM
See 0754

Laser-Based Optical Instrumentation, Los Alamos National Laboratory, Los Alamos, NM
See 0755

National Laser Users Facility, Laboratory for Laser Energetics, Rochester, NY
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Major Research Programs for Mothers and Infants, National Institute of Child Health and Human Development, Bethesda, MD
See 0546

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Medical Research Institute for Infectious Diseases, Frederick, MD
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See 0559

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Population Research Centers, National Institute of Child Health and Human Development, Bethesda, MD
See 0574

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Coastal Engineering Information Analysis Center (CEIAC), Army Engineer Waterways Experiment Station, Vicksburg, MS
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Crude Oil Property Data Base, National Institute for Petroleum and Energy Research, Bartlesville, OK
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National Cartographic Information Center, Reston, VA
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National Center for Standards and Certification Information, National Bureau of Standards, Washington, DC
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National Center for the Thermodynamic Data of Minerals, Reston, VA
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National Clearinghouse for Alcohol Information, National Institutes on Alcohol Abuse and Alcoholism, Rockville, MD
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National Clearinghouse for Drug Abuse Information, Kensington, MD
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National Climatic Data Center, Asheville, NC
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National Coal Resources Data System, Reston, VA
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National Diabetes Information Clearinghouse, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Washington, DC
See 0557

National Digestive Diseases Education and Information Clearinghouse, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Rosslyn, VA
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National Earthquake Information Service (NEIS), Denver, CO
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National Fisheries Information Center, National Fisheries Center, Kearneysville, WV
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National Genetic Sequence Data Bank, Los Alamos National Laboratory, Los Alamos, NM
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National Nuclear Data Center, Brookhaven National Laboratory, Upton, NY
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National Space Science Data Center (NSSDC), Goddard Space Flight Center, Greenbelt, MD
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National Technical Information Service, Springfield, VA
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National Water Data Exchange (NAWDEX), Reston, VA
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Natural Hazards Research Information Center, Boulder, CO
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North Carolina Science and Technology Research Center, Research Triangle Park, NC
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Nuclear Reactor Safety Research Data Bank, Idaho National Engineering Laboratory, Idaho Falls, ID
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Nuclear Safety Information Center, Oak Ridge National Laboratory, Oak Ridge, TN
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Ocean Systems Applicationa Group Chart Facility, Naval Research Laboratory, Washington, DC
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Animal Biomaterials Laboratory, Eastern Regional Research Center, Philadelphia, PA
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National Center for Small-Angle Scattering Research (NCSASR), Oak Ridge National Laboratory, Oak Ridge, TN
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Neutrino Flux Monitoring Facility (NFM), Fermilab, Batavia, IL
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Physics Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
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Users Support Center, Argonne National Laboratory, Argonne, IL
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Reactance Bridge for Power Loss Measurement, National Bureau of Standards, Washington, DC
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Highway Technology Transfer Program, Turner-Fairbank Research Center, McLean, VA
See 0809

Pavements and Soil Trafficability Information Analysis Center, Army Engineer Waterways Experiment Station, Vicksburg, MS
See 0369

HORMONES

Laboratory of Biomedical and Environmental Sciences, Los Angeles, CA
See 0200

National Hormone and Pituitary Program, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Baltimore, MD
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HOUSES

Center for Building Technology, National Bureau of Standards, Washington, DC
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Center for Fire Research, National Bureau of Standards, Washington, DC
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Fire Research Laboratory, National Bureau of Standards, Washington, DC
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House Component and Equipment Field Test Facility, Oak Ridge National Laboratory, Oak Ridge, TN
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Housing Technology Information Service, HUD User, Germantown, MD
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Plumbing Research Facility, National Bureau of Standards, Washington, DC
See 0217

Rural Housing Research Unit, Clemson, SC
See 0218

SERI Daylighting Laboratory, Solar Energy Research Institute, Golden, CO
See 0219

Structures Laboratories, National Bureau of Standards, Washington, DC
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Health Physics Research Reactor(HPRR), Oak Ridge National Laboratory, Oak Ridge, TN
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Mental Retardation Research Centers, National Institute of Child Health and Human Development, Bethesda, MD
See 0551

HUMAN FACTORS

Air Force Human Resources Laboratory (AFHRL), Brooks Air Force Base, TX
See 0783

Ames Research Center, Moffett Field, CA
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Anechoic Chamber and Reverberant Room Facility, Human Engineering Laboratory, Aberdeen Proving Ground, MD
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Human Engineering Laboratory, Aberdeen Proving Ground, MD
See 0532

Human Factors Simulator, Human Engineering Laboratory, Aberdeen Proving Ground, MD
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Individual Protection Laboratory, Army Natick Research and Development Laboratories, Natick, MA
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Rehabilitation Research and Development Center, Hines, IL
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Science and Advanced Technology Laboratory, Army Natick Research and Development Laboratories, Natrick, MA
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HUMAN NUTRITION

Beltsville Human Nutrition Research Center, Beltsville Agricultural Research Center, Beltsville, MD
See 0503

Children's Nutrition Research Center, Houston, TX
See 0514

Clinical Nutrition Research Units, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Bethesda, MD
See 0515

Food and Nutrition Information Center, Beltsville, MD
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Food Engineering Laboratory, Army Natick Research and Development Laboratories, Natick, MA
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Gerontology Research Center, National Institute on Aging, Baltimore, MD
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Human Nutrition Research Center on Aging, Boston, MA
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Human Nutrition Research Center, Grand Forks, ND
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Science and Advanced Technology Laboratory, Army Natick Research and Development Laboratories, Natrick, MA
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U. S. Plant, Soil, and Nutrition Laboratory, Ithaca, NY
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Precision Humidity Measurement, National Bureau of Standards, Washington, DC
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HUNTINGTONS CHOREA

Huntington's Disease Cell Repository, National Institute of Neurological and Communicative Disorders and Stroke, Bethesda, MD
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Huntington's Disease Research Roster, National Institute of Neurological and Communicative Disorders and Stroke, Bethesda, MD
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HURRICANES

Atlantic Oceanographic and Meteorological Laboratory, Miami, FL
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Disaster Research Center, Columbus, OH
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Natural Hazards Research Information Center, Boulder, CO
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Techniques Development Laboratory, Silver Spring, MD
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Mechanical Engineering Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
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Engineering and Research Laboratories, Denver, CO
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Engineering Computer Program Library, Waterways Experiment Station, Vicksburg, MS
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Hanford Thermal Hydraulics Laboratory, Pacific Northwest Laboratory, Richland, WA
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Hydraulic Engineering Information Analysis Center (HEIAC), Army Engineer Waterways Experiment Station, Vicksberg, MS
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Hydraulic Laboratory, Waterways Experiment Station, Vicksburg, KY
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Hydraulic Test Facility(HTF), Energy Technology Engineering Center, Canoga Park, CA
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Plumbing Research Facility, National Bureau of Standards, Washington, DC
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Thermal Hydraulics Experiment Facility, Idaho National Engineering Laboratory, Idaho Falls, ID
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Alloy Preparation Laboratory, National Bureau of Standards, Washington, DC
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Flow and Heat Transfer Test Facility (MCTF), Argonne National Laboratory, Argonne, IL
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GEODESY

Huntington's Disease Cell Repository, National Institute of Neurological and Communicative Disorders and Stroke, Bethesda, MD
See 0538

Interregional Registry of Cytogenetic Disorders and Phenylketonuria, National Institute of Child Health and Human Development, Bethesda, MD
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Metabolism and Radiation Research Laboratory, Fargo, ND
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National Genetic Sequence Data Bank, Los Alamos National Laboratory, Los Alamos, NM
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Sugarbeet Production Research, Salinas, CA
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GEODESY

Army Engineer Topographic Laboratories, Ft. Belvoir, VA
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Charting and Geodetic Service, Rockville, MD
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National Cartographic Information Center, Reston, VA
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Ocean Systems Applications Group Chart Facility, Naval Research Laboratory, Washington, DC
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Earth Science Information Network, Reston, VA
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Engineering and Research Laboratories, Denver, CO
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Experimental Reservoir Engineering Flow Facility, Pacific Northwest Laboratory, Richland, WA
See 0240

National Coal Resources Data Syatem, Reston, VA
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National Earthquake Information Service (NEIS), Denver, CO
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National Environmental Data Referral Service, Washington, DC
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National Geophysical Data Center, Boulder, CO
See 0248

Naval Ocean Research and Development Command, Bay St. Louis, MS
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Remote Sensing Information, Technology Application Center (TAC), Albuquerque, NM
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Soil Mechanica Information Analysis Center (SMIAC), Army Engineer Waterways Experiment Station, Vicksburg, MS
See 0378

Unconventional Gas Recovery, Morgantown Energy Technology Center, Morgantown, WV
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GEOMAGNETISM

Magnetic-Declination Information, Denver, CO
See 0244

National Geophysical Data Center, Boulder, CO
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GEOTHERMAL ENERGY

Mechanical Engineering Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
See 0331

Geothermal Test Facility, Holtville, CA
See 0305

Instrument Sonde Test Facility (ISTF), Los Alamos National Laboratory, Los Alamos, NM
See 0607

National Geophysical Data Center, Boulder, CO
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GERIATRICS

National Flow Cytometry and Sorting Research Resource, Los Alamos National Laboratory, Los Alamos, NM
See 0559

GERMPLASM

Horticultural and Special Crops Laboratory, Northern Regional Research Center, Peoria, IL
See 0064

National Clonal Plant Germplasm Repository-Corvallis, Corvallis, OR
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National Seed Storage Laboratory, Ft. Collins, CO
See 0070

Northeastern Regional Plant Introduction Station, Geneva, NY
See 0071

Northern Great Plains Research Laboratory, Mandan, ND
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Plant Genetics and Gerplasm Institute, Beltsville Agricultural Research Center, Beltsville, MD
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Soybean and Nitrogen Fixation Research Unit, Raleigh, NC
See 0088

Soybean Production Research Unit, Stoneville, MS
See 0089

GERONTOLOGY

Gerontology Research Center, National Institute on Aging, Baltimore, MD
See 0530

GLACIERS

National Geophysical Data Center, Boulder, CO
See 0248

GLASS

Center for Materials Science, National Bureau of Standards, Washington, DC
See 0458

Surfaces and Interfaces Laboratory, Solar Energy Research Institute, Golden, CO
See 0327

GRAIN CROPS

Cereal Products Research Llaboratory, Western Regional Research Center, Berkely, CA
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Nematodes and Weeds Research Unit, Tifton, GA
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New England Plant, Soil, and Water Laboratory, Orono, ME
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Northern Grain Insects Research Laboratory, Brookings, SD
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Ohio Agricultural Research and Development Center, Wooster, OH
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Plant Genetics and Gerplasm Institute, Beltsville Agricultural Research Center, Beltsville, MD
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Plant Science and Water Conservation Research Laboratory, Stillwater, OK
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Southern Grain Insects Research Laboratory, Tifton, GA
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Southern Piedmont Conservation Research Center, Watkinsville, GA
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Tropical Agriculture Research Station-TARS, Mayaguez, PR
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U. S. Regional Pasture Research Laboratory, University Park, PA
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Yakima Agricultural Research Laboratory, Yakima, WA
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Food Proteins Research Unit, Western Regional Research Center, Berkely, CA
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U.S. Grain Marketing Research Laboratory, Manhaftan, KS
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Fruit Breeding and Genetics Research Unit, Fresno, CA
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Statistical Analysis Center, Pacific Northwest Laboratory, Richland, WA
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Crops Research Laboratory, Ft. Collins, CO
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Grassland Soil and Water Research Laboratory, Temple, TX
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Northern Great Plains Research Laboratory, Mandan, ND
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Southwest Rangeland Watershed Research Center, Tucson, AZ
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GREAT LAKES

Great Lakes Environmental Research Laboratory, Ann Arbor, MI
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GROUND WATER

Aquifer Properties Test Facility, Pacific Northwest Laboratory, Richland, WA
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Environmental Research Laboratory (Ada), Ada, OK
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National Center for Groundwater Reaearch, University of Oklahoma, OK
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Southeast Waterahed Research Laboratory, Tifton, GA
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Water Data Storage and Retrieval System (WATSTORE), Reston, VA
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Water Quality and Watershed Reaearch Laboratory, Durant, OK
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GROWTH REGULATORS

National Hormone and Pituitary Program, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Baltimore, MD
See 0561

GUINEA PIGS

Collaborating Center for Defined Laboratory Animals, Bethesda, MD
See 0516

FOOD CHAINS

Food Chain Transport (Large Animals), Oak Ridge Associated Universities, Oak Ridge, TN
See 0198

FOOD CHEMISTRY

Cereal and Food Biochemistry Research, Northern Regional Research Center, Peoria, IL
See 0112

Citrus and Subtropical Products Laboratory, Winter Haven, FL
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Southern Regional Research Center, New Orleans, LA
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FOOD COMPOSITION

Human Nutrition Research Center, Grand Forks, ND
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FOOD PACKAGING

Food Engineering Laboratory, Army Natick Research and Development Laboratories, Natick, MA
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Yakima Agricultural Research Laboratory, Yakima, WA
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FOOD PROCESSING

Animal Science Institute, Beltsville Agricultural Research Center, Beltsville, MD
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Biomaterials Conversion Laboratory, Northern Regional Research Center, Peoria, IL
See 0024

Citrus and Subtropical Products Laboratory, Winter Haven, FL
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Engineering and Food Sciences Research Unit, Western Regional Research Center, Berkely, CA
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Engineering Science Laboratory, Eastern Regional Research Center, Philadelphia, PA
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Food Protection and Processing Research Unit, Richard B. Russell Agricultural Research Center, Athens, GA
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Food Safety Laboratory, Eastern Regional Research Center, Philadelphia, PA
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Food Science Laboratory, Eastern Regional Research Center, Philadelphia, PA
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Northeast Fisheries Center and Associated Laboratories, Woods Hole, MA
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Roman L. Hruska U. S. Meat Animal Research Center, Clay Center, NE
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U.S. Grain Marketing Research Laboratory, Manhattan, KS
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FOOD PRODUCTS

Toxicology and Biological Constituents Research Unit, Richard B. Russell Agricultural Research Center, Athens, GA
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FOOD PROTEIN

Food Proteins Research Unit, Western Regional Research Center, Berkely, CA
See 0118

Toxicology and Biological Evaluation Research Unit, Western Regional Research Center, Berkely, CA
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U. S. Plant, Soil, and Nutrition Laboratory, Ithaca, NY
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FOOD STORAGE

Engineering and Food Sciences Research Unit, Western Regional Research Center, Berkely, CA
See 0114

Food Science Laboratory, Eastern Regional Research Center, Philadelphia, PA
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Fruit Research Laboratory, Wenatchee, WA
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Horticultural Crops Research Laboratory, Fresno, CA
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National Peanut Research Laboratory, Dawson, GA
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Plant Physiology and Chemistry Research Unit, Western Regional Research Center, Berkeley, CA
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Rice Research Unit, Beaumont, TX
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Science and Advanced Technology Laboratory, Army Natick Research and Development Laboratories, Natrick, MA
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Stored-Product Insects Research and Development Laboratory, Savannah, GA
See 0145

Subtropical Horticultural Research Unit, Miami, FL
See 0090

U.S. Grain Marketing Research Laboratory, Manhattan, KS
See 0125

U.S. Horticultural Research Laboratory, Orlando, FL
See 0095

Urban Food Marketing Center, New Brunswick, NJ
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FOOT AND MOUTH DISEASE

Plum Island Animal Disease Center, Greenport, NY
See 0107

FORAGE CROPS

Cereal Products Research Llaboratory, Western Regional Research Center, Berkely, CA
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Crop Science Research Laboratory, Mississippi State, MS
See 0057

Field and Horticultural Crops Research Unit, Richard B. Russell Agricultural Research Center, Athens, GA
See 0060

Forage-Beef Cattle Reaesrch Unit, El Reno, OK
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Grassland Soil and Water Research Laboratory, Temple, TX
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Nematodes and Weeds Research Unit, Tifton, GA
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Northeastern Regional Plant Introduction Station, Geneva, NY
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Plant Science and Water Conservation Research Laboratory, Stillwater, OK
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Plant Structure and Composition Research Unit, Richard B. Russell Agricultural Research Center, Athens, GA
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Southern Agricultural Energy Center, Tifton, GA
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Southern Grain Insects Research Laboratory, Tifton, GA
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Southern Piedmont Conservation Research Center, Watkinsville, GA
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Southwest Rangeland Watershed Research Center, Tucson, AZ
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Tobacco Research Laboratory, Oxford, NC
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U. S. Regional Pasture Research Laboratory, University Park, PA
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Earth Resources Observation Systems (EROS) Data Center, U.S. Geological Survey, Sioux Falls, SD
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Goddard Space Flight Center, Greenbelt, MD
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Intermountain Forest and Range Experiment Station, Ogden, UT
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North Central Forest Experimental Station, St. Paul, MN
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Northeastern Forest Experimental Station, Broomall, PA
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Pacific Northwest Forest and Range Experiment Station, Portland, OR
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Pacific Southwest Forest and Range Experiment Station, Berkeley, CA
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Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO
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Southeastern Forest Experimental Station, Asheville, NC
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Southern Forest Experiment Station, New Orleans, LA
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FOSSIL FUELS

Laboratory for Energy-Related Health Research, Davis, CA
See 0544

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Engineering and Research Laboratories, Denver, CO
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FRACTURES(MATERIALS)

Aerospace Structures Information and Analysis Center (ASIAC), Air Force Wright Aeronautical Laboratories, Wright-Patterson AFB, OH
See 0334

Materials Sciences Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
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FRAMED STRUCTURES

Structures Laboratoriea, National Bureau of Standards, Washington, DC
See 0220

FRESHWATER BIOLOGY

Columbia National Fisheries Research Laboratory, Columbia, MO
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Environmental Laboratory, Waterways Experiment Station, Lexington, KY
See 0388

Great Lakes Environmental Research Laboratory, Ann Arbor, MI
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Great Lakes Fishery Laboratory, Ann Arbor, MI
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La Crosse National Fishery Research Laboratory, La Crosse, WI
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National Fiaheries Center, Kearneysville, WV
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Seattle National Fishery Research Center, Seattle, WA
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FROZEN FOODS

Citrus and Subtropical Products Laboratory, Winter Haven, FL
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FRUIT CROPS

Appalachian Fruit Research Station, Kearneysville, WV
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ENVIRONMENTAL HEALTH

Western Cotton Research Laboratory, Phoenix, AZ
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Asbestos Technical Assistance Program (Asbestos-Tap), Office of Toxic Substances, Washington, DC
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Epidemiology Research Center, Pittsburgh, PA
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Health Effects Research Laboratory, Research Triangle Park, NC
See 0531

Inhalation Toxicology Research Institute, Albuquerque, NM
See 0541

Laboratory for Energy-Related Health Research, Davis, CA
See 0544

Laboratory of Radiobiology and Environmental Health, San Francisco, CA
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ENVIRONMENTAL IMPACTS

Arctic and Offshore Technology Program, Morgantown Energy Technology Center, Morgantown, WV
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Columbia National Fisheries Research Laboratory, Columbia, MO
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Engineering and Research Laboratories, Denver, CO
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Environmental Laboratory, Waterways Experiment Station, Lexington, KY
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Environmental Reaearch Laboratory (Ada), Ada, OK
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Environmental Research Laboratory (Athens), Athens, GA
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Environmental Research Laboratory (Corvallis), Corvallis, OR
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Environmental Research Laboratory (Duluth), Duluth, MN
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Environmental Research Laboratory (Narragansett), Narragansett, RI
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Environmental Sciences Research Laboratory, Research Triangle Park, NC
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Environmental Technical Information System (ETIS), Army Engineer Construction Engineering Research Laboratory, Urbana, IL
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Grosse Ile Field Station, Grosse Ile, MI
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Laboratory of Biomedical and Environmental Sciencea, Los Angeles, CA
See 0200

Marine Research Laboratory, Pacific Northwest Laboratory, Richland, WA
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Marine Sciences Research Center, Kingston, RI
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Monticello Field Station, Monticello, MN
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Newtown Field Station, Newtown, OH
See 0411

Office of Oceanography and Marine Services, Rockville, MD
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Vint Hill Field Station, EPA, Warrenton, VA
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ENVIRONMENTAL QUALITY

National Center for Toxicological Research, Jefferson, AR
See 0554

Toxicology Information Response Center, Oak Ridge National Laboratory, Oak Ridge, TN
See 0596

ENVIRONMENTAL TESTS

Climatic Test Facility, Army Materials Test and Evaluation Command, White Sands Missle Range, NM
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Environmental Test Facility, Army Electronic Proving Ground, Ft. Huachuca, AZ
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EPIDEMIOLOGY

Center for Epidemiologic Research, Oak Ridge Associated Universities, Oak Ridge, TN
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Epidemiology Research Center, Pittsburgh, PA
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Epidemiology, Demography, and Biometry Program, National Institute on Aging, Bethesda, MD
See 0526

Health Effects Research Laboratory, Research Triangle Park, NC
See 0531

Neuroepidemiology Program, National Institute of Neurological and Communicative Disorders and Stroke, Bethesda, MD
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Radiation Emergency Assistance Center Training Site (REACT/TS), Oak Ridge Associated Universities, Oak Ridge, TN
See 0575

EQUINE ENCEPHALITIDES

Arthropod-Borne Animal Diseases Research Laboratory, Denver, CO
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EROS INFORMATION SERVICE

Earth Resourcea Observation Systems (EROS) Data Center, U.S. Geological Survey, Sioux Falls, SD
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EROSION

Northeast Watershed Research Laboratory, University Park, PA
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Animal Biomateriala Laboratory, Eastern Regional Research Center, Philadelphia, PA
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Office of Ocean and Coastal Resource Management, Washington, DC
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ETIS INFORMATION SERVICE

Environmental Technical Information System (ETIS), Army Engineer Construction Engineering Research Laboratory, Urbana, IL
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EVAPORATION

Heat and Mass Transfer Research Laboratory, Solar Energy Research Institute, Golden, CO
See 0306

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Animals with Inherited Retinal Degenerations, National Eye Institute, Bethesda, MD
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Vision Research Centers, National Eye Institute, Bethesda, MD
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Army Industrial Base Engineering Activity, Rock Island Arsenal, IL
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Center for Materials Science, National Bureau of Standards, Washington, DC
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Mechanical Fabrication - R&D Support, Los Alamos National Laboratory, Los Alamos, NM
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Optical Fiber Drawing and Measurement Facility, Naval Research Laboratory, Washington, DC
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Surface Modification and Characterization Program, Oak Ridge National Laboratory, Oak Ridge, TN
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FAILURE

Aerospace Structures Information and Analysis Center (ASIAC), Air Force Wright Aeronautical Laboratories, Wright-Patterson AFB, OH
See 0334

Center for Building Technology, National Bureau of Standards, Washington, DC
See 0212

Center for Materials Science, National Bureau of Standards, Washington, DC
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Government-Industry Data Exchange Program (GIDEP), Corona, CA
See 0433

FAR ULTRAVIOLET RADIATION

National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY
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Engineering Science Laboratory, Eastern Regional Research Center, Philadelphia, PA
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Coupled Fast Reactivity Measurement Facility (CFRMF), Idaho National Engineering Laboratory, Idaho Falls, ID
See 0692

Faat Flux Test Facility, Hanford Engineering Development Laboratory, Richland, WA
See 0694

Fuel System Information Center, Hanford Engineering Development Laboratory, Richland, WA
See 0696

Health Physics Research Reactor(HPRR), Oak Ridge National Laboratory, Oak Ridge, TN
See 0658

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Army Aeromedical Research Laboratory, Fort Rucker, AL
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See 0110

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Biomaterials Conversion Laboratory, Northern Regional Research Center, Peoria, IL
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Fermentation Laboratory, Northern Regional Research Center, Peoria, IL
See 0197

Northern Agricultural Energy Center, Northern Regional Research Center, Peoria, IL
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Southern Agricultural Energy Center, Tifton, GA
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EARTH RESOURCES

Dynamitron Facility (4-MV), Argonne National Laboratory, Argonne, IL
See 0652

Neutron Sources, Argonne National Laboratory, Argonne, IL
See 0674

EARTH RESOURCES

Climate and Earth Sciences Laboratory, Suitland, MD
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Earth Resources Observation Systems (EROS) Data Center, U.S. Geological Survey, Sioux Falls, SD
See 0237

Earth Science Information Network, Reston, VA
See 0238

Goddard Space Flight Center, Greenbelt, MD
See 0792

Satellite Applications Laboratory, Suitland, MD
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Satellite Experiment Laboratory, Suitland, MD
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EARTH SCIENCES

Lawrence Berkeley Laboratory, Berkeley, CA
See 0798

EARTHQUAKES

Disaster Research Center, Columbus, OH
See 0523

Engineering and Research Laboratories, Denver, CO
See 0344

Geotechnical Laboratory, Waterways Experiment Station, Vicksburg, MS
See 0349

National Earthquake Information Service (NEIS), Denver, CO
See 0247

National Geophysical Data Center, Boulder, CO
See 0248

Natural Hazards Research Information Center, Boulder, CO
See 0251

Naval Civil Engineering Laboratory, Port Hueneme, CA
See 0801

Reactor Seismic & Elevated Temperature Structural Design, Hanford Engineering Development Laboratory, Richland, WA
See 0711

Soil Mechanics Information Analysis Center (SMIAC), Army Engineer Waterways Experiment Station, Vicksburg, MS
See 0378

ECAT SCANNING

ECAT Scanning Facility, Oak Ridge Associated Universities, Oak Ridge, TN
See 0524

Radiopharmaceutical Development, Oak Ridge Associated Universities, Oak Ridge, TN
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ECOLOGY

Aquatic Research Laboratory, Savannah River Laboratory, Aiken, SC
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Arid Lands Ecology Reserve, Pacific Northwest Laboratory, Richland, WA
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Cold Regions Science & Technology Information Analysis Center, Cold Regions Research and Engineering Laboratory, Hanover, NH
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Cooperative Fishery and Wildlife Research Units, Washington, DC
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Defense Pest Management Information Analysis Center, Washington, DC
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Denver Wildlife Research Center, Denver, CO
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Eastern Energy and Land Use Team, Kearneysville, WV
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Ecosystems Research Center, Ithaca, NY
See 0196

Environmental Research Laboratory (Ada), Ada, OK
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Environmental Reaearch Laboratory (Corvallis), Corvallis, OR
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Environmental Research Laboratory (Duluth), Duluth, MN
See 0395

Environmental Research Laboratory (Gulf Breeze), Gulf Breeze, FL
See 0396

Environmental Research Laboratory (Narragansett), Narragansett, RI
See 0397

Environmental Technical Information System (ETIS), Army Engineer Construction Engineering Research Laboratory, Urbana, IL
See 0399

Grosse Ile Field Station, Grosse Ile, MI
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Intermountain Forest and Range Experiment Station, Ogden, UT
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Los Alamos National Research Park, Los Alamos National Laboratory, Los Alamos, NM
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Marine Sciences Research Center, Kingston, RI
See 0718

Monticello Field Station, Monticello, MN
See 0406

National Coastal Ecosystems Team, 1010 Gause Blvd. Sidell, LA
See 0204

National Environmental Research Park, Oak Ridge National Laboratory, Oak Ridge, TN
See 0205

North Central Forest Experimental Station, St. Paul, MN
See 0252

Northeastern Forest Experimental Station, Broomall, PA
See 0254

Pacific Northwest Forest and Range Experiment Station, Portland, OR
See 0257

Pacific Southwest Forest and Range Experiment Station, Berkeley, CA
See 0258

Patuxent Wildlife Research Center, Laurel, MD
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Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO
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Savannah River Ecology Laboratory, Aiken, SC
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Southeast Fisheries Center and Associated Laboratories, Miami, FL
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Southeastern Forest Experimental Station, Asheville, NC
See 0263

Southwest Fisheries Center and Associated Laboratories, La Jolla, CA
See 0428

Western Energy and Land Use Team, Fort Collins, CO
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Assessment and Information Services Center, Washington, DC
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Plastics Technical Evaluation Center (PLASTEC), Dover, NJ
See 0476

Viscoelactic Materials Characterization Facility, Naval Research Laboratory, Washington, DC
See 0488

ELDERLY PERSONS

Epidemiology, Demography, and Biometry Program, National Institute on Aging, Bethesda, MD
See 0526

Gerontology Research Center, National Institute on Aging, Baltimore, MD
See 0530

Human Nutrition Research Center on Aging, Boston, MA
See 0536

ELECTRIC CABLES

Cable Test Facility, Brookhaven National Laboratory, Upton, NY
See 0291

Cable Winding Facility, Brookhaven National Laboratory, Upton, NY
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Mobile Cable X-Ray Facility, Brookhaven National Laboratory, Upton, NY
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ELECTRIC FIELDS

Center for Electronics and Electrical Engineering, National Bureau of Standards, Washington, DC
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Electro-Optical High Voltage Field Mapping Systems, National Bureau of Standards, Washington, DC
See 0274

ELECTRIC INSULATION

Center for Electronics and Electrical Engineering, National Bureau of Standards, Washington, DC
See 0272

Electro-Optical High Voltage Field Mapping Systems, National Bureau of Standards, Washington, DC
See 0274

ELECTRIC POWER GENERATION

Engineering and Reaearch Laboratories, Denver, CO
See 0344

Sodium Componenta Test Installation(SCTI), Energy Technology Engineering Center, Canoga Park, CA
See 0376

ELECTRIC VEHICLES

Road Load Simulator, Argonne National Laboratory, Argonne, IL
See 0371

ELECTRICAL ENGINEERING

Electrical Engineering and Instrumentation Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
See 0273

ELECTRICAL PROPERTIES

Center for Materials Science, National Bureau of Standards, Washington, DC
See 0458

Thermophyaical and Electronic Properties Information Analysis Center, West Lafayette, IN
See 0486

ELECTROLYSIS

Integrated Test Bed for Advanced Hydrogen Technology, Brookhaven National Laboratory, Upton, NY
See 0308

ELECTROMAGNETIC INTERFERENCE

Electromagnetic Interference Enclosure, Materiel Testing Directorate, Aberdeen Proving Ground, MD
See 0275

ELECTROMAGNETIC PULSES

Electromagnetic Pulse Simulator Facilities, Harry Diamond Laboratories, Adelphi, MD
See 0276

CRUDE OIL

Soil and Water Conservation Research Unit, Florence, SC
See 0038

Southern Piedmont Conservation Research Center, Watkinsville, GA
See 0040

Subtropical Agricultural Research laboratory, Weslaceo, TX
See 0045

U. S. Regional Pasture Research Laboratory, University Park, PA
See 0049

U. S. Salinity Laboratory, Riverside, CA
See 0050

CRUDE OIL

Crude Oil Property Data Base, National Institute for Petroleum and Energy Research, Bartlesville, OK
See 0300

National Institute for Petroleum and Energy Research, Bartlesville, OK
See 0314

CRYOGENICS

Cryogenic Dilution Refrigerator, Naval Research Laboratory, Washington, DC
See 0742

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X-Ray Diffraction Laboratory, Ames Laboratory, Ames, IA
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CULTURES(BIOLOGY)

Culture Collection Bank, Northern Regional Research Center, Peoria, IL
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Genetic and Cellular Resources Program, Gerontology Research Center, National Institute on Aging, Baltimore, MD
See 0199

Reference/Diagnostic Services, Center for Infectious Diseases, Atlanta, GA
See 0581

CYCLOTRONS

BNL 60-inch Cyclotron, Brookhaven National Laboratory, Upton, NY
See 0645

Cyclotron - 60 inch, Argonne National Laboratory, Argonne, IL
See 0648

Cyclotron, 88-inch, Lawrence Berkeley Laboratory, Berkeley, CA
See 0649

Holifield Heavy Ion Research Facility, Oak Ridge National Laboratory, Oak Ridge, TN
See 0662

JSW168 Small Cyclotron, Brookhaven National Laboratory, Upton, NY
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CYSTIC FIBROSIS

Specialized Centers of Research on Pediatric Pulmonary Diseases, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0592

CYTOGENETICS

Interregional Registry of Cytogenetic Disorders and Phenylketonuria, National Institute of Child Health and Human Development, Bethesda, MD
See 0543

CYTOMETRY

National Flow Cytometry and Sorting Resesrch Resource, Los Alamos National Laboratory, Los Alamos, NM
See 0559

DAIRY PRODUCTS

Food Science Laboratory, Eastern Regional Research Center, Philadelphia, PA
See 0120

DAMS

Hydraulic Laboratory, Waterways Experiment Station, Vicksburg, KY
See 0356

DATA REDUCTION

Jet Propulsion Laboratory, Pasadena, CA
See 0794

Satellite Applications Laboratory, Suitland, MD
See 0182

Satellite Development Laboratory, Madison, WI
See 0183

Satellite Experiment Laboratory, Suitland, MD
See 0184

DAYLIGHTING

SERI Daylighting Laboratory, Solar Energy Research Institute, Golden, CO
See 0219

DECONTAMINATION

Decontamination Technology Development & Demonstration Fac, Pacific Northwest Laboratory, Richland, WA
See 0693

Medical Research Institute of Chemical Defense, Aberdeen Proving Ground, MD
See 0550

DEGRADATION

Surfaces and Interfaces Laboratory, Solar Energy Research Institute, Golden, CO
See 0327

DEMOGRAPHY

Epidemiology, Demography, and Biometry Program, National Institute on Aging, Bethesda, MD
See 0526

DENTISTRY

Center for Materials Science, National Bureau of Standards, Washington, DC
See 0458

Dental and Medical Materials Research, National Bureau of Standards, Washington, DC
See 0520

Dental Research Institutes and Centers, National Institute of Dental Research, Bethesda, MD
See 0521

Naval Dental Research Institute, Great Lakes, IL
See 0567

Peridontal Diseases Centers, National Institute of Dental Research, Bethesda, MD
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DEOXYRIBONUCLEIC ACID

National Genetic Sequence Data Bank, Los Alamos National Laboratory, Los Alamos, NM
See 0560

DEUTERIUM COMPOUNDS

Biological-Materials Growth Center, Argonne National Laboratory, Argonne, IL
See 0192

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BNL 60-inch Cyclotron, Brookhaven National Laboratory, Upton, NY
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Cyclotron - 60 inch, Argonne National Laboratory, Argonne, IL
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Cyclotron, 88-inch, Lawrence Berkeley Laboratory, Berkeley, CA
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JSW168 Small Cyclotron, Brookhaven National Laboratory, Upton, NY
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Positive-Ion Van de Graaff Accelerator, 3 MeV, National Bureau of Standards, Washington, DC
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DIABETES MELLITUS

Diabetes Centers Program, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Bethesda, MD
See 0522

National Diabetes Information Clearinghouse, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, Washington, DC
See 0557

DIAGNOSIS

Cancer Center Program, National Cancer Institute, Silver Spring, MD
See 0506

Radiopharmaceutical Development, Oak Ridge Associated Universities, Oak Ridge, TN
See 0578

Regional Centers for Radiological Physics, National Cancer Institute, Silver Spring, MD
See 0582

Specialized Centers of Research on Adult Respiratory Failure, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0586

Specialized Centers of Research on Arteriosclerosis, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0587

Specialized Centers of Research on Chronic Airway Diseases, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0588

Specialized Centers of Research on Hypertension, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0590

Specialized Centers of Research on Ischemic Heart Disease, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0591

Specialized Centers of Research on Pediatric Pulmonary Diseases, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0592

Specialized Centers of Research on Pulmonary Vascular Diseases, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0593

Specialized Centers of Research on Thrombosis, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0594

DIAGNOSTIC EQUIPMENT

PETT VI Positron Emission Transaxial Tomograph, Brookhaven National Laboratory, Upton, NY
See 0572

Whole Body Prompt-Gamma Activation Facility, Brookhaven National Laboratory, Upton, NJ
See 0601

DIAGNOSTIC SERVICES

Reference/Diagnostic Services, Center for Infectious Diseases, Atlanta, GA
See 0581

DIELECTRICS

Center for Electronics and Electrical Engineering, National Bureau of Standards, Washington, DC
See 0272

Electro-Optical High Voltage Field Mapping Systems, National Bureau of Standards, Washington, DC
See 0274

DIESEL ENGINES

Heat Engine Research, Morgantown Energy Technology Center, Morgantown, WV
See 0228

DIETS

Beltsville Human Nutrition Research Center, Beltsville Agricultural Research Center, Beltsville, MD
See 0503

Food and Nutrition Information Center, Beltsville, MD
See 0115

Human Nutrition Research Center on Aging, Boston, MA
See 0536

Human Nutrition Research Center, Grand Forks, ND
See 0537

COAL

Individual Protection Laboratory, Army Natick Research and Development Laboratories, Natick, MA
See 0465

Navy Clothing and Textile Research Facility, Natick, MA
See 0472

Science and Advanced Technology Laboratory, Army Natick Research and Development Laboratories, Natrick, MA
See 0804

COAL

Advanced Coal Science and Technology, Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0287

Ames Laboratory, Ames, IA
See 0784

Coal Preparation and Characterization Facility, Ames Laboratory, Ames, IA
See 0296

Coal Preparation Program, Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0297

Coal Processing Instrumentation, Morgantown Energy Technology Center, Morgantown, WV
See 0298

Coal Utilization Program, Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0299

Fluidized Bed Combustion Process Development Facility, Argonne National Laboratory, Argonne, IL
See 0225

Fluidized Bed Combustion, Morgantown Energy Technology Center, Morgantown, WV
See 0226

Food Chain Transport (Large Animals), Oak Ridge Associated Universities, Oak Ridge, TN
See 0198

Fossil Energy Users Laboratory (FEUL), Argonne National Laboratory, Argonne, IL
See 0227

Heat Engine Research, Morgantown Energy Technology Center, Morgantown, WV
See 0228

Laramie Energy Technology Center, Laramie, WY
See 0309

Low-Rank Coal Program, Morgantown Energy Technology Center, Morgantown, WV
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Mining Research Facilities, Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0610

National Coal Resources Data System, Reston, VA
See 0246

National Institute for Petroleum and Energy Research, Bartlesville, OK
See 0314

Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0320

University of North Dakota Energy Research Center, Grand Forks, ND
See 0330

COAL GASIFICATION

Coal Gasification, Morgantown Energy Technology Center, Morgantown, WV
See 0294

Coal Processing Component Facilities, Morgantown Energy Technology Center, Morgantown, WV
See 0603

Gas Stream Cleanup, Morgantown Energy Technology Center, Morgantown, WV
See 0400

Laramie Energy Technology Center, Laramie, WY
See 0309

Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0320

Underground Coal Gasification, Morgantown Energy Technology Center, Morgantown, WV
See 0618

University of North Dakota Energy Research Center, Grand Forks, ND
See 0330

COAL LIQUEFACTION

Coal Liquifaction Program, Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0295

Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0320

University of North Dakota Energy Research Center, Grand Forks, ND
See 0330

COAL PROCESSING

Coal Processing Component Facilities, Morgantown Energy Technology Center, Morgantown, WV
See 0603

COASTAL ENGINEERING

Coastal Engineering Research Center (CERC), Waterways Experiment Station, Vicksburg, MS
See 0340

COASTAL ZONES

Coastal Engineering Information Analysis Center (CEIAC), Army Engineer Waterways Experiment Station, Vicksburg, MS
See 0714

Engineering Computer Program Library, Waterways Experiment Station, Vicksburg, MS
See 0345

Environmental Research Laboratory (Gulf Breeze), Gulf Breeze, FL
See 0396

Environmental Research Laboratory (Narragansett), Narragansett, RI
See 0397

Marine Sciences Research Center, Kingston, RI
See 0718

National Coastal Ecosystems Team, 1010 Gause Blvd. Sidell, LA
See 0204

Office of Ocean and Coastal Resource Management, Washington, DC
See 0256

Satellite Data Services Division, Washington, DC
See 0261

COATINGS

Ultra High Sputtering System, Naval Research Laboratory, Washington, DC
See 0487

COLD REGIONS

Cold Regions Science & Technology Information Analysis Center, Cold Regions Research and Engineering Laboratory, Hanover, NH
See 0790

COLD WEATHER

Cold Regions Research and Engineering Laboratory, Hanover, NH
See 0789

COMBUSTION

Advanced Coal Science and Technology, Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0287

Center for Fire Research, National Bureau of Standards, Washington, DC
See 0213

Coal Utilization Program, Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0299

Combustion Research Facility, Jefferson, AR
See 0222

Combustion Research Facility, Sandia National Laboratories, Livermore, CA
See 0223

Fluidized Bed Combustion Process Development Facility, Argonne National Laboratory, Argonne, IL
See 0225

Fluidized Bed Combustion, Morgantown Energy Technology Center, Morgantown, WV
See 0226

Fossil Energy Users Laboratory (FEUL), Argonne National Laboratory, Argonne, IL
See 0227

Hazardous Waste Research Center, Baton Rouge, LA
See 0402

Heat Engine Research, Morgantown Energy Technology Center, Morgantown, WV
See 0228

Industrial Environmental Research Laboratory, Research Triangle Park, NC
See 0403

Low-Rank Coal Program, Morgantown Energy Technology Center, Morgantown, WV
See 0310

Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0320

University of North Dakota Energy Research Center, Grand Forks, ND
See 0330

COMMUNITY HEALTH CARE

Community Cancer Care Programs, National Cancer Institute, Silver Spring, MD
See 0517

Comprehensive Sickle Cell Centers Program, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0518

COMPOSITE MATERIALS

Applied Technology Laboratory, Ft. Eustis, VA
See 0002

Langley Research Center, Hampton, VA
See 0796

Lewis Research Center, Lewis Research Center, Cleveland, OH
See 0799

Metal Matrix Composites Information Analysis Center (MMCIAC), Santa Barbara, CA
See 0470

Plastics Technical Evaluation Center (PLASTEC), Dover, NJ
See 0476

Quantitative Image Analyzer, Naval Research Laboratory, Washington, DC
See 0479

Surface Evaluation Facility, Naval Surface Weapons Center, Silver Spring, MD
See 0484

COMPUTER AIDED DESIGN

Rehabilitation Research and Development Center, Hines, IL
See 0583

COMPUTER AIDED MANUFACTURING

Army Industrial Base Engineering Activity, Rock Island Arsenal, IL
See 0449

Center for Manufacturing Engineering, National Bureau of Standards, Washington, DC
See 0450

COMPUTER APPLICATIONS

Artificial Intelligence in Medicine, Stanford, CA
See 0499

Rehabilitation Research and Development Center, Hines, IL
See 0583

COMPUTER SOFTWARE

Coastal Engineering Research Center (CERC), Waterways Experiment Station, Vicksburg, MS
See 0340

Computer Software and Management Information Center (COSMIC), Athens, GA
See 0430

Data & Analysis Center for Software (DACS), Rome Air Development Center, Griffiss AFB, NY
See 0230

David Taylor Naval Ship Research and Development Center, Bethesda, MD
See 0342

CELL CULTURES

Livestock Insects Research Laboratory, Lincoln, NE
See 0104

Roman L. Hruska U. S. Meat Animal Research Center, Clay Center, NE
See 0036

U.S. Livestock Insects Laboratory, Kerrville, TX
See 0147

CELL CULTURES

Huntington's Disease Cell Repository, National Institute of Neurological and Communicative Disorders and Stroke, Bethesda, MD
See 0538

CELLS(BIOLOGY)

Biomedical Research and Clinical Medicine Program, National Institute on Aging, Bethesda, MD
See 0193

Genetic and Cellular Resources Program, Gerontology Research Center, National Institute on Aging, Baltimore, MD
See 0199

Gerontology Research Center, National Institute on Aging, Baltimore, MD
See 0530

Human Genetic Mutant Cell Respository, National Institute of General Medical Sciences, Bethesda, MD
See 0534

National Flow Cytometry and Sorting Research Resource, Los Alamos National Laboratory, Los Alamos, NM
See 0559

Trauma and Burn Center Program, National Institute of General Medical Sciences, Bethesda, MD
See 0597

CENTRAL NERVOUS SYSTEM

Brain Tissue Resource for Neuropsychiatric Research, National Institute of Neurological and Communicative Disorders and Stroke, Bethesda, MD
See 0505

CERAMICS

Absorber and Ceramics Development, Hanford Engineering Development Laboratory, Richland, WA
See 0689

Center for Materials Science, National Bureau of Standards, Washington, DC
See 0458

Langley Research Center, Hampton, VA
See 0796

Lawrence Berkeley Laboratory, Berkeley, CA
See 0798

Lewis Research Center, Lewis Research Center, Cleveland, OH
See 0799

Materials Sciencea Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
See 0468

Metals and Ceramics Information Center (MCIC), Columbus, OH
See 0471

Standard Reference Materials, National Bureau of Standards, Washington, DC
See 0482

Tuscaloosa Research Center, University, AL
See 0615

CEREAL PRODUCTS

Cereal and Food Biochemistry Reaearch, Northern Regional Research Center, Peoria, IL
See 0112

U.S. Grain Marketing Research Laboratory, Manhattan, KS
See 0125

CFRMF REACTOR

Coupled Fast Reactivity Measurement Facility (CFRMF), Idaho National Engineering Laboratory, Idaho Falls, ID
See 0692

CHARGED PARTICLES

Heavy Charged-Particle Treatment Facility, Lawrence Berkeley Laboratory, Berkeley, CA
See 0659

CHARTS

Charting and Geodetic Service, Rockville, MD
See 0235

Map and Chart Information System, Reston, VA
See 0435

Ocean Systems Applications Group Chart Facility, Naval Research Laboratory, Washington, DC
See 0447

Office of Charting and Geodetic Services, Rockville, MD
See 0255

Office of Oceanography and Marine Services, Rockville, MD
See 0727

CHEMICAL ANALYSIS

Aeronomy Laboratory, Boulder, CO
See 0150

Analytical Chemistry Laboratory, Argonne National Laboratory, Argonne, IL
See 0732

Artificial Intelligence in Medicine, Stanford, CA
See 0499

Automated Mass Spectrometer for Isotopic Nitrogen Analysis, Los Alamos National Laboratory, Los Alamos, NM
See 0733

Central Oil Identification Laboratory, Washington, DC
See 0739

Chemical Research and Development Center, Aberdeen Proving Ground, MD
See 0788

Chemistry and Metallography Laboratory and Instrumentation and Standards Laboratory, Energy Technology Engineering Center, Canoga Park, CA
See 0741

Chemurgy Research Unit, Western Regional Research Center, Berkely, CA
See 0025

Environmental Monitoring and Support Laboratory, Cincinnati, OH
See 0745

In Vivo Bone Lead Assessment Facility, Brookhaven National Laboratory, Upton, NJ
See 0540

Laser-Based Optical Instrumentation, Los Alamos National Laboratory, Los Alamos, NM
See 0755

Mobile Activation Fscility (Cadmium), Brookhaven National Laboratory, Upton, NJ
See 0760

National Flow Cytometry and Sorting Research Resource, Los Alamos National Laboratory, Los Alamos, NM
See 0559

Nuclear Irradiation Facilities, National Bureau of Standards, Washington, DC
See 0675

Nuclear Material Measurement and Standards Laboratory, New Brunswick Laboratory, Argonne, IL
See 0707

Remote Radioactive Analytical Facility, Idaho National Engineering Laboratory, Idaho Falls, ID
See 0624

Supercritical Fluid Chromatography/Masa Spectrometer, Pacific Northwest Laboratory, Richland, WA
See 0776

Whole Body Prompt-Gamma Activation Facility, Brookhaven National Laboratory, Upton, NJ
See 0601

Whole-Body Gamma Spectrometer Facility, Brookhaven National Laboratory, Upton, NY
See 0602

CHEMICAL DEFENSE

Chemical Research and Development Center, Aberdeen Proving Ground, MD
See 0788

Medical Research Institute of Chemical Defense, Aberdeen Proving Ground, MD
See 0550

CHEMICAL ENGINEERING

Biomass Gasification Process Research Units, Pacific Northwest Laboratory, Richland, WA
See 0290

Biomaterials Conversion Laboratory, Northern Regional Research Center, Peoria, IL
See 0024

Center for Chemical Engineering, National Bureau of Standards, Washington, DC
See 0338

Coal Liquifaction Program, Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0295

Coal Preparation Program, Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0297

Coal Processing Instrumentation, Morgantown Energy Technology Center, Morgantown, WV
See 0298

Oil Shale Program, Morgantown Energy Technology Center, Morgantown, WV
See 0316

Oil Shale Test Retort, Los Alamos National Laboratory, Los Alamos, NM
See 0317

Pittsburgh Energy Technology Center, Pittsburgh, PA
See 0320

Tar Sands Program, Morgantown Energy Technology Center, Morgantown, WV
See 0328

CHEMICAL FEEDSTOCKS

Biomaterials Conversion Laboratory, Northern Regional Research Center, Peoria, IL
See 0024

Northern Agricultural Energy Center, Northern Regional Research Center, Peoria, IL
See 0315

CHEMICAL PROPERTIES

Standard Reference Data Centers, National Bureau of Standards, Washington, DC
See 0775

CHEMICAL REACTIONS

Center for Chemical Physics, National Bureau of Standards, Washington, DC
See 0737

Gasification and Pyrolysis Facility, Solar Energy Research Institute, Golden, CO
See 0748

High Pressure Chemistry Laboratory, Northern Regional Research Center, Peoria, IL
See 0749

Standard Reference Data Centers, National Bureau of Standards, Washington, DC
See 0775

Van de Graaff-ESR Spectrometer, Notre Dame Radiation Laboratory, Notre Dame, IN
See 0779

CHEMICAL TESTS

Atmospheric Sampling Aircraft, Pacific Northwest Laboratory, Richland, WA
See 0156

Hanford Engineering Development Laboratory, Richland, WA
See 0793

Mineralogical Services, Minerals and Materials Research, Bureau of Mines, Washington, DC
See 0609

Science and Advanced Technology Laboratory, Army Natick Research and Development Laboratories, Natrick, MA
See 0804

CHEMOTHERAPY

Frederick Cancer Research Facility, Frederick, MD
See 0527

ATMOSPHERICS

George C. Marshall Space and Flight Center, Huntsville, AL
See 0791

Goddard Space Flight Center, Greenbelt, MD
See 0792

High Altitude Chamber Facility, Picatinny Arsenal, Dover, NJ
See 0352

Jicamarca Radio Observatory, Ithaca, NY
See 0167

Langley Research Center, Hampton, VA
See 0796

Millstone Hill Radar, Westford, MA
See 0171

Sondrestrom Radar Facility, Menlo Park, CA
See 0185

ATMOSPHERICS

Institute for Telecommunication Sciences, Boulder, CO
See 0280

John F. Kennedy Space Administration, Kennedy Space Center, FL
See 0795

NOAA Wave Propagation Laboratory, Boulder, CO
See 0724

ATOMIC SPECTROSCOPY

Facility for High-Resolution Spectroscopy, Argonne National Laboratory, Argonne, IL
See 0747

ATR REACTOR

Advanced Test Reactor (ATR), Idaho National Engineering Laboratory, Idaho Falls, ID
See 0691

ATSR REACTOR

Thermal Source Reactor, Argonne National Laboratory, Argonne, IL
See 0684

AUGER SPECTROSCOPY

ESCA-Auger Spectrometer, Idaho National Engineering Laboratory, Idaho Falls, ID
See 0746

SHARE Microanalysis Facility, Oak Ridge National Laboratory, Oak Ridge, TN
See 0773

Surface Science Center, Pacific Northwest Laboratory, Richland, WA
See 0777

AUTOCLAVES

High Pressure/High Temperature Autoclave & Pipe Test Facility, Pacific Northwest Laboratory, Richland, WA
See 0354

AUTOMATED CONTROL EQUIPMENT

Automated Control Systems Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
See 0335

AUTOMOBILE ENGINES

Combustion Research Facility, Sandia National Laboratories, Livermore, CA
See 0223

Road Load Simulator, Argonne National Laboratory, Argonne, IL
See 0371

AUTOMOBILES

Alternative Fuels Data Bank, National Institute for Petroleum and Energy Research, Bartlesville, OK
See 0288

Jet Propulsion Laboratory, Pasadena, CA
See 0794

AVIONICS

Langley Research Center, Hampton, VA
See 0796

BACTERIA

Culture Collection Bank, Northern Regional Research Center, Peoria, IL
See 0519

Plum Island Animal Disease Center, Greenport, NY
See 0107

BACTERIAL DISEASES

Reference/Diagnostic Services, Center for Infectious Diseases, Atlanta, GA
See 0581

BALLOONS

Balloon Design and Flight Analysis Branch, Air Force Geophysics Laboratory, Bedford, MA
See 0003

BARLEY PLANTS

Northern Grain Insects Research Laboratory, Brookings, SD
See 0072

BARRIER FREE DESIGN

Housing Technology Information Service, HUD User, Germantown, MD
See 0216

BATTERIES

Lawrence Berkeley Laboratory, Berkeley, CA
See 0798

Lewis Research Center, Lewis Research Center, Cleveland, OH
See 0799

National Battery Test Laboratory (NBTL), Argonne National Laboratory, Argonne, IL
See 0312

Naval Weapons Support Center, Crane, IN
See 0802

BEAMS(SUPPORTS)

Structures Laboratories, National Bureau of Standards, Washington, DC
See 0220

BEES

Bee Breeding and Stock Center Laboratory, Baton Rouge, LA
See 0191

Carl Hayden Bee Research Center, Tucson, AZ
See 0194

Plant Protection Institute, Beltsville Agricultural Research Center, Beltsville, MD
See 0081

BEHAVIOR

Gerontology Research Center, National Institute on Aging, Baltimore, MD
See 0530

BENEFICIATION

Tuscaloosa Research Center, University, AL
See 0615

BEVALAC

Bevalac Accelerator, Lawrence Berkeley Laboratory, Berkeley, CA
See 0644

BEVERAGES

Citrus and Subtropical Products Laboratory, Winter Haven, FL
See 0113

BIOASSAY

Plant Protection Phytochemistry Research Unit, Western Regional Research Center, Berkeley, CA
See 0141

BIOCHEMICAL MATERIALS

Biotechnology Resources Program, Rockville, MD
See 0504

BIODETERIORATION

Forest Products Laboratory, Madison, WI
See 0463

Microbiological Test Facility, Army Materials Test & Evaluation Command, White Sands Missle Range, NM
See 0203

OTEC Heat Exchanger Test, Argonne National Laboratory, Argonne, IL
See 0318

Science and Advanced Technology Laboratory, Army Natick Research and Development Laboratories, Natrick, MA
See 0804

BIOLOGICAL CONTROL

Beneficial Insects Research Laboratory, Newark, DE
See 0129

Biological Control of Insects Research Laboratory, Columbia, MO
See 0130

Biological Pest Control Research Unit, Gainesville, FL
See 0131

Boll Weevil Research Laboratory, Mississippi State, MS
See 0132

Gypsy Moth Rearing Research Laboratory, Otis AFB, MA
See 0134

Insect Attractants, Behavior, and Basic Biology Research Laboratory, Gainsville, FL
See 0135

Liveatock Insects Research Laboratory, Lincoln, NE
See 0104

Metabolism and Radiation Research Laboratory, Fargo, ND
See 0138

Southern Field Crop Insect Management Laboratory, Stoneville, MS
See 0142

BIOMASS

Biomass Gasification Process Research Units, Pacific Northwest Laboratory, Richland, WA
See 0290

Biomaterials Conversion Laboratory, Northern Regional Research Center, Peoria, IL
See 0024

Chemurgy Research Unit, Western Regional Research Center, Berkely, CA
See 0025

Fermentation Laboratory, Northern Regional Research Center, Peoria, IL
See 0197

Forest Products Laboratory, Madison, WI
See 0463

Gasification and Pyrolysis Facility, Solar Energy Research Institute, Golden, CO
See 0748

Michigan State University - DOE Plant Research Laboratory, East Lansing, MI
See 0202

Northern Agricultural Energy Center, Northern Regional Research Center, Peoria, IL
See 0315

Solar Energy Research Institute, Golden, CO
See 0325

Southern Agricultural Energy Center, Tifton, GA
See 0326

BIOMEDICAL INSTRUMENTS

Biotechnology Resources Program, Rockville, MD
See 0504

Rehabilitation Research and Development Center, Hines, IL
See 0583

BIOMETRY

Epidemiology, Demography, and Biometry Program, National Institute on Aging, Bethesda, MD
See 0526

BIRD DISEASES

Animal Parasitology Institute, Beltsville Agricultural Research Center, Beltsville, MD
See 0099

National Wildlife Health Laboratory, Madison, WI
See 0106

Regional Poultry Research Laboratory, East Lansing, MI
See 0108

AIR POLLUTION MONITORING

Environmental Measurements Laboratory, New York, NY
See 0389

Environmental Monitoring Systems Laboratory, Research Triangle Park, NC
See 0390

Environmental Monitoring Systems Laboratory, Las Vegas, NV
See 0391

Environmental Sciences Research Laboratory, Research Triangle Park, NC
See 0398

Laser-Based Optical Instrumentation, Los Alamos National Laboratory, Los Alamos, NM
See 0755

AIR ROUTES

Office of Charting and Geodetic Services, Rockville, MD
See 0255

AIR TRAFFIC CONTROL

Federal Aviation Administration Technical Center, Federal Aviation Administration, Atlantic City Airport, NJ
See 0808

AIR TRANSPORTATION

Federal Aviation Administration Technical Center, Federal Aviation Administration, Atlantic City Airport, NJ
See 0808

AIRCRAFT

Aerospace Structures Information and Analysis Center (ASIAC), Air Force Wright Aeronautical Laboratories, Wright-Patterson AFB, OH
See 0334

Ames Research Center, Moffett Field, CA
See 0785

Aviation Toxicology Laboratory, P. O. Box 25082, Oklahoma City, OK
See 0502

Protection and Survival Laboratory, Oklahoma City, OK
See 0812

Ranging and Meteorological Equipment, Pacific Missile Test Center, Point Mugu, CA
See 0180

AIRCRAFT ENGINES

Aircraft Propulsion Research and Testing Program, Naval Air Propulsion Center, Trenton, NJ
See 0221

Dynamic Hot Corrosion Test Facility, Army Materials and Mechanics Research Center, Watertown, MA
See 0462

Engine Test Facility, Arnold Engineering Development Center, Arnold AFB, TN
See 0224

ALARMS

Law Enforcement Standards Laboratory, National Bureau of Standards, Washington, DC
See 0797

ALCOHOLISM

National Clearinghouse for Alcohol Information, National Institutes on Alcohol Abuse and Alcoholism, Rockville, MD
See 0555

ALCOHOLS

Mechanical Engineering Unit, Idaho National Engineering Laboratory, Idaho Falls, ID
See 0331

Alternative Fuels Data Bank, National Institute for Petroleum and Energy Research, Bartlesville, OK
See 0288

Northern Agricultural Energy Center, Northern Regional Research Center, Peoria, IL
See 0315

ALGAE

Fermentation Laboratory, Northern Regional Research Center, Peoria, IL
See 0197

ALLERGENS

Reagent Resources Service, National Institute of Allergy and Infectious Diseases, Bethesda, MD
See 0580

ALLERGIC DISEASES

Asthma and Allergic Disease Centers Program, National Institute of Allergy and Infectious Diseases, Bethesda, MD
See 0500

Centers for Interdisciplinary Research on Immunologic Diseases, National Institute of Allergy and Infectious Diseases, Bethesda, MD
See 0513

ALPHA BEAMS

BNL 60-inch Cyclotron, Brookhaven National Laboratory, Upton, NY
See 0645

Van de Graaff Facility (2.5 MeV), Lawrence Berkeley Laboratory, Berkeley, CA
See 0687

ALTERNATE FUELS

Alternative Fuels Data Bank, National Institute for Petroleum and Energy Research, Bartlesville, OK
See 0288

Northern Agricultural Energy Center, Northern Regional Research Center, Peoria, IL
See 0315

ANDROGEN BINDING PROTEIN

Radioimmunoassay Kits for Rat Androgen Binding Protein and Monkey Luteinizing Hormone, National Institute of Child Health and Human Development, Bethesda, MD
See 0577

ANECHOIC CHAMBERS

Acoustic Anechoic Chamber, National Bureau of Standards, Washington, DC
See 0332

Anechoic Chamber and Reverberant Room Facility, Human Engineering Laboratory, Aberdeen Proving Ground, MD
See 0491

Anechoic Flow Facility, David Taylor Naval Ship Research & Development Center, Bethesda, MD
See 0001

ANEMIAS

Comprehensive Sickle Cell Centers Program, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0518

ANESTHESIOLOGY

Anesthesiology Center Program, National Institute of General Medical Sciences, Bethesda, MD
See 0492

ANGINA PECTORIS

Specialized Centers of Research on Ischemic Heart Disease, National Heart, Lung, and Blood Institute, Bethesda, MD
See 0591

ANIMAL DISEASES

Animal Parasite Research Unit, Auburn, AL
See 0098

Arthropod-Borne Animal Diseases Research Laboratory, Denver, CO
See 0102

Forage-Beef Cattle Research Unit, El Reno, OK
See 0103

Insects Affecting Man and Animals Research Laboratory, Gainesville, FL
See 0137

National Animal Disease Center, Ames, IA
See 0105

National Wildlife Health Laboratory, Madison, WI
See 0106

Ohio Agricultural Research and Development Center, Wooster, OH
See 0035

Plum Island Animal Disease Center, Greenport, NY
See 0107

Poisonous Plant Research Laboratory, Logan, UT
See 0085

Veterinary Toxicology and Entomology Research Laboratory, College Station, TX
See 0111

ANIMAL GENETICS

Animal Science Institute, Beltsville Agricultural Research Center, Beltsville, MD
See 0101

ANIMAL MODELS

Animal Models Development Program, National Institute on Aging, Bethesda, MD
See 0493

Animal Models for Trisomy 21, National Institute of Child Health and Human Development, Bethesda, MD
See 0494

Animal Resources Program, Research Resources Information Center, Rockville, MD
See 0495

ANIMAL PHYSIOLOGY

Animal Physiology Research Unit, Richard B. Russell Agricultural Research Center, Athens, GA
See 0100

Roman L. Hruska U. S. Meat Animal Research Center, Clay Center, NE
See 0036

ANTENNAS

Antenna Measurement Facilities, National Bureau of Standards, Boulder, CO
See 0270

Automated Antenna Checkout Stations, Technical Support Directorate, Las Cruces, NM
See 0271

Center for Electronics and Electrical Engineering, National Bureau of Standards, Washington, DC
See 0272

Institute for Telecommunication Sciences, Boulder, CO
See 0280

Langley Research Center, Hampton, VA
See 0796

Lewis Research Center, Lewis Research Center, Cleveland, OH
See 0799

Microwave Space Research Facility, Naval Research Laboratory, Washington, DC
See 0283

ANTIBODIES

Reagent Resources Service, National Institute of Allergy and Infectious Diseases, Bethesda, MD
See 0580

Walter Reed Army Institute of Research, Washington, DC
See 0599

ANTIGENS

Reagent Resources Service, National Institute of Allergy and Infectious Diseases, Bethesda, MD
See 0580

ANTINEOPLASTIC AGENTS

Frederick Cancer Research Facility, Frederick, MD
See 0527

AQUACULTURE

National Fisheries Center, Kearneysville, WV
See 0422

National Fisheries Information Center, National Fisheries Center, Kearneysville, WV
See 0423

Northeast Fisheries Center and Associated Laboratories, Woods Hole, MA
See 0424

AQUATIC ANIMALS

Northwest and Alaska Fisheries Center and Associated Laboratories, Seattle, WA
See 0425

Central Oil Identification Laboratory, Department of Transportation
See 0739

0806 Coast Guard Research and Development Center
Department of Transportation
Avery Point, Groton, CT 06340
Contact: Mr. M.J. D'Angelo (203) 445-8501
EXPERTISE: The laboratory conducts research around six core technologies, namely: Ice technology; Marine nvigation technology; Marine fire and safety technology; Marine pollution technology; Search and rescue technology; and Naval engineering and marine systems technology. The ice technology core area is interdisciplinary, encompassing ice physics, glaciology, oceanography, meterology, statistics, and naval engineering. The major projects contained in marine navigation technology involve buoy design, buoy positioning and auditing (monitoring) techniques, buoy mooring designs, light signal hardware and power sources, extended applications of radio aids to navigation, and information useful for the establishment of aids to navigation standards. The mission of marine fire and safety research is to understand the causes of fires and accidents on ships and boats and to conduct investigations into ways and means of preventing of mitigating these circumstances. Research is also conducted in marine pollution. It involves studies in pollutant detection, identification, quantification, movement prediction, monitoring and containment, as well as the testing of anti-pollution devices. Search and rescue effors involve operations research, computer technology, oceanography, mathematics, and engineering. The naval architecture/marine engineering area is supported by a substantial inventory of electronic sensors and data collection/analysis instrumentation allowing for the collection, documentation and analysis of hardware and system parameters which are critical to ship and marine vehicle performance. Capabilities exist to carry out a wide variety of shipboard tests such as seakeeping, speed/power, machinery and hull vibration.
Facility: A unique fire and safety test facility located at Mobile, Alabama allows conducting of full-scale shipboard fire tests.

0807 Computer Aided Operations Research Facility (CAORF)
National Maritime Research Center, Maritime Administration
Kings Point, NY 11024
Contact: Dr. W. Maclean (516) 482-8200
FACILITY: Studies in many merchant marine disciplines can be conducted employing a realistic simulation of ship performance during navigation and harbor piloting operations in the safety of a land-based facility and at minimum cost. A realistic environment is achieved in CAORF by means of a full-scale ship's bridge containing all controls required by the Captain to maneuver his 'own ship'. Looking through the wheelhouse windows the Captain sees a full-color projected simulation of the outside world. As the Captain initiates ships control actions, a central computer interprets these actions and alters the visual scene accordingly. The central computer also immediately adjusts instrument readings and other cues in accordance with the calculated dynamic response of the particular ship being simulated. Major components include: simulated bridge, control station, central data processor, image generator and display, radar, communications, and computer programs.

0808 Federal Aviation Administration Technical Center
Federal Aviation Administration, Department of Transportation
Atlantic City Airport, NJ 08405
Contact: Mr. Michael L. Yaffee (609) 484-4000
EXPERTISE: Work covers test and evaluation in these main areas: air traffic control, navigation, approach and landing systems, communications, auxiliary support systems, and airports and aircraft safety.
Facilities: Major test facilities include: air traffic control simulation facility which can simulate air traffic operations any place in the world on its radar displays; operational and developmental airport and heliport; and aircraft and helicopter test beds. Other laboratories test automated air traffic control equipment and computer hardware and software for FAA field facilities, and new radars and radar beacon equipment. Special facilities are used for evaluating experimental navigation systems. Highly accurate tracking units measure the performance of aircraft and airborne equipment. They also pinpoint the position of a test aircraft to determine the accuracy of experimental navigation aids and guidance systems. Special buildings and facilities are used for fire and accident tests on airplanes, components, and engines. They include: a catapult, wind flow tunnel, chemistry lab, engne test cells, a full-scale indoor fire test facility which is the largest of its kind in the world, and salvaged or obsolete aircraft.

0809 Highway Technology Transfer Program, Turner-Fairbank Research Center
Federal Highway Administration, Department of Transportation
Turner-Fairbank Research Center, 6300 Georgetown Pike, McLean, VA 22101
Contact: Mr. Robert J. Betsold (703) 285-2034
EXPERTISE: The program was established to maximize the sharing of highway materials and construction techniques between states. New developments are quickly shared with highway departments and interested industries.

0810 Marine Technical and Hazardous Materials Division
Department of Transportation
U.S. Coast Guard, G-MTH, 2100 2nd Street, SW, Washington, DC 20593
Contact: (202) 426-2167
EXPERTISE: Research is conducted on ship safety standards; safe water transport of chemicals and cargoes; fire protection engineering; marine engineering; occupational health and safety; construction of boilers, pressure vessels, marine power plants, piping systems, and electrical equipment and systems; vessel stability and subdivision; vessel load lines; naval architecture and computer applications; vessel maneuverability; foreign chemical tankship certification; and water pollution from oil and chemicals.

0811 National Maritime Research Center
Maritime Administration
U.S. Maritime Administration, Kings Point, NY 11024
Contact: Dr. W. Maclean (516) 482-8200 x377
EXPERTISE: Work addresses improvement of under way ship operations through use of simulation and instrumentation to better define the requirements and criteria for design and operation of ships, waterways, related facilities and support activities; areas of interest include ship operation in defined environments, use of instrumentation fr vessel performance monitoring, heavy weather operational guidance,

processing and property technology; design, test, evaluation of solar systems; nondestructive testing; development of ablative materials; research to develop and modify polymers for adhesive qualities; carbon and graphics; coatings, colorants, and finishes; composite materials; elastomers and plastics; control devices and equipment; guidance systems; navigation and guidance system components; requirements and systems for remote and in situ monitoring of environmental quality; flow-surface interaction noise; aerodynamic heating; optics and lasers; material proerties and processing of advanced solid state electronic devices and sensors; mechanisms of degradation and failure in structural materials; and scattering of electromagnetic energy related to communications.

0797 Law Enforcement Standards Laboratory
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Mr. L. K. Eliason (301) 921-3161
EXPERTISE: Research is conducted and technical services are provided to the U. S. Department of Justice and State and local governments in support of law enforcement agencies. Sample outputs include: standards for police bullet-resistant equipment; communications equipment, physical security equipment, speed measuring devices, and evidential breath testers; Guides for selecting and applying commercial intrusion alarm systems, facsimile equipment, police communications equipment, computer-aided dispatch equipment, and protective equipment; and technical reports on handgun ammunition, blood/breath alcohol analysis, digital communication sytems, arson investigation, barrier materials, intrusion alarm systems, and ballistic resistant materials.

0798 Lawrence Berkeley Laboratory
Department of Energy
University of California, Berkeley, CA 94720
Contact: Mr. Robert J. Morris (415) 486-6502
EXPERTISE: As a large Federal laboratory, LBL conducts research in many areas. Its major activities focus on: Materials Science (alloy design, mechanical metallurgy, ceramic science, solid state physics, materials chemistry); Life Sciences carcinogenesis, mutagenesis, positron emission tomography, nuclear magnetic resonance imaging, the effects of pollutants from energy production on nucleic acids and DNA, basic research on physiological systems and means by which pollutants effect the systems, investigations of effects of trace metals, ozone, high-intensity electric and magnetic fields, and ionizing and nonionizing radiation on living tissue, characterization of lipoproteins); Environmental Research (studies of indoor and outdoor air quality, atmospheric sciences, analytical methods development, combustion research, and environmental and epidemiological statistics); Fusion Energy (basic research in plasma theory, modeling of plasma sources, and experimental atomic physics); High Energy Physics; Accelerators (large scale charged particle accelerators and detectors, advanced accelerator theory and technology, development of stochastic beam cooling and high field superconducting magnets); Nuclear Science (investigation of nuclear properties, nuclear reactions, and nuclear structure, investigation of new elements, utilization of ion beams up to uranium); Building Energy Research (designing buildings and building components with improved energy efficiency including windows and daylighting, artificial lighting, computer modeling of building energy usage, and infiltration and ventilation); Energy Systems Research (advanced batteries for electric vehicles and stationary energy storage; fuel cells and other efficient electrochemical energy conversion devices; new concepts in thermal energy storage using microparticles as absorbers and catalysts); Renewable Energy (development of innovative conversion techniques, provides basic information concerning solar resource, analysis of passive solar approaches in housing, development of solar air conditioning, research in direct solar conversion at high temperatures, production of liquid fuels from biomass); Earth Science (reservoir definition, brine injection technology, and magma energy utilization, geothermal exploration technology); Fossil Fuel (fuel-gas desulfurization, fundamental chemistry and mass-transfer in slurry-scrubbing processes, molecular characterization of organometallic compounds in fossil-fuel precursors and products, research in coal liquifaction); and Nuclear Waste (long-term storage in rock masses, studies of toxic chemical species released from uranium mill tailings).

0799 Lewis Research Center
Lewis Research Center, National Aeronautics and Space Administration
Mail Stop 7-3, 21000 Brookpark Road, Cleveland, OH 44135
Contact: Mr. Harrison Allen (216) 433-4000 x422
EXPERTISE: This facility is involved with: aerodynamic behavior of bodies in large wind tunnels and in zero gravity; design and opertion of vacuum, cryogenic, materials, engine, and power test facilities; high power, high frequency amplifiers for communications satellites; open and closed loop control systems; antenna theory and design, for satellite and spacecraft communications systems; circuit theory, filters, amplifiers, power conditioning and supply circuits, signal conditioning circuits, commutators, logic circuits, switching circuits, phase locked loop circuits; high energy-density battery research, nickel-zinc and silver-zinc batteries, for space and terrestrial applications; gas turbines, topping cycles, magneto-hydrodynamic generation, combustion processes, solar photovoltaic, large wind power systems; solar (photovoltaic), wind (large systems); gas turbines, compressors, pumps, gears, bearings, seals, pressure vessels, advanced materials; lubrication, friction, and wear; advanced materials application and fabrication; nondestructive testing; basic studies of ceramic materials for very high temperature applications; comprehensive research and development on essentially all classes of composite materials; corrosion and corrosion inhibition; research on the nature, properties, propagation, and supression of sound in ducts; research and applications of fluid properties, and static and dynamic behavoir; and research on physical properties of materials particularly as realted to magnetism and superconductivity.

0800 Measurement Assurance Program
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Mr. Brian C. Belanger (301) 921-2805
SERVICES: Measurement assurance (like quality control in industrial production) is a means by which one determines that whatever errors occur in the measurement process are kept sufficiently small to be adequate to the need. There are several elements in a measurement assurance program: It has its beginning in a requirement on the limit of measurement error which can be tolerated; There must be a reference base to which the allowable error is referred (e.g., NBS Volt, NBS Kilogram); There must be documented

aircraft are used to investigate innovative aircraft concepts that combine the desired short field and efficient cruise capabilities. Ames is NASA's lead center for helicopter research, and a wide range of basic and applied rotary wing research is conducted using computers, wind tunnels, and a variety of aircraft.

0786 Army Engineer Topographic Laboratories
Department of the Army
Ft. Belvoir, VA 22060
Contact: Mr. Richard N. Foreman (703) 664-5303
EXPERTISE: The laboratories conduct research and development in the topographic sciences to include mapping, charting, geodesy, and military geographic information. Research and development is also conducted to determine ground position, azimuth, and altitude for weapon survey; to assess the effects of the environment on the design, testing, and operation of materiel; and to provide intelligent machines to assist combat and combat support personnel.

0787 Calibration Service
National Bureau of Standards, Department of Commerce
Washington, DC 20234. Contact Mr. Brian C. Belanger
(301) 921-2805
SERVICES: A critical portion of this mission of NBS is to provide the basis for a complete and consistent national system of physical measurements. The Bureau accomplishes this in a variety of ways, the calibration of instruments, devices, and standards being one of the most familiar. Such calibration services are provided to industry, other government agencies (Federal, State, and local) and the general public. The major measurement categories included are: dimensional; mechanical; electrical; electromagnetic; time and frequency; thermodynamic; optical; ionizing radiation.

0788 Chemical Research and Development Center
Department of the Army
U. S. Army Armanent Munitions, Chemical Command,
Aberdeen Proving Ground, MD 21010
Contact: Mr. William A. Barr (301) 671-2031
EXPERTISE: The laboratory offers an expertise in many areas. Its mission requires an interdisciplinary approach to as wide range of physical and life sciences as well as engineering related to equipment development, from chemical detectors and protective masks to chemical munitions. Fundamental information is obtained in support of new of improved defense systems against chemical and biological threats and a sound deterrence system of chemical munitions. There is also a basic research program in aerosol/obscuration science to support the Army smoke mission. It also serves as a lead laboratory for the planning and coordination of the Army's efforts in pollution abatement and environmental control technology. Research includes: Basic research on new concepts in fibers and sorbents includes surface modified activated charcoal, synthetic carbons and modified polymers. Current investigations of new concepts in air purification include eletrolytic catalysis, chemical reaction catalysts, and fundamental studies. Science-base studies on new concepts in detection, identification, and alarms include gas-solid reactivity of oriented crystals, reactive liquid crystals, detection mechanisms for photo-acoustics, laser mass spectrometry and other electro-optic phenomena, ionic and neutral gas-phase reactions and selective ionization phenoma, and chemisorption on semiconductor surfaces. Basic research is conducted on new concepts in decontamination. Fundamental investigations in contamination avoidance include dynamics of penetration, adsorption and photoactivation of surface catalysts.

0789 Cold Regions Research and Engineering Laboratory
Department of the Army
P.O. Box 282, Hanover, NH 03755
Contact: Mr. Wesley Pietkiewicz (603) 643-3200
EXPERTISE: The laboratory's mission is to understand the characteristics of the cold regions of the world and to apply this knowledge to make it easier for people to live and work there. Research covers a variety of subjects. Both freshwater and seawater ice are extensively studied. Past efforts have included crystalline structure, chemical analysis, ice buildup on structures, snowpack pressure, mountain glaciers, and snowmelt models. Frozen ground, such as permafrost, is also researched to understand frost heaving and mechanical properties. Cold region construction, land transportation, environmental protection, and ice engineering also are studied.
Facilities: The main laboratory building contains 24 coldroom laboratories capable of achieving temperatures of -30C or below. Along with the cold laboratories are chemistry, physics, soils and electronics labs with highly specialized equipment for research at below-freezing temperatures. An Ice Engineering Facility is devoted to the study of problems caused by ice in waterways. This lab permits research that will lessen the effects of winter on the nation's waterways. In the facility is a refrigerated modeling area in which scaled-down rivers, harbors and lakes can be studied, a tilting refrigerated flume for river ice research, and a large test basin in which ice force problems can be studied at nearly full-scale dimensions. A Frost Effects Research Facility is devoted to the study of frost action in soils. This laboratory contains refrigerated research areas for below-freezing testing of pavements, foundations and underground utilities, and permits the study of destructive freeze-thaw cycles in a controlled setting. In Fox, Alaska, a research tunnel in permafrost is maintained.

0790 Cold Regions Science & Technology Information Analysis Center
Cold Regions Research and Engineering Laboratory,
Department of the Army
P. O. Box 282, Hanover, NH 03755
Contact: Mr. Wesley Pietkiewicz (603) 643-3200
INFORMATION SERVICES: The center provides information on snow, ice, and frozen ground; materials, facilities, systems, and operations in cold environments; methods and techniques of using various energy forms and systems to obtain information about surface and subsurface features in all environments for engineering, military, and related scientific purposes; ecology; pollution control in arctic environments.

Disaster Research Center, Federal Emergency Management Agency
See 0523

Engineering and Research Laboratories, Bureau of Reclamation, Department of Interior
See 0344

0791 George C. Marshall Space and Flight Center
National Aeronautics and Space Administraion
Technology Utilization Office, Huntsville, AL 35812
Contact: Mr. Ismail Akbay (205) 453-2223

Spatial Resolution Facility, Army Electronic Proving Ground, Department of the Army
See 0286

0775 Standard Reference Data Centers
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. David R. Lide (301) 921-2467
INFORMATION SERVICES: Reliable information on properties of materials is required for a wide range of appllications in industry, government, and academia. For example, physical and chemical properties play a key role in the design of industrial processes, the identification of potentially toxic substances in the environment, and the improvement of materials durability. To provide the scientific and engineering community with reliable sources of data, data bases of evaluated physical and chemical properties of substances. Experienced researchers in various centers assess the accuracy of the data reported in the literature, prepare complication, and recommend the best values. The data bases are then made available through publications, magnetic tapes, and on-line systems. The following is a list of active data centers: Alloy Data Center; Aqueous Electrolyte Data Center; Atomic Collison Cross Section Information Center; Atomic Energy Levels Data Center; Atomic Transition Probabilities and Atomic Transition Probabilities and Atomic Line Shapes and Shifts Data Center; Chemical Kinetics Information Center; Chemical Thermodynamics Data Center; Center for Information and Numerical Data Analysis and Synthesis; Crystal Data Center; Diffusion in Metals Data Center; Fluid Mixtures Data Center; Fundamental Constants Data Center; Ion Energetics Data Center; Molecular Spectra Data Center; Molten Salts Data Center; Phase Diagrams for Ceramists Data Center; Photonuclear Data Center; Radiation Chemistry Data Center; Thermodynamics Research Center; and X-ray and Ionizing Radiation Data Center.

0776 Supercritical Fluid Chromatography/Mass Spectrometer
Pacific Northwest Laboratory, Department of Energy
P. O. Box 999, Richland, WA 99352
Contact: Dr. W. D. Felix (509) 376-5247, or Dr. L. Schmid (509) 375-2559
FACILITY: In a new technique, supercritical fluid chromatography has been combined with mass spectrometry. Supercritical Fluid Chromatography/Mass Spectrometry is particularly effective for the analysis of high molecular weight, polar or thermally unstable compounds. The method derives its effective separation characteristics from the ability to control compound solubility as a function of pressure at relatively low temperatures. The system is currently being used to determine nitrogen containing compounds in coal derived oils and to track the solubilization of raw coals in supercritical solvents. Other SFC/MS projects will include the development of improved techniques, extraction and analysis of organic emissions absorbed on sampling traps or on particulates, analysis of metabolites of environmental toxins, and identification of procarcinogens in biological substrates. SFC/MS is also extremely effective for the direct monitoring and evaluation of engineering parameters pertinent to newly developing supercritical processes (e.g. coal conversion).

Surface Analytical Facilities, Naval Research Laboratory, Department of the Navy
See 0483

Surface Evaluation Facility, Naval Surface Weapons Center, Department of the Navy
See 0484

Surface Modification and Characterization Program, Oak Ridge National Laboratory, Department of Energy
See 0454

0777 Surface Science Center
Pacific Northwest Laboratory, Department of Energy
P.O. Box 999, Richland, WA 99352
Contact: Dr. M. Tom Thomas (509) 375-2757, or Dr. L. Schmid (509) 375-2559
FACILITY: A multiprobe analysis capability is available to perform experiments on free surfaces, solid-solid interfaces and solid-gas interfaces. The types of information obtained from the analytical equipment include atomic composition, three-dimensional atomic distributions and chemical forms (valence state) of the elements at the surface or interface. The surface science facility has four analytical instruments. Auger Electron Spectroscopy (AES) is used to identify elemental distribution on a surface layer and to develop compositional distribution along the surface and depth profiles. X-ray Photoelectron Spectroscopy (XPS), sometimes called Electron Spectroscopy for Chemical Analyses (ESCA) is used to determine surface composition and elemental chemistry (valence). Secondary Ion Mass Spectroscopy (SIMS) is used to detect elements, especially trace elements, in concentrations as low as 1 ppm. Rutherford Backscattering (RBS) and Nuclear Resonance Spectroscopy are used to provide absolute concentration measurements and nondestructive depth profiles. RBS is done with a 2 MEV Van de Graaf accelerator with p,d, 3HE and 4HE ions. Also a tandem accelerator is used with 15N for hydrogen analyses. It is possible to perform AES, XPS, and SIMS on one location on the specimen in the same apparatus without having to move the specimen.

Surfaces and Interfaces Laboratory, Solar Energy Research Institute, Department of Energy
See 0327

Thermophysical and Electronic Properties Information Analysis Center, Department of the Army
See 0486

0778 Underwater Sound Reference Measurements and Transducers
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: A service was established to provide acoustic calibration and test and evaluation of reference measurements on acoustic transducers and materials.

0779 Van de Graaff-ESR Spectrometer
Notre Dame Radiation Laboratory, Department of Energy
Notre Dame, IN 45556
Contact: Mr. Robert H. Schuler (219) 239-7502
FACILITY: The major objective of the laboratory is to study radiation effects--to obtain, through theoretical and experimental research, detailed descriptions of the mechanisms leading to chemical change following the absorption of high-energy radiation and light; and to construct predictive models that will be useful in experimental and technological applications where reactions are initiated by radiation chemical and photochemical methods. The coupled Van de

point source of x-rays. Temperatures of 70,000,000C and electric fields of one billion volts per centimeter can be generated utilizing an intense pulse of laser light focused onto a solid material. At these temperatures the solid material rapidly becomes a plasma. This point source plasma thus provides the necessary conditions for thermonuclear fusion or for the study of spectroscopy of highly ionized atoms, shock waves, laboratory astrophysics, or the fundamental physics of matter. An additional research opportunity is available for pulsed x-ray diffraction experiments by using the x-rays emitted from this laser-produced plasma. The high densities and temperatures of the plasma produce conditions for strong continuum or discrete x-ray line emission at a wavelength dependent upon the target material. The 24-beam, 12 trillion watt OMEGA laser system provides the main high power irradiation capability of the NLUF. A single-beam replica of OMEGA, the Glass Development Laser (GDL) is also available. The target areas at the NLUF allow users access to three separate chambers. The OMEGA target chamber is used for target interaction experiments with up to twenty four beams. GDL has two target areas. Support laboratories include the Target Fabrication Laboratory, the Optical Testing and Materials Laboratoties, the Optical Fabrication and Coating Laboratories, and the Computing Facility.

National Tritium Labeling Facility, Lawrence Berkeley Laboratory, Department of Energy
See 0623

Neutron Scattering Facility, Oak Ridge National Laboratory, Department of Energy
See 0673

0764 Non-Magnetic Facility
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. E.R. Williams (301) 921-3806
FACILITY: The non-magnetic building is located on an isolated area in the center of a 600-ft square buffer zone. The building is a three-story structure (ground level plus two stories) constructed of non-magnetic materials and contains a minimum amount of electrically conducting materials. Three-dimensional Helmholtz coils are available for cancelling the earth's magnetic field. Variations in the earth's field can be reduced by servo-ing to a magnetometer system in the magnetometer station located nearby. The facilities provide an environment where accurately known uniform magnetic fields can be applied to an experiment or where the earth's magnetic field strength and variations can be reduced a known amount. Currently the gyromagnetic ratio of the proton and the absolute ampere experiments are housed there.

Nuclear Material Measurement and Standards Laboratory, New Brunswick Laboratory, Department of Energy
See 0707

Pesticides Standards Distribution Program, Environmental Monitoring Systems Laboratory, Environmental Protection Agency
See 0414

0765 PHAROS II Glass Laser
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: The laser is a two-beam system which generates a total of approximately one kilojoule in a few nanoseconds. It is one of the country's leading facilities for the study of physical processes involved in laser plasma interaction and is used for the conduit of research on a laser fusion program.

Photovoltaic Devices and Measurements Laboratory, Solar Energy Research Institute, Department of Energy
See 0319

0766 Physical Chemistry and Instrumentation Laboratory
Eastern Regional Research Center, Agricultural Research Service, Department of Agriculture
600 E. Mermaid lane, Philadelphia, PA 19118
Contact: Mr. Robert L. Miller (215) 233-6623
EXPERTISE: The laboratory conducts basic and applied research across a broad spectrum of agricultural problems utilizing sophisticated instrumentation and chemical, physical, and mathematical techniques. It initiates new research and participates in programs of other research units through consultation and collaborative studies. Additionally, it serves as a resource in specialized areas of physical chemical expertise, complex instrumentation, and mathematical/computational assistance. Sections of this Laboratory include: Separations research; Biophysical research; and Surface chemistry.

0767 Physics Unit
Idaho National Engineering Laboratory, Department of Energy
P.O. Box 1645, Idaho Falls, ID 83415
Contact: Mr. Clyde R. Toole (208) 526-6316
EXPERTISE: Research and development emphasises experimental and analytical nuclear physics, reactor physics, radionuclide metrology, and nuclear instrumentation. Diverse capabilities based on this expertise include program development, technical assistance, experimental measurements, reactor physics calculations, and methodology development. Nuclear systems analyzed include a wide range of reactor types-pressurized water reactors (PWR), boiling water reactors (BWR), gas cooled reactors, fast-burst reactors, cavity reactors, materials test reactors, critical facilities, and fuel storage and processing systems. Comprehensive skills are maintained in all types of nuclear radiation dosimetry and spectrometry using state-of-the-art data acquisition and analysis systems. Nuclear electronics experience supports the mission of developing advanced techniques for the measurement of physical phenomena. This involves the development, design, and fabrication of a wide range of instruments, detectors, and measurement systems. Typical of these projects is the development of gamma-ray spectrometers and real-time data acquisition and analysis systems for on-line remote measurement and identification of radionuclides in nuclear plants under normal or accident conditions. Research programs are conducted in nuclear structure physics and radionuclide metrology.

0768 Pulsed Cable Test Facility
Argonne National Laboratory, Department of Energy
Fusion Power Program 9700 South Cass Avenue, Argonne, IL 60439
Contact: Dr. Suk H. Kim (312) 972-6567
FACILITY: The facility was designed to test the development of pulsed cable for ohmic heating coil development

FACILITY: High-pressure chemistry research systems have been designed which can be adapted quickly and conveniently to changing requirements. These facilities offer a versatile means of conducting high-pressure reactions. Safety of the experiments has been a major consideration in laboratory development.

0750 High Voltage Electron Microscope - Tandem Facility (HVEM)
Argonne National Laboratory, Department of Energy
9700 South Cass Ave., Argonne, IL 60439
Contact: Dr. A. J. Taylor (312) 972-5222
FACILITY: Unique combinations of the techniques of advanced high-voltage electron microscopy, ion implantation, ion bombardment, and ion-beam analysis are provided. The ion-beam interface permits direct microscopic observation of the effects of electron and ion bombardment on materials. The unique capabilities of this facility are being applied to a number of studies such as: radiation-induced segregation in steels; dislocation structures in silicon semiconductors; in situ radiation-induced phase changes, surface sputtering, ion implantation, deformation behavior of alloys, kinetics and morphology of oxidation, and basic studies of defects in solids.

Hydroacoustic Facility, Naval Surface Weapons Center, Department of the Navy
See 0358

Hydroacoustics Facility, Naval Weapons Support Center, Department of the Navy
See 0715

0751 Hydrodynamics Laboratory
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Wahsington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: Three tanks are available for research. They are a blow-down water channel for laboratory studies of flow generated noise as it pertains to towed acoustic arrays: a wind-wave tank for studies in the general field of fluid-structure interactions; and a stratified fluid towing tank for studies of coherent structures in turbulent flow.

In Vivo Bone Lead Assessment Facility, Brookhaven National Laboratory, Department of Energy
See 0540

0752 Infrared Information and Analysis Center (IRIA)
Department of the Navy
Envir. Research Inst. of Mich., P.O. Box 8618, Ann Arbor, MI 48107
Contact: Ms. Mildred F. Denecke (313) 994-1200
INFORMATION SERVICES: IRIA's mission is to collect, analyze, and disseminate information on infrared and electro-optical technology with emphasis on the military applications. The subject areas covered include: radiation sources emitting in the UV through IR regions; radiation characteristics of natural and man-made targets; optical properties of materials; detection materials, elements and arrays; lasers; image tubes and sensors; optical systems and components; detector coolers and electronics; atmospheric propagation including absorption, emission, scattering and turbulence effects; and search, homing, tracking, ranging, countermeasures, reconnaissance, and other military infrared and laser systems. It maintains a comprehensive library of technical information in the subject areas listed above, and publishes annotated bibliographies of its holdings, and responds to technical and bibliographic inquiries of qualified users.

0753 Ion Implantation and Ion Beam Analysis Facility
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: Experimental investigations are carried out involving the implantation of ions into the near-surface regions of solids and the concomitant changes in surface properties such as corrosion resistance, sliding wear resistance, fatigue resistance and optical and superconductivity characteristics. Since ion implantation is not subject to the laws of thermodynamics governing equilibrium conditions of solid solubility and diffusivity, it is possible to produce by ion implantation alloys that are not producible by conventional means. The ion beams are also used as probes in making materials analysis measurements of the near-surface implanted regions.

Iron-Free Magnetic Electron Spectrometer, Idaho National Engineering Laboratory, Department of Energy
See 0628

0754 Laser and Laser Spectroscopy Facilities
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Dr. Larry Blair (505) 667-6250
FACILITIES: Extensive, well-staffed, laser facilities are available which can provide laser output energy across the ultraviolet, visible, and infrared portions of the electromagnetic spectrum. There are tunable laser-pumped dye lasers; electrically discharges, rare-gas-excimer lasers; solid-state and semiconductor lasers; HF, CF4 and NH3 gas lasers, and both pulsed and continuous-wave CO2 lasers. Some of the latter attain powers as hish as one kilowatt at one kilohertz repetition rate. Various frequency-shifting and Raman scattering devices are available. Hardware and software are available to theoretically model the laser physics of ultraviolet and infrared systems and to study geometrical and physical optics, radiation transport, and propagation effects. There is a facility to fabricate and test optical components and a facility to evaluate optical materials - including the evaluation of optical damage under conditions of high reflectivity or transmission at high average or high peak powers.

0755 Laser-Based Optical Instrumentation
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Dr. Larry Blair (505) 667-6250
FACILITY: A variety of laser-based optical instrument systems have been and are being developed for point and remote detection and identification of chemical agents. These instruments rely on the selective reaction of the agents to lasers at various wavelengths. In experiments, concentrations below 10 parts per billion have been detected. Past efforts include remote detection of chemical agents and real-time monitoring of effluent gases. The techniques rely on modulated, tunable lasers having a wide range of wavelengths.

0756 Low Level Radionuclide Measurement Instrumentation
Pacific Northwest Laboratory, Department of Energy
P. O. Box 999, Richland, WA 99352

and constants. It also engages in research in atomic and molecular physics at the forefront of the field.

0736 Center for Applied Mathematics
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. Burton H. Colvin (301) 921-2541
EXPERTISE: The center conducts rsearch in selected fields of the mathematical sciences. Research includes: Mathemical methods including modern non-lenear theories of fluid mechanics, solid mchanics, and finite element methods; Numerical and combinatorial optimization; network analysis; mathematical economics; evaluation of algorithms both for numerical caluculations and for mini- and micro-processor based scinetific instrumentation; and develops and implements statistical quality control procedures for measurement operations and of statistical sampling procedures for monitoring and field inspection activities based on physical measurements and test methods.

Center for Chemical Engineering, National Bureau of Standards, Department of Commerce
See 0338

0737 Center for Chemical Physics
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. Pierre Ausloos (301) 921-2711
EXPERTISE: The following are carried out: develops standards and techniques of measurement, conducts theoretical and experimental research, and provides consultative services in the fields of thermodynamics, kinetics, surface science, and molecular spectroscopy; studies the chemistry and phsics of surfaces and the behavior of atoms and molecules on surfaces; determines the geometrical and electronic structures of surfaces as well as the energetics, kinetics and mchanisms of processes occurring on solid and liquid surfaces. Determines chemical rate constants, photochemical parameters, mechanisms of interaction and molecular parameters for technologically important chemical processes using both experimental and theoretical techniques; develops the general methodology and instrumentation for accurate calorimetry and chemical equilibrim measurements; develops methods for predicting and correlating thermodynamic properties of materials needed for industrial chemical processes; develops the methodology for accurate measurements on and interpretation of gaseous ionic processes; provides benchmark values for the ion thermochemical properties for research and development use in industrial, health, environmental and defense related areas; compiles and critically evaluates chemic thermodynamic, ion-energetic, and electrolyte data and applies advanced theoretical concepts to the anaalysis of spectra and to the use of spectroscopic data for determination of molecular properties such as dissociation energies, potential functions, dipole monents,and structures.

0738 Center for Radiation Research
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. Chris E. Kuyatt (301) 921-2551
EXPERTISE: The center carries out the following: Develops and maintains the scientific competences and experimental facilities necessary to provide the Nation with a central basis for uniform physical measurements, measurement methodology, and measurement services in the areas of optical radiation, ultraviolet radiation, and ionizing radiation (x-ray, gamma rays, electrons, neutrons, radioactivity, etc.); promotes the dissemination to Federal, state, and local regulatory bodies, and to the medical, industrial, and defense communities, of the measurement standards and a for the solution of problems in other government agencies, industry, and the public sector.

0739 Central Oil Identification Laboratory
Department of Transportation
U. S. Coast Guard, G-WPE-5 COIL, 2100 2nd Street, SW,
Washington, DC 20593
Contact: LCDR Richard D. Crane (202) 426-5140
EXPERTISE: This facility tests oil spill samples to determine the identity of spill sources. In carrying out this mission, it has developed an expertise in useful in comparing weathered and unweathered oil samples, some of which may contain contaminants.

0740 Cf-Plasma Desorption Mass Spectrometry
Argonne National Laboratory, Department of Energy
9700 South Cass Avenue, Argonne, IL 60439
Contact: Dr. J.E. Hunt (312) 972-3517
FACILITY: Access is offered to the 252Cf-plasma desorption mass spectrometer. The 252Cf-PDMS provides an instrument effective in the analysis of nonvolatile, thermally labile molecules of high molecular weight. The principle use has been to determine the molecular weights of nonvolatile biomolecules. Weak currents (2000/sec) of hundred MeV fission fragments from 252Cf- initiate the desorption-ionization process. The desorbed ions are accelerated and mass analyzed by the time-of-flight method. The desorption-ionization process occurs from a thin solid film of the analyte. 252Cf-PDMS has provided information in the mass range up to 15000 amu, a molecular weight range previously inacessible by conventional mass spectrometry. In addition to its purely analytical capabilities, research related to the particle induced desorption mechanism is possible.

0741 Chemistry and Metallography Laboratory and Instrumentation and Standards Laboratory
Energy Technology Engineering Center, Department of Energy
P.O. Box 1449, Canoga Park, CA 91304
Contact: Mr. K.T. Stafford (213) 700-5326
FACILITY: These laboratories provide analytical services and specialized technical consultation for all on-site test facilities and off-site engineering test programs. The Chemistry Laboratory is fully equipped to identify and characterize unknown materials, and to provide routine impurity analyses of test facility cover gas, sodium, and boiler feedwater. Gas chromatography, spectroscopy, and X-ray diffraction and fluorescence are some of the analytical methods employed. The Metallurgical Laboratory has a full complement of precision optical istruments for microstructure characterization including a computer-aided scanning electron microscope. The Instrumentation and Standards Laboratory maintains over 7000 instruments using on-site service, calibration, and repair capabilities. Working and transfer standards permit traceability of instrumented test data to the National Bureau of Standards. Typical standards maintained include, electrical, volumetric, pressure and flow, linear, time and temperature. A computerized system provides inventory control, calibration recall interval monitoring, and instrument failure trend analyses by type and manufacturer.

Coal Gasification, Morgantown Energy Technology Center, Department of Energy
See 0294

rent predictions: Much of the physical oceanographic information produced by the office, such as predictions of the times and heights of the tides and description of tidal currents, is absolutely vital to safe navigation by both recreational and commercial navigators. These data and information are also used for a variety of non-navigational purposes. They provide the scientific basis for offshore oil and natural gas exploration, dredging operations, coastal and offshore construction, seafloor mining, emergency planning by coastal communities, waste disposal management, and in protecting the marine environment from the adverse effects of ocean and coastal pollution. Ocean assessments: The office conducts studies to assess the environmental effects of human activities in U.S. coastal and estuarine waters, and provides the leadership and expertise at the Federal level that are required to identify compatible multiple uses of marine resources and potentially conflicting uses of these resources. A wide range of strategic assessments of ocean resources, coastal and estuarine assessments, and ocean use impact assessments, in the form of reports, atlases, data bases, and models, are available. Ocean thermal energy conversion: The office maintains a special projects staff to perform ocean engineering work in support of National Oceanic and Atmospheric Administration programs. Currently the staff is working on the development of ocean thermal energy conversion, commonly called OTEC. The staff is developing an information base to guide future development of OTEC conversion technology, including ultimately the construction of commercial ocean thermal energy conversion plants.

0728 Pacific Marine Environmental Research Laboratory
National Oceanic and Atmospheric Administration, Department of Commerce
NOAA Environmental Research Laboratories, Seattle, WA 98115
Contact: Dr. Eddie Bernard (206) 527-6239
EXPERTISE: As an interdisciplinary research laboratory, scientific investigations are carried out in oceanography, marine meteorology, and allied disciplines. Its mission is to assist NOAA and other Federal agencies by conducting research directed toward understanding processes in coastal and open-ocean systems. The current research programs focus on four general subjects: climate, marine environmental assessment, marine observation and prediction, and marine resources. Research results provide information necessary for effective management of marine assets and improved marine environmental forecasting. Two cooperative institutes, the Joint Institute forStudy of the Atmosphere and Ocean (JISAO) and the Joint Institute for Marine and Atmospheric Research (JIMAR), established between NOAA and the Universities of Washington and Hawaii, respectively, provide a bridge between the academic community and laboratory scientists working in such areas as climate dynamics, estuarine processes, tsumamis, equatorial oceanography, and environmental chemistry.

Satellite Applications Laboratory, National Oceanic and Atmospheric Administration, Department of Commerce
See 0182

Satellite Data Services Division, National Oceanic and Atmospheric Administration, Department of Commerce
See 0261

Satellite Experiment Laboratory, National Oceanic and Atmospheric Administration, Department of Commerce
See 0184

Underwater Sound Reference Measurements and Transducers, Naval Research Laboratory, Department of the Navy
See 0778

PHYSICAL SCIENCES

Acoustic Anechoic Chamber, National Bureau of Standards, Department of Commerce
See 0332

0729 Acoustic Characteristics Facility
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILILTY: The characteristics facility consists of 40' x 30' x 27' deep pool and asociated electronics. Both basic and applied research programs in acoustic scattering are carried out in the facility. Targets range from simply shaped bodies, such as spheres and cylinders, to bodies which represent more immediate Navy interest. Data collection, analysis, and display are under the control of a PDP 11/34 computer. A Biomation Model 8100 analog to digital converter is used to obtain the target echoes in digital form, and these are stored in the PDP 11/34 computer memory. Programs have been written which enable a variety of analysis and display techniques to be aplied to the data. Examples include target strength vs aspect in polar form, reflected pressure vs frequency for a particular aspect, and various other means of time and frequency analysis.

Acoustic Facility, Naval Surface Weapons Center, Department of the Navy
See 0333

0730 Acoustic Reverberation Chamber
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. I. Pallett (301) 921-3607
FACILITY: The chamber is a vibration-isolated, shell-within-shell type structure of massive reinforced concrete construction with inside dimensions of 9.14 X 7.62 X 6.10 meters. The chamber is equipped with a unique set of adjustable, variable speed, rotating a unique set of adjustable, variable-speed, rotating vanes to improve the diffusion of the sound field. The chamber is designed to provide a highly diffuse sound field in the frequency range 100 to 4000 Hz, and to permit reasonably accurate acoustical measurements to be made at frequencies as lo as 80 Hz and as high as 10,000 Hz. The wide-band ambient noise level in the chamber with the vanes stationary is about 30 dB. The chamber generally is used for measurement of sound power output of noise and sound sources (e.g., machinery, appliances, loudspeakers, sirens) sound absorption of architectural materials (e.g., acoustical tile, carpeting, drapery) random incidence calibration of sound level meters, microphones and noise exposure meters, and human response to noise.

0731 Acoustical Thermometer
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. J.F. Schooley (301) 921-2801
FACILITY: The instrument is a standing wave ultrasonic interferometer that operates at principally 1 megahertz. It is employed to determine values of temperature between 2

0717 Marine Research Laboratory
Pacific Northwest Laboratory, Department of Energy
P.O. Box 999, Richland, WA 99352
Contact: Dr. B. E. Vaughan (509) 376-3602, or Dr. L. Schmid (509) 375-2559
EXPERTISE: The research facility provides wet chemistry, and bioenergetics laboratories, as well as mobile laboratories for offsite analysis, for studies to determine the fate of contaminants in the marine environment. The studies also examine whether, when, and how pollutants become available to fish and shellfish. Identifying and preventing disease in marine and freshwater species is another concern. A multidisciplinary staff has expertise in animal pathology, microbiology, immunology, analytical chemistry, and animal physiology and biochemistry.

0718 Marine Sciences Research Center
Environmental Protection Agency
University of Rhode Island, Kingston, RI 02881
Contact: Mr. Morris Altschuler (202) 382-7667
EXPERTISE: A major effort in being undertaken in ecological science directed towards increasing our ability to understand and manage coastal marine ecosystems in a realistic manner. Of the many substances discharged into coastal marine waters, little is known about their biological effects, and little about where they go, through what biological or chemical pathways, and what are their ultimate fates.

Meteorological Development Division, National Meteorological Center, National Oceanic and Atmospheric Administration, Department of Commerce
See 0169

National Environmental Data Referral Service, National Oceanic and Atmospheric Administration, Department of Commerce
See 0443

0719 National Oceanographic Data Center
National Oceanic and Atmospheric Adminstration, Department of Commerce
National Environmental Satellite, Data and Information Service, 2001 Wisconsin Avenue, NW, Washington, DC 20235
Contact: Mr. Albert Bargeski (202) 634-7500
INFORMATION SERVICES: NODC is the United States national facility established to acquire, process, archive, and disseminate global oceanographic data. NODC's digital data bases include data collected by Federal, State, and local government agencies; universities and research institutions; and private industry. It also acquires data from foreign sources and operates World Data Center A for Oceanography, a part of the World Data Center systems that facilitates international exchange of scientific data. NODC holds physical, chemical, and biological oceanographic data. Global, deep-ocean data bases include: (1) oceanographic station data--measurements of temperature, salinity, oxygen, phosphate, phosphorus, nitrite, nitrate, silicate, and pH at the surface and serial depths; (2) temperature-depth profiles from expendable and mechanical bathythermographs; and (3) surface current (ship drift) data. In addition, NODC holds environmental assessment data collected primarily on the U.S. outer continental shelf to support studies of the effects on marine ecosystems of offshore development. These data include: (1) winds, waves, and ocean surface data from automated buoys; (2) current meter data; (3) measurements of hydrocarbons, metals, and other pollutants and toxic substances; and (4) data on marine organisms, including plankton, benthos, and marine birds and mammals. Services include: data inventory searches; data products tailored to user specifications, e.g., selective retrieval and formatted output and other computer-generated data summaries, analyses, and graphic displays; publications, including the NODC User's Guide, Mariners Weather Log, NODC annual report, marine atlases, the special data catalogs and inventories; data referral services; and general marine science information.

0720 National Sea Grant College Program
National Oceanographic and Atmospheric Administration, Department of Commerce
Office of Oceanic and Atmospheric Research, 6010 Executive Blvd., Rockville, MD 20852
Contact: Mr. Robert Wildman (301) 443-8925
INFORMATION SERVICES: Access is provided to the project summary information of all the projects and publications funded by the National Sea Grant College Program, a partnership of government, universities, and industry working for sound economic development and appropriate use of the U.S.'s marine and coastal resources, including those of the Great Lakes. These projects include results of basic biological research, oceanographic studies, fishery engineering, and marine industry technology improvements.

Naval Civil Engineering Laboratory, Department of the Navy
See 0801

0721 Naval Ocean Research and Development Command
Department of the Navy
CODE 115, NSTL Station, Bay St. Louis, MS 39529
Contact: Mr. George Stanford (601) 688-4790
EXPERTISE: Broadly based research and development are carried out in ocean science and technology, with emphasis on understanding ocean processes-through measurement and analysis-and the effects of the ocean environment on Navy systems and operations. The areas of current research program interests include: the study of ocean circulation; the Arctic environment; the development of remote sensing techniques to acquire environmental data; the development of theoretical models of ocean environmental parameters; behavior of underwater sound in the dynamic ocean environment; the ocean crust and overlying sediments are studied to determine their acoustical, physical and engineering properties; the study of the properties of oceanic rocks; the sources of marine gravity and magnetic anomalies; prediction of ocean environmental and acoustical phenomena employing computerized mathematical models to simulate the ocean environment and underwater sound propagation; ocean instrumentation systems, with emphasis on in-situ sensors and associated structural components and telemetry; and research, development, testing and evaluation to advance cartographic techniques, and to develop improved techniques for acquiring survey data.

0722 NOAA Data Buoy Center
National Oceanic and Atmospheric Administration, Department of Commerce
National Weather Service, NSTL Station, MS 39529
Contact: Dr. Robert Erickson (601) 688-2822
EXPERTISE: The center is involved in the development, testing, deployment, maintenance and operation of ocean and land-based oceanographic and meteorological data collection platforms, systems, and sensors. Activities have

0706 Nuclear Fuels Laboratory
Pacific Northwest Laboratory, Department of Energy
P.O. Box 999, Richland, WA 99352
Contact: Dr. Patrick E. Hart (509) 375-2906, or Dr. L. Schmid (509) 375-2559
FACILITY: The laboratory is uniquely designed and equipped for developing and fabricating U02, U02-Th02 and Th02 nuclear fuels for special tests and experiments related to reactor safety and improved fuel performance. Fuel pellets can be fabricated in a variety of shapes including dished, annular, and slotted and irradiated in rods and assemblies engineered and fabricated in the laboratory. The laboratory has also been used to fabricate complex instrumented fuel assemblies. Assembly instrumentation has included transducers for measuring fuel rod elongation, fuel rod internal pressure, rod power, and pressure loss on cladding breach; as well as internal and external thermocouples for measuring cladding and fuel temperatures.

0707 Nuclear Material Measurement and Standards Laboratory
New Brunswick Laboratory, Department of Energy
9800 S. Cass Ave., Argonne, IL 60439
Contact: Dr. Carleton D. Bingham (312) 972-2446
SERVICES: The laboratory is an essential part of Federal responsibilities related to national and international safegaurds of nuclear materials for national defense and energy programs. It has an ongoing capability for: the development, certification and distribution of reference materials for the calibration and standardization of nuclear materials measurement technology through extensive interlaboratory comparison of measurements by Government and private laboratories engaged in handling nuclear material; technology exchange and training in nuclear measurement; and highly accurate and precise measurements of a broad variety of nuclear and related materials. NBL specializes in the measurement science and analytical chemistry of nuclear and related materials.

0708 Nuclear Reactor Safety Research Data Bank
Idaho National Engineering Laboratory, Department of Energy
P.O. Box 1625, Idaho Falls, ID 83415
Contact: Mr. Tom Laats (208) 526-9507
INFORMATION SERVICES: This service collects, stores, and makes available data from the many domestic and foreign water reactor safety research programs. Users can access data for safety code development and code assessment. The administrative portion of the service provides data entry, documentation, training, and advisory services to users and the NRC.

0709 Nuclear Safety Information Center
Oak Ridge National Laboratory, Nuclear Regulatory Commission
P.O. Box Y, Bldg. 9711-1, Oak Ridge, TN 37830
Contact: Mr. Joel Buchanan (615) 574-0391
INFORMATION SERVICES: The general scope of the center encompasses all types of nuclear facilities and rectors-from water cooled to liquid fast breeders-as well as the associated fuel cycle, nuclear materials, and related considerations such as operating experience and siting. The range of subject topics runs from general safety considerations, accident analysis, and safety features, to environmental surveys, monitoring, and transportation of radioactive material. Services include consultation with staff specialists, access to the center for use of documents, retrospective searches of computerized file, technical inquiry service, and the technical progress review Nuclear Safety.

Physics Unit, Idaho National Engineering Laboratory, Department of Energy
See 0767

0710 Power Burst Facility Reactor
Idaho National Engineering Laboratory, Department of Energy
P.O. Box 1625, Idaho Falls, ID 83415
Contact: Mr. R. E. Tiller (208) 526-1439
FACILITY: This facility is centered around a light water moderated reactor designed for up to 28 MW steady state or 270 GW burst operation in fuels research work. The high neutron flux region is a right circular cylinder about 0.2 meters in diameter and 1 meter long. Experiments are conducted within a high pressure central in-pile tube connected to an external loop. Heated, high pressure water is circulated through the loop and external equipment allows the generation of the specific environment to meet a wide variety of test conditions. A natural burst yields about 7 x 10 to the 17th hv peak neutron flux and a minimum asymptotic period of 1 ms. Reactor controls allow a variety of flux pulse shapes. A wide assortment of instrumentation is used to record the experiment conditions and results with a high capacity data collection and display system.

0711 Reactor Seismic & Elevated Temperature Structural Design
Hanford Engineering Development Laboratory, Department of Energy
P. O. Box 1970, Richland, WA 99352
Contact: Mr. L. K. Severud (509) 376-5276
EXPERTISE: Experience is available in the following areas: long life core elements, components and piping operating in high temperature (creep), cyclic loaded, irradiated environments; non-ductile failure and crack growth fracture mechanics; transient dynamics, vibrations, and seismic; fatigue and creep life predictions; and computer aided design.

Small Components Test Loop(SCTL), Energy Technology Engineering Center, Department of Energy
See 0375

Sodium Components Test Installation(SCTI), Energy Technology Engineering Center, Department of Energy
See 0376

Sodium Pump Test Facility(SPTF), Energy Technology Engineering Center, Department of Energy
See 0377

Static Sodium Test Rigs, Energy Technology Engineering Center, Department of Energy
See 0379

0712 Thermal Hydraulics Experiment Facility
Idaho National Engineering Laboratory, Department of Energy
P.O. Box 1625, Idaho Falls, ID 83415
Contact: Mr. R.E. Tiller (208) 526-1439
FACILITY: Two systems are available. The Two-Phase Flow Loop (TPFL) is a large, high-temperature, steam-water test system. The loop consists of four large steam-supply vessels that produce steam by centrifugal pump, a water-metering section, a steam-separator, and associated pressure and flow control valves. The Blowdown Loop is an experimental system designed for instrument and component

Energy Technology Engineering Center (ETEC), Department of Energy
See 0301

0694 Fast Flux Test Facility
Hanford Engineering Development Laboratory, Department of Energy
P. O. Box 1970, Richland, WA 99352
Contact: Mr. W. R. Wykoff (509) 376-0758
FACILITY: This is a 400 MWt sodium-cooled, low pressure, high temperature, fast neutron flux nuclear fission reactor plant designed and constructed for irradiation testing of breeder reactor fuels and materials. The reactor provides extensive capability for in-core irradiation testing, including eight core positions that may be used with independent instrumentation for the test specimens.

0695 Felix - Fusion Electromagnetic Induction Experiment
Argonne National Laboratory, Department of Energy
9700 South Cass Avenue, Argonne, IL 60439
Contact: Dr. Richard E. Nygren (312) 972-4836
FACILITY: FELIX is an experimental test facility for the study of electromagnetic effects in the first wall, blanket, shield (FW/B/S) systems of fusion reactors. FELIX provides a steady solenoidal field of 1.0 Telsa(T) and a pulsed vertical field of 0.5 T. with the capability, through an upgrade to boost these fields to 4 T and 1 T respectively. The experimental program in FELIX plus the associated efforts to develop and verify computer codes is part of the Blanket Technology Program. The goal for the experimental program utilizing FELIX is a design data base including a set of computer codes verified by FELIX data and suitable for accurately predicting electromagnetic effects FW/B/S systems.

0696 Fuel System Information Center
Hanford Engineering Development Laboratory, Department of Energy
P. O. Box 1970, Richland, WA 99352
Contact: Mr. F. R. Shober (509) 376-0870
INFORMATION SERVICES: The mission of the center is to provide nuclear engineers and scientists with a broad base of engineering and mechanical properties data on reactor nuclear fuels and cladding materials, and maintain a central data source of materials performance from irradiation tests on experimental mixed oxide fuel elements and FFTF (Fast Flux Test Facility) driver fuel elements. It contains a computerized data base of about 20 reels of magnetic tape and 180 reels (about 360,000 pages) of 16 mm microfilm containing cladding fabrication data, fuel pin fabrication data, mechanical properties, irradiation history data, postirradiation examination results, transient irradiation tests, breached cladding, and data on manufacture of mixed oxide fuel pins for the FFTF.

0697 Hanford - Critical Mass Laboratory
Pacific Northwest Laboratory, Department of Energy
P. O. Box 999, Richland, WA 99352
Contact: Dr. Duane Clayton (509) 373-2404 or Dr. L. Schmid (509) 375-2559
FACILITY: The laboratory is designed for obtaining criticality data (especially on plutonium bearing systems) for prevention of nuclear criticality accidents in the nuclear fuel cycle. It is the only facility now operational in the U. S. wherein such experiments with plutonium solutions have been performed. Some two thousand different critical experiments have been performed. These include a wide variety of measurements on various forms of plutonium and uranium ranging from aqueous homogenous solutions, to solids, to heterogeneous lattice assemblies of fuel rods in water, including experiments on the criticality of interacting arrays and experiments on fuel rods immersed in solutions of fissionable material.

Hanford Engineering Development Laboratory, Department of Energy
See 0793

Hanford Thermal Hydraulics Laboratory, Pacific Northwest Laboratory, Department of Energy
See 0350

0698 High Burnup Effects Program
Pacific Northwest Laboratory, Department of Energy
P.O. Box 999, Richland, WA 99352
Contact: Mr. M.D. Freshley (509) 375-2530 or Dr. L. Schmid (509) 375-2559
EXPERTISE: The program evaluates effects of extended use of burnup of light water reactor fuel. Emphasis is on changes in fuel microstructure and fission gas release as a result of the extended use. An earlier problem that was solved involved irradiation induced fuel densification - a fuel performance problem that affected reactor operation. This technical resource is also available for solutions to other difficult nuclear fuel technical problems. Usually the studies involve numerous firms that work together and share the costs and benefits of the research.

0699 Hot Cell Facilities
Argonne National Laboratory, Department of Energy
9700 South Cass Ave., Argonne, IL 60439
Contact: Associate Lab. Director (312) 972-2000
FACILITIES: Two hot cell facilities are available. The Alpha-Gamma Hot Cell Facility (AGHCF) is equipped for in-depth postirradiation examination of reactor fuels and materials. In addition to reactor fuel elements, the AGHCF is capable of examining a wide range of other materials, such as fuel cladding, small test components and structural materials. The cell contains two levels of atmospheric control, providing inert areas for destructive as well as nondestructive examination of fuels and materials. The Building 200 Hot Cell Facility houses 12 isolated hot laboratories, providing exp erimental flexibility within one main cell complex. Magnetite concrete walls, 1.2 m (4 ft) thick, shield against 1 million curies of 1 MeV gamma radiation. The laboratory is equipped with two highly sensitive electron microprobes and with the world's first ion microprobe used in irradiated materials work.

0700 Hot Cell Facilities
Hanford Engineering Development Laboratory, Department of Energy
P. O. Box 1970, Richland, WA 99352
Contact: Mr. J. M. Lott (509) 376-3779
FACILITY: Three hot cell facilities, the Postirradiation Testing Laboratory. The Shielded Materials Facility and the Shielded Analytical Laboratory are available. The hot cell facilities provide a wide range of capabilities for post-irradiation examination and testing of irradiated reactor fuels and structural materials to evaluate irradiation tests and determine failure mechanisms and effects of irradiation on physical and mechanical properties of reactor core components. Current functions performed include nondestructive examinations, destructive examinations, fabrication of test specimens from reactor core components, fabrication of reactor

a variety of pulsed beam modes. Momentum analyzed beams can be supplied to any of six ports in a low scattering environment or to a single port in a heavily shielded room. Protons and deutrons are the ion species routinely accelerated. Applications include: Standard neutron cross section measurements, neutron flux standards, neutron experiments involving time of flight, neutron capture cross section measurement, fast neutron activation analysis, neutron dosimetry, radiation damage studies, charged particle studies.

0678 Positron-Electron Storage Ring (PEP)
Stanford Linear Accelerator Center, Department of Energy
2775 Sand Hill Rd., Menlo Park, CA 94025
Contact: Dr. L. P. Keller (415) 854-3300
FACILITY: PEP is a Positron-Electron collider with a maximum energy of 18 GeV per beam with an average luminosity of 3 x 10 to the 30th. It has six interaction regions five of which have large experimental halls to accommodate the large detectors used in this field of research. Each interaction region is occupied by a large detector.

0679 Pulsed Electron Linac
Argonne National Laboratory, Department of Energy
9700 South Cass Ave., Argonne, IL 60439
Contact: Dr. George Mavrogenes (312) 972-4893
FACILITY: The Linac is a pulsed L-band linear accelerator with a no-load energy of 22 MeV. It is used primarily in the Chemistry Division's Radiation Chemistry Program. A beam transport/analyzing system is available. As a result of a new development in the injector, the charge of the picosecond pulse has been dramatically increased (from 8 to 40 nC) or 30 ps and 1250 amps.

0680 Radiation Instrument Calibration
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Mr. Robert Scarlett (505) 667-5127
FACILITY: Six vertical shielded tubes are available of which three contain 60Co, one 226Ra, and one 239 Pu-Be neutron sources, mounted on elevator mechanisms. The sixth tube is for experimental source use. The gamma sources, which range from 2mCi to over 200 Ci, produce exposure rates of from 0.145 mR/h to 1692 R/h. Effective neutron fluxes of from 1.5 to 1250 mRem/h are available, depending on the type of instrument being calibrated. Details of the construction and calibration of the fcility and methods used for calibration of levels are traceable to the National Bureau of Standards.

Radiographic Facility, Naval Surface Weapons Center, Department of the Navy
See 0480

0681 SLAC Electron Linear Accelerator
Stanford Linear Accelerator Center, Department of Energy
2575 Sand Hill Rd., Menlo Park, CA 94025
Contact: Dr. L. P. Keller (415) 854-3300
FACILITY: The center operates a 2-mile-long linear electron accelerator that can produce intense beams of electrons at energies up to 22 billion electron volts (GeV), or of positrons with energies up to 15 GeV. SLCA carries out experimental and theoretical research in high energy physics, and also developmental work in new techniques for particle acceleration and for experimental instrumentation. The center is operated as a national facility, available to any qualified user in the United States and overseas; experiments are accepted on the basis of their scientific merit.

0682 SPEAR
Stanford Linear Accelerator Center, Department of Energy
2575 Sand Hill Rd., Menlo Park, CA 94025
Contact: Dr. L. P. Keller (415) 854-3300
FACILITY: This is a 4.0 GeV positron-electron storage ring. It has two interaction regions where detectors may be installed for high energy physics experiments. Since 1972, experimental work at SPEAR and at the similar German storage ring, DORIS, has established much of the fundamental physics in this energy region. Experimental physics areas under way at SPEAR are the F meson, charmed bayrons, the psi family, D mesons, the tau lepton, the total hadronic cross section in the 4-5 GeV regin and the total hadronic cross section above 5 GeV.

0683 SuperHILAC
Lawrence Berkeley Laboratory, Department of Energy
University of California, Berkeley, CA 94720
Contact: Dr. Richard McDonald (415) 486-6476
FACILITY: Ions from carbon (12 atomic mass units (AMU) to uranium (238 AMU) are accelerated to energies up to 8.5 million electron volts (MeV) per AMU at the SuperHILAC. The research program focuses on discovery and evaluation of new elements with more than 100 protons; investigation of equilibration in very heavy systems via deep inelastic scattering; and measurement of band structure and properties of very high spin states in very heavy nuclei; and atomic physics, the study of behavior at the atomic rather than the nuclear level. Some exploration is done in the field of semiconductor ion implantation.

0684 Thermal Source Reactor
Argonne National Laboratory, Department of Energy
9700 South Cass Avenue, Argonne, IL 60439
Contact: Mr. R. J. Armani (312) 972-8101
FACILITY: Thermal neutrons are provided for detector calibration purposes and experimental development in support of the Zero Power Reactors. The reactor is a highly enriched, light-water-moderated thermal reactor. Movable shielding allows complete access to one face (leakage face) of the core. There is ready access to the central and two peripheral core locations, and it is possible to measure samples with small reactivity effects in these locations. A rabbit tube allows a small sample to be pneumatically driven from the control room into the center of the core, where thermal neutron fluxes of up to 6.5 x 10 to the 11th n/sq cm-sec are available.

0685 Van de Graaff (3-MeV)
Argonne National Laboratory, Department of Energy
9700 South Cass Ave., Argonne, IL 60439
Contact: Dr. Jack Aron (312) 972-4895
FACILITY: The 3-MeV Van de Graaff has an energy range 0.3--3.0 meV. It is used in studies of magnetic effects in reactions of radicals generated by pulse radiolysis and in ultra-fast EPR spectroscopy to study short-lived radical species and the products of those transient intermediates examined by NMR spectroscopy. A multi-port beam-transport system is available. This accelerator is operated in either a DC or a pulsed mode.

0686 Van de Graaff Accelerator (2 MEV)
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744

FACILITY: Basic research is conducted on condensed matter in the areas of neutron scattering and radiation effects. Neutron scattering is used to study the static and dynamic structures of crystals, glasses, and liquids; voids and defects in solids; structural transformations associated with magnetic, crystallographic, and electronic phase changes; spin waves and magnetic structures in solids; and structural arrangements in surface-absorbed films, in polymers, and in biological materials. Radiation-effects studies include fast-neutron damage production and annealing at low (4 K) and high temperatures, mechanical properties, microstructural changes, defects in semiconductors, and radiation effect in fusion-magnet materials.

0664 Intermediate-Energy Standard Neutron Field (ISNF)
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. James A. Grundl (301) 921-2421
FACILITY: This facility provides a primary standard neutron field with a smoothly varying energy spectrum that may be accurately calculated. The energy range of the neutron spectrum-95% of the spectrum is between 2 keV and 5 MeV-is just that of core neutrons in presently conceived U.S. fast breeder reactors. The system, which is operated in the thermal column of the NBS rector, is one of several energy-distributed, fast neutron fields developed by the NBS Neutron Standards Program. Total flux intensity is about 10 to the 9th n/sq cm xs. Two general kinds of applications are planned for the ISNF: (1) measurement of absolute and relative integral reaction rates for breeder reactor development; (2) calibration of various types of neutron detectors important for nuclear technology.

0665 Ion Beam Research Facilities
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Dr. Joseph R. Turner (505) 667-5211
FACILITIES: Ion accelerators provide highly collimated and energy resolved beams with energy variable from 20 keV to 25 MeV by means of a complex of three accelerators. These include: A large 7 million volt (MV) single ended Van de Graaff accelerator which delivers positive or negative light ions and negative heavy ions to two floors of experimental area totaling 6000 square feet with 10 beam lines; A 9 MV Model FN tandem Van de Graff accelerator with 6 independent ion sources serving 11 experiments positions covering 7000 square feet; and A low energy (10-120 KV), highly stable accelerator of the hydrogen isotopes. Experiments have been conducted in nuclear physics, nuclear data measurements, materials sciece, surface science and analytical chemistry. The two Van de Graaffs can be operated in series with the single ended machine injecting negative ions into the tandem giving three stages of acceleration. This yields an energy of 25 MeV for a singly charged ion and much higher energies for multiply charged heavy ions. The acceleration of trions in all three accelerators is the house specialty, including polarized tritons from the tandem. Carbon-14 is accelerated in both Van de Graffs. A wide spectrum of experimental equipment is available including a Q3D magnetic spectrograph, scattering chambers and a nuclear microprobe.

0666 JANUS Neutron Reactor and Gamma Ray Irradiation Facilities
Argonne National Laboratory, Department of Energy
9700 South Cass Ave., Argonne, IL 60439
Contact: Dr. Thomas E. Fritz (312) 972-7428
FACILITY: The reactor is a light water moderated 235U nuclear reactor developed specifically for the delivery of fission-spectrum neutrons under highly controlled and calibrated conditions for radiobiological research. Typical applications include: basic radiobiological research exposing mammalian or bacterial cell cultures and small tissue specimens over a wide range of doses or dose rates; acute and low level radiation toxicology studies using large numbers of small rodents; and applied radiation dosiemtry research and dosimeter calibrations. The system operates in a stable manner between 20 watts and 200 kilowatts to provide at least 10,000 range of dose rates. The gamma ray facilities have similar applications for radiobiological research but also include live in quarters that provide the opportunity for continuous irradiation of animals ranging in size from small rodents to dogs.

0667 Linear Electron Accelerator (LINAC)
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. C. D. Bowman (301 921-2234
FACILITY: The linear accelerator (linac) facility was designed for maximum flexibility, beam quality, and beam handling to satisfy the needs of a large variety of programs. It is a high-intensity source of electron, photon, and neutron beams with excellent stability and definition. It's energy is continuously variable (10 to 150 MeV). Applications include: Neutron total cross section measurements by time of flight (above-ground facility); neutron fission yields; neutron flux standards; neutron capture cross sections; fast neutron activation analysis; electron and photon dosimetry; pulsed radiolysis of biochemical systems; electron scattering; electrodisintegration of light nuclei; photonuclear physics with monoenergetic and polarized photons; photon activation analysis; dosimetry and dose distribution using radiochromic dyes; electron and photon beam measurement standards; production of radioactive sources.

0668 Mobile Cable X-Ray Facility
Brookhaven National Laboratory, Department of Energy
Accelerator Department, Building 815, Upton, NY 11973
Contact: Mr. E. B. Forsyth (516) 282-4676
FACILITY: An X-ray facility mounted in a van can be brought directly to a site to x-ray high voltage insulated electric power cables. This fine focus x-ray can be used as a non-destructive testing procedure to locate faults in the lapped insulation.

0669 National Synchrotron Light Source
Brookhaven National Laboratory, Department of Energy
Upton, NY 11973
Contact: Dr. Roger W. Klaffky (516) 282-4974
FACILITY: This source is designed to provide the world's brightest continuous sources of X-ray and UV radiation. It is also the first X-ray facility in the United States dedicated for use as a synchrotron light source. There is a 750 MeV, one Ampere storage ring with 16 ports for VUV and IR research. It incorporates a unique Free Electron Laser designed to be a narrow-band continuously tunable, UV source of average power in the one to several watt range. The 2.5 GeV, 0.5 Ampere X-ray storage ring has 28 ports. Each of the 16 VUV and 28 X-ray ports are divisible into two or three individual beam lines.

0670 Neutral Beam Engineering Testing Facility (NBETF)
Lawrence Berkeley Laboratory, Department of Energy
University of California, Berkeley, CA 94720

Contact: Mr. Jack Aron (312) 972-4895
FACILITY: The cyclotron is a fixed-frequency machine capable of producing beams up to 100 micro A or more of protons up to 10.6 MeV, helium-3 up to 33.9 MeV, deuterons up to 21.1 MeV, and helium-4 up to 42.8 MeV. Neutron fluxes exceeding a median energy of 8 MeV can also be produced. This cyclotron is especially suitable for isotope production (primarily for nuclear-medicine and waste-management studies) and radiation-damage studies.

0649 Cyclotron, 88-inch
Lawrence Berkeley Laboratory, Department of Energy
University of California, Berkeley, Ca 94720
Contact: Dr. Robert G. Stokstad (415) 486-5088
FACILITY: The cyclotron is a multipurpose national facility consisting of a sector-focused cyclotron for both heavy and light ion beams. It has an atomic-beam polarized ion source capable of providing microamperes of polarized protons and deuterons. Heavy ion beams are provided by an internal Penning Ion Gauge source. The maximum energy for protons is 55 million electron volts (MeV) while the energy constant for heavy ions is 160 MeV. The cyclotron delivers beams to a wide variety of experimental apparatus including a new, large volume scattering chamber; a high resolution magnetic spectrometer system; a time-of-flight arm; high radioactivity cave; and an on-line, recoil atom mass analyser (RAMA) for the study of exotic nuclei. Two ModComp computers are available for data acquisition and off-line analysis. The basic research program is focused on nucleon systems, investigation of heavy ion reaction mechanisms, production and study of exotic nuclei far from stability, and structure of nuclei at high angular momentum. In addition to the above, the cyclotron provides a beam for the application of nuclear techniques to other areas of research including biology and medicine, and the study of cosmic-ray damage to satellite electronic components.

0650 Double MP Tandem Accelerator Facility
Brookhaven National Laboratory, Department of Energy
Upton, NY 11973
Contact: Dr. O. C. Kistner (516) 282-3991
FACILITY: This facility consists of two upgraded model MP Tandem Van de Graaff accelerators, four target rooms, a large variety of experimental equipment, and a time sharing computer system for data collection and analysis. The accelerators can be used individually or in two different coupled modes. A wide selection is available of light and heavy ion DC and pulsed beams. Up to now, 55 isotopes of over 40 different elements have been accelerated, ranging from protons to uranium. The beam quality is excellent with beam spot areas typically smaller than 1 sq m m. The energies are continuously variable and precisely known. The maximum energies are obtained in one of the coupled modes. The combination of these two accelerators provides beams roughly equivalent to the beams that could be obtained from a single 19 or 20 MV tandem accelerator. The largest fraction of the beam time is used for nuclear physics research, but there are also important programs in atomic and molecular physics. Applications of interest for solid state physics, plasma physics and biology are also possible. Recently, a new and unique 'accel-decel' capability has been developed to generate highly stripped heavy ions at very low energies such as fully stripped sulphur at 5 MeV.

0651 Dynamitron Electron Accelerator
Brookhaven National Laboratory, Department of Energy
Upton, NY 11973
Contact: Dr. C. L. Snead (516) 282-3502
An electron beam can be routed to any of four target rooms for radiation damage or other materials-science or chemistry experiments. Experimental apparatus for collaborative research includes cryostats, resistivity, internal-friction, and positron-annihilation apparatus. Electron energy of 0.4 to 2.5 MeV is available.

0652 Dynamitron Facility (4-MV)
Argonne National Laboratory, Department of Energy
9700 South Cass Ave., Argonne, IL 60439
Contact: Dr. B. J. Zabransky (312) 972-4044
FACILITY: A wide variety of experimental systems for ongoing research programs in charged-particle physics occupy most of beam lines. A 2-ton crane services the target area, and an on-line PDP 11/45 computer with a variety of hardware and software is available. Some of the principal parameters are: Beams-- atomic or molecular ions of many species; Ion energies-- 300 keV--4.5MeV; Beam energy spread-- 0.5 keV; Ion currents (steady)-- a few nA to several hundred micro A.

0653 E-N Tandem Accelerator
Oak Ridge National Laboratory, Department of Energy
Bldg. 5500, Oak Ridge, TN 37830
Contact: Dr. P. D. Miller (615) 574-4781
FACILITY: Principal use is for high energy atomic collisions in gases and solids. Ion beams of most species through Ar are available (noble gases, alkali, and most alkaline metal ions are not available) and selected heavier ions are available. Typical beams of Cl ions are 1 micro A of Cl(4+) or 3 nA of Cl(7+) at several times 1 0 MeV energies. An Elbek magnetic spectrograph with energy resolution about 10 to the -4 is available for analysis purposes. A variety of photon and electron spectrometers are also available. A PDP 11/45 computer with magnetic disc storage and analog to digital converters can be used for data acquisition and analysis. Several beam lines are available which can accomodate a wide range of space requirements. Beam height is 69 inch.

0654 Electron Linear Accelerator
Oak Ridge National Laboratory, Department of Energy
Oak Ridge, TN 37830
Contact: Dr. R. W. Peelle (615) 574-6113
FACILITY: An intense pulsed-neutron source is available for neutron time-of-flight measurements with a variety of detectors and flight paths. Measurements as a function of neutron energy emphasize the keV energy range, although measurements have been made from thermal energies to beyond 50 MeV. Most types of neutron-induced reactions have been studied at some time.

0655 Electron Van de Graaff Accelerator, 4 MeV
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. C. E. Dick (301) 921-2201
FACILITY: This-accelerator, based on the principle of the Van de Graaff electrostatic generator, produces both continuous and pulsed beams of electrons with good energy resolution and continuous control of beam current and energy. Its capabilities make possible a wide variety of experiments using electrons or photons. Applications include: Interactions of electrons and photons with matter; dosi-

Structure References Bibliographics file has been used to produce recent references issues of the Nuclear Data Sheets. The Evaluated Nuclear Data File (ENDF/B) effort is coordinated by the center. Contributions are also made to the Computer Index of Neutron Data (CINDA) publication which is a bibliographic index to neutron data.

0634 Neutrino Flux Monitoring Facility (NFM)
Fermilab, Department of Energy
Batavia, IL 60510
Contact: Dr. Stephen Pordes (312) 840-3603
FACILITY: The NFM facility consists of toroids and RF cavities to measure secondary particle flux, ion chambers and SWICs to measure secondary particle spatial distributions and muon rates from decays of secondary particles, and a Cerenkov counter to measure pi/K/p ratios. All experiments in the Neutrino Area require a measurement of the neutrino flux.

Physics Unit, Idaho National Engineering Laboratory, Department of Energy
See 0767

0635 Spectrometer Facility
Stanford Linear Accelerator Center, Department of Energy
2575 Sand Hill Rd., Menlo Park, CA 94025
Contact: Dr. L. P. Keller (415) 854-3300
FACILITY: The facility consists of 3 spectrometers: 20 GeV, 8 GeV, and 1.5 GeV and all necessary controls and instrumentation. They have been in use for high energy scattering experiments. All of the spectrometers are mounted on wheeled carriages which ride on circular rails. The fixed end of each spectrometer is connected to a common pivot point at which the experimental targets are located. The path of the incoming electron or photon beams comes in from the Beam Switchyard, through the target, and then out to a power-absorbing beam dump. Both elastic and inelastic electron scattering experiments have been performed as well as photoproduction research.

0636 Tagged Photo Spectrometer (TPS)
Fermilab, Department of Energy
P-East Beamline, Batavia, IL 60510
Contact: Dr. Dan Green (312) 840-3104
FACILITY: The TPS is a spectrometer facility consisting of electron tagging, proportional wire chambers, spectrometer magnet, multicell Cerenkov counters, drift chambers, photon detectors, hadron calorimeters, and muon identifiers. To date two experiments have been run at the TPS, E-516 and E-612.

0637 UNISOR (University Isotope Separator at Oak Ridge)
Oak Ridge Associated Universities, Department of Energy
P.O. Box 117, Oak Ridge, TN 37831
Contact: Dr. Richard E. Wiesehuegel (615) 576-3428
FACILITY: The separator provides a sophisticated, unique research facility for nuclear and atomic scientists. The primary purpose of the UNISOR consortium is to investigate the structures and decay mechanisms of rare, short-lived atomic nuclei. Nuclei are prepared by means of a magnetic isotope separator coupled to the accelerators in the Holifield Heavy-Ion Research Facility at Oak Ridge National Laboratory. Because the accelerators produce a variety of unstable nuclei, the isotope separator isolates the specific nuclei being studied. The UNISOR facility is constructed with the isotope separator on-line so that production, separation, transportation, and study of the nuclei occur continuously. Three beam lines from the isotope separator permit three simultaneous on-line experiments. It contains a wide range of nuclear-particle detectors, spectrometers, and electronics. It also has several computer-based systems for data acquisition and analysis and for experiment control. The isotope separator also has been used for mass-separation of materials, for implantation of atoms in a solid structure, as a low-energy accelerator for atomic physics studies, and for preparation of targets and radioactive sources. It could also have uses in solid-state, chemical, and medical studies.

0638 Users Support Center
Argonne National Laboratory, Department of Energy
9700 South Cass Ave, Argonne, IL 60439
Contact: Mr. W. F. Praeg (312) 972-6543
FACILITY: The center serves research groups in high-energy physics and nuclear fusion by making available the unique facilities and many fields of expertise developed at Argonne. These include: Plastics Shop; Detector fabrication facility for large-area wire spark chamber and foils; Engineering for high current, fast-rise-time power supplies and magnet; Magnet test facility; Computer control engineering, ranging from the control of rapid cycling synchrotrons to computer-based magnet field mapping systems; Superconducting magnet design, design and operation of cryogenic equipment, field and force calculations, and consultation on superconducting magnets; and Pulsed superconducting cable test facility for cables in the form of double pancake coils.

NUCLEAR TECHNOLOGY: Radiation Sources

0639 Accelerator Laboratory
Pacific Northwest Laboratory, Department of Energy
P. O. Box 999, Richland, WA 99352
Contact: Dr. L. H. Toburen (509) 376-3348, or Dr. L. Schmid (509) 375-2559
FACILITY: The accelerator laboratory includes two positive ion electrostatic accelerators. A 2 MV single stage Van de Graaff with an r-f ion source is capable of providing beams of protons, deuterons, helium and carbon ions in the energy range from 100 keV to 2 MeV. One beam line is equipped with a high voltage r-f oscillator which provides a pulsed beam of approximately .5 ns FWHM with repetition rate of 3MHz. In addition, this accelerator is routinely used as a source of monoenergetic neutrons through D-T, D-D, and other reactions. The second accelerator is a 2MV tandem with both duoplasmation and sputter ion sources. Ions formed from both gas and solid sources are readily available. Commonly accelerated ions include H+, He(2+), C(n+), Cu(n+), Ni(n+), I(n+), and Ta(n+) in the energy range from 1 MeV to 2(1+n) MeV where n= 1-4. The accelerator facility presently supports work in radiation physics, radiation biology, fusion energy, and materials research.

0640 Alternating Gradient Synchrotron
Brookhaven National Laboratory, Department of Energy
Upton, NY 11973
Contact: Dr. D. I. Lowenstein (516) 282-4611
FACILITY: This national user facility dedicated to basic research in elementary particle physics. It is proton synchrotron of the alternating gradient type with a maximum energy of 33 GeV. The AGS experimental area consists of 15 sec-

NUCLEAR TECHNOLOGY: Isotopes

Biological-Materials Growth Center, Argonne National Laboratory, Department of Energy
See 0192

Cyclotron - 60 inch, Argonne National Laboratory, Department of Energy
See 0648

0619 Exotic Radioisotopes for Physical Science Research
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Mr. H. A. O'Brien (505) 667-4675
FACILITY: With the unique combination of medium-energy protons (800 MeV) and high beam currents (700-750 micro A) available from the LAMPF accelerator, it is possible to reach nuclides far from the beta line of stability and produce them in quantities hitherto unattainable. For example, irradiation of a silicon target over a two-year period produced 11 micro Ci (-0.7 mg) of 7 x 10 to the 5th -yr26Al, following chemical processing. This and other rare radioisotopes are of great importance to the physical science research community.

0620 Isotope Separator (On-line) for Short Lived Fission Products
Idaho National Engineering Laboratory, Department of Energy
P. O. Box 1625, Idaho Falls, ID 83415
Contact: Mr. R. E. Tiller (208) 526-1439
FACILITY: This facility has been developed for the on-line study of the decay properties of short-lived fission-product nuclides. The isotope separator is a Nucletec machine, with a 100-kV acceleration potential and a 90-degree bending magnet. The fission products are produced from spontaneous fission of 'open' 252Cf samples containing a total of approximately 1.6 mg of Cf and are carried from a shielded cell to the ion source of the isotope separator via a He-jet transport system. Instrumentation of the collector portion of the separator to permit nuclear spectroscopic measurements of individual fission-product nuclides is available.

0621 Isotope Separator Laboratory
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. W. B. Mann (301) 921-2668
FACILITY: Isotopic separations are produced by the combined action of an electric and a magnetic field on a stream of ions, which is transmitted through an electrostatic lens system and a 90 degree-sector magnet to a dispersion and target chamber. Potentials up to 90 kilovolts produce ion beam currents up to 100 microamperes. Mass dispersion is sufficient to separate all known isotopes. Applications include preparation of isotopically pure substances, irradiation of materials, studies of nuclear structure, ion implanation in semiconductors, precise chemical sectioning of foils.

0622 JSW168 Small Cyclotron
Brookhaven National Laboratory, Department of Energy
Upton, NY 11973
Contact: Dr. Alfred P. Wolf (516) 282-4301
FACILITY: This is a fixed energy, two particle machine. The characteristics of the machine are 16 MeV protons and 10 MeV deuterons at external beam current less than or equal to 50 muA. The machine is a prototype cylcotron for the production of positron-emitting radionuclides for biological, physiological and medi cal applications. The smallness of the machine lends itself suitable for installation in the medical school and 'major metropolitan hospital environments'. The cyclotron has the capability of providing large quantities of 11C, 18F, 13N and 15O for use in clinical research and in 'routine' clinical procedures.

Low Level Radionuclide Measurement Instrumentation, Pacific Northwest Laboratory, Department of Energy
See 0756

Medical Radioisotopes Resource, Los Alamos National Laboratory, Department of Energy
See 0548

National Stable Isotopes Resource, Los Alamos National Laboratory, Department of Energy
See 0565

0623 National Tritium Labeling Facility
Lawrence Berkeley Laboratory, Department of Energy
University of California, Berkeley, CA 94720
Contact: Mr. Richard M. Lemmon (415) 486-4325
FACILITY: This national center can be used to attain commercially unavailable, high specific activities of tritium in compounds that will subsequently serve as tracers in chemical and bio-medical research. The facility is used by outside investigators to prepare tritium-labeled compounds under the supervision of the resident staff. The facility is equipped to handle kilocurie amounts of T2 and curie amounts of T2O. Labeling is done by a variety of techniques, including microwave discharges, catalytic tritio-hydrogenation, iodo displacements, and catalytic exchanges. Expertise is available on tritium incorporation into biologically valuable compounds and to purify the labeled compound.

Nuclear Irradiation Facilities, National Bureau of Standards, Department of Commerce
See 0675

Radioactivity Standards Distribution and Testing Program, Environmental Monitoring Systems Laboratory, Environmental Protection Agency
See 0415

Radiological Test Facility, Army Electronic Proving Ground, Department of the Army
See 0770

0624 Remote Radioactive Analytical Facility
Idaho National Engineering Laboratory, Department of Energy
P. O. Box 1625, Idaho Falls, ID 83425
Contact: Mr. J. P. Hamric (208) 526-1395
FACILITY: This is a unique facility for the remote preparation and analysis of samples emitting significant amounts of beta and gamma radiation. Analytical separations or other preparation work can be done on samples with radiation readings up to 50 R/hr with a minimum exposure to personnel. This facility interfaces with a complete inorganic analytical laboratory.

UNISOR (University Isotope Separator at Oak Ridge), Oak Ridge Associated Universities, Department of Energy
See 0637

community and contain sufficient information to warrant industry exploration activities.

0606 Enhanced Oil Recovery
Morgantown Energy Technology Center, Department of Energy
P.O. Box 880, Collins Ferry Road, Morgantown, WV 26505
Contact: Ms. Claire H. Sink (304) 291-4620
EXPERTISE: New processes and problem solving are studied to increase oil recovery. This effort includes research in the areas of underground fluid mobility control, geological control, and chemical systems.

0607 Instrument Sonde Test Facility (ISTF)
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Mr. Bert R. Dennis (505) 667-5697
FACILITY: The ISTF was designed to test downhole well-logging instrument packages for geothermal applications. It is a well-instrumented test facility in which downhole packages up to 6-in. diameter and 20-ft. long can be tested at pressures and temperatures up to 6000 psi at 275C. It has been used to investigate the properties and behavior of many experimental and commercial products under conditions simulating those that exist in geothermal wells. Examples include testing of commercial seals, wiper plugs, packers, cements, pressure housings, and detonator firing systems. Tests lasting 24 hours have been conducted.

Low-Rank Coal Program, Morgantown Energy Technology Center, Department of Energy
See 0310

0608 Materials Resources Data System
U.S. Geological Survey, Department of the Interior
920 National Center, Reston, VA 22092
Contact: Ms. Antoinette Medlin (703) 860-6455
INFORMATION SERVICES: The data system consists of a set of records on the mineral deposits and mineral commodities of the United States and, to a certain extent, the world. The file is arranged so as to accept the basic information needed to describe a mineral deposit or a group of related deposits, such as a mining district. The file is flexible so that what constitutes a record can be decided largely by the user. However, certain minimal data are required to establish a record. Entries are in natural language text wherever possible, but certain entries are rigidly formatted, or coded, or both. The organization of the file together with the program used provides for highly selective retrievals. Retrieved information can be printed in any of three arrangements, or it can be passed to a subsequent program for further processing, such as maps and other graphics.

0609 Mineralogical Services
Minerals and Materials Research, Bureau of Mines, Bureau of Mines, Department of the Interior
2401 E. St., SW, Washington, DC 20241
Contact: Mr. William Miller (202) 634-1233
SERVICES: As an assistance to the public in the search for new mineral deposits within the territoral limits of the United States, the Bureau of Mines makes macroscopic and petrographic examinations of mineral specimens, submitted by individuals, to help in determining the mineralogical content of the specimen, general characteristics of the sample, and the potential commercial importance of the minerals present. The Bureau does not perform chemical constituent analyses of mineral samples submitted by the public as such service is available from commercial assayers. However, the Bureau, at its option, may make spectrographic, X-ray, or chemical analysis of those samples which it finds contain unusual mineralogical content or associations, or samples that may be of particular interest to the Bureau. Information on where the locations of regional centers are located may be obtained at the above address.

0610 Mining Research Facilities
Pittsburgh Energy Technology Center, Department of Energy
P. O. Box 10940, Pittsburgh, PA 15236
Contact: Mr. Sun W. Chun (412) 675-6128
FACILITY: Research and development can be performed on mining equipment, systems and procedures, and relevant physical properties to establish a mining technology data base. The main elements of the complex include: mine haulage equipment maneuverability area; machine mining trials area; a mine roof support test facility; and a hydraulic transport or slurry pipeline facility. The Mine Roof Support Test Rig is a massive, sophisticated, computerized 900 ton machine that applies 3,000,000 lbs. of force onto mechanical mine roof supports thereby guiding development of better supports. A hydraulic transport pipeline systm is available for research on carrying lump coal in water from deep mines.

National Institute for Petroleum and Energy Research, Department of Energy
See 0314

Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, Department of Commerce
See 0256

Oil Shale Program, Morgantown Energy Technology Center, Department of Energy
See 0316

0611 Pittsburgh Research Center
Bureau of Mines, Department of the Interior
U.S. Bureau of Mines, P.O. Box 18070, Pittsburgh, PA 15236
Contact: Director (412) 892-2400
EXPERTISE: The center concentrates on a variety of research efforts. Control and/or suppresion of mines dusts are being attained through the use of machine-mounted water sprays, dust collectors, and ventilation. An active program is the control of underground emissions from diesel-powered equipment, mining explosives, and radioactive ores. Recent developments include direct reading personal monitors for carbon monoxide, oxides of nitrogen and radon daughters, and a particulate filter for decontaminating diesel exhaust. Noise pollution in mines is being controlled through the development of quieting and soundproofing techniques that can be retrofitted on existing equipment or incorporated into new equipment. The center is the sole agency qualified to test explosives and blasting materials to be approved by the Federal Government for use in coal mines. Progress has been made on mine fires through instrumentation for the detection of incipient combustion, remote sealing of mine fires, and drainage of flammable coalbed gas, well in advance of mining. Protection against roof and rock falls in underground mines is being achieved. Procedures have been developed for locating and evacuating miners who are trapped underground following a disaster. Progress is being made with improved oxygen self-rescuers, undeground-to-surface wireless communication, and

heart rhythm disturbances, heart failure, and emergency and rehabilitation techniques and procedures. The goal of activities conducted through the SCOR's is to expedite the development and application of new knowledge essential for improved diagnosis, treatment, and prevention of these disorders.

0592 Specialized Centers of Research on Pediatric Pulmonary Diseases
National Heart, Lung, and Blood Institute, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 6A16, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. Suzanne J. Hurd (301) 496-7208
EXPERTISE: The specialized centers focus resources, facilities, and manpower on basic and clinical research problems related to neonatal respiratory diseases, cystic fibrosis, and bronchiolitis. The goal of activities is to expedite the development and application of new knowledge essential for improved diagnosis, treatment, and prevention of these diseases.

0593 Specialized Centers of Research on Pulmonary Vascular Diseases
National Heart, Lung, and Blood Institute, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 6A16, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. Suzanne J. Hurd (301) 496-7208
EXPERTISE: These centers focus resources, facilities, and manpower on research problems related to pulmonary hypertension, cor pulmonale, and pulmonary edema. The goal of activities is to expedite development and application of new knowledge essential for improved diagnosis, treatment, and prevention of these diseases.

0594 Specialized Centers of Research on Thrombosis
National Heart, Lung, and Blood Institute, National Institutes of Health, Department of Health and Human Services
Federal Building, Room 5A12B, 7550 Wisconsin Avenue, Bethesda, MD 20205
Contact: Dr. Anne P. Ball (301) 496-5911
EXPERTISE: Specialized Centers of Research (SCOR's) on Thrombosis focus resources, facilities, and manpower on research problems related to plasma components involved in coagulation; the function and metabolism of blood platelets and factors influencing their aggregation and deaggregation; diagnostic techniques for detecting hypercoagulable states and for detecting, localizing, and assessing the extent of clinical thrombosis; and clinical studies of anticoagulant and clot-dissolving agents in the prevention and treatment of thromboembolic episodes. The goal of activities conducted through the four SCOR's is to expedite the development and application of new knowledge essential for improved diagnosis, treatment, and prevention of thromboembolic disorders.

0595 Stanford Synchrotron Radiation Laboratory (SSRL)
Stanford Linear Accelerator Center, Department of Energy
2575 Sand Hill Rd., Menlo Park, CA 94205
Contact: Ms. Katherine Cantwell (415) 834-3300
FACILITY: This is a National Users' Research Laboratory for the application of synchrotron radiation to research in biology, chemistry, engineering, materials science, medicine and physics. It is also developing specialized techniques and instrumentation for the generation and experimental utilization of synchrotron radiation. The most important of these efforts are the continuing development of wiggler and undulator sources for ultra-high photon fluxes and brightness. The primary experimental programs are in photoemission, x-ray diffraction and x-ray absorption spectroscopy. In addition, there are programs involving fluorescent lifetime measurements and occasional work in x-ray microscopy and lithography.

0596 Toxicology Information Response Center
Oak Ridge National Laboratory, National Institutes of Health, Department of Health and Human Services
P.O. Box X, Building 2024, Oak Ridge, TN 37830
Contact: Ms. Susan Winslow (615) 576-1743
INFORMATION SERVICES: This is a national center for toxicology information on environmental pollutants, industrial chemicals, food additives, pesticides, pharmaceuticals, and other topics of toxicologic concern. The center is part of the National Library of Medicine's Toxicology Information Program. The center acquires, selects, stores, analyzes, and synthesizes comprehensive literature packages according to a user's specific request or a current need. Not only are online computer literature searches prepared, but access is also made of extensive toxicology document collections.

0597 Trauma and Burn Center Program
National Institute of General Medical Sciences, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 925, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. Emilie Black (301) 496-7373
EXPERTISE: Trauma and Burn Research Centers provide support for multidisciplinary basic laboratory investigations on such problems as energy exchange and metabolism, cellular changes in shock, and sepsis. The results of basic research conducted in the Trauma and Burn Research Centers often can be applied immediately in clinical settings.

0598 Vision Research Centers
National Eye Institute, National Institutes of Health, Department of Health and Human Services
Building 31, Room 6A03, 9000 Rockville Pike, Bethesda, MD 20205
Contact: Dr. Ronald G. Geller (301) 496-4903
EXPERTISE: Broad-based, long-term programs of research in visual sciences are supported through two types of vision research centers. Core research center grants support a central nuclei of resources, facilities, and services that are shared by investigators on a number of individual research projects. Through this mechanism, investigators are brought together in an environment that facilitates multidisciplinary research approaches to problems in the visual sciences. It is an environment that supports laboratory studies, clinical studies, or both, and that promotes interaction and collaboration among vision researchers and investigators from other academic departments or areas of interest. Specialized clinical research center grants, the second mechanism, provide support for both individual clinical research projects and core resources. Specialized centers provide unique environments in which definitive clinical research is conducted on particular human eye problems with an emphasis on investigations involving patients. Center grant

concerning the characteristics of radiopharmaceuticals, including distribution patterns, uptakes, disappearance times, retention, and data on variations in metabolism according to age, sex, disease, and condition of the patient. The data bank contains more than 22,000 references pertaining to radiopharmaceuticals as well as other pertinent decay scheme data, calculation techniques, physiologic behavior, phantoms and mathematical models.

0580 Reagent Resources Service
National Institute of Allergy and Infectious Diseases, National Institutes of Health, Department of Health and Human Services
National Institutes of Health, Westwood Bldg., Room 7A-03, Bethesda, MD 20205
Contact: Mrs. Sylvia Cunningham (301) 496-7036
SERVICES: A variety of allergenic, immunological, and viral research reagents are currently available to biomedical researchers. Plant and insect allergens currently available include ragweed, rye grass, honeybee, yellow jacket, hornet and wasp antigens and their antisera. A variety of microbial and parasite antigens, including those from Ascaris suum,, Micropolyspora faeni, Thermoactinomyces vulgaris, Thermoactinomyces candidus, Saccharomonosporo viridis, and Alternaris tenuis, and serum from humans sensitive to these antigens, are available. The service also supplies mycoplasma species and antisera, myxoviruses, hepatitis viruses, and arbovirus grouping fluids, as well as interferon standards (human, mouse, and rabbit) and their antibodies. Each allergen is characterized by detailed chemical or serological data.

0581 Reference/Diagnostic Services
Center for Infectious Diseases, Center for Disease Control, Department of Health and Human Services
Center for Disease Control, Atlanta, GA 30333
Contact: Dr. Albert Balows (404) 329-3967
SERVICES: A strong collaborative effor among local, state, and federal laboratories provide the foundation for a successful nationwide program for the prevention and control of infectious diseases. Laboratories at each level have distinct responsibilities. As the state public health laboratories provide the local laboratories with reference and diagnostic services of increasing complexity, so the Centers for Disease Control (CDC) provides the state laboratories with services of greater complexity. Providing reference and certain diagnostic services (RDS) in microbiology is the responsibility of the Center for Infectious Deseases (CID) at CDC. These services to state and other qualified laboratories constitute an important segment of CID's mission. All RDS specimens, with a properly completed request form, must be submitted to CID by or through the state public health laboratory or with the knowledge and consent of the state laboratory director or designee. CID will provide RDS on the following: Clinical specimens to aid in the diagnosis of life-threatenig, unusual, or exotic infectious diseases; Cultures and/or paired serum specimens, or tissues or histologic specimens, from patients suspected of having unusual or rarely encountered infectious diseases; Cultures or serum specimens obtained from patients who have infectious diseases that occur only sporadically; Organisms that a) cannot be identified, b) are isolated from normally sterile anatomic sites, or c) are isolated repeatedly from one or more sites of the same patient or group of patients; Organisms that have atypical phenotypic characteristics, do not appear to be 'usual' pathogens, or are associated with nosocomial infections; and Serum specimens or cultures that are clinically important and are sent to CID for confirmation because the results in state laboratories were bizarre or difficult to interpret.

0582 Regional Centers for Radiological Physics
National Cancer Institute, National Institutes of Health, Department of Health and Human Services
Blair Building, Room 620, 8300 Colesville Road, Silver Spring, MD 20910
Contact: Dr. Winfred Malone (201) 427-8643
EXPERTISE: These centers are supported to provide quality assurance and risk reduction activities in therapeutic and diagnostic radiology. The centers review physics support at all facilities in affiliated clinical programs and serve as a resource for technology assessment and transfer.

0583 Rehabilitation Research and Development Center
Veterans Administration
Hines VA Hospital, Box 20, Hines, IL 60141
Contact: Dr. John Trimble (312) 343-7200
EXPERTISE: The center conducts basic and applied research, as well as product development. Applied research and product development is conducted within the following core laboratories. (1) Biomaterials Testing Laboratory: The laboratory is a complete facility for stress testing of biomaterials and internal or external prosthetic appliances. The laboratory has capabilities for both non-destructive and destructive testing. (2) Technical Development Laboratory: This facility designs, developes, and prototypes both medical instrumentation and electronic aids for severely disabled persons. The efforts in medical instrumentation concentrate primarily on equipment for diagnosis of neurological or orthopedic impairments. In this area, devices are being designed for gait analysis, as well as for electrophysiological measurement and diagnosis (EGG, EMG and evoked potentials). In the area of electronic aids for the disabled, the primary emphasis is on voice-operated controls, and synthetic-speech communication aids. The laboratory has capabilities for developing complex digital and analog circuitry, microprocessor-based devices, RF telemetry, ultrasonics (measurement), and CCD signal processors. (3) Human Factors Laboratory: The laboratory is concerned with developing and evaluating techniques for measuring human cognitive, sensory and motor function. Studies in this laboratory deal with: computer-assisted measurement of psychomotor and cognitive skills; information processing during reading; factors affecting intelligibility of visible displays; and, tactile information processing. The human factors laboratory has equipment for: optical and digital image processing, two- and three-dimensional measurement of hand and arm movement; and high-resolution computer graphics. (4) Computer-Aided Design Laboratory: This is a complete facility for mechanical design and analysis. The laboratory staff has expertise in static and dynamic finite element modeling, as well as three-dimensional kinematic analysis. Most of the laboratory's work is devoted biomechanical studies of the human spine and knee, although it has recently developed techniques for the design and structural analysis of prosthetic limbs and wheelchairs.

tion. A series of educational videotapes has been developed to review the application of epidemiology in the analysis of clinical problems in neurology and neurosurgery. Available on 3/4-inch, color, videotape cassettes are General Concepts of Descriptive Epidemiology; Investigating an Epidemic: Cohort Analysis Descriptive Epidemiology; General Concepts of Analytical Epidemiology; and General Concepts of Experimental and Theoretical Epidemiology: A Review. These tapes are loaned without charge to physicians, researchers, medical schools, and residency training programs. NINCDS also sponsors conferences and courses on neurological epidemiology. The courses deal with the principles of neuroepidemiology. The conferences consider current knowledge in neuroepidemology and stress the applicability of this information to the clinical practice of neurology and neurosurgery. The staff of the Section on Epidemiology is interested and eager to serve in a consultative capacity to any clinician or research scientist wishing to investigate the epidemiologic aspects of neurologic diseases.

NOAA Diving Program, National Oceanic and Atmospheric Administration, Department of Commerce
See 0723

0570 Office of State and Community Liasion
National Institute of Mental Health, Alcohol, Drug Abuse, and Mental Health Administration, Department of Health and Human Services
Parklawn Bldg., Room 11C-18, 5600 Fishers Lane, Rockville, MD 20857
Contact: Dr. Howard R. Davis (301) 443-1760
EXPERTISE: Technical assistance and consultation on matters related to solving problems or increasing the quality of mental health care and services offered are. Topics range from programs for chronically mentally ill persons, community support and services, rural services, children and youth, to organizational management and development. Consultation may be provided by appropriate staff specialists or through experts by referral. When needed and available, knowledge on relevant research findings, technological innovations, or notable practices may be provided. Users are asked to consider helping to defray special costs for consultation to extents practicable.

0571 Peridontal Diseases Centers
National Institute of Dental Research, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 504, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. Anthony A. Rizzo (301) 496-7748
EXPERTISE: The main objective of the centers is to facilitate the application of basic research findings in the areas of microbiology, immunology, and pharmacology in clinical investigations of patients with periodontal disease. These centers pursue studies to establish the causative organisms in periodontal diseases, determine the host response to these causative organisms, improve therapeutic techniques and regimens, and develop preventive measures. Researchers in Periodontal Diseases Centers utilize multidisciplinary approaches to pursue study objectives and these studies often involve large patient populations.

0572 PETT VI Positron Emission Transaxial Tomograph
Brookhaven National Laboratory, Department of Energy
Upton, NY 11973
Contact: Dr. Alfred P. Wolf (516) 282-4301
FACILITY: The instrument measures regional positron emitting isotope activity in the brains of humans and animal subjects. The system acquires measurments from seven transaxial slices of the brain simultaneously and subsequently reconstructs these measurements into seven activity maps using a computer technique similar to that of the more familiar CT scanner. The PETT VI has a resolution of 1.0 cm Full-Width-Half-Maximum (FWHM) in the planar slices and 1.4 cm FWHM in the axial direction. Using CsF coincidence detectors, PETT VI can accurately quantitate the spatial distribution of high count-rate activity.

0573 Pharmacology-Toxicology Center Program
National Institute of General Medical Sciences, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 925, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. Emilie Black (301) 496-7373
EXPERTISE: Centers provide discrete central research facilities and resources for teams of pharmacologists, toxicologists, biochemists, and physicians who investigate problems relating to the development of safer and more effective drug therapies.

0574 Population Research Centers
National Institute of Child Health and Human Development, National Institutes of Health, Department of Health and Human Services
Landow Building, Room 7A21, 7910 Woodmont Avenue, Bethesda, MD 20014
Contact: Dr. Philip Corfman (301) 496-1101
EXPERTISE: The centers are supported through the Center for Population Research of NICHD to enhance research on a variety of topics related to human reproduction and population dynamics. Centers provide centralized research services and facilities to augment the quality, productivity, and cost effectiveness of population research projects in areas such as reproductive neuroendocrinology, development and evaluation of fertility-regulating methods, human infertility, acceptability of measures for the regulation of fertility, adolescent fertility, and human population movement and distribution. An additional goal of the centers is to build a national network that will encourage interaction among scientists in locations throughout the United States to coordinate population research.

0575 Radiation Emergency Assistance Center Training Site (REACT/TS)
Oak Ridge Associated Universities, Department of Energy Medical and Health Sciences Division, P. O. Box 117, Oak Ridge, TN 37831
Contact: Dr. R. C. Ricks (615) 576-3131
EXPERTISE: The treatment center and training unit is available for rendering assistance in the management of health problems associated with radiation accidents and for formal teaching of medical and paramedical personnel. The major functions of REAC/TS are to assist and provide medical and health physics support in the event of radiation-related emergencies by direct participation or consultation on a 24-hour basis, to conduct epidemiologic studies on DOE radiation workers and radiation accident survivors, to conduct radiation accident management training courses, exercises, and drills for medical, paramedical, and health physics personnel to meet the need for properly trained professionals in this area of occupational and emergency medicine, to continue to develop and refine cytogenetic techniques for dose estimation of radiation accidents and exposure as-

information in the form of reports, fact sheets, pamphlets, bibliographies, and other publications to Congress, Federal agencies, State and local units of Government, the public, and special interest groups; (3) provides information to State, community and other drug abuse programs through a national network of participating organizations, including Single State Agencies and major universities, and (4) gives technical assistance and consultation in implementing the nationwide Drug Abuse Communications Network (DRACON) and provides liaison with those agencies concerning drug abuse information and resources.

0557 National Diabetes Information Clearinghouse
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, National Institutes of Health, Department of Health and Human Services
Box NDIC, Bethesda, Md. 20205, Washington, DC 20005
Contact: Dr. Lois Lipsett (301) 496-7433 or (301) 468-2162
INFORMATION SERVICES: The National Diabetes Information Clearinghouse serves as a central resource for the collection and dissemination of information about educational and scientific materials, programs, and other resources relevant to diabetes mellitus. The clearinghouse has abstracted, indexed, and incorporated into its data base more than 3,000 educational brochures, booklets, and other materials on diabetes for health care professionals, people with diabetes, and the general public. The clearinghouse not only serves to provide information but also identifies areas needing more educational materials and assists in developing such materials.

0558 National Digestive Diseases Education and Information Clearinghouse
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, National Institutes of Health, Department of Health and Human Services
1555 Wilson Boulevard, Suite 600, Rosslyn, VA 22209
Contact: Mrs. Billie Mackey (703) 496-9707, or (301) 496-6158
INFORMATION SERVICES: The clearinghouse coordinates the national effort to educate the public, patients, families of patients, physicians, and other health care providers about the prevention and management of digestive diseases. The program is specially designed to reach neglected population groups, such as the elderly, minority groups, rural Americans, and children. The clearinghouse provides a central point for the exchange of information among professional organizations, foundations, and voluntary health organizations involved with digestive health and disease. In working with these groups, the clearinghouse aids in the distribution of information products, determines what additional materials are needed, and encourages production of such materials. Clearinghouse services include the following: information on current activities and research development in digestive diseases: fact sheets prepared by leading authorities on specific digestive diseases; and an inquiry and referral service that responds to professional and public requests for information.

0559 National Flow Cytometry and Sorting Research Resource
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Dr. Scott Cram (505) 667-2785
FACILITY: Its purpose is to make state-of-the-art flow cytometric instrumentation available to the biomedical research community. Flow cytometry uses electro-optical techniques to provide quantitative analyses of various cell properties which are sequentially studied in a continuous flow system. On the basis of these measured properties, the cells may then be physically isolated for their use in various biological studies. Cells and subcellular constituents, such as chromosomes, can be analyzed and sorted at rates of up to a few thousand per second. Unique capabilities either exist or are being established in the following areas: chromosome image analysis and sorting, high resolution analysis, super high speed sorting, and multilaser excitation systems. Research fields include immunology, cell biology, gerontology, tumor biology, infectious desease, parasitology, molecular biology, and radiobiology.

0560 National Genetic Sequence Data Bank
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Dr. Walter Goad (505) 667-7510
INFORMATION SERVICES: The data bank - GENBANK - has been established by the National Institutes of Health with co-sponsorship by DOE, NSF, and DoD. DNA sequence data is collected, organized, and annotated in a way to make it useful to a wide spectrum of research activities. As an essential tool of data management, methods of computational analysis are applied for discerning significant features and relationships within the data. To encourage direct contribution, correction, and criticism of data, the system is available for dial-up execution by researchers active in determining genetic sequence.

0561 National Hormone and Pituitary Program
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, National Institutes of Health, Department of Health and Human Services
210 West Fayette Street, Suite 201-9, Baltimore, MD 21201
Contact: Dr. Salvatore Raiti (301) 837-2552
SERVICES: The program provides supplies of human growth hormone for research related to hypopituitary dwarfism and other growth disorders, human pituitaries, and pituitary hormones. Upon application, these materials are available to qualified investigators and are distributed for research only (not therapeutic, diagnostic, or commercial purposes). Available materials include the following: Human thyroid-stimulating hormone, luteinizing hormone, and follicle-stimulating hormone are available in highly purified form and in quantities sufficient for biochemical studies; Human pituitaries in very limited numbers can be requested for specific research if the purified pituitary material is not otherwise available; Human growth hormone (14 IU/vial), follicle-stimulating hormone (50 IU/vial), and luteinizing hormone (2,200 IU/vial) are available. Application forms for these and other human pituitary hormones for chemical and other studies are available from the program. Fees are charged for the handling and shipping of hormones and antisera, but there is no charge for reference preparation.

0562 National Human Neurospecimen Bank
National Institute of Neurological and Communicative Disorders and Stroke, National Institutes of Health, Department of Health and Human Services
Federal Building, Room 714, 7550 Wisconsin Avenue, Bethesda, MD 20205
Contact: Dr. Emanuel M. Stadian (301) 496-1431
SERVICES: With The National Institute of Mental Health, the National Multiple Sclerosis Society, and the Hereditary Disease Foundation, the National Institute of Neurological

Davis and performs research on biomedical and environmental effects of internally deposited radionuclides, external irradiation and fossil fuel energy-related effluents on living systems. Current research includes early diagnosis and methods of preventing cancer of bone, bone marrow and other organs, as well as mechanisms of injury and repair of target organs and integrated assessment of exposure risks. The main objective of the laboratory is to determine, study and quantify the biomedical effects of long-term, low-level exposures to nuclear and fossil fuel-related effluents from energy production. Primary areas of interest include toxicology, immunobiology, experimental hematology, tumor biology, bone pathology, aerosol physics, chemistry, lung physiology and pathology, radiation biology, dosimetry and comparative assessments. The laboratory facilities houses animals, whole-body counters, aerosol generating and exposure chambers, minicomputer and gamma ray field, as well as analytical tissue culture and pathology laboratories.

Laboratory of Biomedical and Environmental Sciences, Department of Energy
See 0200

0545 Laboratory of Radiobiology and Environmental Health
Department of Energy
University of California, School of Medicine-DOE, San Francisco, CA 94143
Contact: Dr. Sheldon Wolff (415) 666-1636
EXPERTISE: The Laboratory is an organized research unit of the University of California School of Medicine. It interacts with various academic departments through faculty appointments and research associateships, and thus both basic science and clinical ties for its research and related graduate and postgraduate training activities. The laboratory's program revolves around the development of methods and the identification of principles for evaluation of radiation and energy-related health hazards in humans. Major activities are focused on deoxyribonucleic acid (DNA) replication and repair, chromosome structure and behavior, mammalian embryo development, regulation of blood formation, modulation of the connective tissue environments, and modification of tissue sensitivity to radiations and chemical agents. Since its inception, the laboratory has pioneered in areas relating to genetic repair, radiation protection and sensitization, and cell population growth and development. The existing laboratory is available for research and training activities in areas pertinent to the understanding of radiation and energy-related injury and repair mechanisms at various levels of biological organization.

Livestock Insects Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0104

0546 Major Research Programs for Mothers and Infants
National Institute of Child Health and Human Development, National Institutes of Health, Department of Health and Human Services
Landow Building, Room 7C03, 7910 Woodmont Avenue, Bethesda, MD 20014
Contact: Dr. Sumner Yasse (301) 496-5097
EXPERTISE: The research programs have been organized to develop new knowledge about diseases and disorders of pregnancy and infancy with the aim of reducing infant morbidity and mortality. The programs support and promote multidisciplinary research efforts in areas where gaps in knowledge are not being sufficiently addressed in ongoing research or promising research areas requiring stimulation. The programs are organized around problem/need themes such as complications or pregnancy, psychosocial aspects of pregnancy, embyronic and fetal growth and development, maternal-infant nutrition, intrauterine growth retardation, initiation of labor, prevention of premature birth, disorders of newborn infants, and the sudden death syndrome. Major Research Programs support hypothesis-testing research efforts; they are not intended to support service, survey, or demonstration projects. However, their locations throughout the United States permit a number of areas to share in the benefits of collaborative research and in the mounting awareness that prevention plays an important role in the good health of pregnant women and infants.

Marine Research Laboratory, Pacific Northwest Laboratory, Department of Energy
See 0717

0547 Marmoset Research Center
Oak Ridge Associated Universities, Department of Energy Medical and Health Sciences Division, P. O. Box 117, Oak Ridge, TN 37831
Contact: Dr. N. C. Clapp (615) 576-4103
EXPERTISE: A breeding colony of marmosets and tamarins are maintained for research purposes, especially for projects by its own staff and by researchers from other institutions. The common marmoset (Callithrix jacchus) has the lowest reproduction cost and is more commonly used in research than other species. But colonies of tamarins (Saguinus fuscicollis/fR and Saguinus oedipus oedipus) are also maintained. The cottontop tamarin (S. o. oedipus) has become increasingly important as an experimental model for studying colon career.

0548 Medical Radioisotopes Resource
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Mr. A. O. O'Brien (505) 667-4675
SERVICES: A wide variety of radioisotopes, produced by proton spallation reactions, is made available by the Medical Radioisotope Research Group to the nuclear medicine research community and the radiopharmaceutical industry. Through collaborative research agreements, individual radioisotopes are prepared and shipped to extramural research groups to facilitate the development of improved diagnostic and therapeutic procedures in nuclear medicine. Some radio-isotopes are currently being supplied to industry. The current list of medically-useful radio-isotopes available from Los Alamos includes: 48V, 52Fe, 67Cu, 68Ge, 77Br, 82Sr, 109Cd, 123I, and 127Xe. Other radio-isotopes of interest are being developed.

0549 Medical Research Institute for Infectious Diseases
Department of Army
Fort Detrick, Frederick, MD 21701
Contact: Mr. William C. Patrick (301) 663-2285
EXPERTISE: Research is conducted to develop expertise and knowledge of the pathogenesis and characteristics of viruses of military significance and to develop chemical and other agents effective either as preventive vaccines for chemoprophylaxis or drugs effective in the chemotherapy of those virus diseases. Studies concerned with these highly dangerous virus microorganisms are performed in sophisticated containment facilities not duplicated elsewhere in the country. Among the current basic and applied re-

Heavy Charged-Particle Treatment Facility, Lawrence Berkeley Laboratory, Department of Energy
See 0659

0532 Human Engineering Laboratory
Department of Army
Aberdeen Proving Ground, MD 21005
Contact: Dr. Donald O. Egner (301) 278-5948
EXPERTISE: The laboratory provides R and D support in the technology areas of human factors engineering. The laboratory conducts fundamental and applied research; weapon system concept feasibility studies; system performance studies; and provides human factors engineering application support on materiel items in various research and development stages of development.

0533 Human Factors Simulator
Human Engineering Laboratory, Department of the Army
Aberdeen Proving Ground, MD 21005
Contact: Dr. Donald O. Egner (301) 278-5948
FACILITY: The Simulator is an interconnected system of minicomputers, aviation simulators, electronic visual display systems, and human operatory interface control systems. The system is capable of reconfiguration to meet diverse needs related to man-machine interface research in the areas of command/control, armor crew interface, aviation, and air defense. The system provides real-time man-in-the-loop simulations and human performance data acquisition and analysis capabilities.

0534 Human Genetic Mutant Cell Respository
National Institute of General Medical Sciences, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 910, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. David Beck (301) 496-7175
SERVICES: The repository at the Institute for Medical Research in Camden, New Jersey, establishes, characterizes, stores, and distributes cell lines to qualified research investigators. Specimens are highly characterized, viable, and contaminant-free cell cultures from patients with biochemical genetic disorders and chromosome aberrations. The repository contains low passage cell cultures which are stored in liquid nitrogen. In addition to the mutant cell lines, cell cultures from apparently normal individuals are stored for use as controls. The collection contains human fibroblast, lymphoblast, and amniotic fluid cell cultures as well as virus transformed fibroblast cultures and selected animal cell lines. Cultures stored in the repository are tested and assured to be free from contamination and are verified as to species of origin, karyotype, viability, and expression of the particular biochemical defect. Cell cultures are available to organizations or individuals engaged in biomedical research or health care to assist in the early diagnosis, prevention, understanding, and treatment of human inherited diseases.

0535 Human Lenses
National Eye Institute, National Institutes of Health, Department of Health and Human Services
Building 31, Room 6A49, 9000 Rockville Pike, Bethesda, MD 20205
Contact: Dr. Henry N. Fukui (301) 496-5984
SERVICES: The institute supports the Cooperative Cataract Research Group to conduct research studies on human cataracts. The central group in Boston and nine additional centers throughout the United States often collect a greater number of lenses than can be utilized in ongoing studies, and these investigators are willing to share this resource with other qualified researchers. Costs of shipping the materials are the responsibility of the recipient.

0537 Human Nutrition Research Center
Agricultural Research Service, Department of Agriculture
2420 2nd Avenue, N, P. O. Box 7166, Univ. Station, Grand Forks, ND 58202
Contact: Dr. Harold H. Sandstead (701) 795-8353
EXPERTISE: The center conducts research to determine human nutrient requirements, particularly for minerals including trace elements. Its research is concerned with factors that influence requirements including age, sex, physiological state, and stress; interactions of mineral nutrients with each other, other nutrients and non-nutrients; the physiological and biochemical consequences of mineral deficiencies; and the bioavailability of minerals from food. The center is organized into two research groups. One group employs animal models to define nutrient functions, while the other utilizes human volunteers to define requirements. The research is interdisciplinary requiring interactions among the scientists in each group and between the groups. The animal models research studies metabolic and physiological function; assesses nutrient interactions; evaluates mechanisms of intestinal absorption; and assesses effects of deficiencies of specific trace elements on various systems including the reproductive, immune, nervous, cardiovascular, as well as endocrine, and on molecular-biochemical function of cells. The human volunteers research focuses on the bioavialability of trace elements; interactions among trace elements; and with other nutrients and non-nutrients present in diets; effects of mild deficiencies or supplementation with trace elements on metabolic and physiological functions such as exercise and neurophysiological performance, endocrine function, thermal regulation, metabolic rate glucose utilization, lipid and protein metabolism, and body composition are studied. Dietary factors that influence the bioavailability of trace elements are defined by balance studies and the use of stable and radioactive isotopic tracers. Assessments concerning other nutrients and their metabolism are done simultaneously with the studies of trace elements to define relationships between trace elements and other nutrients.

0536 Human Nutrition Research Center on Aging
Agricultural Research Service, Department of Agriculture
Tufts University, 711 Washington Street, Boston, MA 02111
Contact: Mary M. Somers (617) 956-7570
EXPERTISE: The mission of the HNRC is to examine the relationship of nutrition to aging and the dietary needs of the elderly. Center scientists are determining the ways in which diet and nutritional status influence the onset and progression of aging, employing experimental animals, tissue cultures, and human subjects for such studies. They are exploring the ways in which diet, alone and in association with other factors, can delay or prevent the onset of degenerative conditions commonly associated with the aging process. This research will determine nutrient requirements during aging and the ways in which an optimal diet, in combination with genetic, physiological, psychological, sociological, and environmental factors, may promote health and vigor over the life span of man.

SERVICES: Bacteria, yeasts, and molds may be requested by name, intended use, or number, if known. Depending upon the strain, cultures are sent on agar slants or as lyophilized (freeze-dried) preparations. There is no charge for our cultures, and, accordingly, we are able to send no more than 12 strains per request, nor more than 24 strains per year per requester. Cultures are sent as promptly as possible after receipt of the written request. Unlike other collections whose holdings encompass pathogenic and saprophytic cultures, including those of only academic interest, the ARS Culture Collection is limited generally to forms that have potential or known industrial importance or related to such forms. Four major groups of microorganisms (bacteria, actinomycetes, yeasts, and molds) are maintained.

0520 Dental and Medical Materials Research
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Mr. R. K. Eby (301) 921-3734
EXPERTISE: Research is conducted to understand, improve, and develop dental materials. Current research encompasses new dental adhesives, new techniques in calcium phosphate chemistry for remineralization and fluoridation, and new concepts to reducing wear of composite restoratives.

0521 Dental Research Institutes and Centers
National Institute of Dental Research, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 504, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. Anthony A. Rizzo (301) 496-7748
EXPERTISE: These centers were established to attract outstanding scientists from different fields to universities to work as multidisciplinary teams on a wide variety of dental research problems. The centers program has not only contributed to basic and clinical dental sciences, but has fostered the training of a significant number of dental researchers and developed collaborative research efforts with investigators within and outside the field of dental research.

0522 Diabetes Centers Program
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 622, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. Keatha Krueger (301) 496-7418
EXPERTISE: The program consists of two types of facilities: Diabetes Endocrinology Research Centers, which concentrate on basic and clinical investigations conducted in a core setting of shared, comprehensive laboratory facilities; and the Diabetes Research and Training Centers, which encompass basic and clinical research as well as the education and training of new investigators and the translation of research results into improved care and management of diabetic patients. Shared facilities in the research component typically include radioimmunoassays, tissue culture, or equipment such as electron microscopes. The training and translation component is directed toward the entire spectrum of health professionals involved in the care of the diabetic patient and often includes continuing medical education programs. Many centers also have demonstration units and outreach programs developed through cooperation, coordination, and collaboration with local, regional, state, and Federal agencies.

0523 Disaster Research Center
Federal Emergency Management Agency
Ohio State University, 128 Derby Hall, 154 N. Oval Mall, Columbus, OH 43210
Contact: Dr. Henry Quarantelli (614) 422-5916
EXPERTISE: The center engages in a variety of sociological research on group and organizational preparations for, responses to, and recovery from community-wide emergencies, particularly natural and technological disasters. Since the Center's inception, there have been over 450 different field studies. Teams have gone to earthquakes in Japan, Chile, Yugoslavia, Italy, Iran, El Salvador, Greece, California, and Alaska; hurricanes in the southern and eastern United States as well as Japan; floods in Italy, Canada, and more than a dozen states; and tornadoes and hazardous chemical incidents around the country. A dozen cities struck by major disasters have been restudied several years after the initial research. For purpose of comparison, center personnel have also examined organizational responses to civil disturbances and riots. Recent studies have focused on: social and organizational aspects of the delivery of mental health services and of emergency medical services in mass emergencies; and socio-behavioral responses to acute chemical hazards and the problems involved in mass evacuation and sheltering. Center personnel have examined legal aspects of governmental responses in disasters, the emergence and operation of rumor control centers, mass media reporting of community crises, the functioning of relief and welfare groups in stress situations, and the handling of the dead in catastrophes. The research provides basic knowledge about group behavior and social life in large scale community crises as well as information which can be applied to develop more effective plans for future disasters. Besides storing its own data collected through indepth interviewing, participant observations, and document gathering, the center serves as a repository for materials collected by other agencies and researchers.

0524 ECAT Scanning Facility
Oak Ridge Associated Universities, Department of Energy
Medical and Health Sciences Division, P. O. Box 117, Oak Ridge, TN 37831
Contact: Dr. K. F. Hubner (615) 576-3098
FACILITY: This facility is currently developing techniques for using positron-emitting radionuclides to produce tomographic images. Once a radionuclide has been injected and concentrates in a particular part of the body, the positron decay produces annihilation photons that can be detected outside the body by coincidence counting. Detection and evaluation of the emissions is done by an emission computerized axial tomographic scanner (ECAT). By viewing the emissions through various angles, it is possible to produce three-dimensional, cross-sectional images of the tissue distribution of the radiopharmaceuticals. The images obtained by positron tomography reflect differences in tissue function rather then differences in tissue density as with X-rays. Thus, they can be used specifically to detect metabolic operations that are associated with disease processes. Current studies are directed to developing techniques for imaging the pancreas, the brain, and soft tissue tumors and for studying pulmonary function.

0525 Epidemiology Research Center
Environmental Protection Agency
University of Pittsburg, Pittsburgh, PA 15261
Contact: Mr. Gerald Rausa (202) 382-7667

0507 Cancer Communication Network
National Cancer Institute, National Institutes of Health, Department of Health and Human Services
Blair Building, Room 103, 8300 Colesville Road, Silver Spring, MD 20910
Contact: Ms. Judy Stein (301) 427-8777
EXPERTISE: The cancer communication network has offices in 17 cancer centers around the country to serve the public and health professionals. A significant aspect of the network is the operation of toll-free telephone lines by which the public can receive answers to cancer-related questions. The telephone services are promoted under the title 'Cancer Information Service.'

0508 Cancer Control Research Units for Defined Population Studies
National Cancer Institute, National Institutes of Health, Department of Health and Human Services
Blair Building, Room 1A01, 8300 Colesville Road, Silver Spring, MD 20910
Contact: Dr. Carlos Caban (301) 427-8735
EXPERTISE: Cancer Control Research Units (CCRU's) focus on studies in cancer prevention and/or management that require long-term support and involve multidisciplinary participation. These studies are carried out in defined populations so that the population impact of cancer control activities can be measured. Defined populations are characterized in terms of numbers of individuals and methods of identifying individuals in the population; demographic characteristic such as age, sex, color, or ethnic group; vital statistics such as incidence, morbidity, and/or mortality; personal or lifestyle factors such as diet or smoking; and genetic and/or biological characteristics or other factors associated with disease. These studies include innovative approaches to problems of cancer prevention and/or management that may be generalizable to larger populations.

0509 Cancer Control Science Program
National Cancer Institute, National Institutes of Health, Department of Health and Human Services
Blair Building, Room 1A01, 8300 Colesville Road, Silver Spring, MD 20910
Contact: Dr. Carlos Caban (301) 427-8735
EXPERTISE: The program is designed to plan and implement cancer control research studies and to serve as a resource for the National Cancer Program. Each program supports a core group of researchers who perform cancer control research studies ranging from the development of new hypotheses to the conduct of demonstration studies in areas such as prevention (primary and secondary) and management (diagnosis, pre-treatment, evaluation, treatment, rehabilitation, and continuing care).

0510 Cancer Information Clearinghouse
National Cancer Institute, National Institutes of Health, Department of Health and Human Services
Building 31, Room 10A29, 9000 Rockville Pike, Bethesda, MD 20205
Contact: Dr. Robert M. Hadshell (301) 496-6631
INFORMATION SERVICES: The clearinghouse collects public and patient education materials. The clearinghouse has collected and abstracted a data file on over 2,000 documents, including pamphlets, brochures, posters, audiovisual materials, program descriptions, and other educational materials. Clearinghouse users include organizations that develop educational programs and those that provide education to health professionals and patients. In addition, the clearinghouse publishes topical bibliographies that are widely distributed to health agencies, professional groups, and others who provide referral and reference services. Over 10,000 hospitals, clinics, health agencies, and information centers, nationwide cooperate with the clearinghouse by supplying new materials and alerting the clearinghouse to needed materials.

0511 Cancer Tissue Culture and Serum Specimen Banks
National Cancer Institute, National Institues of Health, Department of Health and Human Services
National Institutes of Health, Bethesda, MD 20205
Contact: Dr. Ihor J. Masnyk (301) 496-3251
SERVICES: The institute maintains banks of tissues in culture and specimens of serum for cancer patients. Samples of these tissues can be made available to qualified researchers for evaluating new cancer tests and treatment regimens.

0512 Center for Epidemiologic Research
Oak Ridge Associated Universities, Department of Energy Medical and Health Sciences Division, P. O. Box 117, Oak Ridge, TN 37831
Contact: Dr. S. A. Fry (615) 576-3480
EXPERTISE: Research programs are conducted to examine relationships between occupational exposure to ionizing radiation and subsequent health and mortality. The health effects of chemical toxicants, especially uranium and other metals, are also being investigated both as primary and confounding (with respect to radiation) occupational stresses. Biostatisticians and computer scientists are implementing improved methods for epidemiological analyses and data systems for merging large masses of data into analysis files. Editing and correction procedures have been developed to ensure high quality of the data bases that extend back to the early 1940s. Most of the current work of the center involves the DOE Health and Mortality Study, which is designed to examine the health and mortality history of DOE workers. Employees of DOE and its predessor agencies together with the employees of DOE contractors comprise a unique population with possible work exposure to radiation.

0513 Centers for Interdisciplinary Research on Immunologic Diseases
National Institute of Allergy and Infectious Diseases, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 752, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. Robert Goldstein (301) 496-7104
EXPERTISE: An objective of the centers is to accelerate the clinical application of new knowledge of the immune system. The centers are designed to integrate and coordinate research projects in clinical immunology that are relevant to specialties such as dermatology, pulmonary medicine, hematology, nephrology, rheumatology, infectious diseases, and otorhinolaryngology with those in basic research such as immunobiology, immunochemistry, microbiology, virology, genetics, biochemistry, pharmacology, physiology, and pathology. Within this research framework, the centers also develop special projects and activities such as recruitment and training of clinical investigators, demonstration projects, assessments of the regional socioeconomic impact of immunologic and allergic diseases, evaluations of new treatment modalities, applications of promising investi-

noise threats have on hearing and communication, and seek ways to reduce the noise or to protect the exposed soldier. Laboratory and field experiments are conducted seeking to improve efficiency of the eyes in interpreting information presented by helmet mounted displays, CRTs, and a variety of sophisticated vision-enhancement techniques. Investigators are working to determine human ability to function under conditions of extremely low light when vision is degraded by hypoxia or exotic chemicals. Workload stress and fatigue is also studied. Inflight assessment of aviator performance and analysis of human performance data give information upon which to base aircrew work-rest-cycles. Projects are researching tolerance of impact force on the whole body, impact to the head and neck, and impact forces of enemy projectiles defeated by personal body armor. Equipment technology advances have made vibration a real concern. Vibrating effects on the visual, auditory, vestibular, and motor performances, and cardiopulminary and neuromuscular functions are studied.

0498 Arthritis Information Clearinghouse
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, National Institutes of Health, Department of Health and Human Services
P.O. Box 9782, Arlington, VA 22209
Contact: Mr. Victor Wartofsky (703) 558-8250, or (301) 496-7495
INFORMATION SERVICES: The purpose of the Clearinghouse is to identify, collect, process, and disseminate information about print and audio-visual educational materials concerned with arthritis and related musculoskeletal diseases. The clearinghouse focuses on three main areas: a knowledge base, services to users, and communication and evaluation. The knowledge base is designed as an information storage and retrieval system and can produce a variety of outputs including indexes, abstracts, and bibliographies. Clearinghouse services to users complement rather than duplicate services of other information resources. The clearinghouse acts as an information exchange among scientific, medical, and educational organizations, individual experts in the field of arthritis, and other clearinghouse users. Services include maintenance of a user mailing list; development of products such as catalogs, bibliographies, reference sheets, and individualized data base bibliographies in response to user requests on topics of special interest; and referral of users to other relevant organizations as needed. Outreach and liaison activities include exhibits and materials displayed at pertinent conferences, participation in work groups, and cooperation with the Arthritis Foundation, the NIADDK Multipurpose Arthritis Centers, and private-sector organizations such as major hospitals and academic institutions, professional associations, health insurance companies, and pharmaceutical firms.

0499 Artificial Intelligence in Medicine
National Institutes of Health, Department of Health and Human Services
Stanford University Medical Center, Room TB-105, Stanford, CA 94305
Contact: Mr. Thomas Rindfleisch (415) 497-5569
FACILITY: SUMEX-AIM is a nationally shared computer resource devoted entirely to designing artificial intelligence applications for the biomedical sciences. Within the SUMEX-AIM system, the reasoning processes of physicians, chemists, and other biomedical scientists are being analyzed. At present, the ability of most programs is limited and much less flexible than the corresponding human intellect. In specialized areas of medical diagnosis and chemical structure analysis, some programs rival human capabilities. Generally, the logic built into the system's programs is composed of six major elements--plan-generate-and test, domain-specific knowledge, flexible knowledge base, line-of-reasoning, multiple sources of knowledge, and explanation. Users may gain access to SUMEX-AIM as guests of established projects, as temporary pilot projects, or as fully authorized research projects. Those interested in proposing additional projects should contact Dr. Elliott Levinthal at (415) 497-5813. Questions about the SUMEX facility and its operation should be directed to Mr. Rindfleisch. A directory is also available for those interested in contacting principal investigators of specific projects.

Asbestos Technical Assistance Program (Asbestos-Tap), Office of Toxic Substances, Environmental Protection Agency
See 0210

0500 Asthma and Allergic Disease Centers Program
National Institute of Allergy and Infectious Diseases, National Institutes of Health, Department of Health and Human Services
Westwood Building, Room 752, 5333 Westbard Avenue, Bethesda, MD 20205
Contact: Dr. Robert Goldstein (301) 496-7104
EXPERTISE: The program fosters collaborative research approaches that will integrate basic concepts in immunology, genetics, biochemistry, and pharmacology into clinical investigations. The centers seek to translate curent immunologic concepts and methods of clinical studies into a better understanding of the pathophysiologic, biochemical, and immunologic mechanisms of asthma and other human allergic disorders. Objectives of this program include: to encourage collaboration between basic and clinical scientists; to provide a research environment favorable to such interaction; and to implement clinical application of adequately tested research findings and procedures. The centers have facilities, personnel, and expertise needed to design long-term investigations of one or more major allergic disorders or basic mechanisms of human allergic diseases.

0501 Automated Information Systems
National Cancer Institute, National Institutes of Health, Department of Health and Human Services
Building 82, 9000 Rockville Pike, Bethesda, MD 20205
Contact: Dr. Robert J. Esterhay, Jr. (301) 496-5491
INFORMATION SERVICES: Automated information systems include the International Cancer Research Data Bank (ICRDB), the Centralized Cancer Patient Data System (CCPDS), and PDQ. ICRDB facilitates the sharing of cancer information to a worldwide audience through a computerized science information data bank and retrieval system. CCPDS is aimed at developing a uniform data system in the Comprehensive Cancer Centers for capturing data on approximately 50,000 new cancer cases annually. Two goals of the system are to ensure uniform language and procedures in staging cancer and to develop a resource for cooperative research projects. PDQ, a computer data base, makes available information on current methods of cancer therapy. Containing descriptions of approximately 1,000 cancer therapy research programs, PDQ is updated monthly and accessible through the National Library of Medicine's MEDLARS system.

and device development; manufacturing technology; quality control; failure analysis; and environmental protection.

Surface Modification and Characterization Program, Oak Ridge National Laboratory, Department of Energy
See 0454

Surfaces and Interfaces Laboratory, Solar Energy Research Institute, Department of Energy
See 0327

0485 Tension Testing Laboratory
Army Materials and Mechanics Research Center, Department of the Army
Arsenal Street, Watertown, MA 02172
Contact: Mr. David W. Seitz (617) 923-5527
FACILITY: The laboratory consists of four universal tension testing machines of different capacities capable of attaining loads from 0 - 120,000 lbs. in various increments and at speeds of .001 - 40 inches per minute. The system can test at temperatures ranging from -425F to +500F utilizing specialized auxiliary equipment. The tensile test consists of gripping a standard tensile test specimen between the movable heads of a test machine and recording the extension load, head speed, and other pertinent data related to the test. These machines are very versatile and can be adapted to test many complex sizes and shapes. Compressive loads may be applied.

0486 Thermophysical and Electronic Properties Information Analysis Center
Department of the Army
CINDAS, Purdue University, 2595 Yeager Road, West Lafayette, In 47906
Contact: Mr. Wade H. Shafer (317) 494-6300
INFORMATION SERVICES: The mission of TEPIAC is to provide comprehensive, authoritative, and timely scientific and technical information analysis services on thermophysical and electronic properties of materials. It searches, collects, reviews, evaluates, appraises, analyzes, and summarizes the available scientific and technical data and information from worldwide sources on the various thermophysical and electronic (including also electrical, magnetic, and optical) properties of materials so as to maintain a comprehensive, authoritative, and up-to-date national data base. It responds to requests for material properties data and information and for technical advice and assistance and publishes major reference works such as data books, handbooks and retrieval guides.

0487 Ultra High Sputtering System
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: The facility can be used for RF, dc, and bias sputtering. The typical vacuum obtained in the system is 10 to the -18th torr. The sputtering conditions can be varied extensively: substrate temperature, ambient to 1100C; pressure of reactive gases, to 300 millitorr; and power density, to 20 watts per sq cm. The system is capable of handling toxic gases and it has a drive shaft which can be used in coating cylinders. Applications from this work include Josephson detectors, phonon bolometers, and x-ray monochrometers. The Kosterlitz-Thouless 2D phase transition has been studied with granular NbN films made in this system.

0488 Viscoelactic Materials Characterization Facility
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: The efficient use of strong, lightweight polymeric materials requires a detailed knowledge of how they respond when subjected to stresses. To study this question, a facility for measuring the mechanical properties for polymeric materials has been designed and constructed in the Chemistry Division of the Naval Research Laboratory. This equipment can measure the linear viscoelastic properties of polymers over a wide range of times/frequencies and temperatures. Materials examined with this equipment include adhesive and composite resins (glassy polymers), elastomers, and propellants. On-line computer data acquisition and processing equipment with interactive graphics makes possible in-depth analysis of results in real time. This provides the information necessary to help formulate improved materials and predict performance in practical applications.

0489 Welding Diagnostics Laboratory
Idaho National Engineering Laboratory, Department of Energy
P.O. Box 1625, Idaho Falls, ID 83415
Contact: Mr. R. E. Tiller (208) 526-1439
FACILITY: The welding diagnostics laboratory is devoted to temporal characterization of heat and mass transport in welding. The endeavors include temperature distributions using an optical multichannel analysis system interfaced to an emission spectrograph for arcs, interfacial and base metal temperature measurements (greater than 2000 K) using infrared thermography; flow dynamics and gas density using high-speed holographic interferometry; and gas velocity measurements using laser Doppler velocimetry.

MEDICINE & HEALTH

0490 All-Weather Toxic Chamber
Chemical Research and Development Center, Department of the Army
Aberdeen Proving Ground, MD 21010
Contact: Mr. William A. Barr (301) 671-2031
FACILITY: The chamber is used to assess the effects of toxic chemicals on the skin and clothing and the effect of heat restraint on animals. It contains a stainless steel chamber 32 x 9 x 8 feet and can achieve temperature ranges of -70 to 100F with controlled humidity. Pressure inside chamber is less than outside. Mobile units for chemical agents exposure used inside with filtering of effluent air. It may be used as all weather chamber without toxic chemicals.

0491 Anechoic Chamber and Reverberant Room Facility
Human Engineering Laboratory, Department of the Army
Aberdeen Proving Ground, MD 21005
Contact: Dr. Donald O. Egner (301) 278-5948
FACILITY: The chamber consists of a 9x9x6.2-foot anechoic chamber and a 12x9x7-foot reverberant room. The anechoic chamber has 18-inch fiberglass wedges producing an essentially freefield down to 175 Hz. These two rooms are connected to appropriate acoustical instrumentation including a tape recorder; octave, 1/3 octave, and narrow band analyzers; a white noise generator oscillator, shaper, read time analyzer, counter, and microphone amplifier. The anechoic chamber is used when ambient levels below 20

and the Thermal Flammability Simulator that provides controlled thermal energy in the forms of infrared radiand and conductive heat for firefighter's clothing.

Neutron Radiography Facility, National Bureau of Standards, Department of Commerce
See 0366

0473 Nitinol Technology Center
Naval Surface Weapons Center, Department of the Navy
Code R-32, White Oak, Silver Spring, MD 20910
Contact: Dr. David M. Goldstein (301) 394-2468
EXPERTISE: Nitinol is the preeminent engineering alloy among metals exhibiting shape memory effects. New applications for Nitinol continue to appear where designers are able to use small amounts of heat to reestablish a prior shape, produce a mechanical force, or motivate devices. The center has been created to emphasize the manufacturing technology of Nitinol and, assist in the development of Nitinol-using devices. The center offers guidance and/or prototype development programs for the development of Nitinol-using devices.

0474 Nondestructive Testing Information Analysis Center (NTIAC)
Department of the Army
Southwest Research Institute, P.O. Drawer 28510, San Antonio, TX 78284
Contact: Frances P. Hicks (512) 684-5111
INFORMATION SERVICES: NTIAC functions to collect, review, analyze, appraise, summarize, and disseminate pertinent and timely literature on the processes, techniques, and associated techniques, and associated technologies concerning non-destructive testing. All types of techniques are covered such as radiographic, holographic, acoustic, magnetic, and so forth. It is also concerned with the economic aspects of the NDE industry, economic considerations with respect to selection of techniques and processes, and industry trends in applying current NDE technologies in research and development, production, maintenance, safety monitoring, and failure prevention of in service material. Its services include technical handbooks, data books, state-of-the-art reports, and technology assessments.

0475 Optical Fiber Drawing and Measurement Facility
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: Optical fibers for communications and signal processing are fabricated and evaluated. A facility for drawing and on-line coating of glass fibers is available. The optical properties of these fibers, including spectral attenuation and numerical aperture, can also be evaluated using facility apparatus.

0476 Plastics Technical Evaluation Center (PLASTEC)
Department of the Army
Army Armament R and D Command, Dover, NJ 07801
Contact: Mr. Harry Pebly (201) 724-2778
INFORMATION SERVICES: The center is responsible for the generation, evaluation and exchange of technical information related to plastics, adhesives and organic matrix composites. It covers technology from applied research through fabrication with emphasis on properties and performance. Subject areas include structural, electrical, electronic and packaging applications. This includes molded, formed, foamed and laminated materials. A computerized data file is maintained on compatibility of polymers with propellants and explosives. It also maintains a complete file of standards, specifications, and handbooks in subject areas. It provides the following services: technical inquiries, state-of-the-art studies, data compilations, handbooks, consultant, analysis and evaluations, background studies, bibliographic, and literature searches.

0477 Plate Accelerator (Gas Gun) Facility
Army Materials and Mechanics Research Center, Department of the Army
Arsenal Street, Watertown, MA 02172
Contact: Mr. David W. Seitz (617) 923-5527
FACILITY: The facility was established to study material response under shock wave conditions. The objective is to generate a plane wave with a very high stress level in materials by impacting one disk with another disk of either the same or different material. Impact velocity, material velocity, or stress levels are measured and the shock wave theory is employed to determine the equation of state of the material of interest. The facility consists of three major components; namely, a plate accelerator, an electronic measuring system, and a data analyzer. The plate accelerator includes a 4-inch diameter and 26-foot long gun barrel, a catcher and tank, and a breech designed for maximum pressure of 6,000 psi.

0478 Polymer-Concrete Development Laboratory
Brookhaven National Laboratory, Department of Energy
Department of Applied Sciences, Building 526, Upton, NY 11973
Contact: Mr. Meyer Steinberg (516) 282-3036
EXPERTISE: A well equipped laboratory and expert staff are available to perform basic and applied research on materials consisting of a composite of polymer and aggregate. These rapid setting, high strength and high durability materials were originated and developed here and have numerous applications. The laboratory facilities include resin storage, preparation and polymerization equipment. Aggregate storage and preparation equipment for formulating and producing monomer/aggregate mixes, for measurement of material properties and for casting are also available. BNL staff can provide consultation services on all aspects of polymer concrete materials research, development, and implementation.

Pulsed Photoelectron Spectroscopy, Naval Research Laboratory, Department of the Navy
See 0769

0479 Quantitative Image Analyzer
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: This fully automated image analyzer efficiently quantifies microstructural features in composite materials. A television scanner and monitor detects and digitizes contrasting features observed directly in a specimen through an optical microscope or in any photograph through a macroviewer. Interfaced with a PDP-11 computer, the system performs complex quantitative analysis of composite material features in just a few seconds. Some of these features include fiber volume fraction, volume fraction and average thickness of fiber/matrix interface layer, average fiber spacing, and fiber distribution.

2200F. The choice of specimen geometry is open-ended; variations can be selected that will simulate gas turbine engine components.

0463 Forest Products Laboratory
Forest Service, Department of Agriculture
P.O. Box 5130, Madison, WI 53705
Contact: Mr. Robert Steidemann (608) 264-5600
EXPERTISE: The mission of laboratory is to conduct research leading to greater social and economic benefits through better utilization of the timber resource. A threefold approach to this mission has been established. One, to insure the most efficient us of wood as an industrial material. Two, to assist timber resource management. And three, to provide world-wide expertise on the technical aspects of wood. Research is under way to develop techniques and processes to obtain higher yields of such products from both softwood and hardwood timber. New lumber drying methods that save energy and shorten drying times are also being developed. Adhesives research under way includes improved performance of conventional resins, development of new adhesives from petro-chemical substitutes, oxidative bonding of wood, effect of abrasive planing on bond strength, and control of wood degradation by acid-catalyzed phenolics. Recovery of valuable chemicals from current pulping byproducts, processes for production of alcohol utilizing improved hydrolysis techniques, use of wood for energy by direct combustion, gasification and pyrolysis processes, production of wood-derived chemicals through microbial processes, and methods to coproduce chemicals and pulp are being studied. Pulp, paper, and packaging research is continuing on improved performance of products from recycled fiber, chemical additives to improve the properties of hardwood fiber products, expanded use of hardwood and recycled fibers in corrugated fiberboard, how to make high-yield nonpolluting low energy pulp, and better design of corrugated containers to lessen fiber input. Emphasis in light-frame construction is directed at using materials more effectively, improving structural integrity, increasing energy efficiency, and developing better fire safety techniques, Additional research on the properties, design, and performance of engineered wood structures and components is carried out. Current research is directed at finding new concepts and procedures for preserving wood against biological degradation. Improved accuracy of classification and identification of wood-rotting and wood-inhabiting fungi is another laboratory objective. The relationships of such fungi with forest management practices are being investigated.

Government-Industry Data Exchange Program (GIDEP), Department of the Navy
See 0433

0464 Handwear, Footwear, Rainwear, and Tentage Facilities
Materiel Testing Directorate, Department of the Army
STEAP-MT-I, Aberdeen Proving Ground, MD 21005
Contact: R. T. Muse (301) 278-4782
FACILITIES: Accelerated wear test courses have been developed to test materiels, designs, and construction used in military handwear and footwear. The handwear course includes controlled work conditions or tasks contributing to handwear failure. The activities are designed to create strain and abrasion in varying degrees on the seams and surface of gloves. Data can be obtained as to resistance to wear, retention of size and shape under hard use, and the degree of moisture absorption and drying of the gloves. The footwear course consists of various terrain and abrasive surfaces over which footwear is worn. The course is one-sixth of a mile long and includes stretches of crushed quartz, chipped and cubed granite, cinders, sand, mud, water, gravel, slag, and smooth and rough concrete. The rainwear and tentage facility is designed to simulate overall rainfall for testing the adequacy of foul weather garments, tentage, and all types of general military materiel and equipment. High-pressure showerheads projecting from parapets 35 feet high produce simulated rainfall of varying intensities from 1/10th of an inch to 3 inches per hour. The facility covers an area of 86 feet by 50 feet. It is composed of a dynamic rain course and a static rain course. On the dynamic course, personnel wearing test clothing traverse obstacles and other obstructions simulating physical situations that confront troops in combat. Water resistance of tentage, containers, and other materiel and equipment may be evaluated on the static course.

High Voltage Electron Microscope - Tandem Facility (HVEM), Argonne National Laboratory, Department of Energy
See 0750

0465 Individual Protection Laboratory
Army Natick Research and Development Laboratories, Department of the Army
Natick, MA 01760
Contact: Dr. Decareau (617) 651-5188
EXPERTISE: Research and development is conducted on uniforms, protective clothing, personnel armor, and life support equipment systems. The laboratory's divisions develop, evaluate and prototype test specific items of handwear, headwear, footwear, and clothing, all forms of equipage, including canteens, load-carrying equipment, sleeping gear, entrenching tools, body armor and helmets. They develop gear for conditions ranging from Arctic to tropic, explosive to toxic, and flammable to chemical. They conduct human factors, anthropometric, and physiological studies for items of personal use, and conduct research and development on specialty chemical, plastic, paper and derivative products. They also research multi-functional textile materials for uniforms, incorporating coatings, finishes.

0466 Liquid Metal Corrosion Laboratory
Argonne National Laboratory, Department of Energy
9700 South Cass Avenue, Argonne, IL 60439
Contact: Dr. Dale L. Smith (312) 972-5180
FACILITY: Studies are conducted on the corrosion/mass transfer of structural materials in liquid metal (Li, LiPb, Na) environments. The laboratory includes a capability for testing the effects of liquid metal environments on the mechanical properties (fatigue, creep) of structural alloys.

Liquid Metal Technology, Hanford Engineering Development Laboratory, Department of Energy
See 0365

0467 Materials Analysis Laboratory
Idaho National Engineering Laboratory, Department of Energy
P. O. Box 1625, Idaho Falls, ID 83415
Contact: Mr. R. E. Tiller (208) 526-1439
FACILITY: Extensive capability is available for materials analysis including scanning Auger microprobe (with ESCA), scanning electron microscope with energy-dispersive x-ray analyzer, x-ray diffraction, transmission electron micros-

searchers from other governmental, university and industrial laboratories can gain the benefit of the Ames Laboratory's unique capabilities for the preparation, purification, fabrication, and characterization of metals and the preparation of single crystals of certain materials which are not available from private, commercial suppliers. The major categories of materials with which the MPC is currently involved include: refractory metals, the alkaline earths, rare earth metals and compounds, and certain actinide metals.

0452 Mechanical Fabrication - R&D Support
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Mr. Joseph F.B. Szoo (505) 667-4849
FACILITY: In support of R and D activities but without regard to the sponsors identity, the services of the facility are available. The staff of that facility has extensive experience with manufacturing prototype, close-tolerance components and apparatus and in fabrication of radioactive and toxic materials. This facility also has the capability to machine metal laser mirrors by diamond turning.

Microelectronic Processing Facility, Naval Research Laboratory, Department of the Navy
See 0282

0453 Non-Destructive Evaluation
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Mr. Leonard Mordfin (301) 921-3331
EXPERTISE: This office was established to assist industry and government agencies in improving the reliability of materials and structures; it is working to help industry develop methods for accurate and reproducible NDE measurements. This includes technical investigations, development of standards (both measurement standards and procedural documents), characterization of instruments, and assessments of the meaning of NDE measurements in relation to material performance. The main emphasis of the program is on the needs for improved measurements and calibration standards and procedures for many of the NDE methods commonly used in industry. Examples of research in several areas of NDE are: Acoustic ultrasonic programs, Radiography, Electromagnetic methods, Penetrant testing, Wear debris analysis, and Thermal-infrared.

Nondestructive Engineering Unit, Idaho National Engineering Laboratory, Department of Energy
See 0367

Nondestructive Testing Information Analysis Center (NTIAC), Department of the Army
See 0474

Optical Fiber Drawing and Measurement Facility, Naval Research Laboratory, Department of the Navy
See 0475

0454 Surface Modification and Characterization Program
Oak Ridge National Laboratory, Department of Energy
Bldg. 3003, Oak Ridge, TN 37830
Contact: Dr. B. R. Appleton (615) 574-6283
FACILITY: The combined techniques of ion implantation doping, ion induced mixing and pulsed-laser processing are utilized to alter the near-surface properties of a wide range of solids in ultrahigh vacuum. Through in situ analysis by ion beam, surface, and bulk properties techniques, the fundamental materials interactions leading to these property changes are determined. Since both ion implantation doping and pulsed-laser annealing are nonequilibrium processing techniques, they can be used to produce new and often unique materials properties not possible with equilibrium fabrication techniques. This makes them ideal tools for fundamental materials research. They are equally useful for modifying surface properties for practical applications in areas such as friction, wear, corrosion, catalysis, surface hardness, solar cells, semiconducting devices, superconductors, etc.

Ultra High Sputtering System, Naval Research Laboratory, Department of the Navy
See 0487

Ultrasonic Fuel Scanner, Idaho National Engineering Laboratory, Department of Energy
See 0713

Welding Diagnostics Laboratory, Idaho National Engineering Laboratory, Department of Energy
See 0489

MATERIALS

0455 Albany Research Center
Bureau of Mines, Department of the Interior
U.S. Bureau of Mines, P.O. Box 70, Albany, OR 97321
Contact: Director (503) 967-5893
EXPERTISE: The center has international preeminence in the precise determination and cataloging of thermodynamic variables. Accurate thermodynamic data are being determined to aid in the understanding of specific metallurgical reactions, to predict the energy requirements for new metallurgical processes, and to determine the fundamental role of accessory minerals and elements in minerals processing streams. Techniques developed for the melting and casting of titanium and zirconium include consumable electrode arc and inducto-slag melting. Technological problems relating to the metallurgy of zirconium, hafnium, columbium, tungsten, tantalum, and other reactive and refractory metals and their alloys are being investigated. Mineralogical measurements are performed on materials obtained from mineral processing operations, exploration, and mining in order to characterize them in support of mineral and metallurgical research activities.

0456 Alloy Preparation Laboratory
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Mr. H. C. Burnett (301) 921-2813
FACILITY: Research grade samples of metals and alloys are prepared when such samples are not readily available commercially, or when accurate dils are required concerning the purity of the constituents and the melting and fabricating history. Capabilities include vacummn-induction meltingand casting; arc furnace; levitation melting furnance; electron-beam zone refiner; electron-beam button melter; electron-beam evaporator; induction and resistance melting and casting furnaces; heat-treating furnaces; cold-working equipment for rolling, swaging, and drawing; apparatus for producing metallic hydrides under hydrogen pressures up to 1000 psi.

Ames Laboratory, Department of Energy
See 0784

three major NTIS subscription services which alert businesses to newly issued technical reports or technologies. A weekly bulletin is available on a subscription basis in each of twenty-eight different subject areas. The bulletin, called Abstract Newsletters, announces summaries of newly released government R and D reports and provides complete coverage of broad areas of Government research. Another weekly bulletin, Government Inventions for Licensing, announces annually more than 1,500 U.S. Government-owned inventions available for licensing, often on an exclusive basis. The third major current awareness service is a monthly subscription alerting companies to new federal technology having practical or commercial potential. This awareness service, called Tech Notes, offers its readers one- and two-page fact sheets, often illustrated, of new processes, equipment, software, and materials. Special bibliographies, called Published Searches, have been prepared on more than 3,500 different topics. Designed to help companies inexpensively find information about past research in specific areas, each bibliography offers a convenient way to survey the state-of-the-art before new research is undertaken. For further information please write to NTIS, Springfield, VA 22161 and ask for brochures PR-205, PR-365, PR-750, PR-154, and PR-701.

National Water Data Exchange (NAWDEX), U.S. Geological Survey, Department of the Interior
See 0250

Natural Hazards Research Information Center, Federal Emergency Management Agency
See 0251

0445 New England Research Applications Center (NERAC)
National Aeronautics and Space Administration
Mansfield Professional Park, Storrs, CT 06268
Contact: Mr. Sam Di Savino (203) 486-4533
INFORMATION SERVICES: NERAC aids and promotes the transfer of technology by helping business and industry, colleges and universities, and local governments locate appropriate technical and business information. Its mission is to help industry benefit by using previously developed technology. NERAC's attempt at achieving this mission involves a total service approach using multiple data bases. User inquires are handled by a staff of full-time technical specialists. Each staff member is trained not only in computerized information retrieval, but also has formal graduate education training and industrial experience in his field of expertise. Most are trained in multidisciplinary areas, facilitating the multiple data base approach. In order to locate technical and business information, NERAC makes use of sources from throughout the world. More than 100 data bases are available on NERAC's in-house computer. One area of specialization at NERAC is the availability of current awareness profiles which offer users a means of keeping up to date on a particular topic.

Nitinol Technology Center, Naval Surface Weapons Center, Department of the Navy
See 0473

Nondestructive Testing Information Analysis Center (NTIAC), Department of the Army
See 0474

0446 North Carolina Science and Technology Research Center
National Aeronautics and Space Administration
P.O. Box 12235, Research Triangle Park, NC 27709
Contact: 1-800-334-8561 (In North Carolina call (919)549-0671)
INFORMATION SERVICES: The center is one of the oldest NASA information centers, serving business and industry throughout the Southeast since 1964. Using remote online terminals, its staff of information specialists have access to more than 100 million reprorts and documents form worldwide sources. These are scanned daily for information needed by a wide variety of clients. Because of industry needs, the center has specialized in textiles, food science and technology, education and training, electronics, biomedics, chemistry/toxicology. The recent influx of high tech industries such as semiconductors, pharmaceuticals, and telecommunications has led the center to expand its resources and areas of expertise; staff members now use over 200 data collections to identify material on subjects from agriculture to zoology. Services provided by the Center include development of bibliographies on specific topics, regular scanning of new developments on selected subjects, special studies of areas of concern, conferences and workshops, a monthly technical bulletin, and assistance in adapting material provided.

Northwest Ocean Service Center, National Oceanic and Atmospheric Administration, Department of Commerce
See 0725

Nuclear Reactor Safety Research Data Bank, Idaho National Engineering Laboratory, Department of Energy
See 0708

Nuclear Safety Information Center, Oak Ridge National Laboratory, Nuclear Regulatory Commission
See 0709

0447 Ocean Systems Applications Group Chart Facility
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
EXPERTISE: One of the most comprehensive Navy chart systems is maintained. Navigational charts, publications, and data are received and updated on a continuous basis as an integral component of the automatic chart and publication distribution system of the Defense Mapping Agency. The main function of the facility is to provide the sea-going scientist with pre-cruise planning information and navigation expertise during the actual experimental phase.

0448 Office of Data Base Services
National Technical Information Service, Department of Commerce
U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161
Contact: (703) 487-4808
SERVICES: The Office of Data Base Services was established to improve access to the variety of products produced by the Government that are machine processable. This is being accomplished through extensive contact with the various Federal agencies to identify machine-processable products. The Office is organized into four major product areas: Bibliographic Data Bases; Computer Software; Numeric and Textural Source Data Files; and Statistical Services. A number of bibliographic files produced by other

dite the transfer of technology by assisting clients identify and apply information beneficial to their particular needs. In order to accomplish its objectives, NIAC has marshalled an array of resources and talents from NASA, many of the leading Federal research laboratories, and internationally-recognized academic institutions. NIAC regularly works with all the NASA research centers including the Lewis Research Center in Cleveland, Ohio; the Goddard Space Flight Center in Greenbelt, Maryland; and the Langley Research Center in Hampton, Virginia. As part of this highly sophisticated resource network, NIAC calls upon the expertise of its technology utilization officers who are resident within the various NASA research facilities. This contact allows for immediate access to the work of literally thousands of NASA engineers and scientists. As an integral part of the University of Pittsburgh, NIAC frequently utilizes the unique talents of the faculty and has access to many impressive research centers on campus. In addition, NIAC also works with many scientists and researchers at other leading edge academic institutions. Skilled faculty members are often called upon on an ad hoc basis to review and analyze information and products to meet client's needs.

0437 NASA Industrial Applications Center(NIAC)
National Aeronautics and Space Administration
University of Southern California, Denney Research Bldg., Los Angeles, CA 90007
Contact: Dr. Robert Mixer (213) 743-6132
INFORMATION SERVICES: The center offers the locating of information through on-line searches of computerized bibliographic databases. The product of a NIAC search is a bibliography, listing the title, author, publication information, and usually a short, descriptive abstract of each article. Information is accessed for clients with problems in research and development, patent innovation, quality control, manufacturing, and other diverse technical areas. Special searches are also offered where a technical coordinator, located at the NASA Ames Research Center, contacts experts in both government and industry for opinions on solutions to technical problems. A special service also is offered by NIAC, the Remote Interactive Search (RIS). With RIS, clients with the proper computer terminal can follow the informational search in real time from the convenience of their offices. NIAC is a recipient of an SBA Grant for informational assistance to companies involved with the Small Business Innovation Research (SBIR) Program, and therefore is in the position of providing quick turnaround for technology information for small businesses interested in participating in the program.

0438 NASA-Florida State Technology Applications Center
National Aeronautics and Space Administration
University of Florida, 307 Weil Hall, Gainesville, FL 32611
Contact: (904) 392-6760
INFORMATION SERVICES: The center is an information retrieval system designed to provide up-to-the-minute facts to help answer questions about the best ways to handle business operations and problems. As an outgrowth of NASA's enormous investments in research and development, STAC emphasises assitance in the transfer of these technological benefits to Florida businesses. STAC provides access to many different computer bases for information pertinent to specific questions. STAC produces for its clients information in both summary form and in actual hard copy documents that have been published about a particular question. Information files available cover a full range of technology, science, industry, management, marketing, economic, business, and other applications.

0439 NASA/UK Technology Applications Program
National Aeronautics and Space Administration
University of Kentucky, 109 Kinkead Hall, Lexington, KY 40506
Contact: (606) 257-6322
INFORMATION SERVICES: Contemporary organizations face the continuing challenge of adequately defining their problems and acquirng pertinent information to solve those problems. Technology coordinators with the program work one-on-one with each organization requesting assistance to better define these needs. Through computer database searching, the program will retrieve and make available information representing public and private research that can help in the decision making process. In addition, NASA field centers are contacted or other technical resources accessible to the program are used in order to provide the assistance necessary to solve a problem. The program's primary mission is to aid state and local government officials in allocating resources effectively to meet the needs of all citizens. Government administrators can access technical information and research possessing the potential to solve public sector problems. Decision-makers and managers in the private sector benefit from practical information about processes, products, research and newly developed technologies. Engineers benefit from the world-wide experience of others in creating solutions to design problems. Firms can explore new applications for existing products or services. Energy, chemicals, plastics, metals and pollution control represent just part of the information areas that are available to the business and industrial user. Colleges, universities and other non-profit organizations can utilize the program's resources to access scientific and technical information in support of sponsored research or other problem solving.

0440 National Cartographic Information Center
U.S. Geological Survey, Department of the Interior
503 National Center, Reston, VA 22092
Contact: (703) 860-6167
INFORMATION SERVICES: The center was established to help the public find maps of all kinds--and much of the data and materials used to compile and to print them. NCIC collects, sorts and describes all types of cartographic information from Federal, State and local government agencies and, where possible, from private companies in the mapping business. It is the public's primary source for cartographic information. NCIC staff will: Inform one about maps and other cartographic information available from many government and private sources; Take orders for any of the full range of maps, map byproducts, and other cartographic information produced by the Geological Survey, including millions of aerial photos and space images; and Search vast holdings of maps and other cartographic information to obtain quickly the desired information or products.

0441 National Center for Standards and Certification Information
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Mr. Walter G. Leight (301) 921-3272
INFORMATION SERVICES: The service provides up to-date information on standards and certification programs. NCSCI develops and maintains computerized data bases

expect each Unit to be oriented only to Fish and Wildlife Service interests. However, the Service does expect each Unit to have a program that serves the mutual needs of the cooperators. Research of these units include fish ecology; fisheries management; habitat assessment; population dynamics; limnology; wildlife management; animal ecology; and other basic studies to fish and wildlife.

0420 Great Lakes Fishery Laboratory
U.S. Fish and Wildlife Service, Department of the Interior
1451 Green Road, Ann Arbor, MI 48105
Contact: Dr. Bernard L. Griswold (313) 994-3331
EXPERTISE: Current research is directed toward fishery resource assessment; ecology/limnology; and fish physiology and contaminant chemistry.

0421 La Crosse National Fishery Research Laboratory
U.S. Fish and Wildlife Service, Department of the Interior
P.O. Box 818, 2630 Fantan Reed Road, La Crosse, WI 54601
Contact: Dr. Donald C. Hales (608) 783-6451
EXPERTISE: Research is directed toward toxic effects, modes of action, residue dynamics, and ecological impacts of chemicals used to manage fishery resources or to culture fishes; interrelationships between water chemistry variations, pollutants and contaminants, and biological strains and their effects on the activity of fishery chemicals; techniques for counteracting, neutralizing, or synergizing the activity of fishery chemicals; alternate control techniques; screening candidate compounds to meet needs identified by resource managers, and the effects of navigation and development on fishery and related resources in large river systems.

0422 National Fisheries Center
U.S. Fish and Wildlife Service, Department of the Interior
P.O. Box 700, Kearneysville, WV 25430
Contact: Mr. Joseph McCraren (304) 725-8461
EXPERTISE: The center and its components located in five other states, have a combined total of nearly 200 years of experience in the development of fish cultural technology. It provides information on: Health, Genetics, Training, Feeds, Facilities, Bio-Engineering, Equipment, Transportation, and Propagation.

0423 National Fisheries Information Center
National Fisheries Center, U.S. Fish and Wildlife Service, Department of the Interior
P.O. Box 700, Kearneysville, WV 25430
Contact: Mr. Joseph P. McCraren (304) 725-8461
INFORMATION SERVICES: Literature searches and referral services are provided. The coverage includes culturing of all freshwater organisms (warmwater, coolwater, coldwater); Pond aeration techniques; Pond fertilization; Drug clearance; Water reuse systems; Spawning and rearing techniques; Fish disease identification; treatment and control; Fish nutrition and feed formulation; Genetics; Hybridization, and Strain evaluation.

0424 Northeast Fisheries Center and Associated Laboratories
National Oceanic and Atmospheric Administration, Department of Commerce
National Marine Fisheries Service, Woods Hole, MA 02543
Contact: Mr. Herbert Stern (617) 548-5123
EXPERTISE: The work at the center and co-located Woods Hole Laboratory concentrates on two major areas: monitoring and evaluation of the marine fisheries resources for international negotiations, regional Fisheries Management Councils, and state/federal programs; and evaluation of the biological and environmental interactions of marine fisheries resources. The laboratory conducts major research vessel surveys of the fish and shellfish resources from North Carolina to Canada. Extensive evaluations are made of biological parameters on single and multispecies bases. The Manned Undersea Research and Technology Program, a unique research unit of the center, specializes in studies which require use of submersibles and advanced SCUBA technology. These studies provide information on areas such as oil drilling on Georges Bank, performance of fishing gear, and descriptions of critical areas of the ocean floor. Other laboratories associated with the Northeast Fisheries Center and their areas of expertise are: Narragansett Laboratory endeavors to improve forecasts of fish stock abundance by measuring the biological and environmental fluctuations that control the size of the Northeast shelf fisheries. The Gloucester Laboratory houses laboratory and refrigerated storage space, food preparation and processing area for research and development, and Marine Products Development Irradiation, the only semi-commercial irradiation facility in the East for preserving fish quality with the use of gamma radiation. The primary mission of the laboratory is to optimize the use of the fishery resources of the Northeast. Basic research areas include development of underutilized species for domestic and foreign markets, improving the quality of seafoods, utilization of discarded species, and increasing the productivity and efficiency of harvesting and processing seafoods. The two pronged mission of the Milford Laboratory involves aquaculture research and devlopment of the bay scallop, surf clam, and American oyster; and identification of environmental pollution affecting marine fisheries resourcs. The information gained is used in management planning to conserve marine habitats and maintain fishery resources for commercial and recreational use.

0425 Northwest and Alaska Fisheries Center and Associated Laboratories
National Ocean and Atmospheric Administration, Department of Commerce
National Marine Fisheries Service, 2725 Montlake Blvd., Seattle, WA 98112
Contact: Mr. George Tananaka (206) 442-4760
EXPERTISE: The laboratory includes six field stations in Washington, three in Oregon, one in Alaska, the National Marine Laboratory, and the National Analytical Facility. The Seattle Laboratory and field facilities conduct various types of research. Included is research relating to the effects of environment and environmental changes on marine resources and anadromous fishes in the Northwestern U. S.; research on marine mammals; multidisciplinary research on effects of major classes of pollutants on marine organisms and their habitats; Columbia River estuary studies and living resources; and experimental fishway and other engineering resources used primarily for adult salmonid passage studies. The Auke Bay Laboratory, north of Juneau, Alaska, and its associated field stations has responsibility for providing research and advisory support to U. S. negotiators in fishery treaty deliberations with Canada and Japan to reduce interceptions of our salmon resouces in their commercial fisheries; for assessing groundfish resources in the eastern Gulf of Alaska: for habitat studies focusing on impacts of petroleum and logging on Alaska fishery resources; for re-

of the potential product and discharge problems expected from the emerging synthetic fuels industry through the evaluation of pilot-scale and commercial-scale synthetic fuels plants already in operation. (2) Utilities and industrial processes, which includes improvement of the performance and cost-effectiveness of existing sulfur oxide and particulate removal technologies, continuing fundamental research to better define particulate collection mechanisms. (3) Very low-cost, retrofittable nitrogen oxide/sulfur oxide control, a special project of the laboratory to bring to commercialization a process known as the Limestone Injection Multistage Burner, and (4) Stationary source sampling, analytical procedures, data quality and management generic and specific cost estimation methods development, and support to other EPA components in hazardous waste incineration measurements.

0404 Industrial Waste Elimination Center
Environmental Protection Agency
South Bend, IN 60616
Contact: Mr. Morris Altshuler (202) 382-7667
EXPERTISE: Management of industrial wastes has become a major international problem and target of public concern, as a result of increased recognition of the immediate and long-term hazards to human health and the environment from the wastes generated by industry. The center is dedicated to research on fundamental aspects of industrial wastes management, associated with in-plant recovery and containment, avoidance, or reduction of pollutant discharges. The research focus is multimedia, and primarily concerned with reduction and elimination of industrial pollutant discharges through innovations in industrial processes and development of recycle/recovery strategies.

Inhalation Toxicology Research Institute, Department of Energy
See 0541

0405 Innovative and Alternative Technology Program
Municipal Environmental Research Laboratory,
Environmental Protection Agency
Cincinnati, OH 45268
Contact: Mr. Morris Altschuler (202) 382-7667
EXPERTISE: A technical support group has been established to assess and provide guidance in the form of cost, performance, design and energy information for a variety of innovative municipal wastewater treatment technologies.

Laboratory for Energy-Related Health Research, Department of Energy
See 0544

Laboratory of Biomedical and Environmental Sciences, Department of Energy
See 0200

Laboratory of Radiobiology and Environmental Health, Department of Energy
See 0545

Marine Sciences Research Center, Environmental Protection Agency
See 0718

Mobile Activation Facility (Cadmium), Brookhaven National Laboratory, Department of Energy
See 0760

0406 Monticello Field Station
Environmental Protection Agency
Monticello, MN 55362
Contact: Mr. Morris Altschuler (202) 382-7667
EXPERTISE: Research is conducted on the movement and fate of both conventional and toxic pollutants in natural aquatic environments.

0407 Municipal Environmental Research Laboratory
Environmental Protection Agency
Cincinnati, OH 45268
Contact: Mr. Morris Altschuler (202) 382-7667
EXPERTISE: Ways to prevent, control and treat pollutants that affect communities are studied. These include developing cost-effective methods of providing safe drinking water; community environmental management; solid and hazardous waste disposal; wastewater treatment; and new and improved technology for collecting, transporting, processing and disposing of solid and hazardous wastes.

0408 National Center for Groundwater Research
Environmental Protection Agency
University of Oklahoma, OK 73019
Contact: Mr. Morris Altschuler (202) 382-7667
EXPERTISE: The center identifies, plans, and conducts research within three approved substantive areas. These areas include the transport and fate of pollutant materials, subsurface characterization, and methods development.

National Center for Toxicological Research, Environmental Protection Agency
See 0554

0409 National Intermedia Transport Research Center
Environmental Protection Agency
University of California, Los Angeles, CA 90024
Contact: Mr. Gerald Rausa (202) 382-7667
EXPERTISE: The center was established for the study of pollutant exchange processes between certain environmental compartments. These exchange processes describe transport between the air, land and water. Intermedia transport processes, in turn, depend upon a set of transport processes occurring within each environmental compartment. The pollutant source, which drives the transport processes, plays a central role.

0410 National Small Flows Clearinghouse
Environmental Protection Agency
West Virginia University, Morgantown, WV 26506
Contact: Mr. Morris Altschuler (202) 382-7667
INFORMATION SERVICES: The clearing house is designed for sanitary engineers, consultants, and developers who feel the pressure to keep up-to-date with the latest small wastewater flows technology. It was established to facilitate the dissemination of information on rural community alternatives to conventional technologies for the collection, treatment and disposal of wastewater.

0411 Newtown Field Station
Environmental Protection Agency
Newtown, OH 45244. Contact Mr. Morris Altschuler (202) 382-7667
EXPERTISE: The station develops and validates methodology for measuring toxicity of complex mixtures, protocols for determining ways to reduce the toxicity of effluents, and microcosms for studying the effects of pollutants.

studying pathways of contaminants from source to man and applies new technological developments to the detection and analysis of ionizing radiation, trace metals, and other pollutants. Aside from its ordinary laboratory facilities, specialized equipment is used for measuring pollutants from nuclear and non-nuclear sources, measuring aerosols, and developing experimental equipment and instruments.

Environmental Monitoring and Support Laboratory,
Environmental Protection Agency
See 0745

0390 Environmental Monitoring Systems Laboratory
Environmental Protection Agency
Research Triangle Park, NC 27711
Contact: Dr. Si Duk Lee (919) 541-2266
EXPERTISE: The laboratory provides monitoring services, quality assurance techniques, and standardized analysis methods to those engaged in environmental research. Trace metals analysis is conducted on samples collected by a world-wide precipitation network. A long-term study is continuing to determine the impact of emissions from the new automobile catalytic converters. Other EPA and State laboratories are assisted with the development and implementation of quality assurance programs. A standardization program establishes the precision and accuracy of measurement methods and provides test laboratories with standard reference materials. Fuels and fuel additives are collected and analyzed to provide an independent information base on constituent elements and compounds present in fuels and fuel additives.

0391 Environmental Monitoring Systems Laboratory
Environmental Protection Agency
Las Vegas, NV 89114
Contact: Dr. Gilbert Potter (702) 798-2100
EXPERTISE: Research is centered on environmental monitoring; monitoring systems and techniques development; remote sensing of the environment; and radiation quality assurance.

0392 Environmental Research Laboratory (Ada)
Environmental Protection Agency
Ada, OK 74820
Contact: Mr. Douglas Kreis (405) 332-8800
EXPERTISE: Areas studied include water pollution: water quality: agricultural wastes; ground water quality and pollution; combined industrial wastes; waste water treatment; treatment and control of wastes from petrochemicals and petroleum; effects of pollutants on soil and ground water ecology; soil treatment systems; and water quality control by means other than conventional treatment processes.

0393 Environmental Research Laboratory (Athens)
Environmental Protection Agency
Athens, GA 30613
Contact: Dr. Si Duk Lee (919) 541-2266
EXPERTISE: The laboratory plans, conducts, and manages research and development to identify and measure environmental pollutants, determine pollutant transport and fate in freshwater and soil, and control pollutants from agricultural and silvicultural nonpoint sources by rational strategies based on environmental or process systems models, and to develop new instrumentation and new applications for existing instrumentation. Focus of research is on specific pollutants, especially pesticides and other toxicants, plant nutrients, and natural or synthetic organics, and their environmental pathways.

0394 Environmental Research Laboratory (Corvallis)
Environmental Protection Agency
Corvallis, OR 97333
Contact: Mr. Marvin Allum (503) 757-4601
EXPERTISE: Research is conducted on the effects of environmental pollutants on terrestrial, freshwater, and marine water ecosystems; the behavior, effects, and control of pollutants in lakes and river systems; and development of predictive models on the movement of pollutants in the biosphere.

0395 Environmental Research Laboratory (Duluth)
Environmental Protection Agency
Duluth, MN 55804
Contact: Mr. Morris Altschuler (202) 382-7667
EXPERTISE: The laboratory is a nationwide resource center of expertise on freshwater aquatic toxicology in the areas of pesticides, toxic substances, hazardous wastes, water quality criteria data and methods, and energy related effects on the environment. The mission is to develop the scientific basis for policy, regulatory, and operational functions of EPA by conducting the following research: Fish toxicology; development of water quality criteria for aquatic life; and effects of complex and variable effluents on aquatic life and/or freshwater ecosystems.

0396 Environmental Research Laboratory (Gulf Breeze)
Environmental Protection Agency
Gulf Breeze, FL 32561
Contact: Mr. Richard Voyer (401) 789-1071
EXPERTISE: Research is conducted on the effects of toxic organics, including pesticides, on estuarine animals and their environment; chemical analysis of organic residues in estuarine animals; estuarine ecology; biology of estuarine fishes, crustaceans, and mollusks; and estuarine fauna of Florida.

0397 Environmental Research Laboratory (Narragansett)
Environmental Protection Agency
Narragansett, RI 02882
Contact: Mr. Richard Voyer (401) 789-1071
EXPERTISE: The laboratory's research program is based on two mandates: to develop water quality criteria for regulating pollution to assure the integrity of various water uses, and to develop information to be used in the prohibitions and regulations concerning ocean dumping of pollutants from various land-based sources. Physical, chemical, and biological sciences are applied to questions of transport, transformation, and fate of pollutants in estuarine, coastal, and oceanic waters. Laboratory strategy goals are combining quantitative assessments of resource exposure to pollutants and quantitative effects of pollutants upon resources to arrive at a hazard assessment which is the predicted likelihood of pollution consequences. Disciplines employed are hydrology, computer science, analytical inorganic and organic chemistry, botany, field biology, experimental biology, sedimentology, biometrics, statistics, histopathology, and systems modeling.

0398 Environmental Sciences Research Laboratory
Environmental Protection Agency
Research Triangle Park, NC 27711
Contact: Dr. Si Duk Lee (919) 541-2266
EXPERTISE: The effects of air pollution on the atmosphere and the subsequent impact on air and water quality and land use are studied. Research and development programs provide technology for measuring and characterizing pollut-

bleed technique of injecting sodium at a programmed rate. Pumps tested include DOE's FFTF pump and an inducer pump at 14,500 gpm. Testing of a CRBR prototype pump to 35,000 gpm is complete. Planned facility modifications will increase SPTF flow test capability to 110,000 gpm for testing larger prototypes. All test facilities are designed to be easily adapted to a wide range of test parameters. Facility modifications to meet user needs at minimal cost are a prime feature of ETEC's can-do engineering posture.

0378 Soil Mechanics Information Analysis Center (SMIAC)
Army Engineer Waterways Experiment Station, Department of the Army
P. O. Box 631, Vicksburg, MS 39180
Contact: Dr. Paul Hadala (601) 634-3475
INFORMATION SERVICES: Information is provided on soil mechanics, engineering geology, rock mechanics, seismology, geophysics, and earthquake engineering. This work is directed primarily toward military needs. Services include literature searches in specific areas of interest development of state-of-the-art reviews and bibliographies, responses to requests for specific data and technical information searches, directing persons seeking information to qualified individuals with specialized knowledge for advisory and consultant services, performing technical analyses and evaluations, and periodic publication and distribution of abstracts and brief evaluation statements of recent acquisitions.

0379 Static Sodium Test Rigs
Energy Technology Engineering Center, Department of Energy
P. O. Box 1449, Canoga Park, CA 91304
Contact: Mr. K. T. Stafford (213) 700-5326
FACILITY: These multiple test rigs were established for evaluating various types of instrumentation in a static sodium environment. Instruments for measuring temperature, pressure, level, and mechanical strain are tested and calibrated in sodium up to 1200F and 300 psig.

Structures Laboratories, National Bureau of Standards, Department of Commerce
See 0220

0380 Structures Laboratory
Waterways Experiment Station, Department of the Army
P.O. Box 631, Lexington, KY 39180
Contact: Mr. Joseph V. Dawsey (601) 634-2767
EXPERTISE: The laboratory carries out research, development, testing, and evaluation work in the fields of weapons effects, earth dynamics, structural design, structural behavior, and construction materials. This work is performed by designing and analyzing structures to resist static and dynamic loadings; defining effects of detonations and explosives; evaluation of materials properties, applications, and behavior in service; and defining the state of stress in soil and rock masses, especially as associated with transient loadings.

0381 Temperature and Pressure Test and Evaluation Facility
Idaho National Engineering Laboratory, Department of Energy
P. O. Box 1625, Idaho Falls, ID 83415
Contact: Mr. R. E. Tiller (208) 526-1439
FACILITY: Environmental testing for pressure and temperature can be accomplished utilizing the following equipment in the facilities: Temperature test facilities include: vacuum furnaces - the ultimate vacuum obtainable in the furnace chamber is approximately 2 x 10 to the -6th torr. The maximum operating temperature is 3000C in vacuum; autoclaves - 5000 psig, 650F. The pressure facilities include: vibration test system - the vibration test system includes a 200 force-pound table, Unholtz Dickie Model 105, and associated instruments for sine wave testing; flowmeter calibration facility - the system is a primary standard, traceable to NBS, ambient temperature flow loop facility - ambient temperature water recirculating system used to characterize test articles in single phase flow, and high temperature flow loop - 600F, 2250 psig closed loop, single phase, recirculating system.

0382 Thermal Transient Facility(TTF)
Energy Technology Engineering Center, Department of Energy
P. O. Box 1449, Canoga Park, CA 91304
Contact: Mr. K. T. Stafford (213) 700-5326
FACILITY: TTF is used to simulate the effect of process fluid transient temperatures on plant components. Simulations for hot water, sodium, slurries, and molten salts can be achieved by directing high-velocity inert gas through thermally pre-conditioned test articles. Component temperatures are computer-controlled to match predicted values, and data acquisition and parametric controls are programmed to allow continuous thermal cycling and recording of temperature, pressure, flow and strain gage measurements. Twin test bays permit test setup activities on one side while testing on the other. TTF also contains a large hydraulic loading structure mounted on a massive steel-reinforced concrete base, which permits simultaneous mechanical and thermal stress testing of components up to 32 by 40 by 15 feet. Plans are to use TTF's 500,000-lb seismic mass, which is set in bedrock, as a base for high-level seismic failure testing of piping systems and components. Failure frequencies of 3 to 5 Hz (30 to 50 times SSE) will be used, making TTF's seismic test capability an order of magnitude greater than any existing large component test facility.

Transportation Test Center, Department of Transportation
See 0813

0383 Undersea Weapons Tank
Naval Surface Weapons Center, Department of the Navy
Code D21, White Oak, Silver Spring, MD 20910
Contact: Mr. Ramsey D. Johnson (301) 394-1505
FACILITY: The cylindrical tank, the only facility of its kind in the United States, is 100 feet deep and 50 feet in diameter. It holds 1.5 million gallons of water. Underwater observation is facilitated by an array of underwater lamps, observation platforms, ann an automatic camera system capable of viewing the entire tank. One of the special features of the tank is the retrieving platform, which can be positioned at any depth down to 100 feet, or elevated above the water level for equipment assembly. Typical tests and studies conducted are free-fall stabilization and water impact tests of weapons, evaluation of hydrostatic pressure devices, and research on swimmer devices.

0384 Universal Testing Machine, Twelve Million Pound-Force
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Mr. Roscoe L. Bloss (301) 921-2621

Naval Civil Engineering Laboratory, Department of the Navy
See 0801

Neutron Radiography Facility, Hanford Engineering Development Laboratory, Department of Energy
See 0671

0366 Neutron Radiography Facility

National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Mr. Harold Berger (301) 921-3634
FACILITY: Neutron radiography may display contrasts unobtainable by x-radiography because of the varying attenuation characteristics for the elements, the differences in neutron attenuation between isotopes, and the capability of neutron detection in high gammaray intensities. A well-moderated neutron beam has been extracted from the reactor thermal column for neutron radiographic use. The beam covers a detector area of 12.5 cm diameter with a thermal neutron intensity that can be varied from 5 x 10 to the 5th n/sq cm x s to 2 x 10 to the 7th n/sq cm x s, with a cadmium ratio (0.5 mm cadmium cover on gold) of about 600. Detectors available with this facility include direct methods (convertors include gadolinium metal and scintillators) with films, activation transfer detectors (indium, dysprosium, gold), track-etch plastics, and a neutron image intensifier-television system. The latter system provides images at a rate of 30 frames per second and permits object motion to be followed. With neutrons one can readily obseve materials containing hydrogen, lithium, boron, cadmium or several rare earths in combination with other materials, even dense metals. Therfore, examinations of adhesives, fluids, explosives, plastics or hydriding in metals becomes feasible, as does examination of items such as boron filament composites or cadmium plating. Isotopic sensitivity permits, as examples, differentiation between hydrogen and deuterium, or between 113Cd and other cadmium isotopes. In addition, the fact that neutron images can be made by gamma-ray insensitive techniques leads to inspection capability for radioactive materials.

0367 Nondestructive Engineering Unit

Idaho National Engineering Laboratory, Department of Energy
P.O. Box 1645, Idaho Falls, ID 83415
Contact: Mr. Clyde R. Toole (208) 526-6316
EXPERTISE: The unit advances inspection technology to assure that the increasingly stringent reliability and safety requirements imposed on energy and other engineered systems are met. Involved are evaluation of the mathematical and physical basis for the concept, conduct of laboratory experiments to prove the principles and solve problems and finally development of the hardware and procedures for field application of the technique. Emphasis is placed on the development of automated systems with enhanced sensitivity, repeatability, independence of operator-inspector variability and documentation of results. Accordingly, a high dependence is placed upon computer systems for control, data processing, and data storage. These systems provide assistance to the operator by processing the raw information gathered from the NDE sensors and presenting it to him in a readily understandable form. Special emphasis is placed on the development and application of automated ultrasonic inspection.

0368 Nondestructive Testing

Hanford Engineering Development Laboratory, Department of Energy
P.O. Box 1970, Richland, WA 99352
Contact: Mr. E. A. Proudfoot (509) 376-3807
FACILITY: Nondestructive testing/examination services may be available in the radiographic, neutron radiographic, ultrasonic, eddy current, leak test, magnetic particle, and liquid penetrant methods of examination. Equipment is maintained in a state of calibration traceable to the National Bureau of Standards. The range of equipment capability is: Radiography: 35 Kv to 140 Ci Co-60 (13 pieces of equipment plus accessories); Neutron Radiography: TRIGA reactor; Ultrasonic: Contact, immersion, immersion to 30' length, 0.5 MHz to 50 MHz; Eddy Current: 6 pieces of equipment for single frequency applications; Leak Test: 0.01 to 10 to the -10th std. atm. cc/sec; Magnetic Particle: Field units to 3000 amps, stationary 2000 amp laboratory unit; Penetrant Test: Visible and fluorescent dyes, high temperature penetrants to 400F.

OTEC Heat Exchanger Test, Argonne National Laboratory, Department of Energy
See 0318

0369 Pavements and Soil Trafficability Information Analysis Center.

Army Engineer Waterways Experiment Station, Department of the Army
P.O. Box 631, Vicksburg, MS 39180
Contact: Mr. Gerald W. Turnage (601) 634-2734
INFORMATION SERVICES: Subjects covered by the Center include flexible and rigid pavements, expedient surfacing, ground flotation, and research in surface vehicle mobility, trafficability, and terrain analysis. This work is directed primarily toward military needs. Services provided by the center include literature searches in specific areas of interest, development of state-of-the-art reviews and bibliographies, responses to request for specific data and technical information searches, directing persons seeking information to organizations of qualified individuals with specialized knowledge for advisory and consulting services, and performing technical analyses and evaluations.

0370 Petroleum, Oil, and Lubricant Bulk Handling Test Facility

Materiel Testing Directorate, Department of the Army
STEAP-MT-T, Aberdeen Proving Ground, MD 21005
Contact: E. H. Roberts (301) 278-4277
FACILITY: Approximately 4,000 feet of 8-inch coupled victaulic pipe constructed in a closed loop has been constructed including a 10,000 barrel welded-steel fuel storage tank of internal floating roof design. Pressure regulating equipment (0 - 2000 psi), flow metering equipment (0 - 3500 gpm), and necessary high volume pumping equipment and regulating valves to furnish up to 3500 gpm flow are available. A high volume heat exchanger provides the capability of maintaining test fuel temperatures of 70 degrees - 90 degrees F, at flow rates of 100 -3500 gpm for tests of high volume pumping units. An earthen storage berm will contain collapsible storage tanks up to 25,000 barrel capacity. Temporary office, storage, and maintenance building space is provided adjacent to the pipe loop as well as individual concrete pads, electrical connections, and a high volume foam-generated fire fighting system. The equipment has been used to test techincal performance and capacity of all

0352 High Altitude Chamber Facility
Picatinny Arsenal, Department of the Army
Energetic Materials Division, DRDAR-LC-E, Dover, NJ 07801
Contact: (201) 328-2291
FACILITY: Two 8,000 cubic foot vacuum chambers comprise this facility. They can be evacuated to simulate altitudes of over 100,000 feet. These chambers are 75 ft. long with a 15 ft. cylinder at the large end and then tapering to a 5 ft. diameter where they terminate at an instrumentation center. All test instrumentation, as well as the controls for six rotary piston vacuum pumps, are located at a dual instrumentation panel.

0353 High Pressure Generators
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. Peter L. M. Heydemann (301) 921-2121
FACILITY: Two systems for generating high pressures have been developed for the measurement of electrical, mechanical and pressure/volume properties of liquids and solids. System 1 offers pressures of 26 Kbar for a volume of 19 x 100 mm. System 2 offers pressures of 40 kbar for a volume of 10 x 10 mm. System 1 has been used for ultrasonic measurements on solids and liquids, for electrical resistance measurements, for measurements of crack propagation in glasses and for the study of phase transition. System II has been used for ultrasonic measurements in liquids and in solids under either hydrostatic or non-hydrostatic conditions.

0354 High Pressure/High Temperature Autoclave & Pipe Test Facility
Pacific Northwest Laboratory, Department of Energy
P.O. Box 999, Richland, WA 99352
Contact: Dr. R. A. Clark (509) 376-0174, or Dr. L. Schmid (509) 375-2559
FACILITY: Studies are conducted on corrosion, stress corrosion cracking, and tube pressure capability; development of nondestructive crack detection and crack growth measurement techniques; and leak rate measurements. Autoclaves range in size from 300cc to 95 gallons. Pressure and temperature capabilities extend to 20,000 psig and 1250F. Pipe test facilities include a loop with a floor rate capacity of up to 150 gpm at 650F and 2500 psig. A programmed cyclic tensile load of up to 100 tons can be applied to each specimen. A second loop has operated at 550F, 1200 psig and can supply up to two million pounds of axial load of 2-ft pipe specimens. Other capabilities include loads of up to 4 million pounds tensile of 2 million pounds compression. Other loop facilities for use with sulphurs and chlorides are also available.

Highway Technology Transfer Program, Turner-Fairbank Research Center, Federal Highway Administration, Department of Transportation
See 0809

0355 Hydraulic Engineering Information Analysis Center (HEIAC)
Army Engineer Waterways Experiment Station, Department of the Army
P.O. Box 631, Vicksberg, MS 39180
Contact: Mr. B. J. Brown (601) 634-3368
INFORMATION SERVICES: Information is collected, analyzed, and distributed in the field of hydraulic engineering. Topics covered include river, harbor, and tidal hydraulics; flow-through pipes, conduits, channels, and spillways, as related to flood control and navigation; hydraulic design and performance of dams, locks, channels, and other navigation structures; and water waves and underwater shock effects. Services provided by the center include literature searches in specific areas of interest, development of state-of-the-art reviews, and bibliographies, responses to requests for specific data and technical information searches, performance of technical analyses and evaluations, and directing persons seeking information to organizations or qualified individuals with specialized knowledge for advisory and consultant services.

0356 Hydraulic Laboratory
Waterways Experiment Station, Department of the Army
P.O. Box 631, Vicksburg, KY 39180
Contact: Mr. Joseph V. Dawsey (601) 634-2767
EXPERTISE: Comprising of engineering specialists, the laboratory is developing new answers to hydraulic problems and conducting research. The principal tool of the laboratory is the hydraulic model; however, the laboratory has an equally strong computer-based capability for problem solving using numerical models of hydraulic and hydrodynamic phenomena and simulation models for systems analysis. Applications of this work are applied to dams, flood-control levees, river and harbor construction projects, soil-erosion control, streambank erosion control, thermal pollution, and water quality. It is the largest hydraulics laboratory in the world.

0357 Hydraulic Test Facility(HTF)
Energy Technology Engineering Center, Department of Energy
P. O. Box 1449, Canoga Park, CA 91304
Contact: Mr. K. T. Stafford (213) 700-5326
FACILITY: The HTF circulates demineralized water for hydraulic testing of flow components ranging from 0 to 4500 gpm. The water can be heated and regulated to permit thermal transient testing. The facility is equipped with a digital data acquisition system for generating on and off-line processing, real-time CRT displays and recall plotting. FM-analog data acquisition is also available at HTF and most other ETEC facilities.

0358 Hydroacoustic Facility
Naval Surface Weapons Center, Department of the Navy
Code D21, White Oak, Silver Spring, MD 20910
Contact: Mr. Ramsey D. Johnson (301) 394-1505
FACILITY: The function of the Facility is to perform complex acoustic testing of underwater ordnance by means of rapid, simple, and routine procedures. The equipment includes many unique items. Two tanks, one 30 feet in diameter X 20 feet deep, is filled with fresh water at room temperature, and an elongated tank, 14 feet long, 6 feet wide, and 4 feet deep, is filled with artificial seawater at temperatures from 32 degrees to 100 degrees Fahrenheit. These tanks are shielded from acoustical, mechanical, thermal, and electrical disturbances. Background noise level is 55 dB below one microbar at 100 Hz.

0359 Hydroballistics Facility
Naval Surface Weapons Center, Department of the Navy
Code D21, White Oak, Silver Spring, MD 20910
Contact: Mr. Ramsey D. Johnson (301) 394-1505
FACILITY: While the Facility is primarily designed to study water-entry and water-exit phenomena, it is by no means limited to such studies. The facility is well suited for observing the sinking characteristics of free-fall items and the

ence, literature-searching, abstracting, indexing, current-awareness, microform, and reproduction services; providing information on research in progress; making referrals to other sources of information; and permitting onsite use of its collection.

0342 David Taylor Naval Ship Research and Development Center
Department of the Navy
Code 012.2, Bethesda, MD 20084
Contact: Dr. Basil V. Nakonechny (202) 227-1037
EXPERTISE: Of primary concern are new vehicle concepts, ship and aircraft compatibility, ship trials and the development of vehicle technology. Areas addressed include hull-form, structures, propulsion, silencing, maneuvering and control auxiliary machinery, environmental effects, pollution abatement, logistics research, computer techniques and software for analysis and design. Research is conducted on advanced concepts for aircraft and ships where aerodynamic phenomena play a significant role; hull forms and propulsors, providing the basis for new ship designs; structural methods for evaluating and designing high strength hulls of steel and other materials, providing stronger, lighter-weight ships; underwater acoustics and ship vibrations; computer software for use in a variety of Navy applications, including theory of structures, numerical hydrodynamics, signal processing, computer-aided ship design and construction, logistics, naval warfare analysis and the design of information systems; a wide variety of naval machinery, addressing such areas as power systems, ships automation and control, machinery dynamics, mechanical systems and components, electrical systems integration, and shipboard energy conservation; and metals and alloys, corrosion, welding and fabrication, fuels and lubricants, paints, elastomers and coatings, encapsulants, shipboard fire engineering, shipboard pollution abatement and advanced composites.

0343 Drop Test Facility
Oak Ridge National Laboratory, Department of Energy
Chemical Technology Division, P. O. Box X, Oak Ridge, TN 37830
Contact: (615) 576-2066
FACILITY: The facility is capable of dropping packages from heights up to 60 meters and weights up to 100 tons. The impact surface is armor plate imbedded in a large mass of reinforced concrete weighing approximately 670 tons. Packages other than those designed for carrying radioactive material may also be tested.

Energy Technology Engineering Center (ETEC), Department of Energy
See 0301

Energy-Related Inventions Program, National Bureau of Standards, Department of Commerce
See 0303

0344 Engineering and Research Laboratories
Bureau of Reclamation, Department of Interior
Bureau of Reclamation, Code D-1500 B,Denver Fed. Ctr., Denver, CO 80225
Contact: Mr. B. J. Brink (303) 234-3549
EXPERTISE: The laboratories are divided among the Hydraulics, Concrete and Structural, Applied Sciences, Geotechnical, and Power and Instrumentation Branches. Hydraulic research is conducted to solve the wide variety of design, operation, and maintenance problems associated with water conveyance and control structures. Most of this work is carried out with the use of hydraulic scale models. Special equipment used in this laboratory includes: fixed and tilting glass-walled flumes, tanks to study flow through aquifers, a blower for testing with air, and a vacuum chamber to study cavitation. The Concrete and Structural Branch investigates, researches, and tests the physical properties of concrete construction materials and the mechanical properties and engineering behavior of the concretes used in Reclamation structures. Materials tested include cements, pozzolans, aggregates, chemical admixtures, and metals. This branch has many facilities, including a small plant used to process laboratory samples of concrete aggregate, and equipment and apparatus for mixing and testing fresh concrete. The vibration testing laboratory is also part of this branch. Earthquake vibrations captured on magnetic tape can be electronically reproduced on test equipment to help engineers determine the effects of earthquakes on concrete and earthfill dams. One special piece of equipment is the triaxial testing machine, believed to be one of the largest of its kind. The machine can apply a total axial load of 33.4 meganewtons at lateral pressures of up to 862 000 kilopascals. The Applied Sciences Branch investigates chemical and physical properties of engineering materials; the effects of construction and operation of project facilities on the water quality and ecology of lakes, rivers, and canals; the use and effects of herbicides employed to control weeds; and chemically analyzing such substances as water, cement, paint, soils, and crops. The Geotechnical Branch performs laboratory and field tests, research, and engineering analyses of soils and rocks and foundations on which Reclamation facilities are constructed. The Power and Instrumentation Branch conducts research in support of Reclamation's electric power generation and instrumentation activities. Most of this research consists of applying rapidly expanding developments in electrical and electronic engineering to solve existing problems. A major effort of the branch is the field test program which emphasizes full-scale testing of power system apparatus operating under actual load conditions. An advanced applications group studies of new energy developments such as solar and wind on bureau projects.

0345 Engineering Computer Program Library
Waterways Experiment Station, Department of the Army
P. O. Box 631, Vicksburg, MS 39180
Contact: Ms. Rosemary Peck (601) 634-2581
INFORMATION SERVICES: The library functions as a repository and lending library for the documentation and source program material of civil and military engineering computer programs approved for Corps of Engineers use and for visual aid materials acquired for training engineers and scientists in automatic data processing applications. ECPL personnel publish and distribute semiannually a catalog of programs and visual aid materials and assist in obtaining engineering computer programs from other sources for Corps of Engineers offices.

0346 Environmental Test Facility
Army Electronic Proving Ground, Department of the Army
STEEP-MT-T, Ft. Huachuca, AZ 85613
Contact: Mr. Silvestri (602) 538-6417
FACILITIES: The effects of all major climatic extremes and a wide range of structural tests can be provided. Climatic chambers with a 4x4x4-foot working area and a 10x10x16-foot temperature/humidity chamber are used for tempera-

0316 Oil Shale Program
Morgantown Energy Technology Center, Department of Energy
P.O. Box 880, Collins Ferry Road, Morgantown, WV 26505
Contact: Ms. Claire H. Sink (304) 291-4620
EXPERTISE: Oil shale surface, in-situ, and modified in-situ retorting processes are studied. Basic research through pilot scale investigations of these processes is conducted.

0317 Oil Shale Test Retort
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Mr. L. M. Holland (505) 667-2754
FACILITY: The nature of the products - gases, liquids and solids - evolved from oil shale depend not only on the nature of the original shale but on the conditions under which it is retorted. To study these products, to learn what factors influence their formation, and to determine their biological activity, the laboratory now employs two non-pressurized test retorts and has a third, larger, pressurized test retort under construction. These units allow the shale to be heated directly by its own combustion or indirectly by exogenously supplied heat. Heating can occur in the presence of inert gases or combustion gases. The attained temperature, time at temperature, and gas mix can all be varied. Inhalation experiments using the evolved gases are routinely performed, and the chemistry and toxicology of the byproducts and waste products is also studied.

0318 OTEC Heat Exchanger Test
Argonne National Laboratory, Department of Energy
9700 South Cass Ave., Argonne, IL 60439
Contact: Mr. Anthony Thomas (312) 972-8071
FACILITY: A highly instrumented facility originally designed for testing heat exchangers for the Ocean Thermal Energy Conversion program. The facility has separate loops for warm water, cold water, and a working fluid. Nominal heat duty is 3.2 million Btu/hr (approximately 1 MW thermal) with a range of 1 to 5 million Btu/hr. Nominal flow in both water loops is 3200 gpm with a range of 1000 to 5000 gpm. Nominal water temperatures of 40F and 80F for cold-water and warm-water loops respectively. It was designed for ammonia as the working fluid but has also been used with Freon 22. Design pressure for working-fluid system is 215 psig. It has completely automated data acquisition system which samples all instruments several times a minute, keeps running averages, and periodically prints out average data values and calculations based thereon. Experimental research in biofouling, corrosion and biofouling control is carried out, primarily at the Seacoast Test Facility in Hawaii. Promising biocontrol techniques are selected and subjected to long-term testing in marine environments. This work is important because levels of biofouling which may be acceptable in conventional power plants are unacceptable for OTEC applications.

Petroleum, Oil, and Lubricant Bulk Handling Test Facility, Materiel Testing Directorate, Department of the Army
See 0370

0319 Photovoltaic Devices and Measurements Laboratory
Solar Energy Research Institute, Department of Energy
1617 Cole Blvd., Golden, CO 80401
Contact: Mr. Dana Moran (303) 231-7115
FACILITY: The laboratory is designed to provide full support to researchers concerned with interfacial, electro-optical and chemical problems in the development of photovoltaic devices. It provides a combination of equipment, resources, and scientific and technical skills, unique in the field. Some of the capabilities are: auger electron spectroscopy, secondary ion mass spectroscopy, X-ray photoelectron spectroscopy, ultraviolet photoelectron spectroscopy, electron energy loss spectroscopy, molecular beam epitaxy, Electron probe microanalyzer, Scanning electron microscope, scanning transmission electron microscope, X-ray fluorescence, X-ray diffraction, and an acoustic microscope.

0320 Pittsburgh Energy Technology Center
Department of Energy
P.O. Box 10940, Pittsburgh, PA 15236
Contact: Mr. Sun W. Chun (412) 675-6128
EXPERTISE: The center conducts a comprehensive research and development program in coal technology. Coal preparation research explores a variety of physical and chemical separation methods to remove impurities. This program is oriented toward producing a 'super-clean coal'. It is also exploring new ways of reducing the high moisture content of peat. An active role has been taken in demonstrating the technical feasibility of burning coal-oil, coal-water, and coal-methanol mixtures in boilers, furnaces and process heaters originally designed to burn oil. The combustion process to improve efficiency and boiler performance is also studied. New and innovative techniques are under study for removing pollutants from the emissions of coal-burning facilities. Current liquefaction research activities focus on broad-based concepts that hold promise for a variety of synthetic fuel technologies.

Rural Housing Research Unit, Agricultural Research, Department of Agriculture
See 0218

0321 Salt Gradient Solar Pond
Argonne National Laboratory, Department of Energy
9700 South Cass Ave., Argonne, IL 60439
Contact: Dr. W. W. Schertz (312) 972-6230
FACILITY: The solar pond is a 1,000 sq m, 4m deep salt gradient solar pond which has obtained operating temperatures of 170F. Facilities include the capability of establishing arbitrary salinity gradients, measuring ground heat loss, and making measurements of temperatures, salinity and radiation flux at any depth and location in the pond. Capability of performing heat extraction experiments are also possible.

SERI Daylighting Laboratory, Solar Energy Research Institute, Department of Energy
See 0219

0322 Small Wind Systems Test and Development Center
Rocky Flats Plant, Department of Energy
P.O. Box 464, Golden, CO 80401
Contact: Mr. Robert M. Nelson (303) 497-4639
EXPERTISE: The center is involved in the testing of small wind energy conversion systems. In addition to its test activities, it has been involved in administering federally funded small wind systems research and development projects which include hardware development programs in the less-than-100 kW range, special research programs on design parameters of wind machines and institutional projects aimed at reducing regulatory barriers faced by the small wind energy industry. A nationwide Field Evaluation Program was initiated to gather data on wind machines under actual user conditions. Information gathered from

0305 Geothermal Test Facility
Department of Energy
co WESTEC Services, Inc., P.O. Box 791, Holtville, CA 92250
Contact: Mr. A. J. Adduci (415) 273-7943
FACILITY: The test facility has been established to assist the commericalization of the geothermal energy potential by providing geothermal fluid and supportive services for tests of heat extraction and energy coversion equipment and materials. It is located in the East Mesa area of California's Imperial Valley, 20 miles east of El Centro, California. Three geothermal fluid wells have been piped to the test pad to provide experimenters with a range of chemical characteristics for flexibility in testing. The usable space on the concrete pad designed for the placement of test equipment is about 80 feet by 160 feet, with a 15 foot wide access strip adjacent to the pad. There are four manifold arrangements for use by investigators. A chemical laboratory is also located at the GTF and is equipped with the following: atomic absorption spectrophotometer equipped for flame work; principal metal analysis with HGA furnace capability; gas chromatograph equipped with hot wire detector for non-condensable gases; and a scanning ultraviolet/visible dual beam spectrophotometer for various cation and anion determinations.

0306 Heat and Mass Transfer Research Laboratory
Solar Energy Research Institute, Department of Energy
1617 Cole Blvd., Golden, CO 80401
Contact: Mr. Dana Moran (303) 231-7115
FACILITY: The laboratory is designed for the study of methods of transferring heat and mass under the small driving forces which often exist in solar conversion processes. Adjacent warm and cold water loops in a 4-ft. by 6-ft. test chamber have the capacity to supply and remove one million Btu per hour. The instrumented test chamber can be evacuated or filled with non-condensible gases for varied experimental purposes. At the present time, the laboratory is being used to evaluate the performance of Claude-cycle concepts, but it has flexibility for the measurement of characteristics of a variety of evaporator and condenser designs.

Heat Engine Research, Morgantown Energy Technology Center, Department of Energy
See 0228

0307 Heat Pump Laboratory
Brookhaven National Laboratory, Department of Energy
Department of Applied Science, Building 120, Upton, NY 11973
Contact: Mr. Tom O'Hare (516) 282-3428
EXPERTISE: The laboratory can be used for transient or steady-state tests of liquid-source heat pumps or of individual heat pump components. An interactive data logger-computer data acquisition system permits computer controlled transient testing based on predetermined plans or on the results of the test under way. Controllable liquid and air sources are available, permitting the rapid determination of heat pump or component performance over a wide range of source conditions.
Facility: A ground coupling research facility consists of 11 well-instrumented earth coils and buried tanks all connected to a central hub. This facility is suitable for testing either new ground-coupling devices or for performing long-term heat pump tests using the existing ground-coupling devices. A data logger-computer based acquisition system is available. Currently, seven experiments can be operated simultaneously.

House Component and Equipment Field Test Facility, Oak Ridge National Laboratory, Department of Energy
See 0215

Instrument Sonde Test Facility (ISTF), Los Alamos National Laboratory, Department of Energy
See 0607

0308 Integrated Test Bed for Advanced Hydrogen Technology
Brookhaven National Laboratory, Department of Energy
Department of Applied Science, Building 120, Upton, NY 11973
Contact: Mr. Tom O'Hare (516) 282-3428
FACILITY: The purpose of this facilty is to illustrate hydrogen technology advances from production through storage and transport. Initially, the test bed is being used to investigate the production of hydrogen from solar energy via electrolysis. A 15 kW advanced technology electrolyzer is powered by a 5 kW photovoltaic array augmented by utility electricity. The electrolyzer system is operated and monitored by a computer-directed data acquisition/control system. Both steady-state and transient operation are possible. The system is capable of operating with electronically stored weather data, permitting round-the-clock operation of the electrolyzer based upon ambient conditions from any location where such data are available. The flexibility of the test bed design permits the rapid installation of other electrolyzers, hydrogen storage and end-use devices, or energy inputs for testing. A laboratory is available for analysis of the hydrogen gas steam, electrolyte content, or similar experiments.

0309 Laramie Energy Technology Center
Department of Energy
P.O. Box 3395, University Station, Laramie, WY 82071
Contact: Dr. James H. Weber (307) 721-2353
EXPERTISE: The center is the nation's foremost research laboratory in in situ technology. Current programs apply this technology with research efforts geared to the long range, high risk obstacles to energy production from the natural resources of oil shale, tar sands, and coal. The goal ofthe oil shale research and development program is to develop the appropriate technology base for efficient conversion of U.S. shale resources in an environmentally acceptable manner. Much of the emerging commerical development is based on technology developed, or supported in the past, by the program. The basic objective of the tar sands program is to determine the recovery potential in the known tar sand resources, and to identify specific technology-related problems. The goal of the in situ coal gasification program is to develop the technology to produce clean fuels from coal deposits that are unsuitable for mining. The highest priority of this program is to develop the technology base to the point where reliable process economic predictions can be made.

0310 Low-Rank Coal Program
Morgantown Energy Technology Center, Department of Energy
P.O. Box 880, Collins Ferry Road, Morgantown, WV 26505
Contact: Ms. Claire H. Sink (304) 291-4620
EXPERTISE: Research is conducted to study the uses of low-rank coal. The experience gained to date has included characterizing the coal and the solid waste products of

Buildings Energy Use, Pacific Northwest Laboratory, Department of Energy
See 0211

0291 Cable Test Facility
Brookhaven National Laboratory, Department of Energy
Accelerator Department, Building 815, Upton, NY 11973
Contact: Mr. E. B. Forsyth (516) 282-4676
FACILITY: This facility can test insulated electric power cables of 100 meters in length to maximum 60 Hz ratings of 250 Kv and 6000 amperes. Test apparatus is available for both superconducting cables and conventional oil-impregnated cables. Cables can be impulse tested to 650Kv.

0292 Cable Winding Facility
Brookhaven National Laboratory, Department of Energy
Accelerator Department, Building 815, Upton, NY 11973
Contact: Mr. E. B. Forsyth (516) 282-4676
FACILITY: This facility can produce research on experimental lengths of electric power cables with an AC underground rating of 138kV and 230kV. Lengths to one mile are possible with diameters ranging from 1 1/2 inches to 2 3/4 inches. Cables can consist of solid conductors, or superconducting tapes over a hollow core, insulated with lapped dielectric tapes of polyethelene or other plastics and covered with protective metal tapes.

Center for Building Technology, National Bureau of Standards, Department of Commerce
See 0212

0293 Center for Industrial Energy Demand Forecasting
Pacific Northwest Laboratory, Department of Energy
P.O. Box 999, Richland, WA 99352
Contact: Mr. Marvin Clement (509) 376-4743 or Dr. L. Schmid (509) 375-2559
EXPERTISE: The center develops, modifies, validates and uses computer models for energy demand forecasting for industrial sectors and special situations. The models are based upon highly disaggregated, process/engineeering structure and are well suited for evaluating changes in energy demands resulting from new technologies. Capability is included for analysis of effects of price changes of energy products and changes in government policies; i.e., changes in taxes on energy credits.

Chemurgy Research Unit, Western Regional Research Center, Agricultural Research Service, Department of Agriculture
See 0025

0294 Coal Gasification
Morgantown Energy Technology Center, Department of Energy
P.O. Box 880, Collins Ferry Road, Morgantown, WV 26505
Contact: Ms. Claire H. Sink (304) 291-4620
EXPERTISE: Extensive experience in advanced gasification research and development is available. Research covers novel gasification and gas stream cleanup concepts; new process chemistries; process modeling; analytical and process control instrumentation; and design, construction, start-up, and operation of both pilot and commerical plants. This experience is supported by advanced research facilities and an integrated data base that provides critical information to the gasification community.
Facility: The center also has the only fully integrated process development unit fixed-bed gasifier system in the U.S. The facility can gasify high sulfur, caking coals and includes a full cleanup train.

0295 Coal Liquifaction Program
Pittsburgh Energy Technology Center, Department of Energy
P.O. Box 10940, Pittsburgh, PA 15236
Contact: Mr. Robert Oltmanns (412) 675-6128
EXPERTISE: Research is conducted on the liquefaction of coal to liquid fuels. All aspects of this technology is studied. A liquefaction data base is maintained which contains scientific and engineering information obtained from the U.S. Government's coal liquefaction demonstraction program.

0296 Coal Preparation and Characterization Facility
Ames Laboratory, Department of Energy
Iowa State University, Ames, IA 50011
Contact: Mr. Ray Fisher (515) 294-3758
FACILITY: The facility consists of continuous process circuits (including comminution, sizing, sample splitting, and float-sink testing, heavy-media vessel and cyclone separation, concentration, hydrocycloning, dewatering, and filtration units), and batch process circuits (including pretreatment, oil agglomeration, froth flotation, chemical desulfurization, dewatering, clarification, and reconstitution by pelletizing, briquetting, and extrusion). Additional equipment is being installed to upgrade the plant and to convert some of the batch processes to continuous process operation. The plant is also available to test and evaluate new equipment and processes. The capacities range from a few hundred pounds up to 20 tons per hour. Extensive analytical support is available using such state-of-the-art instruments as a scanning electron microscope with automated image analyzer, an inductively coupled plasma atomic emission spectroscope, and x-ray diffraction and fluorescence equipment, as well as more conventional instruments and classical techniques.

0297 Coal Preparation Program
Pittsburgh Energy Technology Center, Department of Energy
P.O. Box 10940, Pittsburgh, PA 15236
Contact: Mr. Robert Oltmanns (412) 675-6128
EXPERTISE: Raw coal contains impurities must be removed to make it a more clean-burning fuel. Coal preparation research explores a variety of physical and chemical separation methods to remove these impurities. The program is oriented toward producing a 'super-clean coal' by combining a number of preparation techniques in an attempt to remove as many of the impurities found in raw coal as possible. PETC is also exploring new ways of reducing the high moisture content of peat and promoting its use in industrial applications.

Coal Processing Component Facilities, Morgantown Energy Technology Center, Department of Energy
See 0603

0298 Coal Processing Instrumentation
Morgantown Energy Technology Center, Department of Energy
P.O. Box 880, Collins Ferry Road, Morgantown, WV 26505
Contact: Ms. Claire H. Sink (304) 291-4620
EXPERTISE: The center is an international leader in coal processing instrumentation and control technology. It has made significant advances in adapting instrumentation to the high-temperature, high-pressure, erosive/corrosive environments found in most conversion processes. Expertise encompasses specialized studies of electronic and optical phenomena. Support provided has resulted in the design

vided with 30' diameter turntables with capacity of 120,000 pounds) and seven transmitters (with CW, AM, FM, and pulse modulation) which provide field intensities in excess of 200 volts/meter from 100 KHz thru 18 GHz. Sweep capabilities are provided in the ranges of 10 KHz thru 225 MHz and 500 MHz thru 1 GHz. Capabilities and facilities exist for development, fabrication, and installation of necessary instrumentation. Data are collected and recorded in a data center. Electrostatic discharge facilities capable of testing up to 500,000 volt levels are available for simulation of discharge of electrostatic energy which may be developed on helicopters and/or personnel.

0278 Fiber Optics Sensor System Facilities
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITIES: A number of experimetal facilities are utilized to study fiber optic acoustic sensors. These include: static pressure cells, a low frequency pressure gradient calibrator, a 150,000 gallon acoustic pool facility and ultrasonic tanks. A variety of demodulation techniques are utilized in these studies including homodyne, heterodyne, and phase sweeping. Both bulk and all fiber interferometer systems are employed. In addition to the acoustic response, sensitivity to temperature, strain, acceleration, and magnetic fields is determined. Various fiber configurations are studied including loops, lines, two-dimensional planar elements helices, and spatially shaded elements.

0279 Gamma Testing of Electronics
Naval Surface Weapons Center, Department of the Navy
Code D21, White Oak, Silver Spring, MD 20910
Contact: Mr. Ramsey D. Johnson (301) 394-1505
SERVICES: Prompt gamma irradiation testing services are provided. Consultation on electronics hardening against nuclear radiation is also available. New high density integrated electronics are particularly susceptible to ionizing radiation from nuclear sources. Prompt gamma significantly affects the performance of digital electronics such as microprocessors and computers. Testing circuits, components, and materials in representative environments is an integral part of the design process to harden against these effects.

Government-Industry Data Exchange Program (GIDEP), Department of the Navy
See 0433

Infrared Information and Analysis Center (IRIA), Department of the Navy
See 0752

0280 Institute for Telecommunication Sciences
Department of Commerce
NTIA, Boulder, CO 80302
Contact: Dr. Harvey M. Gates (303) 497-3589
EXPERTISE: Research is conducted on the efficient use of the radio frequency spectrum, engineering and evaluation of communication systems and propagation and transmission of radio signals. Programs include model performance tests, mobile satellite earth terminals, electronic message handling, microwave communication systems, evaluation of digital systems, optical communication systems, antenna design and measurement, atmospheric refractive index measurements, and predicting propagation effects on radio systems.

0281 Instrumentation Development Branch
Materiel Testing Directorate, Department of the Army
ATTN: STEAP-MT-G, Aberdeen Proving Ground, MD 21005
Contact: Mr. Palmer L. Paules (301) 278-4318
EXPERTISE: The branch is responsible for the research and development of instrumentation and methodology for obtaining test data and measurements or specific test conditions when none of the presently owned government equipment or readily available commercial equipment will do the job. Normally, this involves developing a concept, demonstration of feasibility through a breadboard or prototype and construction or fabrication of a final model. Experience has been established in the areas of video instrumentation, PCM telemetry, and microprocessor based information systems.

0282 Microelectronic Processing Facility
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: The facility is a complete microelectronics processing line. It is capable of fabricating LSI and VLSI integrated circuits. Currently the focus of research is submicron structure development as well as the investigation of radiation hardening of ICs.

0283 Microwave Space Research Facility
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
FACILITY: The facility conducts tests, evaluations, and experiments related to satellite communication. These may range from integration testing on the WSC-6 shipboard SATCOM terminal, to FLTSATCOM testing, and antenna nulling experiments.

National Battery Test Laboratory (NBTL), Argonne National Laboratory, Department of Energy
See 0312

Naval Weapons Support Center, Department of the Navy
See 0802

Non-Magnetic Facility, National Bureau of Standards, Department of Commerce
See 0764

0284 Reactance Bridge for Power Loss Measurement
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. Oskars Petersons (301) 921-3121
FACILITY: A typical high voltage inductor or shunt reactor on a power transmission lines has a reactive power rating of 100 megavolt-amperes and a power loss of about 200 kilowatts. Thus the power losses are of economic significance, but it is difficult if not impossible to measure them by conventional wattmeter methods because of the low power factor, i.e. the presence of very large reactive or circulating power. The shunt reactors are used to 'tune out' the capacities of transmission lines. A reactance bridge has been developed and constructed which in conjunction with readily available high-voltage standard capacitors can measure accurately such losses. Inductance and capacitance can also be measured. The instrument is designed for measurement of devices rated at moderate to extra high voltages--several hundred volts to one megavolt. The in-

limnology; subsurface water management; wastewater renovation; energy balance; drainage, groundwater pollution by irrigation, remote sensing, new crops.

0266 USDA Sedimentation Laboratory
Agricultural Research Service, Department of Agriculture
P.O. Box 1157, Oxford, MS 38655
Contact: Dr. Neil L. Coleman (601) 234-4121
EXPERTISE: The Laboratory's mission is to seek, through research, better methods, practices, and techniques for control of sediment and its resulting effect on the quality of the environment. Of primary importance is the concept of sediment as a pollutant and as a carrier of pollutants, including agricultural chemicals. Areas of research include sedimentation, sediment transport, sediment deposition, soil erosion, hydraulics, and pollution.

0267 Water Data Storage and Retrieval System (WATSTORE)
U.S. Geological Survey, Department of the Interior
437 National Center, Reston, VA 22092
Contact: Mr. Charles Showen (703) 860-6879
INFORMATION SERVICES: All types of water data are accessed through WATSTORE. Data are grouped and stored on the basis of common characteristics and data collection frequencies. These data are organized into five files: (1) Station Header File - an index file for the 220,000 sites for which data are stored; (2) Daily Values File - contains over 200 million daily values for water parameters such as streamflow, ground-water levels, specific conductance, and water temperatures; (3) Peak Flow File - 400,000 records on annual maximum streamflow and gage height values; (4) Water Quality File - stores results of 1.4 million analyses that describe 185 different biological, chemical, physical, and radiochemical characteristics of surface and ground waters; and (5) Ground-Water Site-Inventory File - independent but cross-referenced to Daily Values and Water Quality Files - contains data on 700,000 sites; stores site information, data on construction history, geohydrologic data, and one-time field measurements such as water temperature for wells, springs, and other ground water sources.

0268 Water Quality and Watershed Research Laboratory
Agricultural Research Service, Department of Agriculture
P.O. Box 1430, Durant, OK 74701
Contact: Dr. J. Rogrt McHenry (405) 924-5066
EXPERTISE: Areas of interest include development of mathematical models to describe and predict runoff and the movement of nutrients and other related chemicals from agricultural watersheds; assessment of the movement and transformations of phosphorus and nitrogen in surface and ground water; evaluation of potential ground water contamination from agricultural waste retention basins; assessment of nutrient balance for influent and effluent to fish-rearing ponds; effects of microbial action on the degradation of common pesticides in agricultural ponds; development of correlations between microcosms, simulated ponds, and natural farm ponds; assessment of remote sensing techniques for water quality monitoring; and dating of sediments.

0269 Western Energy and Land Use Team
U.S. Fish and Wildlife Service, Department of the Interior
2627 Redwing Rd, Creekside 1, Fort Collins, CO 80526
Contact: Dr. Ralph Morganweck (303) 226-9398
EXPERTISE: Most natural resource problem solving requires a blend of applying existing operational methodologies, research and development efforts, technology and information transfer, and support services. This integration is tailored for each specific application. As a result, innovative perspectives to natural resource planning and environmental assessment can be developed. Expertise available includes fish and wildlife biologists, aquatic and terrestrial ecologists, biometricians, information and technology transfer scientists, computer specialists, hydrologists, remote sensing specialists, resource economists, and institutional specialists.

ELECTROTECHNOLOGY

0270 Antenna Measurement Facilities
National Bureau of Standards, Department of Commerce
Boulder, CO 80303
Contact: Dr. R. C. Baird (303) 497-3301
FACILITY: The Electromagnetic Division of the NBS Boulder Laboratories has recently perfected two new and highly accurate methods for determining antenna characteristics from measurements made at greatly reduced distances. The methods are known as the near field scanning (NFS) and extrapolation techniques and two types of unique facilities have been constructed in order to implement them. Near-Field Scanning Facility is used to measure the near-field phase and amplitude over a plane area close to the test antenna. From this information it is possible to accurately calculate the gain, pattern, and polarization characteristics at all distances from the antenna, near field as well as far field. Applications include: measurement of antenna patterns, gain, and polarization from about 750 MHz to 75 GHz. Any other application where it is necessary to have a detailed knowledge of electromagnetic field configurations, e.g., scattering experiments. Extrapolation Range Facilities consist of a 60-meter outdoor range and a 10-meter indoor range, for performing high accuracy measurements of gain and polarization of directive antennas. They are used to determine the desired far-field (infinite separation distance) gain and polarization properties of the antennas. Applications include: high-accuracy measurements of antenna gain and polarization above about 500 MHz with no discernible upper limit.

0271 Automated Antenna Checkout Stations
Technical Support Directorate, Department of the Army
DRDAR-TSE-IT, New Mexico State Univ., Las Cruces, NM
FACILITY: The station consists of two major items: A positioner which is capable of handling large antennas up to a maximum length of 25 feet, maximum diameter of 50 inches, and a maximum weight of 2,500 pounds. The positioner can be automatically raised and lowered from the base. All-weather house-type trailer housing the controls and instrumentation needed to run and plot antenna patterns. The station will provide the following measurements: Radiation density plots over a full sphere with printout level suppression. The station operates primarily in L and S Band. Frequency extension to cover 200 MHz to 18 GHz is planned. Polarization plots over a full sphere. Amplitude and phase of near field distribution. Phase center location for an antenna.

Cable Test Facility, Brookhaven National Laboratory, Department of Energy
See 0291

strument flight rule and visual flight rule charts for flights in the National Airspace System in the U.S. and U.S. possessions, as well as chart-related products for air traffic controllers, airport ground personnel, and the FAA.

0256 Office of Ocean and Coastal Resource Management

National Oceanic and Atmospheric Administration, Department of Commerce
National Ocean Service, 3300 Whitehaven Street, NW, Washington, DC 20235
Contact: Mr. Peter Tweedt (202) 634-4232
EXPERTISE: This office provides the coordination and expertise at the Federal level needed for the effective management of resources within the U.S. coastal zone. Working closely with coastal States, it administers the Coastal Zone Management Program, the National Estuarine Sanctuary Program, the National Marine Sanctuary Program, the Coastal Energy Impact Program, and the Ocean Minerals and Energy Impact Program. Coastal zone management: The office provides technical assistance to U.S. States and territories, emphasizing special area management planning, coastal hazards mitigation, cost-effective coastal management, and the simplification of permit processes for coastal activities. Estuarine sanctuaries: The office administers the National Estuarine Sanctuary Program, which provides funding to U.S. States and territories to acquire and manage estuarine areas for research and education. Marine sanctuaries: The office administers the National Marine Sanctuary Program, which designates and manages offshore marine areas to preserve or restore their natural resources. Coastal energy: The office administers the Coastal Energy Impact Program, which has provided grants, loans, and loan guarantees to U.S. States and territories to help alleviate the effects of outer continental shelf oil and natural gas development and other coastal energy activities. Although direct funding has ended, the office is continuing to provide technical assistance and to monitor the disbursement and collection of the remaining program grants and loans. Ocean minerals and energy: The office serves as the focal point within the National Oceanic and Atmospheric Administration to assist the private sector in establishing new industries to develop ocean minerals and ocean energy resources, including hard minerals on the ocean floor and ocean thermal energy conversion.

0257 Pacific Northwest Forest and Range Experiment Station

Forest Service, Department of Agriculture
809 N.E. 6th Ave., Portland, OR 97232
Contact: Mr. J. Louise Parker (503) 231-2094
EXPERTISE: The following areas of research are conducted: Forest residues and energy program; Spruce budworms program; Timber quality and product yield potential of Western softwood; Renewable resources evaluation; Reforestation systems in the Pacific Northwest; Ecological basis for management of Northwest coniferous forests; Genetic improvement of Douglas-fir and other Pacific Northwest trees; Impacts of management activities on watershed resource values in Douglas-fir forests; Behavioral and microbial agents for managing Western forest insects; Forest tree diseases in the Pacific Northwest; Mycorrhizal applications in ecosystem management; Culture of forests of eastern Oregon and Washington; Wildlife habitat and range; Population ecology and integrated pest management strategies for Western forest defoliators; Biology and silviculture; Logging systems for fragile mountain terrain; Productivity of high elevation forests; Ecology of Southeastern Alaska forests; and Anadromous fish habitat.

0258 Pacific Southwest Forest and Range Experiment Station

Forest Service, Department of Agriculture
1960 Addison Street, P.O. Box 245, Berkeley, CA 94701
Contact: Mr. Richard L. Hubbard (415) 486-3286
EXPERTISE: The station is the Forest Service's wildlands research organization in California, Hawaii, and the Western Pacific. Studies cover research on silviculture of Sierra Nevada conifer types; genetics of western forest trees; environmental hydrology of the snow zone of the Sierra Nevad and the Coast Ranges of California; timber management wildlife interactions in Northern California forest types; landscape and urban forestry disease pests; of field evaluation of chemical insecticides; biology of insects adversely affecting regeneration and establishment of western forests; the ecology of chaparral and associated ecosystems; range management; protection and management of sensitive species in California; prevention of man-caused wildfires; meteorology for forest and brushland management; hybridization and the evolution of forest trees; and integrated management systems for forest insect pests and diseases.

0259 Remote Sensing Information

Technology Application Center (TAC), National Aeronautics and Space Administration
University of New Mexico, 2500 Central Ave., SE, Albuquerque, NM 87131
Contact: (505) 277-3622
INFORMATION SERVICES: A wide range of value added services in the remote sensing field are offered. Image processing capabilities and data management activities are available. A visiting scientist program provides personalized on-the-job training in remote sensing applications. Remote sensing workshops are scheduled, addressing the applications of this technology to various disciplines. Photo search and retrieval services are conducted. Software capabilities include principle components classification, regression and correlation analysis, improved image registration, and slope and aspect modeling through digitized topographic data. Further projects may involve data from HCMM, SEASAT, and the French SPOT satellites.

0260 Rocky Mountain Forest and Range Experiment Station

Forest Service, Department of Agriculture
240 W. Prospect Street, Fort Collins, CO 80526
Contact: Dr. J. S. Krammes (303) 221-4390
EXPERTISE: Research is conducted in a number of areas. Water research at the station is focusing on operations techniques for managing vegetation to protect water quality and improve water yields, revegetating surface-mined land to control erosion, managing blowing snow to improve water yield and soil moisture, developing a better understanding of the properties of wind-blown snow and ways of managing it; and measures for assessing the potential of snow avalanche damage, and developing a system for identifying and measuring the full range of values associated with water. Range research is emphasizing ways to rehabilitate abused rangeland, and integrate grazing with wildlife, recreation and other resource values. Station scientists are working to determine the interactions among wildlife and other resource uses, find ways to minimize conflicts

lected coal samples by USGS laboratories; US Bureau of Mines summary reserve/base analysis data; and major-, minor-, and trace-element analyses by USGS laboratories of coal from several foreign countries. Digital Elevation Model (DEM) data may now be used in the NCRDS to calculate overburden for a given coal bed.

0247 National Earthquake Information Service (NEIS)
U.S. Geological Survey, Department of the Interior
Denver Federal Center, Box 25046, MS 967, Denver, CO 80225
Contact: Mr. Waverly Person (303) 234-3994
INFORMATION SERVICES: The primary objectives are to acquire and disseminate information on the global occurrence of earthquakes and to conduct research on the internal structure of the earth. In addition to seismic data received from the USGS network, data are received from over 650 stations around the world including the U.S.S.R. and the People's Republic of China. The data received from the stations are entered into a timeshare computer. The computer processes as much as possible and prints out formats for review by an experienced geophysicist. The information provided to interested scientists in Preliminary Determination of Epicenters is lists of earthquakes which occur worldwide, i. e., date, time, size, location; seismicity maps; station directories; and alerting service to State and Federal Government agencies about damaging earthquakes.

National Environmental Data Referral Service, National Oceanic and Atmospheric Administration, Department of Commerce
See 0443

0248 National Geophysical Data Center
National Oceanic and Atmospheric Adminstration, Department of Commerce
National Environmental Satellite, Data and Information Service, 325 Broadway, Boulder, CO 80303
Contact: Dr. Michael Chinnery (303) 497-6215
INFORMATION SERVICES: The center collects, manages, archives and distributes data in the fields of solid earth geophysics, marine geology and geophysics, and solar-terrestrial physics, NGDC data sources include NOAA's observing programs and through cooperative arrangements, data from universities, other government agencies and foreign organizations. NGDC also serves as World Data Center-A for the above disciplines. Available data include: Earthquake Seismology, more than 300,000 seismograms per year from about 150 earthquake monitoring stations worldwide are processed and archived; Solid Earth Geophysics, extensive files of common depth point seismic reflection, gravity, and topography data; Geothermics, holdings encompass data and maps on volcanoes, geothermal energy, and world heat flow; Marine Geology and Geophysics, gravimetric, magnetic, bathymetric, and seismic data, as well as geotechnical, textural, petrologic, and paleontologic analyses and descriptions of sediment and rock samples. Geomagnetic Data, archived at NGDC show both changes in direction and strength of Earth's magnetic field; Solar-Terrestrial Data, from domestic observatories and worldwide sources under international exchange agreements; Solar Activity Data, records of solar flares, solar radioemission events, sudden ionospheric disturbances, and some satellite-monitored measurements of the solar wind and ultraviolet, X-ray, and particle emissions; Ionospheric Data; and Glaciology, the National Snow and Ice Data Center is an information-retrieval center for snow and ice research, glacier changes, and paleoglaciology.

0249 National Soil Erosion Research Laboratory
Agricultural Research Service, Department of Agriculture
Purdue University 2700 Kent Avenue, West Lafayette, IN 47906
Contact: Dr. Harold L. Barrows (317) 494-8673
EXPERTISE: The mission of the laboratory is to define and clarify in both field and lab, basic principles that govern the detachment and transport of soil and aricultural chemicals by raindrops and surface flow, to formulate these principles into mathematical computer models; to develop practical prediction methods of national and international applicability for use by technicians in determining probable erosion levels; to test in field and laboratorynew erosion control concepts and practices under varied conditions of climate, soil, land use, management, etc.; and to determine the economic consequences of erosion as it affects soil productivity and land use. Research currently underway includes: conservation tillage, erosion and deposition mechanics, soil characterization for erodability, erosion and sediment yield of farm fields, mathematical/computer modeling of the erosion process, and overland flow hydrology and hydraulics.

0250 National Water Data Exchange (NAWDEX)
U.S. Geological Survey, Department of the Interior
421 National Center, Reston, VA 22092
Contact: Mr. Douglas Edwards (703) 860-6031
INFORMATION SERVICES: The service is a computerized data system that identifies sources of water data and that indexes the types of water data these sources collect. The primary purpose of the system is to facilitate the exchange of data between the organizations that gather water data and the organizations that need the data. A variety of services is provided by the NAWDEX Program Office and a national network of Assistance Centers, including the District Offices of the Water Resources Division. Information is available on (1) orgranizations that collect water data, specific locations within the organization that provide the data, alternative sources for the data, the geographic area in which the organization works, and the types of data collected and available; and (2) Location of the site, the organization operating the site, the types of data available, the parameters for which data are available, the frequency of measurement of these parameters, and the media in which the data are available.

0251 Natural Hazards Research Information Center
Federal Emergency Management Agency
Campus Box 482, University of Colorado, Boulder, CO 80309
Contact: Ms. Susan Tubesing (303) 492-6818
INFORMATION SERVICES: The center is a national clearinghouse of research data dealing with the economic loss, human suffering, and social disruption caused by earthquakes, floods, hurricanes, and other natural disasters. Knowledge is constantly being accumulated about ways to dimish the effects of natural hazards including both pre-disaster mitigation and effective recovery techniques. The center begins the process of putting this information to use by strengthening communication between researchers and the individuals, organizations, and agencies concerned with public action relating to natural hazards. The operations of the center are supported by five federal agencies: the Federal Emergency Management Agency, the National Science

data, and calibration base line data. These data are made available to various elements of the scientific and surveying/mapping communities. There are approximately 10,000 publications available in quad and county formats. In addition, the National Geodetic Networks are cartographically depicted on approximately 850 different control diagrams. Horizontal positional data and gravity data are available on magnetic tape. Calibration standards for distance measurement instruments are provided by Calibration Base Lines (CBL's). They are established for the nation's surveying profession to provide a means to detect contant and scale errors in measuring instruments. High precision special purpose geodetic surveys are conducted to support scientific and engineering projects of other agencies and institutions. The special projects usually have unique requirements, designs, and solutions. An extension service assists state and local governments in performing supplemental geodetic control surveys. The service includes the mark maintenance and state geodetic advisor programs.

Climate and Earth Sciences Laboratory, National Oceanic and Atmospheric Adminstration, Department of Commerce
See 0160

0236 Digital Image Processing Laboratory
Naval Research Laboratory, Department of the Navy
ORTA Code 1405, 4555 Overlook Ave., Washington, DC 20375
Contact: Mr. Richard Fulper (202) 767-3744
EXPERTISE: Imagery is produced from satellite data provided by DOD, NASA, NOAA and other laboratories. The data is from visual, infrared, passive or active microwave or synthetic aperture radar sensors. The facility includes high speed computer processing equipment with color TV and hard copy printing output devices.

0237 Earth Resources Observation Systems (EROS) Data Center
U.S. Geological Survey, U.S. Geological Survey, Department of the Interior
Sioux Falls, SD 57198
Contact: (605) 594-6511
INFORMATION SERVICES: The center is operated as part of the Department of the Interior's Earth Resources Observation Systems Office. The center provides access primarily to NASA (National Aeronautics and Space Administration) multispectral imagery of the Earth from Landsat satellites; aerial photographs acquired by the Department of the Interior; and photographs and imagery acquired by NASA from research aircraft and Skylab, Apollo, and Gemini spacecraft. The primary functions of the center are data storage, retrieval and reproduction, and user assistance and training. The Center operates Applications Assistance Facilities that maintain microfilm copies of data archived at the center and that provide computer-terminal inquiry and order capability to the central computer complex at the center. Scientists are also on hand to provide training and assistance in the application of the data to a variety of resource and environmental problems and in ordering data from the center. EROS Data Reference Files have been established throughout the United States to maintain microfilm copies of the data available from the EROS Data Center and to provide assistance to visitors in reviewing and ordering data.

0238 Earth Science Information Network
U.S. Geological Survey, Department of the Interior
12201 Sunrise Valley Drive, Reston, VA 22092
Contact: Mr. Michael Gall (703) 860-7108
INFORMATION SERVICES: The network is a cooperative service which provides Earth science information to the private and public sectors. It is designed to provide better coordination between existing public service programs of the Geological Survey; to improve the sharing of data, information, and resources of these programs; to better inventory and disseminate the Survey's Earth science data; to provide a more consistent and effective level of service to the user who has an interdisciplinary need for Earth science data; and to better coordinate the Survey's Earth science information programs with those in other Bureaus and Agencies. The services currently offered include the sale and distribution of the Geological Survey's geologic, hydrologic, geographic, and topographic maps and reports, as well as the dissemination of data from various Earth science data systems. A network of regional centers offer easy access by the public.

0239 Eastern Energy and Land Use Team
U.S. Fish and Wildlife Service, Department of the Interior
Route 3, Box 44, Kearneysville, WV 25430
Contact: Dr. R. Kent Schreiber (304) 725-2061
EXPERTISE: Research is directed toward providing management and support for research development and technology transfer in acid precipitation, water quality, and species information bases; coordinating and integrating the Service's research and development in acid rain research with the National Acid Precipitation Assessment Plan; and managing the national program for development of mitigation strategies for acidified aquatic systems.

0240 Experimental Reservoir Engineering Flow Facility
Pacific Northwest Laboratory, Department of Energy
P. O. Box 999, Richland, WA 99352
Contact: Dr. Landis D. Kannberg (509) 375-3919, or Dr. L. Schmid (509) 375-2559
FACILITY: Changes in simulated natural underground environments involving fluids are assessed in the facility. It provides technological information regarding compressed air energy storage, insitu oil shale and tar sands retorting, enhanced petroleum recovery, geothermal energy exploitation, chemical and nuclear waste disposal, and hydrogen storage. The facility will generate data for the design, operation and maintenance criteria necessary to examine the economic viability of a specific project. The information on underground environments also will be used to resolve environmental issues such as water quality, geochemistry, ground subsidence and seismicity. The research facility is equipped with data acquisition and control for stainless steel pressure vessels used to encase geological samples. Using the flow facility, researchers can simultaneously apply triaxial stress and flow controlled steam and air mixture through the core at elevated temperature while monitoring structural and hydrological flow properties and geochemistry. The pressure vessels are designed for radial pressures up to 10,000 psi; axial ram pressures up to 80,000 psi; fluid pore pressures to 1500 psi; and temperatures to 550F. Sample size is 4-in. long by 2-1/8 in. in diameter. Compressed air can be supplied at 30 scfm and steam generated at 35 lb/hr and delivered at 1800 psia. The chamber flow can be regulated to prescribed relative humidity levels. Instruments attached to the sample record axial and circumferential strains. Other controls and instruments record and regulate temperature, pressure, mass flow rate and humidity.

toxic trace elements such as Hg, Be, Pb, and F and corrosive elements such as Na and K in the flue gas; test equipment for removing less than 10 micron diameter particulate solids from the flue gas, tests of newly developed in-line process analytical instruments; and testing of the behavior of different limestones during alternate combustion/regeneration processing. The experimental equipment consists of a 6-in.-dia, fluidized-bed combustor, a compressor to provide fluidizing-combustion air, peripheral-sealed rotary feeders for metering solids into an air stream fed into the combustor, and two cyclone separators and two filters in series for solids removal from the flue gas.

0226 Fluidized Bed Combustion
Morgantown Energy Technology Center, Department of Energy
P.O. Box 880, Collins Ferry Road, Morgantown, WV 26505
Contact: Ms. Claire H. Sink (304) 291-4620
EXPERTISE: Research is carried out on atmospheric and pressurized fluidized-bed combustion technology. Applications such as cogeneration, repowering, and conventional and advanced novel systems are developed. Expertise encompasses a continuum of activities, from process fundamentals to pilot-scale fluid-bed combustors capable of testing all types of coal, waste materials, and coal-water mixtures.
Facility: A cold flow simulator and a bench-scale shale retort unit support this research effort.

0227 Fossil Energy Users Laboratory (FEUL)
Argonne National Laboratory, Department of Energy
9700 South Cass Ave., Argonne, IL 60439
Contact: Dr. Terry R. Johnson (312) 972-5964, or Mr. Eugene Smyk (312) 972-4379
FACILITY: FEUL can accommodate a wide range of experiments related to coal and oil combustion, and to fossil-fired boiler systems. The facility has two test legs; one having a combustor capable of burning liquid fuels, including liquid-solid slurry fuels, and the other a two-stage cyclone coal combustor. Each test leg as the necessary fuel-feed, support, and control systems. They share a combustion air preheater, effluent cleaning equipment, cooling systems and data acquisition system. The nominal thermal power is 2 Mw and hot gas flow rate is 1 kg/s. Combustion temperatures up to 4000F over a wide range of fuel-air ratios can be achieved. Experiments are made by installing instrumented test sections downstream of the combustor. A variety of interchangeable test sections that simulate various steam plant components are available. Typically, tests are made to determine combustor performance, heat transfer, fouling, and entrained particulate characteristics, and behavior of NOx and SOx.

0228 Heat Engine Research
Morgantown Energy Technology Center, Department of Energy
P.O. Box 880, Collins Ferry Road, Morgantown, WV 26505
Contact: Ms. Claire H. Sink (304) 291-4620
EXPERTISE: A program to use coal in the form of a coal-liquid mixture or coal fuel gas to power heat engines is being undertaken. The two primary areas of interest are gas turbines and diesel engines. By developing new technologies that allow heat engines to accept 'dirty' fuels or slurries, it is hoped to reduce the cost of electricity and the capital investment for generating systems. Major projects being pursued include basic data for coal-water mixtures, water-cooled components testing, low nitric oxide combustor technology, and heat engine systems research and development. For future programs, areas of interest include Sterling engines and materials for advanced combustion cycles.

Low-Rank Coal Program, Morgantown Energy Technology Center, Department of Energy
See 0310

Pittsburgh Energy Technology Center, Department of Energy
See 0320

University of North Dakota Energy Research Center, Department of Energy
See 0330

COMPUTER TECHNOLOGY

0229 ALICE Group
Argonne National Laboratory, Department of Energy
9700 South Cass Avenue, Argonne, IL 60439
Contact: Dr. Cecil Shelman (312) 972-5430
EXPERTISE: The ALICE Group of the Applied Mathematics Division at Argonne National Laboratory develops and applies computerized resources that provide the means to convert original mapped and graphic 'images' into digital representations that computers can translate, analyze, and display. The ALICE System is one of the computer-assisted resources that the ALICE Group has developed and applies in this process. In general, the ALICE System is programmed to transform the line-and-space information recorded on microscopic slides, 16mm or 35mm black-and-white film, or hard-copy maps and graphics into a set of digital coordinates representing the location of the recorded images. The 'image' databases created by ALICE can be transferred to the central IBM computer system at the Applied Mathematics Division for further processing by users. Applications of the ALICE System have been the areas of biology, city planning, chemistry, the environment, metallurgy, and physics. These applications have included the computerization and analysis of soil maps, wetland areas, animal optic nerve fibers, air quality areas, tax parcel maps, fingerprints, paths of charged particles, and other mapping, counting, and sizing problems.

Artificial Intelligence in Medicine, National Institutes of Health, Department of Health and Human Services
See 0499

Center for Applied Mathematics, National Bureau of Standards, Department of Commerce
See 0736

Center for Manufacturing Engineering, National Bureau of Standards, Department of Commerce
See 0450

Computer Software and Management Information Center (COSMIC), National Aeronautics and Space Administration
See 0430

0230 Data & Analysis Center for Software (DACS)
Rome Air Development Center, Department of the Air Force
ATTN: ISISI, Griffiss AFB, NY 13441
Contact: Ms. Shirley Gloss-Soler (315) 330-3395
INFORMATION SERVICES: This information analysis center was established in response to a recognized need

0215 House Component and Equipment Field Test Facility
Oak Ridge National Laboratory, Department of Energy
Oak Ridge, TN 37830
Contact: Mr. R. D. Ellison (615) 574-2019
FACILITY: This site includes a sophisticated instrumentation and data acquisition system. The site includes three main house (167 sq m each), originally one solar, one Annual Cycle Energy System, and one control; and currently three other experimental buildings. These houses are being used to obtain performance data on existing and new types of HVAC equipment and appliances and their interactions with the building structure.

0216 Housing Technology Information Service
HUD User, Department of Housing and Urban Development
P.O. Box 280, Germantown, MD 20874
Contact: (301) 251-5154
INFORMATION SERVICES: Information is provided on research concerning housing and urban topics. These topics include affordable housing, building technology, community development, energy conservation and utilization, services for the elderly and handicapped, and neighborhood rehabilitation and conservation. Three types of services are provided: publication dissemination, standard and custom bibliographies, and information announcements of new reports. A blueprint reproduction service is offered which includes designs reflecting the newest innovations in housing technology.

0217 Plumbing Research Facility
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. L. S. Galowin (301) 921-3293
FACILITY: With a high-speed, computerized data acquisition system and hot and cold water supplies with precisely controlled pressures and temperatures over a wide range of demands, as well as standard laboratory fluid services, this laboratory offers unique opportunities to advance the state of the art both in the design and in the design and in the evaluation of plumbing equipment and systems. Capabilities include tests on systems up to 45 ft. in height and up to 50 ft. in length; water supply of up to 1000 gpm at constant head in gravity mode; up to 300 gpm in automatically controlled pressure mode up to 70 psi; and hot water at volumes up to 200 gph at 180F. Applications include the development of improved criteria for general hydraulic design of and for prediction of loads on plumbing systems; the development of test methodology for calibration and performance evaluation of innovative plumbing equipment and systems; investigations of performance of piping materials as affected by pressure, flow, and contact with hot and cold water; methodology for cost effective approaches in needed national programs to update information on plumbing loads and to develop a modern data bank on performance characteristics of innovative equipment and systems.

Polymer-Concrete Development Laboratory, Brookhaven National Laboratory, Department of Energy
See 0478

0218 Rural Housing Research Unit
Agricultural Research, Department of Agriculture
P.O. Box 792, Clemson, SC 29633
Contact: Jerry O. Newman (803) 654-3646
EXPERTISE: The unit is a national program directed toward reducing housing, farm structures, and service building construction and operating costs for low-income rural residents. It conducts research projects in collaboration with other USDA agencies, academic institutions, and the Department of Energy. Areas of research includes low-cost housing; solar heating; and energy conservation.

0219 SERI Daylighting Laboratory
Solar Energy Research Institute, Department of Energy
1617 Cole Blvd., Golden, CO 80401
Contact: Mr. Dana Moran (303) 231-7115
FACILITY: The use of natural light as a substitute for artificial light in commercial buildings offers significant savings in energy costs. Sky conditions are continuously mapped and maintained in a reference data base. The facility is the only temperate clear climate daylighting laboratory located in the United States. All of the instrumentation associated with the laboratory is mounted on top of a mobile home which contains data acquisition equipment. The laboratory has facilities to monitor daylight levels inside scale models of building configurations. These models are used to characterize the daylighting performance of various building configurations, develop and validate daylight prediction techniques, and to examine the impact of daylighting on building energy consumption.

Solar Energy Research Institute, Department of Energy
See 0325

0220 Structures Laboratories
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. R. A. Crist (301) 921-3471
FACILITY: Static and dynamic testing is accomplished by use of a heavily reinforced tie-down floor permitting mounting of complete structural members. Hydraulic actuators provide test loads in static test while closed-loop electro-hydraulic actuators provide test loads in dynamic tests. Automatic recording of up to 200 channels of sensor data is accomplished by a mini-computer-controlled data acquisition system. A 53-foot section has a 12,000 ft-kip bending moment capacity, and its 25-foot extension has a bending moment capacity of 8,000 ft-kips. The crosswise section 47 feet in length will withstand a total bending moment of 21,000 ft-kips. The floor will withstand a total horizontal shear force of 1800 kips in either direction and a vertical shear force of 2,000 kips. Beams, slabs, frames or complete structures can be subjected to static loads as limited by test floor capacity or cyclic loads up to 50,000 pounds with programmed amplitude and frequency. Two mini-computer controlled data acquisition systems are available.

Structures Laboratory, Waterways Experiment Station, Department of the Army
See 0380

Test House, Brookhaven National Laboratory, Department of Energy
See 0329

COMBUSTION & ENGINES

Advanced Coal Science and Technology, Pittsburgh Energy Technology Center, Department of Energy
See 0287

0221 Aircraft Propulsion Research and Testing Program
Naval Air Propulsion Center, Department of the Navy
Director, Resource Management Dept., P.O. Box 7176, Trenton, NJ 08628

Newtown Field Station, Environmental Protection Agency
See 0411

Northeast Fisheries Center and Associated Laboratories, National Oceanic and Atmospheric Administration, Department of Commerce
See 0424

0206 Northern Prairie Wildlife Research Center
U.S. Fish and Wildlife Service, Department of the Interior
P.O. Box 1747, Jamestown, ND 58401
Contact: Dr. Gerald A. Grau (701) 252-5363
EXPERTISE: Areas of interest include factors influencing productivity of upland nesting ducks; breeding biology and migrational ecology of diving ducks; management of wetlands; land management practices for upland nesting waterfowl; relationships of Pacific Flyway wetlands to migratory birds; predator management practices; and nongame birds.

0207 Patuxent Wildlife Research Center
U.S. Fish and Wildlife Service, Department of the Interior
Laurel, MD 20708
Contact: Dr. Russell J. Hall (301) 498-0300
EXPERTISE: The center is involved with the following: contaminant problems in marine, estuarine, freshwater, woodland, grassland, and cropland habitats; ecological studies on Hawaiian forest birds, Newell's Manx shearwater, eastern timber wolf, California condor, Bald eagle, Everglade kite, yellow-shouldered blackbird, Puerto Rican parrot, Puerto Rican plain pigeon, whooping crane, masked bobwhite quail, Kirtland's warbler, and endangered bats; behavioral, physiological, and nutritional studies on whooping cranes, sandhill cranes, and Andean condors; studies of nongame bird communities to aid Federal agencies and other groups in the management of both large and small tracts of land; and studies of game bird populations, mainly waterfowl, to obtain reliable data with which to manage hunted species and populations. Special work is also conducted on developing methodology for analysis of organochlorine, organophosphate, and carbamate pesticides; petroleum residues; polynuclear aromatic hydrocarbons; and metals.

Plant Physiology and Chemistry Research Unit, Western Regional Research Center, Agricultural Research Service, Department of Agriculture
See 0077

Plant Physiology and Photosynthesis Research Unit, Agricultural Research Service, Department of Agriculture
See 0078

Plant Physiology Research Unit, Richard B. Russell Agricultural Research Center, Agricultural Research Service, Department of Agriculture
See 0080

Plant Structure and Composition Research Unit, Richard B. Russell Agricultural Research Center, Agricultural Research Service, Department of Agriculture
See 0084

Plum Island Animal Disease Center, Agricultural Research Service, Department of Agriculture
See 0107

Poisonous Plant Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0085

0208 Savannah River Ecology Laboratory
Department of Energy
Drawer E, Aiken, SC 29801
Contact: Dr. Michael H. Smith (803) 725-2472
EXPERTISE: The main programs are in: thermal ecology, where the goal is to study the environmental effects of the release of cooling water from the Savannah River Plant's production reactors; mineral cycling, where the goal is to produce information on movement of heavy metals, radioisotopes, and other toxic materials and stable elements through natural communities in the coastal plain area; the radioecology of transuranics, where the general principles of mineral cycling are used to evaluate environmental movement of plutonium and other transuranic elements under the humid climatic conditions of the southeastern United States; and studies of basic and theoretical ecology, where specific studies often suggest broader generalities which can be defined by basic research.

Scanning Transmission Electron Microscopy Facility, Brookhaven National Laboratory, Department of Energy
See 0772

Southwest Fisheries Center and Associated Laboratories, National Oceanic and Atmospheric Administration, Department of Commerce
See 0428

Soybean and Nitrogen Fixation Research Unit, Agricultural Research Service, Department of Agriculture
See 0088

Tobacco Safety - Genetic, Biological, and Chemical Research, Agricultural Research Service, Department of Agriculture
See 0092

Toxicology and Biological Constituents Research Unit, Richard B. Russell Agricultural Research Center, Agricultural Research Service, Department of Agriculture
See 0110

Toxicology and Biological Evaluation Research Unit, Western Regional Research Center, Agricultural Research Service, Department of Agriculture
See 0124

U.S. Livestock Insects Laboratory, Agricultural Research Service, Department of Agriculture
See 0147

0209 Variable-Dose-Rate Irradiation Facility
Oak Ridge Associated Universities, Department of Energy
Medical and Health Sciences Division, P. O. Box 117, Oak Ridge, TN 37831
Contact: Dr. E. B. Darden (615) 576-3333
FACILITY: A variable dose rate irradiation facility is maintained, and the necessary dosimetry support services, for use in radiation studies. The facility is available to outside researchers who wish to purchase time and technician support. The facility is equipped to expose a variety of plants and animals, including large animals, to cobalt-60 gamma radiation at variable doses. The dose can range from a few millirads to kilorads per minute. Six large animals can be exposed to uniform dose rates of radiation up to 20 rads/min, and small animals or seeds to kilorads/min. Large-scale radiation sterilization of insects has been conducted here. Because of the flexibility of the facility, it can be used for studies on the synergistic actions of radiation and other toxic agents.

Environmental Research Laboratory (Duluth), Environmental Protection Agency
See 0395

Environmental Research Laboratory (Gulf Breeze), Environmental Protection Agency
See 0396

0197 Fermentation Laboratory
Northern Regional Research Center, Agricultural Research Service, Department of Agriculture
1815 N. University Street, Peoria, IL 61604
Contact: Dr. A. M. Cowan (309) 685-4011
EXPERTISE: The laboratory develops methods to convert agricultural commodities into foods, feeds, and useful biologically active compounds. It maintains and develops a national collection of bacteria, actinomycetes, molds, and yeasts of agricultural and commercial import. Microbial means are investigated to improve crop yields and to utilize agricultural wastes. Studies are conducted to detect and prevent microbial toxins from entering foods and feeds. Bioconversion of agricultural residues and animal waste materials to more useful forms is studied with special emphasis on producing animal feeds and alternative energy resources. Scientists investigate the microbial genetics of fermentative organisms and fungi that degrade lignocellulosic residues. Recombinant DNA techniques are evaluated. Investigations are conducted into various forms of nitrogen-fixing symbioses ranging from leaf to root types and into associations between plants and blue-green algae that occur in wetland agriculture. Elucidation of structures of rhizobial polysaccharides is carried out. Scientists evaluate and modify analytical methods for determining mycotoxins in agricultural commodities. Researchers investigate mycotoxins of economic importance in cereals and oilseeds including the isolation and testing of fungus cultures from agricultural products for their ability to produce mycotoxins old or new to science. Fermentation studies are made on toxin producing fungi to establish conditions for toxin production and method of biosynthesis, and to isolate, purify, and identify mycotoxins.

0198 Food Chain Transport (Large Animals)
Oak Ridge Associated Universities, Department of Energy
Medical and Health Sciences Division, P. O. Box 117, Oak Ridge, TN 37831
Contact: Dr. G. R. Eisele (615) 576-4081
EXPERTISE: Researchers are studying the food chain transport of synthetic fuels to determine the impact of coal conversion processes on the food chain. The chemicals to be tested are selected from a risk assessment unit, a generalized organic category developed to represent synfuel compounds. Some of the chemicals are known to be part of synthetic fuel processes, and many are known or suspected carcinogens. Researchers subject laying hens, pigs and dairy cattle to chronic and acute exposures to see if the chemicals appear in eggs, meat, and milk. The data will eventually be used in developing risk assessment models for synthetic fuel processes.

Food Safety Laboratory, Eastern Regional Research Center, Agricultural Research Service, Department of Agriculture
See 0119

Fruit and Vegetable Chemistry Laboratory, Agricultural Research Service, Department of Agriculture
See 0061

0199 Genetic and Cellular Resources Program
Gerontology Research Center, National Institute on Aging, National Institutes of Health, Department of Health and Human Services
Baltimore City Hospital, Room 1E07, Baltimore, MD 21224
Contact: Dr. Richard Greulich (301) 496-9419
SERVICES: The program currently supports a repository for cellular resources at the Institute for Medical Research in Camden, New Jersey. The objectives of this program are to stimulate research in cellular and molecular mechanisms of senescence; develop, characterize, store, and distribute cell cultures for gerontological research; and establish a repository of frozen, viable genetic and mutant organisms of interest to aging research. Resources that currently can be made available to investigators engaged in aging research include human fetal lung fibroblast cell lines IMR-90 and IMR-91, fibroblast-like cells derived from adult humans, cell lines derived from adults with specific genetic syndromes, and virally transformed cells.

Horticultural and Special Crops Laboratory, Northern Regional Research Center, Agricultural Research Service, Department of Agriculture
See 0064

Insect Attractants, Behavior, and Basic Biology Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0135

Insects Affecting Man and Animals Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0137

JANUS Neutron Reactor and Gamma Ray Irradiation Facilities, Argonne National Laboratory, Department of Energy
See 0666

0200 Laboratory of Biomedical and Environmental Sciences
Department of Energy
University of California, 900 Veterans Avenue, Los Angeles, CA 90024
Contact: Dr. William J. Moffitt (213) 825-9431
EXPERTISE: Research programs focus on problems of national significance in energy-related medical, biomedical and environmental fields. Scientists are involved in studies on the mechanism of cellular damage by energy related pollutants. Research is also conducted on the mechanism of action of certain hormones and neurotransmitters, control of metabolic reactions, regulation of gene expression and of carcinogenesis, and on the formation and properties of cellular membranes. Other research is concerned with the environmental effects of various technologies on various environments, particularly arid regions. Basic research on desert ecosystem biology is carried out in support of problems related to energy development and use. A further laboratory objective is the introduction of new atraumatic diagnostic procedures for earlier detection of disease. Progress is dependent on the development of new instumentation, radiopharmaceuticals and diagnostic strategies, first applied to animals and then directly to man. Emphasis is being placed on computer tomography techniques for studying physiological processes in the heart and brain.

solar radio and optical data and abstractions from interplanetary propagation models; develop and test magnetohydrodynamic models for fully describing the spatial and temporal evolution of disturbances from their sources at the sun and propagation to the Earth; assessment of geomagnetic activity using data from the real-time magnetometer network; improved evaluation of the magnitude, extent and duration of energetic solar particle events, using GOES and NOAA/TIROS data; and development of operational methods for characterizing the particle environment as information useful to customers for their evaluation of ionospheric disturbances, spacecraft charging and satellite electronics degradation, atmospheric heating, and radiation hazards.

0187 Techniques Development Laboratory
National Oceanic and Atmospheric Administration, Department of Commerce
National Weather Service, Room 825, Gramax Bldg., 8060 13th Street, Silver Spring, MD 20910
Contact: Dr. Harry Glahn (301) 427-7768
EXPERTISE: Applied research and development is aimed at improvement of diagnostic and prognostic weather information primarily used as guidance field offices. This guidance may be produced at the National Meteorlogical Center and disseminated to field offices, or it may be produced on minicomputers at field offices. The laboratory: carr ies out studies both for the general improvement of prediction methodology used in the National Meteorological Service System and for more effective utilization of weather prediction by the ultimate user; develops computer programs required to improve the overall performance of the NMSS, and directs effort to improve prediction techniques in the areas of public weather, agricultural weather, marine weather, and aviation weather. Special emphasis is given to the development of improved methods for prediction of tornadoes, severe local storms, and hurricane storm surge. Projects involve use of modern physical, dynamical, and statistical prognostic techniques and high-speed electronic computers.

0188 Test and Evaluation Division
National Oceanic and Atmospheric Administration, Department of Commerce
National Weather Service, R. D. 1, Box 105, Sterling, VA 22170
Contact: Mr. Robert C. Strickler (703) 471-5302
EXPERTISE: The division is assigned three major functions: test and evaluation; observing techniques development; and development and operation of the NWS test facilities. The test and evaluation role includes both hands-on testing and the development of test programs which are carried out by others, such as the vendor of an equipment system. This role begins in the earliest stages of an equipment development and continues through implementation. The observing techniques development role produces the methods and procedures used to take weather observations, either manually or with computer-based automatic weather stations. Most of the observing techniques development work is now aimed at automating the weather observation, consequently T and ED's products are the mathematics and logic (algorithms) used to program automatic weather stations. The third function, development and operation of the National Weather Service test facilities, allows the first two functions to be accomplished. The environmental simulation facilities and outdoor test beds at Sterling are designed specifically for evaluation of meteorological equipment and the development of observing techniques.

BIOLOGICAL SCIENCES

Animal Parasitology Institute, Beltsville Agricultural Research Center, Agricultural Research Service, Department of Agricultural Research Center
See 0099

0189 Aquatic Research Laboratory
Savannah River Laboratory, Department of Energy
Aiken, SC 29808
Contact: Dr. E. W. Wilde (803) 725-7400
FACILITY: The laboratory consisting of 4 laboratory modules is located on the shore of Par Pond, a 2700-acre recirculating cooling pond for a nuclear reactor. The laboratory facilities include boats for sampling, a supply of Par Pond water, and appropriate aquatic biology measurement capabilities. The laboratory has examined biofouling and biocorrosion of various heat exchanger materials, impact of chlorination on aquatic life and response of the Par Pond ecosystem to discharges of cooling water from the nuclear reactor.

0190 Arid Lands Ecology Reserve
Pacific Northwest Laboratory, Department of Energy
P.O. Box 999, Richland, WA 99352
Contact: Dr. W. H. Rickard (509) 376-5011 or Dr. L. Schmid (509) 375-2559
FACILITY: The site provides a protected study area for short- and long-term ecological research concerning wildlife and environments of semi-arid areas of the western United States. It is a large area of about 120 square miles that is completely fenced to exclude stray livestock, and access to the site is for research and education purposes only. Natural impacts such as wildfires are studied as well as man-induced disturbances such as the severe soil disturbances related to shallow land burial of radioactive wastes, the biological effects of controlled livestock grazing, and the short- and long-term fate and effects of chemical contaminants introduced to soil and surface waters in experimental quantities. Included are on-site laboratories needed for the maintenance of plants and animals under controlled environmental conditions and outdoor facilities designed to safely contain experimental quantities of toxic materials and yet expose growing plants to realistic environmental conditions of temperature, sunlight, wind and soil water variations.

Arthropod-Borne Animal Diseases Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0102

0191 Bee Breeding and Stock Center Laboratory
Agricultural Research Service, Department of Agriculture
Route 3, P.O. Box 82-B, Ben Hur Road, Baton Rouge, LA 70820-9799
Contact: Dr. Thomas E. Rinderer (504) 766-6064
EXPERTISE: Research is conducted on honey bee breeding and bee genetics, long term germplasm storage, physiology, reduction of African bee impact, and improvement of bee performance. The Laboratory also serves as a stock center for honey bee germ plasm (inbred lines and mutant markers).

Biological Control of Insects Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0130

the National Radio Quiet Zone site in Green Bank. The premier telescope at Green Bank is the 43-meter instrument, which permits the study of spectral lines at centimeter wavelengths. The telescope is an integral part of the Very Long Baseline Interferometer network; this network is involved in studies of quasars and the high-resolution mapping of galactic objects over transcontinental and intercontinental distances. The large-aperture, 91-meter telescope is instrumented for survey studies of both continuum and spectral-line radiation from galaxies where its great sensitivity is an advantage. A 12-meter millimeter-wavelength telescope is located on Kitt Peak to take advantage of the high altitude and dry climate necessary for short radio wavelengths. This telescope is capable of both continuum and spectral-line studies at wavelengths from 1 centimeter to as short as 1 millimeter. The Very Large Array(VLA) west of Socorro, New Mexico, consists of 27 antennas, available for use in an interferometric mode for aperture synthesis observations of faint radio sources. Both continuum and spectral-line observations at wavelengths of 1.3, 2, 6, and 20 centimeters can be made. The four-element interferometer at Green Bank is operated full time for the U.S. Naval Observatory on a program of measuring the earth's rotation and determining certain astronomical constants.

0177 National Severe Storms Laboratory
National Oceanic and Atmospheric Administration, Department of Commerce
NOAA Environmental Research Laboratories, 1313 Halley Circle, Norman, OK 73069
Contact: Dr. Edwin Kessler (405) 360-3620
EXPERTISE: The laboratory supports NOAA's weather observing and forecasting missions through studies of storm processes, numerical and conceptual modeling of storm phenomena, and development of improved means for observation. Recent emphasis has been toward Doppler radar applications and studies of storm electricity. The laboratory maintains a 50-station capability for digital recording of surface meteorological parameters, and maintains instrumentation on the tallest tower in the United States that is equipped for recording boundary layer parameters. Two 10-cm Doppler radars on a 41-km baseline provide unique capabilities for recording atmospheric circulations in both precipitating weather systems and the optically clear boundary layer. A comprehensive range of instrumentation for recording electrical parameters has been brought to a high peak of refinement so that distributions of wind, water, and lightning can be recorded contemporaneously, and their interaction examined. The laboratory is working closely with the Joint System Program Office of the Next-generation Radar (NEXRAD) program to help develop an effective national weather radar network and meteorological airspace system for the late 1980's and beyond. Laboratory expertise resides in the following areas: fluid dynamics, numerical modeling, severe storms meteorlogy, aviation meteorology, radar engineering, microwave propagation and scattering, signal processing and digital logic.

0178 National Space Science Data Center (NSSDC)
Goddard Space Flight Center, National Aeronautics and Space Administration
Code 601, Greenbelt, MD 20771
Contact: (301) 344-6695
INFORMATION SERVICES: The center's mission is to provide the means for further analysis and dissemination of satellite experimental space science and applications data beyond that provided by the analyses, presentations, and publications of principal investigators and their co-workers. Areas of interest cover data relating to all natural phenomena occurring in space outside the earth's lower atmosphere and specific areas of earth science and meteorology. Subjects include astronomy, ionospheres, cosmic rays, trapped radiation, magnetospheric plasma, solar plasma, planetary atmospheres, solar physics, X-ray astronomy, gamma ray astronomy, meteorology, earth and planetary sciences, solar cosmic rays, geomagnetism, celestial mechanics, electric fields, and cosmic dust.

NOAA Wave Propagation Laboratory, National Oceanographic and Atmospheric Administration, Department of Commerce
See 0724

Northwest Ocean Service Center, National Oceanic and Atmospheric Administration, Department of Commerce
See 0725

Pacific Marine Environmental Research Laboratory, National Oceanic and Atmospheric Administration, Department of Commerce
See 0728

0179 Precision Humidity Measurement
National Bureau of Standards, Department of Commerce
Washington, DC 20234
Contact: Dr. George Marinenko (301) 921-2883
FACILITY: This facility comprises two precision humidity generators and a gravimetric hygrometer that can be used separately or in combination for calibration, testing, and development of instruments, sensors and devices and for research on the properties of moist gases. The generators produce continuous gas flows of constant moisture content whereas the hygrometer makes accurately humidity measurements. The capability includes gas flow up to 150 cubic decimeters per minute, ambient temperatures from +65 to -75C, dew point of +65C to frost point of -100C, ambient pressures from atmospheric to 50 mb, generated moisture contents known to 0.5% or better over most of range and to 2% at extremes. Applications include calibration of dewpoint hygrometers, psychrometers, electric hygrometers, infra-red hygrometers, dewcels, coulometric hygrometers; evaluation and testing of such sensors as carbon film, aluminum oxide crystal array, lithium chloride, barium floride; and enhancement of water vapor in air with pressure.

0180 Ranging and Meteorological Equipment
Pacific Missile Test Center, Department of the Navy
Point Mugu, CA 93042
Contact: Mr. Jay Scott (805) 982-8801
EXPERTISE: The center is the Navy's premier air/surface weapons test range. A major airfield, test facilities, an island facility and many instrumentation sites are available. Aircraft testing is conducted for not only the Navy but all other services and private industry, on occasion. Some facilities and instrumentation capabilities are available to the private sector on a cost-reimbursement basis.

0181 Sacramento Peak Observatory
National Science Foundation
AURA Inc., Sunspot, NM 88349
Contact: Mr. Frank A. Hegwer (505) 434-1390
EXPERTISE: The observatory is a national center for research on the physics of the sun. Besides maintaining its own in-house research effort, Sacramento Peak is also available through its visitor program to aid U. S. scientists in

0165 Integrated System Laboratory
National Ocean and Atmospheric Adminstration, Department of Commerce
National Weather Service, Room 201, 8060 13th Street, Silver Spring, MD 20910
Contact: Mr. Richard Waters (301) 427-7809
EXPERTISE: The analysis, design, development and test activities is conducted in support of the implementation, operation and improvement of NWS systems. Primary emphasis is on systematic solution of current problems and development of systems that can be implemented within three years. The laboratory develops detailed system specifications; conducts evaluations of system performance, identifies critical problem areas and analyzes the impact of proposed changes on operational system integrity as well as performance; designs, develops, integrates and tests comprehensive hardware/software solutions in support of ongoing meteorological, hydrological and oceanographic observing, data acquisition, processing, display, interpretation, communication and dissemination functions; considers interfaces with other government agencies and external users; and prepares supporting documentation and maintains a library of technical specifications and standards. Maintains supporting facilities and staff for design, drafting, fabrication, model development and experimental testing.

0166 Ionospheric High Frequency Radar Facility
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Mr. David J. Simons (505) 667-5930
FACILITY: An advanced digital ionospheric sounder is available operating under computer control which will measure ionospheric motions from the E-region to the upper F-region. Using an array of four spaced antennas North-South and East-West tilts and motions can be derived. Identical systems are located at the European Ionospheric Incoherent Scattering Facilities in Tromso, Norway and Sounderstomfyord, Greenland.

Jet Propulsion Laboratory, National Aeronautics and Space Administration
See 0794

0167 Jicamarca Radio Observatory
National Science Foundation
Department of Electrical Engineering, Cornell University, Ithaca, NY 14853
FACILITY: The observatory is one of four large incoherent-scatter radar facilities located along a longitudinal chain from Greenland to Peru. In response to a need for more understanding of global-scale thermospheric and ionospheric problems, these facilities have been upgraded and realigned into a chain extending from the polar cap to the magnetic equator. The major goal of the UAF Program is to promote basic research on the structure and dynamics of the earth's upper atmosphere by supporting the operation and scientific research of the longitudinal chain of incoherent-scatter radars. At the low latitude of this observatory in Peru evidence has been found for the penetration of magnetic fields. In addition, UAF supports the heating facility (HF) site at Arecibo Observatory. This powerful facility uses the ionosphere as a gigantic plasma physics laboratory, artifically injecting energy into the ionospheric medium to study basic plasma wave processes.

0168 Kitt Peak National Observatory
National Science Foundation
P.O. Box 26732, Tucson, AZ 85726
Contact: Dr. Dale Schrage (602) 327-5511
FACILITIES: The observatory is the Nation's center for research in ground-based optical and infrared astronomy. Large optical telescopes, observing equipment, and research support services are made available to qualified scientists. Observing facilities are located on Kitt Peak, a 2,089-meter mountain. The observatory is the site of the second largest reflector in the United States, the 4-meter Mayall Telescope, and the largest solar research instrument, the 1.5-meter McMath Solar Telescope. Among the other KPNO telescopes atop Kitt Peak are a 2.1-meter tation. The Observatory's activities include development of two-dimensional optical and infrared detectors, large diffraction gratings, auxiliary instruments for existing telescopes, and engineering designs for telescopes of the future.

0169 Meteorological Development Division
National Meteorological Center, National Oceanic and Atmospheric Administration, Department of Commerce
World Weather Building, Room 101, Camp Springs, MD 20233
Contact: Dr. John A. Brown (301) 763-8005
EXPERTISE: The division conducts research and development in numerical weather and oceanic prediction which is directed towards the improvement of the products of the National Meteorological Center. It adapts research results to oceanic and numerical weather prediction techniques which are suitable for operational forecasting. It develops, tests, and evaluates (1) methods of analysis for extracting maximum information from the various meteorological and oceanographic observing systems and (2) oceanic and numerical weather prediction models for improving the accuracy, extending the range, and enlarging the geographical domains of forecasts. In its R and D processes, the division analyzes and evaluates physical methods and numerical procedures which are appropriate to operational forecasting. The division also performs diagnostic studies of the earth's fluid environment to obtain a better understanding of its physical structure and motion.

0170 Meteorological Test Facility
Dugway Proving Ground, Department of the Army
STEDP-C, Dugway, UT 84022
Contact: Dr. Lothar L. Salomon (801) 522-3314
FACILITY: A means is provided of measuring weather elements within the surface boundary layer and up to heights of 30 km. These measurements are processed by computer and displayed in a format suitable for analysis. Within the boundary layer, dense arrays of sensors are installed at remote grids, where analog signals are collected, digitized and transmitted by radio link to a data central. A computer at the data central displays the information for real time applications and recording on magnetic tape. Permanent, mobile and transported systems collect and record weather information to accomodate various requirements of location and area of interest.

0171 Millstone Hill Radar
National Science Foundation
Haystack Observatory, Westford, MA 14853
FACILITY: The radar is located south of the auroral oval, in the region where significant mid-latitude phenomena are observed. Observations of high-altitude regions--from almost directly above the radar at Sondre Stromfjord to almost directly above the next radar in the chain at Arecibo.

EXPERTISE: The center studies the social and economic impacts on the nation of short-term climatic and oceanic anomalies and manages NOAA's libraries and their participation in the national network of scientific information centers and libraries. It develops techniques for integrating socio-economic data with current and historical environmental data to provide qualitative and quantitative assessments of the social and economic effects of extended episodes of unusual weather and oceanic anomalies. The studies focus primarily on the national economy and its major industrial sectors (agriculture, energy, transportation, construction, etc.) however, it also develops models and techniques for estimating weather impacts on agricultural production in developing countries and provides assessments to the Agency for International Development and the Department of Agriculture. The center also participates in research on the value of the use of climatological data in water management, energy use and conservation and agricultural production.

0154 Atlantic Oceanographic and Meteorological Laboratory
National Oceanographic and Atmospheric Adminstration, Department of Commerce
NOAA Environmental Research Laboratories, 4301 Rickenbacker Causeway, Miami, FL 33149
Contact: Dr. Hugo F. Bezdek (305) 361-4300
EXPERTISE: The laboratory is organized to pursue basic and applied research programs in oceanography and tropical meteorology. Oceanographic investigations center on fluxes of energy, momentum, and materials through the air-sea interface; the transport and composition (thermal and chemical) of water in the ocean volume; and hydrothermal processes of mineralization at seafloor spreading centers. Meteorological research is carried out to improve the description, understanding, and prediction of hurricanes and to determine their potential for beneficial modification. Current research addresses processes related to climate, marine assessment, marine resourcs, ocean and lake services, and weather observations and predictions.

0155 Atmospheric Light Detection and Ranging Facility (LIDAR)
Los Alamos National Laboratory, Department of Energy
Los Alamos, NM 87545
Contact: Mr. Robert Karl (505) 667-4702
FACILITY: A system uses several pulsed lasers to probe the atmospheric molecules and aerosols out to 90 km range. The scattered return is recorded with the 16 in Cassegrain telescope at a 10 bit 10 Mhz rate and is processed to obtain atmospheric aerosol profiles or absolute pollutant concentration in three dimensions.

0156 Atmospheric Sampling Aircraft
Pacific Northwest Laboratory, Department of Energy
P. O. Box 999, Richland, WA 99352
Contact: Dr. Nels Laulainen (509) 376-8414, or Dr. L. Schmid (509) 375-2559
FACILITY: An extensive airborne and ground-level pollutant sampling capability is used to construct mathematical models which aid prediction of pollutant concentration and the transfer of pollutant to other environmental media. A twin-engine Cesna 411 and DC-3 are an important part of the capability. Both aircraft are equipped to measure meteorological parameters and sample and analyze pollutants. They are also instrumented for data storage and processing. Probes attached to the aircraft collect pollutants as they disperse in the atmosphere. The on-board equipment analyzes sulphur dioxide, nitric oxide, ozone, carbon dioxide, and other hydrocarbons.

0157 Atmospheric Sciences Laboratory
Department of the Army
ERADCOM, Attn: DELAS-D, White Sands Missile Range, NM 88002
Contact: Mr. Carl Wright (505) 678-3504
EXPERTISE: The laboratory is involved with research and development aimed at minimizing the deleterious effects of the natural and battlefield atmospheric environments on Army weapons systems and material, the development of remote atmospheric sensors/systems and associated techniques, and meteorological measurements and analyses supporting Army research. Areas of interest include: remote sensing research; atmospheric dynamics research; aerosol physics research; electromagnetic (EM) propagation research; atmospheric effects on EM propagation; weather modification; artificial intelligence and robotics; computer modeling; development of advanced meteorological instrumentation; detection, identification, quantification, and transport and diffusion of hazardous agents; synoptic meteorology; climatology; meteorological observations and weather forecasts; reduction and quality control of meteorological data; meteorological instrumentation and calibration; meteorological rockets; electronic engineering; computer programming; electrical and mechanical engineering.

0158 Cerro Tololo Inter-American Observatory
National Science Foundation
CTIO Liaison Officer, Kitt Peak Observatory, P.O. Box 26732, Tucson, AZ 85726
FACILITIES: The observatory provides qualified scientists with the telescopes and related facilities required for research in ground-based optical astronomy in the southern hemisphere. Observing facilities are located on Cerro Tololo, a 2,194-meter mountain on the western slopes of the Andes. CTIO has seven telescopes, including the 4-meter near-twin to the Kitt Peak 4-meter instrument. The others are the 1.5-meter, 91-centimeter, 61-centimeter, and 41-centimeter reflectors; a 61/91-centimeter Schmidt telescope on loan from the University of Michigan; and a 1-meter reflector on loan from Yale University. These instruments are equipped with spectrographs, cameras, and photometers similar to the ones at Kitt Peak. CTIO has a permanent staff of scientists, engineers, and technicians available to help visiting scientists and observers.

0159 Climate Analysis Center
National Meteorological Center, National Oceanic and Atmospheric Administration, Department of Commerce
World Weather Building, Camp Springs, MD 20233
Contact: Dr. James L. Rasmussen (301) 763-8167
EXPERTISE: The center conducts research in climate diagnostics and prediction. Specific research areas include: large-scale global climate studies, stratospheric and ozone studies, empirical and statistical climate prediction, and climate modeling. The Center also participates in national and international research programs in climate system research.
Information Services: The center disseminates monthly and seasonal climate predictions and provides climate monitoring and current data and information products for use in agriculture, energy, and water resource management. It is the principal national point for the acquisition, processing, and

to insects, nematodes, and pathogens. The research team includes intomologists, chemists, and plant pathologist and physiologists. Crop plants investigated include alfalfa, corn, cotton, sorghum, soybean and tomato.

0142 Southern Field Crop Insect Management Laboratory
Agricultural Research Service, Department of Agriculture
Delta States Research Center, P. O. Box 225, Stoneville, MS 38776
Contact: Dr. Edgar G. King (601) 686-2311 x231
EXPERTISE: The laboratory is involved with biological methods for insect management including mass rearing parasite predator evaluations; cotton insect management research including cotton field insect population dynamics, chemical control, surveillance and prediction systems; soybean insect management including soybean field insect population dynamics, chemical control, integrated insect management systems.

0143 Southern Grain Insects Research Laboratory
Agricultural Research Service, Department of Agriculture
Tifton, GA 31793
Contact: Dr. Charlie E. Rogers (912) 382-6904 x30
EXPERTISE: The laboratory is involved with bioecology, migration, pathogens, and semiochemicals of corn, sorghum, and forage grass insects (esp. corn earworms and fall armyworms); corn and sorghum plant resistance; and mass rearing.

0144 Southern Weed Science Laboratory
Agricultural Research Service, Department of Agriculture
P.O. Box 225, Stoneville, MS 38776
Contact: Mr. C. G. McWhorter (601) 686-2311
EXPERTISE: The purpose of the laboratory is to develop technology that will reduce the losses caused by weeds and at the same time be safe to crops, the soil, and man. The Research is directed primarily toward improving weed control in the humid Southeastern states. Research emphasizes the development of techniques to control weeds in cotton, soybeans, corn, sorghum, and other crops adapted to the immediate geographical area, as well as weeds of importance in other crops and areas of the Southeast. More efficient and more effective methods of controlling weeds are developed through: increased fundamental knowledge of the ecology, biology, and biochemistry of weeds; improved methods that reduce losses in yield and quality and reduce the cost of control and energy requirements; and improved weed control technology to increase efficiency in production of food, feed, and fiber.

0145 Stored-Product Insects Research and Development Laboratory
Agricultural Research Service, Department of Agriculture
3401 Edwin Street, P.O. Box 22909, Savannah, GA 31403
Contact: Dr. Robert Davis (912) 233-7981
EXPERTISE: The laboratory's mission is to conduct research on the development of new and improved methods of controlling insects and preventing their damage in stored products-food, feed, seed, and fiber in the marketing channels. These channels extend from harvest through all storing, processing, and transporting phases until the commodity or product is consumed. To fulfill the laboratory's mission, the research and development program is spread among five research units for operational purposes. This research covers (1) Basic biology, ecology, genetics, morphology, and physiology of effective biological control by the use of natural enemies such as parasites and predators. (2) Studies of new, safer materials that will kill the pests, repel them, or otherwise prevent them from infesting, contaminating, or damaging stored commodities. (3) Modifications in the handling, processing, and storage environment of agricultural commodities as means to control or suppress insect pests. The use of insect-tight and insect-resistant packaging is an important area of investigation of this unit. Modification in the proportion of gases, such as oxygen, nitrogen, and carbon dioxide, which make up the storage atmosphere, is another very active research pursuit. The biochemistry of host-plant resistance is being investigated in an attempt to isolate naturally recurring chemicals with potential as new pesticides. (4) Research on what happens to pesticide residues on agricultural commodities and new and improved ways to detect pesticide residues in agricultural products. (5) Research is being conducted on the possible uses of various kinds of energy to control insects. Gamma ray, X-ray, microwave, and infrared radiation offer possibilities as excellent alternatives to the use of chemical pesticides.

Subtropical Horticultural Research Unit, Agricultural Research Service, Department of Agriculture
See 0090

0146 Tobacco Budworm Distribution Program
Southern Field Crop Insect Management Laboratory, Agricultural Research Service, Department of Agriculture
P.O. Box 225, Stoneville, MS 38776
Contact: Dr. E.G. King (601) 686-2311
SERVICES: The laboratory has developed the capability for large-scale rearing of the cotton bollworm and tobacco budworm. Distribution of these insects is made to various U.S. laboratories for research on insecticides, pheromones, chemosterilants, and development of resistant plant cultivars. Private and public laboratories can receive eggs and/or pupae at reduced costs through cooperation with the Cotton Foundation. Consultation is available on field crop insect management.

Tropical Fruit and Vegetable Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0094

0147 U.S. Livestock Insects Laboratory
Agricultural Research Service, Department of Agriculture
P.O. Box 232, Kerrville, TX 78028
Contact: Dr. R.O. Drummond (512) 257-3566
EXPERTISE: Research covers the biology and control of insect, tick, and mite pests of livestock. This effort is conducted in three research units: (1) Biting Fly and Cattle Grub Research Unit: develops animal protectant sprays and systemic insecticides; pathogens for biological control; immunological technology for pest control; delivery systems to enhance activity of and decrease hazards of insecticides; biology-ecology of livestock pests; and strategies for IPM systems. (2) the Scabies and Mange Mite Research Unit: finds new acaricides for control of Psoroptes ovis of cattle; determines the basic aspects of the physiology, biochemistry, biology, and host/parasite relationship of scabies mites; and develops specific immunologic tests to determine scabies infestations of livestock. (3) the Tick Research Unit: finds new acaricides and other agents for tick control; studies biology and ecology of ticks of livestock; and discovers genetic, cytogenetic, biochemical, and immunological mechanisms for tick control.

0128 Aquatic Plant Management Laboratory
Agricultural Research Service, Department of Agriculture
3205 SW College Ave. Ft. Lauderdale, FL 33314
Contact: Dr. Kerry K. Steward (305) 475-0541
EXPERTISE: The mission of the laboratory is to develop fundamental knowledge of the biology, ecology, and biochemistry of aquatic weeds including principles and mechanisms for control of aquatic weeds by biological, chemical, cultural, ecological, and integrated methods that are safe, and will avoid or minimize hazards to the environment. Three species of insects have been released in an effort to implement a program on the biological control of waterhyacinth. The latest was the moth Sameodes albiguttalis which was released in 1978 and successfully established in Florida. Studies designed to determine its effect on the growth dynamics of waterhyacinth are now underway. Preliminary studies have been initiated to determine the feasibility of integrating waterhyacinth control with plant growth regulators. Steps have been taken to expand the biological control program to include Eurasin watermilfoil and hydrilla as targets for this approach. Attempts are being made to identify factors responsible for successful establishment and spread of an aquatic weed. Studies of the basic biology of hydrilla, a submersed weed, reveal the plant obtains nutrition thru both root and foliar absorption. Fertility of sediments appears to be important in establishment and expansion of infestations. A new biotype of hydrilla was discovered in the NE, US which has potential for sexual reproduction. Comparative studies of the monoecious and dioecious strains are in progress. Research is being conducted on ways of improving efficacy of the very limited number of herbicides currently registered for use in water. Several controlled release formulations of selected herbicides and plant growth regulators have recently been developed and evaluated for their potential utility in managing nuisance aquatic plant growths. Studies are now underway to investigate soil absorption, site(s) of plant uptake and to determine what modifications of the controlled release formulations are desirable to optimize their effects on the target plants and the aquatic ecosystem.

0129 Beneficial Insects Research Laboratory
Agricultural Research Service, Department of Agriculture
501 S. Chapel Street, Newark, DE 19711
Contact: Dr. R.J. Dysart (302) 731-7330
EXPERTISE: The mission of the laboratory is to receive, quarantine, and transship exotic natural enemies of insect pests to federal and state agencies interested in biological control; to detect and eliminate (in quarantine) any unwanted secondary parasites; to develop methods relating to the transportation of insects; and to propagate, liberate, establish, and evaluate introduced parasites and predators of insect pests of crops and trees. Some specific areas of research include: Biocontrol of weevils affecting cool-season legumes; Biocontrol of insects attacking forests and shade trees; Biocontrol of alfalfa blotch leafminer; and Research on Predators and parasites of gypsy moth.

0130 Biological Control of Insects Research Laboratory
Agricultural Research Service, Department of Agriculture
Research Park, Route K, P.O. Box A, Columbia, MO 65205
Contact: Dr. Carlo M. Ignoffo (314) 875-5361
EXPERTISE: Developing ways to prevent insect damage using biological control agents is the primary objective of the unit. Specifically, its mission is to discover, define, clarify, and implement biological control principles and concepts. The biological control scientists' raw materials for studies are naturally occurring parasites, predators, and pathogens that attack insects. Insect parasites are organisms that live on or in, and at the expense of, other insects. Major areas of investigation are: (1) the effects of the environment on parasites, predators, and pathogens; (2) in vitro methods of propagating endoparasites and predators; (3) microbial control, microbiology, and pathology of target pests, parasites, and predators; (4) importation, screening, and biology of native and foreign parasites, predators, and pathogens; (5) insect rearing and nutrition; (6) population dynamics and manipulation of beneficial and pest insects; (7) parasite and predator behavior; and (8) studies on selective biocontrol chemicals.

0131 Biological Pest Control Research Unit
Agricultural Research Service, Department of Agriculture
P. O. Box 1269, Gainesville, FL 32602
Contact: Dr. Gary R. Buckingham (904) 372-3505 x124
EXPERTISE: Research is conducted on the importation and evaluation of biological control agents for insects and weeds.

0132 Boll Weevil Research Laboratory
Agricultural Research Service, Department of Agriculture
P.O. Box 5367, Mississippi State, MS 39762
Contact: Dr. E.P. Lloyd (601) 323-2230
EXPERTISE: Research is conducted on the elimination of the boll weevil as an economic factor in cotton production; cotton plant resistance to insects; boll weevil quantitative population ecology and population models; pest management schemes, including the use of boll weevil parasites, diseases, pheromone; and boll weevil biology and physiology, and biosystematics of the boll weevil.

0133 Defense Pest Management Information Analysis Center
Department of the Army
AFPMB, WRAMC FG, Washington, DC 20307
Contact: (301) 427-5365
INFORMATION SERVICES: The center collects, analyzes, indexes, stores, and disseminates pertinent published and unpublished information and provide consultation in the areas of important arthropod vector and pest biology, ecology and geographical distribution, integrated pest management, artropod-borne diseases, stored products pests, structural pests, as well as control techniques, organisms and compounds. Other important subjects incide rodent and bird control, the effects of venomous vertebrates and invertebrates in contact with man, marine organisms hazardous to military personnel and medically important toxic flora.

0134 Gypsy Moth Rearing Research Laboratory
Agricultural Research Service, Department of Agriculture
Building 268, Otis AFB, MA 02542
Contact: Dr. R.A. Bell (617) 563-9303
EXPERTISE: The mission of the unit is to obtain basic information and develop the technology for mass production of the gypsy moth and its major viral pathogen--a nucleopolyhedrosis virus recently registered. To accomplish this mission, the research unit is involved in (1) defining and establishing the optimal nutritional and environmental requirements and developing low-cost artificial diets; (2) developing, evaluating, and demonstrating machinery, facilities, and special equipment for prototype large-scale production; and (3) developing methods for evaluating and improving the ef-

high quality, pre-prepared, shlef stable food, packaged in half steam table sized containers; Meal, Ready to Eat - an operational ration replacing the Meal, Combat, Individual, which is lightweight, easy to open and provides one-third of the daily nutrient allowance; and Food Packet, Assault - a lightweight, high density, combat food packet designed as a restricted diet for use during assault and reconnaissance missions. Other activities include development of logistically effective foods, development of a diesel fueled burner, evaluation of commercial equipment to determine energy characteristics, maintaining and updating the Armed Forces Recipe file, development of Commercial Item Descriptions for food and equipment items, and production and engineering of restructed meats.

0117 Food Protection and Processing Research Unit
Richard B. Russell Agricultural Research Center,
Agricultural Research Service, Department of Agriculture
P.O. Box 5677, Athens, GA 30613
Contact: Dr. James E. Thompson (404) 546-3531
EXPERTISE: Areas of interest includes improved efficiency and sanitation of poultry processing and detection and elimination of salmonella in meats and feeds.

0118 Food Proteins Research Unit
Western Regional Research Center, Agricultural Research Service, Department of Agriculture
800 Buchanan Street, Berkely, CA 94710
Contact: Dr. Donald D. Kasarda (415) 486-3695
EXPERTISE: The missions within the unit are to: characterize wheat proteins at the molecular level in relation to defining the nature of their essential contributions to dough-forming and bread-baking quality in wheat; study protein biosynthesis in developing wheat grain; define the structure of the wheat genome as it relates to genes coding for storage protein components and their expression; determine the molecular structure of the toxic factor associated with wheat gliadin proteins that is responsible for the specific immune response characteristic of celiac disease and related conditions (such as dermatitis herpetiformis); and characterize properties of proteins of eggs and other food sources that are directly related to their biological function, and which affect the properties of food - particularly in processing.

0119 Food Safety Laboratory
Eastern Regional Research Center, Agricultural Research Service, Department of Agriculture
600 E. Mermaid Lane, Philadelphia, PA 19118
Contact: Mr. Robert L. Miller (215) 233-6623
EXPERTISE: Basic and applied chemical and biological research is conducted on fresh and processed foods in order to assure a safe, wholesome food supply. This laboratory emphasizes animal derived foods, primarily meat. Isolation and identification of residual and metabolic products of agricultural chemicals, naturally occurring toxicants, food additives and contaminants as well as potentially harmful compounds produced during processing provide a scientific basis for developing and recommending improved procedures for producing, storing or processing food products with reduced or no risk to the consumer. The roles of processing variables, such as sodium concentration, pH, temperature, water activity, fermentation culture, and radiation dosage, in maintaining and preserving the quality and safety of food products are investigated. Investigations of the biochemistry, physiology, and genetics of the growth and toxin formation by food-borne pathogens and studies of low-dose food and feed irradiation furnish information for minimizing or eliminating microbiological public health hazards from the food supply. Sections of this laboratory include: food additive research, microbiological safety research, food contaminant research, and four irradiation research.

0120 Food Science Laboratory
Eastern Regional Research Center, Agricultural Research Service, Department of Agriculture
600 E. Mermaid Lane, Philadelphia, PA 19118
Contact: Mr. Robert L. Miller (215) 233-6623
EXPERTISE: The laboratory conducts basic and applied research directed toward assuring the consumer a plentiful low-cost supply of high quality, nutritious foods, with emphasis on use of animal products. Research is conducted on biochemcial, physical, and chemical processes which effect the cost, availability, and quality of milk and meat and of dairy and meat products, as well as related foods. Processes occurring during animal production, storage, and conversion to consumer products are studied to determine their effect on basic properties and suggest new approaches to improve efficiency, to enhance nutritional quality, to reduce sodium content in processed foods, and to improve consumer acceptance factors. Facilities are maintained to test new treatments and processing concepts on a practical scale. Sections of this laboratory include: Dairy research, Meat and meat products, Food quality; and Food chemistry.

Horticultural Crops Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0065

0121 Meat Quality Research Unit
Richard B. Russell Agricultural Research Center,
Agricultural Research Service, Department of Agriculture
P.O. Box 5677, Athens, GA 30613
Contact: Dr. Leroy C. Blankenship (404) 546-3566
EXPERTISE: This unit is concerned with microbiological safety and quality as well as nutrient, sensory, and functional quality of meat and poultry.

Northeast Fisheries Center and Associated Laboratories, National Oceanic and Atmospheric Administration, Department of Commerce
See 0424

0122 Nutrients Research Unit
Western Regional Research Center, Agricultural Research Service, Department of Agriculture
800 Buchanan Street, Berkely, CA 94710
Contact: Dr. Antoinette A. Betschart (415) 486-3159
EXPERTISE: The missions of this research unit focus upon enhancement of the bioavailability of nutrients in our food supply as the primary goal. Characterization of nutritional potential and ultimate bioavailability of nutrients in humans and small animals receive major emphasis. The goal of these research efforts is to guide or design innovative changes in production, processing and preparation practices which enhance nutrient bioavailability and minimize antinutritional properties of foods.

Roman L. Hruska U. S. Meat Animal Research Center, Agricultural Research Service, Department of Agriculture
See 0036

myelitis. This laboratory, the only one of its kind in the nation, provides maximum isolation and security to prevent transmission of the disease while conducting research on the viruses and their insect vectors.

0103 Forage-Beef Cattle Research Unit
Agricultural Research Service, Department of Agriculture
USDA Forage Livestock Research Laboratory, P.O. Box 1199, El Reno, OK 73036
Contact: Dr. Floyd P. Horn (405) 262-5291
EXPERTISE: The unit's program covers the utilization of grain crop residues and forage as well as livestock production including the reduction of stress and respiratory disease losses in beef calves.

Insects Affecting Man and Animals Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0137

0104 Livestock Insects Research Laboratory
Agricultural Research Service, Department of Agriculture
Univ. of Nebraska, 305A Plant Industry Bldg., Lincoln, NE 68533
Contact: Dr. Ivan L. Berry (402) 472-2918
EXPERTISE: The mission of the research unit is to discover and develop integrated systems for the control of flies around confined livestock. The behavior, ecology and population dynamics of stable flies and house flies are studied in order to improve survey systems and develop long-term or large-area control programs. Natural and exotic biocontrol agents are studied and evaluated for control potential. The management of livestock and their confinement facilities are studied for the possible application of cultural control tactics. Population models and automated data systems are proposed for the integration of existing and new control technologies into complete systems. Specific studies are concerned with measuring and describing the feeding behaviors of stable flies and their variations with environment and age of the flies; development of better methods for determining the size and other parameters of populations; evaluation and improvement of the effectiveness of several native hymenopterous parasites of fly pupae; the general biology and ecology of selected pupal parasites; the contribution of various feedlot subsystems to fly populations; the development of a population model for stable flies; and the integration of different control components into an entire control system.

0105 National Animal Disease Center
Agricultural Research Service, Department of Agriculture
P. O. Box 70, Ames, IA 50010
Contact: Dr. Phillip A. O'Berry (515) 232-0250
EXPERTISE: The laboratory is the research center for the study of domestic diseases of livestock. Research is conducted on the infectious and noninfectious animal diseases prevalent in the United States having national significance or causing serious economic loss. Areas of interest includes: veterinary sciences and related pathology, physiology, biochemistry, microbiology, and toxicology; livestock vaccines and biological products (production standards, quality control, contamination, deterioration); and diagnostic reagents.

0106 National Wildlife Health Laboratory
U.S. Fish and Wildlife Service, Department of the Interior
6006 Schroeder Road, Madison, WI 53711
Contact: Dr. Wallace R. Hansen (608) 271-4640
EXPERTISE: The mission of the laboratory is to: determine the impact of disease on the wildlife resources under FWS stewardship; identify the role various pathogens have in contributing to these losses; develop effective means for disease prevention when possible; and significantly reduce wildlife losses to disease. This mission emphasizes disease investigations from a wildlife perspective rather than from an agricultural or public health perspective. Disease monitoring, diagnosis, control of disease outbreaks, research, and training of others in disease indentification and control are major activities carried out in support of this mission. Current research is directed toward migratory bird research directed at avian cholera; development of a data bank on lead poisoning in migratory birds; evaluation of control techniques for management of nuisance Canada goose problems; mammal and nonmigratory bird research limited to diagnostic support; and determining causes of mortality in Bald eagles and developing an associated data base.

0107 Plum Island Animal Disease Center
Agricultural Research Service, Department of Agriculture
P. O. Box 848, Greenport, NY 11944
Contact: Dr. Jerry J. Callis (516) 323-2500
EXPERTISE: The center is responsible for (1) developing diagnostic capabilities for animal diseases that are foreign to the United States, (2) conducting a wide range of research endeavors on the causative agents of these diseases, and (3) developing procedures for the safe importation of animals and animal products. Scientists have the responsibility to diagnose approximately 40 animal diseases foreign to the United States and to differentiate them from domestic animal diseases. Key emphasis is on foot-and-mouth disease and other vesicular diseases, such as swine vesicular disease, vesicular stomatitis, and vesicular exanthema of swine. The study of viruses has progressed to the molecular level. Recombinant DNA techniques are being used to determine nucleotide sequences of the genes of viruses and bacteria and to divulge the structure of the proteins they encode. The center has been instrumental in the development of a cloned viral protein which is the basis for a vaccine for foot-and-mouth disease. Reagants and diagnostic tests have been developed for African swine fever, African horsesickness, Akabane disease, heartwater, ephemeral fever, exotic bluetongue disease, Rift Valley fever, and several other foreign anthropod-borne diseases.

0108 Regional Poultry Research Laboratory
Agricultural Research Service, Department of Agriculture
3606 East Mt. Hope Rd., East Lansing, MI 48823
Contact: Dr. R. L. Witter (517) 337-6828
EXPERTISE: The research laboratory was originally established to study avian leukosis, a group of cancer-like diseases that were and still are one of the most important causes of mortality in chickens. Two important diseases of this group, Marek's disease and lymphoid leukosis, have been studied extensively by laboratory scientists and are now known to be caused by viruses. Laboratory scientists have developed chicken lines with special characteristics of value to research programs in neoplastic diseases. They maintain as many as 13 lines and sublines with a variety of special characteristics. Included are those that resist or are susceptible to infection and tumor induction by Marek's disease, lymphoid leukosis, or Rous sarcoma viruses. The inbred lines constitute a unique resource, not duplicated elsewhere in the world. One aim of this program is to im-

Contact: Dr. Richard F. Wilson (919) 737-3267
EXPERTISE: The research unit is responsible for the development of germplasm with superior characteristics for yield, resistance to disease and insects, and the quality and quantitiy of vegetable protein and oil. It covers the development of improved selection methodology based upon genetic theory of quantitatively inherited traits; determination of biological mechanisms which affect seed constituents; study of the physiological basis for enhanced nitrogen fixation; investigation of the genetic and biochemical control of lipid metabolism and water-stress tolerance; and investigations of unique nitrogen fixation mechanisms through recombinant DNA and genetic engineering methods.

0089 Soybean Production Research Unit
Agricultural Research Service, Department of Agriculture
P.O. Box 196, Stoneville, MS 38776
Contact: Dr. Thomas C. Kilen (601) 686-9311 x232
EXPERTISE: Studies are conducted on breeding, genetics, pathology, germplasm, and entomology, and host plant resistance.

0090 Subtropical Horticultural Research Unit
Agricultural Research Service, Department of Agriculture
13601 Old Cutler Road, Miami, FL 33158
Contact: Dr. Donald H. Spalding (305) 238-9321
EXPERTISE: Areas of interest include postharvest quality maintenance of horticultural crops; protection of horticultural crops from deterioration and damage from insects, diseases, and other hazards during storage and marketing; introduction, evaluation, breeding, preservation, and distribution of tropical and subtropical fruit and ornamental plants; determination of factors influencing populations of tephritid fruit flies in Florida and development of methods for management of fruit fly populations; development of new and improved treatments for commodities susceptible to infestation by fruit fly larvae of quarantine importance.

0091 Tobacco Research Laboratory
Agricultural Research Service, Department of Agriculture
Route 2, Box 16 G, Oxford, NC 27565
Contact: Dr. James F. Chaplin (919) 693-5151
EXPERTISE: Research conducted at the laboratory is concerned with the tobacco smoking and health issue. This is being done with two broad objectives: (1) Improve tobacco safety through use of new chemical, physical and applied sciences to reduce or remove constituents from tobacco leaf or smoke that are potentially hazardous to the consumer. (2) Improve tobacco safety through new biological and genetic principles and methods to reduce or eliminate chemicals from tobacco leaf. Research to accomplish these objective include modifying leaf and smoke components by cultural and harvesting techniques; biological control of insects and diseases to circumvent the need for potentially hazardous chemicals; new and standard genetic techniques to modify leaf and smoke composition including the dihaploid method of breeding; genetic control of diseases and insects, thereby eliminating the need for pesticides; extract protein for human and animal comsumption; and maintain germplasm. Forage research is also conducted. Research is aimed at identifying disease and insect pests and breeding resistant varieties of white clover and alfalfa.

0092 Tobacco Safety - Genetic, Biological, and Chemical Research
Agricultural Research Service, Department of Agriculture
University of Kentucky, Agronomy Dept., Lexington, KY 40546
Contact: Dr. J. Everett Leggett (606) 257-3146
EXPERTISE: Areas of research include nutrient absorption; leaf chemistry; senescence; breeding; and disease control.

0093 Tropical Agriculture Research Station-TARS
Agricultural Research Service, Department of Agriculture
P.O. Box 70, Mayaguez, PR 00709
Contact: Dr. Antonio Sotomayor-Rios (809) 832-2435
EXPERTISE: Research includes identification of pathways, regulatory sites, and mechanisms associated with the partitioning of photosynthetically fixed CO2 between starch and sucrose in C3 and C4 plants; identification of endogenous control systems involved in the regulation of photosynthesis and translocation, and the modulation of regulatory systems by synthetic plant growth regulators; characterization of synthesis, composition, organization, and regulatory mechanisms of chlorophyll-proteins; biochemical mechanisms involved in the action of herbicides at the cellular and molecular levels; efficacy of tobacco growth regulators including agents that can be used to control the development of auxiliary buds; and identification of environmental factors that affect the physiology, growth, and competitiveness of native and exotic weeds, and crop plants.

0094 Tropical Fruit and Vegetable Research Laboratory
Agricultural Research Service, Department of Agriculture
2727 Woodlawn Drive, P. O. Box 2280, Honolulu, HI 96804
Contact: Mr. G. E. Gilmore (808) 988-2158
EXPERTISE: The laboratory has an overall mission to produce biologically and environmentally sound methods of detection, prevention, exclusion, and control/eradication of quarantine pests of tropical and subtropical fruits and vegetables in the United States. Technology that is economically and biologically appropriate to tropical agriculture is researched in multilateral areas of mass rearing for sterile insect technology, bait and lure identification, and augmentary control such as parasites, pheromone and bait/spray formulations. Studies are conducted on demography, distribution, and abundance of fruit flies, their natural enemies, host plants and associates sharing the same habitats for use to improve the efficiency, economy, and environmental acceptability of methods and strategies for detection and control. Improved methods are developed to disinfest tropical fruits, develop improved decay control methods for tropical fruits, develop methods to control fruit ripening in market channels and to improve physical handling of tropical fruits and vegetables.

0095 U.S. Horticultural Research Laboratory
Agricultural Research Service, Department of Agriculture
2120 Camden Road, Orlando, FL 32803
Contact: Director (305) 898-6791
EXPERTISE: Studies are carried out on biological, chemical, and cultural control of citrus fruit production, maturation, abscission, and senescence; control of citrus insects; nematode pathology, identification, etiology, and control of diseases of citrus trees; breeding to improve citrus scions and cultivars; mineral nutrition, cold hardiness, and freeze protection of citrus trees; blight, viruses, and stress physiology of citrus trees; transportation, packaging, and storing of fruits and vegetables; postharvest physiology of citrus and

0072 Northern Grain Insects Research Laboratory
Agricultural Research Service, Department of Agriculture
R.R. 3, Brookings, SD 57006
Contact: Dr. Gerald R. Sutter (605) 693-5201
EXPERTISE: The laboratory conducts basic and applied research leading to improved or new control methods for insects and insect-related diseases affecting grain crops in the North Central States; elucidation of physiological processes that affect oil quality and yield of oilseeds; and development of improved barley varieties for the North Central States.

0073 Nursery Crops Research Laboratory
Agricultural Research Service, Department of Agriculture
359 Main Road, Delaware, OH 43015
Contact: Dr. Lawrence R. Schreiber (614) 363-1129
EXPERTISE: Research is conducted on the following topics: Developing fundamental information on the physiological ultrastructural changes which occur in woody plants subjected to environmental stress; Breeding and selecting genetically superior trees for urban plantings; developing and releasing Ulmus and Acer clones that are tolerant to diseases, deicing salts and other physiological stresses; identifying nursery crops cultivars; finding accurate methods for specific diagnosis of air pollution-induced injury to nursery crops; identifying specific etiological agents of nursery crop diseases and analyze host-parasite relationships; developing data for use in registration of fungicides for ornamental crops as part of Special Research Program on Minor-Use Pesticides; studying the feasibility of a mechanical harvesting and handling system which can produce high quality nursery crops at a lower cost to the nurseryman and to the consumer; and conducting research to develop control measures for Dutch elm disease and/or Verticillium wilt through the use of antagonistic microorganisms.

0074 Oilseed Crops Laboratory
Northern Regional Research Center, Agricultural Research Service, Department of Agriculture
1815 N. University Street, Peoria, IL 61604
Contact: Dr. A.M. Cowan (309) 685-4011
EXPERTISE: Research is performed on physical, chemical, nutritional, and flavor properties of soybean proteins and oil and their relationship to functional properties, quality, and safety to reduce post-harvest losses, to enhance export markets for soybeans and derived products, and to modify vegetable soils for use as petrochemical-sparing renewable resources.

0075 Plant Disease Research Laboratory
Agricultural Research Service, Department of Agriculture
P.O. Box 1209, Frederick, MD 21701
Contact: Dr. W.M. Dowler (301) 663-7344
EXPERTISE: Basic and applied research is conducted in areas of disease management and biological control of weeds. Research focuses primarily on plant pathogens and plant diseases not yet present in the United States but potentially dangerous to our major agricultural crops, particularly corn, soybeans, and wheat. The laboratory is the primary United States quarantine facilty for the receipt of foreign plant pathogens imported for research purposes and for the receipt of foreign or endemic plant pathogens intended for use as biological control agents for noxious weeds. Through selective screening of the world's plant pathological literature and personal communication with scientists throughout the world, the staff maintains cognizance of the current status of pathogens and diseases of major food crops. Exotic pathogens with high potential for causing damage to major United States crops are intensively studied in laboratory, greenhouse, and field.

0076 Plant Genetics and Gerplasm Institute
Beltsville Agricultural Research Center, Agricultural Research Service, Department of Agriculture
Beltsville, MD 20705
Contact: Dr. A.K. Stoner (301) 344-3235
EXPERTISE: The Institute is responsible for collection, conservation, and improvement of plants and seeds by genetic and cultural methods. Scientists travel worldwide to collect plants and seed which are conserved and distributed as germplasm throughout the world. The germplasm is used in research to understand and improve the quality and productivity of many crops. The staff obtains plant material for chemical and biological screening to identity useful new products. A data bank on distribution, ecological attributes, and nutritional values of economic plants and weeds is maintained. Basic research in genetics, breeding, pathology, entomology, remote sensing, and agronomy allows scientists to develop better cultural practices and better varieties of crop plants. Personnel introduce, evaluate, distribute, and exchange germplasm needed in research and guide scientists in locating sources of germplasm and crop collections. The staff maintains over 80,000 accession of wheat, oats, barley, and rye, and 15,000 rice accessions plus limited quantities of other crops. Scientists study plants of economic or potential economic value in the field, the herbarium, and the library, with emphasis on grasses and legumes. Improved technology for producing, storing, and marketing high quality seeds is developed from an understanding of physiological and biochemical factors that comprise seed quality.Variables of tobacco plants from their genetic makeup through conditions during growth and after harvest are studied to improve tobacco safety and usability.

0077 Plant Physiology and Chemistry Research Unit
Western Regional Research Center, Agricultural Research Service, Department of Agriculture
800 Buchanan Street, Berkeley, CA 94710
Contact: Dr. Glen Fuller (415) 486-3379
EXPERTISE: Research is conducted to develop basic information concerning regulation of biochemical processes in plants; gain basic knowledge necessary to understand and improve the processes of photosynthesis and nitrogen fixation; increase the quality of processed and stored horticultural crops by delaying postharvest senescence, by lowering the incidence of microbial spoilage, by improving processing methods and by seeking improved varieties.

0078 Plant Physiology and Photosynthesis Research Unit
Agricultural Research Service, Department of Agriculture
North Carolina State Univ., P.O. Box 5155, Raleigh, NC 27650
Contact: Dr. Donald E. Moreland (919) 737-2661
EXPERTISE: Research includes mechanisms of herbicide action; efficacy of tobacco growth regulators; and growth and competitiveness of native and exotic weeds.

0079 Plant Physiology Institute
Beltsville Agricultural Research Center, Agricultural Research Service, Department of Agriculture
Beltsville, MD 20705
Contact: Dr. M. N. Christiansen (301) 344-3036

0056 Cotton Production Research Unit
Agricultural Research Service, Department of Agriculture
P. O. Box 2131, Florence, SC 29503
Contact: Dr. Raymond F. Moore (803) 669-6664
EXPERTISE: Research is carried out on biological and chemical insect control, breeding for yield, quality, and insect resistance; insect nutrition and rearing; and electrophoresis of isozymes.

0057 Crop Science Research Laboratory
Agricultural Research Service, Department of Agriculture
Robey Wentworth Harned Lab., P.O. Box 5367, Mississippi State, MS 39762
Contact: Dr. Johnie N. Jenkins (601) 323-2230
EXPERTISE: The mission of the laboratory is to conduct genetic, entomological, pathological, and plant resistance studies on cotton, corn, and Trifolium species for major insect and disease pests and to develop models simulating growth and yield of agronomic crops using systems methodology and controlled environment experiments. In addition, it develops forage production systems and cow-calf, stocker grazing systems. To accomplish this mission the laboratory has four research units: Cotton Host Plant Resistance Research, Forage Research, Corn Host Plant Resistance Research, and Crop Simulation Research.

0058 Crops Research Laboratory
Agricultural Research Service, Department of Agriculture
Colorado State University, Ft. Collins, CO 80523
Contact: Dr. Richard J. Hecker (303) 482-7717
EXPERTISE: Research is conducted in the following areas: Nutrient cycling in cultivated and grassland communities; Crop nutritional needs under level basin, multi-set, and other irrigation management systems; Nitrogen dynamics in distrubed-land ecosystems; Nutritional and environmental significance of the Foliar Exchange of NH3 and NOx; Improved surface irrigation systems in the Upper Colorado River Basin; Breeding, physiology, and management of perennial legumes for semiarid regions; Effects of stress on growth of range forage plants on the Central Great Plains; Modeling range ecosystems for improved management in the Central Great Plains; Develop management systems for efficient livestock production from forages; Coordination of small watershed model development; Modify wheat models for forecasting; and conduct research in genetics, pathology, and physiology of sugarbeet designed to directly or ultimately increase sugar production per unit area of land.

0059 Environmental Physiology Research Unit
Agricultural Research Service, Department of Agriculture
University of Florida, Agronomy Physiology Lab., Gainsville, FL 32611
Contact: Dr. Thomas R. Sinclair (904) 392-6180
EXPERTISE: This unit studies plant and environment interactions limiting crop productivity.

0060 Field and Horticultural Crops Research Unit
Richard B. Russell Agricultural Research Center,
Agricultural Research Service, Department of Agriculture
P. O. Box 5677, Athens, GA 30613
Contact: Dr. Donald B. Burdick (404) 546-3318
EXPERTISE: Basic research is conducted on composition, quality, and utilization of forages, fruits, vegetables, and sunflower seed oil as well as the elimination of salmonella in feeds.

0061 Fruit and Vegetable Chemistry Laboratory
Agricultural Research Service, Department of Agriculture
263 South Chester Ave., Pasadena, CA 91106
Contact: Dr. V. P. Maier (213) 796-0239
EXPERTISE: Chemical and biochemical research on plants is conducted that involves studies of the biosynthesis, metabolism and regulation of plant constituents and their biological activities as related to crop and product quality and yield.

0062 Fruit Breeding and Genetics Research Unit
Agricultural Research Service, Department of Agriculture
P.O. Box 8143., Fresno, CA 93747
Contact: Director (209) 487-5334
EXPERTISE: Studies at this facility concentrate on developing new insect and disease-resistant varieties of stone fruits and grapes with improved yield, vigor, shipping quality, and a range of harvest times from early to late season.

0063 Fruit Research Laboratory
Agricultural Research Service, Department of Agriculture
1104 N. Western Ave., Wenatchee, WA 98801
Contact: Director (509) 662-4317
EXPERTISE: The mission of the laboratory is to help reduce production costs, improve handling methods, and deliver the best quality fruit to the consumer by studying the producing, harvesting, handling, storing, and transporting of deciduous fruits grown in the Pacific Northwest. Considerable effort is devoted to studies on the effect of growth regulators on trees and on fruit. Chemical tests are being made to offset biennial bearing and to advance or retard fruit maturation, permitting longer periods during which quality fruit can be harvested, thereby lengthening storage. Fruit loosening agents are being tested to aid in harvesting and handling sweet cherries. Studies are also under way to identify naturally occurring regulators and to determine their role in fruit set of apples and pears. Mechanical harvesting of apples and pears continues to occupy the engineers who are designing fruit harvesting and handling equipment. Work on virus and viruslike diseases is continuing. Studies are being conducted to determine the effects of mineral nutrition and environmental factors on maturity of apples. Refinements are being made on methods for determining optimum maturity for fruit harvest. Work continues on electronic sorting of fruit for internal and external color and for internal blemishes, with attention being given to the development of electronic sorting equipment for large-scale operations in packinghouses. Engineering research is being directed toward developing greater efficiency in the packinghouse and modifying equipment to minimize bruising during packing.

0064 Horticultural and Special Crops Laboratory
Northern Regional Research Center, Agricultural Research Service, Department of Agriculture
1815 N. University Street, Peoria, IL 61604
Contact: Dr. A. M. Cowan (309) 685-4011
EXPERTISE: World plant resources are examined for new knowledge of chemical-botanical relationships, models for improved agricultural chemicals, and evidence of germplasm that can provide novel seed oils, new drugs, pesticides, critical raw materials, or other desirable natural constituents. Understanding of unusual plant metabolism and routes to improved vegetable crops and new crop plants are explored via conventional biochemical research in cooperation with geneticists as well as through plant cell and

EXPERTISE: Research is conducted on production management systems; disease research; nutrition; environmental stress; facility design; and energy relationships.

Southern Agricultural Energy Center, Agricultural Research Service, Department of Agriculture
See 0326

0040 Southern Piedmont Conservation Research Center
Agricultural Research Service, Department of Agriculture
P. O. Box 555, Highway 53, Watkinsville, GA 30677
Contact: Dr. James E. Box (404) 769-5631
EXPERTISE: Research is conducted in the following areas: Integrated row crop management systems; Integrated forage-livestock management systems; and Wheat production in conservation tillage double cropping systems.

0041 Southern Plains Cotton Research Laboratory
Agricultural Research Service, Department of Agriculture
Route 3, Lubbock, TX 79401
Contact: Dr. Jerry E. Quisenberry (806) 762-7413
EXPERTISE: Three research areas include cotton ginning research, cotton production engineering, and plant stress and water conservation.

0042 Southern Regional Research Center
Agricultural Research Service, Department of Agriculture
1100 Robert E. Lee Blvd., P. O. Box 19687, New Orleans, LA 70179
Contact: Dr. I. W. Kirk (504) 589-7511
EXPERTISE: The center carries out research programs primarily related to processing, marketing, safety and use of agricultural commodities produced in the Southern United States. Specific research is conducted on: the molecular architecture of cotton fibers, to determine their microstructure and the electronic nature of their surfaces; the properties that make some cotton fibers more valuable than others in the manufacture of textiles; methods for processing cotton textiles and developing new and innovative methods for converting cotton and cotton-blend fiber into quality yarns; fabric formation and certain phases of chemical finishing; causes of the pulmonary disease, byssinosis; biochemical interactions of fungi and plants, particularly cotton and corn; increasing crop yields by improved control of weeds; increasing the productivity and energy efficiency of oilseed extraction (including cottonseed and peanuts); factors that can affect nutritional, flavor, and shelf-life stability of oilseed crops and rice; constituents that contribute to or function as the determinants of end-use value of commodities and products, and new concepts for producing cane sugar; and developing a basic understanding of oilseed proteins, including cottonseed protein.

0043 Southwest Rangeland Watershed Research Center
Agricultural Research Service, Department of Agriculture
2000 E. Allen Rd., Tucson, AZ 85719
Contact: Dr. Kenneth G. Renard (602) 629-6381
EXPERTISE:The mission of the Center is to study the hydrology of rangeland watersheds and the effects of changing land uses and practices on the hydrologic cycle. This includes the rainfall, which is natural input to the watersheds; the quality and movement of water on the surface and below the surface; erosion from the watersheds and channels within the watersheds; sedimentation within the channels and reservoirs; and the present and potential uses of available water. Primary emphasis is on: understanding and evaluating the effects of changing land use, including range renovations and conservation practices, and developing the principles for such understanding in order to apply the results and findings from research to areas having little or no research data. Ongoing research activities are centered on: improving hydrologic forecast and simulation techniques, implementing infiltration control to either induce additional infiltration or inhibit infiltration for maximum forage production, evaluating the nutritional and moisture requirements of desirable range plant species, developing grass seeding criteria (based on land management practices and knowledge of precipitation probabilities) to improve the chances for success in reseeding depleted rangelands, evaluating the effects of vegetation manipulation on the hydrologic balance and erosion/sedimentation of watersheds, and developing ways to monitor and control the movements of agricultural chemicals.

0044 Southwestern Cotton Ginning Research Laboratory
Agricultural Research Service, Department of Agriculture
P. O. Box 578,300 E. College, Mesilla Park, NM 88047
Contact: Mr. Sidney E. Hughs (505) 526-6381
EXPERTISE: This small laboratory develops improved methods for ginning and cleaning agricultural fibers and for preparing them for conversion into yarns, webs, and fabrics. Three current research activities include: cotton quality measurement and gin plant control and automation; conditioning, cleaning, and ginning cottons in the Western area; cotton gin design to minimize dust, noise and energy use.

0045 Subtropical Agricultural Research laboratory
Agricultural Research Service, Department of Agriculture
P.O. Box 267, Weslaceo, TX 78596
Contact: Dr. Charles M. Heald (512) 565-2423
EXPERTISE: Research is conducted on fresh market quality of fruits and vegetables; potentially toxic substances of subtropical fruits and vegetables; sugar from sweet sorghum and sugarcane; screwworm attractants and diets; management systems with minimal production and energy requirements; irrigation and drainage; salinity; guayule; biology and control of plant nematodes; technologies for maintaining product quality of fruits and vegetables; weed control technologies; population dynamics and biology of insects; and integrated pest management system for vegetables. Remote sensing research covers crop modeling, spectral refectance and emission of crops, rangeland and soils multispectral analysis in relation to early warning and crop condition assessment, remote sensing instrumentation, and image analysis using computer for detection of stress.

0046 Sugarbeet Production Research
Agricultural Research Service, Department of Agriculture
U. S. Agricultural Research Station, P. O. Box 5098, Salinas, CA 93915
Contact: Dr. James E. Duffus (408) 443-2253
EXPERTISE: The unit conducts research to improve the productivity of the sugarbeet. Emphasis is on developing sugarbeet breeding lines with higher yields and quality, better adaptation to local conditions, and greater resistance to disease. Major attention also is given to basic research to provide information to aid in the eventual reduction of losses from diseases and nematodes. Work continues to combine high yielding potential with improved resistance to curly top, virus yellows, beet mosaic, Erwinia root rot, Fusarium stalk rot, and bolting. The researchers also are investigating new breeding techniques to increase the effi-

ponents, especially plant biopolymers, through study of their molecular architecture and physical, chemical and biological behavior. Scientists conduct both fundamental and applied research of an interdisciplinary nature involving applied microbiology, fermentation, enzyme technology, and chemical engineering practice for the fermentative production of alcohol fuels and chemical feedstocks. Engineers investigate research problems that are either not amenable to laboratory-scale evaluations or those that require, primarily, the use of engineering concepts in their solution. This would include, for example, the extraction of hydrocarbons from whole plant materials such as the separation and recovery of rubber from guayule and milk weed. New, acceptable, and effective handling procedures and uses for corn, wheat, sorghum, and other crops are developed. Scientists identify and evaluate plant species capable of providing chemicals, feed, food, and fiber with emphasis on whole-plant oils and hydrocarbons for industrial chemicals. Major plant components are isolated and identified, and their chemical and physical properties are determined. Improved and new detection and quantitation technologies are developed to facilitate the monitoring of concentration changes elaborated during plant research on previously uncultivated species.

0025 Chemurgy Research Unit
Western Regional Research Center, Agricultural Research Service, Department of Agriculture
800 Buchanan Street, Berkely, CA 94710
Contact: Dr. Attila E. Pavlath (415) 486-3251
EXPERTISE: Program missions within the group consist of conversion of agricultural products and waste to useful chemicals. Research is carried out to determine the basic reactions involved in the gasification and liquefaction of biomass components and to determine the optimal conditions to obtain gasesous ad liquid useful chemicals. Both chemical and biochemical processes are studied. The study also includes the development of new principles, systems and methods which will allow the identification and separation of the products. Special emphasis is placed on the separation of water from agricultural products without distillation. Adsorption and osmotic techniques are studied.

0026 Conservation and Production Research Laboratory
Agricultural Research Service, Department of Agriculture
P. O. Drawer 10, Bushland, TX 79012
Contact: Dr. B. A. Stewart (806) 378-5721
EXPERTISE: Research is conducted on soil and water conservation; weed control; entomological studies; fertilizer research; crop improvement; crop production economics; livestock disease and nutrition; wind-powered irrigation; and sunflower germplasm.

0027 Cotton Quality Research Station
Agricultural Research Service, Department of Agriculture
P.O. Box 792, Clemson, SC 29633
Contact: Mr. C. Kenneth Bragg (803) 656-2488
EXPERTISE: Physical and chemical research is conducted which is necessary to develop methods, techniques, instruments, and apparatus for rapid representative sampling and accurate objective measures of quality factors in cotton and cotton products. The results are applicable for use in standardization and grading to determine the true utility value of cotton in marketing channels and for safety and health purposes.

0028 Engineering Science Laboratory
Eastern Regional Research Center, Agricultural Research Service, Department of Agriculture
600 E. Mermaid Lane, Philadelphia, PA 19118
Contact: Mr. Robert L. Miller (215) 233-6623
EXPERTISE: Emphasis is on development of concepts, principals, and methodology using the disciplines of chemical, mechanical, and food engineering to provide basic innovations and new approaches for the conversion of raw agricultural products to forms required by users. Theoretical concepts are tested in prototype machinery and processing systems, using major commodities most suited for application of innovations under study. Improvements in efficiency, cost, or energy use are considered as they afftect the safety, pollution impact, or nutrient content of the process output. This laboratory initiates new research and participates in programs with other units through consultation and collaborative studies. Research is directed to the needs of farms and businesses as required. Sections of the Laboratory include: engineering systems analysis, chemical and food engineering applications, and materials handling and equipment design research.

0029 Field Crops Mechanization Research Unit
Agricultural Research Service, Department of Agriculture
P.O. Box 36, Stoneville, MS 38776
Contact: Dr. J. Ray Williford (601) 686-9311 x284
EXPERTISE: This unit studies cotton and soybean production systems; energy conservation; harvesting research; tillage; and controlled traffic.

0030 Grassland Soil and Water Research Laboratory
Agricultural Research Service, Department of Agriculture
P.O. Box 748, Temple, TX 76503
Contact: Dr. Earl Burnett (817) 774-1201
EXPERTISE: The mission of the laboratory is to develop technology for maximizing forage and crop production; revegetating depleted, brush-infested watersheds; controlling noneconomic brush and weeds; breeding forages with increased quality and yield potential; and solving problems relating to soil and water management, crop production, soil fertility, erosion, hydrology, and water quality. Research is carried out on the physiology, morphology, ecology, and phenology of important range and pasture weed and brush species. New germplasm of pasture and range grasses is developed with improved forage quality and production, winterhardiness, drought resistance, seedling establishment, seed fertility and retention, disease resistance, and adaptation to problem soils. Techniques are developed for predicting, evaluating, and managing the quantity of runoff from agricultural lands. Fertilizer practices are optimized for nutrient uptake efficiency and crop production in conservation tillage systems. A computerized system of crop evaluation is being established that integrates climate, soil, management, and plant genetic characteristics.

National Soil Erosion Research Laboratory, Agricultural Research Service, Department of Agriculture
See 0249

0031 National Tillage Machinery Laboratory
Agricultural Research Service, Department of Agriculture
P.O. Box 792, Auburn, AL 36830
Contact: Robert L. Schafer (205) 887-8596
EXPERTISE: Research is conducted on tillage; physical properties of soils; root growth; earthmoving; traction and

gage balances are used for measuring force and moment. Propulsion cycle (open circuit) is used for testing burning propulsion systems generating combustion products. Aerodynamic (closed circuit) is used for other tests.

0016 Transonic Wind Tunnel

David Taylor Naval Ship Research & Development Center, Department of the Navy
Bethesda, MD 20084
Contact: Dr. Basil V. Nakonechny (202) 227-1037
FACILITY: The 7 by 10 foot wind tunnel is a closed circuit, single return type, with a test section of 7 feet high, 10 feet wide, 19 feet long, and a contraction ratio of 14,481. It is constructed of reinforced concrete in low velocity portions of the circuit, and of machined steel in the remainder. The facility is capable of operating continuously over a Mach number range from 0.4 to 1.15. The facility is the Navy's only transonic wind tunnel; and is the largest transonic facility capable of conducting aircraft/weapons separation experiments. The low speed leg of the tunnel is currently being modified to provide an additonal V/STOL aircraft capability.

0017 Transonic Wind Tunnels

Ames Research Center, National Aeronautics and Space Administration
Moffett Field, CA 94035
Contact: Mr. Lado Muhlstiein (415) 965-5852
FACILITIES: The three tunnels are used for the following activities: (1) A 14 foot tunnel is used primarily for performance and stability and control testing of aircraft configurations. In addition, the tunnel is used periodically for aero-optics research. For conventional steady-state testing, models are supported on a cantilevered sting via a strut with variable pitch capability. A turntable is also available for semi-span models. (2) A 2 X 2-foot tunnel is used for NASA sponsored aerodynamic research. Conventional, steady-state models can be installed on a sting using an internal strain-gage balance to measure forces and moments. Two-dimensional airfoils and three-dimensional wings can be installed via wall mounts. (3) The third tunnel is used for force, moment and pressure tests of aircraft configurations or specific aircraft components, limited aero-acoustic and nonsteady aerodynamic tests are conducted. Internal strain-gage balances are used for measuring forces and moments.

0018 Transonic Wind Tunnels

Langely Research Center, National Aeronautics and Space Administration
Hampton, VA 23665
Contact: Mr. Charlie Schilling (804) 865-4501
FACILITIES: Two of eight tunnels are two-dimensional transonic tunnels with solid sidewalls and slotted upper and lower walls. Another tunnel offers a sting-type model support system with an angle range of about plus or minus 120 degrees and tunnel wall mounts. There is a schlieren system for low visualization. The test section is slotted for about 5% porosity in the transonic configuration for which the most extensive calibration exists. The stagnation pressure can be varied from below 0.25 atmospheres at any Mach number to 2.0 atmospheres at the 0.2 Mach number. One tunnel is dedicated to aeroelasticity research. It can test cable mounted, sidewall mounted, sting mounted or floor mounted models. Utilizing any of the four basic model support systems, it is capable of testing dynamic models of sufficient size to allow simulation of important structural properties of airplanes, rotorcraft and spacecraft. The tunnel has gust simulation capability. Force, moment, pressure, and propulsion-airframe integration studies can be carried out on another tunnel. Model mounting consists of sting, sting-strut, and fixed strut arrangements. Propulsion simulation studies can be made utilizing dry, cold, high pressure air. The high pressure (15 lb/sec at 1000 psi) air system and model mounting ground test stand. The test section length is 22 feet for speeds up to Mach 1.0 and 8 feet for speeds above Mach number 1.0. The tunnel is equipped with an air exchanger with adjustable intake and exit vanes to provide some temperature control. At another tunnel, an aft-mounted sting provides support to three-dimensional models while the model pitch can range from -11 degrees to 19 degrees exist and roll from -180 degrees to 180 degrees. Sideslip angles are achieved by combinations of pitch and roll angles. Available are: model assembly and check out rooms, model carts, model deformation, and angle of attack systems. A facility provides a unique operating envelope with varying temperature, pressure and Mach number capability, thus, enabling independent studies of: Mach number, aeroelastic, and Reynolds number effects. The tunnel can operate at extremely high Reynolds numbers (about 120 million per foot) and, with 2-D airfoils installed simulates flight equivalent conditions. A final facility provides the unique three parameter operating envelope which is characteristic of variable pressure and variable temperature. In addition, the tunnel ceiling and floor can be shaped to minimize the erroneous wall effects. A boundary layer central apparatus will be incorporated to enable sidewall boundary layer removal.

0019 Von Karman Gas Dynamics Facility

Aronold Engineering Development Center, Department of the Air Force
Directorate of Aerospace Flight Dynamics Test, Arnold AFB, TN 37389
Contact: (615) 455-2611 x5280
FACILITY: This facility is used for the aerodynamic testing of variously shaped aircraft, missiles, satellites and aerospace vehicles and their components. Highly realistic flight conditions, ranging from Mach 1.5 to 20 and above, are simulated in VKF's wind tunnels and ballistic ranges. Test units include conventional continuous flow tunnels, intermittent blowdown tunnels, intermittent acr-heated hypervelocity tunnels, and free flight ranges for both impaction and aerodynamic tests. Aerospace chambers provide for full-scale spacecraft and subsystems tests, plume tests, and sensor calibrations at chamber pressures to 10 to the -8 Torr.

0020 Wind Tunnel Facilities

Chemical Research & Development Center, Department of the Army
U.S. Army Armament Munitions, Chemical Command, Aberdeen Proving Ground, MD 21010
Contact: Mr. William A. Barr (301) 671-2031
FACILITIES: Five wind tunnels are available. (1) Subsonic Wind Tunnel No. 1: This is an open circuit, continuous flow, subsonic wind tunnel with a test section which is 3 feet long and 14 inches x 20 inches in cross section. Models can be mounted for making force and moment measurements in both test sections. A modified pyramidal, six-component, strain-gauge balance system is permanently mounted beneath the high speed test section. (2) Subsonic Wind Tunnel No. 2: This open circuit, continuous flow, sub-

Contact: Mr. Lado Muhlstiein (415) 965-5852
FACILITY: This closed circuit, blowdown, wind tunnel utilizes interchangeable contoured axisymmetric nozzles. Heat is supplied to the test gas by a storage heater containing aluminum oxide pebbles, preheated by burning natural gas, aerodynamic force and moment and heating data are obtained on models inserted remotely into the test stream. Remotely actuated angle of attack can be varied between plus or minus 20 degrees. Shadowgraph and high-speed cameras are available for flow visualization.

0007 Hypersonic Wind Tunnels
Langely Research Center, National Aeronautics and Space Administration
Hampton, VA 23665
Contact: Mr. Charlie Schilling (804) 865-4501
FACILITIES: Eleven tunnels are available. In two tunnels models can be sting mounted to strut systems with an angle-of-attack range of plus or minus 18; bent stings extend the range. Sideslip angles are set at constant values (prebent stings) for sweeps through the angle-of-attack range. Another two tunnels can measure heat transfer, pressures, forces and moments, skin friction, equilibrium temperatures, temperatures, boundary layer and flow profiles and one has a separate system to provide gases for model engine exhaust simulation. A model injection system beneath the facility allows models up to 5-feet long to be rapidly injected into the moving airstream with angle-of-attack and yaw angle variation. In the High Reynolds Number Tunnel the test medium is air heated by electric resistance heaters. Also, the tunnel incorporates an axisymmetric-contoured nozzle with a low-flow turning angle to minimize pressure gradient effects on the nozzle wall boundary layer. There are two interchangeable test sections. One test section has schlieren windows and a model injection system capable of injection 4-foot long modes for configuration and heat transfer studies are Reynolds numbers up to 200 million. The other test section is for tunnel-wall boundary-layer studies using heat-transfer skin friction and pitot and total temperature survey measurements over a length of 12 feet and Reynolds numbers up to 1200 million. The test section diameter is approximately 12 inches. A sidewall mounted model injection system permits access to the model while the tunnel is running and allows rapid injection into the flow for heat transfer tests in another tunnel. Pressure and force tests are also performed. Free stream Mach number 10 is achieved in a 31-inch square test section. In a blowdown-type facility, the required energy level is achieved for flight simulation by burning methane in air under pressure and using the resulting combustion products as the test medium. The nozzle is a conical-contoured, axisymmetrical design with an exit diameter of 8 feet. Model mounting is semispan or sting with insertion after the tunnel is started. CF4 (tetrafluoromethane test gas) yields a normal shock density ration of about 12, permitting simulation of real gas effects at entry speeds for Earth and the terrestial planets in another tunnel. A model injection system permits heat transfer studies. One tunnel allows Models to be sting or strut mounted. A sequence of 3 spark schierens can be taken with adjustable time delay between photographs. Electron beamflow visualization is also available. At an electric-arc-heated facility, a true-temperature, true-velocity flow environment is provided for testing hydrogen-burning scramjet engine models. Facility systems include 2-10 MW d.c. electric power supplies, a 34.58 MN/m2 air supply system, a 9.75 MN/m2 deionized cooling water system, a gaseous hydrogen fuel system, a hydraulic model injection system, a 30.48 m diameter vacuum sphere, and a 3-stage steam ejector for evacuating the shpere. Finally, a tunnel allows the measurement of aerodynamic of aerodynamic forces and moments; performances; stability; and control of advanced aerospace vehicles; pressure distributions. The facility is composed of 4000-gal liquid nitrogen storage tank, a 6 gal. per min. cryopump/evaporator system, two 6 cu. ft. high pressure surge tanks, a MW power supply, a tungsten grid resistance heater, and a stagnation chamber-nozzle-test section assembly.

0008 Hypervelocity Tunnel
Naval Surface Weapons Center, Department of the Navy
Code D21, White Oak, Silver Spring, MD 20910
Contact: Mr. Ramsey D. Johnson (301) 394-1505
FACILITY: The tunnel provides aerodynamic simulation in the critical moderate altitude regime experienced by missile systems. A broad range of Mach and Reynolds numbers simulates reentry flight environments. It represents noteworthy advances over existing facilities, including the capability of testing models with fully developed turbulent boundary layers. A significant achievement is increased data productivity per tunnel run, hence, reduced cost per data point. An important feature to users is its large test cell, which accommodates full size models up to six feet long and eighteen inches in diameter.

0009 Propulsion Wind Tunnel Facility
Arnold Engineering Development Center, Department of the Air Force
Directorate of Aerospace Flight Dynamics Test, Aronold AFB, TN 37389
Contact: (615) 455-2611 x5280
FACILITY: Wind tunnels in the facility are used to test large-scale models and, in some cases, full-scale aircraft, missiles, satellites and space vehicles and the propulsion systems for them in the speed range from Mach 0.5 to 4.75. Altitude conditions ranging from sea level to well above 100,000 feet can be simulated. Two large tunnels have interchangeable test sections, allowing preparations for one test to be made while another is being run in the tunnel.

0010 Subsonic Wind Tunnels
Ames Research Center, National Aeronautics and Space Administration
Moffett Field, CA 94035
Contact: Mr. Lado Muhlstiein (415) 965-5852
FACILITIES: Three tunnels are available: (1) Full-scale low-speed V/STOL powered lift investigators and full-scale rotorcraft systems are tested in an 80 x 120 ft. tunnel. High lift devices for take-off and landing of conventional aircraft are also examined at low forward speed. (2) An 40 X 80-Foot tunnel is used for full-scale rotorcraft research. Measurements taken include force and moment, pressure, dynamic stability and acoustic signatures. The tunnel is also used extensively for V/STOL powered lift investigations. (3) A 12 ft. pressure tunnel is used primarily for high Reynolds number testing, including the development of high lift sytems for commercial transports, high angle of attack testing of maneuvering aircraft, and high Reynolds number research. A variety of different types of tests can be conducted using the various model-support systems available.

EXAMPLES OF MAIN ENTRY SUMMARIES

Directory reference number referred to by the indexes and cross reference entries. →

0123 Rocky Mountain Forest & Range Experiment Station
U.S. Department of Agriculture
240 W. Prospect Street, Fort Collins, CO 80526
Contact: Dr. J.S. Krammes (303) 221-4390
EXPERTISE: Research is conducted in a number of areas. Water research at the station is focusing on operation techniques for managing vegetation to protect water quality and improve water yields, re-vegetating surface-mined land to control erosion, managing blowing snow to improve water yield and soil moisture, developing a better understanding of the properties of wind-blown snow and ways of managing it, assessing the potential of snow avalanche damage, and developing a system for identifying and measuring the full range of values associated with water. Range research is emphasizing ways to rehabilitate abused rangeland, and integrate grazing with wildlife, recreation and other resource values. Station scientists are working to determine the interactions among wildlife and other resource uses, finding ways to protect and restore habitats while maintaining other resource values, and developing improved methods of measuring the economic and social values of wildlife. Research also is seeking ways to improve the survival and growth of seedling trees, improve forest growth and wood yield potential, and integrate timber mangement with other forest resource values. Efforts are underway to develop planning tools for determining the effect of fires on wildland resources, improved procedures for using fire under prescribed conditions as a forest management tool, integrate pest management systems to prevent and/or reduce damage from insect and disease pests, and trees resistant to pests.

0126 Heat and Mass Transfer Research Laboratory
Solar Energy Research Institute, U.S. Department of Energy
1617 Cole Blvd., Golden, CO 80401
Contact: Dana Moran (303) 231-7115
FACILITIES: The laboratory is designed for the study of methods of transferring heat and mass under the small driving forces which often exist in solar conversion processes. Adjacent warm and cold water loops in a 4ft by 6ft test chamber have the capacity to supply and remove one million Btu per hour. The instrumented test chamber can be evacuated or filled with noncondensible gases for varied experimental purposes. At the present time the laboratory is being used to evaluate the performance of Claude-cycle concepts, but it has flexibility for the measurement of characteristics of a variety of evaporator and condenser designs.

How to Use the Directory

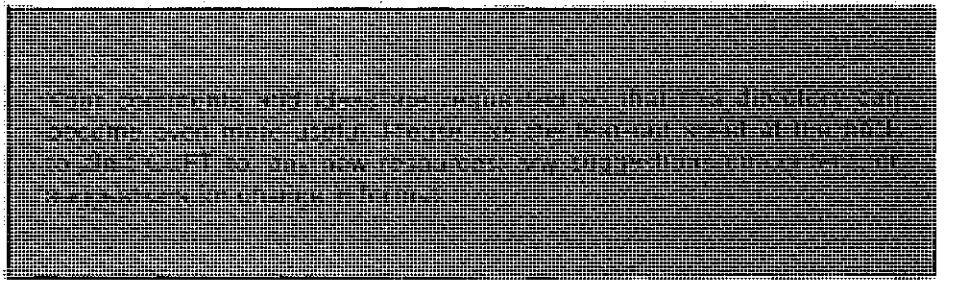
The directory consists of four sections: (1) a resource summary section listing more than 800 summaries arranged into 30 subject-oriented categories, (2) a subject term index, (3) a resource index, and (4) a geographic index. The indexes and subject categories offer many different access points to locate appropriate resources. In the summary section, each resource is described in full detail for each primary entry. Cross references are provided in other categories when appropriate. Within each category, summaries are listed alphabetically by resource name, and each resource is labeled with one of the following four terms:

- EXPERTISE
- FACILITY
- INFORMATION SERVICES
- SERVICES

Sometimes listings may be incorrect or services may be no longer available because of changes in workloads, missions and personnel at the source. Every effort was undertaken to assure correctness of address and telephone numbers.

Future Editions

This is the first edition of this directory. Currently plans include updating every two years and possibly providing access to the information through an online computer system. As experience is gained about use of the directory, changes may be required. Current purchasers will be informed of subsequent editions.



Federal Technology Transfer and the Center for the Utilization of Federal Technology

A new organization has now been established within the National Technical Information Service (NTIS) to alert industry to selected Federal technology having immediate practical value. It is the *Center for the Utilization of Federal Technology (CUFT),* and it was established in response to the recently enacted Stevenson-Wydler Technology Innovation Act. CUFT is working with Federal agencies and their laboratories to select and highlight new technologies which have potential commerical or industrial application.

Starting with many thousands of companies who are customers of NTIS, the Center is drawing upon NTIS' resources to alert industry to this *selected* technology. It is expanding the announcement of Government inventions available for licensing, increasing the technology fact sheets in its Tech Notes service, and preparing new special current awareness catalogs, directories, and services.

About The Stevenson-Wydler Technology Innovation Act

The Stevenson-Wydler Technology Innovation Act was enacted to encourage the transfer of Federal technology to the U.S. economy. It requires each Federal agency conducting R&D and their major laboratories to identify technology having potential commercial or practical application and to take steps to encourage the transfer of this technology. As part of this effort, agencies and their laboratories have established Offices of Research and Technology Assessment (ORTA) to locate and identify potential practicable technologies. Along with the establishment of these offices, the law also created the *Center for the Utilization of Federal Technology (CUFT).* The Center, at NTIS, will be working with the Offices of Research and Technology Assessment to receive and disseminate information on their newly developed technologies.

CUFT was established within the National Technical Information Service (NTIS) of the Department of Commerce because, as a national technical information clearinghouse and a cornerstone of the technology publishing structure in the United States, NTIS is a key participant in the development of advanced information products and services for the achievement of U.S. productivity and innovation goals in the 1980's. NTIS is the central source for the public sale of U.S. Government-sponsored research, development, and engineering reports and computer software.

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