

(dollars in thousands)

FY 2006	FY 2007	FY 2008
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▪ **Experimental Program to Stimulate Competitive Research (EPSCoR)**

7,280 8,000 8,240

This activity supports basic research spanning the complete range of activities within the Department in states that have historically received relatively less federal research funding. The EPSCoR states are Alabama, Alaska, Arkansas, Delaware, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, New Hampshire, Nevada, New Mexico, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee (graduated from program in April 2006), Vermont, West Virginia, Wyoming, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands. The work supported by the EPSCoR program includes research in materials sciences, chemical sciences, biological and environmental sciences, high energy physics, and nuclear physics, fusion energy sciences, and the basic sciences underpinning fossil energy, energy efficiency, and renewable energy. In FY 2008, funding is increased for EPSCoR research activities (\$+240,000). The following table shows EPSCoR distribution of funds by state.

EPSCoR Distribution of Funds by State

Alabama	685	258	128
Alaska	—	—	—
Arkansas	135	139	—
Delaware	—	—	—
Hawaii	—	—	—
Idaho	375	375	375
Kansas	135	—	—
Kentucky	—	—	—
Louisiana	462	375	375
Maine	—	—	—
Mississippi	132	—	—
Montana	455	133	131
Nebraska	265	269	140
Nevada	740	105	468
New Hampshire ^a	—	—	—
New Mexico	135	—	—
North Dakota	923	—	350
Oklahoma	350	350	350
Rhode Island	—	—	—
Puerto Rico	375	—	—
South Carolina	660	525	525

^a Became eligible in FY 2006.

(dollars in thousands)

	FY 2006	FY 2007	FY 2008
South Dakota	125	—	—
Tennessee	140	140	140
Vermont	—	—	—
U.S. Virgin Islands	—	—	—
West Virginia	855	135	495
Wyoming	140	140	—
Technical Support	193	110	110
Other ^a	—	4,946	4,653

▪ **Electron-beam Microcharacterization** **7,790** **7,945** **8,183**

This activity, which was previously budgeted in Structure and Composition of Materials, supports three electron-beam microcharacterization user centers: the Electron Microscopy Center for Materials Research at Argonne National Laboratory, the National Center for Electron Microscopy at Lawrence Berkeley National Laboratory, and the Shared Research Equipment Program at Oak Ridge National Laboratory. These centers contain a variety of highly specialized instruments to provide information on the structure, chemical composition, and properties of materials from the atomic level up, using direct imaging, diffraction, spectroscopy, and other techniques based primarily on electron scattering.

Atomic arrangements, local bonding, defects, interfaces and boundaries, chemical segregation and gradients, phase separation, and surface phenomena are all aspects of the nanoscale and atomic structure of materials, which ultimately controls the mechanical, thermal, electrical, optical, magnetic, and many other properties and behaviors. Understanding and control of materials at this level is critical to developing materials for and understanding principles of photovoltaic energy conversion, hydrogen production, storage, and utilization, catalysis, corrosion, response of materials in high-temperature, radioactive, or other extreme environments, and many other situations that have direct bearing on energy, environmental, and security issues.

Electron probes are ideal for investigating such structure because of their strong interactions with atomic nuclei and bound electrons, allowing signal collection from small numbers of atoms—or, in certain cases, just one. Furthermore, the use of these charged particles allows electromagnetic control and lensing of electron beams, resulting in spatial resolution that can approach single atomic separations or better.

Capital equipment is provided for instruments such as scanning, transmission, and scanning transmission electron microscopes, atom probes and related field ion instruments, related surface characterization apparatus and scanning probe microscopes, and auxiliary tools such as spectrometers, detectors, and advanced sample preparation equipment.

In FY 2008, additional funds are provided for continued user operations, scientific research of the staff, and development of new instruments or techniques at the electron beam microcharacterization user centers (\$+238,000).

^a Uncommitted funds in FY 2007 and FY 2008 will be competed among all EPSCoR states.