

NEAT at UC Davis Receives Millions of Dollars in Energy Frontier Research Centers

We will participate in two of 46 new multi-million-dollar Energy Frontier Research Centers (EFRCs) announced by the White House in conjunction with a speech by President Barack Obama at the annual meeting of the National Academy of Sciences. The EFRCs, which will pursue advanced scientific research on energy, are being established by the U.S. Department of Energy Office of Science at universities, national laboratories, nonprofit organizations and private firms across the nation.

The 46 EFRCs, to be funded at \$2-5 million per year each for a planned initial five-year period, were selected from a pool of some 260 applications received in response to a Funding Opportunity Announcement (FOA) issued by the U.S. Department of Energy Office of Science in 2008. Selection was based on a rigorous merit review process utilizing outside panels composed of scientific experts.

Center for Nanoscale Control of Geologic CO₂
Donald DePaolo, Director
Lawrence Berkeley National Laboratory

Objective: To establish the scientific foundations for the geological storage of carbon dioxide.

The objective of this EFRC is to enhance the scientific foundation of how subsurface fluids and rocks interact as they are moved away, sometimes far away, from equilibrium by technological applications. The immediate application of interest is the problem of geological storage of carbon dioxide related to reducing greenhouse gases released to the atmosphere from stationary power sources, but long term benefits are expected for predicting the performance of any subsurface storage application for long periods of time. The EFRC includes planned collaborations with scientists at Lawrence Livermore National Laboratory, Oak Ridge National Laboratory, Massachusetts Institute of Technology, and the **University of California-Davis**. The EFRC will utilize the Advanced Light Source, Molecular Foundry, and National Energy Research Scientific Computing Center at Lawrence Berkeley National Laboratory and the Spallation Neutron Source Oak Ridge National Laboratory.

Total funding: \$20M over 5 years
UC Davis portion: \$1.21M over 5 years
UC Davis participant: Alexandra Navrotsky

Materials Science of Actinides
Peter C. Burns, Director
University of Notre Dame

Objective: To understand and control, at the nanoscale, materials that contain actinides (radioactive heavy elements such as uranium and plutonium) to lay the scientific foundation for advanced nuclear energy systems.

All nuclear fuels contain actinide materials; the research of this EFRC is expected to lead to better fundamental understanding, as well as control of, chemical and physical processes that occur in the extreme environments within the nuclear fuel cycle: nuclear fuels during and after irradiation in a nuclear reactor; recycling of used nuclear fuel to create a “green” closed nuclear fuel cycle; and the behavior of radioactive materials in nuclear waste repositories. This EFRC includes planned collaborations with scientists at the University of Michigan and the **University of California-Davis**; Pacific Northwest National Laboratory including the Environmental Molecular Sciences Laboratory, Savannah River National Laboratory, and Sandia National Laboratories. The EFRC will make use of the National Synchrotron Light Source at Brookhaven National Laboratory, the Advanced Photon Source at Argonne National Laboratory, and the Spallation Neutron Source at Oak Ridge National Laboratory.

Total funding: \$18.5M over 5 years
UC Davis portion: \$3.88M over 5 years
UC Davis participant: Alexandra Navrotsky, William Casey, Mark Asta, Niels Jensen