May 6, 2009

Secretary Chu Announces Funding for 71 University-Led Nuclear Research and Development Projects

WASHINGTON, DC – U.S. Energy Secretary Steven Chu today announced the selection of 71 university research project awards as part of the Department of Energy's investments in cutting-edge nuclear energy research and development (R&D). Under the Nuclear Energy University Program (NEUP), these 71 projects will receive approximately $44 million over three years to advance new nuclear technologies in support of the nation's energy goals. By helping to develop the next generation of advanced nuclear technologies, the Nuclear Energy University Program will play a key role in addressing the global climate crisis and moving the nation toward greater use of nuclear energy.

"As a zero-carbon energy source, nuclear power must be part of our energy mix as we work toward energy independence and meeting the challenge of global warming," said Secretary Chu. "The next generation of nuclear power plants – with the highest standards of safety, efficiency and environmental protection – will require the latest advancements in nuclear science and technology. These research and development university awards will ensure that the United States continues to lead the world in the nuclear field for years to come."

Selected R&D projects include 31 U.S. universities that will act as lead research institutions for projects in more than 20 states. Other universities, industries, and national laboratories will serve as collaborators and research partners. Under the Nuclear Energy University Program, DOE will support projects in the following nuclear energy research fields: the Advanced Fuel Cycle Initiative (AFCI), the Next Generation Nuclear Plant (NGNP) also known as Generation IV Nuclear Energy Systems, Investigator-Initiated Research (IIR), and Light Water Reactor Sustainability (LWRS).

In keeping with the Obama Administration's commitment to training the next generation of American scientists, Secretary Chu also announced that DOE is accepting applications for individual nuclear science and engineering scholarships and fellowships under the Nuclear Energy University Program. As part of the Department's efforts to recruit and train the next generation of nuclear scientists and engineers, DOE is offering approximately $2.9 million in university fellowships and scholarships to support students entering the nuclear science and engineering fields. Further details on the Request for applications are available from the Center for Advanced Energy Studies.

Contracts for the R&D projects are expected to be awarded by September 30, 2009 by the Battelle Energy Alliance, LLC (BEA), a Management and Operating contractor for DOE at the Idaho National Laboratory (INL).

Read more information about the 71 research and development awards.

Advanced Fuel Cycle Initiative (AFCI)

Title	Organization
Fundamental Understanding of Ambient and High-Temperature Plasticity Phenomena in Structural Materials in Advanced Reactors	Georgia Institute of Technology
Advanced Elastic/Inelastic Nuclear Data Development Project	Idaho State University
Heterogeneous Recycling in Fast Reactors	Massachusetts Institute of Technology
Thermodynamic Development of Corrosion Rate Modeling in Iron Phosphate Glasses	Missouri University of Science and Technology

Development of Subspace-Based Hybrid Monte Carlo-Deterministic Algorithms for Reactor Physics Calculations	North Carolina State University
SiC Schottky Diode Detectors for Measurement of Actinide Concentrations from Alpha Activities in Molten Salt Electrolyte	Ohio State University
Simulations of Failure via Three-Dimensional Cracking in Fuel Cladding for Advanced Nuclear Fuels	Oklahoma State University
Improvements to Nuclear Data and Its Uncertainties by Theoretical Modeling	Rensselaer Polytechnic Institute (Troy, NY)
Sharp Interface Tracking in Rotating Microflows of Solvent Extraction	State University of New York at Stony Brook
Bulk Nanostructured FCC Steels with Enhanced Radiation Tolerance	Texas A&M University
Fuel Performance Experiments and Modeling: Fission Gas Bubble Nucleation and Growth in Alloy Nuclear Fuels	Texas A&M University
Computational Design of Advanced Nuclear Fuels	University of California, Davis
Data Collection Methods For Validation of Advanced Multi-Resolution Fast Reactor Simulations	University of Idaho
Simulations of the Thermodynamic and Diffusion Properties of Actinide Oxide Fuel Materials	University of Michigan
Adsorptive Separation and Sequestration of Krypton, I and C14 on Diamond Nanoparticles	University of Missouri, Columbia
Development of Alternative Technetium Waste Forms	University of Nevada, Las Vegas
Quantification of UV-Visible and Laser Spectroscopic Techniques for Materials Accountability and Process Control	University of Nevada, Las Vegas
High-Fidelity Space-Time Adaptive Multiphysics Simulations in Nuclear Engineering	University of Nevada, Reno
Advanced Mesh-Enabled Monte Carlo Capability for Multi-Physics Reactor Analysis	University of Wisconsin, Madison
Ab Initio Enhanced Calphad Modeling of Actinide Rich Nuclear Fuels	University of Wisconsin, Madison
Development of Diffusion Barrier Coatings and Deposition Technologies for Mitigating Fuel Cladding Chemical Interactions (FCCI)	University of Wisconsin, Madison
Thermal Properties of LiCl-KCl Molten Salt for Nuclear Waste Separation	University of Wisconsin, Madison

Next Generation Nuclear Plant (NGNP) / Generation IV Nuclear Systems

Irradiation Creep in Graphite	Boise State University
Modeling the Stress Strain Relationships and Predicting Failure Probabilities For Graphite Core Components	Cleveland State University
TRISO-Coated Fuel Durability Under Extreme Conditions	Colorado School of Mines
An Innovative and Advanced Coupled Neutron Transport and Thermal Hydraulic Method (Tool) for the Design, Analysis and Optimization of VHTR/NGNP Prismatic Reactors	Georgia Institute of Technology
Millimeter-Wave Thermal Analysis Development and Application to Gen IV Reactor Materials	Massachusetts Institute of Technology
Accurate Development of Thermal Neutron Scattering Cross Section Libraries	North Carolina State University
Understanding Creep Mechanisms in Graphite with Experiments, Multiscale Simulations, and Modeling	North Carolina State University

Multiaxial creep-fatigue and creep-ratcheting failures of Grade 91 and Haynes 230 alloys toward addressing the design issues of Gen IV nuclear power plants	North Carolina State University
Verification & Validation of High-Order Short-Characteristics-Based Deterministic Transport Methodology on Unstructured Grids	North Carolina State University
Microscale Heat Conduction Models and Doppler Feedback	North Carolina State University
Optimizing Neutron Thermal Scattering Effects in Very High Temperature Reactors	North Carolina State University
Investigation of Countercurrent Helium-air Flows in Air-ingress Accidents for VHTRs	Ohio State University
Testing of Performance of Optical Fibers Under Irradiation in Intense Radiation Fields, When Subjected to Very High Temperatures	Ohio State University
Non Destructive Thermal Analysis and In Situ Investigation of Creep Mechanism of Graphite and Ceramic Composites using Phase-sensitive THz Imaging & Nonlinear Resonant Ultrasonic Spectroscopy	Rensselaer Polytechnic Institute
A Distributed Fiber Optic Sensor Network for Online 3-D Temperature and Neutron Fluence Mapping in a VHTR Environment	Texas A&M University
Investigation on the Core Bypass Flow in a Very High Temperature Reactor	Texas A&M University
CFD Model Development and Validation for High Temperature Gas Cooled Reactor Cavity Cooling System (RCCS) Applications	Texas A&M University
Study of Air ingress across the duct during the accident conditions	Texas A&M University
Verification of the CENTRM Module for Adaptation of the SCALE Code to NGNP Prismatic and PBR Core Designs	University of Arizona
Integral and Separate Effects Tests for Thermal Hydraulics Code Validation for Liquid-Salt Cooled Nuclear Reactors	University of California, Berkeley
Mechanisms Governing the Creep Behavior of High Temperature Alloys for Generation IV Nuclear Energy Systems	University of Cincinnati
ALD Produced B2O3, Al2O3 and TiO2 Coatings on Gd2O3 Burnable Poison Nanoparticles	University of Colorado, Boulder
Experimental Study and Computational Simulations of Key Pebble Bed Thermomechanics Issues for Design and Safety	University of Idaho
Prediction and Monitoring Systems of Creep-Fracture Behavior of 9Cr-1Mo Steels for Reactor Pressure Vessels	University of Idaho
Understanding Fundamental Material Degradation Processes in High Temperature Aggressive Chemomechanical Environments	University of Illinois, Urbana-Champaign
Multi-Scale Multi-physics Methods Development for the Calculation of Hot-Spots in the NGNP	University of Michigan
Corrosion and Creep of Candidate Alloys in High Temperature Helium and Steam Environments for the NGNP	University of Michigan
Creation of a Full-Core HTR Benchmark with the Fort St. Vrain Initial Core and Validation of the DHF Method with Helios for NGNP Configurations	University of Michigan
Fission Product Sorptivity in Graphite	University of Missouri, Columbia
Identifying and Understanding Environment-Induced Crack Propagation Behavior in Ni-Based Superalloy INCONEL 617	University of Nevada, Las Vegas
Graphite Oxidation Simulation in HTR Accident Conditions	University of New Mexico
Tritium Sequestration in Gen IV NGNP Gas Stream via Proton Conducting Ceramic Pumps	University of South Carolina
Materials, Turbomachinery and Heat Exchangers for Supercritical CO2 Systems	University of Wisconsin, Madison
Experimental Studies of NGNP Reactor Cavity Cooling System with Water	University of Wisconsin, Madison

Assessment of Embrittlement of VHTR Structural Alloys in Impure Helium Environments	University of Wisconsin, Madison
Modeling Fission Product Sorption in Graphite Structures	University of Wisconsin, Madison
Liquid Salt Heat Exchanger Technology for VHTR Based Applications	University of Wisconsin, Madison
Effect of Post-Weld Heat Treatment on Creep Rupture Properties of Grade 91 Steel Heavy Section Welds	Utah State University

Investigator-Initiated Research (IIR)

Neutron Damage and MAX Phase Ternary Compounds	Drexel University
Maximum Fuel Utilization in Fast Reactors without Chemical Reprocessing	University of California, Berkeley
Developing a High Thermal Conductivity Fuel with Silicon Carbide Additives	University of Florida
Fabrication of Tungsten-Rhenium Cladding Materials via Spark Plasma Sintering for Ultra High Temperature Reactor Applications	University of Idaho
Ionic Liquid and Supercritical Fluid Hyphenated Techniques for Dissolution and Separation of Lanthanides, Actinides, and Fission Products	University of Idaho
Utilization of Methacrylates and Polymer Matrices for the Synthesis of Ion Specific Resins	University of Nevada, Las Vegas
Improved LWR Cladding Performance by EPD Surface Modification Technique	University of Wisconsin, Madison
Atomistic Calculations of the Effect of Minor Actinides on Thermodynamic and Kinetic Properties of UO2+x	Georgia Institute of Technology
Improved Fission Neutron Data Base for Active Interrogation of Actinides	University of Michigan

Light Water Reactor Sustainability (LWRS)

Advanced Models of LWR Pressure Vessel Embrittlement for Low Flux-High Fluence Conditions	University of California, Santa Barbara

Media contact(s):
(202) 586-4940