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**NEWS MEDIA CONTACT:**  
**(202) 586-4940**

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### 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 towards 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 at: <http://www.caesenergy.org> (<http://www.caesenergy.org/>).

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).

#### **Advanced Fuel Cycle Initiative (AFCI)**

Title	Organization
Fundamental Understanding of Ambient and High-Temperature Plasticity Phenomena in Structural Materials in Advanced Reactors ( <a href="#">../universityPrograms/2009awards/NEUP_09-269_abstract.pdf</a> )	Georgia Institute of Technology
Advanced Elastic/Inelastic Nuclear Data Development Project ( <a href="#">../universityPrograms/2009awards/NEUP_09-475_abstract.pdf</a> )	Idaho State University
Heterogeneous Recycling in Fast Reactors ( <a href="#">../universityPrograms/2009awards/NEUP_09-095_abstract.pdf</a> )	Massachusetts Institute of Technology
Thermodynamic Development of Corrosion Rate Modeling in Iron Phosphate Glasses ( <a href="#">../universityPrograms/2009awards/NEUP_09-144_abstract.pdf</a> )	Missouri University of Science and Technology
Development of Subspace-Based Hybrid Monte Carlo-Deterministic Algorithms for Reactor Physics Calculations ( <a href="#">../universityPrograms/2009awards/NEUP_09-365_abstract.pdf</a> )	North Carolina State University
SiC Schottky Diode Detectors for Measurement of Actinide Concentrations from Alpha Activities in Molten Salt Electrolyte ( <a href="#">../universityPrograms/2009awards/NEUP_09-351_abstract.pdf</a> )	Ohio State University
Simulations of Failure via Three-Dimensional Cracking in Fuel Cladding for Advanced Nuclear Fuels ( <a href="#">../universityPrograms/2009awards/NEUP_09-416_abstract.pdf</a> )	Oklahoma State University
Improvements to Nuclear Data and Its Uncertainties by Theoretical Modeling ( <a href="#">../universityPrograms/2009awards/NEUP_09-247_abstract.pdf</a> )	Rensselaer Polytechnic Institute (Troy, NY)
Sharp Interface Tracking in Rotating Microflows of Solvent Extraction ( <a href="#">../universityPrograms/2009awards/NEUP_09-349_abstract.pdf</a> )	State University of New York at Stony Brook
Bulk Nanostructured FCC Steels with Enhanced Radiation Tolerance ( <a href="#">../universityPrograms/2009awards/NEUP_09-048_abstract.pdf</a> )	Texas A&M University
Fuel Performance Experiments and Modeling: Fission Gas Bubble Nucleation and Growth in Alloy Nuclear Fuels ( <a href="#">../universityPrograms/2009awards/NEUP_09-357_abstract.pdf</a> )	Texas A&M University
Computational Design of Advanced Nuclear Fuels ( <a href="#">../universityPrograms/2009awards/NEUP_09-408_abstract.pdf</a> )	University of California, Davis
Data Collection Methods For Validation of Advanced Multi-Resolution Fast Reactor Simulations ( <a href="#">../universityPrograms/2009awards/NEUP_09-321_abstract.pdf</a> )	University of Idaho
Simulations of the Thermodynamic and Diffusion Properties of Actinide Oxide Fuel Materials ( <a href="#">../universityPrograms/2009awards/NEUP_09-185_abstract.pdf</a> )	University of Michigan
Adsorptive Separation and Sequestration of Krypton, I and C14 on Diamond Nanoparticles ( <a href="#">../universityPrograms/2009awards/NEUP_09-221_abstract.pdf</a> )	University of Missouri, Columbia
Development of Alternative Technetium Waste Forms ( <a href="#">../universityPrograms/2009awards/NEUP_09-315_abstract.pdf</a> )	University of Nevada, Las Vegas

<a href="#">Quantification of UV-Visible and Laser Spectroscopic Techniques for Materials Accountability and Process Control (.../universityPrograms/2009awards/NEUP_09-350_abstract.pdf)</a>	University of Nevada, Las Vegas
<a href="#">High-Fidelity Space-Time Adaptive Multiphysics Simulations in Nuclear Engineering (.../universityPrograms/2009awards/NEUP_09-391_abstract.pdf)</a>	University of Nevada, Reno
<a href="#">Advanced Mesh-Enabled Monte Carlo Capability for Multi-Physics Reactor Analysis (.../universityPrograms/2009awards/NEUP_09-129_abstract.pdf)</a>	University of Wisconsin, Madison
<a href="#">Ab Initio Enhanced Calphad Modeling of Actinide Rich Nuclear Fuels (.../universityPrograms/2009awards/NEUP_09-225_abstract.pdf)</a>	University of Wisconsin, Madison
<a href="#">Development of Diffusion Barrier Coatings and Deposition Technologies for Mitigating Fuel Cladding Chemical Interactions (FCCI) (.../universityPrograms/2009awards/NEUP_09-282_abstract.pdf)</a>	University of Wisconsin, Madison
<a href="#">Thermal Properties of LiCl-KCl Molten Salt for Nuclear Waste Separation (.../universityPrograms/2009awards/NEUP_09-319_abstract.pdf)</a>	University of Wisconsin, Madison

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

<a href="#">Irradiation Creep in Graphite (.../universityPrograms/2009awards/NEUP_09-453_abstract.pdf)</a>	Boise State University
<a href="#">Modeling the Stress Strain Relationships and Predicting Failure Probabilities For Graphite Core Components (.../universityPrograms/2009awards/NEUP_09-347_abstract.pdf)</a>	Cleveland State University
<a href="#">TRISO-Coated Fuel Durability Under Extreme Conditions (.../universityPrograms/2009awards/NEUP_09-257_abstract.pdf)</a>	Colorado School of Mines
<a href="#">An Innovative and Advanced Coupled Neutron Transport and Thermal Hydraulic Method (Tool) for the Design, Analysis and Optimization of VHTR/NGNP Prismatic Reactors (.../universityPrograms/2009awards/NEUP_09-396_abstract.pdf)</a>	Georgia Institute of Technology
<a href="#">Removal of 14C from Irradiated Graphite for Graphite Recycle and Waste Volume Reduction (.../universityPrograms/2009awards/NEUP_09-030_abstract.pdf)</a>	Idaho State University
<a href="#">Millimeter-Wave Thermal Analysis Development and Application to Gen IV Reactor Materials (.../universityPrograms/2009awards/NEUP_09-111_abstract.pdf)</a>	Massachusetts Institute of Technology
<a href="#">Accurate Development of Thermal Neutron Scattering Cross Section Libraries (.../universityPrograms/2009awards/NEUP_09-068_abstract.pdf)</a>	North Carolina State University
<a href="#">Understanding Creep Mechanisms in Graphite with Experiments, Multiscale Simulations, and Modeling (.../universityPrograms/2009awards/NEUP_09-097_abstract.pdf)</a>	North Carolina State University
<a href="#">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 (.../universityPrograms/2009awards/NEUP_09-288_abstract.pdf)</a>	North Carolina State University

Verification & Validation of High-Order Short-Characteristics-Based Deterministic Transport Methodology on Unstructured Grids ( <a href="http://universityPrograms/2009awards/NEUP_09-366_abstract.pdf">../universityPrograms/2009awards/NEUP_09-366_abstract.pdf</a> )	North Carolina State University
Microscale Heat Conduction Models and Doppler Feedback ( <a href="http://universityPrograms/2009awards/NEUP_09-479_abstract.pdf">../universityPrograms/2009awards/NEUP_09-479_abstract.pdf</a> )	North Carolina State University
Optimizing Neutron Thermal Scattering Effects in Very High Temperature Reactors ( <a href="http://universityPrograms/2009awards/NEUP_09-522_abstract.pdf">../universityPrograms/2009awards/NEUP_09-522_abstract.pdf</a> )	North Carolina State University
Investigation of Countercurrent Helium-air Flows in Air-ingress Accidents for VHTRs ( <a href="http://universityPrograms/2009awards/NEUP_09-158_abstract.pdf">../universityPrograms/2009awards/NEUP_09-158_abstract.pdf</a> )	Ohio State University
Testing of Performance of Optical Fibers Under Irradiation in Intense Radiation Fields, When Subjected to Very High Temperatures ( <a href="http://universityPrograms/2009awards/NEUP_09-346_abstract.pdf">../universityPrograms/2009awards/NEUP_09-346_abstract.pdf</a> )	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 ( <a href="http://universityPrograms/2009awards/NEUP_09-320_abstract.pdf">../universityPrograms/2009awards/NEUP_09-320_abstract.pdf</a> )	Rensselaer Polytechnic Institute
A Distributed Fiber Optic Sensor Network for Online 3-D Temperature and Neutron Fluence Mapping in a VHTR Environment ( <a href="http://universityPrograms/2009awards/NEUP_09-241_abstract.pdf">../universityPrograms/2009awards/NEUP_09-241_abstract.pdf</a> )	Texas A&M University
Investigation on the Core Bypass Flow in a Very High Temperature Reactor ( <a href="http://universityPrograms/2009awards/NEUP_09-341_abstract.pdf">../universityPrograms/2009awards/NEUP_09-341_abstract.pdf</a> )	Texas A&M University
CFD Model Development and Validation for High Temperature Gas Cooled Reactor Cavity Cooling System (RCCS) Applications ( <a href="http://universityPrograms/2009awards/NEUP_09-464_abstract.pdf">../universityPrograms/2009awards/NEUP_09-464_abstract.pdf</a> )	Texas A&M University
Study of Air ingress across the duct during the accident conditions ( <a href="http://universityPrograms/2009awards/NEUP_09-515_abstract.pdf">../universityPrograms/2009awards/NEUP_09-515_abstract.pdf</a> )	Texas A&M University
Verification of the CENTRM Module for Adaptation of the SCALE Code to NGNP Prismatic and PBR Core Designs ( <a href="http://universityPrograms/2009awards/NEUP_09-390_abstract.pdf">../universityPrograms/2009awards/NEUP_09-390_abstract.pdf</a> )	University of Arizona
Integral and Separate Effects Tests for Thermal Hydraulics Code Validation for Liquid-Salt Cooled Nuclear Reactors ( <a href="http://universityPrograms/2009awards/NEUP_09-080_abstract.pdf">../universityPrograms/2009awards/NEUP_09-080_abstract.pdf</a> )	University of California, Berkeley
Mechanisms Governing the Creep Behavior of High Temperature Alloys for Generation IV Nuclear Energy Systems ( <a href="http://universityPrograms/2009awards/NEUP_09-113_abstract.pdf">../universityPrograms/2009awards/NEUP_09-113_abstract.pdf</a> )	University of Cincinnati
ALD Produced B <sub>2</sub> O <sub>3</sub> , Al <sub>2</sub> O <sub>3</sub> and TiO <sub>2</sub> Coatings on Gd <sub>2</sub> O <sub>3</sub> Burnable Poison Nanoparticles ( <a href="http://universityPrograms/2009awards/NEUP_09-312_abstract.pdf">../universityPrograms/2009awards/NEUP_09-312_abstract.pdf</a> )	University of Colorado, Boulder
Experimental Study and Computational Simulations of Key Pebble Bed Thermomechanics Issues for Design and Safety ( <a href="http://universityPrograms/2009awards/NEUP_09-151_abstract.pdf">../universityPrograms/2009awards/NEUP_09-151_abstract.pdf</a> )	University of Idaho

Prediction and Monitoring Systems of Creep-Fracture Behavior of 9Cr-1Mo Steels for Reactor Pressure Vessels ( <a href="#">../universityPrograms/2009awards/NEUP_09-458_abstract.pdf</a> )	University of Idaho
Understanding Fundamental Material Degradation Processes in High Temperature Aggressive Chemomechanical Environments ( <a href="#">../universityPrograms/2009awards/NEUP_09-516_abstract.pdf</a> )	University of Illinois, Urbana-Champaign
Multi-Scale Multi-physics Methods Development for the Calculation of Hot-Spots in the NGNP ( <a href="#">../universityPrograms/2009awards/NEUP_09-304_abstract.pdf</a> )	University of Michigan
Corrosion and Creep of Candidate Alloys in High Temperature Helium and Steam Environments for the NGNP ( <a href="#">../universityPrograms/2009awards/NEUP_09-354_abstract.pdf</a> )	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 ( <a href="#">../universityPrograms/2009awards/NEUP_09-511_abstract.pdf</a> )	University of Michigan
Fission Product Sorptivity in Graphite ( <a href="#">../universityPrograms/2009awards/NEUP_09-376_abstract.pdf</a> )	University of Missouri, Columbia
Identifying and Understanding Environment-Induced Crack Propagation Behavior in Ni-Based Superalloy INCONEL 617 ( <a href="#">../universityPrograms/2009awards/NEUP_09-075_abstract.pdf</a> )	University of Nevada, Las Vegas
Graphite Oxidation Simulation in HTR Accident Conditions ( <a href="#">../universityPrograms/2009awards/NEUP_09-417_abstract.pdf</a> )	University of New Mexico
Tritium Sequestration in Gen IV NGNP Gas Stream via Proton Conducting Ceramic Pumps ( <a href="#">../universityPrograms/2009awards/NEUP_09-510_abstract.pdf</a> )	University of South Carolina
Materials, Turbomachinery and Heat Exchangers for Supercritical CO2 Systems ( <a href="#">../universityPrograms/2009awards/NEUP_09-116_abstract.pdf</a> )	University of Wisconsin, Madison
Experimental Studies of NGNP Reactor Cavity Cooling System with Water ( <a href="#">../universityPrograms/2009awards/NEUP_09-202_abstract.pdf</a> )	University of Wisconsin, Madison
Assessment of Embrittlement of VHTR Structural Alloys in Impure Helium Environments ( <a href="#">../universityPrograms/2009awards/NEUP_09-237_abstract.pdf</a> )	University of Wisconsin, Madison
Modeling Fission Product Sorption in Graphite Structures ( <a href="#">../universityPrograms/2009awards/NEUP_09-245_abstract.pdf</a> )	University of Wisconsin, Madison
Liquid Salt Heat Exchanger Technology for VHTR Based Applications ( <a href="#">../universityPrograms/2009awards/NEUP_09-274_abstract.pdf</a> )	University of Wisconsin, Madison
Effect of Post-Weld Heat Treatment on Creep Rupture Properties of Grade 91 Steel Heavy Section Welds ( <a href="#">../universityPrograms/2009awards/NEUP_09-323_abstract.pdf</a> )	Utah State University

## Investigator-Initiated Research (IIR)

Neutron Damage and MAX Phase Ternary Compounds ( <a href="#">../universityPrograms/2009awards/NEUP_09-323_abstract.pdf</a> )	Drexel University
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<a href="#">/universityPrograms/2009awards/NEUP_09-081_abstract.pdf</a>	
Maximum Fuel Utilization in Fast Reactors without Chemical Reprocessing ( <a href="#">../universityPrograms/2009awards/NEUP_09-040_abstract.pdf</a> )	University of California, Berkeley
Developing a High Thermal Conductivity Fuel with Silicon Carbide Additives ( <a href="#">../universityPrograms/2009awards/NEUP_09-456_abstract.pdf</a> )	University of Florida
Fabrication of Tungsten-Rhenium Cladding Materials via Spark Plasma Sintering for Ultra High Temperature Reactor Applications ( <a href="#">../universityPrograms/2009awards/NEUP_09-477_abstract.pdf</a> )	University of Idaho
Ionic Liquid and Supercritical Fluid Hyphenated Techniques for Dissolution and Separation of Lanthanides, Actinides, and Fission Products ( <a href="#">../universityPrograms/2009awards/NEUP_09-537_abstract.pdf</a> )	University of Idaho
Utilization of Methacrylates and Polymer Matrices for the Synthesis of Ion Specific Resins ( <a href="#">../universityPrograms/2009awards/NEUP_09-285_abstract.pdf</a> )	University of Nevada, Las Vegas
Improved LWR Cladding Performance by EPD Surface Modification Technique ( <a href="#">../universityPrograms/2009awards/NEUP_09-519_abstract.pdf</a> )	University of Wisconsin, Madison
Atomistic Calculations of the Effect of Minor Actinides on Thermodynamic and Kinetic Properties of UO <sub>2+x</sub> ( <a href="#">../universityPrograms/2009awards/NEUP_09-267_abstract.pdf</a> )	Georgia Institute of Technology
Improved Fission Neutron Data Base for Active Interrogation of Actinides ( <a href="#">../universityPrograms/2009awards/NEUP_09-414_abstract.pdf</a> )	University of Michigan

#### Light Water Reactor Sustainability (LWRS)

Advanced Models of LWR Pressure Vessel Embrittlement for Low Flux-High Fluence Conditions ( <a href="#">../universityPrograms/2009awards/NEUP_09-196_abstract.pdf</a> )	University of California, Santa Barbara
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More information about the 71 research and development awards is available at: <http://www.ne.doe.gov/universityPrograms/neUniversity2a.html> ([../universityPrograms/neUniversity2a.html](#))

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