National Nuclear Security Administration
Office of Defense Programs

The Stewardship Science Academic Alliances Program

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NSAC
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SSAA Program Objectives

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- Help grow U.S. academic scientific community
- Provide scientific advances in
  - Condensed matter and materials science
  - Plasma and high energy density physics
  - Low energy nuclear science
- Train scientists in areas of relevant research
- Promote scientific interactions between academia and NNSA/DP labs
- Increase availability of unique NNSA facilities to academic researchers
- Develop and maintain long-term recruiting pipeline

NNSA/Defense Programs Stewardship Science Academic Alliances Program will support research areas aligned with DP mission needs

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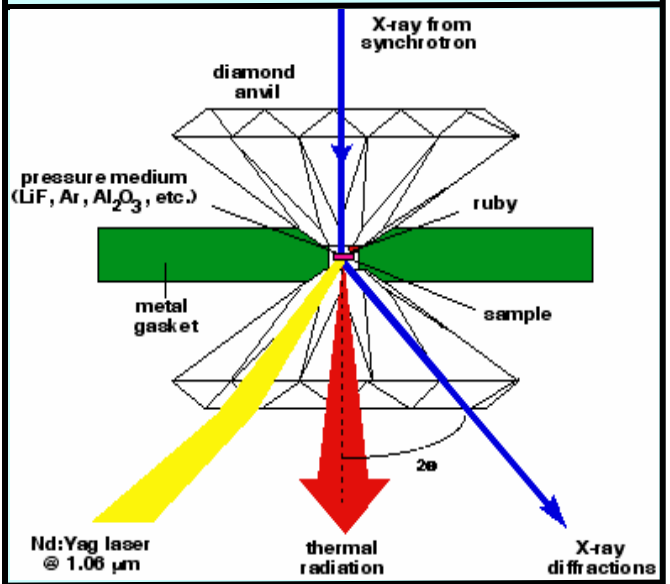
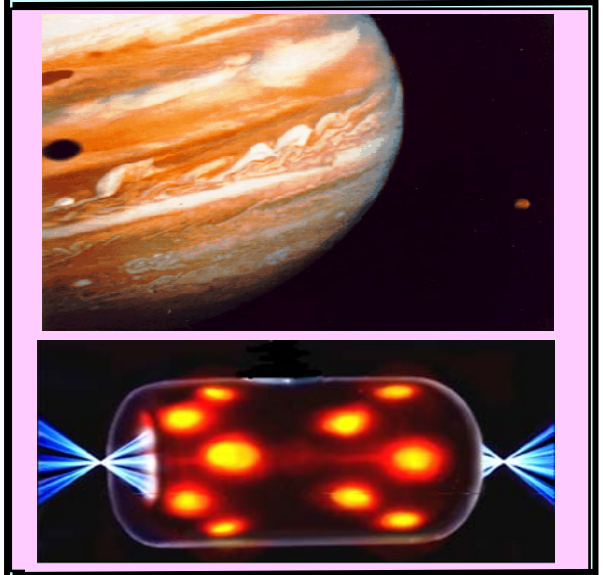
- Materials under extreme conditions
- Hydrodynamics



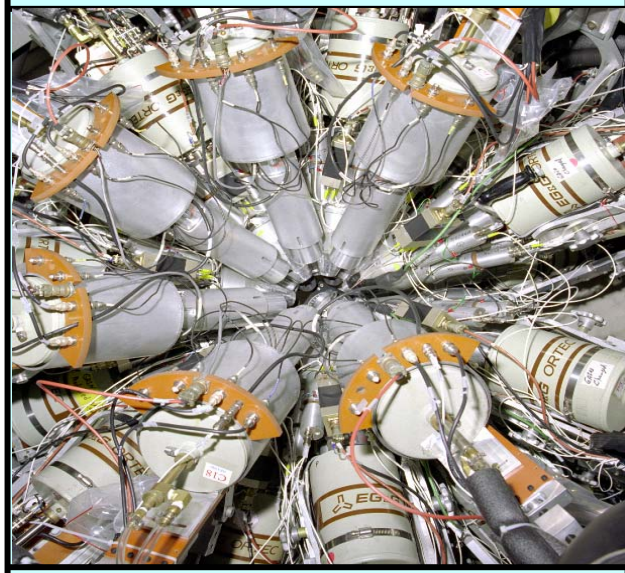
- Static and dynamic properties of materials at high-pressure/temperature
  - EOS
  - Phase diagram
  - Constitutive properties
  - Dynamic materials response
- Hydrodynamic experiments in low-energy-density regimes

- High-energy-density physics
- Fluid dynamics



- Properties of matter in high-energy-density regimes as produced by:
  - lasers
  - pulsed power
- Physics of turbulence and fluid interfaces

- Nuclear science



- Cross-sections of stable and unstable nuclei
- Reaction rates for neutron-, γ-, and ion-induced reactions of relevance to radiochemistry diagnosis

NUCLEAR SCIENCE

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1. Investigations leading to greater accuracy in the knowledge of low energy cross sections of stable and unstable nuclei and corresponding reaction rates for neutron-, γ- and ion-induced reactions.

2.Development of advanced simulations and measurement techniques leading to improved radiation and particle detection methods, in terms of energy and spatial resolution.

3. Physics of the fission process, including division of mass and charge as a function of excitation, production of energy, and the reaction properties of prompt fission products.

4.Investigations of particle production and advanced diagnostic techniques relevant to high-energy proton radiography.

5.Development of experimental diagnostic techniques for laser implosion systems.

SSAA – the process

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- Pre-applications (letters of intent) required
  - **185 rec'd.**
- Full proposals received
  - **Nuclear physics 41 grants 4 centers**
  - **SSAA Program total 114 grants 24 centers**
- **Requests were several times available resources!!**
- Each grant proposal reviewed by at least 3 reviewers
- Each center proposal reviewed by at least 4 reviewers

Thank you for your help!!

SSAA – the process (continued)

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- Proposals, scores, reviewer comments etc. considered by review panels to determine rank order in each discipline –centers and grants separately. Each panel met for a full day.
- Executive Committee merged the lists from the 3 areas and provided recommendation to Dave Crandall NA-11.
- Press Release on September 12, 2002 announces selections.
- Implementation is contingent on a favorable resolution of the FY'03 NNSA budget.

NNSA NEWS
National Nuclear Security Administration

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Office of Defense Programs

For Immediate Release
September 12, 2002

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National Nuclear Security Administration Announces University Grants

Stewardship Science Academic Alliances program strengthens national security

WASHINGTON, D.C. – The National Nuclear Security Administration (NNSA), a semi-autonomous agency of the U.S. Department of Energy, announced today almost $27.5 million in award selections for its Stewardship Science Academic Alliances program. The 27 recipients, principally universities and colleges, received the funding from a field of 138 applications that included a large number of high-quality, scientifically relevant projects.

The proposals, submitted in response to a solicitation published late last year, were subjected to an intense and extensive peer review by subject matter experts with those of the highest technical merit and importance to NNSA receiving support. The result is a technical program incorporating a broad spectrum of universities from all regions of the U.S.

NNSA made the grants to

- grow the U.S. scientific community through university involvement in areas of fundamental science and technology relevant to stockpile stewardship;
- promote and sustain scientific interactions between the academic community and scientists at the NNSA laboratories including the use of unique NNSA experimental facilities;
- train scientists in specific areas of research relevant to stockpile stewardship; and
- complement the current NNSA Advanced Simulation and Computing Academic Strategic Alliances Program by emphasizing primarily experimental research in forefront scientific areas aligned with the NNSA mission needs.

NNSA Deputy Administrator for Defense Programs Dr. Everet Beckner, said, "Our grants to cooperative programs with universities are significant contributors to the science which underpins the NNSA stewardship of the nuclear weapons stockpile. These grants are also a key means of training the scientists needed to maintain the outstanding capabilities of our national laboratories."

The awards we are announcing at this time were selected for funding beginning in late calendar year 2002. Pending the resolution of the fiscal year 2003 NNSA budget, additional awards may be announced at a later date.

NNSA enhances U.S. national security through the military application of nuclear energy, maintains the U.S. nuclear weapons stockpile, promotes international nuclear non-proliferation and safety, reduces global danger from weapons of mass destruction, provides the U.S. Navy with safe and effective nuclear propulsion, and oversees national laboratories to maintain U.S. leadership in science and technology.

Attached is the list of the grants and their recipients.

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Title	Principal University	Location
Center of Excellence		
Center for the Study of Pulsed-Power-Driven High Energy Density Plasmas	Cornell University	Ithaca, NY
Research Grants		
Electron Interactions in Actinides and Related Systems under Extreme Conditions	Florida State University	Tallahassee, FL
Development of Designer Diamond Anvil Technology for High Pressure-High Temperature Experiments in Support of the Stockpile Stewardship Program	University of Alabama - Birmingham	Birmingham, AL
Experimental Investigation of Magnetic, Superconducting, and Other Phase Transitions in Novel f-Electron Materials at Ultra-high pressures Using Designer Diamond Anvils	University of California - San Diego	La Jolla, CA
Micro- and Nano- Structure Development and Multiscale Physics at Sliding Metal Interfaces	The Ohio State University	Columbus, OH
Microstructures and properties of materials under repeated laser irradiation	University of Illinois – Urbana/Champaign	Urbana, IL
High-Pressure Thermodynamic Properties of f-Electron Metals, Transition Metal Oxides, and Half-Metallic Magnets	University of California - Davis	Davis, CA
Determining the Mechanical Constitutive Properties of Metals as a Function of Strain Rate and Temperature: A Combined Experimental and Modeling Approach	University of Illinois – Urbana/Champaign	Urbana, IL
Investigation of the Rayleigh-Taylor and Richtmyer-Meshkov Instabilities	University of Wisconsin - Madison	Madison, WI
Continuation of the Application of Parallel PIC Simulations to Laser and Electron Transport Through Plasmas Under Conditions Relevant to ICF and SBSS	University of California - Los Angeles	Los Angeles, CA
Coherent Imaging of Laser Plasma Interactions using XUV High Harmonic Radiation	University of Colorado - Boulder	Boulder, CO
Studies of the Nonlinear Interactions between Optical-Mixing-Controlled Stimulated Scattering Instabilities in Laser-Produced Plasmas	Polymath Research Inc.	Pleasanton, CA
Detailed Measurements of Turbulent Rayleigh-Taylor Mixing at Large and Small Atwood Numbers	Texas A&M University	College Station, TX
Nuclear Probing of Dense Plasmas	Massachusetts Institute of Technology	Cambridge, MA
Hydrodynamics and Radiative Hydrodynamics with Astrophysical Applications	University of Michigan	Ann Arbor, MI
Dense Plasma Studies with Ultra-bright soft X-Ray Laser Probes	Colorado State University	Ft. Collins, CO
Measurements of Neutron-induced Reaction Cross Sections	Duke University	Durham, NC
Studies in Low Energy Nuclear Science	Ohio University	Athens, OH
Neutron Capture Experiments on Unstable Nuclei	University of California - Berkeley	Berkeley, CA
Nuclear Level Densities and γ-Ray Strength Functions	North Carolina State University	Raleigh, NC
Proton Radiography: Cross Section Measurements and Prototype Detector Development	University of Michigan	Ann Arbor, MI
Nuclear Reaction Measurements with Radioactive Beams and Targets	University of California - Berkeley	Berkeley, CA
Measurements of the Energy, Mass, Charge and Angular Distribution of Fission Fragments as a Function of Energy Using a Lead Slowing Down Spectrometer	Rensselaer Polytecnic Institute	Troy, NY
Measurement of Fission Neutron Multiplicities and Energy Spectra for Actinide Nuclei	Oregon State University	Corvallis, OR
Nuclear Stewardship Research	Yale University	New Haven, CT
Nuclear Level Densities for Modeling Nuclear Reactions: An efficient Approach Using Statistical Spectroscopy	San Diego State University Foundation	San Diego, CA
Theoretical Description of the Fission Process	University of Tennessee	Knoxville, TN

Low Energy Nuclear Science

Nuclear Stewardship Research	Yale U	Beausang, Cornelius E.
Studies in Low Energy Nuclear Science	Ohio U	Brune, Carl R.
Nuclear Reaction Measurements with Radioactive Beams and Targets	UC- Berkeley	Cerney, Joseph
Measurements of the Energy, Mass, Charge and Angular Distribution of Fission Fragments as a Function of Energy Using a Lead Slowing Down Spectrometer	Rensselaer Polytecnic Inst	Danon, Yaron
Neutron Capture Experiments on Unstable Nuclei	UC- Berkeley	Hoffman, Darleane
Nuclear Level Densities for Modeling Nuclear Reactions: An efficient Approach Using Statistical Spectroscopy	San Diego St U Foundation	Johnson, Calvin W.
Proton Radiography: Cross Section Measurements and Prototype Detector Development	U of Michigan	Longo, Michael J.
Measurement of Fission Neutron Multiplicities and Energy Spectra for Actinide Nuclei	Oregon State U	Loveland, Walter
Nuclear Level Densities and γ-Ray Strength Functions	NC State U	Mitchell, Gary E.
Theoretical Description of the Fission Process	U Tenn	Nazarewicz, Witold
Measurements of Neutron-induced Reaction Cross Sections	Duke U	Tornow, Werner

The SSAA Program

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- $27.5 M over 3 years
  - One Center
  - Twenty-six Research Grants
- Rough annual budget
  - $9.1 M total
  - $7.1 M in Research Grants
  - $2.5 M for Eleven Nuclear Physics Research Grants

Observations

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- The NNSA FY'03 budget is not yet settled.
- We are caught in a Continuing Resolution
- Pending NNSA budget resolution (House-Senate Committee), we hope to make additional awards.
- Quality of proposals very high. We are looking forward to great research results!