

Office of Science
Notice DE-FG01-04ER04-22

*Annual Notice
for Continuation of Availability of Grants and Cooperative
Agreements for Nuclear Physics*

U.S. Department of Energy

Office of Science Financial Assistance Program Notice DE-FG01-04ER04-22; Annual Notice for Continuation of Availability of Grants and Cooperative Agreements for Nuclear Physics

AGENCY: U.S. Department of Energy

ACTION: Notice inviting grant and cooperative agreement applications.

SUMMARY: The Office of Nuclear Physics (NP), within the Office of Science (SC) of the Department of Energy (DOE), hereby announces its continuing interest in receiving **NEW** applications for support of research in Nuclear Physics.

On September 3, 1992, DOE published in the Federal Register the Office of Energy Research Financial Assistance Program (now called the Office of Science Financial Assistance Program), 10 CFR Part 605, Final Rule, which contained a solicitation for this program. The purpose of this solicitation is to request that all **NEW** applications for the Office of Nuclear Physics be submitted in response to this notice instead of the "Annual Notice - Continuing Solicitation for all Office of Science Programs". This does not change the process for renewal and supplemental applications. All **renewal and supplemental** applications should still be submitted in response to the "Annual Notice - Submission of Renewal and Supplemental Applications for Office of Science Grants". Information about submission of applications, eligibility, limitations, evaluation and selection processes and other policies and procedures are specified in 10 CFR Part 605 which can be accessed at: <http://www.sc.doe.gov/production/grants/grants.html>.

DATES: Applications must be submitted **prior to November 1** of the Fiscal Year for which funding is desired to permit timely consideration for award in that Fiscal Year. If this deadline is not met, the application will probably not be considered for funding until the next Fiscal Year. Any new applications not able to meet this deadline may be submitted in response to the "Annual Notice - Continuing Solicitation for all Office of Science Programs" mentioned above.

ADDRESSES: Formal applications referencing Program Notice DE-FG01-04ER04-22 must be sent electronically by an authorized institutional business official through DOE's Industry Interactive Procurement System (IIPS) at: <http://e-center.doe.gov> (see also <http://www.sc.doe.gov/production/grants/grants.html>). IIPS provides for the posting of solicitations and receipt of applications in a paperless environment via the Internet. In order to

submit applications through IIPS your business official will need to register at the IIPS website. **IIPS offers the option of using multiple files, please limit submissions to one volume and one file if possible, with a maximum of no more than four files.** The Office of Science will include attachments as part of this notice that provide the appropriate forms in PDF fillable format that are to be submitted through IIPS. Color images should be submitted in IIPS as a separate file in PDF format and identified as such. These images should be kept to a minimum due to the limitations of reproducing them. They should be numbered and referred to in the body of the technical scientific application as Color image 1, Color image 2, etc. Questions regarding the operation of IIPS may be E-mailed to the IIPS Help Desk at: HelpDesk@pr.doe.gov, or you may call the help desk at: (800) 683-0751. Further information on the use of IIPS by the Office of Science is available at: <http://www.sc.doe.gov/production/grants/grants.html>.

If you are unable to submit the application through IIPS, please contact the Grants and Contracts Division, Office of Science at: (301) 903-5212 or (301) 903-3604, in order to gain assistance for submission through IIPS or to receive special approval and instruction on how to submit printed applications.

SUPPLEMENTARY INFORMATION: The following program descriptions are offered to provide more in-depth information on scientific and technical areas of interest to the Office of Science.

Nuclear Physics

The Nuclear Physics program supports basic research, technical developments and world-class accelerator facilities to expand our fundamental understanding of the interactions and structures of atomic nuclei and nuclear matter, and an understanding of the forces of nature as manifested in nuclear matter. Today, the reach of nuclear physics extends from the quarks and gluons that form the substructure of the once-elementary protons and neutrons, to the most dramatic of cosmic events-supernovae. These and many other diverse activities are driven by five broad questions articulated recently by the Nuclear Science Advisory Committee (NSAC) in the *Opportunities in Nuclear Science: A Long-Range Plan for the Next Decade*. The four subprogram areas and their objectives are organized around answering these five key questions. Research activities supported by the Office of Nuclear Physics are aligned with and contribute to the overall progress of the following long term performance measures:

- Make precision measurements of fundamental properties of the proton, neutron and simple nuclei for comparison with theoretical calculations to provide a quantitative understanding of their quark substructure.
- Recreate brief, tiny samples of hot, dense nuclear matter to search for the quark-gluon plasma and characterize its properties.
- Investigate new regions of nuclear structure, study interactions in nuclear matter like those occurring in neutron stars, and determine the reactions that created the nuclei of atomic elements inside stars and supernovae.
- Measure fundamental properties of neutrinos and fundamental symmetries by using neutrinos from the sun and nuclear reactors and by using radioactive decay measurements.

The program is organized into the following four subprograms:

(a) Medium Energy Nuclear Physics

This subprogram supports experimental research primarily at the Thomas Jefferson National Accelerator Facility and with the polarized proton collision program at the Relativistic Heavy Ion Collider (RHIC-Spin), directed at answering the first key question: *What is the structure of the nucleon?* Detailed investigations of the structure of the nucleon are aimed at understanding how these basic building blocks of matter are constructed from the elementary quarks and gluons of Quantum Chromo-Dynamics (QCD) and how complex interactions among them generate all the properties of the nucleon, including its electromagnetic and spin properties. New knowledge in this area would also allow the nuclear binding force to be described in terms of QCD, thus providing a path for understanding the structure of atomic nuclei from first principles.

Program Contact: (301) 903-3904

b) Heavy Ion Nuclear Physics

This subprogram supports experimental research primarily at the Relativistic Heavy Ion Collider (RHIC) directed at answering the second question: *What are the properties of hot nuclear matter?* At extremely high temperatures, such as those that existed in the early universe immediately after the "Big Bang," normal nuclear matter is believed to revert to its primeval state called the quark-gluon plasma. This research program aims to recreate extremely small and brief samples of this high energy density phase of matter in the laboratory by colliding heavy nuclei at relativistic energies. At much lower temperatures, nuclear matter passes through another phase transition from a Fermi liquid to a Fermi gas of free roaming nucleons; understanding this phase transition is also a goal of the subprogram.

Program Contact: (301) 903-4702

(c) Low Energy Nuclear Physics

This subprogram supports experimental research directed at understanding the remaining three questions: *What is the structure of nucleonic matter?* Forefront nuclear structure research lies in studies of nuclei at the limits of excitation energy, deformation, angular momentum, and isotopic stability. The properties of nuclei at these extremes are not known and such knowledge is needed to test and drive improvement in nuclear models and theories about the nuclear many-body system. *What is the nuclear microphysics of the universe?* Knowledge of the detailed nuclear structure, nuclear reaction rates, half-lives of specific nuclei, and the limits of nuclear existence at both the proton and neutron drip lines is crucial for understanding the nuclear astrophysics processes responsible for the production of the chemical elements in the universe, and the explosive dynamics of supernovae. *Is there new physics beyond the Standard Model?* Studies of fundamental interactions and symmetries, including those of neutrino oscillations, are indicating that our current "Standard Model" theory which explains what the universe is and what holds it together is incomplete, opening up possibilities for new discoveries by precision experiments.

Program Contact: (301) 903-6093

(d) Nuclear Theory (including the Nuclear Data subprogram)

Progress in nuclear physics, as in any science, depends critically on improvements in the theoretical techniques and on new insights that will lead to new models and theories that can be applied to interpret experimental data and predict new behavior. The Nuclear Theory program

supports theoretical research directed at understanding all five of the central questions identified in the NSAC 2002 Long Range Plan.

Included in the theory program are the activities that are aimed at providing information services on critical nuclear data and have as a goal the compilation and dissemination of an accurate and complete nuclear data information base that is readily accessible and user oriented.

Program Contact: (301) 903-7878

Program Funding

It is anticipated that approximately \$70 million will be available for all Nuclear Physics grant and cooperative agreement awards in Fiscal Year 2005. A total of approximately **25%-30%** of that amount will be available for new awards under this notice and renewals of existing grants. The DOE is under no obligation to pay for any costs associated with the preparation or submission of an application. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this Notice.

Merit Review

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following evaluation criteria, which are listed in descending order of importance as codified at 10 CFR Part 605.10(d):

1. Scientific and/or Technical Merit of the Project,
2. Appropriateness of the Proposed Method or Approach,
3. Competency of Applicant's Personnel and Adequacy of Proposed Resources,
4. Reasonableness and Appropriateness of the Proposed Budget.

The evaluation will include program policy factors such as the relevance of the proposed research to the terms of the announcement and the Department's programmatic needs. External peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Non-federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

The Catalog of Federal Domestic Assistance number for this program is 81.049, and the solicitation control number is ERFAP 10 CFR Part 605.

Martin Rubinstein
Grants and Contracts Division
Office of Science

Posted on the Office of Science Grants and Contracts Web Site
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