

Funding Opportunities

NSF 09-502 Major Research Instrumentation Program

<http://www.nsf.gov/pubs/2009/nsf09502/nsf09502.htm>

This is a limited submission proposal. A letter of intent is due November 17, 2008 and a preproposal is due to the VPR's office December 15, 2008. For complete instructions, please go to

<http://dagon.admin.purdue.edu/cgi-bin/lcid.cgi>

NSF Applied Mathematics

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5664&org=NSF&sel_org=NSF&from=fund

- Full Proposal Window: November 1, 2008 – November 15, 2008

Supports mathematics research motivated by or having an effect on problems arising in science and engineering. Mathematical merit and novelty, as well as breadth and quality of impact on applications, are important factors. Proposals to develop critical mathematical techniques from individual investigators as well as interdisciplinary teams are encouraged.

NSF 05-608 Astronomy and Astrophysics Research Grants (AAG)

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf05608

- Full Proposal Window: September 15, 2008 – November 15, 2008

The Astronomy and Astrophysics Research Grants (AAG) Program provides individual investigator and collaborative research grants for observational, theoretical, laboratory and archival data studies in all areas of astronomy and astrophysics, including but not limited to the following areas of study:

- Planetary Astronomy: Studies of the detailed structure and composition of the surfaces, interiors and atmospheres of the planets and satellites in the Solar System; the nature of small bodies (asteroids and comets); the inter-planetary medium; and the origin and development of the Solar System.
- Stellar Astronomy and Astrophysics: Studies of the structure and activity of the Sun and other stars; the physical properties and composition of all types of single and multiple stars; compact objects and their interactions; extra-solar system planet formation and detection; star formation and stellar evolution; stellar nucleosynthesis; and the properties of atoms and molecules of relevance to stellar astronomy.
- Galactic Astronomy: Studies on the composition, structure and evolution of the Milky Way galaxy and nearby galaxies. Research may focus on the stellar populations in these galaxies; the characteristics of star clusters; the interstellar medium; and the properties of atomic and molecular constituents of the interstellar medium.
- Extragalactic Astronomy and Cosmology: Studies of the more distant Universe. Research topics include galaxy formation, evolution and interaction; active galaxies; quasars; large-scale structure; and all areas of cosmology.

Proposals submitted to the AAG Program do not require categorization into one of the study areas identified above. Proposals may span multiple disciplines and/or areas of study and may utilize multiple techniques. Principle Investigators are encouraged to contact one of the Program Officers listed in this announcement prior to submitting a proposal to the AAG Program, particularly if the proposal will include investigators at multiple institutions.

NSF 08-578 CISE Cross-Cutting Programs: FY 2009 and FY 2010

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08578

- Full Proposal Window: Large Projects – total budget \$1,200,001 - \$3,000,000 for up to five years – November 1, 2008 – November 28, 2008
- Full Proposal Window: Small Projects – budget up to \$500,000 for up to three years – December 1, 2008 – December 17, 2008

This solicitation seeks proposals in cross-cutting areas that are scientifically timely, and that benefit from the intellectual contributions of researchers with expertise in a number of computing fields and/or sub-fields. The cross-cutting programs for FY 2009 and 2010 are:

- Data-intensive Computing;
- Network Science and Engineering; and
- Trustworthy Computing.

The full descriptions of these programs can be found in the *II. Program Description* section of this solicitation.

CISE expects that over time, these cross-cutting programs will evolve or be absorbed into the core programs, and that new cross-cutting programs will be introduced. The directorate anticipates receiving proposals in the Data-intensive Computing, Network Science and Engineering, and Trustworthy Computing programs at least through the FY 2010 competition (i.e. receiving proposals through December 2009).

NSF 08-576 Computer and Network Systems (CNS): Core Programs

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08576

- Full Proposal Window: Large Projects – November 1, 2008 - -November 28, 2008
- Full Proposal Window: Small Projects – December 1,2008 – December 17, 2008

CISE's Division of Computer and Network Systems (CNS) supports research and education projects that develop new knowledge in two core programs:

- The Computer Systems Research (CSR) program; and
- The Networking Technology and Systems (NeTS) program.

Proposers are invited to submit proposals in three project classes, which are defined as follows:

- Small Projects - up to \$500,000 total budget with durations up to three years;
- Medium Projects - \$500,001 to \$1,200,000 total budget with durations up to four years; and
- Large Projects - \$1,200,001 to \$3,000,000 total budget with durations up to five years.

A more complete description of the three project classes can be found in section *II. Program Description* of this document.

CISE investments in Small, Medium and Large projects complement the directorate's investments in the Expeditions in Computing program, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503169&org=CISE&from=home, where projects are funded at levels of up to \$10,000,000 total for durations up to 5 years.

NSF 08-577 Computing and Communications Foundations: Core Programs

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08577

- Full Proposal Window: Large Projects – November 1, 2008 – November 28, 2008
- Full Proposal Window: Small Projects – December 1, 2008 – December 17, 2008

CISE's Division of Computing and Communication Foundations (CCF) supports research and education projects that develop new knowledge in three core programs:

- The Algorithmic Foundations program;
- The Communications and Information Foundations program; and
- The Software and Hardware Foundations program.

Proposers are invited to submit proposals in three project classes, which are defined as follows:

- Small Projects - up to \$500,000 total budget with durations up to three years;
- Medium Projects - \$500,001 to \$1,200,000 total budget with durations up to four years; and
- Large Projects - \$1,200,001 to \$3,000,000 total budget with durations up to five years.

A more complete description of the three project classes can be found in section *II. Program Description* of this document.

CISE investments in Small, Medium and Large projects complement the directorate's investments in the Expeditions in Computing program,

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503169&org=CISE&from=home, where projects are funded at levels of up to \$10,000,000 total for durations up to 5 years.

NSF 08-599 Emerging Frontiers in Research and Innovation 2009 (EFRI – 2009)

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08599

Preliminary Proposal Deadline: December 2, 2008 REQUIRED

Full Proposal Deadline: April 30, 2009

The Directorate for Engineering at the National Science Foundation has established the Office of Emerging Frontiers in Research and Innovation (EFRI) to serve a critical role in focusing on important emerging areas in a timely manner. The EFRI Office is launching a new funding opportunity for interdisciplinary teams of researchers to embark on rapidly advancing frontiers of fundamental engineering research. For this solicitation, we will consider proposals that aim to investigate emerging frontiers in the following two specific research areas: (1) BioSensing & BioActuation: Interface of Living and Engineered Systems (BSBA), and (2) Hydrocarbons from Biomass (HyBi). EFRI seeks proposals with transformative ideas that represent an opportunity for a significant shift in fundamental engineering knowledge with a strong potential for long term impact on national needs or a grand challenge. The proposals must also meet the detailed requirements delineated in this solicitation.

NSF 08-604 Cyber-Enabled Discovery and Innovation (CDI)

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08604

- Preliminary Proposal Window: **TYPE I** : November 8, 2008 – December 8, 2008
- Preliminary Proposal Window: **TYPE II**: November 9, 2008 – December 9, 2008
- Full Proposal Window: **TYPE I AND TYPE II**: April 20, 2009 – May 20, 2009

Cyber-Enabled Discovery and Innovation (CDI) is NSF's bold five-year initiative to create *revolutionary* science and engineering research outcomes made possible by innovations and advances in computational thinking. Computational thinking is defined comprehensively to encompass computational concepts, methods, models, algorithms, and tools. Applied in challenging science and engineering research and education contexts, computational thinking promises a profound impact on the Nation's ability to generate and apply new knowledge. Collectively, CDI research outcomes are expected to produce paradigm shifts in our understanding of a wide range of science and engineering phenomena and socio-technical innovations that create new wealth and enhance the national quality of life.

CDI seeks ambitious, transformative, multidisciplinary research proposals within or across the following three thematic areas:

- **From Data to Knowledge:** *enhancing human cognition and generating new knowledge from a wealth of heterogeneous digital data;*
- **Understanding Complexity in Natural, Built, and Social Systems:** *deriving fundamental insights on systems comprising multiple interacting elements; and*
- **Building Virtual Organizations:** *enhancing discovery and innovation by bringing people and resources together across institutional, geographical and cultural boundaries.*

With an emphasis on bold multidisciplinary activities that, through computational thinking, promise radical, paradigm-changing research findings, CDI promotes transformative research within NSF. Accordingly, investigators are encouraged to come together in the development of far-reaching, high-risk science and engineering research and education agendas that capitalize on innovations in, and/or innovative use of, computational thinking. Research and education efforts around the world are beginning to address various aspects of the CDI themes, and CDI projects are expected to build upon productive intellectual partnerships involving investigators from academe, industry and/or other types of organizations, including international entities, that advance CDI objectives within the rapidly evolving global context.

Congruent with the three thematic areas, CDI projects will enable transformative discovery to identify patterns and structures in massive datasets; exploit computation as a means of achieving deeper understanding in the natural and social sciences and engineering; abstract, model, simulate and predict complex stochastic or chaotic systems; explore and model nature's interactions, connections, complex relations, and interdependencies, scaling from sub-particles to galactic, from subcellular to biosphere, and from the individual to the societal; train future generations of scientists and engineers to enhance and use cyber resources; and facilitate creative, cyber-enabled boundary-crossing collaborations, including those with industrial and international dimensions, to advance the frontiers of science and engineering and broaden participation in STEM fields.

Two types of CDI awards will be supported as a result of the FY 2009 CDI competition:

- Type I awards will require efforts up to a level roughly comparable to: summer support for two investigators with complementary expertise; two graduate students; and their collective research needs (e.g. materials, supplies, travel) for three years.
- Type II awards will require larger (than Type I) efforts up to a level roughly comparable to: summer support for three investigators with complementary expertise; three graduate students; one or two senior personnel (including post-doctoral researchers and staff); and their collective research needs (e.g. materials, supplies, travel) for four years. The integrative contributions of the Type II team should clearly be greater than the sum of the contributions of each individual member of the team.

In subsequent years, subject to availability of funds, funding opportunities will be provided for three classes of awards, Types I and II as defined above, and Type III as defined below:

- Type III awards will require the engagement of larger (than Type II) multidisciplinary teams, roughly comparable to multiple senior investigators with complementary expertise, multiple graduate students, several senior personnel, and their collective research needs (e.g. materials, supplies, travel) for up to five years. As for Type II awards, the integrative contributions of the Type III team should be clearly greater than the sum of the contributions of each individual member of the team.

NSF Computational Mathematics

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5390&org=NSF&sel_org=NSF&from=fund

- Full Proposal Window: December 1, 2008 – December 15, 2008

Supports mathematical research in areas of science where computing plays a central and essential role, emphasizing algorithms design, numerical methods and their analysis, and symbolic methods. The prominence of computation in the research is a hallmark of the program. Proposals ranging from single-investigator projects that develop and analyze innovative computational methods to interdisciplinary team projects that not only create new mathematical and computational techniques but use them to model, study, and solve important application problems are encouraged.

NSF 08-575 Information and Intelligent Systems (IIS):Core Programs

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08575

- Full Proposal Window: Large Projects November 1, 2008 – November 28, 2008
- Full Proposal Window: Small Projects: December 1, 2008 – December 17, 2008
- Full Proposal Window: Medium Projects: August 1, 2009 – August 30, 2009

CISE's Division of Information and Intelligent Systems (IIS) supports research and education projects that develop new knowledge in three **core programs**:

- The Human-Centered Computing program;
- The Information Integration and Informatics program; and
- The Robust Intelligence program.

Proposers are invited to submit proposals in three project classes, which are defined as follows:

- Small Projects - up to \$500,000 total budget with durations up to three years;
- Medium Projects - \$500,001 to \$1,200,000 total budget with durations up to four years; and
- Large Projects - \$1,200,001 to \$3,000,000 total budget with durations up to five years.

A more complete description of the three project classes can be found in section *II. Program Description* of this document.

CISE investments in Small, Medium and Large projects complement the directorate's investments in the Expeditions in Computing program, http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08568&org=NSF, where projects are funded at levels of up to \$10,000,000 total for durations up to 5 years.

NSF 08-591 Industry/University Cooperative Research Centers Program (I/UCRC)

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08591

- Letter of Intent Deadline: January 2, 2009 - Letter of intent is only needed when submitting a planning grant proposal.
- Full Proposal Deadline: March 6, 2009

The Industry/University Cooperative Research Centers (I/UCRC) program develops long-term partnerships among industry, academe, and government. The centers are catalyzed by a small investment from the National Science Foundation (NSF) and are primarily supported by industry center members, with NSF taking a supporting role in their development and evolution. Each center is established to conduct research that is of interest to both the industry and the center. An I/UCRC not only contributes to the Nation's research infrastructure base and enhances the intellectual capacity of the engineering and science workforce through the integration of research and education, but also encourages and fosters international cooperation and collaborative projects.

NSF 07-502 Scientific Computing Research Environments for the Mathematical Sciences (SCREMS)

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf07502

- Full Proposal Deadline: January 22, 2009

The Division of Mathematical Sciences (DMS) of the National Science Foundation plans a limited number of awards for the support of computing environments for research in the mathematical sciences. Scientific Computing Research Environments for the Mathematical Sciences (SCREMS) proposals are for computing environments dedicated to research in the mathematical sciences. Proposals may request support for the purchase of computing equipment and limited support for professional systems administrators or programmer personnel for research computing needs. These grants are intended to support research projects of high quality that require access to advanced computing resources. Requests for routine upgrades of standard desk-environment workstations or laptop computers are not appropriate for this program. Awards are made to provide support for specific research projects rather than to provide general computing capacity. Proposers are encouraged to include projects involving symbolic and algebraic computations, numerical computations and simulations, and graphical representations (visualization) in aid of the research.

NSF Strategic Technologies for Cyberinfrastructure (STCI)

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=500066&org=NSF&sel_org=NSF&from=fund

- Full Proposal Target Date: February 12, 2009

The primary purpose of the Strategic Technologies for Cyberinfrastructure Program (STCI) is to support work leading to the development and/or demonstration of innovative cyberinfrastructure services for science and engineering research and education that fill gaps left by more targeted funding opportunities. In addition, it will consider highly innovative cyberinfrastructure education, outreach and training proposals that lie outside the scope of targeted solicitations.

The National Science Foundation provides a number of targeted funding opportunities for the development of cyberinfrastructure, for the provision of cyberinfrastructure services, and for related education, outreach and training. However, cyberinfrastructure technology and training are broad continua. It is anticipated that, at any given time, there will be ideas that do not map neatly onto the extant portfolio of cyberinfrastructure solicitations yet have a high potential impact on research and education. Accordingly, the Strategic Technologies for Cyberinfrastructure program will accept proposals for cyberinfrastructure

development, demonstration, education, outreach and training activities that are not aligned with the specific goals of other existing cyberinfrastructure funding opportunities and which have the potential to transform multiple areas of research or education.

Projects appropriate for this program should:

- Be activities that include a demonstration of the potential impact on science or engineering research or education;
- Generate outcomes not currently under development elsewhere;
- Meet a clearly described cyberinfrastructure need not met elsewhere;
- Generate outcomes that will be of interest to a range of science and engineering communities.

Investigators interested in submitting proposals with large budgets (roughly \$500,000 per year or larger) are encouraged to develop strong support from within the science and engineering community prior to submitting a proposal and to document this support within the proposal; for example, in the form of references to workshop reports, reports from the National Academies of Science or Engineering, or other reports based on broad community input, on the topic proposed.

Proposals should include a clear and compelling description of why the proposed work has the potential to significantly advance research or education capabilities in multiple areas of science and engineering. Proposals should also provide a convincing explanation of why the project is not suitable for other NSF programs or solicitations.

Before developing a proposal intended for this Program, investigators are encouraged to discuss their ideas with program officers associated with the Program to check that there is no targeted solicitation in development for which the project would be a better fit.

Proposals for workshops, symposia and Small Grants for Exploratory Research clearly related to the scope of the Program described above, may be submitted. For general information about how to submit such proposals, please see the Grant Proposal Guide.

NSF 08-574 George E. Brown Jr. Network for Earthquake Engineering Simulation Operations (NEES Ops)

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08574

- Full proposal deadline: February 13, 2009

The Division of Civil, Mechanical and Manufacturing Innovation (CMMI) in the Directorate for Engineering (ENG) of the National Science Foundation (NSF) is soliciting proposals for network-wide leadership, management, operations, and maintenance of the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) from October 1, 2009 through September 30, 2014. NEES is a NSF-supported shared resource of experimental facilities and cyberinfrastructure for research and education to advance knowledge discovery and innovation to reduce losses from earthquakes. The NEES experimental infrastructure comprises a network of 15 earthquake engineering equipment sites, located at universities across the United States, available for testing on-site, in the field, or through telepresence. The NEES equipment sites include shake tables, geotechnical centrifuges, a tsunami wave basin, unique large-scale testing laboratories, and mobile and permanently installed field equipment. The NEES cyberinfrastructure connects the equipment sites, via Internet2, and provides data curation and a curated central data repository; telepresence; simulation, computational, data visualization, and collaborative tools; hybrid (coupled computational and physical) simulation and multi-site hybrid simulation capabilities; user support services; middleware; and a cybersecurity framework.

A single award will be made for NEES operations, as a cooperative agreement, for a duration of five years from October 1, 2009 to September 30, 2014. The awardee will use this NSF support to provide governance, a network-wide management headquarters, and subawards to the equipment sites and cyberinfrastructure, education, outreach, and other partner organizations based on the awardee's strategic

plan, policies and procedures, annual goals and priorities, and the terms and conditions of the cooperative agreement. The NEES equipment sites are not being competed as part of this solicitation and no new equipment sites will be added to NEES as a result of this competition. Cyberinfrastructure operations and education and outreach activities are being competed as part of the award to be made under this solicitation and proposers should address these in their proposal submission. The awardee itself will not conduct research under this cooperative agreement; NSF separately funds researchers and educators to use NEES.