

Human and Social Dynamics: Special Competition for FY 2003 (HSD)

Program Solicitation

NSF 03-552



National Science Foundation

Directorate for Social, Behavioral, and Economic Sciences

Division of Behavioral and Cognitive Sciences

Division of Social and Economic Sciences

Full Proposal Deadline(s) (due by 5 p.m proposer's local time):

June 11, 2003

Deadline for Enhancing Human Performance (EHP) Proposals

June 12, 2003

Deadline for Empirical Implications of Theoretical Models (EITM) Proposals

July 15, 2003

Deadline for Decision Making Under Uncertainty (DMUU) Center Proposals

July 15, 2003

Deadline for Decision Making Under Uncertainty (DMUU) Developmental Proposals

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Human and Social Dynamics: Special Competition for FY 2003 (HSD)

Synopsis of Program:

This special competition inaugurates the Human and Social Dynamics (HSD) priority area. This priority area aims to develop and apply multi-scaled, multi-disciplinary approaches to better understand the causes and ramifications of change and to increase collective capabilities to anticipate its complex consequences. A related goal is to improve the understanding of the dynamics of behavior and the human mind. HSD also aims to advance knowledge of the cognitive and social structures that create and define change and to help people and organizations better manage profound or rapid change. In this initial year of a multi-year effort, the following topical areas will be emphasized: (A) Decision Making Under Uncertainty (DMUU), a part of the President's Climate Change Research

Initiative; (B) Enhancing Human Performance (EHP); and (C) Empirical Implications of Theoretical Models (EITM).

In all areas, emphasis is placed on advancement of fundamental understanding within and across the social, behavioral, and economic science disciplines as well as related science and engineering disciplines. Emphasis also is placed on the integration of theoretical and empirical research. Four special competitions will be conducted in FY 2003. Two relate to the Decision Making Under Uncertainty topical area. One DMUU special competition (A1) will emphasize the establishment of centers where teams of researchers in partnership with decision makers and other stakeholders advance knowledge about decision-making processes and develop decision-support tools and other products that will facilitate decision making associated with climate change. A second DMUU special competition (A2) will provide support for developmental activities to advance longer-term capabilities for conducting fundamental research on decision making associated with climate change. A third HSD special competition (B) will focus on Enhancing Human Performance; a fourth (C) will focus on Empirical Implications of Theoretical Models. For the EHP and EITM special competitions, individuals and small groups of investigators as well as teams may submit proposals to advance fundamental understandings and achieve a range of broader impacts.

Cognizant Program Officer(s):

- Please see the full text of this funding opportunity for contact information.

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.075 --- Social, Behavioral and Economic Sciences

Eligibility Information

- **Organization Limit:** None Specified.
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** None Specified.

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant or Cooperative Agreement
- **Estimated Number of Awards:** 45 to 55 - (3 to 5 cooperative agreements for DMUU Centers, 7 to 10 standard grants for DMUU Developmental awards, 25 to 30 standard or continuing grants for EHP awards, and 10 to 12 standard grants for EITM awards)
- **Anticipated Funding Amount:** \$10,000,000 (approximately \$10,000,000 will be awarded across all subcompetitions, pending the availability of funds in FY 2003 and FY 2004)

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Full Proposal Deadline Date(s)** (due by 5 p.m proposer's local time):
 - June 11, 2003
 - Deadline for Enhancing Human Performance (EHP) Proposals
 - June 12, 2003
 - Deadline for Empirical Implications of Theoretical Models (EITM) Proposals
 - July 15, 2003
 - Deadline for Decision Making Under Uncertainty (DMUU) Center Proposals
 - July 15, 2003
 - Deadline for Decision Making Under Uncertainty (DMUU) Developmental Proposals

Proposal Review Information

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Additional reporting requirements apply. Please see the full text of this solicitation for further information.

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I. INTRODUCTION

At the dawn of the twenty-first century, uncertainty and change are inescapable facts of life. The tragedy of September 11, 2001, emphasized that Americans were not immune from the world's bloody conflicts. Sudden changes in the fortunes of many firms have shaken faith in the new economy. Advances in biotechnology have brought with them the promise of postponing aging and conquering disease, but they also have exacerbated major rifts in conceptions of human life and ethical research. Computer technology has created a wealth of new employment opportunities, transformed many jobs and rendered many others obsolete. Workplace rewards for education have increased dramatically, but these improvements have not yet had a significant impact for many people, nor is the nation's educational system producing a sufficiently large and globally competitive science and technological workforce.

Social and knowledge systems do not develop independently. Humans develop new knowledge that leads to new technologies. Social institutions shape what is produced and determine how these new products become part of everyday life. People and institutions respond to and are sometimes buffeted by new knowledge and technologies. Understanding the human and social dynamics underlying these complex interdependencies is essential for our nation's continued progress. Multi-scaled, multi-disciplinary approaches, many of which have been made possible by recently acquired knowledge and new technologies, can yield this understanding.

To address contemporary problems and to advance fundamental knowledge and the welfare of the nation, the National Science Foundation will develop and apply multidisciplinary approaches through a new Human and Social Dynamics (HSD) priority area. This priority area seeks to better understand the causes and ramifications of change; to increase our collective ability to anticipate the complex consequences of change; to better understand the dynamics of behavior and the human mind; to better understand the cognitive and social structures that create and define change; and to help people and organizations better manage profound or rapid change.

The goals of HSD priority area are:

- To develop a comprehensive, multi-disciplinary approach to understanding human and social dynamics;
- To capitalize on the convergence in biology, engineering, nanotechnology, information technology, and cognition to advance the understanding of behavior and performance at both the individual and social levels;
- To refine knowledge about decision making, risk, and uncertainty and to learn how to translate this knowledge into improved decision making;
- To develop the broad range of infrastructure needed to support transformative interdisciplinary research; and
- To create relevant large-scale data resources and advance methodological frontiers, such as agent-based modeling, complex network analysis, non-linear dynamics, computer-assisted qualitative analysis, multi-level, multi-scalar analysis and other innovations grounded in measurement research and new technologies. These will provide the foundation for social and behavioral investigations for the next decade.

The Human and Social Dynamics priority area will be developed over the following five years with the guidance of an implementation team consisting of representatives of all of NSF's directorates. During its expected full implementation period from 2004 to 2008, the HSD priority area is expected to encourage and facilitate research, education, and related activity on six major themes:

- **Enhancing human performance.** Research on behavior, cognition, development, emotion, language, neuroscience, and social interaction in conjunction with advances in biology, engineering, nanotechnology, robotics, and information technology will aid the development of approaches for enhancing human performance. Research on organizations, markets, and informal groups will advance understanding of how social structure interacts with human capacities to encourage or impede performance.
- **Decision making.** Research will analyze decision making in normal and crisis circumstances, the implications of distributed versus centralized decision-making systems, and risk assessment and management. Research also will aim at the development of databases, decision-support tools, and other approaches to facilitate effective decision making.
- **Agents of change.** Research will examine large-scale transformations, such as globalization and democratization; the reciprocal relationship between individual and social action; the evolution of society and its interaction with climate, geography and environment; the implications of cultural variation for conflict and assimilation; the implication of such transformations for

diversity and equality; and adaptation and resistance to technological change and new science-based knowledge.

- **Modeling human and social dynamics.** Research will explore the modeling of complex networks, such as social groups, large organizations, communication grids, and economic systems; approaches that integrate formal modeling and empirical modeling in transparent ways; and group and societal behavior that results from numerous individual or small group actions and decisions. Promising lines of inquiry may include the development and application of stochastic agent-based modeling, complex social network analysis, and techniques for modeling human behavior and interaction using innovative information and engineering technologies.
- **Spatial social science.** Research will consider how recent technological advances like embedded sensors, global positioning systems, and geographic information systems are providing tools and techniques for acquiring information about location that can be combined with behavioral, demographic, political, health-related and other social data to advance fundamental understandings of human and social dynamics, to more fully develop the spatial dimensions of human and social dynamics, and to expand the utility and accessibility of the tools that make spatial analysis possible.
- **Instrumentation and data resource development.** Research infrastructure will be enhanced through the development of instrumentation and software that takes advantage of advanced technologies. Data resources will be expanded in a variety of formats, including new and extended longitudinal databases, tools suitable for data-rich linguistic analysis and corpus linguistics, and mechanisms for preserving confidentiality in databases that incorporate sensitive biological, behavioral, and social information.

To prepare for the full development of the HSD priority area, the Division of Behavioral and Cognitive Sciences and the Division of Social and Economic Sciences in the Directorate for Social, Behavioral, and Economic Sciences will conduct four special competitions in three interdisciplinary topic areas during Fiscal Year 2003. NSF expects that a broader range of competitions will be conducted in future fiscal years.

Three interdisciplinary areas will be emphasized and supported during the FY 2003 competition, pending availability of funds. These areas are:

- **Decision Making Under Uncertainty (DMUU),** supporting research, education, and outreach that increases understanding of decision-making processes and of the information needed by decision makers, develops tools to support decision makers and increases their ability to make sound decisions, and facilitates interaction among researchers and decision makers. This topical area is part of the President's Climate Change Research Initiative (CCRI) and will include two special competitions, one establishing a set of centers and one supporting developmental projects.
- **Enhancing Human Performance (EHP),** supporting research that increases fundamental understanding of human performance through basic research in the behavioral, cognitive, and social sciences and that strengthens links between these sciences and other relevant research communities, especially, biology, engineering, robotics, and information technology. This topical area will include one special competition.
- **Empirical Implications of Theoretical Models (EITM),** supporting research and related activities that encourage the integration of empirical research and formal modeling in and across the social and behavioral science disciplines; stimulates innovative research that systematically ties the specification of formal theories to empirical tests of those theories; and supports pilot and planning projects, particularly those involving new combinations of empirical and formal research approaches. This topical area will include one special competition.

II. PROGRAM DESCRIPTION

Because of possible uncertainties regarding the availability of funds, proposers are urged to regularly check www.nsf.gov/sbe/hsd03/update.htm for updates regarding the status and timing of this competition.

Proposals submitted for one of the Human and Social Dynamics FY 2003 special competitions must be focused on research in one of the topical areas described below.

TOPICAL AREAS

A. Decision Making Under Uncertainty (DMUU)

As part of the President's Climate Change Research Initiative (CCRI), a multi-agency activity designed to study areas of uncertainty in climate change and to identify priority areas where focused investments could make a difference, NSF has designated \$5 million in funding during FY 2003 to support research on decision making under uncertainty related to climate change and variability. In the context of this competition, decision making is defined broadly and includes actions associated with adaptation to climate change and variability as well as decisions associated with mitigation strategies. Decision makers also are considered broadly, and may include private citizens; informal and formal groups, firms, organizations; and governments ranging from the local to state and federal levels. As scientific research has increased knowledge about the causes and consequences of climate change and variability, awareness has grown of the need to better understand how decision makers can choose more effectively among alternative courses of action. The goals of NSF's Decision Making Under Uncertainty funding opportunity in the Climate Change Research Initiative are:

- To improve understanding of all facets of decision-making processes related to climate change and other problems for which information exists but uncertainty remains.
- To increase knowledge of the content and form of information needed by decision makers.
- To develop tools to support decision makers and increase their ability to make sound decisions over multiple time scales.
- To facilitate interaction among researchers and decision makers, thereby enhancing fundamental research and increasing the speed with which new research findings are adopted and used by decision makers.

For the FY 2003 special competition, NSF invites proposals for the following activities: (1) centers focused on research, education, and outreach and (2) developmental activities, such as workshops and exploratory research proposals.

1. **DMUU Centers**

NSF seeks proposals for the creation of interdisciplinary centers that will produce new knowledge, information, and tools related to decision making under uncertainty associated with longer-term climate change and shorter-term climate variability. Centers are expected to conduct integrative research on scales larger than normally would be expected through individual research projects. The size, structure, collaborative arrangements, and operation of each center should be appropriate for the proposed research, education, and outreach activities the center plans to undertake. To be competitive, proposed centers should exhibit the following characteristics:

- The center must conduct fundamental research on decision making associated with climate change and variability. The research should be well grounded in relevant theoretical frameworks based in the social, behavioral, and economic sciences as well as other appropriate science and engineering disciplines. The proposed research program should advance basic understanding of decision processes dealing with issues like inter-temporal choice, risk perception, hazards, disaster reduction, trade-offs, equity, framing, and probabilistic reasoning associated with risky phenomena. The research program should also advance understanding of decision making under uncertainty specifically associated with climate change and variability. To those ends, centers may choose to focus on one or more research themes. Possible themes include:
 - Research that gauges public and stakeholders understanding and evaluation of the causes and consequences of increased climate variability. This kind of research might identify options for addressing risks and develop more effective ways of communicating this information to relevant parties through education and other forms of communication.
 - Research on the interconnected issues related to socio-economic stability and insurance. The availability of stable insurance markets is crucial to maintaining healthy communities. This line of inquiry could recognize that climate change is one of several major issues challenging the stability

and solvency of insurance markets, and it would aim to develop and test innovative methods to assess and allocate financial risks associated with climate change.

- Research that focuses on potentially vulnerable communities and ecologically sensitive places. Inquiries associated with this theme could build on identification of many American landscapes and ecosystems as threatened by climate change and variability as well as other stresses associated with land-use change and other human activities. These inquiries might yield new tools for evaluating the vulnerability of different locales and methods for assessing the viability of different strategies for maintaining environmental quality.
 - Research on decision making associated with different kinds of strategies for adapting to and/or mitigating climate change in specific places.
 - Research that develops the databases, tools, and fundamental knowledge about global biophysical and socioeconomic systems needed to make more effective national and international decisions regarding climate change. This line of research could develop better methods for reaching decisions about global climate change risks using scientific models of interdependent biophysical and socioeconomic global systems in which there is a great deal of uncertainty about underlying parameters and key relationships.
- The center must develop tools that people, organizations, and governments can use to better understand the risks associated with climate variability and change and the options they have to address those risks. Proposals must address how the basic research can help people and/or organizations make better-informed decisions to cope with the potential consequences of climate change.
 - The center must provide education and research opportunities for U.S. students and faculty. The groups to be served through these educational efforts may be varied, and include undergraduate and graduate students, postdoctoral researchers, students from groups underrepresented in the social and behavioral sciences, K-12 teachers, and visiting scientists and engineers.
 - The center must develop and disseminate tangible products for researchers, decision makers and other relevant stakeholders. As part of its dissemination plan, the center may include the development of user-friendly web sites and/or other mechanisms to facilitate the dissemination of climate change information and its effective use in decision making.
 - The center must participate in each of the set of annual conferences to be held in FYs 2004 through 2007 that will bring together researchers from all centers funded by this activity, other researchers, and relevant decision makers and stakeholders. In addition, each center will host at least one of the conferences. (Funding for hosting a conference will be provided separately through a supplement during the year of the conference to be negotiated between NSF and the host institution.)
 - The center must be based at a U.S. academic institution, where it is directed by a faculty member and integrated into the institution's academic programs. Other institutions, including non-academic institutions, may participate as partners with the lead institution.
 - The center must consist of a multidisciplinary team of researchers, and the team's research must be firmly grounded in the social, behavioral, and economic sciences. The research may also draw on and contribute to theoretical frameworks based in other science and engineering disciplines.

Pending the availability of funds, NSF expects to reserve approximately \$4.5 million for center awards in FY 2003. Support for centers will be provided through cooperative agreements. NSF anticipates supporting three to five centers at levels of \$900,000 to \$1,500,000 annually for up to five years of support. No annual budget in a DMUU Center proposal should exceed \$1,500,000.

Through the multi-agency Climate Change Research Initiative, NSF will coordinate its activities with those of other federal agencies. Depending on the lines of research and products to result from funded centers, additional support from other agencies may be available.

2. ***DMUU Developmental Activities***

In order to identify research gaps or future research needs for decision making under uncertainty related to climate change, NSF invites investigators to submit proposals for workshops or symposia, high-risk exploratory research efforts, or supplements to current awards. Standard grants for developmental activities will be made on a one-time basis and will not exceed \$100,000 for the duration of the award. NSF expects to reserve approximately \$500,000 for the support of developmental activities in FY 2003.

B. Enhancing Human Performance (EHP)

From the classroom to the workplace, and in every other sphere of society, people strive to live happier, healthier, and more productive lives. A significant challenge for social and behavioral researchers is to gain a better understanding of everyday human performance and action and of how such performance is influenced by rapid change. Research on behavior, cognition, development, emotion, language, neuroscience, cultural understanding, and social interaction is converging with advances in biology, engineering, robotics, and information technology to show how people can improve performance in the face of rapid change. Research on the effects of cultural, socioeconomic, and other contexts will also shed light on factors that constrain or enhance human performance. To advance research on these interrelated topics, NSF has designated \$4 million in FY 2003 to support research on Enhancing Human Performance (EHP). The goals of this first EHP special competition are:

- To increase fundamental understanding of basic research on human performance in the behavioral, cognitive, and social sciences.
- To strengthen links between these research communities and other relevant communities, especially biology, engineering, robotics, and information technology.

The EHP special competition seeks to support research projects that meet these goals. Proposed projects must include a strong focus on individual performance, but they can also examine one of the broader contextual settings that influences individual performance alone or in groups. Especially encouraged are projects that examine three broad areas that relate human performance and rapid change:

- The behavioral, cognitive, social, and cultural context of human performance in a changing world.
- The development of human performance, ranging from lifespan to evolutionary scales of time, and how it interacts with a changing world.
- How the design and engineering of physical and social infrastructures can be psychologically and socially relevant to a changing world.

Proposals submitted for the EHP special competition are most likely to be considered by one or more programs in the [Division of Behavioral and Cognitive Sciences](#), but relevant proposals from other disciplinary traditions and interdisciplinary proposals are welcome. In addition to the \$4,000,000 reserved explicitly for the EHP special competition, it is expected that standing NSF programs will provide additional funds for the support of projects. NSF therefore expects to make 25 to 30 standard or continuing grants ranging in size from \$75,000 to \$200,000 annually, with grants averaging three years in duration. NSF also expects to make a limited number of developmental awards for workshops or symposia, high-risk exploratory research efforts, or supplements to current awards. Standard grants for developmental activities will be made on a one-time basis and will not exceed \$100,000 for the duration of the award.

C. Empirical Implications of Theoretical Models (EITM)

The last thirty years have seen major advances in the methods available to derive and test scientific theories of human behavior, as reflected in both the behavior of individuals and the behavior of groups and organizations. These methodological advances have contributed to the development of new paradigms for understanding complex and dynamic interrelationships among people by allowing more rigorous analysis and more sophisticated tests of propositions about human behavior. Among these developments are:

- Game theory, which captures bargaining, strategic behavior, and asymmetric information.
- Bounded-rationality theory, which provides a rigorous and realistic basis for studying human decision making.
- Dynamic stochastic models, which provide powerful analytical methods for studying social and economic dynamics under uncertainty.
- Network, contact, and diffusion models, which provide new insights into how humans and groups are linked and the implications of different linking structures.
- Agent-based modeling, which increases knowledge of how individual behavior aggregates to form patterned behavior.

A valuable synergy exists between formal and empirical analysis. Formal models generate transparent relations and predictions, most of which can be empirically tested. Robust empirical findings can support or question model assumptions and allow more adequate models to be generated. An example of such synergies is found in the development of "rank-dependent utility models" in behavioral economics. One formal model based on expected-utility theory was used to generate empirical predictions. Empirical research demonstrated that these predictions were systematically inaccurate, which led to the development of a new class of formal models that preserved the mathematical rigor of expected-utility theory but did a better job of describing actual behavior. Research supported through the EITM special competition should promise such synergies.

These kinds of methodological advances have the potential to transform and dramatically improve scientific empirical and substantive research on social change and human behavior. In order to more fully realize this potential, advanced theoretical research and sophisticated empirical research need to be linked more effectively in many of the social and behavioral sciences. To accelerate and encourage research linking formal models with sophisticated empirical tests, NSF has designated \$1,000,000 for a special competition on Empirical Implications of Theoretical Models (EITM).

Research supported through this special competition is intended to disseminate these formal and empirical links into the mainstream of research and to develop new generations of analytical and forecasting tools. New insights into important and pressing social, economic, and political scientific topics will occur as research combines the most advanced and promising formal scientific theories of social behavior with important substantive empirical research. The goals of the EITM special competition are:

- To encourage the integration of empirical research and formal modeling in and across social and behavioral science disciplines.
- To stimulate innovative research that systematically ties the specification of formal theories to empirical tests of those theories.
- To support pilot and planning projects, particularly those involving new combinations of empirical and formal research approaches.

The EITM special competition seeks to support research that will integrate the formal (mathematical) delineation of theories with testable empirical specifications of what these delineations imply. Research projects funded through this competition should develop new formal models or clearly specify the implications of insufficiently tested existing models. The research should permit empirical testing of the plausibility of the original model, and it should allow the construction of a refined model that is empirically more adequate. To qualify for EITM funding, a proposal therefore **must** have both formal and empirical components, and those components must be integrated. Proposals not meeting this criterion will be returned without review.

For the purposes of this competition, formal models include models specified by axiomatic systems (such as game theory, dynamic stochastic modeling, expected utility theory, Bayesian probability theory) and computational models (such as computer simulations). Empirical components include (but are not limited to) applied statistical procedures and experiments. "Hybrid" techniques (such as agent-based modeling) are welcome.

In many social and behavioral science disciplines, considerable research already links theoretical and empirical perspectives. Projects using established forms of integration will be considered by standing programs in the NSF

Directorate for Social, Behavioral, and Economic Sciences through their regular competitions. The EITM special competition seeks to support innovative new approaches within and across social and behavioral science disciplines. Examples of new lines of inquiry that might be pursued with EITM funding are research in "behavioral economics," or research in political science that might test game-theoretic designs with real-world data rather than data from standard sub-field experiments. Also encouraged are projects that cross disciplinary barriers that are now rarely breached, such as research that might test a historically rich formal model of economic development or social stratification with archeological or anthropological data.

Proposals submitted for the EITM special competition are most likely to be considered by one or more programs in the [Division of Social and Economic Sciences](#), but relevant proposals from other disciplinary traditions and interdisciplinary proposals are welcome. In addition to \$1,000,000 reserved explicitly for the EITM special competition, it is expected that relevant standing NSF programs will provide matching funds of roughly equivalent amounts. NSF therefore expects to make 10 to 12 standard grants, which will range in size from \$50,000 to \$250,000 and in duration from one to three years. Additional support may be available for EITM proposals that include explicit collaborations between social and/or behavioral scientists and mathematicians and/or statisticians.

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the [Grant Proposal Guide](#) are eligible to submit proposals under this program announcement/solicitation.

IV. AWARD INFORMATION

Estimated program budget, number of awards, and average award size/duration are subject to the availability of funds.

Because of possible uncertainties regarding the availability of funds, proposers are urged to regularly check www.nsf.gov/sbe/hsd03/update.htm for updates regarding the status and timing of this competition.

The expected number and size of awards and award mechanisms for each subcompetition are:

- Decision Making Under Uncertainty for Climate Change (DMUU): NSF expects to support three to five centers through cooperative agreements between NSF and the lead institution. Each center will be supported at a level of \$900,000 to \$1.5 million annually for up to five years. Centers will not be renewed after five years, although NSF may consider requests for supplements to complete development, evaluation, and dissemination of specific products over an additional year or two. NSF expects to support about 7 to 10 developmental projects ranging in size from \$25,000 to \$100,000 through standard grants.
- Enhancing Human Performance (EHP): NSF expects to make 25 to 30 standard or continuing grants ranging in size from \$75,000 to \$200,000 annually, with awards averaging three years in duration.
- Empirical Implications of Theoretical Models (EITM): NSF expects to make 10 to 12 standard grants, which will range in size from \$50,000 to \$250,000 and in duration from one to three years.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Instructions:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the

general guidelines contained in the NSF *Grant Proposal Guide* (GPG). The complete text of the GPG is available electronically on the NSF Website at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

Directing a Proposal to an HSD Topical Area:

Once you have identified the Program Solicitation Number on the proposal Cover Sheet, the three relevant topical areas (DMUU, EHP, and EITM) will be listed in the Program Box. Highlight the topical area that your proposal addresses and click on the "Select Program" button. Your proposal will automatically be assigned on the Cover Sheet to the division that is coordinating management of this competition.

Please note that for both the EHP and EITM special competitions, research proposals that have been submitted to standing programs prior to the respective deadline of these competitions may also be considered in the special competition. Principal investigators who have submitted a proposal to a standing program and who believe it is appropriate for a special competition should contact by e-mail both the program officer of the program to whom they submitted the proposal and the team leader of the special competition for which they would like their proposal considered.

The same investigator may submit more than one proposal to the same or different topical areas only if the proposals are substantively different from each other.

Proposal Format:

All sections of a proposal submitted for any Human and Social Dynamics special competition must be in conformance with GPG. Proposals not in conformance with the proposal-preparation requirements specified in GPG will be returned without review.

This program announcement/solicitation requests materials about the personnel involved in the project. Please use the following definitions to provide the corresponding information:

- **Principal Investigators** -- individuals who would assume responsibility for an award resulting from this competition, would manage the award, and are identified on the cover sheet of the proposal.
- **Senior Project Personnel** -- named individuals who will receive salary support as well as non-salaried senior investigators who will play lead roles in the work of the project. (This group includes all principal investigators.)
- **Project Participants** -- every person involved with the research project, including students.

Project Description

In addition to items to be included in GPG, project descriptions submitted for any of these subcompetitions must include the following sections:

- **Results from prior support.** This section is required only for principal investigators (as defined above) who have received NSF support within the last five years. Refer to GPG, Section II.C.3.
- **Broader impacts.** GPG requires that broader impacts resulting from the proposed project must be addressed in the project description and described as an integral part of the narrative. Examples illustrating activities likely to demonstrate broader impacts are available electronically at www.nsf.gov/pubs/2002/nsf022/bicexamples.pdf. Education and international activities are among the examples.

For the DMUU Centers competition: Project Descriptions may not exceed **20** pages. In addition to the required sections described above, the project description must include the following sections:

- **Narrative description of the focus, research plans, and relevance.** Develop a research focus that is sufficiently long term to justify a center form of organization and agile enough to permit change as the research progresses. Discuss some of the

likely tools that will be developed from this activity.

- **Educational and human resource development.** Discuss the rationale and goals of the proposed education and human resource development activities and how they integrate strategically with the research, tool development, and outreach components of the center.
- **Outreach activities.** Describe products that are expected to result from the project and plans for linking appropriate communities and institutions beyond the sponsoring institution to enhance involvement and knowledge transfer. Partnerships and linkages beyond the boundaries of the academic institution are to be emphasized here.
- **Management plan.** Provide a description of the organizational structure of the center. Specify which individuals will have responsibilities for which projects and activities as well as for overall coordination and management. Outline mechanisms for focusing center activities, selecting and integrating related research and tool development projects, allocating funds and equipment across all center activities, and managing the involvement of other groups, including decision makers and other stakeholders. Describe the role and composition of a diverse external advisory group that will include both researchers and decision makers and that will provide guidance and advice on all center activities.
- **Rationale for the center concept.** Specify why a center is necessary and what unique opportunities will be provided by the proposed center.

For the EHP special competition: Project descriptions are limited to **15** pages in length. Investigators should present a coherent view of their plans within these limits. Proposals should clearly specify all relevant facets of the proposed project. The proposal should outline the theoretical foundations of the project as based in relevant literature. It should specify the methods that will be used, the expertise that different researchers will bring to different facets of the project, and how and where results will be disseminated. In addition to the required sections described above, the project description must include the following section:

- **Relevance for Enhancing Human Performance.** Devote at least one page of the project description to a discussion of how the proposed research will contribute to a better understanding of human performance in the context of a changing world.

For the EITM and DMUU Developmental special competitions: Project descriptions are limited to **15** pages in length. Investigators should present a coherent view of their plans within these limits. Proposals submitted for these competitions should clearly specify all relevant facets of the proposed project. The proposal should outline the theoretical foundations of the project as based in relevant literature. It should specify the methods that will be used, the expertise that different researchers will bring to different facets of the project, and how and where results will be disseminated.

Supplementary Documentation

Appropriate items for inclusion are specified in GPG, Section II.C.9. For example, letters of commitment from collaborating institutions, including foreign institutions, should be placed in this section.

Proposals that include materials in this section that belong in the project description may be returned without review.

Conflicts of Interest

For the DMUU Centers special competition: In addition to the formal submission of the proposal, the principal investigator must send by e-mail a compilation of conflicts of interest information in a spreadsheet format directly to first program officer listed for the DMUU special competitions. The spreadsheet must be submitted by no later than July 22, 2003, which is one week after the proposal-submission deadline.

The top of the list should include the proposal number of the proposal submitted to the DMUU Centers competition. Include the full names of all people for whom there would be a conflict of interest related to reviewing this proposal because of their association with one or more of the senior personnel on the project. Conflicts to be identified are: (1) PhD thesis advisors or advisees, (2) postdoctoral advisors or advisees, (3) collaborators or co-authors for the past 48 months, and (4) any other individuals or institutions with which the investigator has financial ties (please specify type). For further clarification of conflicts of interests, please refer to the NSF Grant Policy Manual, Section 510. Three columns are suggested for the spreadsheet: People for whom there is a conflict, the senior personnel whose relationship makes the person in that row conflicted, and the relationship that causes the conflict of interest.

For all three other HSD special competitions: No special action is needed beyond identification of collaborators and advisors/advisees in biographical sketches.

Proposals Involving Multiple Institutions

For the DMUU Centers special competition: In the case of proposals involving multiple institutions, a single institution should be identified as the lead institution and a single proposal describing the entire project should be submitted by that institution. Funds may be distributed among partner institutions via subawards from the lead institution. A budget on the standard NSF budget form should be submitted for each subawardee. Letters confirming collaborations can be scanned and submitted via FastLane as Supplementary Documentation (in Section I). If multiple proposals seeking support for a single center (often called "collaborative proposals") are submitted, all proposals in the set will be returned without review.

For all three other HSD special competitions: Proposals involving multiple institutions may be submitted either with a single institution serving as the lead institution and support to other institutions provided through subawards, or "collaborative" proposals may be submitted by each institution. See GPG Section II.B.11.b for instructions regarding the preparation of collaborative proposals, and carefully follow on-line instructions regarding their preparation in FastLane.

Proposals Involving Collaborators at Foreign Institutions

Proposers are reminded they must provide biographical sketches of all senior personnel, including those at foreign institutions. In addition, as supplementary documentation, proposals involving foreign collaborators must provide letters of endorsement from the foreign counterpart institutions.

Pre-Submission Checklist

Proposals submitted for any of the HSD special competitions must be in compliance with GPG and special requirements in the announcement in order to be considered for review. Proposals not in compliance with these requirements will be returned without review. Please refer to the following checklist to address some of the items for which proposals often are non-compliant:

- Font and margin requirements
- Paginated pages
- Project summary that includes a description of broader impacts
- Project description that is 15 pages or less (20 pages or less for DMUU Center proposals)
- Project description that includes separate sections for results from prior NSF support (if appropriate), broader impacts, and any other special sections specified in this announcement for a particular HSD special competition
- Biographical sketches for all senior personnel
- Current and Pending Support forms for all senior personnel
- *For the DMUU Centers special competition only:* Conflict of Interest list submitted to the DMUU team leader by e-mail. The list should be provided in alphabetized order by last name of the individuals who would have a conflict of interest related to the evaluation of this proposal.

Proposers are reminded to identify the program announcement/solicitation number (03-552) in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

Cost sharing is not required in proposals submitted under this Program Solicitation.

Other Budgetary Limitations:

Specific topical areas have award size limitations. Details are in Section II, Program Description.

For CCRI-DMUU Centers: Budgets must include travel funds for principal investigators (both lead PIs and co-PIs) to attend an annual meeting of PIs.

For all other HSD special competitions: Budgets must include travel funds to enable the PI to attend one meeting of PIs over the course of the award.

C. Due Dates

Proposals must be submitted by the following date(s):

Full Proposal Deadline(s) (due by 5 p.m proposer's local time):

June 11, 2003

Deadline for Enhancing Human Performance (EHP) Proposals

June 12, 2003

Deadline for Empirical Implications of Theoretical Models (EITM) Proposals

July 15, 2003

Deadline for Decision Making Under Uncertainty (DMUU) Center Proposals

July 15, 2003

Deadline for Decision Making Under Uncertainty (DMUU) Developmental Proposals

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the [Grant Proposal Guide](#) for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: <http://www.fastlane.nsf.gov>

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#)). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as

required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued [Important Notice 127](#), Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the [Grant Proposal Guide](#) Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to make judgments.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

NSF staff will give careful consideration to the following in making funding decisions:

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria

In addition to the NSB-approved review criteria, NSF will ask reviewers and panel members to evaluate proposals based on the goals and special requirements outlined in this announcement for each of the HSD special competitions. With respect, for example, to the DMUU Centers competition, this will include asking reviewers and panel members to address special sections included in the project description, such as the management plan, outreach activities, and rationale for the center concept.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Ad Hoc and/or panel review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1); * or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Website at <http://www.gpo.gov>.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

For the DMUU Centers competition: DMUU centers will be required to submit annual reports on progress and plans, which will be used as a basis for performance review and determining the level of continued funding. Centers will be required to develop a set of management and performance indicators for submission annually to NSF. These indicators are both quantitative and descriptive and may include, for example, the characteristics of center personnel and students; research activities; education activities; outreach and knowledge transfer activities; decision-support products and tools; publications; degrees granted to students involved in center activities; and descriptions of significant advances and other outcomes of the center effort. Such reporting requirements will be included in the cooperative agreement between NSF and the lead institution.

For all other HSD special competitions: In accordance with requirements outlined in the *Grant Proposal Guide*, all awards of more than 12 months must submit annual progress reports. There are no special reporting requirements.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project reporting system, available through FastLane, for preparation and submission of annual and final project reports. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding this program should be made to:

- For contacts in Decision Making Under Uncertainty (DMUU), see www.nsf.gov/sbe/hsd03/contacts.htm.
- For contacts in Enhancing Human Performance (EHP), see www.nsf.gov/sbe/hsd03/contacts.htm.
- For contacts in Empirical Implications of Theoretical Models (EITM), see www.nsf.gov/sbe/hsd03/contacts.htm.

For questions related to the use of FastLane, contact:

- Philip Johnson, Computer Specialist, Directorate for Social, Behavioral & Economic Sciences, Division of Behavioral and Cognitive Sciences, 995 N, telephone: (703) 292-8740, fax: (703) 292-9068, email: pxjohnso@nsf.gov
- Alicia E. Harris, Program Technology Specialist, Directorate for Social, Behavioral & Economic Sciences, Division of Behavioral and Cognitive Sciences, 995 N, telephone: (703) 292-7423, fax: (703) 292-9068, email: aeharris@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF [E-Bulletin](#), which is updated daily on the NSF Website at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's [Custom News Service](http://www.nsf.gov/home/cns/start.htm) (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF, although some programs may have special requirements that limit eligibility.

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the GPG Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230

- **For General Information** (NSF Information Center): (703) 292-5111

- **TDD (for the hearing-impaired):** (703) 292-5090

- **To Order Publications or Forms:**
 - Send an e-mail to: pubs@nsf.gov

 - or telephone: (301) 947-2722

- **To Locate NSF Employees:** (703) 292-5111

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

OMB control number: 3145-0058.