

RESEARCH IN SUPPORT OF THE NATIONAL SPACE WEATHER PROGRAM

Program Solicitation

NSF 99-174

DIRECTORATE FOR GEOSCIENCES
DIVISION OF ATMOSPHERIC SCIENCES

DEADLINE DATE: JANUARY 7, 2000



NATIONAL SCIENCE FOUNDATION



The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants 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 Web site at:

<http://www.nsf.gov>

Location:	4201 Wilson Blvd. Arlington, VA 22230
For General Information (NSF Information Center):	(703) 306-1234
TDD (for the hearing-impaired):	(703) 306-0090
To Order Publications or Forms:	
Send an e-mail to:	pubs@nsf.gov
or telephone:	(301) 947-2722
To Locate NSF Employees:	(703) 306-1234

SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Name: Research in Support of the National Space Weather Program

Short Description/Synopsis of Program:

The National Space Weather Program (NSWP) is a multi-agency Federal program whose goal is to mitigate the adverse effects of space weather by providing timely, accurate, and reliable space environment observations, specifications and forecasts. Information about the NSWP can be obtained from the National Space Weather Program Strategic Plan and Implementation Plan. Both of these documents are available online through the Office of the Federal Coordinator for Meteorology at <http://www.ofcm.gov/homepage/text.pubs.htm>. Proposals are submitted for basic research aimed at meeting the goals of the NSWP.

Cognizant Program Officer(s):

Dr. S. Basu, Program Officer, Aeronomy, Room 775, Division of Atmospheric Research, telephone 703-306-1529, e-mail: sbasu@nsf.gov.

Dr. K. B. Baker, Program Officer, Magnetospheric Physics, Room 775, Division of Atmospheric Research, telephone 703-306-1519, e-mail: kbaker@nsf.gov.

Dr. P. Evenson, Program Officer, Solar-Terrestrial Research, Room 775, Division of Atmospheric Research, telephone 703-306-1530, e-mail: pevenso@nsf.gov.

Applicable Catalog of Federal Domestic Assistance (CFDA) No.: 47.050 - Geosciences

ELIGIBILITY

- ◆ Limitation on the categories of organizations that are eligible to submit proposals: **As indicated in NSF Grant Proposal Guide (NSF 00-2) Section 1.D.**
- ◆ PI eligibility limitations: **None**
- ◆ Limitation on the number of proposals that may be submitted by an organization: **None**

AWARD INFORMATION

- ◆ Type of award anticipated: **Standard or Continuing Grant**
- ◆ Number of awards anticipated in FY 2000: **15 - 20 awards**
- ◆ Amount of funds available: **Approximately \$1.2 million will be available for this initiative in FY 2000**
- ◆ Anticipated date of award: **June 2000**

PROPOSAL PREPARATION & SUBMISSION INSTRUCTIONS

◆ Proposal Preparation Instructions

- Letter of Intent requirements: **None**
- Preproposal requirements: **None**
- Proposal preparation instructions: **Standard NSF Grant Proposal Guide instructions**
- Supplemental proposal preparation instructions: **All proposal titles should begin with the words “Space Weather”.**
- Deviations from standard (GPG) proposal preparation instructions: **None**

◆ Budgetary Information

- Cost sharing/matching requirements: **None**
- Indirect cost (F&A) limitations: **None**
- Other budgetary limitations:

Award amounts up to a maximum of \$150,000/year. Average award will be between \$50,000 and \$80,000 per year for up to three years.

◆ FastLane Requirements

- FastLane proposal preparation requirements: **FastLane use optional**
- FastLane point of contact: Phyllis Hurley or Ruth Joel, Rm 775, ph: 703-306-1520, email: phurley@nsf.gov; rjoel@nsf.gov

◆ Deadline/Target Dates

- Full Proposal Deadline **5:00 PM, ET, January 7, 2000 (paper)**
 5:00 PM local time, January 7, 2000 (FastLane)

PROPOSAL REVIEW INFORMATION

- ◆ Merit Review Criteria: **Standard National Science Board approved criteria and relevance to the National Space Weather Program**

AWARD ADMINISTRATION INFORMATION

- ◆ Grant Award Conditions: **GC-1 or FDP III**
- ◆ Special grant conditions anticipated: **None anticipated**
- ◆ Special reporting requirements anticipated: **None**

INTRODUCTION

The Upper Atmosphere Research Section of the Division of Atmospheric Sciences of the National Science Foundation (NSF), in coordination with the Air Force Office of Scientific Research (AFOSR) and the Office of Naval Research (ONR), solicits proposals in support of the National Space Weather Program (NSWP). Proposals should benefit and advance the NSWP goal to mitigate the adverse effects of space weather by providing timely, accurate, and reliable space environment observations, specifications, and forecasts.

PROGRAM DESCRIPTION

An effective National Space Weather Program requires a strong commitment to basic research in many areas of space-related science. Emphasis will be on understanding the fundamental physical processes that affect the state of the sun, magnetosphere, ionosphere, and upper atmosphere, focusing on answering research questions that will improve the ability to specify and predict conditions in the space environment. Although any proposal meeting the above criteria will be considered, several basic research areas address significant gaps in our present understanding and represent particular opportunities to advance Space Weather goals:

- Understanding and prediction of processes affecting solar activity, such as coronal mass ejections (CMEs) and solar flares;
- Coupling between the solar wind and the magnetosphere and between the magnetosphere and ionosphere;
- The origin and energization of magnetospheric plasma;
- The triggering and temporal evolution of storms and substorms
- Improved global ionospheric specification and forecast and the evolution of ionospheric irregularities, including the onset of low latitude ionospheric irregularities, with particular emphasis on those processes affecting communication and navigation systems;
- Improved specification of thermospheric dynamics and neutral densities, and;
- Validation and enhancement of space weather models to improve specification and prediction capabilities, with emphasis on the application of data assimilation techniques.

Modelers who wish to implement and run codes at the Community Coordinated Modeling Center (CCMC) in order to accomplish any of the above objectives may include these activities in their proposals. For a description of the CCMC see <http://www.ccmc.gsfc.nasa.gov/>. Proposers should make it clear which part of the total proposed effort relates to, or is dependent on, the CCMC. Researchers who currently have grants from NSF may request a supplement to allow them to utilize the CCMC facilities. See the information on Proposal Preparation and Submission Instructions below for details on submitting a supplement request. Further information about the CCMC may be obtained by contacting the CCMC Director at Goddard Space Flight Center, Dr. Michael Hesse, (301) 286-8224.

ELIGIBILITY

The eligibility requirements are the standard NSF requirements as documented in the Grant Proposal Guide (NSF 00-2) section 1.D.

AWARD INFORMATION

Under this announcement, proposals may be submitted for any funding amount up to \$150,000 per year for up to three years. Grants may be awarded in a wide variety of sizes and durations. NSF expects to fund approximately 15 to 20 awards depending on the quality of submissions and the availability of funds. In exceptional cases, awards for up to five years may be considered if the justification and promise are compelling. Approximately \$1.2 million will be available for this initiative in FY 2000. Anticipated date of awards: June 2000.

PROPOSAL PREPARATION & SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions.

Proposals submitted in response to this program announcement should be prepared and submitted in accordance with the general guidelines contained in the *Grant Proposal Guide* (GPG), NSF 00-2. The complete text of the GPG (including electronic forms) is available electronically on the NSF Web site at: <<http://www.nsf.gov/cgi-bin/getpub?nsf002>>. 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.

Proposers are reminded to identify the program announcement number (NSF 99-174) in the program announcement/solicitation block on the NSF Form 1207, "*Cover Sheet for Proposal to the National Science Foundation.*" Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing. Also, all proposal titles should begin with the words "Space Weather".

Investigators who wish to request a supplement to an existing research grant in order to support activities using the CCMC should prepare a description of the activities to be pursued on the CCMC. This description should explain how the proposed activities will relate to the original research proposal and should be sufficiently complete that an independent reviewer will be able to review the request without referring to the original proposal. Supplement requests should not exceed 20% of the total funding of the original award. The standard NSF Budget Form 1030 should be appended to the description and ten copies should be sent, along with a cover letter, directly to the cognizant program officer. The cover letter must be signed by the Principal Investigator(s) and the institution's sponsored research officer.

B. Proposal Due Dates.

For paper submission of proposals, the paper copies of the proposal **MUST** be received by 5:00 PM, ET, January 7, 2000. Copies of the proposal must be made and submitted to NSF according to the normal procedures for paper proposals identified in the GPG.

For electronic submission of proposals, the proposal **MUST** be submitted by 5:00 PM, local time, January 7, 2000. Copies of the signed proposal cover sheet must be submitted in accordance with the instructions identified below.

Submission of Signed Cover Sheets. For proposals submitted electronically via FastLane, the signed proposal Cover Sheet (NSF Form 1207) should be forwarded to the following address and received by NSF by January 14, 2000:

National Science Foundation
DIS-FastLane Cover Sheet
4201 Wilson Blvd.
Arlington, VA 22230

A proposal may not be processed until the complete proposal (including signed Cover Sheet) has been received by NSF.

C. FastLane Requirements.

Proposers are encouraged to prepare and submit proposals using the NSF FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at <https://www.fastlane.nsf.gov/a1/newstan.htm>. If the proposal contains color figures the proposer should prepare 10 copies of each color figure and forward the copies to the cognizant program officer within five working days following proposal submission.

Submission of Signed Cover Sheets. For proposals submitted electronically, the signed paper copy of the proposal Cover Sheet (NSF Form 1207) should be forwarded to NSF within five working days following proposal submission in accordance with FastLane proposal preparation and submission instructions referenced above.

Paper Submission of Proposals. For paper submission of proposals, proposers should follow submission instructions contained in the NSF Grant Proposal Guide (GPG), (NSF 00-2) Section I.F.

PROPOSAL REVIEW INFORMATION

A. Merit Review Criteria.

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.

Proposals will be reviewed against the following general merit review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal 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 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?

PIs should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give these factors careful consideration 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 learner 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 -- are 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.

Relevance to the Goal of the National Space Weather Program

In addition to the general NSF review criteria, proposals will be evaluated according to their relevance to the National Space Weather Program. Proposals should benefit and advance the NSWP, and contribute to the goal of mitigating the adverse effects of space weather by providing timely, accurate, and reliable space environment observations, specifications and forecasts. Special consideration will be given to research which holds the promise for improving operational space weather capabilities within five years. Proposals that include CCMC-related activities will be evaluated on their appropriateness for the CCMC, the level of effort required to implement and test the models, and the likelihood for eventual transition to Space Weather operations.

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. Most of the proposals submitted to NSF are reviewed by mail review, panel review, or some combination of mail and panel review. Proposals submitted in response to this announcement will be reviewed by a combination of mail reviews and a panel review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. A program officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation. **In most cases, proposers will be contacted by the program officer after his or her recommendation to award or decline funding has been approved by his or her supervisor, the division director. This informal notification is not a guarantee of an eventual award.** NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. 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 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 an 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 Officer does so at its own risk.

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 (DGA). 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.

B. Grant Award Conditions.

An NSF grant consists of: (1) the award letter, which includes any special provisions applicable to the grant 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 grant conditions, such as Grant General Conditions (NSF GC-1)* or Federal Demonstration Partnership Phase III (FDP) Terms and Conditions* and (5) any NSF brochure, program guide, announcement or other NSF issuance that may be incorporated by reference in the award letter. Electronic mail notification is the preferred way to transmit NSF grants 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 Web site at: <<http://www.nsf.gov/cgi-bin/getpub?nsf003>>. 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, (NSF 95-26) available electronically on the NSF Web site. The GPM also is available in paper copy by subscription from the Superintendent of Documents, Government Printing Office, Washington, DC 20402. The GPM may be ordered through the GPO Web site at: <<http://www.gpo.gov>>. The telephone number at GPO for subscription information is 202.512.1800.

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.

Within 90 days after expiration of a grant, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented a new electronic project reporting system, available through FastLane, which 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. Reports will continue to be required annually and after the expiration of the grant, but PIs will not need to re-enter information previously provided, either with the proposal or in earlier updates using the electronic system.

Effective October 1, 1999, PIs are required to use the new reporting system for submission of annual and final project reports.

D. New Awardee Information.

If the submitting organization has never received an NSF award, it is recommended that the organization's appropriate administrative officials become familiar with the policies and procedures in the NSF *Grant Policy Manual* which are applicable to most NSF awards. The "Prospective New Awardee Guide" (NSF 99-78) includes information on: Administrative and Management Information; Accounting System Requirements and Auditing Information; and Payments to Organizations with NSF Awards. This information will assist an organization in preparing documents that NSF requires to conduct administrative and financial reviews of an organization. The guide also serves as a means of highlighting the accountability requirements associated with Federal awards. This document is available electronically on NSF's Web site at: <<http://www.nsf.gov/cgi-bin/getpub?nsf9978>>.

CONTACTS FOR ADDITIONAL INFORMATION

General inquiries should be made to one of the cognizant program officers for this initiative:

Dr. S. Basu, Aeronomy, Rm 775, phone: 703-306-1529, email: sbasu@nsf.gov

Dr. K. B. Baker, Magnetospheric Physics, Rm 775, phone: 703-306-1519, email: kbaker@nsf.gov

Dr. P. Evenson, Solar-Terrestrial Research, Rm 775, phone: 703-306-1530, email: pevenso@nsf.gov

- For questions related to use of FastLane, contact Phyllis Hurley or Ruth Joel, Rm 775, ph: 703-306-1520, email: phurley@nsf.gov or rjoel@nsf.gov

OTHER PROGRAMS OF INTEREST

The NSF Guide to Programs is a compilation of funding for research and education in science, mathematics, and engineering. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter. Many NSF programs offer announcements concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices listed in Appendix A of the GPG. Any changes in NSF's fiscal year programs occurring after press time for the Guide to Programs will be announced in the NSF Bulletin, available monthly (except July and August), and in individual program announcements. The Bulletin is available electronically via the NSF Web Site at <http://www.nsf.gov>. The direct URL for recent issues of the Bulletin is <http://www.nsf.gov/od/lpa/news/publicat/bulletin/bulletin.htm> Subscribers can also sign up for NSF's Custom News Service to find out what funding opportunities are available.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Grantees 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 (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) 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 program announcement or contact the program coordinator at (703) 306-1636.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation regarding NSF programs, employment, or general information. TDD may be accessed at (703) 306-0090 or through FIRS on 1-800-877-8339.

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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 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.

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 H. Plimpton, Reports Clearance Officer; Division of Administrative Services; National Science Foundation; Arlington, VA 22230.

YEAR 2000 REMINDER

In accordance with Important Notice No. 120 dated June 27, 1997, Subject: Year 2000 Computer Problem, NSF awardees are reminded of their responsibility to take appropriate actions to ensure that the NSF activity being supported is not adversely affected by the Year 2000 problem. Potentially affected items include: computer systems, databases, and equipment. The National Science Foundation should be notified if an awardee concludes that the Year 2000 will have a significant impact on its ability to carry out an NSF funded activity. Information concerning Year 2000 activities can be found on the NSF web site at <http://www.nsf.gov/oirm/y2k/start.htm>.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this document or other NSF-published materials, please contact us at plainlanguage@nsf.gov.

OMB # 3145--0058
CFDA 47.050 Geosciences

NSF 99-174
(replaces 98-134)