

Energetics and Dynamics of the Mesosphere and Lower Thermosphere: CEDAR/ TIMED Collaborative Studies

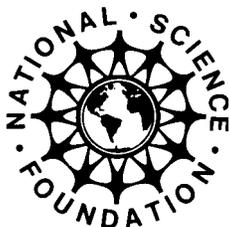
Interagency Program Announcement
NSF/NASA Joint Program
NSF 99-99

DIRECTORATE FOR GEOSCIENCES
DIVISION OF ATMOSPHERIC SCIENCES

DEADLINE DATE: JUNE 3, 1999



NATIONAL SCIENCE FOUNDATION



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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

**Program Name: Energetics and Dynamics of the Mesosphere and Lower Thermosphere:
CEDAR/ TIMED Collaborative Studies**

Short Description/Synopsis of Program:

Understanding the Earth's upper atmosphere is the goal of two complementary programs that will be poised to take advantage of joint measurement capabilities in the 2000-2001 timeframe. These are the NSF Coupling Energetics and Dynamics of Atmospheric Regions (CEDAR) program and the NASA Thermosphere Ionosphere Mesosphere Energetics and Dynamics (TIMED) mission. The modes of implementation of the CEDAR and TIMED programs, which feature, respectively, ground-based and space-borne instrumentation, are inherently synergistic. Through this NSF Program Announcement, NSF and NASA wish to take the best possible advantage of the complementary nature of these two programs through the support of correlative studies on the Energetics and Dynamics of the Mesosphere and Lower Thermosphere.

Cognizant Program Officer(s):

National Science Foundation:

Dr. Sunanda Basu
Program Director
Aeronomy
(703) 306-1529
sbasu@nsf.gov

Dr. Robert Robinson
Program Director
Upper Atmospheric Facilities
(703) 306-1531
rmrobins@nsf.gov

National Aeronautics and Space Administration:

Dr. Mary Mellott
Discipline Scientist
Ionospheric, Thermospheric and Mesospheric Physics Research Program
(202) 358-0893
mary.mellott@hq.nasa.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) No.: 47.050 — Geoscience Grants

ELIGIBILITY

- ◆ Limitation on the categories of organizations that are eligible to submit proposals:

Proposals may be submitted by institutions or organizations that are traditionally supported by NSF (as specified in the Grant Proposal Guide, NSF 99-2). Proposals from organizations not traditionally supported by NSF may be submitted for NASA funding.

- ◆ PI eligibility limitations:

Principal Investigators with current TIMED Program awards are not eligible to receive funds from this program or

to serve as Co-Investigators or team members on proposals submitted in response to this announcement. PIs of Upper Atmospheric Facilities, described in Addendum A.4.9 to the NASA Research Announcement NRA-99-OSS-01 (ROSS-99), which can be accessed via the World Wide Web at <http://spacescience.nasa.gov/research.htm> may not be PIs on proposals, but they may be Co-investigators. Other facilities staff members may be PIs or Co-investigators.

- ◆ Limitation on the number of proposals that may be submitted by an organization:

None

AWARD INFORMATION

- ◆ Type of award anticipated: Two year Standard and Continuing Grants
- ◆ Number of awards anticipated in FY 2000 : 10 -15 awards
- ◆ Amount of funds available: Approximately \$1.5 million will be available for this initiative in both FY 2000 and FY 2001; \$0.5 M will come from NSF and \$1.0 M from NASA in each fiscal year
- ◆ Anticipated date of award: November 1, 1999

PROPOSAL PREPARATION & SUBMISSION INSTRUCTIONS

- ◆ **Proposal Preparation Instructions**

- Letter of Intent requirements: Proposers are strongly encouraged to submit a Notice of Intent on or about 7 April 1999 to <http://propos.oss.hq.nasa.gov>.
- Preproposal requirements: None
- Proposal preparation instructions: Proposers are requested to prepare a single proposal, including
 - (i) BOTH NSF AND NASA cover sheets
 - (ii) Completed NSF Budget Form 1030 and NASA Budget Forms
 - (iii) Completed other forms required by and found in NSF's Grant Proposal Guide (NSF- 99-2) and in ROSS-99.Proposals from organizations not traditionally supported by NSF may be submitted for funding by NASA and therefore, need not include NSF forms.
- Supplemental proposal preparation instructions: Fifteen copies of each proposal, and an additional one with original signatures, should be sent to the following mailing address:

Mesosphere and Lower Thermosphere Studies
Jorge Scientific Corporation
Suite 700
400 Virginia Ave. SW
Washington, DC 20023

Proposals should be received at the above address by 3 June 1999 in order to be considered for funding under this program.

- Deviations from standard (GPG) proposal preparation instructions: Since this is an Interagency Program Announcement there are several deviations from the standard requirements, all of which are listed above.

◆ **Budgetary Information**

- Cost sharing/matching requirements: None
- Indirect cost (F&A) limitations: None
- Other budgetary limitations: The typical award size is expected to be \$75,000 to \$150,000 per year.

◆ **FastLane Requirements**

- FastLane proposal preparation requirements: Not applicable. Proposals submitted for this competition cannot use FastLane submission.

◆ **Deadline/Target Dates**

- Full Proposal Deadline: 5:00 PM, EDT, June 3,1999

PROPOSAL REVIEW INFORMATION

- ◆ Merit Review Criteria: Standard National Science Board approved criteria and criteria specified in ROSS-99.

AWARD ADMINISTRATION INFORMATION

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

INTRODUCTION

A coordinated competition for basic research proposals relating to the energetics and dynamics of the terrestrial mesosphere and lower thermosphere is envisaged. The objective of this program is to stimulate research that enhances understanding of these regions through collaborative efforts with the NASA Thermosphere Ionosphere Mesosphere Energetics and Dynamics (TIMED) program and the National Science Foundation (NSF) Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR) program. Understanding the Earth's upper atmosphere is the goal of these two complementary programs that will be poised to take advantage of joint measurement capabilities in the 2000-2001 timeframe.

PROGRAM DESCRIPTION

The objectives of this targeted competition is to focus the attention of the research community on the areas of investigation mentioned above in order to advance our understanding of the common processes that affect the region of the atmosphere between 60 and 180 km altitude. The TIMED mission, which is scheduled for launch early in the year 2000, was designed to study this region of the atmosphere. This region constitutes the primary interface between the terrestrial lower atmosphere and the space environment. Although much has been learned from ground-based studies about the processes which control this region, relatively little is known about its global characteristics because atmospheric densities in the region are too great to allow long-term in situ satellite reconnaissance and because the geographical distribution of ground-based observatories is limited.

It was to fill this gap in knowledge that the TIMED mission was designed. The primary scientific objectives of this program are (1) To determine the temperature, density, and wind structure of the mesosphere/lower thermosphere/ionosphere (MLTI), including the seasonal and latitudinal variations; and (2) To determine the relative importance of the various radiative, chemical, electrodynamical, and dynamical sources and sinks of energy for the thermal structure of the MLTI.

TIMED has much in common in terms of goals with the NSF CEDAR program, which are to characterize and understand the atmosphere above 60 km with emphasis on the energetic and dynamic processes determining the basic composition and structure of the atmosphere. Particular attention is given to how these processes influence the coupling between different atmospheric regions. Phase III of the CEDAR program has begun and is expected to extend through the next decade. The scientific agenda of CEDAR Phase III has four science initiatives: coupling to lower altitudes, solar-terrestrial interactions, polar aeronomy, and long-term variations, all of which have close ties with TIMED objectives.

The beginning of the new century will be a time of intense activity for both programs. The modes of implementation of the TIMED and CEDAR programs, which feature, respectively, space-borne and ground-based instrumentation, are inherently synergistic and NASA and NSF wish to take the best possible advantage of the complementarity of the two programs. For these reasons, NASA and NSF are jointly soliciting proposals for investigations of the mesosphere and lower thermosphere, and portions of the CEDAR and TIMED (Mission Operations and Data Analysis) budgets have been dedicated to the support of collaborative studies.

For more detailed information about the TIMED and CEDAR programs pertaining to this announcement, prospective proposers are referred to Addendum A.4.9 to the NASA Research Announcement NRA-99-OSS-01 (ROSS-99). ROSS-99 can be accessed via the World Wide Web at <http://spacescience.nasa.gov/research.htm>.

ELIGIBILITY

NSF will consider for funding proposals submitted by institutions or organizations that are traditionally supported by NSF (as specified in the Grant Proposal Guide, NSF 99-2). Proposals from organizations not traditionally supported by NSF may be submitted for funding by NASA and, therefore, need not include NSF forms. This will not affect their standing in the merit review process. It is expected that between 30 and 50 proposals will be submitted to this competition. Proposals will be received at Jorge Scientific Corporation, and staff there will carry

out the logistical duties associated with proposal receipt and review under NASA support. Jorge Scientific Corporation will send the original of each proposal eligible for NSF funding to the NSF where it will be managed using standard NSF procedures.

AWARD INFORMATION

Up to \$3,000,000, depending on the quality of proposals, will be awarded for proposals submitted in response to this competition. NASA will contribute \$2,000,000 and NSF will contribute \$1,000,000, pending availability of funds. The NSF contribution is expected to be made up from CEDAR funds in the Aeronomy and Upper Atmospheric Facilities Programs amounting to a total of \$500,000 in each of FY 2000 and FY 2001. It is anticipated that the combined funding from both agencies will result in a total of 10 to 15 awards. The typical award size is expected to be \$75,000 to \$150,000 per year of the award.

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 99-2, except as noted below. The complete text of the GPG (including electronic forms) is available electronically on the NSF Web site at: <<http://www.nsf.gov/>>. 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 99-99) 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.

Proposers are strongly encouraged to submit a Notice of Intent on or about 7 April 1999 to <http://props.oss.hq.nasa.gov>. This information will not be distributed for peer review but will assist NSF and NASA staff in planning the review process.

Proposers are requested to prepare a single proposal, including

- (i) BOTH NSF AND NASA cover sheets
 - (ii) Completed NSF Budget Form 1030 and NASA Budget Forms
 - (iii) Completed other forms required by and found in NSF's Grant Proposal Guide (NSF 99-2) and in ROSS-99.
- Proposals from organizations not traditionally supported by NSF may be submitted for funding by NASA and, therefore, need not include NSF forms.

Fifteen copies of each proposal, and one with original signatures, should be sent to the following mailing address:

Mesosphere and Lower Thermosphere Studies
Jorge Scientific Corporation
Suite 700
400 Virginia Ave. SW
Washington, DC 20023

B. Proposal Due Dates.

The paper copies of the proposal **MUST** be received by 5:00 PM, EDT, June 3, 1999.

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, adjacent disciplines to that principally addressed in the proposal, etc.

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?

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. PIs should address this issue in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give it careful consideration in making funding decisions.

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. PIs should address this issue in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give it careful consideration in making funding decisions.

Proposals will be expected to demonstrate the potential for contributing to the science goals of the TIMED and

CEDAR programs. Funding is intended to support scientific research that may require activities such as the analysis and coordination of data from satellite and ground-based instruments, data collection and assimilation, and interaction with the modeling community. Although proposals for the support of single-instrument data sites are not excluded, proposals that provide for the coordination of a number of investigators and data sets in the attack on a common scientific goal will be particularly competitive. The establishment of new instrumentation is out of scope for this program.

B. Merit Review Process.

Review of the proposals will be through a combination mail review and panel. The NSF merit review criteria will be used. The mail reviewers and the panelists will be selected by the NSF and NASA Program Directors. The panel will meet at NSF to review the proposals. Jorge Scientific will provide the administrative assistance associated with the panel review, while logistical support on the actual dates of the panel meeting will be provided by NSF Staff. The NSF program Directors for Aeronomy and UAF will attend the panel review as will the NASA ITM Program Director. Originals of the written reviews will be filed in the proposal jackets at NSF. Copies, with reviewer identities removed, will be sent to the PI at the time the decision is made.

Based on the outcome of the review, the NSF and NASA Program Directors will select those proposals that NSF will fund and those that NASA will fund. Since all proposals eligible for funding by NSF will be entered as pending proposals at NSF, the NSF will fund those proposals selected by the NSF Program Directors for awards; administratively withdraw those proposals that NASA funds; and decline the remainder. It is anticipated that the combined funding from both agencies will result in a total of 10 to 15 awards.

NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of the proposals. The time interval begins on the proposal deadline and the interval ends when the division director accepts the program officer's recommendation.

In all cases, after final programmatic approval has been obtained, award recommendations are then forwarded to NSF's 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/>>. 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/>>.

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, 1998, PIs are required to use the new reporting format for annual and final project reports. PIs are strongly encouraged to submit reports electronically via FastLane. For those PIs who cannot access FastLane, paper copies of the new report formats may be obtained from the NSF Clearinghouse as specified above. NSF expects to require electronic submission of all annual and final project reports via FastLane beginning in October, 1999.

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 97-100) includes information on: Administration and Management Information; Accounting System Requirements and Auditing Information; and Payments to Organizations with 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?nsf97100>>.

CONTACTS FOR ADDITIONAL INFORMATION

Points of contact at NSF and NASA are as follows:

National Science Foundation:

Dr. Sunanda Basu
Program Director
Aeronomy
(703) 306-1529
sbasu@nsf.gov

Dr. Robert Robinson
Program Director
Upper Atmospheric Facilities
(703) 306-1531
rrobins@nsf.gov

National Aeronautics and Space Administration:

Dr. Mary Mellott
Discipline Scientist
Ionospheric, Thermospheric and Mesospheric Physics Research Program
(202) 358-0893
mary.mellott@hq.nasa.gov

OTHER PROGRAMS OF INTEREST

The NSF Guide to Programs is a compilation of funding opportunities 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. Beginning in fiscal year 1999, the NSF Guide to Programs only will be available electronically, at <http://www.nsf.gov/cgi-bin/getpub?gp>. 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 E-Bulletin, available electronically on the NSF Web site at: <http://www.nsf.gov/home/ebulletin/>. The direct URL for recent issues of the Bulletin is <http://www.nsf.gov/home/ebulletin/>. 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 (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 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: Reports Clearance Officer; Information Dissemination Branch, DAS; 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>.

Catalogue of Federal Domestic Assistance (CFDA) No.: 47.050 – Geoscience Grants
OMB No.: 3145-0058 NSF 99-99