# RIDGE 2000

## PROGRAM SOLICITATION
## NSF 09-527

## *REPLACES DOCUMENT(S):*
## NSF 07-571

**National Science Foundation**

Directorate for Geosciences
Division of Ocean Sciences

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

April 07, 2009

April 7, Annually Thereafter

active from 2009 to 2012

## REVISION NOTES

**A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), NSF 09-1, was issued on October 1, 2008 and is effective for proposals submitted on or after January 5, 2009. Please be advised that the guidelines contained in NSF 09-1 apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 5th, 2009, must also follow the guidelines contained in NSF 09-1.**

**One of the most significant changes to the PAPPG is implementation of the mentoring provisions of the America COMPETES Act. Each proposal that requests funding to support postdoctoral researchers must include, as a separate section within the 15-page project description, a description of the mentoring activities that will be provided for such individuals. Proposals that do not include a separate section on mentoring activities within the Project Description will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II.C.2.d for further information).**

Important revisions to the deadline for submission of proposals, award conditions, reporting requirements, and review criteria are included in this solicitation and should be read carefully by all proposers.

This solicitation heralds the integration and synthesis phase of the Ridge 2000 Program. Proposers should be sensitive to this shift in emphasis and prepare proposals accordingly. Field programs, while still encouraged, must demonstrate that they are essential for integration and synthesis.

## SUMMARY OF PROGRAM REQUIREMENTS

### General Information

**Program Title:**

RIDGE 2000

**Synopsis of Program:**

Ridge 2000 is a science initiative focused on integrated geological, biological, and geochemical studies of the Earth-encircling mid-ocean ridge system. Central to the Ridge 2000 program is the recognition that the origin and evolution of life in deep-sea hydrothermal ecosystems are inextricably linked to, and perhaps an inevitable consequence of, the flow of energy and material from Earth's deep mantle to the seafloor and ocean via magmatic and hydrothermal systems. To sharpen our knowledge of mid-ocean ridge systems, the first phase of the Ridge 2000 program involved integrated field, laboratory, and modeling studies of three representative, but geographically limited study sites. Research activities spanned a broad range of disciplines: from geophysics to geochemistry and from geology to biology to hydrothermal vent fluid dynamics.

With this solicitation, Ridge 2000 moves into its integration and synthesis phase where results from previous and on-going interdisciplinary field expeditions and laboratory studies are to be brought to bear on advancing our conceptual and quantitative understanding of mid-ocean ridge systems and the processes that link geological, geophysical, geochemical, hydrothermal, and biological processes. As such, the program now shifts its focus from

field data acquisition to integration and synthesis to help the program achieve its science goals.

**Cognizant Program Officer(s):**

- David Garrison, telephone: (703) 292-7588, email: dgarrison@nsf.gov
- Richard Carlson, telephone: (703) 292-7978, email: rcarlson@nsf.gov
- Barbara Ransom, telephone: (703) 292-7792, email: bransom@nsf.gov

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

- 47.050 --- Geosciences

## Award Information

**Anticipated Type of Award:** Standard Grant or Continuing Grant or Fellowship Grant

**Estimated Number of Awards:** 10 to 20 integrated, interdisciplinary projects of two or three year duration.

**Anticipated Funding Amount:** $5,300,000 Pending availability of funds, $5,300,000 per year through 2012 will be available to initiate new Ridge 2000 activities. This sum does not include costs, such as ship time and deep submergence facilities, that are normally covered by NSF in support of seagoing operations.

## Eligibility Information

**Organization Limit:**

Proposals may only be submitted by the following:

- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

**PI Limit:**

**Ridge 2000 Research Program.** None specified for proposals addressing Integrated Research Studies or Time Critical Studies.

**Ridge 2000 Postdoctoral Fellowship Program.** There are eligibility requirements for the Postdoctoral Fellowship program.

Applicants must be U.S. citizens or permanent residents; initiate the award no more than two years after receipt of their doctoral degree; and have a commitment from a scientific sponsor at a host institution that is different from the applicant's previous PhD and/or doctoral work.

**Limit on Number of Proposals per Organization:**

None Specified

**Limit on Number of Proposals per PI:**

None Specified

## Proposal Preparation and Submission Instructions

**A. Proposal Preparation Instructions**

- **Letters of Intent:** Not Applicable
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/pubs/policydocs/grantsgovguide607.pdf)

**B. Budgetary Information**

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.
- **Indirect Cost (F&A) Limitations:**

Indirect cost limitations apply to the Ridge 2000 Postdoctoral Fellowship. The Fellowship provides an institutional allowance of $300 per month of tenure for the Fellow for partial reimbursement of expenses incurred in support of the Fellow's research (such as space, equipment, secretarial assistance, and general purpose supplies).

- **Other Budgetary Limitations:** Not Applicable

**C. Due Dates**

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

  April 07, 2009

  April 7, Annually Thereafter

  active from 2009 to 2012

## Proposal Review Information Criteria

**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:** Additional award conditions apply. Please see the full text of this solicitation for further information.

**Reporting Requirements:** Additional reporting requirements apply. Please see the full text of this solicitation for further information.

## TABLE OF CONTENTS



## I. INTRODUCTION

Ridge 2000 science objectives are encapsulated in the phrase "from mantle to microbe". This expresses the inextricable link between geological processes of planetary renewal occurring at mid-ocean ridge plate boundaries and the chemical and biological processes that sustain life at hydrothermal vents in the deep ocean in the absence of sunlight. To date, Ridge 2000 activities have focused on intensive characterization and analysis of three well-defined, geographically limited, representative, ocean spreading centers called Integrated Study Sites. These are located at:

- the 9 - 10 degree N segment of the East Pacific Rise, Central Pacific,
- the East Lau Spreading Center, Western Pacific,
- the Endeavor segment of the Juan de Fuca Ridge, Northwest Pacific.

These sites were selected on the basis of various criteria, including the frequent occurrence of seafloor magmatic and tectonic

events that perturb hydrothermal systems and their associated ecosystems. The sites provided opportunities to study important, but commonly ephemeral, earth-transforming processes and the links among magmatic, geological, hydrological, and biological seafloor systems.

To date, the Ridge 2000 Program has been successful in generating a wealth of co-located, multi- and interdisciplinary data from expeditions to the Integrated Study Sites. Important outcomes have included novel and fundamentally important biological and geophysical experiments; the development of ground breaking technology in the form of new sensors, sampling, and other essential infrastructure for seafloor science; new and improved geophysical and geochemical tools and means of data analysis; and the development of new and more sophisticated conceptual and quantitative models of crustal processes and how they tie to and influence hydrothermal circulation and vent ecosystem development

In 2009, Ridge 2000 moves into its integration and synthesis phase, where results of its multi-disciplinary field expeditions, laboratory, and analytical studies, and modeling efforts are to be combined to provide a holistic and advanced, conceptual and quantitative understanding of Earth's mid-ocean ridge system and its unique and intertwined chemosynthetic ecosystems.

## II. PROGRAM DESCRIPTION

The Ridge 2000 program has three components: Integrated Research Studies, Time Critical Studies, and the Ridge 2000 Postdoctoral Fellowship. It also has a dedicated data repository, the Ridge 2000 Data Portal (http://www.marine-geo.org/portals/ridge2000/), which has tools to facilitate knowledge and data exchange to enable integrative studies that pull together information from disparate data sets in order to view the mid-ocean ridge system from a broader, more global perspective.

The ultimate goal of the Ridge 2000 Program is to understand the mid-ocean ridge as a complex geobiological reactor with interconnected parts that relate via diverse controls and feedbacks in time and space. Investigators are encouraged to develop proposals that attempt to draw together disparate data sets from each of the three Ridge 2000 Integrated Study Sites and from the broader mid-ocean ridge literature.

**RIDGE 2000 Integrated Research Studies**

In the integration and synthesis phase of the program, Ridge 2000 Integrated Research Studies will focus on activities that lead to the development of quantitative or conceptual study-site and/or whole-system models using results of previous and on-going Ridge 2000, coordinated, multi- and interdisciplinary, field studies and laboratory experiments. Use of complementary data from other mid-ocean ridge studies is strongly encouraged.

In FY 2009, priority will be given to proposals that finalize datasets and synthesize findings at the three Integrated Study Sites (see Section I). Projects that fill gaps, identified in community workshops held in the fall of 2008, will also be considered a priority as will experimental and/or theoretical studies that are necessary to interpret field data (see workshop reports posted on the web at http://www.ridge2000.org/science/meetings/index.php). Investigators are encouraged to develop theory-based understandings of critical processes, as well as proposals involving in-depth analysis, testing, and refinement of both conceptual and numerical models. Proposals involving controlled laboratory experiments that are focused on understanding the fundamental behavior of the system are also encouraged. In addition, activities to develop innovative communications strategies to increase community interaction, disseminate findings, and broaden participation in the integration and synthesis phase of the program will also be considered. In FY 2010 and beyond, proposals focusing on integrating across sites and building a global understanding of mid-ocean ridge processes will be emaphsized.

To facilitate integration and synthesis in the 2009-2012 time frame, the Ridge 2000 Office will organize workshops and meetings so that investigators can share ideas and focus on developing process-oriented models. This might include, but is not limited to, understanding interfaces and fluxes, variations in processs with spreading rate, and time constants governing the evolution of linked components throughout the mid-ocean ridge geobiological and hydrologic systems. Stimulation of ideas and publication of interdisciplinary studies will be goals of the workshops. Notification of workshops and other idea-sharing activities will be posted on the Ridge 2000 Office website (http://www.ridge2000.org/) as they are organized. Investigators wishing to participate in these workshops or learn more about the Ridge 2000 program, its objectives, and present knolwedge in the area should consult the Ridge 2000 website. It is recommended that investigators consult the site frequently to stay current with the developing integration effort.

**RIDGE 2000 TIME CRITICAL STUDIES**

Major sporadic and/or transient events have important biological, chemical, hydrological, and geological impacts on mid-ocean ridge systems. This component of Ridge 2000 is devoted to detecting and locating these events and providing rapid deployment of instruments and sampling devices to events in progress. Events may include volcanic eruptions on the sea floor, intrusion of dikes or other magma bodies at the ridge axis, deformation events related to sea floor spreading and related phenomena, and dramatic changes in hydrothermal venting. Critical Time Studies will continue to be supported by Ridge 2000 during this phase of the program because of its importance in adding to our knowledge of fundamental seafloor spreading center processes and their effects on hydrothermal and hydrothermal vent ecosystems.

During the present phase of the program, proposals for consideration under the Time Critical Studies umbrella should first be discussed with the cognizant NSF Program Officer and approved before submission. Proponents should be prepared to discuss the importance of the event, the outstanding scientific questions the field program will illuminate, as well as how the work will support the integration and synthesis phase of the program. More information on Ridge 2000 Time Critical Studies and available instrumentation can be found on the Ridge 2000 website (http://www.ridge2000.org/).

**Ridge 2000 POSTDOCTORAL FELLOWSHIP PROGRAM**

Ridge 2000 has an associated Postdoctoral Fellowship Program to foster cross-disciplinary interaction and encourage the infusion of new ideas in the field. A second objective is to broaden the expertise and professional development of the applicant. Applicants from within the field of marine science, as well as those from the outside, are encouraged to apply. Postdoctoral applicants should apply their conceptual and technical expertise to a priority Ridge 2000 objective. Projects should be distinct from those in which the applicant has previously participated.

Ridge 2000 Postdoctoral Fellowships will be awarded for a two-year period and are renewable for a third year. Fellowships provide: a salary and benefits consistent with normal institutional practice for post-doctoral fellows. A special research allowance of $5,000 per year, expendable at the fellow's discretion and intended to be used for scientific equipment and supplies, travel, publication expenses, etc. Other research-related costs can also be included.

**INFORMATION**

As Ridge 2000 moves into its synthesis and integration phase, the scope of fieldwork that will be supported will be more limited than during the first phase of the Program. From 2009 onward, all Integrated Research Studies proposals to conduct field work must specifically fill identified knowledge gaps or unexamined linkages/processes within the system. For all field programs, investigators will need to make a clear case for how collection of the new data is crucial for progress toward Ridge 2000 program goals and how those goals will be achieved within the timeframe of Ridge 2000, for which the last year for the awarding of new activities will be 2012.

## III. AWARD INFORMATION

Pending availability of funds, $5,300,000 per year through 2012 will be available to initiate new Ridge 2000 activities. This sum does not include costs, such as ship time and deep submergence facilities, that are normally covered by NSF in support of seagoing operations. NSF estimates that 10 to 20 standard or continuing awards will be made each year. The number of awards and average award size and duration are subject to availability of funds. Award size is expected to range from $100,000 to $1 million for research grants and $100,000 to $150,000 for postdoctoral fellowship grants. Ridge 2000 Postdoctoral Fellowships will be awarded for scientific research at any appropriate non-profit United States academic institution. Awards will be made to the institution in the name of the Fellow as the principal investigator or co-principal investigator, in accordance with normal institutional practice. Fellows are expected to devote full time to appropriate scientific research and training during the tenure of the Fellowship and to pursue the work for which the Fellowship was awarded, although teaching one semester is allowable for professional development purposes. Major changes in the science work plan, in the fellow's tenure, or in the host institution require prior NSF approval. Ridge 2000 Postdoctoral Fellowships will be awarded for a two-year period, and are renewable for a third year. Fellowships provide: a salary and benefits consistent with normal institutional practice for post-doctoral fellows. Institutions may supplement Fellowship stipends without prior permission from the NSF, provided it is done in accordance with established institutional policies. Supplemental funding cannot be conditional on the performance of duties in addition to NSF-approved fellowship activities.

## IV. ELIGIBILITY INFORMATION

**Organization Limit:**

Proposals may only be submitted by the following:

- For-profit organizations: U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research or education.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

**PI Limit:**

**Ridge 2000 Research Program.** None specified for proposals addressing Integrated Research Studies or Time Critical Studies.

**Ridge 2000 Postdoctoral Fellowship Program.** There are eligibility requirements for the Postdoctoral Fellowship program.

Applicants must be U.S. citizens or permanent residents; initiate the award no more than two years after receipt of their doctoral degree; and have a commitment from a scientific sponsor at a host institution that is different from the applicant's previous PhD and/or doctoral work.

**Limit on Number of Proposals per Organization:**

None Specified

**Limit on Number of Proposals per PI:**

None Specified

**Additional Eligibility Info:**

## V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

### A. Proposal Preparation Instructions

**Full Proposal Preparation Instructions:** Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program 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/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF 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.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/pubs/policydocs/grantsgovguide607.pdf). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.3 of the Grant Proposal Guide provides additional information on collaborative proposals.

**Ridge 2000-Specific Instructions:** Proposals for Ridge 2000 should be prepared in accordance with the guidelines provided in the NSF Grant Proposal Guide (GPG) or the NSF Grants.gov Application Guide. Each proposal must include explicit statements of the following:

1. Relevance of the work to Ridge 2000 science goals and how the work supports the integration and synthesis phase of the program (the Ridge 2000 science plan can be found at: http://www.ridge2000.org/science/info/science_plan_plan.php).

2. For previous Ridge 2000 awardees, a discussion of the status of compliance with the Ridge 2000 Data Policy (http://www.ridge2000.org/science/downloads/Ridge2000DataPolicy.pdf) must be included in the Results of Prior NSF Support section in the Project Description. For proponents with awards that have ended, a note from the Ridge 2000 Data Management Group (http://www.marine-geo.org/portals/ridge2000) verifying compliance with the Data Policy should be included as one of the supplementary documents.

**Ridge 2000 Fellowship Program Instructions:** Prior to writing a proposal, applicants should establish a collaborative relationship with a person who will serve as a sponsor. Applicants or their proposed sponsor, depending on requirements of the host institution, should submit a Ridge 2000 proposal, written by the fellow, that outlines the proposed research. The Project Description in the proposal must also include within its specified 15-page limit:

1. A personal statement (not to exceed two single-spaced pages) that describes the applicant's career goals what role the chosen research and associated collaborations will play in enhancing their professional development, conceptual approach, and technical skills.

2. A short abstract of the applicant's dissertation research and publications (also include a list of those planned or in preparation).

3. A statement from the sponsoring scientist at the host institution indicating agreement to work with the applicant if the award is made.

4. A statement explaining the relevance of the work to Ridge 2000 science objectives and how the work helps support the integration and synthesis goals of the present phase of the program.

Please note: To submit a Postdoctoral Fellowship proposal use the Proposal Preparation function in FastLane, NOT the link to NSF Postdoctoral Fellowships and Other Programs.

**Instructions for Proposals that Require UNOLS, Deep Submergence, and Other Vessel Support:** It is recommended that investigators wishing to submit large field proposals call and consult with one of the cognizant NSF program officers prior to proposal preparation. Proponents who wish to use geophysical tools (e.g., air guns, mulitchannel seismic, etc.) should inform NSF as early in the proposal preparation process as possible to permit adequate time for permitting.

All projects that require the use of ships from the University-National Oceanographic Laboratory System (UNOLS) or that require deep submergence facilities should follow the UNOLS procedure (http://www.unols.org/). Proposers must submit a ship request form to UNOLS and include a copy of it in their proposal. Similarly, projects that require the use of ocean bottom seismometers (OBS) must include a copy of the request form from one of the three OBSIP providers. If requesting use of a non-UNOLS vessel, please include a letter from the vessel operator with an estimate of the costs, supportability, and approximate schedule of the work in the proposal supplementary documents.

**Additional Information:** Proposals that are re-submissions must be substantially changed from the original. Proposals must comply with GPG font specifications. Biosketches must follow GPG content and formatting rules. Lists of recent collaborators, students, advisors, and postdocs must be complete and follow GPG rules.

## B. Budgetary Information

**Cost Sharing:** Cost sharing is not required under this solicitation.

**Indirect Cost (F&A) Limitations:**

Indirect cost limitations apply to the Ridge 2000 Postdoctoral Fellowship. The Fellowship provides an institutional allowance of $300 per month of tenure for the Fellow for partial reimbursement of expenses incurred in support of the Fellow's research (such as space, equipment, secretarial assistance, and general purpose supplies).

**Budget Preparation Instructions:**

A special research allowance of $5,000 per year, expendable at the fellow's discretion, can be included in the Ppostdoctoral Fellow budget. These funds are intended to be used for scientific equipment and supplies, travel, publication expenses, and other

research-related costs.

## C. Due Dates

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

  April 07, 2009

  April 7, Annually Thereafter

  active from 2009 to 2012

## D. FastLane / Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

  Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: https://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 solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

  ***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. Further instructions regarding this process are available on the FastLane Website at: https://www.fastlane.nsf.gov/fastlane.jsp.

- **For Proposals Submitted Via Grants.gov:**

  Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at:
  http://www.grants.gov/CustomerSupport. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

  ***Submitting the Proposal:*** Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

# VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

## A. NSF Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. 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 the reviewer is qualified to make judgements.

**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, original, or potentially transformative 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?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf.

NSF staff also 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:**

**Ridge 2000-Specific Review Criteria:** The NSF-specific criteria above will be used by the ad hoc mail reviewers to evaluate proposals. The NSF-specific criteria above as well as the Ridge 2000-specified criteria below will be used by the panels of experts, convened to evaluate submitted proposals, and NSF Program Officers in their consideration of the propsoal.

**Ridge 2000 Integrated Research and Critical Time Studies:** The extent to which Ridge2000 Integrated Research projects or Time Critical Studies proposals address goals of the integration and synthesis phase of the program will be taken into account when assessing projects. For proponents with prior Ridge 2000 funding, compliance with the Ridge 2000 Data Policy will also be taken into consideration.

**Ridge 2000 Postdoctoral Fellowships:** The evaluation of postdoctoral fellow proposals will be based on the scientific quality of the research likely to emerge, its potential to address Ridge 2000 science goals, and its importance in serving the integration and synthesis phase of the program. Other considerations include the proponent's ability as evidenced by their past research work, on the suitability of the sponsoring scientist and host institution, and on the likely impact of the work on the professional development of the applicant.

## B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review 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.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. 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 deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's 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 Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

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 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.B. 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 (GC-1); * or Research Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

**Special Award Conditions:**

**Ridge 2000-Specific Award Condition**: Principal Investigators of Ridge 2000-funded awards are required to submit their data, including appropriate metadata, to the Ridge 2000 Data Portal (http://www.marine-geo.org/portals/ridge2000) and to other national and international data repositories as appropriate, in compliance with the Ridge 2000 Data Policy (http://www.marine-geo.org/MGDS_Forms/marine/marine_v3.6/Data_Policies/Ridge2000_Data_Policy.pdf).

**Ridge 2000 Fellowships:** Fellows are nominally expected to devote full time to appropriate scientific research and training during the tenure of the Fellowship and to pursue the program for which the Fellowship was awarded, although teaching one semester per year is allowable. Major changes in the plan of scientific research, in tenure, or in Fellowship institution require prior NSF approval. Institutions may supplement Fellowship stipends without prior permission from NSF provided that it is done in accordance with established institutional policies. Supplementation may not be conditioned on any requirement for duties in addition to normal Fellowship activities.

## C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a final project report.

Failure to provide the required annual or final project reports will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. 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. Such reports provide information on activities and findings, project participants (individual and organizational) 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. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

**Ridge 2000-Specific Reporting Requirements**

Open access to Ridge 2000 data is crucial to the success of the integration and synthesis phase of the program. Therefore, all annual and final reports and requests for no-cost extensions, must discuss progress in fulfilling the Ridge 2000 Data Policy (http://www.ridge2000.org/science/downloads/Ridge2000DataPolicy.pdf). In this regard, NSF has the expectation that all requirements stated in the Data Policy will be met according to its specified timetable.

Approval of Final Reports will be contingent on compliance with the Ridge 2000 Data Policy. To prevent delays in complying with this requirement, Principal Investigators should examine the formats of the required metadata spreadsheets and reports in advance to assure timely entry and submssion of all required meta- and derived datasets. Any questions concerning this policy should be directed to the cognizant program officers.

**Ridge 2000 Data and Sample Archiving:** Principal investigators should submit the data collected to designated data centers in accord with the Ridge 2000 Data Policy. Data, such as some biological data deposited in other national databases (see Appendix III, Other Data Bases, in Division of Ocean Sciences Data and Sample Policy, NSF publication 04-004 (http://www.nsf.gov.pubs/2004/nsf04004/nsfo4oo4.pdf), should be cross listed on the Ridge 2000 Data Portal with appropriate metadata. In compliance with instructions in the NSF Grant Proposal Guide, it is expected that investigators will share with other researchers, at no more than incremental cost and within a reasonable time, the data, derived data products, samples, physical collections, and other supported materials gathered or created in the course of the research project.

The NSF programs sponsoring the Ridge 2000 program consider the documentation of datasets, known as metadata, as vital to the exchange of information on mid-ocean ridge research and to a dataset's accessibility and longevity for reuse. These metadata should include easily accessible information about the data holdings, including quality assessments, supporting ancillary information, and guidance for locating and obtaining the data.

Where possible, rock and hydrothermal vent samples should be assigned unique sample identifiers through the System for Earth Science Registration (SESAR) housed at Lamont Doherty Earth Observatory (ttp://www.geosamples.org/sesarWeb/index.jsp).

National and international standards should be used to the greatest extent possible for the collection, processing and communication of Ridge 2000-sponsored data sets.

## VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- David Garrison, telephone: (703) 292-7588, email: dgarrison@nsf.gov
- Richard Carlson, telephone: (703) 292-7978, email: rcarlson@nsf.gov
- Barbara Ransom, telephone: (703) 292-7792, email: bransom@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

The Ridge 2000 science plan and information on Ridge 2000 community activities, including meetings, workshops, workshop reports, Ridge 2000 newsletters, abstracts of Ridge 2000 awards, steering committee minutes, data and data listings, and research opportunities can be found on the Ridge 2000 Office web site (http://www.ridge2000.org). Requests can also be sent by mail to the Ridge 2000 Office (Woods Hole Oceanographic Institution, 266 Woods Hole Rd., Woods Hole, MA 02543, Tel: 508-289-2348, Email: ridge2000@whoi.edu). Information regarding the complementary international mid-ocean ridge studies program, InterRidge, and requests for InterRidge documents can be obtained from the InterRidge web site (http://www.interridge.org).

## IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, MyNSF (formerly the Custom News Service) is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. MyNSF also is available on NSF's Website at http://www.nsf.gov/mynsf/.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at http://www.grants.gov.

## ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

*Facilitation Awards for Scientists and Engineers with Disabilities* provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

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 about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

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: | (703) 292-7827 |
| • **To Locate NSF Employees:** | (703) 292-5111 |

## 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; and 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 proposer 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 or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; 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," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records, " 69 Federal Register 26410 (May 12, 2004). 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 Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0023. Public reporting burden for this collection of information is estimated to average 12 hours per response, including the time for reviewing instructions. Send comments regarding the 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



The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749