Management and Operation of the Virtual Astronomical Observatory

Program Solicitation

NSF 08-537

National Science Foundation

Directorate for Mathematical & Physical Sciences
Division of Astronomical Sciences

National Aeronautics and Space Administration

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

April 22, 2008

REVISION NOTES

In furtherance of the President's Management Agenda, NSF has identified programs that will offer proposers the option to utilize Grants.gov to prepare and submit proposals, or will require that proposers utilize Grants.gov to prepare and submit proposals. Grants.gov provides a single Government-wide portal for finding and applying for Federal grants online.

In response to this program solicitation, proposers may opt to submit proposals via Grants.gov or via the NSF FastLane system. 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.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Management and Operation of the Virtual Astronomical Observatory

Synopsis of Program:

Proposals are solicited to manage and operate the Virtual Astronomical Observatory (VAO) through a cooperative agreement with the National Science Foundation (NSF), in partnership with the National Aeronautics and Space Administration (NASA).

The Virtual Astronomical Observatory will serve to link a multitude of astronomical data sets into an integrated system that allows automated search and analysis among all cataloged objects. The VAO will provide access to data sets, create and maintain data protocols and standards, and provide analysis tools and services to the astronomical research and educational community. The VAO is expected to act as an enabling and coordinating structure to facilitate the development of tools, protocols, and collaborations necessary to utilize fully the scientific potential of current and future astronomical data.

Any implementation of the VAO and its ongoing operation will build on the framework for virtual observatories being developed by the U.S. National Virtual Observatory (NVO) project and the NASA astrophysics data centers, within the international context provided by the International Virtual Observatory Alliance (IVOA). Any proposed implementation of the VAO must utilize the IVOA and NVO established standards and protocols for unified content descriptors, catalog, data and database access, data models, and documents. NVO tools and services should be incorporated in any proposed implementation of the VAO. Proposals must include a transition plan describing how the framework established by the NVO project and its current activities will be continued and evolve into the proposed management structure and long-term operations of the VAO.

Cognizant Program Officer(s):

- Nigel Sharp, Program Director, Division of Astronomical Sciences, NSF, 1030, telephone: (703) 292-4905, fax: (703) 292-9034, email: nsharp@nsf.gov
- Jeffrey Hayes, Discipline Scientist, NASA, telephone: (202) 358-0353, fax: (202) 358-3096, email: jhayes@nasa.gov
- Eileen D. Friel, Executive Officer, Division of Astronomical Sciences, NSF, 1045 S, telephone: (703) 292-4895, fax: (703) 292-9034, email: efriel@nsf.gov

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

- 47.049 --- Mathematical and Physical Sciences

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1 See Section V.A. for information on collaborative proposals.

Anticipated Funding Amount: $5,500,000 Funding of up to $5.5M is expected to be available in FY2008 and up to $6M annually for the period FY2009-FY2012 pending availability of funds.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Proposals may be submitted by all U.S. organizations, including universities and colleges, non-profit, non-academic organizations, for-profit organizations, and government sponsored organizations. Because access to NASA centers and Federally Funded Research and Development Centers (FFRDCs) sponsored by NASA or NSF is open to any awardee, such centers and FFRDCs will not be eligible as primary proposers, only as supporting partners, participating to meet the NSF and NASA responsibilities negotiated under the award instrument.

PI Limit:

None Specified

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/bfa/dias/policy/docs/grantsgovguide.pdf)

B. Budgetary Information

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

C. Due Dates

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

  April 22, 2008

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.

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I. INTRODUCTION

The National Research Council decadal survey report of 2000, “Astronomy and Astrophysics in the New Millennium,” recommended, as its highest priority small initiative, the creation of a national virtual observatory. Recognizing that astronomy “faces a revolution in data collection, storage, analysis and interpretation of large data sets”, the survey committee envisioned a virtual observatory that would “link the major astronomical data assets into an integrated, but virtual, system to allow automated multiwavelength search and discovery among all cataloged astronomical objects.” This virtual observatory would not only provide access to data sets, but would also create and maintain data protocols and standards and provide analysis tools and services for the astronomical community. The survey committee also recognized the potential of a virtual observatory for education and outreach and as a tool for increasing science literacy.

In response to this recommendation NSF and NASA created a National Virtual Observatory (NVO) Science Definition Team (SDT), whose charge was to define and formulate a joint NSF/NASA initiative to pursue the NVO goals, using input from the U.S. astronomy community. The SDT produced a report to NASA and NSF which can be found at http://www.nsf.gov/mps/ast/nvo_report.jsp.

At the same time, the NSF funded the development of the Framework for the National Virtual Observatory, while NASA continued to support the creation and maintenance of archives from space astrophysics missions and their distributed data systems through the NASA data centers. Both agencies have funded a number of smaller research projects contributing to the NVO development effort. Through the International Virtual Observatory Alliance (IVOA), which coordinates international VO development efforts, the virtual observatory is developing with shared and agreed-upon global standards and protocols.

These development efforts have established and continue to develop and refine standards and protocols that serve as the framework for a fully functional virtual observatory. With this framework in place, NSF and NASA are now soliciting proposals for the implementation, long-term operation and management of a Virtual Astronomical Observatory (VAO) for the US community.

II. PROGRAM DESCRIPTION

The Virtual Astronomical Observatory will serve to link a multitude of astronomical data sets into an integrated system that allows automated search and analysis among all cataloged objects. The VAO will provide access to data sets, create and maintain data protocols and standards, and provide analysis tools and services to the astronomical research and educational community. The VAO is expected to act as an enabling and coordinating structure to facilitate the development of tools, protocols, and collaborations necessary to utilize fully the scientific potential of current and future astronomical data. Any implementation of the VAO and its ongoing operation should build on the framework for virtual observatories being developed by the U.S. NVO project and the NASA astrophysics data centers, with the shared and agreed-upon international standards established by the IVOA. Information on the U.S. NVO project is available at http://us-vo.org. Those proposing may also find it helpful to review the report made to NASA and NSF by the NVO Science Definition Team, which can be found at http://www.nsf.gov/mps/ast/nvo_report.jsp.

Any proposed implementation of the VAO must utilize the IVOA and NVO established standards and protocols for unified content descriptors, catalog, data and database access, data models, and documents. NVO tools and services must be incorporated in any proposed implementation of the VAO. Proposals must include a transition plan describing how the framework established by the NVO project and its current activities will be continued and evolve into the proposed management structure and long-term operations of the VAO. The management of the VAO is expected to work closely and in cooperation with the current NVO management in making this transition and to ensure the continued smooth operation of current NVO-supported activities, including international coordination.

The scope of the proposals should focus on, but is not limited to:

- standards support;
- software and systems development and maintenance;
- software and documentation curation;
- interface and coordination with computing resources;
- user support;
- planning for media migration and long-term data preservation;
- interface with the national and international communities through the IVOA and other means; and
- education and outreach activities.

III. AWARD INFORMATION

The initial award will be for a duration of 5 years, beginning October 1, 2008, with anticipated annual funding of up to $5,500,000 in FY2008 and up to $6,000,000 annually over the period FY2009-FY2012.

Funding will be provided by both NSF and NASA. NSF funding is expected to be up to $4M in FY2008 and no more than $4.5M per year for the period FY2009-2012. NASA funding is expected to be at the level of $1.5M per year. Annual funding increments will be determined on the basis of annual program plans submitted by the awardee to NSF and NASA and approved by NSF and NASA, subject to the availability of appropriated funds.

The award mechanism is anticipated to be in the form of a cooperative agreement issued by NSF between NSF and the awardee. If a NASA-funded center is selected in partnership with a non-governmental entity that will serve as prime awardee, NASA will fund its center's activities directly.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Proposals may be submitted by all U.S. organizations, including universities and colleges, non-profit, non-academic organizations, for-profit organizations, and government sponsored organizations. Because access to NASA centers and Federally Funded Research and Development Centers (FFRDCs) sponsored by NASA or NSF is open to any awardee, such centers and FFRDCs will not be eligible as primary proposers, only as supporting partners, participating to meet the NSF and NASA responsibilities negotiated under the award instrument.

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

None Specified

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/bfa/dias/policy/docs/grantsgovguide.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.

Proposals for the management and operation of the VAO may be submitted by all U.S. organizations, including universities, colleges, non-profit, non-academic institutions, for-profit organizations, and government sponsored organizations. NASA centers and FFRDCs sponsored by NSF or NASA may participate *only* as supporting partners to the lead institution/organization and prime awardee.

Collaborative proposals may be submitted either as a single proposal, in which a single award is requested, with subawards administered by the lead organization, or by simultaneous submission of proposals from different organizations, with each organization requesting a separate award. All collaborative proposals must clearly describe the roles to be played by the other organizations, specify the managerial arrangements, and explain the advantages of the multi-organizational effort within the project description.

Project Description:

The project description of each proposal must not exceed 30 pages. It should present the proposing organization's vision of the VAO in the national and global context of astronomical research and education. Each proposal should address the proposing organization's scientific, technical, and managerial qualifications to operate the VAO, and should address, but not be limited to, the following:

- standards support;
- software and systems development and maintenance;
- software and documentation curation;
- interface and coordination with computing resources;
- user support;
- planning for media migration and long-term data preservation;
- interface with the national astronomical community;
- interface with the international community through the IVOA and other means; and
- education and outreach activities.

Essential components of the proposal include:

1. A Management and Transition Plan

   This plan must fully describe the proposed organization and management structure for the VAO. If the proposal includes participation by a NASA center, in consideration of its funding directly by NASA outside the central VAO office, the proposing institution/organization must describe in detail how the management and oversight of activities at the NASA center will be integrated with that of the centrally funded VAO operation. Attention should be given to mechanisms for interacting with the larger astronomical community both nationally and internationally and for providing oversight and user feedback.

   The plan must identify key positions in the management structure and either identify and provide professional biographical information for persons identified as Key Individuals, or describe a process by which key personnel will be identified. Proposing organizations may propose as Key Individuals persons currently involved in the NVO project collaboration.

   The proposal must present a plan for the transition from the development of the NVO framework to an implementation of the fully functional, user-oriented VAO. The management of the VAO is expected to work closely and in cooperation with the current NVO management to ensure the continued smooth operation of current NVO-supported activities during the transition, with particular attention to maintaining international collaboration and participation in standards activities, continuing development in key areas such as the registry, Data Access Layer, Virtual Observatory Query Language, etc., and supporting the public applications (e.g. DataScope, registry interface, OpenSkyQuery, etc.).

2. A Technical Program Plan

   The proposal must describe the technical needs of the VAO in order to accomplish the scientific objectives. This includes plans for acquisition and maintenance of computing facilities, plans for upgrades of existing facilities or development of new capabilities. The proposal must describe mechanisms to be used for prioritizing capabilities and new initiatives.

3. An Education and Outreach Plan

   The proposal must describe planned education and public outreach activities, both within the VAO and in collaboration with other organizations or programs. Staffing and budget details must be sufficient to show clearly which activities are included within the proposed budget.

   Budget:

   Proposers shall provide all staffing and budgeting information needed to describe how proposers will fulfill the expectations in Sections I and II of this solicitation. Requested budget amounts for each year of the proposal should reflect the level considered necessary to perform the activities described in the proposal, subject to the funding limitations specified in Section III.

   Collaborative proposals originating from a NASA Center or the Jet Propulsion Laboratory must be submitted with fully loaded costs including procurement, civil service labor, travel, service pools, center G&A, and corporate G&A. In compliance with the full cost policies, proposals that are submitted by non-NASA organizations but that involve a NASA organization must ensure that any NASA costs are fully documented in compliance with full cost accounting and include an agreement by the center management that the commitment will be honored for the price quoted. The web address for NASA's Full Cost Initiative is: http://www.hq.nasa.gov/fullcost.

B. Budgetary Information

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

Other Budgetary Limitations: FY2008 budget should not exceed $5.5 million. The budget for FY2009-FY2012 should not exceed $6 million annually.

C. Due Dates

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

  April 22, 2008

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 and, if they meet NSF proposal preparation requirements, for review. 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 with the proposer.

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

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

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

Additional Review Criteria:

In addition to the above merit review criteria, each proposal will be evaluated on the basis of:

- The quality of the proposing organization's overall vision for the VAO;
- The suitability, quality and cost effectiveness of the management plan for operating and maintaining the VAO;
- The suitability, experience, and professional stature of key management individuals, both within the proposing organization and within the VAO;
- The proposing organization's experience in operating scientific facilities;
- The experience and stature of key scientific and technical staff;
- The extent and quality of specified educational programs; and
- The potential for appropriate partnerships with universities, non-Federal observatories, and industry.

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 date of receipt. 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 Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative 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/general_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:

Awards will be made for a period of 5 years. Awards are expected to be made as cooperative agreements between NSF and the awardee. Cooperative agreement awards will be administered in accordance with NSF's Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) which can be found at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=cafatc60107.

Performance and progress toward meeting the goals and objectives originally proposed as well as those of long-range plans will be evaluated on the basis of regular reports and site visits as necessary. These evaluations will lead to a joint agency decision before the end of the 4th year of funding either to request a renewal proposal from the managing organization or to issue a new solicitation for the management and operation of the VAO for the next 5-year period.

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.

The managing organization will be required to provide quarterly and annual reports. Annual submission of yearly program plans and long range plans for periods of 5 years will be required. Annual site visits may be arranged at the discretion of NSF and NASA. The agencies may request special reports on an ad hoc basis but all such requests will be coordinated by the agencies. Details of the reporting requirements will be specified in the final cooperative agreement.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Nigel Sharp, Program Director, Division of Astronomical Sciences, NSF, 1030, telephone: (703) 292-4905, fax: (703) 292-9034, email: nsharp@nsf.gov
- Jeffrey Hayes, Discipline Scientist, NASA, telephone: (202) 358-0353, fax: (202) 358-3096, email: jhayes@nasa.gov
- Eileen D. Friel, Executive Officer, Division of Astronomical Sciences, NSF, 1045 S, telephone: (703) 292-4895, fax: (703) 292-9034, email: efriel@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.
- Kim S. Elliott, Computer Specialist, 1053 S, telephone: (703) 292-4894, email: kelliott@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.

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.

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