

Grant Opportunities for Academic Liaison with Industry (GOALI)

PROGRAM SOLICITATION

09-516

REPLACES DOCUMENT(S):

NSF 07-522



National Science Foundation

- Directorate for Biological Sciences
- Directorate for Computer & Information Science & Engineering
- Directorate for Education & Human Resources
- Directorate for Engineering
- Directorate for Geosciences
- Directorate for Mathematical & Physical Sciences
- Directorate for Social, Behavioral & Economic Sciences
- Office of International Science and Engineering

Supplement Due Date(s):

Proposals Accepted Anytime

Investigators should discuss supplemental funding with their NSF program officer prior to submission.

Full Proposal Deadline(s):

Proposals Accepted Anytime

Check with the program officer in the specific field of the proposed research for acceptable submission periods.

REVISION NOTES

Additional instructions were added to inform proposer's to only contact GOALI Program Officers about questions specific to the GOALI program and not for technical information and assessments or submission dates.

Note: throughout this document we use the term industry to also include firms of all sizes.

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. 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).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Grant Opportunities for Academic Liaison with Industry (GOALI)

Synopsis of Program:

Grant Opportunities for Academic Liaison with Industry (GOALI) promotes university-industry partnerships by making project funds or fellowships/traineeships available to support an eclectic mix of industry-university linkages. Special interest is focused on affording the opportunity for:

- Faculty, postdoctoral fellows, and students to conduct research and gain experience in an industrial setting;
- Industrial scientists and engineers to bring industry's perspective and integrative skills to academe; and
- Interdisciplinary university-industry teams to conduct research projects.

This solicitation targets high-risk/high-gain research with a focus on fundamental research, new approaches to solving generic problems, development of innovative collaborative industry-university educational programs, and direct transfer of new knowledge between academe and industry. GOALI seeks to fund transformative research that lies beyond that which industry would normally fund.

Cognizant Program Officer(s):

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.078 --- Office of Polar Programs
- 47.079 --- Office of International Science and Engineering
- 47.080 --- Office of Cyberinfrastructure

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant or Fellowship Grant or Other Grant Supplement to Existing Award

Estimated Number of Awards: 60 to 80 awards.

Anticipated Funding Amount: \$10,000,000 total expected from all participating directorates.

Eligibility Information

Organization Limit:

None Specified

PI Limit:

For fellowships/traineeships, only U.S. citizens, nationals, or permanent residents are eligible to apply for support under this program.

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 costs are not allowed in fellowship/traineeship grants.
- **Other Budgetary Limitations:** Not Applicable

C. Due Dates

- **Supplement Due Date(s):**

Investigators should discuss supplemental funding with their NSF program officer prior to submission.
- **Full Proposal Deadline(s):**

Check with the program officer in the specific field of the proposed research for acceptable submission periods.

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria apply.

Award Administration Information

Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

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I. INTRODUCTION

A major objective of the National Science Foundation (NSF) is to improve the nation's capacity for intellectual and economic growth by increasing the number of industrial partnerships and collaborations. By serving as a catalyst for industry-university partnerships, NSF helps ensure that intellectual capital and emerging technologies are brought together in ways that promote economic growth and an improved quality of life. Benefits to universities may include extensions to in-house research capabilities, alignment of efforts with viable technology options; direct and more immediate impact on technology and its design infrastructure; and the training of students for industrial positions. Possible benefits for industry include more research-intensive activities, investigations of high-risk ideas, increased efforts towards research, shortening the research and development cycles, training students for future employment, and vetting of future hires.

To meet this objective, the GOALI program seeks to stimulate interactions and staff exchange between universities and industry. For example, faculty, postdoctoral fellows, and students are encouraged to develop creative modes of collaborative interactions with industry through individual or small-group projects, and industry-based fellowships or traineeships for students and post-doctoral fellows. The GOALI mechanisms suggested below are *examples only* and proposers are encouraged to modify or adapt them to meet individual needs or realize imaginative ideas.

Examples of Proposal Ideas

- An extended faculty experience in industry (of several months duration) to foster industry-university collaboration;
- A faculty visit to industry (of several months duration) at the beginning of a multiple-year university-based research project to better enable the transfer of research results to industry by project's end;
- Visit of a leading engineer, scientist, or manager from industry to a university, to catalyze collaborative research or teach and develop curricula;
- Support for one or two semesters of work in industry by a doctoral student under the guidance of an academic adviser;
- Post-doctoral support for one or two years of work in an industrial setting, under the guidance of an academic mentor in collaboration with an industrial partner;
- Support for a supplement to an existing grant for high-risk/high-gain research in order to gain basic knowledge necessary for development of a generic technology;
- Opportunities for graduate students and faculty to attend planned seminars or carry-out of research;
- Support of untenured faculty for an internship in industry;
- Research Experiences for Industry (REI) opportunity support;
- University-based support for partnering university and industry scientists, or engineers, or both on a research project of mutual interest, including joint graduate student advising. A letter from the industrial collaborator(s) documenting the intention to collaborate should be appended to the proposal;
- Support for interdisciplinary research or educational projects of two or three faculty from different academic units to interact with one or more industrial partners in a virtual industry-university group or network;
- Research support in conjunction with a new industrial chair position,
- Support for continuing education in industry towards advanced degrees; and
- Research Experiences for Teachers in Industry (RETI) to gain research experience in an industrial setting.

International collaborations that strengthen proposed project activities are encouraged, when there is an opportunity for coordinated funding with colleagues from foreign institutions who will add value to the project. This program will support the US-based scientists and their students. Collaborators in institutions outside the US must seek funding from their respective funding organizations. Proposals for international collaborations will be evaluated on the value that they add to the domestic research proposed. NSF requires that proposals with international collaborations include the following: description of the collaboration; discussion of US and foreign contributions to the project; costs of travel to work with foreign partners; costs for students to travel overseas for short or extended visits in foreign laboratories; foreign collaborators' biographical sketches (CVs); and documentation of their agreement to collaborate on the proposed project, as well as the means by which they will support their part of the work.

II. PROGRAM DESCRIPTION

The topics addressed in a GOALI proposal should address research within an intellectual envelope shared by the industrial partner. Fundamental research generally is performed in academe in parallel with more applied research in industry. Investigators are expected to integrate their research objectives with educational and industrial needs. Industry involvement assures that the research is industrially relevant.

The GOALI program emphasizes improving industry-university research linkages in the design and implementation of products and processes. The research should strengthen the fundamental scientific and engineering foundations on which new design and production practices and methods are based. This emphasis aims to improve basic understanding and the development of integrated design tools in both academe and industry. The length of support requested should be appropriate to the purpose and may vary.

Industry participation in the research and education projects is required for collaborative work at industrial sites. However, industrial organizations may partner in research awards for projects performed in universities. Proposals may include participation by a "third partner" such as one of the National Labs or a non-profit organization.

A co-investigator or co-advisor from industry is required in a collaborative project or industrial fellowship/traineeship. This provides relevance for the research effort through the active participation of industry in the design and implementation.

NSF Organizational Opportunities.

Important: Persons interested in requesting funds under GOALI must communicate with an NSF program director in the specific area of the proposed research for guidance on proposal submission. The NSF web site at <http://www.nsf.gov> has a staff and organizational list of programs and telephone numbers.

For additional current information, you are encouraged to browse the web sites of the appropriate directorate. While flexibility exists for proposals focused on one or several of the examples listed above, the following directorates offer specific guidelines for GOALI-

related activities:

Directorate for Biological Sciences (BIO) - Opportunities are available for bioscience undergraduate and graduate students supported as a supplement to existing BIO awards. GOALI mechanisms of interest include:

- Faculty and Students in Industry:
 - Graduate Student Traineeships
 - Undergraduate Traineeships

Directorate for Computer and Information Science and Engineering (CISE) - offers opportunities in all areas usually supported by the directorate. GOALI mechanisms of interest include:

- Industry-University Collaborative Projects
- Faculty and Students in Industry:
 - Faculty-in-Industry
 - Post Doctoral Industrial Fellowships
 - Graduate Student Industrial Fellowships
 - Undergraduate Industrial Fellowships
- Industry Engineers and Scientists in Academe
 - Industry Presence on Campus
 - Industry-Based Graduate Assistantship

Directorate for Education and Human Resources (EHR) - supports research and education projects and fellowships in all areas of the directorate using these GOALI mechanisms:

- Industry-University Collaborative Projects
- Faculty and Students in Industry:
 - Faculty-in-Industry
 - Post Doctoral Industrial Fellowships
 - Graduate Student Industrial Fellowships
 - Undergraduate Industrial Fellowships
- Industry Engineers and Scientists in Academe
 - Industry Presence on Campus
 - Industry-Based Graduate Assistantship

Directorate for Engineering (ENG) - supports research/education projects and fellowships in all areas of the directorate. GOALI mechanisms of interest include:

- Industry-University Collaborative Projects
- Faculty and Students in Industry:
 - Faculty-in-Industry
 - Post Doctoral Industrial Fellowships
 - Graduate Student Industrial Fellowships
 - Undergraduate Industrial Fellowships
- Industry Engineers and Scientists in Academe
 - Industry Presence on Campus
 - Industry-Based Graduate Assistantship

Directorate for Geosciences (GEO) - supports research/education projects and fellowships in all areas of the directorate. GOALI mechanisms of interest include:

- Industry-University Collaborative Projects
- Faculty and Students in Industry:
 - Faculty-in-Industry
 - Post Doctoral Industrial Fellowships
 - Graduate Student Industrial Fellowships
 - Undergraduate Industrial Fellowships
- Industry Engineers and Scientists in Academe
 - Industry Presence on Campus
 - Industry-Based Graduate Assistantship

Directorate for Mathematical and Physical Sciences (MPS) - encourages a broad range of GOALI proposals reflecting innovative academic-industrial cooperative pursuits in research and education in all areas supported by the directorate. GOALI mechanisms of interest include:

- Industry-University Collaborative Projects
- Faculty and Students in Industry:
 - Faculty-in-Industry
 - Post Doctoral Industrial Fellowships
 - Graduate Student Industrial Fellowships
 - Undergraduate Industrial Fellowships
- Industry Engineers and Scientists in Academe
 - Industry Presence on Campus
 - Industry-Based Graduate Assistantship

Directorate for Social, Behavioral and Economic Sciences (SBE)- encourages theory building in actual operational and managerial processes, problem solving, risk management, strategic planning and decision-making in private-sector organizations. GOALI mechanisms of interest include:

- Industry-University Collaborative Projects
- Faculty and Students in Industry:
 - Faculty-in-Industry
 - Post Doctoral Industrial Fellowships
 - Graduate Student Industrial Fellowships
 - Undergraduate Industrial Fellowships
- Industry Engineers and Scientists in Academe
 - Industry Presence on Campus
 - Industry-Based Graduate Assistantship

Office of International Science and Engineering (OISE) - participates with mechanisms that have an international component. NSF requires that proposals with international collaborations include the following: description of the collaboration; discussion of US and foreign contributions to the project; costs of travel to work with foreign partners; costs for students to travel overseas for short or extended visits in foreign laboratories; foreign collaborators' biographical sketches (CVs); and documentation of their agreement to collaborate on the proposed project, as well as the means by which they will support their part of the work. NSF will consider proposals for cooperative projects involving US and foreign organizations, provided support is requested only for the US portion of the collaborative effort.

GOALI Program Mechanisms

These guidelines provide additional information regarding the characteristics of the GOALI program mechanisms for the industry-university collaboration in NSF directorates. The proposers may combine or modify these mechanisms to meet their interests, or propose other arrangements to achieve directorate GOALI objectives. Proposers interested in submitting proposals for GOALI must contact the appropriate NSF program director in their area of research/education prior to proposal submission. Some programs may only consider supplement proposals while other programs may only fund full proposals.

Program 1: Industry - University Collaborative Projects

Opportunities are made available for collaborative industry-university projects for individuals or small groups. These research and education projects are jointly designed and implemented by university and industry engineers and scientists. The principal investigators and their students are encouraged to perform some of their research at the industrial sites. Researchers from industry and academe tend to complement each other and thus form effective teams. Many teams provide expertise in materials, devices, characterization, measurements, or other areas that exceed the capabilities of a single group. This mechanism offers a special opportunity for industry, including small businesses, to leverage their research efforts with university research in collaborative projects.

Interdisciplinary research and educational projects of two or three faculty from different academic departments or institutions to interact with one or more industrial partners in virtual industry-university groups or networks are also encouraged. Valuable educational opportunities may be derived that would be unobtainable from a single academic department. Students gain exposure to the real world workings of industry, and from research and potential employment opportunities and mentoring that they receive from industrial colleagues.

Proposal description: The proposal must describe the research approach and a detailed plan of the industry-university collaboration including the tasks for both partners. The purpose of the eventual visit(s) in industry or academe must be explained. In the last year of the project, the principal investigator must plan at least two industrial seminars, one of which should be within the collaborating industrial unit.

Budget: NSF funds are for university research/educational activities. The university grant may support activities of faculty and his/her students and research associates in the industrial setting.

Program 2: Faculty and Students in Industry

Opportunities are made available for academic personnel to gain research experience in an industrial setting. Industrial partners can help frame the research and refine the projects for relevancy. The proposal must include the research and education plans, industry-university collaboration plan, and facilities and resources that will be available to support the research during the visit. Students must provide a résumé showing their special qualifications, and a statement of planned interactions with the academic adviser and industrial mentor. Postdoctoral fellows must include a résumé, a professional goal statement, and a statement of planned interaction with the academic adviser and industrial mentor. Proposals must contain a supporting letter from the industrial mentor for students or postdoctoral fellows. The following Faculty and Students in Industry opportunities may be considered:

Faculty-in-Industry - for science, engineering, and mathematics faculty to conduct research for three to twelve months in industry.

Budget - Faculty-in-Industry awards will typically range from \$30,000 to \$75,000 for up to one year and may include a portion of the faculty salary and fringe benefits during the industrial residency period. Up to 20 percent of the total requested amount may be used for travel and research expenses for the faculty and his/her students, including materials but excluding equipment. Faculty in Industry proposals must include clear evidence of the institution's partnership with industry.

Postdoctoral Industrial Fellowship - for engineering, science, and mathematics fellows for full-time work in industry under the guidance of an academic advisor and an industrial mentor. Budget: Awards from NSF will be for amounts up to \$75,000 per year for one to two years. An award may also include transportation and moving expenses (limited to \$4,000). Indirect costs are not allowed in either fellowships or travel grants; fellowships provide an institutional allowance of \$5,000 as partial reimbursement of direct and indirect costs.

Graduate Student Industrial Fellowship/Traineeship - for science, engineering, and mathematics graduate students for full or part-time work in industry in an area related to his/her research under the guidance of an academic adviser and an industrial mentor. Supplement proposals must include plans for managing the project and evaluating the outcomes and the commitment of both academic adviser and industrial mentor. Budget: Awards will be for up to one year with award amounts typically up to \$30,000, and may include the following: a stipend of \$1,500 to \$1,800 per month for one to four semesters (3 to 24 months); transportation expenses for the graduate student; and a 10 percent allowance for the faculty advisor for research-related expenses. Indirect costs are not allowed in fellowship/traineeship grants.

Undergraduate Student Industrial Fellowship/Traineeship - for engineering, science, and mathematics undergraduate students for summer projects, or one to two semesters of part-time or full-time work in industry in an area related to his/her academic program under the guidance of an academic advisor and an industry mentor. For BIO, supplement proposals must include plans for managing the project and evaluating the outcomes and the commitment of both academic adviser and industrial mentor. Budget: Awards include stipends in amounts typically \$10,000. Total project costs are expected to be typically \$500 to \$800 per student per week and may include some assistance with housing, or travel expenses, or both. Indirect costs are not allowed in either fellowships/traineeships or travel grants.

Program 3: Industry Engineers and Scientists in Academe

Opportunities are made available for industry personnel to interact with the academic community. The proposal is submitted by the host university on behalf of an academic principal investigator or the student's adviser and a co-principal investigator or student's co-adviser from industry. The visitor must maintain his/her initial affiliation in industry during the project. Proposals for Industry Presence on Campus awards must include the objectives of the research/educational project, and a plan of the industry-university interaction on campus. Proposals for Industry-Based Graduate Assistantships must include the research plan, a résumé of the graduate student showing the student's special qualifications, training arrangements, description of the facilities, and graduate student working conditions. Two examples for the Industry Engineers and Scientists in Academe opportunity are:

Industry Presence on Campus - for industrial engineers and scientists to visit academe for two to twelve months to catalyze

collaborative research or provide innovations in teaching and engineering curricula, or both. Flexibility of time periods within the duration of an award may be accommodated. Budget: Awards are for a maximum of \$75,000 for up to one year. The award may include part-time salary support for the visiting specialist(s); expenses for student projects; teaching enhancement; and visits of faculty and students to the industrial site.

Industry-Based Graduate Assistantship - for part-time science and engineering students, with permanent positions in industry to continue their graduate studies, particularly toward the Ph.D. The stipend will partially support the time necessary for course work and interaction with a faculty research adviser. Awards are limited to \$30,000 per year for one year (new awards) including indirect cost. Requests may be made as a regular proposal submission to the directorates or as a supplement to an existing grant. A statement detailing the contributions by industry is required and will be considered in the determination of an award.

III. AWARD INFORMATION

Anticipated Type of Award: Continuing Grant or Fellowship or Standard Grant or Supplement to Existing Award

Estimated Number of Awards: 60 to 80 awards

Anticipated Funding Amount: \$10,000,000 total expected from all participating directorates

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. Please see the solicitation description for additional information. All awards are subject to the availability of funds and quality of proposals.

IV. ELIGIBILITY INFORMATION

Organization Limit:

None Specified

PI Limit:

For fellowships/traineeships, only U.S. citizens, nationals, or permanent residents are eligible to apply for support under this program.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

None Specified

Additional Eligibility Info:

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

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.

Supplemental funding requests must be submitted via the NSF FastLane system.

Before submitting a GOALI proposal:

Read the entire solicitation. There are a few things you need to do before trying to submit a GOALI proposal to NSF. These are:

1. Identify and contact the specific NSF program officer who handles the type of research that you are planning to propose or who best matches your discipline area. Use the NSF organization phone directory at <http://www.nsf.gov/staff/orglist.jsp> to narrow the directorate, division, and program where you need to apply.
2. Discuss your proposal with the program officer to find out:
 - If your proposed project is within the scope of the program. (GOALI only provides partial funds), and
 - When the proposal submission dates are for that program.

GOALI Submission Instructions

Unless otherwise instructed by the program officer, submit your proposal to the program for your discipline as an unsolicited proposal. The title of your project will start with "GOALI:" and then the normal title of your project. Again, do NOT submit a proposal directly to the GOALI Solicitation unless instructed by the program director to do so as this document is only a vehicle to describe this special opportunity for unsolicited proposals.

The following instructions must also be followed in preparing the GOALI proposal for NSF:

- Industrial co-PI must be listed on the cover page at the time of submission;
- The Project Summary must address in separate statements the intellectual merit and the broader impacts of the proposed activity and, within the context of these two statements, the value added by the proposed industrial collaboration; and
- The PI is encouraged to list at least two prospective reviewers who may be familiar with the subject of the proposal including persons from industry.

Collaborations with foreign companies must be justified by significant benefits to the U.S. researcher and education enterprise, and overall benefits for the U.S. The proposal must address how distant teams will be enabled for collaboration and industry/university interactions.

The industry-university interaction must be presented in the "Proposal Description".

All commitment letters, industry-university agreement letters on intellectual property, and documentation of collaborative arrangements of significance to the proposal should be provided as supplementary documentation. (Grants.gov users: Supplementary documents should be attached in Field 11 of the R&R Other Project Information Form.) This supplementary documentation will not be counted towards the 15-page Project Description limitation.

- A letter from the industrial partner must confirm the participation of a co-PI or co-adviser from industry. The letter should show the plan of interaction with the academic institution, the time commitment of the industrial researcher(s), and the nature of the work. Normally the co-PI is someone who will be involved with the project on a day-to-day basis and the letter of commitment is from someone at a higher level within the company or consortium.
- Intellectual Property (IP) - Academic and industry partners must agree in advance as to how intellectual property rights will be handled. An industry-university agreement on intellectual property including publication and patent rights must be submitted prior to an award. Documentation outlining the IP agreement should be submitted with the proposal, and the signed agreement must be submitted by the date of award.

B. Budgetary Information

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

Indirect Cost (F&A) Limitations: Indirect costs are not allowed in fellowship/traineeship grants.

C. Due Dates

- **Supplement Due Date(s):**

Investigators should discuss supplemental funding with their NSF program officer prior to submission.

- **Full Proposal Deadline(s):**

Check with the program officer in the specific field of the proposed research for acceptable submission periods.

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.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review, or Internal NSF Review.

Proposals will be reviewed in accordance with the requirements and instructions provided in this announcement.

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.

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.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Donald Senich, GOALI Solicitation Coordinator: Senior Advisor, Small Business Procurement Policy, Directorate for Engineering, 550 S, telephone: (703) 292-7082, fax: (703) 292-9056, email: dsenich@nsf.gov
- John Cherniavsky, Senior EHR Advisor for Research, Directorate for Education and Human Resources, 855S, telephone: (703) 292-5136, fax: (703) 292-9046, email: jchernia@nsf.gov
- Frederica Darema, Program Director, Directorate for Computer & Information Science & Engineering, telephone: (703) 292-8900, email: fdarema@nsf.gov
- Leonard Johnson, Program Director, Directorate for Geosciences, telephone: (703) 292-8559, email: lejohnso@nsf.gov
- Glenn Larsen, Program Director, Directorate for Engineering, Division of Industry Innovation and Partnerships, telephone: (703) 292-8383, email: glarsen@nsf.gov
- Jacqueline Meszaros, Program Director, Innovation and Organizational Sciences, Directorate for Social, Behavioral & Economics Sciences, 980.12, telephone: (703) 292-7261, email: jmeszaro@nsf.gov
- Diane Jofuku Okamuro, Program Director, Biological Infrastructure, Directorate for Biological Science, telephone: (703) 292-8470, fax: (703) 292-9062, email: dokamuro@nsf.gov
- Sonia Ortega, Program Director, Directorate for Education and Human Resources, telephone: (703) 292-8697, email: sortega@nsf.gov
- Celeste Rohlifing, Head, Office of Multidisciplinary Activities, Directorate for Mathematics and Physical Sciences, 1005N, telephone: (703) 292-4962, email: crohlifin@nsf.gov
- Osman A Shinaishin, Program Coordinator, Office of International Science and Engineering, telephone: (703) 292-7228, email: oshinais@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.

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>.

Other programs may be of interest to those seeking GOALI opportunities. Please check the NSF website for the latest opportunities in the following programs:

- NSF Graduate Teaching Fellowships in K-12 Education
- Integrative Graduate Education and Research Traineeship Program (IGERT)
- Developing Global Scientists and Engineers
- Industry/University Cooperative Research Centers Program
- Partnerships for Innovation (PFI)
- Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs
- American Competitiveness in Chemistry - Fellowships (ACC-F) ([NSF 08-541](#))

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

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