NSF CAREER AWARD TOOLKIT

This resource is designed to give junior faculty an in-depth overview of the National Science Foundation (NSF) Faculty Early Career Development Program (CAREER Award). We encourage you to explore the background of this program, gain insights on the proposal and peer-review processes and read helpful tips from past recipients.

CAREER AWARD PURPOSE AND BACKGROUND

All NSF directorates participate in the CAREER Program, designed to support junior faculty in their dual roles as teacher-scholars. CAREER Awards provide recipients the opportunity to enhance their professional career development, better integrate their research and education responsibilities and build academic leadership abilities.

The CAREER Award deadlines for 2014 are in July and are arranged by the NSF Directorate to which you are applying. More details about this are found in the CAREER Award program announcement (see page 2 of this document.)

Three areas emphasized by NSF program officers and CAREER awardees are:

- **Begin work on a CAREER Award proposal early.** This is a very competitive program, awarding just 600 proposals each year. It is also unlike any other proposal you will submit to NSF because it involves planning your career objectives and illustrating how the CAREER Award will contribute to your professional development over the next 5, 10 and 20 years.
- **CAREER Awards represent a true balance between your faculty research and education roles.** The required educational component may focus on any level: K-12 students, undergraduates, graduate students and/or the general public. When planning this component, design innovative outreach efforts that go well beyond what you normally do in your faculty role.
- **Partnerships, especially industrial partnerships, are considered a positive aspect,** but keep in mind that *no co-principal investigators or senior personnel are allowed on CAREER proposals.* International collaborations are also encouraged.

This toolkit is arranged in four sections: (1) KNOW THE NSF CAREER PROGRAM (2) KNOW THE NSF ITSELF (3) KNOW THE CAREER SUBMISSION/REVIEW PROCESS AND (4) LEARN FROM PAST NSF CAREER AWARD RECIPIENTS.

KNOW THE NSF CAREER PROGRAM

CAREER AWARD WEB PAGE

Access to the latest program announcement, a program officer contact list and an awards listing describing over 1000 recently funded CAREER awards complete with proposal abstracts is available at http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503214.

CAREER AWARD PROGRAM ANNOUNCEMENT (NSF 14-532, Updated January, 2014)

The CAREER Award announcement (http://www.nsf.gov/pubs/2014/nsf14532/nsf14532.pdf) provides specific details about the program. Proposers should be very familiar with this document as well as the ***NSF Proposal and Award Policies and Procedures Guide*** (see below).

NSF PROPOSAL AND AWARD POLICIES AND PROCEDURES GUIDE (NSF 14-001)

The ***NSF Proposal and Award Policies and Procedures Guide*** (NSF 14-001) provides standard proposal requirements and is available at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf14001&org=NSF. Proposers should consult both the Guide and the current CAREER Award program announcement when preparing proposals.

CAREER FREQUENTLY ASKED QUESTIONS (FAQs) (NSF 11-038)

Consult the FAQ list (http://www.nsf.gov/pubs/2011/nsf11038/nsf11038.pdf) for clarification of eligibility requirements, NSF expectations for the CAREER educational component, budgeting rules, proposal submission issues, documentation needed for project partners and other important areas.

CAREER AWARD ELIGIBILITY CRITERIA

- Eligible CAREER Award Principal Investigators:
- Hold a doctoral degree
- Are untenured
- Have not received a previous CAREER or NSF Presidential Early Career Award for Scientists and Engineers (PECASE) award
- Are employed in a tenure-track position as an assistant professor at an academic institution in the US

CAREER AWARD LIMITS – PROPOSALS AND BUDGETS

Proposal Limits: Principal investigators may only submit one CAREER Award proposal per competition. Faculty members are limited to participation in three (3) CAREER Award competitions.

Budget Limits: CAREER Award budgets currently have a minimum $400K limit (total costs) for five-year projects (the Biological Directorate and the Office of Polar Programs stipulate a minimum of $500K for five-year projects.) Please note that minimum figures also tend to represent the approximate maximums you can expect. You will want to discuss these budget limits with your program officer.

KNOW THE NATIONAL SCIENCE FOUNDATION

NSF DIRECTORATES AND PROGRAM AREAS

CAREER proposers will want to research NSF, carefully perusing the agency's website to determine which Foundation Directorate represents the best fit for your research interests and expertise. After careful examination, you are then ready to determine the appropriate program within the directorate to target. Multi-disciplinary proposals may require selection of more than one Directorate/Program.

NSF Directorates

Biological Sciences (BIO) – http://www.nsf.gov/dir/index.jsp?org=bio
Computer and Information Science and Engineering (CISE) – http://www.nsf.gov/dir/index.jsp?org=cise
Education and Human Resources (EHR) – http://www.nsf.gov/dir/index.jsp?org=ehr
Engineering (ENG) – http://www.nsf.gov/dir/index.jsp?org=eng
Geosciences (GEP) – http://www.nsf.gov/dir/index.jsp?org=geo
Mathematical and Physical Sciences (MPS) – http://www.nsf.gov/dir/index.jsp?org=mps
Social, Behavioral and Economic Sciences (SBE) – http://www.nsf.gov/dir/index.jsp?org=sbe

Other NSF Program Areas

Environmental Research and Education (ERE) – http://www.nsf.gov/dir/index.jsp?org=ERE
Office of Cyberinfrastructure (OCI) – http://www.nsf.gov/dir/index.jsp?org=OCI
Office of International and Integrative Activities (IIA) – http://www.nsf.gov/od/iia/ise/index.jsp
Polar Programs (PLR) – http://www.nsf.gov/div/index.jsp?org=PLR

CAREER PROGRAM CONTACTS

Proposers are highly encouraged to discuss expectations and approaches best suited to the particular discipline and NSF program, expected proposal budget limits, and other areas with NSF program officers. Be certain to have a quick summary of your proposed CAREER project prepared before this conversation. Specific contacts by Directorate and Program are provided at http://www.nsf.gov/crssprgm/career/contacts.jsp.

KNOW THE CAREER SUBMISSION/REVIEW PROCESSES

MERIT REVIEW CRITERIA

The National Science Board (NSB) has set two main review criteria for NSF-funded proposals: Intellectual Merit and Broader Impacts. These criteria are the main considerations for outside peer reviewers. When planning your proposal, remember that the reviewers are your main audience. Concentrate on making your proposal relevant to your audience by telling your career story within the context of these criteria. Below, are the NSB definitions of the review criteria:

> INTELLECTUAL MERIT: the potential of the project to advance knowledge.
> BROADER IMPACTS: the potential to benefit society and contribute to the achievement of specific desired societal outcomes.

Additional details about the NSF Review Criteria are available in the ***NSF Proposal and Award Policies and Procedures Guide*** (NSF 14-001), starting at Section III-1. The Guide is available on the NSF website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg14001&org=NSF.

In addition to the general review criteria above, when NSF staff members are making final funding decisions they consider two CAREER Award special criteria: Integration of Research and Education, and Integrating Diversity.

PROPOSAL SECTIONS

All standard proposal sections, as outlined in the ***NSF Proposal and Award Policies and Procedures Guide*** (NSF 14-001), are required for CAREER Award proposals (cover sheet, project summary, table of contents, project description, references cited, biographical sketch, budget, budget justification, current and pending support, facilities/equipment/ other resources and supplementary documentation). Deviations from the GPG are outlined in the NSF CAREER Award Program Announcement and summarized below:

> COVER SHEET – Your project title must begin with "CAREER:" No co-principal investigators are permitted. Be certain to reference the appropriate NSF CAREER Award program announcement number to insure the proposal is reviewed in accordance with CAREER Award criteria.
>
> PROJECT SUMMARY – This one-page document provides an overview of the project as well as separate statements illustrating how the proposal meets both the Intellectual Merit and Broader Impact review criteria (this requirement is standard for all NSF proposals.)
>
> PROJECT DESCRIPTION – The project description is limited to 15 pages. Within the project description, the proposer should provide the research project plan, the educational activities/outreach plan (and how this piece will be evaluated), a thorough explanation of how the research and education plans are integrated with one another and results of previous NSF-supported projects (if applicable). Integration does not

happen accidentally; you should describe your intentional plan to bring this about. A careful balance of the research and education components is essential.

REFERENCES CITED – References for both the research and educational activities components should be provided.

BIOGRAPHICAL SKETCH – Biographical sketches are limited to two pages and should include both your research and education activities and accomplishments. There is a limit of 10 publications you can include in your bio sketch. Utilize this section to prove you are the best person to complete this project, a requirement for all proposals but even more important for individual awards of this nature.

SUPPLEMENTARY DOCUMENTATION

Department Chair Letter: A major goal of the CAREER Award Program at NSF is to encourage awardee institutions to place greater value on integration of research and educational activities. Institutions and awardees are expected to work closely together throughout the CAREER project to ensure this outcome. Institutions provide evidence of institutional support of the applicant and the project goals through the letter from the department chair. This two-page departmental letter should provide the following aspects:

- an indication of institutional support for the project outcomes and professional development of the CAREER Awardee
- a description of the relationship between the CAREER project, the recipient's career goals and job responsibilities and the goals of the department/institution
- a description of how the department chair will ensure appropriate mentoring for the CAREER Awardee and verification of CAREER Program eligibility of the PI

Collaboration Letters: Additional letters of collaboration may be submitted in this section, as applicable. These are **not** letters of recommendation but rather are short letters of commitment from collaborators, illustrating types of support to be provided to the project, e.g., access to labs or equipment.

Postdoctoral Researcher Mentoring Plan: A one-page mentoring plan is required if you request a postdoctoral associate in your budget.

Data Management Plan: All NSF proposals including CAREER Award proposals must contain a description of the data that will be produced, how you plan to manage the project data and specifics as to how you will share your project results.

BUDGET DETAILS – The minimum award size is $400,000 in total costs for a five-year period (the Biological Directorate and the Office of Polar Programs have set $500,000 for a five-year period as their minimum award size.) Proposers are strongly encouraged to discuss appropriate award size for the research and educational components to be proposed and typical funding levels for their discipline with their NSF program officer. Allowable costs for CAREER Award proposals include funds for postdoctoral fellows, graduate, and undergraduate students; salary support for the principal investigator; educational outreach

activities; support for an evaluator; necessary equipment and supplies; and travel and consultant expenses. NO salary support for Senior Personnel other than the PI is allowed on CAREER Awards, either in the lead institution budget or in any subawards. Budget preparation should begin early in the proposal process to ensure proposal goals may be met. Careful budgeting and a strong budget justification prove to reviewers that the PI will be a good project business manager.

BUDGET JUSTIFICATION – Justifications are limited to three pages and should provide convincing evidence to reviewers and program staff as to why each dollar is required.

PROPOSAL SUBMISSION

NSF CAREER Award proposals may be submitted via the NSF FastLane System or Grants.gov. Regardless of system, be certain to start the process early as many US academic institutions are submitting multiple CAREER Award proposals in the short timeframe allotted, thus taxing the capacity of both electronic submission systems. *Consult your department or school/college grant administrator for internal submission requirements.*

MERIT REVIEW PROCESS

As previously noted in this document, the National Science Board (NSB) has set two main review criteria for NSF-funded proposals: Intellectual Merit and Broader Impacts. These criteria are the main considerations for outside peer reviewers. Reviewers are asked to support or decline each proposal. Program Officers then consider the advice provided by the reviewers in formulating their recommendations for awards. In addition, when making final funding decisions NSF program officers/staff will consider the proposal in terms of how it will advance (1) the integration of research and education and (2) diversity. Program officer recommendations are then forwarded to the Division Director who is responsible for finalizing award selection. These final selections are sent to the NSF Grants Office where the award notification documents are prepared and sent out (the Grants Office process can take a month or more to complete.) Verbatim copies of peer reviewer comments are provided to the PIs by the Program Officer along with an explanation of the decision to award or decline.

NSF PEER REVIEW PROCESS

LEARN FROM PAST NSF CAREER AWARD RECIPIENTS

CAREER AWARD TIPS FROM CURRENT AND PAST RECIPIENTS

ZJ Pei, a faculty member at Kansas State University and CAREER Award recipient, has edited and compiled a book of articles written by select CAREER Awardees titled "NSF CAREER Proposal Writing Tips" (2007). ***Dr. Pei has given ORED permission to distribute his book to you for free. Please contact us at 307-766-2047 or fgraf@uwyo.edu, indicating your preference for an electronic or hard copy version.***

ORED has developed a checklist of the major themes presented by the CAREER Award recipients in this book:

- **LEARN EVERYTHING YOU CAN ABOUT THE NATIONAL SCIENCE FOUNDATION.** Utilize the NSF website, talk with colleagues who have had NSF funding, review agency awards and abstracts.
- **DEPICT YOUR RESEARCH AND EDUCATION VISION FOR THE NEXT TEN TO TWENTY YEARS.** Then describe your long-term career goals in the context of the CAREER award, indicating how this award will benefit your career during and after the award period.
- **READ OTHER SUCCESSFUL CAREER PROPOSALS.** You may request copies of previously awarded proposals from NSF through the Freedom of Information Act but this can be time-consuming. Standard practice allows you to ask previous CAREER awardees for copies of their funded proposals. Unsuccessful proposals are also informative but more difficult to obtain.
- **EMPLOY PROPOSAL READERS, BOTH EXPERTS IN YOUR FIELD AND OTHERS OUTSIDE YOUR FIELD.** NSF peer review panels are comprised of experts in your field and closely related fields, but take nothing for granted. Utilizing expert readers in and out of your field will ensure that your proposal avoids technical jargon and is easily understandable for high-level science and engineering experts in any field. Ask a STEM (science/technology/engineering/mathematics) education expert to read your proposal and comment on the educational outreach component.
- **START EARLY.** Allow plenty of time to write the proposal. You will also need time to obtain letters from your department chair and project partners/collaborators.
- **ESTABLISH INDUSTRY COLLABORATIONS EARLY.** Making these connections and bringing industry partners into the process early is a good strategy for convincing reviewers that your partners see future applications of your fundamental research project. Industry partners may choose to invest in your project, another plus for reviewers, by providing additional funding or in-kind support, e.g., running preliminary analyses or providing student internships.
- **BE STRATEGIC ABOUT THE BROADER IMPACTS OF YOUR PROPOSED PROJECT.** You can distinguish your proposal by laying out unique dissemination tactics. Again, start planning your project early so you have the time needed to bring science museums, high school teachers, etc. into your project and obtain your necessary collaboration letters from them.
- **SEEK THE APPROPRIATE BALANCE BETWEEN RESEARCH AND EDUCATION PLANS PRESENTED.** The educational outreach plan should go beyond what is already expected of professors.
- **HAVE A CONVERSATION(S) WITH THE NSF PROGRAM OFFICER ONCE YOU HAVE DETERMINED YOUR PROJECT GOALS.** Be prepared to discuss and ask/answer questions. Program officers can help you understand: (1) their program missions, (2) how best to situate your project to meet

the mission or whether your project would benefit from submission to another NSF program more closely aligned with your project goals, and (3) potential funding ranges and more.

- **UTILIZE HIGH-QUALITY GRAPHICS IN YOUR PROPOSAL TO ILLUSTRATE YOUR IDEAS.** Be certain the graphics text is easily readable for tired reviewers.
- **INFORM THE PROGRAM OFFICER OF YOUR WILLINGNESS TO SERVE ON PEER REVIEW PANELS.** You will gain much knowledge from this process in terms of what makes a good or bad proposal. Serving in this capacity also provides you with the opportunity to interact with colleagues and agency personnel.
- **KNOW YOUR INSTITUTION.** Read the CU Denver mission and vision statements and be certain to incorporate them within your research and education plans. It is critical that reviewers gain a positive sense of the institutional support level you will have when undertaking your CAREER project, and this along with the department chair letter are two key areas in which you can make your institutional support case to reviewers.
- **PROVIDE TIMELINES FOR RESEARCH AND EDUCATIONAL COMPONENTS IN YOUR CAREER PROPOSAL.** It helps reviewers realize that you have an appropriate plan and will be able to complete it within the five-year period.
- **KEEP TRYING.** You have three opportunities for a CAREER award and most of the contributors to the "NSF CAREER Proposal Writing Tips" book applied to the program more than once before receiving their CAREER awards.

GOOD LUCK ON YOUR NSF CAREER AWARD PROPOSAL!
PLEASE CONTACT ORED WITH ANY QUESTIONS YOU HAVE ABOUT CAREER AWARDS.

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