Status of NSF’s Faculty Early Career Development Program (CAREER)

Theresa Maldonado – Chair of CAREER Coordinating Committee
Anita La Salle – Co-Chair of CAREER Coordinating Committee

April 2013
History of NSF Targeted Young Faculty Awards

Pre-1995
Two types of young investigator awards
Both focused on research

Prestige grants:
PYI (1985-91)

Starter grants:
Research Initiation Awards (until ~1991)

Integration of Research and Education
CAREER (1995 – pres.)
PECASE (1996 – pres.)
### Benefits of CAREER award as reported by past awardees

<table>
<thead>
<tr>
<th>Benefit</th>
<th>ENG</th>
<th>Δ</th>
<th>NSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support for research prior to a tenure decision</td>
<td>98%</td>
<td>0%</td>
<td>98%</td>
</tr>
<tr>
<td>Positively influenced my receipt of tenure</td>
<td>96%</td>
<td>0%</td>
<td>96%</td>
</tr>
<tr>
<td>An opportunity to leverage other funds to support my research</td>
<td>77%</td>
<td>+19%</td>
<td>58%</td>
</tr>
<tr>
<td>In some other way(s), fostered my research productivity</td>
<td>74%</td>
<td>+5%</td>
<td>69%</td>
</tr>
<tr>
<td>Engagement in a new kind of research that I would not have otherwise been able to pursue</td>
<td>55%</td>
<td>+5%</td>
<td>50%</td>
</tr>
<tr>
<td>In some other way(s), enabled me to pursue educational activities</td>
<td>51%</td>
<td>+4%</td>
<td>47%</td>
</tr>
<tr>
<td>An opportunity to form a partnership with industry</td>
<td>48%</td>
<td>+26%</td>
<td>22%</td>
</tr>
<tr>
<td>An opportunity to pursue an educational activity that subsequently benefited my research</td>
<td>47%</td>
<td>+4%</td>
<td>43%</td>
</tr>
<tr>
<td>Additional time because I did not need to spend time applying for other grants prior to tenure</td>
<td>39%</td>
<td>-12%</td>
<td>51%</td>
</tr>
<tr>
<td>An opportunity to move to a more prestigious institution</td>
<td>18%</td>
<td>+3%</td>
<td>15%</td>
</tr>
</tbody>
</table>
## What Department Heads Say About the Impact of CAREER

<table>
<thead>
<tr>
<th>Impact</th>
<th>% ENG</th>
<th>Δ</th>
<th>% NSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing the department’s prestige</td>
<td>82%</td>
<td>+1%</td>
<td>81%</td>
</tr>
<tr>
<td>Increasing the supply of funding for graduate students</td>
<td>65%</td>
<td>+8%</td>
<td>57%</td>
</tr>
<tr>
<td>Increasing the overall quantity of faculty-led research</td>
<td>52%</td>
<td>+3%</td>
<td>49%</td>
</tr>
<tr>
<td>Improving the overall quality of faculty-led research</td>
<td>51%</td>
<td>+2%</td>
<td>49%</td>
</tr>
<tr>
<td>Increasing the value placed by departmental faculty on research</td>
<td>41%</td>
<td>+5%</td>
<td>36%</td>
</tr>
<tr>
<td>The development of new courses</td>
<td>38%</td>
<td>-7%</td>
<td>45%</td>
</tr>
<tr>
<td>Improving the overall quality of students’ education</td>
<td>32%</td>
<td>-1%</td>
<td>33%</td>
</tr>
<tr>
<td>Increasing the value placed by departmental faculty on the integration of research and education</td>
<td>28%</td>
<td>-2%</td>
<td>30%</td>
</tr>
<tr>
<td>Improving departmental instruction overall</td>
<td>25%</td>
<td>-3%</td>
<td>28%</td>
</tr>
<tr>
<td>Increasing the value placed by departmental faculty on education activities</td>
<td>17%</td>
<td>-2%</td>
<td>19%</td>
</tr>
<tr>
<td>The development of new degree programs</td>
<td>6%</td>
<td>-1%</td>
<td>7%</td>
</tr>
</tbody>
</table>
Department chairpersons’ perception of how Engineering Directorate CAREER awardees compare to their peers in ENG

<table>
<thead>
<tr>
<th>Engineering Directorate</th>
<th>CAREER More</th>
<th>Both Groups Equally Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quickly establish their research program</td>
<td>58%</td>
<td>39%</td>
</tr>
<tr>
<td>Progress quickly towards tenure</td>
<td>44%</td>
<td>53%</td>
</tr>
<tr>
<td>Incorporate activities integrating research and education into their instruction</td>
<td>44%</td>
<td>48%</td>
</tr>
<tr>
<td>Are regarded as leaders within this institution</td>
<td>41%</td>
<td>50%</td>
</tr>
<tr>
<td>Are regarded as leaders within the department</td>
<td>32%</td>
<td>60%</td>
</tr>
<tr>
<td>Attract graduate students</td>
<td>22%</td>
<td>75%</td>
</tr>
<tr>
<td>Conduct excellent research</td>
<td>18%</td>
<td>79%</td>
</tr>
<tr>
<td>Are effective educators</td>
<td>13%</td>
<td>80%</td>
</tr>
<tr>
<td>Devote time to mentoring students</td>
<td>10%</td>
<td>84%</td>
</tr>
</tbody>
</table>
First, an overview of why we are here .....  

• CAREER Program has been in place in its current form since 1995.  
• CAREER supports junior faculty who have the potential to become future leaders in their profession.  

• Reporting on a year-long exploration of the relevance of CAREER and potential future directions the program might take:  
  • NSF CAREER Coordinating Committee (CCC)  
  • Focus groups  
    • Within the Foundation (ENG and CISE) and  
    • External to the Foundation (at NSF outreach sessions)  
  • NSF Committee of Visitors (COV) and Policy representatives  
  • NSF’s Assistant Directors (ADs)  
  • CAREER External (Temporary) Advisory Committee (AC) - met Dec. 2012  
    • Formed as a sub-committee reporting to the Engineering Advisory Committee  
    • Comprised of STEM representatives from a broad range of institution types and disciplines represented by NSF
AC Pre-Meeting Preparation

- Documents and web site information distributed
  - Charge letter (Handout)
  - Meeting Attendees
  - Agenda and Guidelines
  - CAREER Program Solicitation
  - CAREER FAQs
  - Research Universities and the Future of America
  - Report to the President: Transformation and Opportunity: The Future of the U.S. Research Enterprise

- “Food for Thought” questions (Handout)

Charge: to offer recommendations on
1. The future of “CAREER” and
2. How NSF should support junior faculty, in general.

• Context of the External Community
• Next-Generation “CAREER”
Now -- Highlights of Recommendations

- Expand the **eligibility pool** to include others than tenure-track faculty.

- **Remove the requirement** for “Research + Education” and expand the integration aspect of proposals to include:
  - Research + Entrepreneurship,
  - Research + Industrial Collaboration,
  - Research + Society,
  - Research + Broadening Participation,
  - as well as Research + Education and other combinations that the PI may design that serves career goals and national priorities.

- **Increase the level of funding** at the individual award level and across NSF’s Divisions and Directorates and *increase the number of awards*.

- Build in flexibility that permits PIs to determine the **appropriate time-frame** for their projects.
• Encourage **collaboration** within the PI’s Department, institution, and outside the PI’s institution, (including international collaboration) where collaborators may or may not appear on the cover sheet or within the budget.

• Encourage **multi- and trans-disciplinary** research and build management processes at NSF that insure the **equitable treatment** of such proposals.

• Foster **mentoring** of junior faculty through **formal mechanisms**.

• **Remove many of the complexities** from the program solicitation and reduce the number of FAQs.

• Permit **course buy-outs** for PIs from non-Tier-1 institutions.

• Provide **non-program funds supplements** to reward PIs whose projects have exemplary outcomes.

• Tailor the solicitation so that it **serves many types of institutions and communities**.
Remaining Tasks:

• Finalize Advisory Sub-Committee Report
• CCC Review
• Report to ADs and ACs
• Compose Solicitation/PIMs
• Compose FAQs/PIMs
• Directorate Approvals
• Publish Solicitation

Questions?
These reports are example references to support our discussions.
We are going to tell you about:

why we are here,

where we started,

what’s been done,

progress so far, and

what is yet to be done with respect to NSF’s CAREER Program.
• Maldonado and La Salle appointed as Chair and Co-Chair of CAREER Coordinating Committee in January 2012.

• Met, during the period March – November 2012, with CCC, NSF Director’s Office, ADs, Management, COV Coordinator, Policy, and other individuals.

• Held focus groups internally and externally.

• Management decision to forego retrospective CAREER COV in favor of an external advisory body (Temporary Advisory Committee (AC) chartered as a sub-committee of the ENG Directorate’s AC) to provide guidance about future CAREER Program.
CAREER AC Meeting convened on December 12-14, 2012

Selection of [Temporary] AC Members:

- Recommendations from CCC members
- Recommendations from Directorates: ADs, DADs, ...
- Invited members of Directorate ACs
- CCC interactions/involvements
- Strove for diversity across institutions and members (Gender, R1/non-R1, discipline, ethnicity, rank, CAREER-recipients/non-recipients, AC members/non-members, geography, EPSCOR, public/private institutions)
- Issued approximately 100 invitations to serve on AC – received 25 acceptances – 24 attended plus one teleconferenced
- Invited Federal Panelists who manage career programs – four gave overviews of their agency’s career management (DARPA, DOE, NIH, ONR)
AC Draft Report is Complete

A. Outcomes of AC Meeting: Executive Summary
B. Outcomes of AC Meeting: Report
   1) Preamble: Overview of CAREER AC Deliberations
   2) AC’s Overarching Concerns
   3) Scope of Program and Solicitation-Centric Issues
   4) Post-Award Issues
   5) Management-Centric Issues
CAREER AC Membership

CHAIR --Patrick Farrell
Provost and Vice President for Academic Affairs
Lehigh University

Cindy Atman
Director, Center for Engineering Learning & Teaching
Professor, Human Centered Design & Engineering
Human Centered Design and Engineering
University of Washington

Theodore Bergman
Charles E. & Mary Jane Spahr Professor; Department Chair
Mechanical Engineering
University of Kansas

Cecilia Bitz
Chair and Associate Professor in the Atmospheric Sciences Department, an Affiliate Physicist for the Polar Science Center
Atmospheric Science
University of Washington

Michael P. Brenner
Glover Professor of Applied Mathematics and Applied Physics
School of Engineering and Applied Sciences
Harvard University

Vicki L. Colvin
Vice Chancellor for Research
Kenneth S. Pitzer-Schlumberger Professor of Chemistry and Professor of Chemical & Biomolecular Engineering
Department of Chemistry
Rice University

Teresa Dahlberg
Associate Dean
Undergraduate Programs and Administration
College of Computing and Informatics
University of North Carolina

David V. Dearden
Professor
Department of Chemistry and Biochemistry
Brigham Young University

Jimmy de la Torre
Associate Professor
Graduate School of Education
Rutgers University

Alison Flatau
Associate Dean of Research and Professor
Department of Aerospace Engineering
University of Maryland

Matthew Fouch
Staff Scientist in Geophysics
Dept. of Terrestrial Magnetism
Carnegie Institution of Washington

Juan E. Gilbert
IDEAS Professor and Chair
Human-Centered Computing Division
Clemson University

Sharon Glotzer
Stuart W. Churchill Collegiate Professor of Chemical Engineering, and Professor of Materials Science and Engineering, Physics, Macromolecular Science and Engineering, and Applied Physics
University of Michigan

Richard Halverson
Associate Professor
Department of Educational Leadership and Policy Analysis
University of Wisconsin - Madison

Heather Haveman
Professor
Sociology and Business
UC Berkeley

Linda Hayden
Director, Center of Excellence in Remote Sensing Education and Research
Elizabeth City State University

Psarris Kleanthis
Dean, School of Natural and Behavioral Sciences
Brooklyn College (CUNY)

Elizabeth A. Lada (by Phone)
Professor of Astronomy
University of Florida

Karen Lozano
Professor, Mechanical Engineering Department
The University of Texas-Pan American

Walter G. Secada
Senior Associate Dean, School of Education
Professor, Department of Teaching and Learning
University of Miami

Susan R. Singer
Laurence McKinley Gould Professor of Natural Sciences,
Carleton College

Keivan Stassun
Professor of Physics and Astronomy
Director, Vanderbilt Initiative in Data-intensive Astrophysics (VIDA)
Adjunct Professor of Physics – Fisk University
Vanderbilt University

Agnes Szanto
Associate Professor
Departments of Mathematics
North Carolina State University

Valerie Taylor
Royce E. Wisenbaker Professor
Computer Science and Engineering
Texas A&M University

Niescja Turner
Associate Professor
Physics and Space Sciences Department
Florida Institute of Technology

Federal Panelists

Dr. Tayo Akinwande
Defense Advanced Research Projects Agency

Dr. Linda Blevins
U.S. Department of Energy

Dr. Nancy Desmond
The National Institute of Mental Health (NIMH)

Dr. William Lukens
Office of Naval Research