# 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)
NYI (1992-1994)
PFF (1992-1994)

Starter grants:
Research Initiation
Awards (until ~1991)
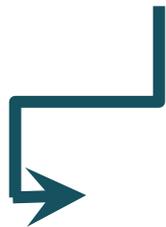
Integration of Research and Education
CAREER (1995 – pres.)
PECASE (1996 – pres.)

# Benefits of CAREER award as reported by past awardees

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

# What Department Heads Say About the Impact of CAREER

| | % ENG | Δ | % NSF |
|---|---|---|---|
| Increasing the department's prestige | 82% | +1% | 81% |
| Increasing the supply of funding for graduate students | 65% | +8% | 57% |
| Increasing the overall quantity of faculty-led research | 52% | +3% | 49% |
| Improving the overall quality of faculty-led research | 51% | +2% | 49% |
| Increasing the value placed by departmental faculty on research | 41% | +5% | 36% |
| The development of new courses | 38% | -7% | 45% |
| Improving the overall quality of students' education | 32% | -1% | 33% |
| Increasing the value placed by departmental faculty on the integration of research and education | 28% | -2% | 30% |
| Improving departmental instruction overall | 25% | -3% | 28% |
| Increasing the value placed by departmental faculty on education activities | 17% | -2% | 19% |
| The development of new degree programs | 6% | -1% | 7% |

# Department chairpersons' perception of how Engineering Directorate CAREER awardees compare to their peers in ENG

| Engineering Directorate | CAREER More | Both Groups Equally Well |
|---|---|---|
| Quickly establish their research program | 58% | 39% |
| Progress quickly towards tenure | 44% | 53% |
| Incorporate activities integrating research and education into their instruction | 44% | 48% |
| Are regarded as leaders within this institution | 41% | 50% |
| Are regarded as leaders within the department | 32% | 60% |
| Attract graduate students | 22% | 75% |
| Conduct excellent research | 18% | 79% |
| Are effective educators | 13% | 80% |
| Devote time to mentoring students | 10% | 84% |

**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)**
    - F**ocus 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

About process

# 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"**

About process

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**CAREER Coordinating Committee**
**External Advisory Committee (CCC-EAC)**
**December 12-14, 2012**

The Virginia Suites
1500 Arlington Boulevard
Arlington, VA 22209
(703) 522-9600

...to think about

...program has not changed since its implementation about 16 years ago. The CAREER External Advisory Committee is being asked to consider a broad range of issues related to the CAREER program such as: Is there value in having an NSF-wide program like CAREER? If so, does this program, CAREER, contribute fully to that value. If not, what are the holes? Can a single program serve all the needs of junior faculty support? These and the questions that follow are meant to help to focus the CAREER-AC meeting.

1) **Context of the External Community**

What value(s) do universities place on the CAREER award? Is there a difference across disciplines? What is the relative worth of a CAREER award versus a single investigator research award? Has this program influenced the university culture or vice versa? Are there broadly different expectations from Tier~1 versus teaching universities or minority serving institutions? Does the university culture "victimize" CAREER non-recipients? How tied to the "organization" should the value of the award be? Should the university's commitment come from the Chair? The college? The administration?

What are the current trends in academe that will influence the future populations of researcher-scholar-educators? As university structures evolve, what new expectations will there be for junior scholars?

What are the issues facing junior-faculty? How do universities and faculty cope with those issues? What CAREER-like strategies have worked within universities? Did not work? What options have been used and were successful to support Junior Faculty? Does the single-PI model strengthen a CAREER award? Limit its value? Is CAREER a mentoring opportunity for young faculty? Does feedback and assessment inside and outside the institution add value for the PI? Is the educational component requirement appropriate? Is it effective? Is inter-, intra-, multi-disciplinary research served by the CAREER program? How should a career-like program differentiate and compensate for broad differences in teaching loads across institutions? With respect to career-life-balance – how might that enter into the responsibilities of the institution and help transform organizations?

2) **Next-Generation "CAREER"**

The last version of NSF's CAREER Program was considered "radical" at the time. Should we be looking for new, radical models and ideas?
Should there be a commonly accepted (Foundation-wide) set of objectives for the CAREER Program, and, if so, what are they? How should they be established? Reviewed? Changed? What should happen to the NSF CAREER Program to most benefit the recipient, the NSF, the university, and the country? How well have prior objectives been met? How do we know? Input from universities? Faculty, Depts, CAREER, recipients and non-recipients? Students? NSF? External evaluators? Should we re-visit – "What does

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NSF want to achieve with this program?" – Is it to improve the quality of the academy? Research? Education? The economy? Influence the R&T process? Improve/feed the pipeline?

"Research and Education" outcomes – does evidence support the focus on integration of research and education? Should it be retained? Should there be different models for awards: Scholar/Teacher, Scholar/Entrepreneur, Scholar/Broadening Participation, Scholar/Collaborator, etc? How many different models should we define? Should we have a "super-star" program? Prizes? Other?

How can a solicitation address and serve the appropriate cohort of applicants? What is that cohort? What will the next generation of junior scholars look like? What expectations will drive them? What tensions or barriers will they face? Given the future population of scholar-educators, what will we try to achieve with a "Career" program?

Should a future program have a common "look and feel" across the Foundation? Should NSF increase the CAREER award success rate around the Foundation? Should "Research Initiation" awards be revived – to accommodate smaller awards but more of them? What mechanisms might accomplish research initiation-like awards? Should we consider a creative mechanism such as CEAGERS? Seed funding?

Should NSF be explicit in the solicitation about the mentoring model that will be applied at the PI's institution? Should we devise flexible mechanisms that permit the PI to optimize for his/her situation and institution's mission and still meet NSF's goals? There is a general consensus that most CAREER awards are conservative. Should there be special opportunities for high-risk awards? What are the resources that would be needed to achieve the perfect program? Should there be Industrial supplements (or other such mechanisms) so that collaboration with industry can be rewarded? What other collaborations might be encouraged and rewarded? Should the program be expanded to include CAREER-like awards for mid-career, tenured faculty to engage in purely educational activities?

Is five years an appropriate duration for a CAREER award? Should variations in durations of awards be permitted; such as, initially 5 years and then extendable or initially 3, 4, or 5 years? Or, are multiple variations within the same program a possibility?

Does the Chair's letter add value? Could it be replaced with a post-submission/pre-award letter?

Is the current proposal deadline appropriate?

Should NSF reconsider the 3-and-out rule? What about the July deadline? How should we address the "tenure-track" issue in light of the creation of new non-tenure-track appointments?

The "local" funding model for the CAREER program allows for disciplinary variation, but also allows for varying levels of investment, visibility, and importance. Does this matter? Should all awards, regardless of discipline and NSF ownership, have the same conditions with respect to size of the award, and other aspects?

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## 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.

Outcomes

- 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**.

# NSF CAREER Program
Activities Timeline: January 2012 – December 2013

Jan-12
Maldenado &
La Salle Appointed

03/18/2012 - 11/01/2012
CAREER WG Strategy Meetings, interactions with Director's Office,
COV Coordinator and Planning for AC

02/01/2012  03/01/2012  04/01/2012  05/01/2012  06/01/2012  07/01/2012  08/01/2012  09/01/2012  10/01/2012

01/07/2012                                                                                         11/01/2012

12/12/2012 - 12/14/2012
CAREER Temp
AC Meeting

01/23/2013
Report to ADs

February - March
DRAFT AC Report – CCC Review

April - June
Present to Directorate Spring Ad Comms

01/01/2013  02/01/2013  03/01/2013  04/01/2013  05/01/2013  06/01/2013

12/01/2012                                                                                         06/30/2013

February - March
EHR, ENG, CISE Admin Review

March - April
Report to ADs

05/15/2013
CISE AC Briefing

05/20/2013
SBE AC Briefing
Confirmed

04/25/2013
BIO AC Briefing???

04/17/2013
ENG AC Briefing
Confirmed

04/04/2013
MPS AC Briefing

04/11/2013
GEO AC Briefing

04/20/2013
EHR AC Briefing???

07/03/2013
Draft Solicitation
circulated

July - September
Integrate Feedback – Produce final Solicitation
And FAQs

September - November
PIMS Approvals

12/12/2013
Solicitation and FAQs Published

08/01/2013  09/01/2013  10/01/2013  11/01/2013  12/01/2013

07/01/2013                                                                                         12/31/2013

**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.



SUMMARY
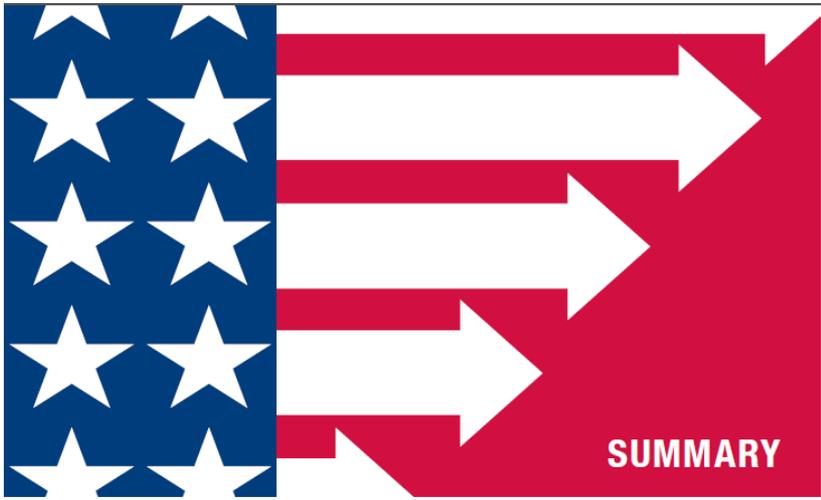
**RESEARCH UNIVERSITIES AND THE FUTURE OF AMERICA**

Ten Breakthrough Actions Vital to Our Nation's Prosperity and Security

NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES



REPORT TO THE PRESIDENT

TRANSFORMATION AND OPPORTUNITY: THE FUTURE OF THE U.S. RESEARCH ENTERPRISE

Executive Office of the President

President's Council of Advisors on Science and Technology

NOVEMBER 2012
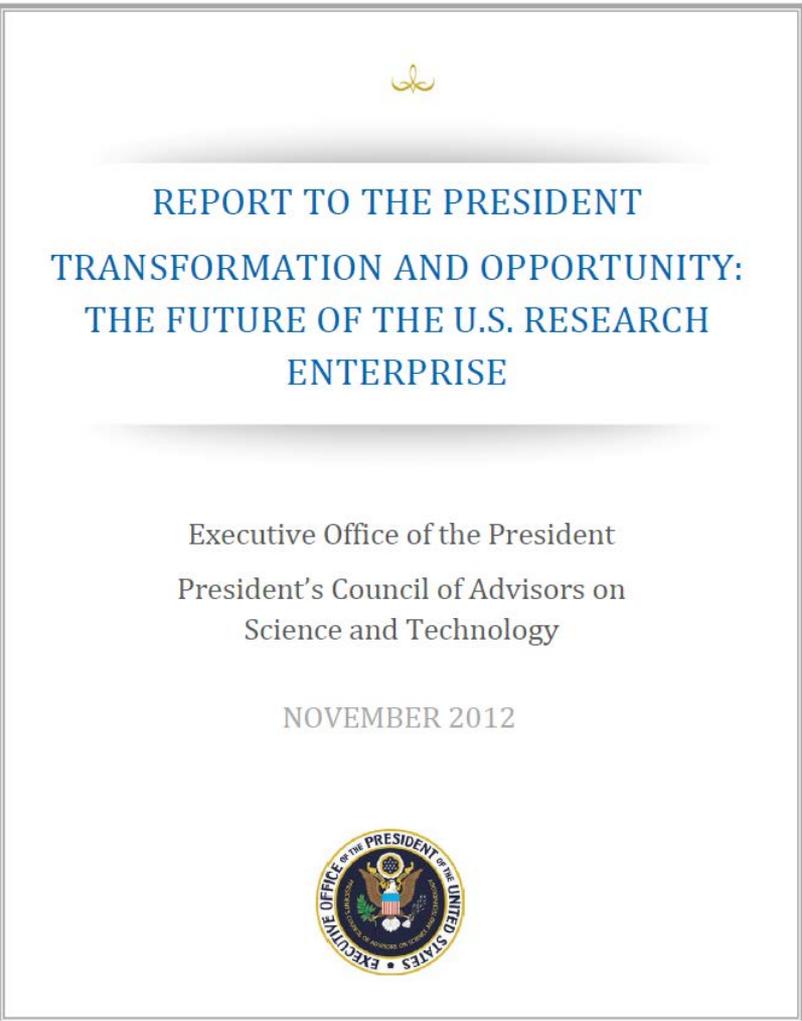
We are going to tell you about:

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.

NSF CAREER Program
Activities Timeline: January 2012 – December 2013

Jan-12
Maldenado &
La Salle Appointed

03/18/2012 - 11/01/2012
CAREER WG Strategy Meetings, interactions with Director's Office,
COV Coordinator and Planning for AC

01/07/2012    02/01/2012    03/01/2012    04/01/2012    05/01/2012    06/01/2012    07/01/2012    08/01/2012    09/01/2012    10/01/2012    11/01/2012
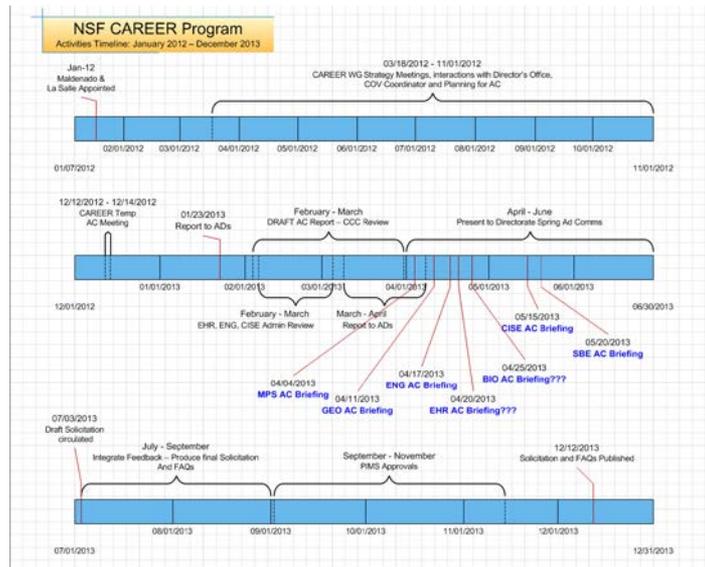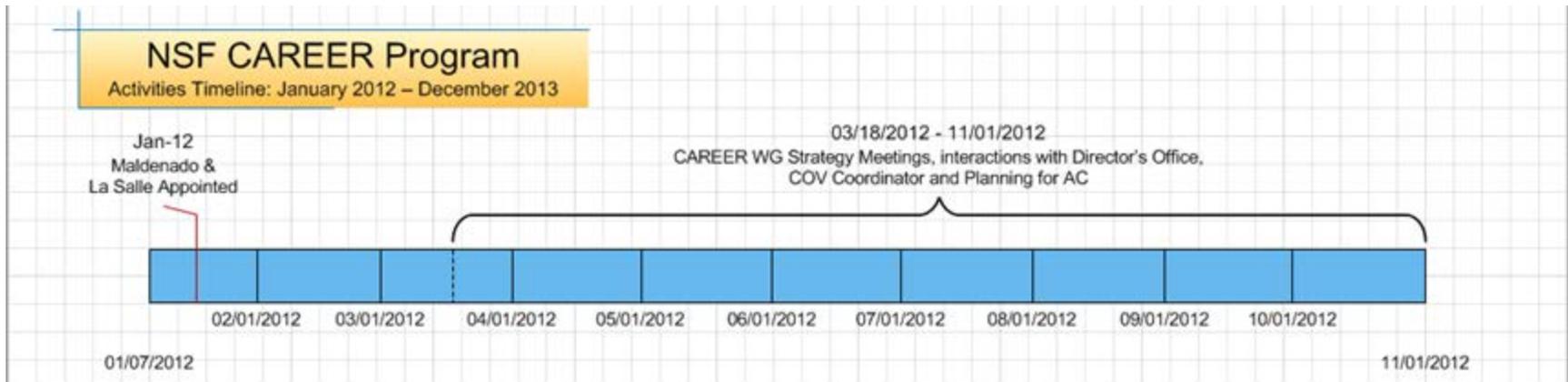
- Maldonado and La Salle appointed as **Chair and Co-Chair** of CAREER Coordinating Committee in January 2012.

- 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.

About process
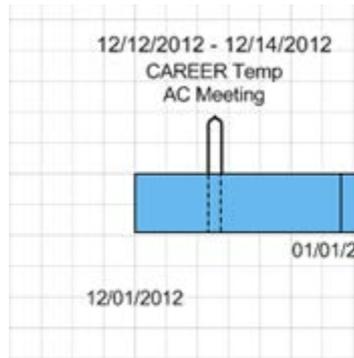
**CAREER AC Meeting convened on December 12-14, 2012**

**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)

12/12/2012 - 12/14/2012
CAREER Temp
AC Meeting

01/01/2

12/01/2012

About process

# AC Draft Report is Complete

**National Science Foundation**
**CAREER Coordinating Committee**

**Outcomes and Recommendations**

**Temporary Advisory Committee**
**For**
**NSF Faculty Early Career Development Program (CAREER)**

March 19, 2013

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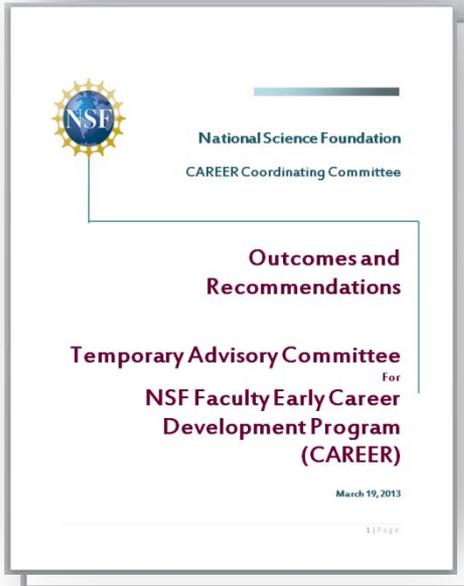
Report organized according to …

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

Outcomes Report of the Meeting of CAREER Temporary Advisory Committee

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Outcomes Report of the Meeting of CAREER Temporary Advisory Committee

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# 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
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**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

About process