Focus on Faculty Early Career Proposals

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Types of early career funding

- Research
- Research and Teaching
- Research + Teaching + Outreach
- Seed/pilot funding
- Opportunities to participate in large networks and Centers

Why seek early career funding?

- May not require as much pilot data as some other types of funding.
- Competing only against others at your level.
- Many of these are very prestigious awards.

Some opportunities (a very partial listing)

- NSF Faculty Early Career Development (CAREER) Program
- William T Grant Foundation Scholars Program
- DOE Early Career Research Program
- NASA ROSES Fellowships for Early Career Researchers
- NIH K (Early Career) Awards
- American Psychological Association (APA) Early Career Pilot Study Awards
- DOD DARPA Young Faculty Award

For a more complete list….

- See http://rds.ucmerced.edu/funding-opportunities/funding-opportunities-lists
- 89 Curated early career opportunities
- See also NIH K Kiosk: http://grants.nih.gov/training/careerdevelopmentawards.htm

Some due dates:

- DOE: Pre-proposal in September; full proposals by invitation in November
- DARPA: Early winter, January or February
- NIH: Standard dates 3X per year but may vary by IC or by Solicitation.

Focus on NSF CAREER

http://www.nsf.gov/pubs/2015/nsf15555/nsf15555.htm

"CAREER: The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's *most prestigious awards in support of junior faculty* who *exemplify the role of teacher-scholars* through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations. Such activities should build a firm *foundation for a lifetime of leadership in integrating education and research*"

Before you start….

- Read the RFA! (several times)
- Draft a proposal development plan and timeline working backwards to due date.
- Consult with RDS
- Plan time to speak with the program contact(s).
- Build in time to seek internal review and comments.

A quick overview….

- Minimum award: $400K over five years; Bio, ***ENG*** or PLR $500K (includes IDC.)
- Funding rates vary by Directorate, but about 20% overall (per year).
- Eligibility: PhD in field supported by NSF, untenured/tenure track; can only apply three times.
- No Co-PIs or Senior Persons named or in budget.
- Requires letter from Dean/Dept. head to demonstrate institutional support and verify eligibility.(At UC Merced this is By-Law 55 unit Chair other than in ENG).
- In any area normally supported by NSF.

Quick Overview continued.

- Mark your Calendars for the **Due Dates**:
  - Tuesday, July 21: BIO, CISE, EHR
  - Wednesday, July 22: ENG
  - Thursday, July 23: GEO, MPS, SBE

- Division and Directorate Contacts: http://www.nsf.gov/crssprgm/career/contacts.jsp

- FAQ: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf15057

Quick Overview, contd.

- Funds the academic career development of new faculty; it is not just a research award;
- All CAREER proposals must have an integrated research and education plan at their core.
- "NSF… encourages all applicants to think creatively about how their research will impact their education goals and, conversely, how their education activities will feed back into their research. These plans should reflect both the proposer's own disciplinary and educational interests and goals, as well as the needs and context of his or her organization."

An Overview of the CAREER Proposal Components

- **Title: must begin with 'CAREER'.**
- **Cover Sheet.**
- **Project Summary** (1 page equivalent)
- **Description (15 page limit)**:
- **PI Biosketch**: Standard NSF format, but *include both research and educational activities and accomplishments*.
- **References cited.**
- **Budget and budget justification.**
- **Facilities and resources.**
- **Current and pending support.**
- **Post-doc mentoring plan** (if applicable; 1 page limit).
- **Data Management plan** (2 page limit);
- **Supplemental Documents**:
  - Departmental/Dean Letter: (2 pages)
  - **Letters of Collaboration (1 page each; prescribed single sentence format! (new this year).**

Elements of the Project Description (15 pages)

- Description of the proposed research project, including:
  - Preliminary data where appropriate;
  - Specific Objectives, methods and procedures;
  - Expected significance.

- Description of the proposed educational activities;
  - including evaluation and assessment.

- Description of how the research and educational activities are integrated;

- Must address intellectual merit and broader impacts;

- Results of prior NSF support, if applicable.

Don't forget….

- From the Solicitation:

"Proposers are encouraged to communicate with the CAREER contact or cognizant Program Officer in the Division closest to their area of research to discuss the expectations and approaches that are most appropriate for that area."

http://www.nsf.gov/crssprgm/career/contacts.jsp

Don't forget the Funder's goals!

- Stable support for junior PIs.
- Career development of outstanding 'teacher-scholars' *within the context of their institution*.
- Build a foundation for a lifetime of integrated contributions to research and education.
- Give universities incentives to value integration of research and education.
- Increase participation of traditionally underrepresented groups in STEM.

How are CAREER Proposals reviewed?

- Often co-reviewed between programs within a Division, a Directorate, or across Directorates/ Offices.
- **Ad hoc vs. Panel**
  - Ad hoc: sent out for review; reviewers usually have specific expertise in field
  - Panel: reviewers have broader scientific knowledge.

CAREER Review process varies by Directorate:

- MPS: varies by Division
- CISE, EHR, ENG: mostly dedicated panels.
- BIO, SBE, Most of GEO: Ad hoc plus panel
  - *Source: Fisher, NSF http://crewman.uta.edu/NSF-CAREER-Workshop2013/Files/NSF-Presentation-CAREER-Program.pdf*

CAREER Awards at UC Merced

- Past UC Merced Early Career Recipients include:

  - **Asmeret Asefaw Berhe**, LES (EAR)
  - **Elliott Campbell**, Environmental Engineering (CBET)
  - **Miguel Carreira-Perpinan**, EECS (IIS)
  - **Alberto Cerpa**, EECS (CNS)
  - **Sayantani Ghosh**, Physics (DMR)
  - **Linda Hirst**, Physics (DMR)
  - **Christopher Kello**, Cognitive Science (BCS)
  - **Kevin Mitchell**, Physics (PHY)
  - **Shawn Newsam**, EECS (IIS) (PECASE Recipient)
  - Florin Rusu, EECS (DOE Early Career)
  - **Lin Tian**, Physics (DMR)
  - **Ming-Hsuan Yang**, EECS (IIS)

Elements of departmental letter

- Statement that PI is eligible for the CAREER;
- Indication that proposed research and education activities are supported by and integrated into educational and research goals of the department and UC Merced;
- Indication that department/school is committed to the support and professional development of the PI.

Elements of departmental letter contd.

- A description of the relationship between the CAREER project, the PI's career goals and job responsibilities, and the goals of his/her department/UC Merced;

- A description of ways in which the department head (or equivalent) will ensure mentoring and professional development of the PI in the context of the PI's career development and integration of research and education;

Don't forget:

- From the RFA: "A letter that fails to acknowledge institutional commitment to the professional development and mentoring of the PI in both research and education may disadvantage an otherwise outstanding proposal."

- Meet early with your unit head/Dean to go over the elements of the letter.

How can RDS help?

- Support for Program Officer contacts;
- Connections to educational activities, evaluators, collaborators;
- Assistance drafting Dean/Dept. letter;
- Strategies to integrate education/research activities;
- Feedback on objectives, approach, activities;
- Editing suggestions geared to solicitation;
- Post-doc mentoring and data management plans;
- Resource section;
- Budget/Budget justification;
- Sample proposals, mock peer review;
- ASK EARLY: For NSF by May 1at latest for more than minimum!

CAREER Resources on the Internet….

- NSF provides lots of resources, see e.g. this list and slide presentations compiled for a workshop hosted by NSF:
- http://aries.imse.ksu.edu/nsf/nsfcareer2013/resource.htm

- There is even a book! (just keep in mind that it was written in 2007):
- http://aries.imse.ksu.edu/nsf/nsfcareer2013/subfolder/career.pdf

- You can watch workshops on You Tube: http://www.youtube.com/watch?v=taYMgx_U3YY&feature=share&list=PLS7JwklCxwEYiXvzKJD3IjKj7a2gF0lfx

- And you can get copies of presentations at CAREER workshops, e.g.:
- http://www.research.uci.edu/research-development/docs/workshop-archive/Spring-2014-NSF%20CAREER-workshop-presentation.pdf

- AND a sample NSF Briefing for a review panel:

http://crewman.uta.edu/NSF-CAREER-Workshop2013/Files/CAREER-Panel-Briefing.pdf

NSF CAREER Resources, contd.

- Presentation on what NOT to do:
  - http://www.umass.edu/research/system/files/Rutgers_Pazzani_near-misses.pdf
- Blogs (this one includes a successful proposal):
  - https://alliance.seas.upenn.edu/~aribeiro/wiki/index.php?n=Research.CAREER
- Information from NSF on its review process:
  - http://www.nsf.gov/bfa/dias/policy/outreach/grantsconf/meritreview_march13.pdf
  - See also: http://www.nsf.gov/nsb/publications/2012/nsb1228.pdf
    - (appendices include information on funding rates, often by Directorate)
- Some successful CAREER proposals in Geosciences:
  - http://serc.carleton.edu/NAGTWorkshops/earlycareer/research/NSFgrants.html

A few more points to remember:

- Cross-disciplinary projects are encouraged (even though you can't include senior persons in your budget).
- Sub-awards that support cross disciplinary activities, assessment and educational activities are allowed.
- Cross-disciplinary proposals may be co-reviewed across programs, divisions and directorates.
- International aspects are encouraged, if included contact the relevant country program officer in the International Science and Engineering Section.

Finally…

- Pay attention to and address the review criteria (IM and BI) and review elements for BOTH the research and the educational activities.

- This won't be as much of a challenge if the activities are truly integrated.

The Educational Component: What works, what doesn't

Strategies to effectively integrate research and education

- Engaging others (students, teachers, members of the public) in your research activities
- Collaborating with science outreach or science training programs
- Suggesting new ways to disseminate your research to non-academic audiences.

Developing the Educational Component; the basics.

- Activities "should be consistent with research and best practices in curriculum, pedagogy, and evaluation" (from the Solicitation).
  - Read (and cite, where appropriate!) the resources listed in the Solicitation!
  - Cite educational research and research on human behavior; remember that you are expected to include *both research and educational citations* in your proposal.
- Proposed activities can be in a broad range of areas and can by directed at *any* level;
  - K-12; u/g; grad students and/or the general public.
  - See examples in Solicitation, but don't limit your activities to those!

Developing the Educational Component, contd.

- Education and research activities must be integrated.
  - Ask yourself and answer: how are they related and how do they support each other?
  - Ask yourself: what are creative ways to reach out to underserved groups and to disseminate research findings?

- Activities should be developed and described within the context of your institution.
  - Hint: build on UC Merced's strengths and existing resources
  - UC Merced's HSI status in this context.

- Funds should be included in budget to support outreach and education activities; (can include funds for evaluation.)

But don't forget…

- "While excellence in both education and research is expected, activity of an intensity that leads to an unreasonable workload is not."

- Research and educational activities do not need to be addressed separately, can be dispersed throughout the Project Description.

Examples of integrated educational activities

- Research, field work and lab involvement (UG, G, K12, adult learners, the public, 'citizen scientists');
- Implement existing instructional innovations in your own courses; work with future teachers (pre-service) – research experiences, course content;
- Work with in-service teachers – workshops, curriculum units, research experiences;
- Work with high school/middle school students;
- Provide content expertise to existing education projects;
- Workshops or tutorials

More examples:

- Curriculum development (UG, G, K12, 6-12 teachers, inter- or cross-disciplinary course development, online course development);
- Assessment of curriculum;
- Mentoring (UG, G, 9-12);
- Linking activities to industrial, international, or cross-disciplinary work.

Educational Activities: what works

- Describe how the activities will improve your teaching (develop your own pedagogical content knowledge as it relates to your field);
- Describe how new learning materials or strategies are guided by research on teaching and learning, as well as advances within your discipline;
- Describe how the specific activities support your educational goals;
- Show you can do it! (preliminary results count here too!); Describe how they build on your successes as an educator.
- Highlight what you've already done: **extend your reach** to include innovative change and outreach.

Educational Activities: what works, contd.

- **Partner** with communities traditionally underrepresented in STEM
- **Think systemically**
  - i.e. how to involve teachers *and* students if looking at K-12 activities.
  - How will your activities have the broadest impact?
  - Who is the intended audience?
  - Nice to refer to alignment of K-12 activities with State curriculum standards
    - See http://www.cde.ca.gov/be/st/ss/
    - Consult with the teachers and administrators you will be involving in your work.
    - But don't forget to think outside the box in delivery!

- **Assess**: How will you know that your work was successful (how will you know that you achieved the goals)?

Educational Component: what doesn't work

- Don't over-commit!
- Don't only outline activities that are part of your current position (such as current courses taught).
- Has it been done a million (or even a hundred) times?
  - If you can catch the reviewers' attention they are more likely to believe that you can catch the intended audience's attention.
- Don't try to do it alone: you probably aren't an expert, but even if you are, your reach will be limited if you don't involve others.

Educational/outreach resources at UC Merced

- RDS (to make connections)
- Undergraduate Research Opportunities Center (UROC): http://uroc.ucmerced.edu/
- STEM Resource Center:
  - http://stemresourcecenter.campuscms.ucmerced.edu/
- School based instructional assessment
- Center for Educational Partnerships(K-12 outreach)
  - http://cep.ucmerced.edu/
- Center for Research on Teaching Excellence:
  - http://crte.ucmerced.edu/

Questions?

Questions for the panelists..

- What advice would you give to new NSF CAREER applicants?
- What was the most challenging aspect of developing your CAREER proposal?
- If you didn't get the funding on the first try, how did the first review impact your resubmission?
- How has writing and receiving a CAREER proposal helped your research and teaching career?
- Anything else you'd like faculty applying for CAREER to know.