

Faculty Early Career Development (CAREER) Program

Program Solicitation – NSF 15-555

- For questions not answered during the May 26 webinar, please ask the appropriate Divisional contact found at <http://www.nsf.gov/crssprgm/career/contacts.jsp>
- NSF CAREER program page <http://www.nsf.gov/career> has links to all relevant information

Sonia Esperança, Ph. D. - Division of Earth Sciences
Member, CAREER Coordinating Committee



Support for New Investigators

- All NSF programs support new investigators as part of the regular (“core”) research competitions.
- About 1/3 of all NSF research proposals last year were by new PIs (24% of all awards)
- Faculty Early-Career Development (**CAREER**) Program
 - Most prestigious awards to help a junior faculty member develop activities that can effectively integrate research and education within the context of his/her organization.
 - In 2014, CAREER Proposals by New PIs - 66%
 - Awards to New PIs - 54%

Goals of the CAREER Program

- **Provide stable support for five years ($\geq 400\text{K}$ in most Directorates – BIO, GEO/PLR, ENG are $\geq 500\text{K}$) to allow the career development of outstanding new teacher-scholars in the context of the mission of their organization.**
- **Build a foundation for a lifetime of integrated contributions to research and education.**
- **Provide incentives to Universities to value the integration of research and education.**
- **Increase participation of those traditionally underrepresented in science and engineering.**

Investigator Eligibility Criteria

- **Hold a doctoral degree in a field supported by NSF by proposal deadline**
- **Be untenured by Oct 1st following proposal deadline**
- **Be employed in a tenure-track (or equivalent) position at an eligible institution as an Assistant Professor (by Oct 1st following deadline)**
- **Have not previously received a CAREER award**
- **Have not had more than two CAREER proposals reviewed**
- **Untenured Associate Professors are NOT eligible**



Institutional Eligibility

- **Academic institutions in the U.S., its territories or possessions, and the Commonwealth of Puerto Rico that award degrees in fields supported by NSF.**
- **Non-profit, non-degree-granting organizations such as museums, observatories or research labs may also be eligible to submit proposals, if the eligibility requirements of the PI's position are satisfied**
- **NSF encourages proposals from different institutional types, including Minority Serving and Undergraduate Institutions**

Is CAREER the right program for you?

- **Can you think of a proposal that is appropriate for NSF with research and education activities that are innovative and ambitious?**
- **Is your Department/Organization supportive?**
- **Are you seriously committed to the goals of CAREER?**
- **Are you at the right stage in your career?**
- **Would like to be considered for the Presidential Early Career Awards for Scientists and Engineers (PECASE), if eligible?**
- **Have you discussed your ideas with mentors, fellows, program officers?**



CAREER is NSF wide

- **The program started in 1996**
- **All Directorates/Offices participate in the program**
- **Proposals are submitted to program of interest**
- **Thousands of CAREER awards have been made over the years**
- **NSF Presidential Early-Career Awards in Science and Engineering (PECASE) are selected out of the pool of recent CAREER awardees**

CAREER varies across NSF

(Program Expectations)

- CAREER proposals are submitted to, and reviewed by one or more of the disciplinary programs
- Assessment of Departmental Letter plays a role in the review of the proposal
- Typical award size varies
- Expectations for scope of research and education activities varies with community norms
- Talk to Division Contact(s) for additional information (<http://www.nsf.gov/crssprgm/career/contacts.jsp>)
- For interdisciplinary proposals, contact all relevant Program Directors or Division Contacts

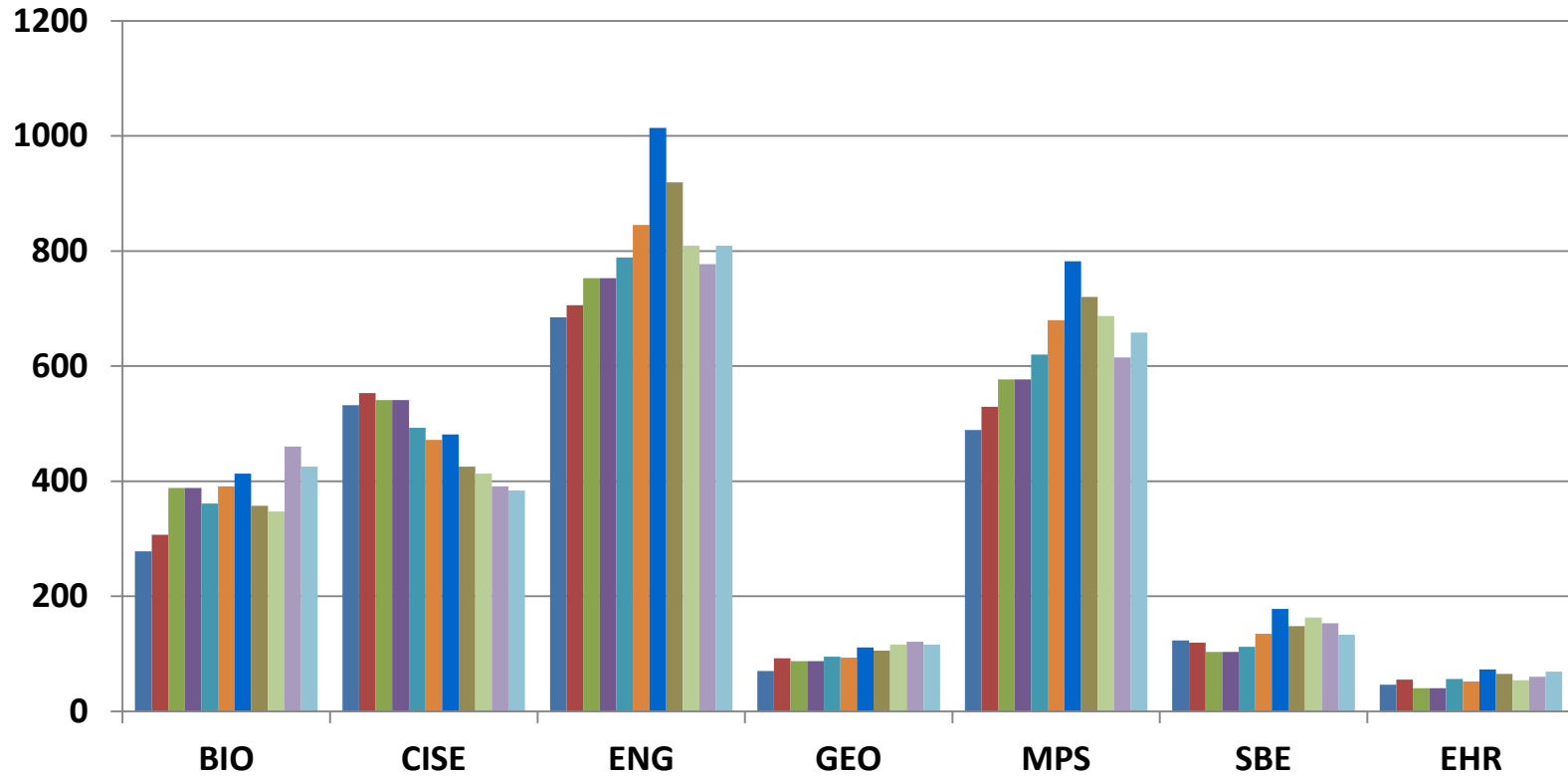


CAREER varies across NSF

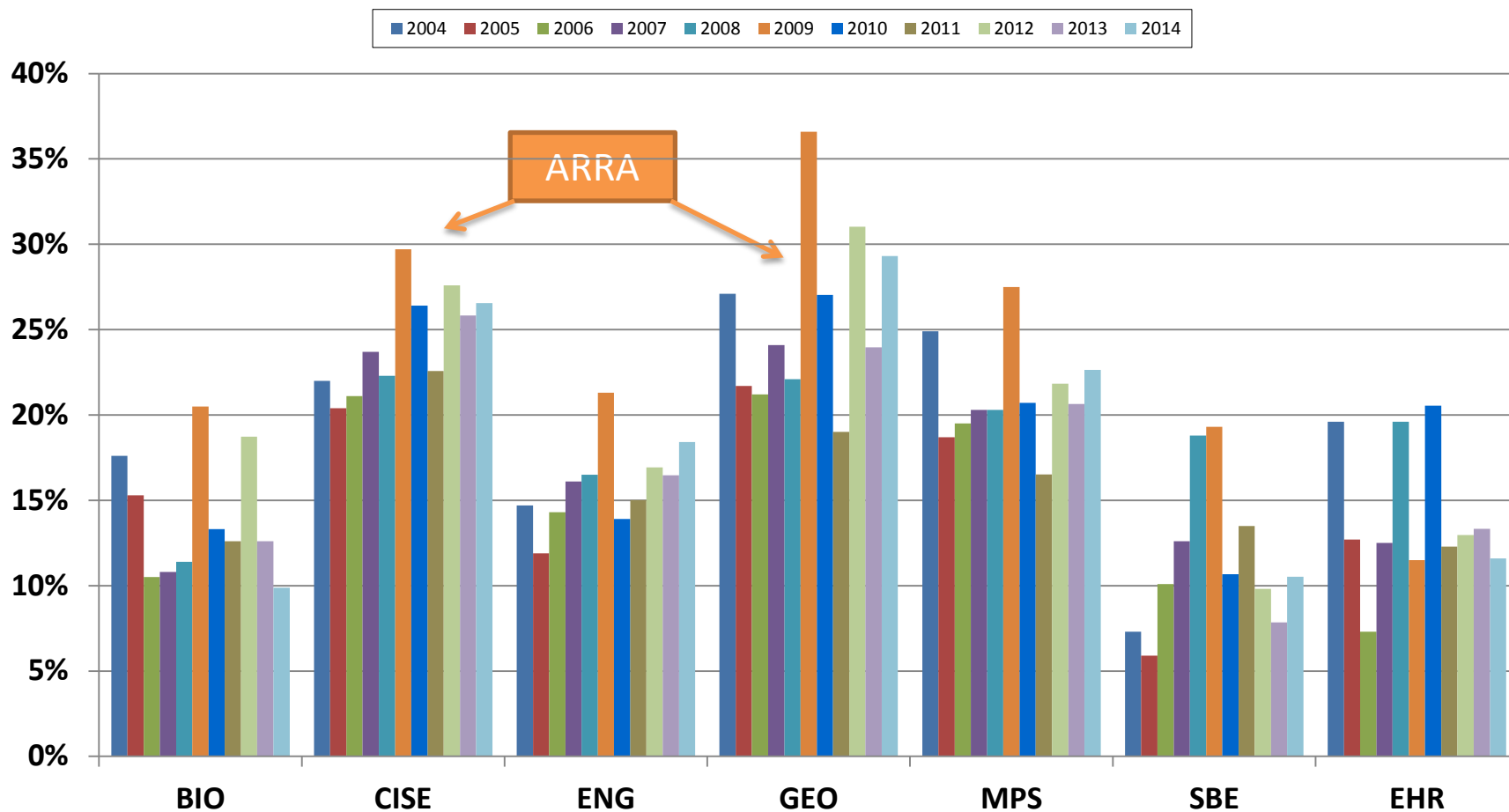
(Merit Review)

- **Ad hoc + Panel (with other proposals in the Program)**
 - most of GEO (AGS uses ad hoc only)
 - BIO and SBE
- **Primarily dedicated CAREER Panels**
 - ENG, CISE, EHR
 - MPS varies by Division:
 - ✓ AST : Panel only
 - ✓ CHE, DMR – Mix of ad hoc and panels
 - ✓ DMS – mostly panels (2 programs ad hoc only)

Proposals Submitted



Success Rate



CAREER Proposal Ingredients

- **A compelling research plan ***
- **An innovative but feasible education plan ***
- **A plan for the effective integration of both sets of activities (evaluation plan is a big plus)**
- **Departmental Letter**
- **Letters of Collaboration if appropriate**
- **A budget that is consistent with the scope of the research and education activities**

* More later in the presentation



Integration of Research and Education

How will your research impact your education goals and how will your education activities feed back into your research?

- Involving others (graduate, undergraduates, K-12, high school teachers, public) in your research using new tools, laboratory methods, field components, web outreach, cyber networks, etc...
- Partnering with those in other communities, especially those traditionally underrepresented in Sciences and Engineering
- Bringing the excitement of your research topics to help in the education of others
- Searching for new methods to deliver your research results to a broader audience than those in the immediate research community
- Using the broader community to gather data for your scientific pursuits (“citizen science”)



Departmental Letter (2 pages)

- **Support for the PIs proposed CAREER research and education activities**
- **Description of how the PIs career goals and responsibilities mesh with that of the organization and department**
- **Commitment to the professional development of the PI with mentoring and whatever is needed to forward the PIs efforts to integrate research and education**
- **Statement that indicates the PI is eligible for the CAREER program**

Letter(s) of Collaboration

- **Project Description must document the nature of and need for all project collaborations, such as:**
 - Intellectual contributions to the project
 - Permission to access a site, use instrumentation or facility
 - Offer to furnish samples / materials for research
 - Logistical support / evaluation services
 - Mentoring of U.S. students at a foreign site
- **Single-sentence statement of collaboration:**
 - “If the proposal submitted by Dr. [name of the PI] entitled [proposal title] is selected for funding by the NSF, it is my intent to collaborate and/or commit resources as detailed in the Project Description.”
 - Must not recommend or endorse PI or project

CAREER personnel and budgets

- **No co-principal investigators or other senior staff are allowed**
- **Consultants, sub-awards are allowed (no senior personnel costs in sub-awards)**
- **Some programs will support buy out of academic year time for teaching intensive institutions (check with your Program Officer)**
- **International activities are encouraged and may be supported by the Office of International Science and Engineering (OISE)**
- **Budget justification should be consistent with the scope of the science and education activities**



Traits of Successful CAREER proposals

- CAREER proposals should match the expectations in the disciplinary programs in terms of research and education - This is a highly competitive program!
- Written with peer reviewers (Ad Hoc and/or Panel) in mind - **Ask your Program Officer** who will be assessing your proposal
- Appropriate scope of education and research activities. It is a 5-year plan, not your whole life
- Goes outside the education box of regular research proposals in your field
- Strikes a balance between doable research activities and more risky pursuits



CAREER Urban Myths

- **“You cannot apply because you have another award”**
- **“It is an entry program, so apply to CAREER first”**
- **“I need to see a successful proposal to write a successful proposal”**
- **“ I read on the web that to succeed, I have to....”**
- **“CAREER proposals are more portable”**
- **“The education component does not matter”**
- **“You have no chance, if you are not from a research-intensive institution”**

The Proposal Process

- Proposal is prepared using guidelines from the Grant Proposal Guide (GPG) and Program Solicitation
- It is submitted and is deemed compliant
- It undergoes merit review

How a decision is made:

- Program Officer balances the recommendation of reviewers/panel against their portfolio
- Program Officer recommends award or decline
- Division Director concurs with the recommendation



Submitting a Compliant Proposal

- Read Program Solicitation and FAQ's @ www.nsf.gov/career
- Start your preparation as early as possible (late submissions will be returned without review - RWR)
- Pay attention to the details and mechanics
- Get feedback from mentors, if needed
- Contact your Chair for Letter (proposals without this will be RWR)
- Letter of Collaboration only in supplementary documents (NO Letters of Support - they will be removed or RWR)
- Make sure to download and keep a copy of the submitted proposal and check for problems with the PDF
- File changes/updates can be made **ONLY** up to the deadline (no excuses accepted)

NSF Merit Review Process

All CAREER proposals at NSF require at least three external evaluations before the Program Officer can take an action to recommend an award or declination

Evaluation can be done by either:

- **Ad Hoc reviewers only**
- **Panel Review Only (panelists write reviews before the panel meeting)**
- **Combination of both Ad Hoc and Panel Review**

Reviewer Selection

- **The ad hoc/panel reviewers:**
 - have specific content expertise
 - have general science or education expertise
- **Sources of ad hoc/panel reviewers:**
 - Program Officer's knowledge of the research area
 - References listed in proposal
 - Recent professional society programs
 - Computer searches of journal articles related to the proposal
 - Investigators are encouraged to:
 - Suggest persons they believe are especially well qualified to review the proposal
 - Identify persons they would prefer not review the proposal

Five Review Elements

- 1. What is the potential for the proposed activity to:**
 - a. advance knowledge and understanding within its own field or across different fields (**Intellectual Merit**); and
 - b. benefit society or advance desired societal outcomes (**Broader Impacts**)?
- 2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts**
- 3. Is the plan for carrying out the proposed activities well-reasoned, well organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success**
- 4. How well qualified is the individual, team, or institution to conduct the proposed activities**
- 5. Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?**

Basis for the decision

- **Peer Review**

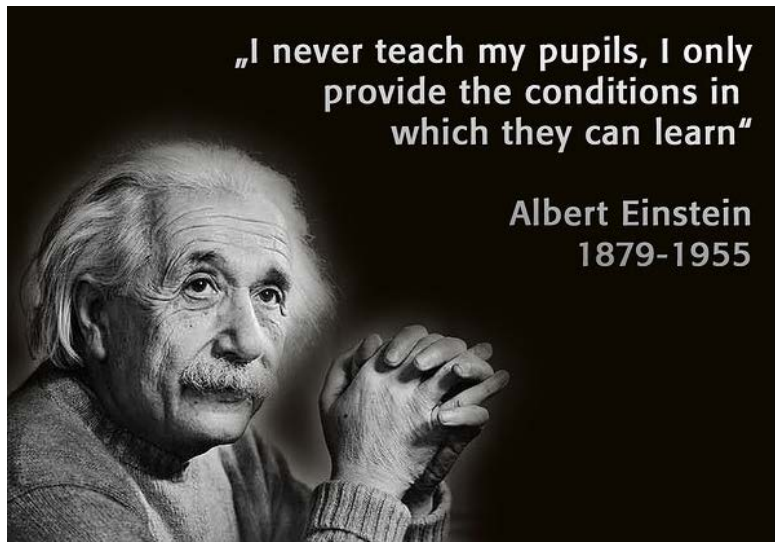
- Content of the review is more important than rating
- Program Officer analyzes: Fairness and substance of the reviews; any technical issues raised (can they be resolved swiftly and easily); reviewer's enthusiasm for the project; any additional feedback from reviewers/panels or other program officers; sometimes also clarification from the PI if needed

- **Portfolio Balance**

- Research and education topics and their integration; potential for transformative impact in both; priority or timeliness of the area of research and systems; demographics of the PI population and diversity of institution types; stage of the career development of the PI; international partnerships

Strengths of Highly Competitive Proposals

- **NOVEL IDEA/RESEARCH QUESTION**
- **WELL WRITTEN**
- **WELL JUSTIFIED**
- **RESEARCH PLAN THAT CAN ADDRESS THE QUESTION**



- "Imagination is more important than knowledge."
- "If we knew what it was we were doing, it would not be called research, would it?"
- "The most beautiful thing we can experience is the mysterious. It is the source of all true art and all science."
- "Any intelligent fool can make things bigger and more complex... It takes a touch of genius --- and a lot of courage to move in the opposite direction."



The Idea/Research Question

- **Ask yourself and convince reviewers**
 - What do you intend to do that others want to know?
 - Why is the work important, innovative and exciting?
 - What has already been done and why is your way better?
 - How are you going to do the work to answer the question uniquely?
- **Prepare yourself and demonstrate knowledge**
 - Literature survey and discussions with others
 - Get preliminary data for research and education components
 - If you do not have access to the best facilities, who will you collaborate/partner with?



Comments on Meritorious Proposals

- The proposed activity has the potential to transform the way others will view this problem in the future
- The broader impacts are exceptional and add another dimension to what the community is doing in this area
- The PI is incredibly productive, creative, incisive
- The PI is a new leader in this field of research
- This is the best proposal I have seen in many years reviewing for NSF
- **WOW!!!**



Comments you do not want to see in reviews

- This is a solid but not particularly original study that stomps on old ground
- The results of this study will have limited impact in the field as the techniques/approaches are outdated
- The PI has not been very productive either during or since his Ph.D.
- This proposal is naive/overly ambitious
- The PI has not demonstrated expertise in this methodology



Grantsmanship makes a big difference

- **Does NSF fund your area of research?**
 - Search Awards in the NSF website
 - Ask funded colleagues, mentors, advisors, past rotators
 - Email Program Officers/CAREER Division Contacts
- **Know your audience - Who will read your proposal?**
 - Ad hoc reviewers are close experts in your field, whereas a panel will see your proposal from a greater distance
 - Make it easy for the reviewers to identify the merits of the project. If it is not stated in the first two pages, nobody will look for it in the next 13 pages
 - Write accurately, concisely, logically, clearly.
 - Make sure at least one person (in addition to your SRO!) reads your proposal before you submit it.

Tips for putting your best foot forward

- **Start early and take advice from mentors, advisors**
- **If revising a declined proposal, pay attention to what reviewers and PO said**
- **Be aware of the scope – not too ambitious or too narrow**
- **If you identify potential pitfalls of the research plan, address them in the proposal or reviewers will pick it apart for you**
- **Capture the reviewers' interest at the beginning of the proposal or you may lose them forever**

First impressions do play a part



- This is a proposal and not a manuscript - Know the difference
- All parts of the proposal have a role to play in communicating your ideas to the reviewers and POs
- Do not compress the font or squeeze the margins – use your 15 page Project Description wisely
- Embed the figures correctly and make it look good on the page
- Demonstrate that the care you took with this proposal will translate in the way you perform your research and manage your education program
- If you cannot write well – Take a class!



Education Component - Critical to Success!

- Your education component should be innovative and creative as well
- Demonstration of previous results with successful education activities is a plus
- Leverage activities at your institution that have relevance to your research
- Make sure that the education activities are well integrated with the research or the workload will not be manageable
- Who will benefit from the proposed activities?
- How will you know if these activities are having impact?
- Do you need a collaborator for evaluation/assessment?

Declination is part of the game

- **Stay Calm and Do NOT Get Discouraged!**
 - Breathe deeply and read the reviews more than once
 - Ask others to interpret the reviews for you
 - Contact the PO only after you have had time to digest the feedback (Reviews, Panel Summary, PO Comment, Context Statement) and reflect on your next move
- **Resubmit only after addressing significant weaknesses**
 - Do you need more preliminary data?
 - What were the common themes in the reviews?
 - Is one component better than another?
 - Did anyone identify a significant strength that you could build upon for resubmission?

Most Common Mistakes made by PIs (Research Component)

- **Work is too close to what has been done before – i.e., incremental advance**
- **Techniques and methodology are not cutting edge**
- **Project has too large a scope or is too narrowly focused to be exciting**
- **Proposed methods/research plan are not likely to yield results that will address the stated goals of the project**
- **The experiment/theoretical/analytical design is flawed**
- **Resources not available or PI does not have demonstrated expertise in it**



Most Common Mistakes made by PIs (Education Component)

- Education component is generic and what is expected of any PI in your field – one more student is not enough!
- Unrealistic education activity – "will impact K-12 education in the state of X"
- Reinventing the wheel – another blog, another website
- Research and education plans are not aligned or integrated – *"parallel lines that will never intersect"*
- Lack of understanding of what is effective in education – literature search helps here too – Scholarship of the education component



The CAREER website – www.nsf.gov/career

- Latest Program Solicitation - NSF 15-555
- Frequently Asked Questions - NSF 15-057
- CAREER Directorate/Division Contacts
- Link to recent awards
- Link to PECASE awards
- Next Deadlines
 - July 21, 2015 - BIO, CISE, EHR
 - July 22, 2015 - ENG
 - July 23, 2015 - GEO, MPS, SBE

QUESTIONS ?



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