Priorities & Opportunities at the NSF

Different division directors participating and providing brief overviews

$1 Billion for ENG + SBIR/STTR R&RA budget - similar to 2009 when they had ARRA funding as well.

**CBET - JoAnn Lighty**
INFEWS (nexus of food, energy and water systems)
Intersections - DOE is energy, USDA is food, but NSF is looking at intersection
Looking for innovative solutions to critical FEW problems
Expect to see more "Dear Colleague" letters with new opportunities in specific areas.
Solicitations will focus on systems approach and interdisciplinary approaches
Understanding the brain - focusing on the President's Brain initiative
Bio photonics, neuroprosthetics, noninvasive imaging
EAGER - do not go to panel, only the program director (just out for FY16)
Important internal collaborations - with DMR, CHEM to benefit CBET, also CISE and CMMI, National Robotics Institute

Greg Roemer - Energy for sustainability, Bruce Hamilton - Environmental sustainability

**CMMI - Deborah Goodings (Civil, Mechanical & Manufacturing Innovation)**
They are interested in collaborating on programs between different divisions within the NSF.
Advanced Manufacturing - highlighted by programs from the President and other bodies
Wearable sensors, robotics, bio manufacturing (in CBET as well as CMMI and ECCS)
$176 M in NSF, $84M in ENG
Nano systems design, scalable manufacturing, advanced bio manufacturing
Industry university cooperative research centers (IUCRC)
Cyber-enabled materials manufacturing and smart systems  $257 NSF, $112 ENG
Robotics, cyber-physical systems, breakthrough materials, advanced manufacturing
Risk and Resilience - natural and human-induced hazards
Includes Critical Resilient interdependent infrastructure systems and processes (CRISP) - $43M NSF, $14M ENG
CRISP is supported by ENG CISE and SBE
Other CMMI highlights - $1.5 M trial awards, Natural Hazard Engineering Research Infrastructure (NHERI)
Running a trial with awards up to 5 years, up to $1.5 M - to see how this works out (vs. standard $100K per year for 3 years)
Citizen science - working with citizens to have them collect samples/data as part of a study
EFRI: New Light and Acoustic Wave Propagation (4 year awards) - like a trial balloon to see if they should continue to fund in this area.
Interested in looking into integration of new areas with ENG/CMMI
- Biological applications
- advanced computing and communications
- human-centered engineering

Samir El-Ghazally - ECCS (Electrical, Communications and Cyber Systems)
National Nanotechnology Initiative (NNI) $415 NSF, $169 ENG
Is within several divisions in ENG directorate
National Nanotechnology Coordinated INfrastructure (NNCI) - competition for individual sites of university-based user facilities
$16M for 5 years
Slide shows 16 sites funded
Cyber infrastructure for 21st century (CIf21) - $100M NSF, $4M ENG
Secure and trustworthy cyberspace (SaTC) - $150M NSF, $3M ENG
Cyber-physical systems (CPS)
Cross-cutting initiative including ENG and CISE
Since 2009, over 300 awards and over $250M invested
Enhancing Access to the Radio Spectrum (EARS) - FY15 funding was $15M - cross-directorate involvement - may change the name, even though ENG will continue to support
Energy efficient computing: from devices to architecture (E2CDA) -
proposals due Mar. 28
A lot of support from industry ($7M for 3 years, with possibility to extend to 5 years)
Looking for new technologies, scalable solutions
Smart and Connected Communities - $22M NSF, $2M ENG
Can be linked to traffic, and other community needs
ECCS Emerging Areas & Possible Future Directions (slide too small to read, get copy)

Mario Rotea - Engineering Education and Centers (EEC)
EEC - engineering research, education and broadening participation to benefit society
Includes ERC's, Engineering education (Eng. Ed. - like RED program), workforce development (WFD - includes REU and RET programs)), boarding participating in engineering (BPE - includes INCLUDES)
Keith Roper is the ERC lead, plus 2 more people over ERC, plus 2 more PD open positions
Listed the other program directors over the other areas (in slides)
NSF INCLUDES - Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers of Engineering and Science
He said this program will be very big/ FY 2017 request is $16M
Achieve National Scale Impact in broadening participation in STEM
The program involves multiple areas within NSF
Looking for collective impact - he says like systems engineering on steroids
Open to everyone - not just usual suspects who submit to NSF
NSF 16-544 Deadlines April 15 pre-proposal, June 24 - full proposal
$300K to plan your activity
Launch pilots and form alliances - leads to much larger funding ($2.5M?)
5-year initiative with ambitious goals
FY16 opportunities:
RIEF (Research Initiation in Engineering Formation) - initiate collaborations with colleagues in the social and/or learning sciences related to problems in the professional formation of engineers - deadline Mar. 31
BPE (Broadening Participation in Engineering) - deadline May 30
Other program - Preparation for graduate students - train them for productive careers, to give them skills outside of what they learn in their research grant work (>75% ENG go to industry)
ERC - new solicitation in FY2017 - National Academy of Engineering is performing a study on what they should do with these centers in the future, and this study may impact solicitation. Will also streamline the post-award management process.

RED - NSF 15-607 $1-2M total for a duration of up to 5 years

Barry Johnson - Industrial and Innovation Partnerships
Has slide with Org chart of his division - has academic cluster, and then also SBIR/STTR program cluster. Shows the different program directors and their focus areas.
He says don’t feel limited to programs listed on this page, as they are looking for great new ideas that can lead to Commercialization, so even if it doesn’t fit in a particular area they may be interested.
Nice slide on Development profile of technologies over time, and shows the NSF type of programs.
Includes GOALI, I/UCRC (been around 40 years - doubled amount for this recently), PFI:BIC, I-Corps, PFI:AIR, then SBIR/STTR - shows where these fit in pathway between conceptualization to commercialization. Many of the awards requires an industry partner to help translate the research. Often includes multiple universities (for the larger awards, like PFI:BIC - $1M)
SBIR/STTR - created at NSF in 1976, then spread to other agencies in 1983. Fund companies, but a large number tend to have a university partner. 30% of funding can go to university. Phase I - $225k - 12 mo, Phase II $750K 24 months, Phase IIB - additional $500K
IIP - focused on translational research
Last slide shows good example of translating fundamental research - using various different IIP programs to eventually form a company and successfully commercialize the technology.

Final Comments -
Maximize impact of NSF outreach - involve neighboring universities when we host someone from NSF; engage NSF with engineering societies and dept. chair meetings, develop information networks
NSF proposal success is not a numbers game - success rate is typically 50% for very good proposals. Not just a matter of writing a lot of proposals.
ENG proposal-writing workshops (like CAREER), lectures, webinars
Encourage faculty to cultivate ongoing multi-disciplinary collaborations, serve on NSF review panels (can be very helpful to them), call PDs after proposals declined (maybe wait a week or two to calm down...).

Q&A Portion of the Panel
Any changes in compliance checking? Tried to make it the same for everyone in ENG
Broader Impacts? An upcoming workshop - concerned that universities, PIs and reviewers understand what is need. They have a "Backup Slide" that shows how we can do this.
Essentially: Advancement of scientific knowledge and activities that contribute to the achievement of societally relevant outcomes.
Workshop around May 10-11
NSF visitors coming to our institutions: A very good way to do this is via a tele-visit; could have an NSF day with several program directors, may be more difficult, but can more easily set up a visit with an individual program director. NSF pays for the costs. Timing - September is usually the best - they close out their FY books in August; they tend to be more available around that time. Still, best to contact the person you want to see when they can come.