Welcome to...

NSF Funding Opportunities for CS, Education and Learning & Proposal review and Proposal writing

2017 ACM CHI

Chia Shen (EHR/DRL), Dan Cosley (CISE/IIS), Amy Baylor (EHR/DRL)
PART 0: Quick overview of finding funding
• NSF structure
• General strategies for finding funding

PART I: (Some) CHI-related funding
• EHR and CISE Funding opportunities
• Big Ideas (Human-Tech Frontier)

PART II: Writing proposals
• Proposal review process
• Proposal writing: DOs and DONTs
Part 0:
NSF Structure and Funding Opportunities, Broadly
NSF is broadly organized by Directorates...

- Education and Human Resources (EHR)
- Computer and Information Science and Engineering (CISE)
- Social, Behavioral, and Economic Sciences (SBE)
- ... (ENG, MPS, BIO, GEO)

Chia, Amy

Dan
Directorates contain divisions...

EHR

Division of Research on Learning... (DRL)
Division of Undergraduate Education (DUE)
Division of Graduate Education (DGE)
Division of Human Resource Development (HRD)

That run programs...

Discovery Research K-12 (DR-K12)
Advanced Technological Education (ATE)
Innovative Tech. Experiences for Students and Teachers (ITEST)

...
Directorates contain divisions...

CISE

- Division of Comp. & Comm. Foundations (CCF)
- Division of Computer and Network Systems (CNS)
- Division of Information & Intelligent Systems (IIS)
- Office of Advanced Cyberinfrastructure (ACI, now OAC)

That run programs...

- Cyber Human Systems (CHS, was HCC)
- Information Integration and Informatics (III)
- Robust Intelligence (RI)
Directorates, divisions, and programs participate in cross-cutting programs, both within...

- STEM + Computing Partnerships (STEM+C)
- EHR Core Research (ECR)
- CISE Research Initiation Initiative (CRII)
- CISE Research Infrastructure (CRI)
- Secure and Trustworthy Cyberspace (SaTC)
- Smart and Connected Communities (S&CC)
- Computer Science for All (CSforAll:RPP)
- Cyberlearning and Future Learning Tech. (Cyberlearning)
- Research Experiences for Undergraduates (REU)
- Faculty Early Career Dev. Program (CAREER)

...and across directorates... (https://www.nsf.gov/funding/pgm_list.jsp?type=xcut)

...(!!) that tend to align with executive branch and NSF leadership and mission priorities. (!!)
General Ways to Find Opportunities

• NSF Award search

• Subscribe to NSF pubs
  – “Program announcements and information”

• Talk to folks in your area
  – Often visible in paper acknowledgements

• Browse the directory tree
### Browse Funding Opportunities A-Z

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Finding Funding Opportunities on the NSF Website: www.nsf.gov

Research on Learning in Formal and Informal Settings (DRL)

EHR has established a new Crosscutting Research Program. Proposals are encouraged that help synthesize, build and/or expand research foundations in four core areas. See the announcement at:

EHR Core Research (ECR)
(NSF 13-555) Posted April 12, 2013

Programs and Funding Opportunities

Key: C Crosscutting | N NSF-wide

Advanced Technological Education (ATE)

Advancing Informal STEM Learning (AISL)
Q&A for Part 0
Part I
NSF Funding Opportunities for CS, Education and Learning
CHI-ish CISE-ish Opportunities

• CHS (and sometimes III, and RI)

• Computing Research Infrastructure (CRI)
  – Not to be confused with CRII...

• Topic/approach specific: SaTC, S&CC, SCH, BIGDATA, NRI-2.0, AitF, CSforAll, ...

• Remember...
EHR/DRL Programs

• Cyberlearning (cross-directorate: CISE and EHR)
• STEM+C
• ITEST
• AISL
• DRK-12
• DUE
Choosing the Appropriate Program

• Where is the “intellectual center of gravity” of your project?
  – Innovations in both learning and computer sciences (Cyberlearning)
  – Foundational learning research (ECR)
  – Resources, Models, & Tools (DRK-12)
  – Informal STEM learning (AISL)
  – Workforce development in STEM for youth & teachers (ITEST)
  – Integration of Learning Computational with one or more STEM (STEM+C)

• Examine the websites of the relevant programs
  – Prepare a 1-2 -page summary of your project
  – Address the merit review criteria
  – Contact one of the listed Program Directors (on the program, not just Chia, Dan, or Amy!) with questions about relevance of your project
Resource Centers

NSF funds resource centers linked to some programs. The resource websites have project abstracts, research and evaluation reports, and a variety of other useful info for project planning and proposal development.

• Advancing Informal STEM Learning: informalscience.org
• Discovery Research PK-12: cadrek12.org
• Innovative Technology Experiences for Students & Teachers: stelar.edc.org/
• Cyberlearning: http://circlcenter.org/
NSF's Ten Big Ideas

**RESEARCH IDEAS**

- Harnessing the Data Revolution
- Work at the Human-Technology Frontier: Shaping the Future
- Windows on the Universe: The Era of Multimessenger Astrophysics
- The Quantum Leap: Leading the Next Quantum Revolution

- Understanding the Rules of Life: Predicting Phenotype

**PROCESS IDEAS**

- Mid-scale Research Infrastructure
- NSF 2050
- Growing Convergent Research at NSF
- NSF INCLUDES: Enhancing STEM through Diversity and Inclusion
NSF Big Idea:

“Work at the Human-Technology Frontier”

– understand and build the human-technology partnership;

– design new technologies to augment human performance;

– illuminate the emerging socio-technological landscape; and

– foster lifelong and pervasive learning with technology
DCL

Dear Colleague Letters

Another way of NSF soliciting focused areas of research proposals

(remember, https://www.nsf.gov/publications/)
Dear Colleague Letter: Growing Convergence Research at NSF

April 3, 2017

Dear Colleague:

Growing Convergence Research at the National Science Foundation (NSF) is one of 10 Big Ideas for Future NSF Investments. NSF seeks to highlight the value of convergence as a process for catalyzing new research directions and advancing scientific discovery and innovation. This Dear Colleague Letter describes an initial set of opportunities to explore Convergence approaches within four of the research-focused NSF Big Ideas:

- Harnessing the Data Revolution for 21st Century Science and Engineering
- Navigating the New Arctic
- The Quantum Leap: Leading the Next Quantum Revolution
- Work at the Human-Technology Frontier: Shaping the Future

Another Big Idea, Understanding the Rules of Life: Predicting Phenotype, is actively promoting Convergence research through other mechanisms.

BACKGROUND
International Funding

• NSF OISE

• There are sometimes co-funding opportunities for international partners.

• Must have an official MOU.

• Example: EHR/DRL **AISL Science Learning+** is a collaboration between NSF and Wellcome Trust at UK.

• Postdoc and CAREER int’l travel support
Q&A for Part I
Part II
Proposal review and Proposal writing
Proposal Review Process and Timeline

Organization submits via FastLane

NSF Program

Ad hoc

Advise

Panel

Program Officers

Recommend

Division Director Concur

Award

DGA

Organization

Decline

Proposal Receipt at NSF

6 Months

DD Concur

30 Days

DGA Award
NSF Review Criteria

All proposals are reviewed under two criteria:

**Intellectual Merit** and **Broader Impact**

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?
Help the Reviewers

• Writing to reviewers and program officers

• Make what they are looking for easy to find, using the language of the review criteria and headings to highlight the elements of the project description.

• Don’t assume that all reviewers will know the jargon of your discourse community or commonly used acronyms as reviewers may not be in your subspecialty.

• Make sure the most important things receive the most space
Before You Begin Writing

• Do your homework
  – Print and read the PAPPG
  – Read the solicitation carefully multiple times
  – Check the NSF Awards Search Page
  – Visit the Website of the resource center or network for the relevant program.
  – Read sample proposals; ask funded PIs politely

• Talk to NSF Program Officers about your ideas
  – POs may ask for a 1-2 page summary in advance.
Project Summary Suggestions

• One page maximum
• First Sentence
  • Type of Proposal (Many EHR programs have “strands”)
• Second Sentence (for EHR)
  • STEM or STEM Cognate areas of emphasis
  • Grade or Age level (s) addressed
• A general description of the project to be designed, implemented, and evaluated.
• Intellectual Merit and Broader Impacts
  • Must include separate statements on each of these two NSB criteria
Project Description Should Include…

- Project overview
- Project goals and objectives
- Explanation of principles that guided the project design, informed by the literature
- Effectiveness and impact of prior support
- Detailed work plan with a timeline
- Qualifications of key personnel
- Anticipated results
- Research plan (if appropriate)
- External review or evaluation process (If appropriate)
- Dissemination plan
What Makes This Project Important?

• How is it innovative or potentially transformative?
• How will it advance knowledge and move the field forward?
• What are the anticipated outcomes or products of this project?
• Who will be interested in these outcomes, and how will you target dissemination of findings to them?
• How might these products or findings be useful on a broader scale?
What Have You And Others Done?

• Describe the theoretical and research basis on which the proposal is based.
• How has the prior research influenced this project?
• Discuss how the proposal is innovative and different from similar projects.
• If you have previously been funded by NSF for similar work, provide evidence about the **effectiveness** and **impact** of that work.
Who Will Do the Work?

• Briefly describe the expertise of the persons included on the proposal and why they are needed:
  – Education researchers and evaluators
  – Teachers and/or practitioners
  – Community and/or industry
  – STEM-related content experts

• Upload two page bios for all senior personnel
• Don’t forget the mentoring plan if Post-Docs are involved.
Research or R&D Topic

• Where is the “intellectual center of gravity” of your project? What do you want to learn by doing this project?

• DRL does not fund “development only” projects.
  – “Applied” also often a negative CHS/SaTC word

• Research vs. evaluation as knowledge building
Better broader impacts

• Some (not all) possible pathways:
  – Education (grad, undergrad, K-12, informal)
  – Impact across disciplines/public and science outreach
  – Inclusion/broadening participation/diversity
  – Datasets, tools, software, other materials
  – Actual (not long con) social impacts of the work

• Be specific: what will you do, how will you know?
• Few believable impacts >> many perfunctory ones
Common reasons for proposals to be rated non-competitive

Importance
- Proposed problem not nationally important
- Weak, vague, or no connection to STEM content
- Relevant literatures not cited

Methods (For DRL proposals)
- Inadequate or inappropriate research design
- Vague or inappropriate data collection & analyses
- Too much data being collected
- Appropriate expertise not represented
- Cost at small scale prohibitive when scaled up
Some Things POs Suggest You Avoid

- Ignoring requirements stated in the solicitation or the *Proposal & Award Policies & Procedures Guide* (PAPPG)
- The “Trust Me” approach. Provide citations or evidence for critical assertions made, and details of work.
- The “Oversell” of yourself or your project; take a neutral tone and let the evidence speak.
- General, vague, or rambling narrative without precision and details.
- Too much rationale and prior work, not enough method and details of what will actually be implemented.
- Note: URLs are no longer allowed in Project Description
Thanks for Participating!

We look forward to receiving your proposals.

(And, hopefully, your serving on panels -- good for you, for us, for CHI.)
Questions?

Contact Information

PROGRAM OFFICERS

Chia Shen  
cshen@nsf.gov

Dan Cosley  
dcosley@nsf.gov

Amy Baylor  
abaylor@nsf.gov

*Check the NSF program pages for more email addresses*
NSF Needs You!

Program Officers
Division Directors
Ad hoc Reviewers
Advisory Panelists