# NSF Funding Opportunities


David Campbell

DR K-12 PI Meeting

August 5, 2014

# Presentation outline

- David Haury - ITEST
- Edith Gummer - ECR
- Arlene de Strulle – STEM-C
- Dave Campbell – ATE
- Bob Russell - AISL
- Rick Duschl – Science Learning +
- Chris Hoadley - cyberlearning
- John Cherniavsky – cross-cutting programs
- Ben Schrag - SBIR

# Aim of the ITEST Program

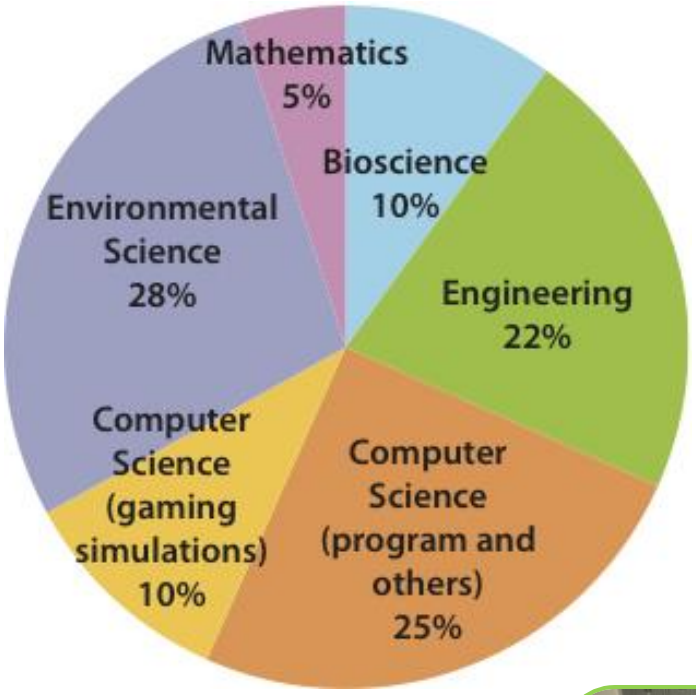
Ensure a high-quality STEM workforce by supporting projects that:

- Increase student awareness of career opportunities in STEM and cognate fields.
- Motivate students to pursue appropriate educational pathways to STEM-related careers.
- Provide technology-rich experiences that develop disciplinary knowledge, practices, and non-cognitive skills needed in STEM fields.

# ITEST Portfolio

**Computer Science – Gaming & Simulations**
use and creation of gaming and simulations in formal & informal education

**Computer Science – Programming**
programming; web development; multimedia – audio, video and animation; computer hardware; general skills




**Environmental Science**
GIS/GPS, remote sensing technology, climate modeling, and ecological research and analysis

**Bioscience**
bioinformatics, biotechnology, DNA analysis/sequencing, and biomedicine

**Engineering**
aerospace, astronomy, design, robotics and nanotechnology

# EDUCATION CORE RESEARCH [ECR]

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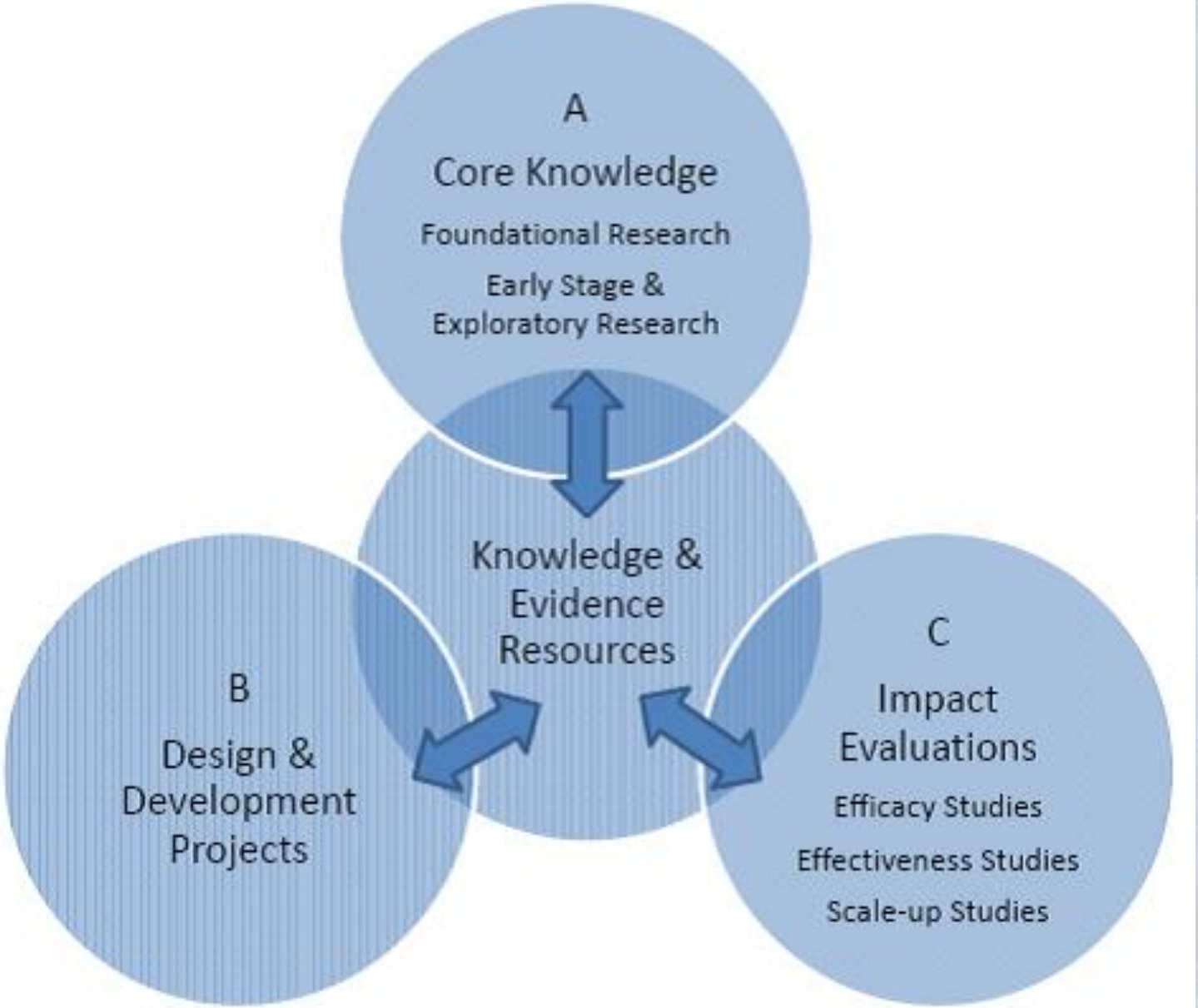
- Fiscal YR 2015:
  - A singular program of STEM foundational research
  - Budget request for foundational research in STEM CORE areas
  - $70 million


A
Core Knowledge
Foundational Research
Early Stage &
Exploratory Research
Knowledge &
Evidence
Resources
B
Design &
Development
Projects
C
Impact
Evaluations
Efficacy Studies
Effectiveness Studies
Scale-up Studies

# Education Core Research [ECR]

- The EHR Core Research (ECR) program establishes a mechanism in the Directorate for Education and Human Resources to provide funding in foundational research areas that are broad, essential and enduring.
- ECR invites researchers to identify and conduct research on questions or issues in order to advance the improvement of STEM learning in general, or to address specific challenges of great importance.

# ECR

EHR seeks proposals that will help synthesize, build and/or expand research foundations in the following core areas:

- STEM learning
- STEM learning environments
- Workforce development
- Broadening participation in STEM

New Announcement in September, 2014.

# STEM - C

- The STEM-C (Science, Technology, Engineering and Mathematics, including Computing) Partnerships program is a major research and development effort of two NSF Directorates, the Directorate for Education and Human Resources (EHR) and the Directorate for Computer and Information Science and Engineering (CISE), which supports innovative partnerships to improve teaching and learning in science, technology, engineering, and mathematics (STEM) disciplines. STEM-C Partnerships combines and advances the efforts of both the former Math and Science Partnership (MSP) and the former Computing Education for the 21st Century (CE21) programs.

# STEM - C

- The STEM – C solicitation is undergoing revision.  The new solicitation is expected to be released in the late fall.

# Advanced Technology Education

- With an emphasis on two-year colleges, the ATE program focuses on the education of technicians for the high-technology fields that drive our nation's economy. The program involves partnerships between academic institutions and industry to promote improvement in the education of science and engineering technicians at the undergraduate and secondary school levels.

# Advanced Technology Education

Opportunities

- Curriculum development
- Professional development
- Career pathways (high school – 2 yr – 4 yr)
- Pre-service for technology education teachers
- Research into technician education

Tracks

- Projects
- Centers (National Regional, Support)
- Small grants for institutions new to the ATE program

Resources

- Atecenters.org
- Atecentral.net
- Teachingtechnicians.org
- www.evalu-ate.org
- Deadline: October 9, 2014

# Advancing Informal STEM Learning (AISL)

- **R&D related to informal (out of school) STEM learning and emerging STEM learning environments that transcend traditional boundaries.**
- **Supports work that advances informal learning by building knowledge via innovative learning approaches and novel research.**
- **Learning outcomes: interest, engagement, motivation, behavior, identity, persistence, understanding, awareness, knowledge, and 21st century skills.**
- **STEM–all of NSF-funded STEM areas.**

# AISL project types

- **Research and development in STEM informal learning:**
- **Cyber-enabled learning, emerging technologies, educational games**
- **Citizen science projects and networks**
- **Youth and community projects**
- **Film, radio programs, and TV series**
- **Exhibits at zoos, science centers, museums**
- **Professional development for formal and informal educators**
- **Distributed learning, collaborations, educator networks**

# SOLICITATION #14-555

- http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf14555

- **Proposal deadline:**

- **November 14, 2014**

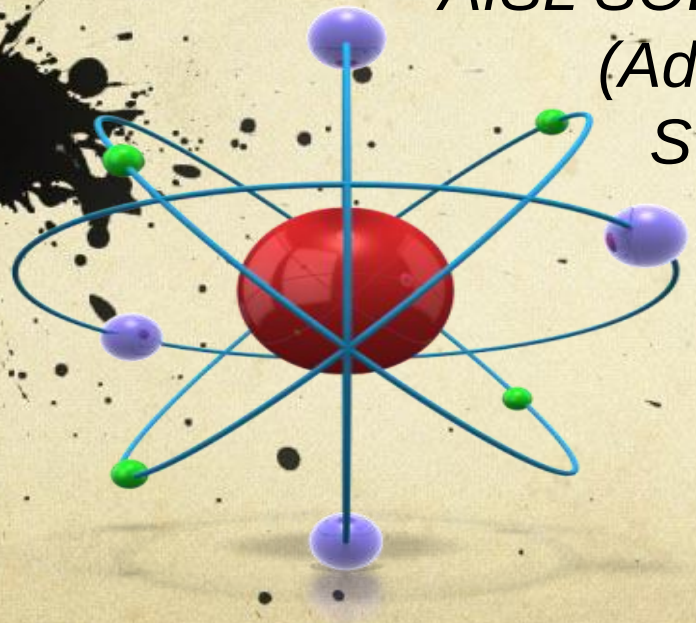
- **DRLAISL@nsf.gov**

# Characteristics and Goals of Science Learning+ Proposals

*in*

*AISL SOLICITATION (#14-555)*

*(Advancing Informal STEM Learning)*



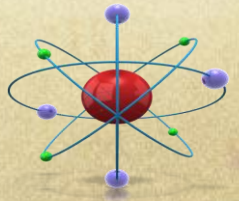
# Characteristics of Science Learning+ Proposals

Strengthen the research and knowledge base by:

- researching the value and impacts of informal STEM experiences, especially upon young people aged from birth to 19 years
- developing a theoretical understanding of the processes which lead to these impacts
- developing better methodologies to measure the impacts of informal STEM experiences especially upon learning and mediation of learning
- building research capacity in informal STEM learning

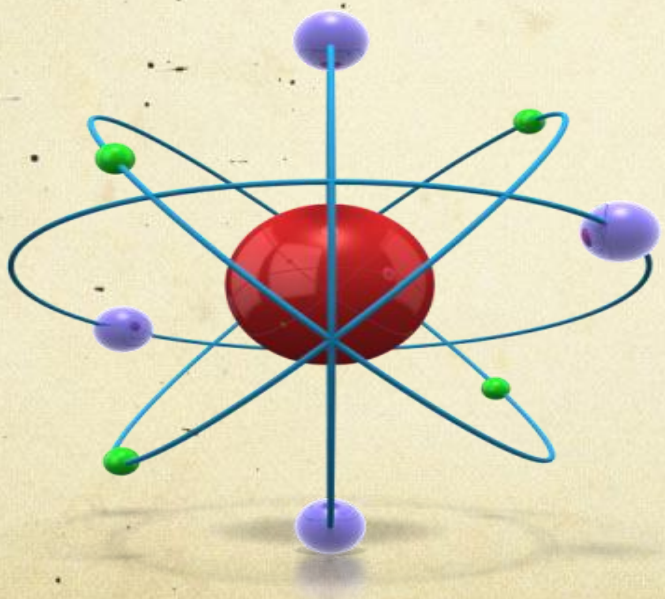
Bridge the practice and research gap by:

- increasing partnerships, understanding and influence between researchers and practitioners
- developing collaborations among institutions and individuals engaged in informal STEM experiences
- translating, communicating and documenting the outcomes of research into practice



# Science Learning+ is a

Two Phase Process

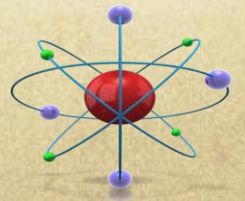


# Two Phase Process

- Phase 1- Planning Grants - Short-term (1-year) Planning Grants of up to $115,000 to enable groups of people and organizations in the UK and/or US to meet with each other and develop ideas and strategies. The intent is 5 funded by NSF and 5 funded by The Wellcome Trust for 2015. Due date is past 7/10/14.

- Phase 2 - Partnership Grants - Longer-term research grants of up to $2.4 million for up to five years. While these will typically build on relationships established in Phase 1, successful funding in Phase 1 would not guarantee funding in Phase 2.

- Phase 2 will be open to new applicants (and any who were unsuccessful in receiving Phase 1 grants). The plan is to fund up to five Partnership Grants in FY 16 (Some funded by NSF and some by the Wellcome Trust). Targeted due date – Fall 2015.



# Cyberlearning and Future Learning Technologies Program (CISE, EHR, SBE, ENG)

Chris Hoadley

# Cyberlearning & Future Learning Technologies

**Need**

- Pressing societal need or technological opportunity
- *Any domain of learning* (not just STEM)

**Innovation**

- Design and iteration of technology
- Imagining/inventing the future of learning

**Learning**

- Builds on what we know about how people learn
- Contributes to important learning questions

**Genre**

- More than just an app or a curriculum
- Learning about what has traction

# Cyberlearning program facts

- Must integrate design & research on learning
- Must be grounded in state of the art
- Interdisciplinary teams strongly recommended
- Not implementation or scaling driven—imagining the future!

| Track | Due | Amount |
|---|---|---|
| EXP Exploration | Dec. | $550k/$750k<br>2-3 years |
| DIP Dev't & Implementation | Jan. | $1.35m<br>3-5 years |
| INT Integration | July | $2.5m<br>4-5 years |
| CAP Capacity Building | Rolling | $50/100k<br>1-2 years |

http://go.usa.gov/N5T5

# Some Cross-Directorate Programs

John C Cherniavsky

# Software Infrastructure for Sustained Innovation - SSE & SSI (SI2 - SSE&SSI)

- SI2 is a long-term investment focused on catalyzing new thinking, paradigms, and practices in developing and using software to understand natural, human, and engineered systems. SI2's intent is to foster a pervasive cyberinfrastructure to help researchers address problems of unprecedented scale, complexity, resolution, and accuracy by integrating computation, data, networking, observations and experiments in novel ways.

# Example Project

Software for managing data from citizen science projects. The software can be used in any citizen science project to implement the collection of data from large numbers of amateur scientists.

# Data Infrastructure Building Blocks (DIBBs)

The Data Infrastructure Building Blocks (DIBBs) program is an integral part of CIF21, supporting interdisciplinary and collaborative research in areas of inquiry stimulated by data through the development of robust, shared resources and the means for enabling partnerships across diverse communities. DIBBS investments are expected to develop the robust, scalable, well-designed infrastructure (the ‘building blocks') contributing to future discovery and innovation across the various disciplines.

# Example Project

A national data repository for storing interaction data from interactive systems such as MOOCs, Intelligent Tutors, Serious games, Instrumented classrooms, Video, etc. The repository comes with tools for analyzing the interaction data.

# Big Data Research Initiative

BIGDATA proposals must focus on one or more of three areas: (i) big data and knowledge management, (ii) big data and knowledge analytics, or (iii) on any aspect of scientific discovery and innovation processes (e.g., in biology, education, social and behavioral sciences, engineering, economics, etc.) impacted by big data. These techniques can be drawn from disparate fields, including computer science, statistics and probability, and can be relevant to any area of science or engineering. Innovation is an important criterion in all areas addressed by this solicitation and can include development of novel techniques or improved understanding of existing techniques

# Example Project

Multi-university study of how to fuse UG student data (from Course Management Systems, Testing Data, Health Data, etc.) to improve student outcomes and to allow targeted student interventions. This includes privacy issues, analytics, and data interoperability issues.

# Building Community and Capacity in Data-Intensive Research in Education

As part of NSF's Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21) activity, the Directorate for Social, Behavioral, and Economic Sciences (SBE), the Directorate for Education and Human Resources (EHR), and the Office of Cyberinfrastructure seek to enable research communities to develop visions, teams, and capabilities dedicated to creating new, large-scale, next-generation data resources and relevant analytic techniques to advance fundamental research for the SBE and EHR areas of research. Successful proposals will outline activities that will have significant impacts across multiple fields by enabling new types of data-intensive research. Investigators should think broadly and create a vision that extends intellectually across multiple disciplines and that includes--but is not limited to--the SBE or EHR areas of research.

# Example Project

This project develops a community of researchers that crosses domains of education, social science, statistics and computer science to expand the research agenda that utilizes large scale, longitudinal educational databases. This research collaborative is engaging in the design and implementation of computationally-intense data analytic methodologies to address limitations experienced by researchers who use these techniques to analyze multiple types of large scale data in education including data from a national transcript study, local education agency longitudinal student data and an administrative dataset collected about students across a large university system. The researchers are developing and implementing a seminar on data-intense research methodologies that includes practical analysis of three different educational databases, conducting iterative bi-weekly workshops for researchers, and developing, implementing and documenting a graduate level course for new researchers. Scholars from across the country are recruited to participate in a virtual community.

# NSF SBIR 60k-foot view



What we fund:

- High technical risk R&D (unproven, early-stage) for the purpose of feasibility/ viability of a new product, process or service
- Validated market need and high commercialization potential if the R&D works
- Societal/environmental benefits and enabling technology also factored in
- Almost zero topical focus/restriction

How we fund:

- R&D **grants** to small businesses (mostly start-ups)
- Proposal-driven external merit review process (technical + commercial focus)
- Phase I ($150k/$225k), Phase II ($750k), plus supplemental opps (> $500k)

Who we fund:

- 86% of awardees have 10 or fewer employees
- 68% of awardee companies were incorporated within the past 5 years
- 76% of awardees had never had a prior Phase II award from any agency

# NSF SBIR resources



Ben Schrag - bschrag@nsf.gov

Program website - http://www.nsf.gov/eng/iip/sbir/

Follow us on Twitter: @NSFInnovateSBIR
Email listserve: send blank email to
INNOVATION-SUBSCRIBE-REQUEST@listserv.nsf.gov
YouTube channel: https://www.youtube.com/user/NSFInnovationIIP

Last Phase I solicitations (new ones expected in September):
SBIR: http://www.nsf.gov/pubs/2014/nsf14539/nsf14539.htm
STTR: http://www.nsf.gov/pubs/2014/nsf14540/nsf14540.htm

# Questions???????????

Please direct your questions to the program officers' table based on the program of interest