



*Transforming Education
Promoting Excellence*

National Science Foundation (NSF)

Directorate for Education
and Human Resources (EHR)

Overview

2010



NATIONAL SCIENCE FOUNDATION • DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES

NSF Strategic Goals



- **Discovery**

Advance the frontiers of knowledge

- **Learning**

Cultivate a world-class, inclusive science and engineering workforce

- **Research infrastructure**

Build research capability via advanced instrumentation, facilities, cyberinfrastructure and experimental tools

- **Stewardship**

Support excellence and ensure a capable and responsive organization

EHR's Mission



To strengthen U.S. education at all levels, in both formal and informal settings, and to support continued U.S. economic and research preeminence.

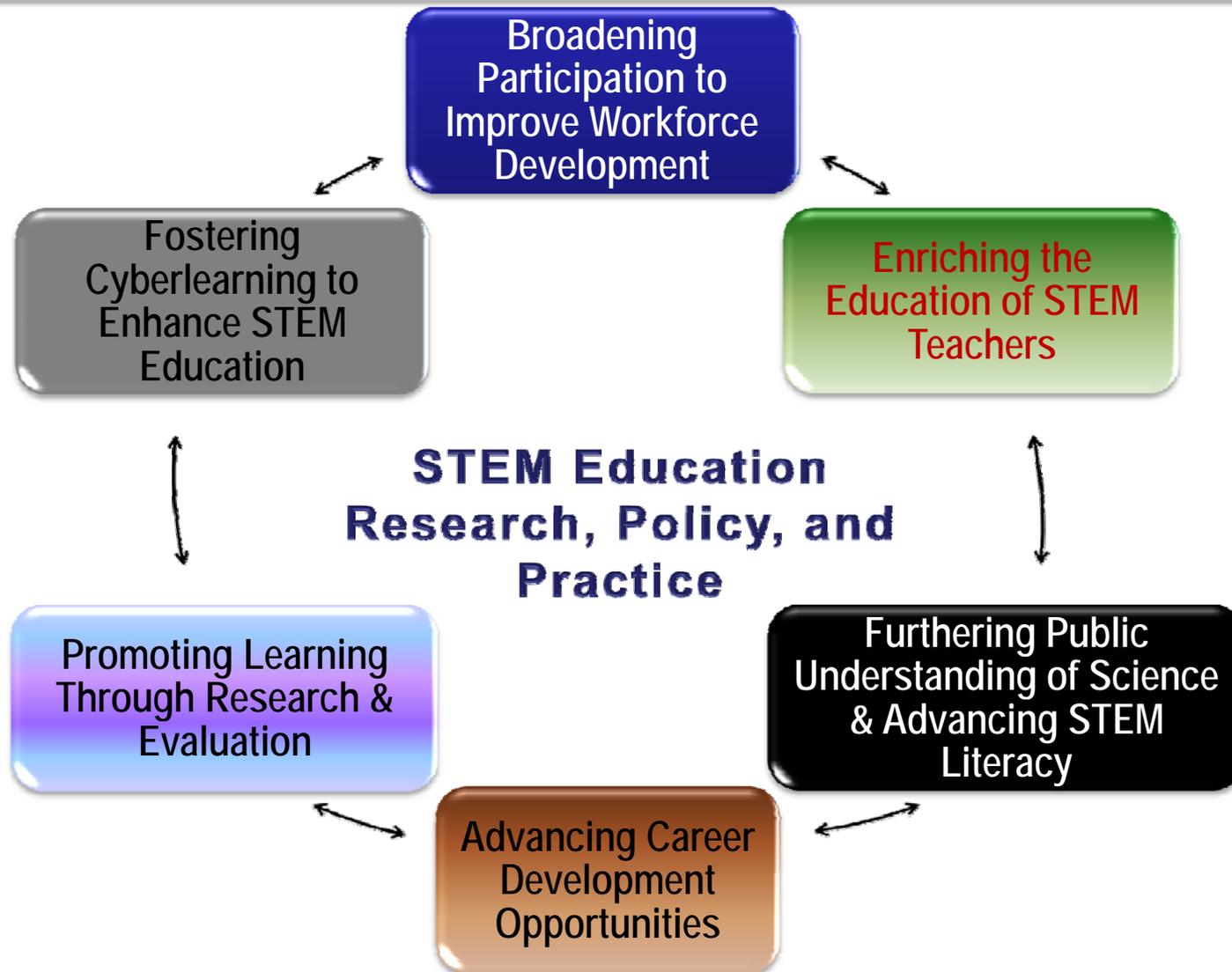


To sustain national leadership in STEM research, policy, and practice, in FY 2010 EHR will invest its resources through six thematic priorities:



EHR Thematic Framework

Directorate-Wide Coordination/Connections



EHR's Organizational Structure



Office of the Acting Assistant Director

Division of Graduate Education (DGE)

Division of Human Resource Development (HRD)

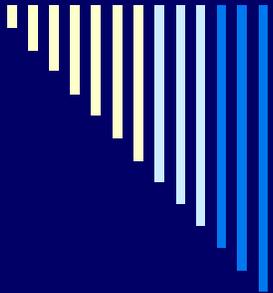
Division of Research on Learning in Formal and Informal Settings (DRL)

Division of Undergraduate Education (DUE)

FY 2011 Budget Request (Millions)



Division	FY 09 Actual	FY 10 Estimate	FY 11 Request	Change	Percent
DRL	226.68	242.00	247.85	5.85	2.40
DUE	283.08	292.41	289.98	-2.43	-0.08
DGE	181.67	181.44	185.26	3.82	2.10
HRD	154.08	156.91	168.91	12.00	7.60
Total	\$846.23	\$872.76	\$892.00	\$19.24	2.20%

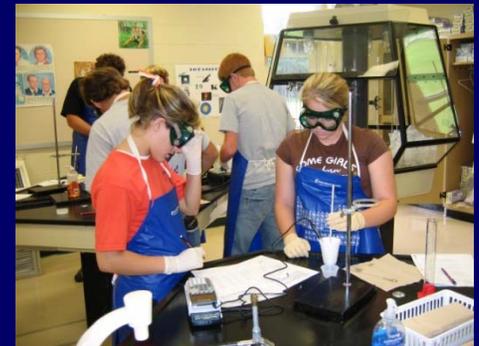


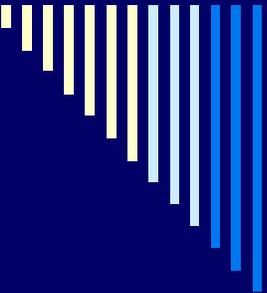
Division of Undergraduate Education (DUE)

DUE supports comprehensive approaches to strengthening STEM education at two- and four-year colleges and universities.

The goals of DUE are to:

- Provide leadership
- Support curriculum development
- Prepare high-qualified workforce
- Foster connections at all education levels





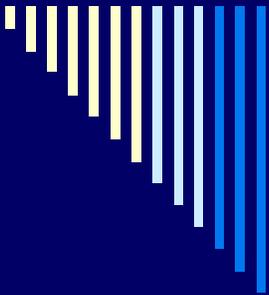
Core DUE Programs



- Advanced Technological Education (**ATE**) [managed jointly with DRL]
- Course, Curriculum and Laboratory Improvement (**CCLI**)
- Federal Cyber Service: Scholarship for Service (**SFS**)
- Math and Science Partnership (**MSP**)
- Excellence Awards in Science and Engineering (**EASE**) [managed jointly with DRL]
- National STEM Education Distributed Learning (**NSDL**)
- NSF Scholarships in Science, Technology, Engineering, and Mathematics (**S-STEM**)
- Robert Noyce Teacher Scholarship Program (**NOYCE**)
- Science, Technology, Engineering, and Mathematics Talent Expansion Program (**STEP**)
- Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences (**UBM**)

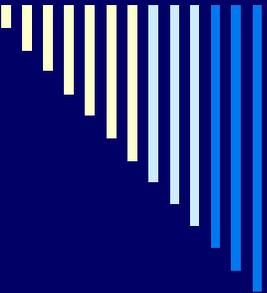
DUE---Advanced Technological Education (ATE)

[Managed Jointly with DRL]



- Focuses on the education of technicians for high-technology fields, with an emphasis on two-year colleges
- Involves partnerships between academic institutions and employers to improve the education of science and engineering technicians at the undergraduate and secondary school levels
- Provides development and training opportunities for prospective teachers in technological education

Program solicitation #: NSF10-539
Letter of Intent deadline: April 22, 2010
Full proposal deadline: October 21, 2010



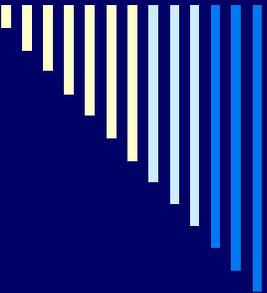
DUE---Course, Curriculum and Laboratory Improvement (CCLI)



CCLI-supported UCLA continuing education workshop under the Statistics Online Computational Resource for Education project.

- Creates, adapts, and disseminates new learning materials and teaching strategies
- Develops faculty expertise
- Implements educational innovations
- Assesses learning and evaluates innovations
- Conducts research on STEM teaching and learning

Program solicitation #: 09-529 (Archived) New Solicitation TBA
For type 1, deadline: TBA
For type 2 and 3 proposals, deadline: TBA



DUE---Federal Cyber Service: Scholarship for Service (SFS)

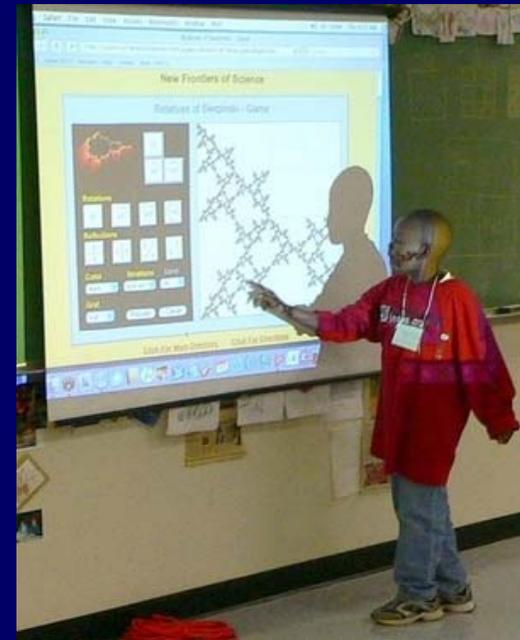
- Supports scholarships and capacity building activities designed to recruit, retain, and graduate an increased number of students at the undergraduate and graduate levels in the fields of cyber security



SFS supported new graduates from the Master of Science in Security Informatics program at the Johns Hopkins University.

DUE----Math and Science Partnership (MSP)

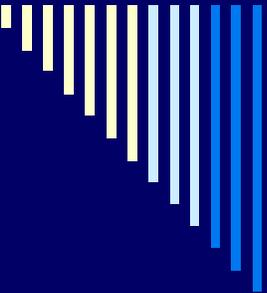
- Supports innovative partnerships between institutions of higher education and local school districts
 - Seeks to improve learning in math and science for all students at all grade levels
- Aims to increase the number, quality, and diversity of mathematics and science teachers
 - Enhances schools' capacity to provide more challenging curricula for all students, and promotes organizational change in education system



A middle school student describes a mathematical image at the Summer Institute for Middle School Math teachers in Broward County, Florida.

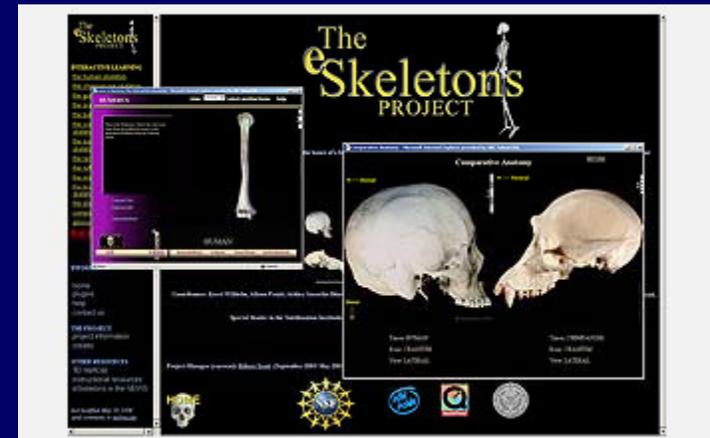
Program Solicitation #: 09-507

Due date: April 7, 2010



DUE---National STEM Education Distributed Learning (NSDL)

- Aims to establish a national network of learning environments and resources for STEM education at all levels.



Cyberskeletons are now a click away at an interactive and expanding digital library of human and primate anatomy.

Program solicitation #: NSF 09-531 (new Solicitation TBA)

Due date: TBA

DUE---NSF Scholarships in Science, Technology, Engineering and Mathematics (S-STEM)

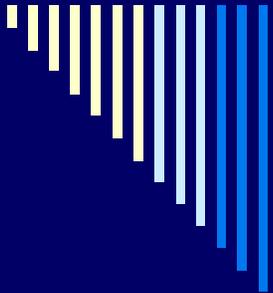
- Supports scholarships for academically talented, financially needy students in STEM disciplines at institutions of higher education



Native American and Latino students working Math problems for intercollegiate mathematics Competition [S-STEM award to Heritage University, Washington State.

Program solicitation #: 09-567
Letter of Intent: July 14, 2010
Full proposal deadline: August 12, 2010

*Organizations represent the top 5 investments in amount awarded to date among currently active S-STEM awards as of August 6, 2008.



DUE---Excellence Awards in Science and Engineering (EASE) [Managed Jointly with DRL]

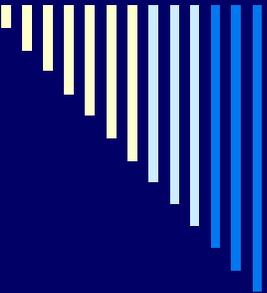
EASE
A combination of two existing programs

The Presidential Awards for Excellence in Mathematics and Science Teaching (**PAEMST**) is the highest recognition that a Kindergarten through 12th-grade teacher may receive for outstanding teaching in the U.S.

The Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring (**PAESMEM**) highlights the importance of role models and mentors in the development of students who are from under-represented groups in STEM.

PAESMEM program solicitation #: 10-520
Full proposals due: March 23 & Oct. 6l, 2010

PAEMST web site:
<http://www.paemst.org/controllers/home.cfc?method=view>



DUE---Robert Noyce Scholarship Program (NOYCE)

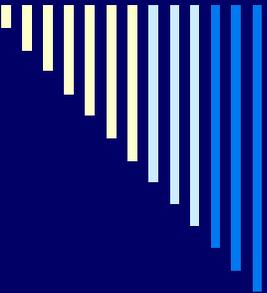
- Provides funds to institutions of higher education to support scholarships, stipends, and programs for undergraduate students, career-changers, teaching fellows, and Master teaching fellows who commit to teaching in high-need K-12 school districts



An undergraduate Noyce Scholar from California State University, Fresno participates in mathematics Lesson Study with math teachers and other Noyce Scholars.

Program solicitation #: 10-514

Due date: March 10, 2010, I-cubed: April 17, 2010



DUE---Science, Technology, Engineering and Mathematics Talent Expansion Program (STEP)

- Seeks to increase the number of students (U.S. citizens or permanent residents) receiving associate or baccalaureate degrees in established or emerging STEM fields
- Supports implementation and education research projects



Eastfield College student collects a *Lycogala epidendrum* slime mold specimen in the Big Thicket.

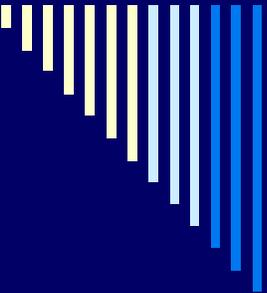
Program solicitation #: 08-569

Letter of Intent deadline

August 17, 2010

Full proposal deadline

September 28, 2010



DUE---Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences (UBM)

[Managed jointly with the MPS and BIO Directorates]



UBMTP students are working in the lab, determining the relationship between a cell's mitotic spindle and its shape.

- Provides long-term interdisciplinary research opportunities for students from biological and mathematical sciences
- Focuses on research at the intersection of biological and mathematical sciences
- Enhances interdisciplinary research capacity at higher education institutions

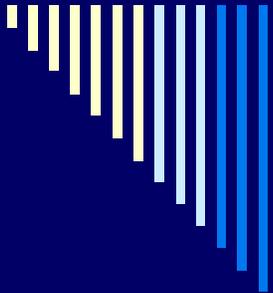
Program solicitation #: 08-510

Full proposal deadline: February 10, 2011

Division of Graduate Education (DGE)



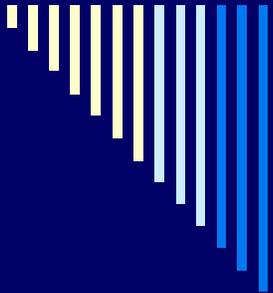
DGE leads NSF's effort to attract the most talented U.S. students into graduate studies, and to support them in their quest to become the leading scientists and engineers of the future.



Core DGE Programs

- Graduate Research Fellowship Program (**GRF**)
- Integrative Graduate Education and Research Traineeship Program (**IGERT**)
- NSF Graduate STEM Fellows in K-12 Education (**GK-12**)





DGE---Graduate Research Fellowship Program (GRF)

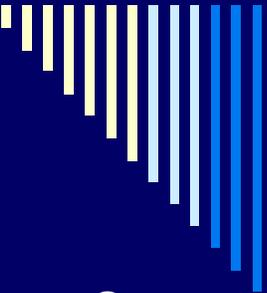


GRF Kathie Dionisio is installing a smaller version of sampling equipment in the cooking area of a home in Accra, to sample more directly the pollution from cooking in that particular home.

- Awards fellowships for graduate study leading to research-based master or doctoral degrees
- Provides fellows with three years of support within a five-year period, which may be used at an institution in the U.S. or abroad

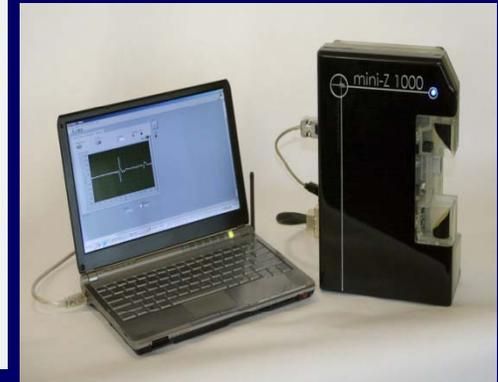
Program Solicitation #: 09-603

Full proposal deadline for FY2010: Call GRF Operations Center at 1-866-673-4737



DGE---Integrative Graduate Education and Research Traineeship Program (IGERT)

- Supports education of U.S. Ph.D scientists and engineers with interdisciplinary backgrounds and subject expertise
- Promotes innovative and collaborative interdisciplinary research
- Catalyzes a culture change in graduate education
- Prepares a world-class, broadly-inclusive and globally-engaged science and engineering workforce

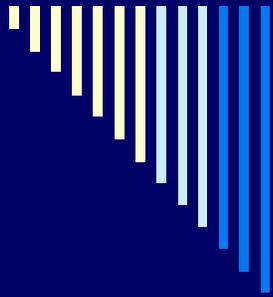


IGERT-funded researcher, Brian Schulkin at Rensselaer Polytechnic Institute, develops hand-held terahertz spectrometer, which has application in medical, aerospace, security and other fields.

Program solicitation #: 10-523

Preliminary Proposal deadline: March 29, 2010

Full proposal deadline: September 30, 2010



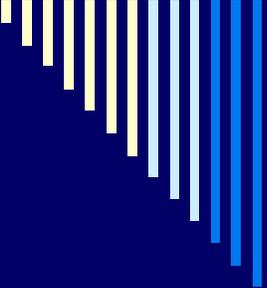
DGE---NSF Graduate STEM Fellows in K-12 Education (GK-12)

- Enhances graduate students' skills in teaching, communication and team building
- Provides professional development opportunities for K-12 teachers
- Improves student learning in STEM subjects
- Strengthens and sustains partnerships between institutions of higher education and local school districts



University of Hawaii-Manoa GK-12 fellow Meaghan Parker is working with elementary teacher and students in a seed-planting experiment at Lyon Arboretum.

Program solicitation #: 09-549
Letter of Intent: April 20, 2010
Proposal Deadline: June 3, 2010



DGE---NSF Science Master's program

- Prepares graduate students for careers in business, industry, nonprofit organizations and government agencies by
 - providing them with a strong foundation in STEM, and
 - research experiences, internships, and professional skills to succeed in those careers

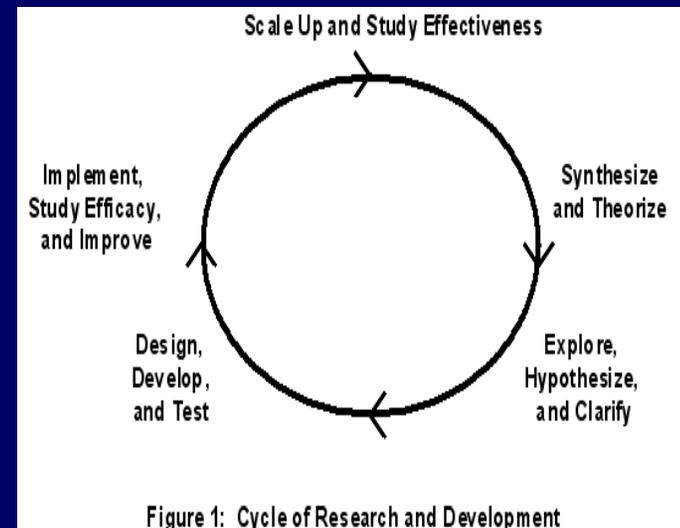
Solicitation No. 09-607

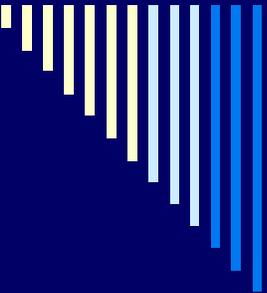
Letter of Intent: TBA for 2010

Proposal Deadline: TBA for 2010

Division of Research on Learning in Formal and Informal Settings (DRL)

DRL promotes innovative research, development, and evaluation of learning and teaching across all STEM disciplines by advancing cutting-edge knowledge and practices in both formal and informal settings.

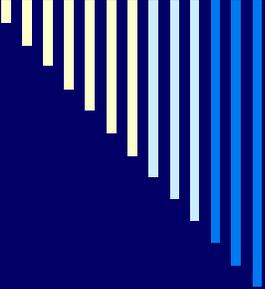




DRL: Core Programs

- Discovery Research K-12 (**DR-K12**)
- Informal Science Education (**ISE**)
- Innovative Technology Experiences for Students and Teachers (**ITEST**)
- Research and Evaluation on Education in Science and Engineering (**REESE**)





DRL: Discovery Research K-12 (DR-K12)



Astrobiology students create models of molecules.

- Enables student and teacher learning through the development, implementation, and study of STEM resources, models, and tools.
- Meets a variety of educational needs, from those that address immediate and pressing challenges facing preK-12 STEM education to those that anticipate opportunities for the future.

Program solicitation #: 09-602

Full proposal deadline: TBA for 2010

DRL: Informal Science Education (ISE)



"The State of the Planet's Oceans" –
An episode in the award winning
environmental film series, *Journey to Planet
Earth*.

- Advances knowledge in the field through research and evaluation about STEM learning in informal environments.
- Supports the design, implementation, and study of exhibits, models, resources, and programs for STEM learning in informal settings such as science centers, zoos, film, radio, youth programs, and games.
- Expands the capacity of professionals engaged in informal STEM education programs.

Program solicitation #: 09-553

Preliminary proposal deadline: June 24, 2010

Full proposal deadline: November 19, 2009; November 2010

CRPAs: No Deadlines

DRL: Innovative Technology Experiences for Students and Teachers (ITEST)

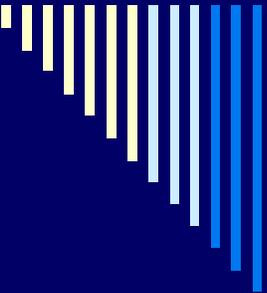


Middle and high school students participate in the *Build IT* underwater remotely operated vehicle (ROV) competition.

- Encourages K-12 students to prepare for and consider careers in information technology.
- Equips teachers to prepare and encourage students to enter the STEM workforce.
- Builds a general knowledge base on approaches that increase capacity in the STEM workforce in the United States.

Program solicitation #: 09-506

Full proposal deadline: April 7, 2010



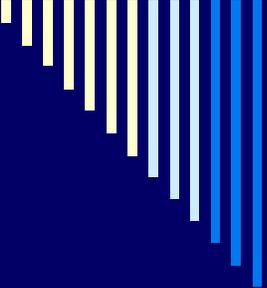
DRL---Research and Evaluation on Education in Science and Engineering (REESE)



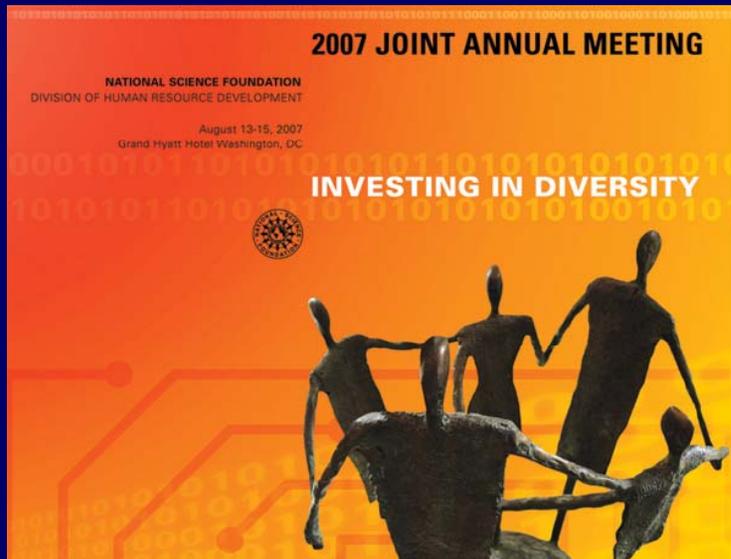
A teacher helps students solve problems using a computer based tutorial program.

- Focuses on core scientific questions about STEM teaching and learning.
- Catalyzes discovery and innovation at all ages and in all settings.
- Supports interdisciplinary research among education, policy, evaluation, and cognitive sciences.

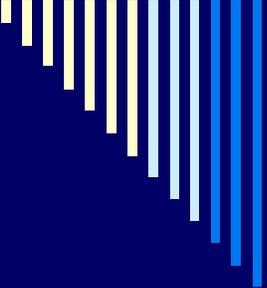
Program solicitation #: 09-601
Full proposal deadlines: TBA for 2010



Division of Human Resource Development (HRD)

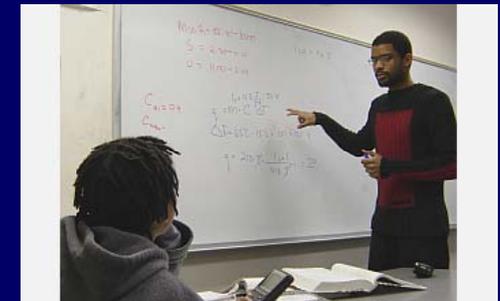


HRD serves as a focal point for NSF's agency-wide commitment to enhancing the quality and excellence of STEM education and research through broadening participation of underrepresented groups and institutions.



HRD Core Programs

- Research in Disabilities Education (**RDE**)
- Tribal Colleges and Universities Program (**TCUP**)
- **ADVANCE**: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers
- Research on Gender in Science and Engineering (**GSE**)
- Centers of Research Excellence in Science and Technology (**CREST**)
- Alliances for Broadening Participation in STEM (**ABP**)
- Historically Black Colleges and Universities – Undergraduate Program (**HBCU-UP**)



HRD---Research in Disabilities Education (RDE)

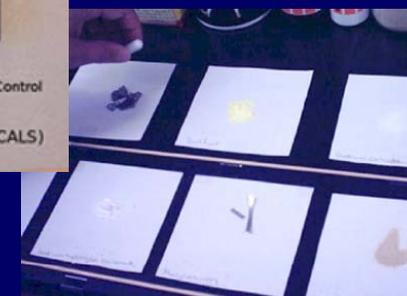
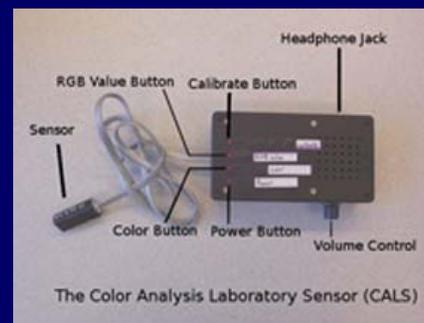
Increases the participation of persons with disabilities in STEM education and careers.

Three program tracks:

- Demonstration, Enrichment, and Information Dissemination (RDE-DEI)
- Focused-research Initiative (RDE-FRI)
- Regional Alliances for persons with disabilities in STEM education. (RDE-RAD)

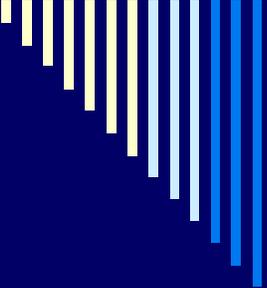


Effective tools for visually impaired students in Chemistry



Program solicitation #: 09-508

Multiple Due Dates in 2010. Consult solicitation



HRD---Tribal Colleges and Universities Program (TCUP)

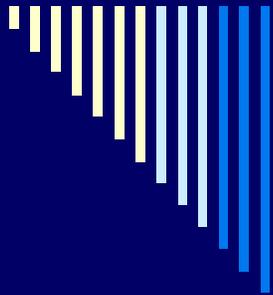


Sitting Bull College student is gathering up a net to capture animal data in environmental science research.

- Enhances the quality of STEM instructional and outreach programs at Tribal Colleges and Universities, Alaskan Native-serving Institutions and Native Hawaiian-serving institutions
- Strengthens STEM teaching and learning to improve access to, retention within, and graduation from STEM programs

Program Solicitation #: 10-501

Full Proposal Deadlines: March 31, 2010; I-cubed: April 7, 2010

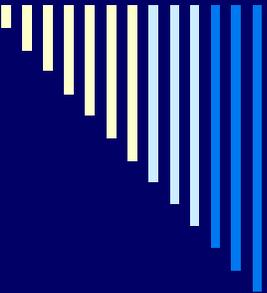


HRD---ADVANCE: Increasing the Participation of Women in Academic Science and Engineering Careers

- Develops systematic approaches to increase the representation and advancement of women in academic science and engineering careers
- Supports systematic efforts to improve the climate for women in the U.S. academic institutions and to facilitate women's retention and advancement to the highest ranks of academic leadership



The University of Michigan Ann Arbor established the Strategies and Tactics for Recruiting to Improve Diversity and Excellence (STRIDE) committee.



HRD---Research on Gender in Science and Engineering (GSE)



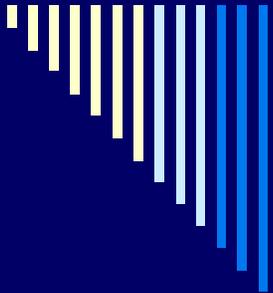
- Broadens the participation of girls and women in all fields of STEM education by supporting research, the diffusion of research-based innovations, and extension services in education



Girls received hands-on opportunities to engage in science activities through *Bring Up the Girls in Science*.

Program Solicitation #: 10-516

Multiple due dates in 2010; consult solicitation

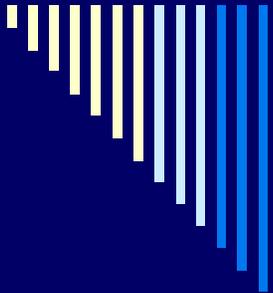


HRD---Centers of Research Excellence in Science and Technology (CREST)

- Enhances research capabilities of minority serving institutions through the establishment of centers that effectively integrate education and research
- Promotes the development of new knowledge, enhancements of the research productivity of individual faculty, and an expanded presence of students historically underrepresented in STEM disciplines



Students work in one of 25 computer science laboratories at Florida International University.



HRD---Alliances for Broadening Participation in STEM (ABP)

- Louis Stokes Alliances for Minority Participation (**LSAMP**) seeks to increase the quality and quantity of students receiving baccalaureate degrees in STEM fields.
- Bridge to the Doctorate (**BD**) provides significant financial support for matriculating candidates in STEM doctoral programs at eligible alliance sites.
- Alliances for Graduate Education and the Professoriate (**AGEP**) furthers the graduate education of underrepresented students through the doctorate level, preparing them for pursuing careers as STEM faculty and research professionals.



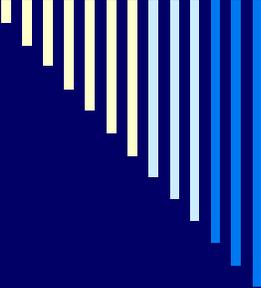
Dr. Carole Baldwin discusses some specimens of deep sea creatures with LSAMP participants.



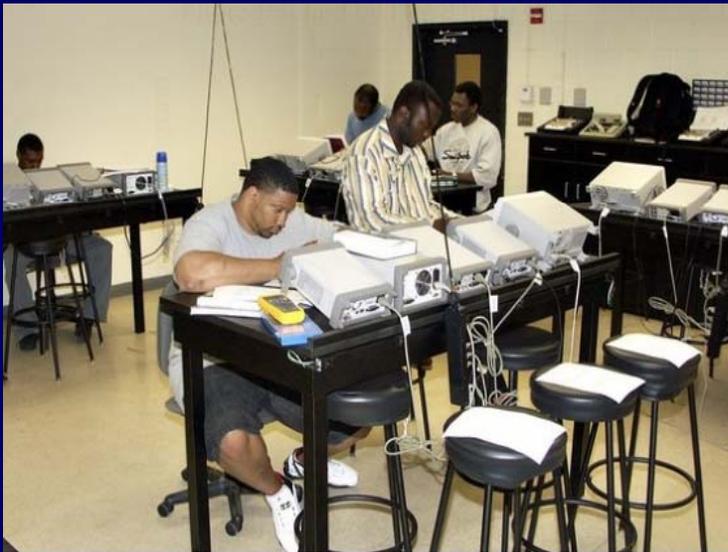
AGEP student, Victor Vega, graduated in 2007.

Program solicitation #: 10-522

Full proposal deadlines--**Consult Solicitation**



HRD---Historically Black Colleges and Universities- Undergraduate Program (HBCU-UP)



Benedict College students work in the laboratory.

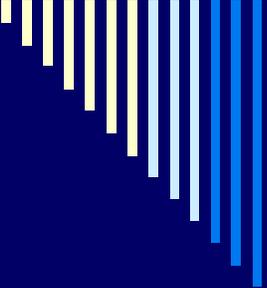
- Seeks to increase the quality of the STEM education at Historically Black Colleges and Universities
- Addresses HBCU's institutional STEM needs, long-term goals, and mission
- Supports Implementation Projects, Planning Grants, Education Research Projects, and Targeted Infusion Projects

Program Solicitation #: 10-518

Multiple Dates (consult solicitation)

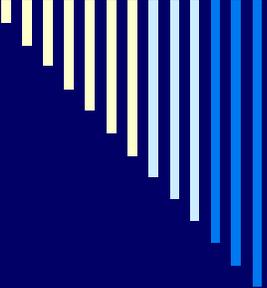
Innovation Through Institutional Integration (I³)





Innovation Through Institutional Integration (I³)

- I³ challenges institutions to think strategically about the creative integration of NSF-funded awards, with particular emphasis on awards managed through programs in the Directorate for Education and Human Resources (EHR), but not limited to those awards
 - In FY 2010, proposals are solicited in multiple EHR programs that advance I³ goals: CREST, GSE, HBCU-UP, ITEST, LSAMP, MSP, Noyce, RDE, and TCUP
 - All I³ proposals are reviewed in competition with one another
 - An institution may submit only one I³ proposal in only one program; Does not affect submission to other programs
 - Due dates: For FY2010, please contact staff for any of the programs offering I³ opportunities.
-



Cross-Cutting Program: EHR, BIO, GEO, OPP Climate Change Education (CCE)

- Seeks to establish coordinated national network of regional or thematically-based partnerships for high-quality education programs and resources related to the science of climate change and its impacts.
- Projects should have catalytic or transformative impact.
- Projects must have representation from:
 - Climate scientists
 - Experts in learning sciences
 - Practitioners from formal and/or informal learning venues.

Solicitation: 10-542

Letter of Intent: April 23, 2010

Full Proposals: May 24, 2010



National Science Foundation
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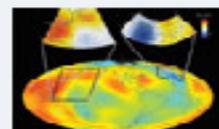
Special Notice

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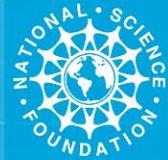
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