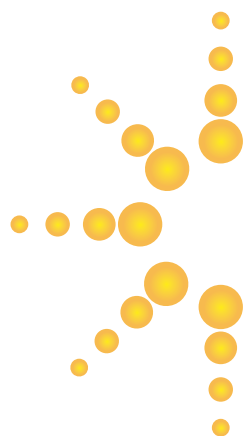


Early-Concept Grants for Exploratory Research (EAGER) at NSF

Presented by: Michael Lesiecki, PhD

Provided by:



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Early-concept Grants for Exploratory Research (EAGER) at NSF

Michael Lesiecki, Executive Director
Maricopa Advanced Technology Education Center
An NSF Funded Center of Excellence in the Advanced Technological Education Program
December 13, 2011

About the Presenter

- I have had the privilege to be a PI and Reviewer for both NIH and NSF grants since 1989.
- My technical background is chemical physics with a lot of focus on applications of laser technology in science and medicine.



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Objectives

- Knowing if your proposed research fits the EAGER criteria.
- Determining if the proposed research does or does not fit into existing programs at the NSF.
- Establishing a connection with the program officer.
- Identifying focus areas aligned with NSF's ideas of transformative research.
- Scoping the work and budget to fit NSF expectations.

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How does an investigator determine if the proposed research fits the EAGER criteria?



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4

EAGER

EArly-concept Grants – Exploratory Research

- This is a special mechanism to promote and support potentially transformative research
- *Transformative...?*

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5

Transformative....

- Transformative research is driven by ideas:
 - that have the potential to radically change our understanding of an important existing scientific or engineering concept or
 - leading to the creation of a new paradigm or field of science or engineering.

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6

Transformative...

Such research is also characterized by its challenge to current understanding or its pathway to new frontiers.



Georgia Tech photo by Gary Meek; NSF Multimedia Gallery

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Disciplinary Category

- Environmental and Life Sciences
- Physical Sciences and Engineering
- Social Sciences

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EAGER Example

- Core Capabilities for Smart Cars
- Program: Computer and Network Systems
- Carnegie Mellon, \$300k, two years
- *Enables a direct and timely interaction between CMU and the U.S. automotive industry to explore challenges that must be overcome before autonomous and highly-automated vehicles can be safely deployed in real-world driving situations*

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9



- http://www.rec.ri.cmu.edu/projects/urban_challenge/

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Looking for “High Risk – High Payoff”

- Radically different approaches
- Applies new expertise
- Engages in new perspectives

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EAGER Examples – the First Award in 2009

- A Self-Healing Approach for Smart Assembly Systems
- Program: Civil, Mechanical and Manufacturing Innovation - Manufacturing Enterprise Systems
- Virginia Polytechnic
- \$199k
- *A New Paradigm*



http://www.cibm.ise.vt.edu/People/Bios/bio_jaime_camelio.html

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EAGER Scope

- Up to \$300,000 over two years
- There is quite a range; at the low end, \$17k for one year
 - Most are in the \$100 – 200k

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EAGER Example – One of The Most Recent Awards

- Collaborative Research: Towards Context-Aware Security and Privacy for RFID Systems
- Program: Computer and Network Systems – Trustworthy Computing
- University of Alabama- \$90k
- *Next generation RFID tags that are context-aware*

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EAGER Awards – 911 to date

- The first award was in 2009

Year	# of Awards
2009	174
2010	401
2011	336

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Analysis of a Random Sample of 100 EAGER Proposals Across the NSF

Acronym	NSF Organization	Number
CMMI	Civil, Mechanical and Manf. Innovation	28
CNS	Computer and Network Systems	11
CBET	Chem., Bioengineering, Environmental, and Transport Systems	9
IIS	Information and Intelligent Systems	8
CCF	Computer and Comm. Foundations	7
OCI	Cyber Infrastructure	6
14 others		32

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- ### EAGER - Example
- Cloud-Computing and High-Speed Internet Enabled Manufacturing
 - Northwestern University
 - \$99,999 – one year
 - ENG Interdisciplinary research
 - *Several plausible futuristic manufacturing scenarios under the theme Cloud-Manufacturing, will be explored.*
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- ### It is Important to Establish a Connection With the Program Officer – How is That Best Done?
- Not only important but....
 - "If I get and EAGER without communication with the PI beforehand....forget it!
 - NSF program officer
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Program Officer Connections

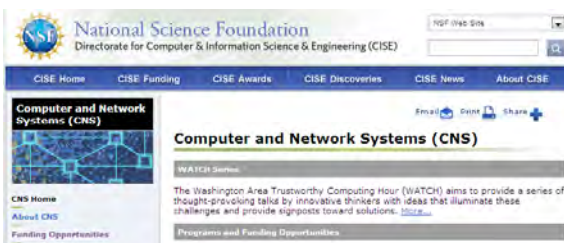
- If you are currently NSF funded that is an obvious starting place because you have a current program officer
- If you have a general idea of the fit to a program go right to the web site
 - Example Computer and Network Systems

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Searching For a Fit at The Program Level



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NSF is Organized Into the Following Directorates:

- Directorate for Biological Sciences (BIO)
- Directorate for Computer and Information Sciences (CISE)
- Directorate for Education and Human Resources (EHR)
- Directorate for Engineering (ENG)
- Directorate for Geosciences (GEO)
- Directorate for Mathematics and Physical Sciences (MPS)
- Directorate for Social, Behavioral and Economic Sciences (SBE)

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21

EAGER Example

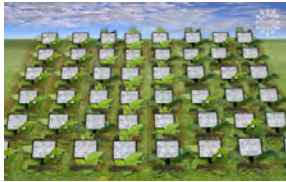
- Solid Freeform Fabrication of a Conceptual Artificial Photosynthesis Device
- Program: Civil, Mechanical, and Manufacturing Innovation
- Kansas State, \$99k, one year
- *Help realize the vision of affordable bio-based energy manufacturing*

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How Can an Investigator Identify Focus Areas That Are Aligned With NSF's Ideas of Transformative Research?



Experimental Computing Cluster at the University of Illinois
Zina Deretsky, National Science Foundation

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Identify Focus Areas?

- Align your work with some of the Grand Challenges
 - Basic Energy Sciences, see handout link
 - Grand Challenges for Engineering, see handout link

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EAGER – Making Connections

Arizona State	11
BYU	3
Cal Tech	4
Carnegie Mellon	8
William and Mary	2
Columbia	11
Drexel	9
Duke	11
Georgia Tech	25
IIT	2
National Bureau of Economic Research	1

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EAGER Examples -

- Oxygen Management During Flight in Bar-headed Geese
- Program: International Research Fellowship
- \$31k, six months
- *Severe urgency with regard to availability of, or access to data, facilities or specialized equipment*



□ <http://www.zoology.ubc.ca/person/mejr>

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Urgency and Opportunity

- The PI currently has a flock of imprinted bar-headed Geese and access to a large wind tunnel in a window of opportunity

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What Scope of Work and Budget Fit NSF's EAGER Expectations

- The award size will be consistent with the project scope and of a size comparable to grants in similar areas (NSF grant Proposal Guide)

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Does the EAGER Review Process Differ in Any Significant Ways?

- Definitely yes
 - In a general sense a program officer can make a decision him or herself if less than \$50k.
 - If less than \$100k it is likely to reviewed only internally.
 - If more than \$100k the proposal may have an external review (usually by mail) using the standard NSF intellectual merit and broader impact criteria.

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EAGER Example

- Underwater Optical Communication and Perception
- Program: Information and Intelligent Systems
- MIT, \$49,999, two years
- *Explores new methods for acoustic and optical underwater coordination that lead to target identification and efficient data muling using autonomous underwater vehicles.*

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30

Is it Important to Qualify the Proposal as “high risk”?

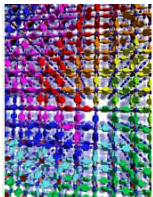


Image of 3-D, synthetic, DNA-like crystals.
NSF/CNSI, UCLA-Department of Energy Institute of Genomics and Proteomics

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Project Description – Keep It Short

- The Project Description is expected to be brief (five to eight pages) and include:
 - clear statements as to why this project is appropriate for EAGER funding
 - why it does not “fit” into existing programs and
 - why it is a “good fit” for EAGER

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EAGER Example

- *Discovering Knowledge from Scientific Research Networks*
- *Program: Cyber Infrastructure*
- *Northwestern, \$256k, two years*
- *Develops an infrastructure called DiscKNet (Discovering Knowledge from Scientific Research Networks) to mine the enriched scientific research network for emerging trends, new research areas, potential collaborations, etc.*

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Language from the NSF

- PI(s) must contact the NSF program officer(s) whose expertise is most germane to the proposal topic prior to submission of an EAGER proposal.
- This will aid in determining the appropriateness of the work for consideration under the EAGER mechanism;
- This suitability must be assessed early in the process

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34

More NSF Language

- The box for “EAGER” must be checked on the Cover Sheet.
- Only internal merit review is required for EAGER proposals. Under rare circumstances, program officers may elect to obtain external reviews to inform their decision

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Eager Example – An Extension of Traditional Work

- Collaborative Research: Attention, (Re)Action, and Perception: Measuring Presence in Collaborative Virtual Environment
- Cyber Infrastructure
- Arizona State University, \$100k
- *Evolution of potentially transformative collaborative virtual environments for organizational work*

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ASU PI Interview

- This was an extension of a traditionally (competitively) funded NSF project (VOSS program) in which we discovered a problem that got in the way of us being able to complete all of the work we originally proposed
- The EAGER grant came at the end of a 3 year process of engagement with the program officer

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Interview - Continued

- Persistence was a non-trivial part of why we ended up with the invitation to submit an EAGER

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- NSF tends to be smaller
- NSF is more open to risky, exploratory, paradigm-challenging work
- NSF stresses basic research
- NSF has no scoring system, percentile system
- NSF program officers make funding decisions
- NSF uses "revision encouragement" loosely
 - Robert O'Connor, NSF Workshop Presentation at Penn State

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39

Summary:

- Knowing if your proposed research fits the EAGER criteria.
 - ✓ exploratory work in its early stages on untested, but
 - ✓ potentially transformative, research ideas or approaches.

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Summary - Continued

- Determine if the proposed research does or does not fit into existing programs at the NSF.
 - Examine programs and in particular, the award data base (see handout for link)
- Establish a connection with the program officer.
 - A "must-do"

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Summary - Continued

- Identify focus areas aligned with NSF's ideas of transformative research.
 - Ideas that have the potential to radically change our understanding of an important existing scientific or engineering concept or
 - leading to the creation of a new paradigm or field of science or engineering.
- Scope the work and budget to fit NSF expectations.

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Questions

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Web Seminar: Early-concept Grants for Exploratory Research (EAGER) at NSF

References and Resources:

Files accessed December 8, 2011

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http://www.nsf.gov/nsb/documents/2007/tr_report.pdf
3. Searching the NSF Award Database for the EAGER program,
<http://www.nsf.gov/awardsearch/piSearch.do?PIFirstName=&PICountry=&Search=Search&PIZip=&PILastName=&PIInstitution=&Restriction=2&SearchType=piSearch&page=1&QueryText=eager&d-49653-p=1&PIState=>
4. The Grant Proposal Guide describes EAGER in section II-21,
<http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpgprint.pdf>
5. How to find out what NSF thinks is unique and transformative? Read the 2012 NSF budget, <http://www.nsf.gov/about/budget/fy2012/index.jsp>
6. Align yourself with Grand Challenges like those in the Basic Energy Sciences,
<http://science.energy.gov/bes/News%20and%20Resources/Reports/Abstracts/>, or Engineering,
<http://www.engineeringchallenges.org/>



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Overall Experience	5	4	3	2	1
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Quality of Speaker	5	4	3	2	1
Conference Company	5	4	3	2	1
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