Enhancing Support of Transformative Research at the NSF

National Science Foundation

Arden L. Bement, Jr.
Director
To the National Science Board
August 2007

Presentation Outline

1. NSF actions to enhance opportunities for Transformative Research

2. NSF Response to NSB Recommendation

National Science Foundation

What NSF Currently Does To Facilitate Transformative Research

- Mechanisms
  - Small Grants for Exploratory Research (SGERs)
  - Accomplishment Based Renewals
  - Creativity Extensions
- Programs
  - Instrumentation and Infrastructure
  - Centers
  - Frontiers and Interdisciplinary

National Science Foundation

NSB Recommendation and Guidelines

Board's Recommendation to NSF: Develop a distinct, Foundation-wide Transformative Research Initiative (TRI)

Guidelines:
1. Adopt the Board's definition of transformative research
2. Weave TRI into the core values of the Foundation.
3. Fund this initiative as soon as possible
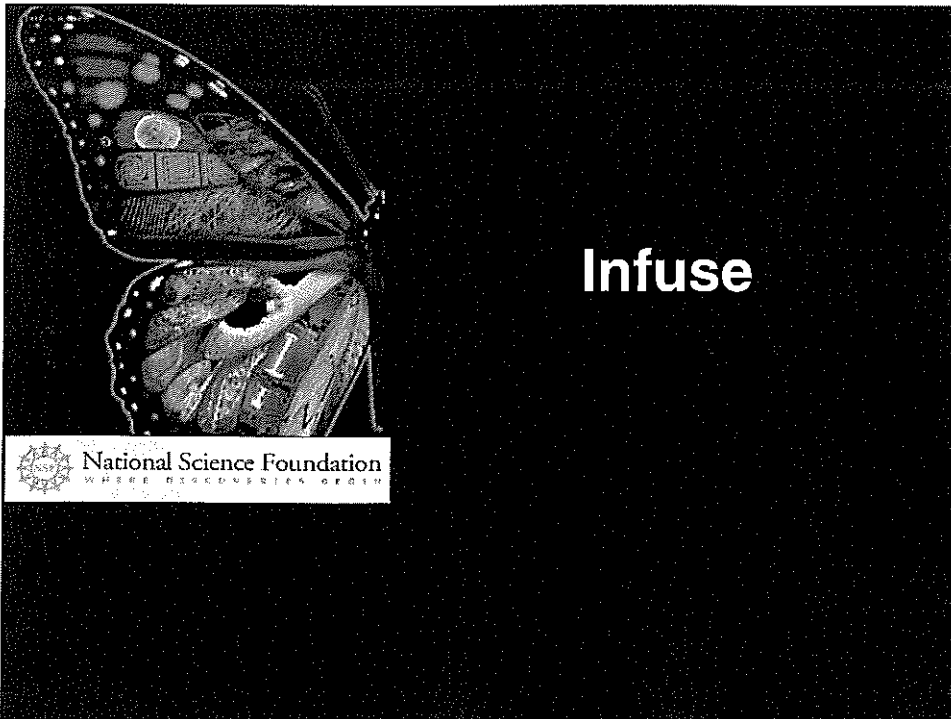
National Science Foundation

NSF Response

We Propose A Three Pronged Approach:

- *Infuse* support of Potentially Transformative Research (PTR) throughout NSF and all its programs

- *Learn* how to facilitate PTR

- *Lead* the community through opportunities for PTR proposal submissions

National Science Foundation

5

Infuse

National Science Foundation
WHERE DISCOVERIES BEGIN

Infuse: Weaving Support of Transformative Research into the Core Values of the Foundation

- Promote transformative research as a core value of NSF
- Encourage increased use of SGER and other existing mechanisms
- Merit Review Training for POs, including enabling transformative research
- Guidance in the FY 2009 budget development
- Assessment of "transformative highlights" as a GPRA evaluation criteria
- Propose a change to the intellectual merit review criterion (requires Board approval)

National Science Foundation

Infuse: Requested Change to the Intellectual Merit Review Criterion

1) What is the intellectual merit of the proposed activity?

- How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative, original, **or potentially transformative** concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?
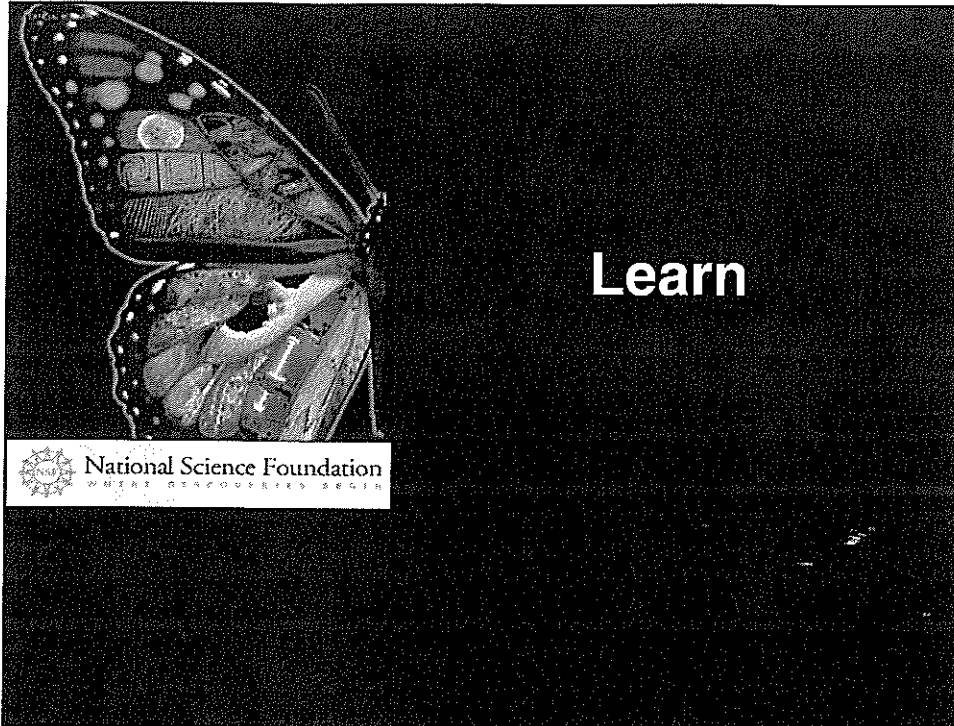
= Proposed new language

National Science Foundation
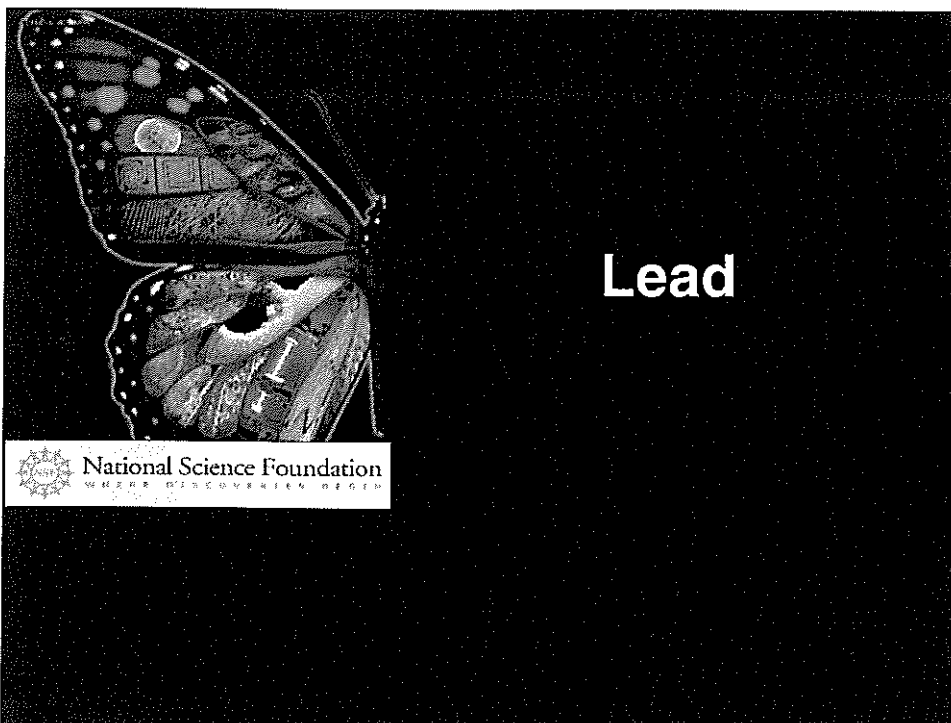
Learn

National Science Foundation

Learn: Test and Assess Existing Mechanisms, Experimental Pilots

- Formed a small group within the OD to integrate advice and recommendations from across the Foundation into the framework of a TRI

- Put new funding mechanisms in place in FY 2008 to involve all Divisions/Directorates, including Cyber-enabled Discovery and Innovation ($52 M)

- Planning a database and analysis of grants made with existing and new award mechanisms

10

National Science Foundation

Learn: Survey Community Perceptions of NSF's Openness for Transformative Research

- NSF Proposer Survey
  - Distributed to 43,412 proposers; 56% responded
  - Included a set of questions on transformative research, requested and designed in part by the Board
- Results revealed:
  - A majority of respondents perceive that NSF welcomes transformative research
  - NSF was strongly preferred over other funding sources as the place to submit a transformative idea
  - There is room for improvement

11

National Science Foundation

Lead

National Science Foundation

Lead: Program Award Initiative
(3-Year Trial)

1. **Replace SGER by**
- One mechanism exclusively for funding proposals requiring rapid response
  - **TIGUR** (Timely Grants for Urgent Research)
2. **Establish a two-tiered "early-concept" award mechanism**
  - **EAGER:** (EArly-concept Grants for Exploratory Research)
  - Tier I: Limited funding grants, internally-reviewed
  - Tier II: Larger grants requiring additional level of review
  - Working group established to recommend implementation details
  - Monitor and track for impact and lessons-learned
  - Advertise new approach to the community at large

13

Lead: NSF Is Implementing this Initiative as Follows

1. Continue to develop initiative details
   - NSF-wide discussions on PTR
   - Form NSF- wide Team for Facilitating PTR
   - Refine new funding mechanisms in anticipation of a Dear Colleague letter early in FY 2008
   - Infuse facilitating PTR in FY 2009 budget development
   - Charge Directorates/Offices to develop evaluation plans, goals, and metrics in cooperation with OD

2. Present further progress to the Board

14

Resources are Required

- Adequate Foundation AO&AM budget is critical

- New initiative will generate additional demands on overworked Program Officers and administrative staff

15   National Science Foundation

Requested Board Resolutions

1. Approve change to the Intellectual Merit review criterion, to add the phrase "potentially transformative" to the third sentence.

2. Approve the conceptual Transformative Research Initiative outlined in this talk for further development and implementation by NSF

16   National Science Foundation