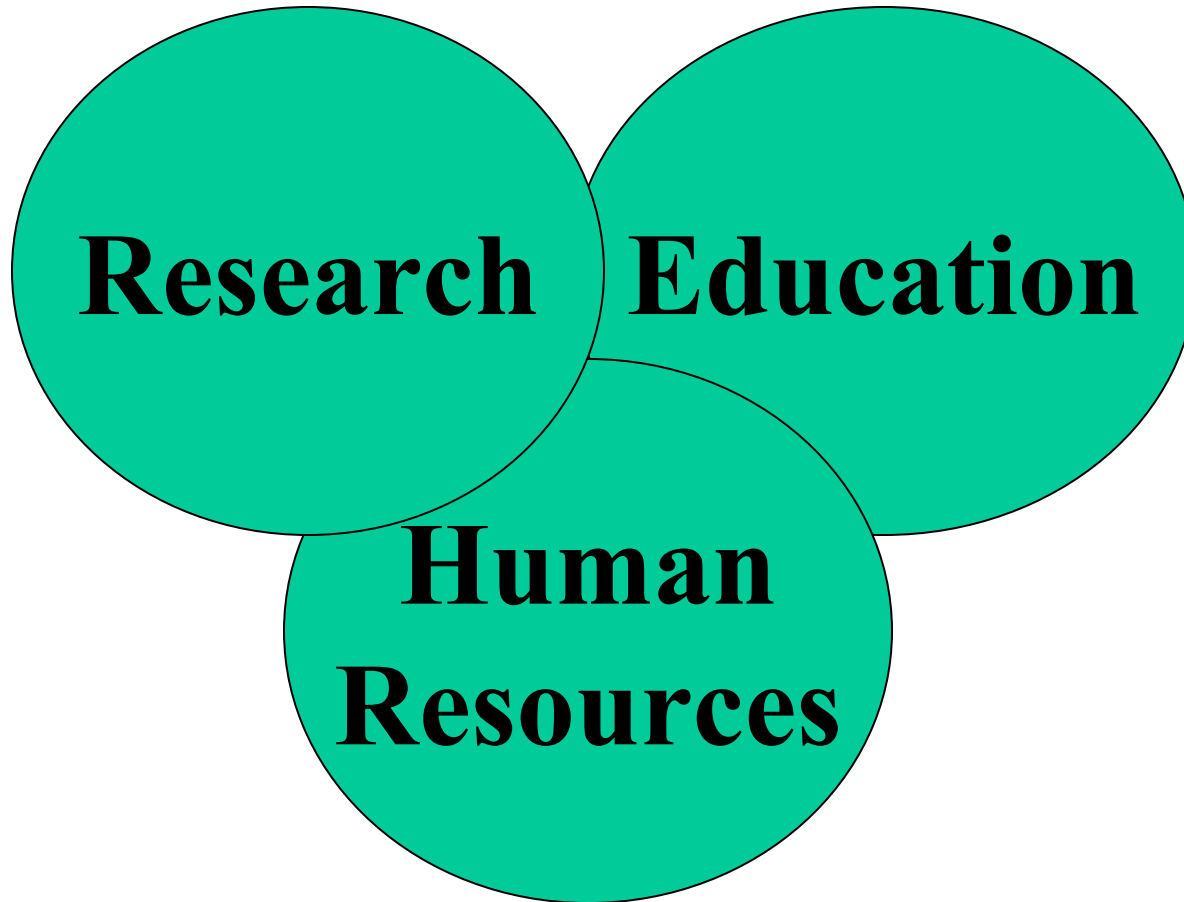


Grand Challenges



Research

Education

**Human
Resources**

National Education and Workforce Concerns

Declining MPS undergraduate degrees

Declining MPS graduate degrees

Strategic gaps in expertise

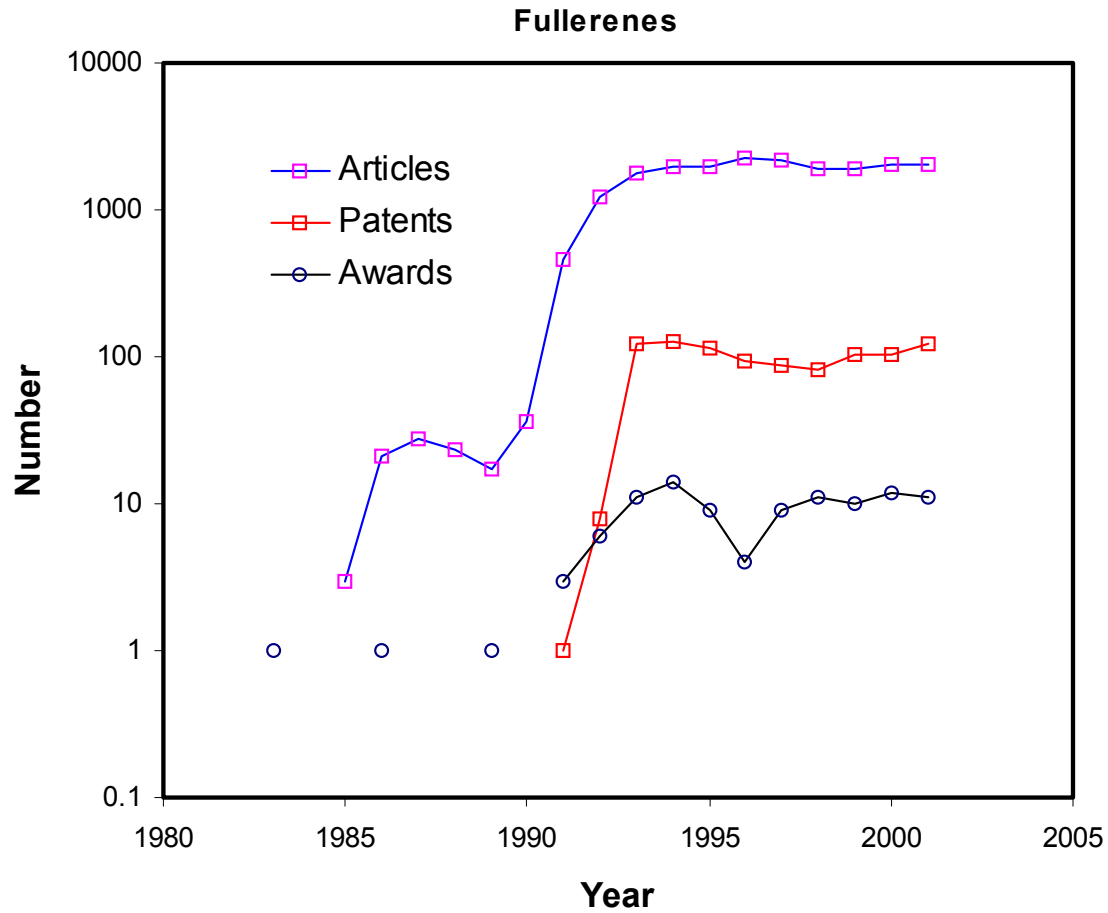
Inclusiveness

NSF Proposal Review Criteria

Intellectual merit
Broader impact



Investment Metrics



Broader Impacts

- Communication
- Education
- Industry
- Environment
- National security
- Health
- Quality of life



Dear Colleague Letter 02-161

Broader Impacts

	PI-1	PI-2	PI-3	PI-4	PI-5
PEOPLE					
training students	X	X	X	X	X
diversity	X	X		X	
international collaborations		X		X	X
IDEAS					
publications	X	X	X	X	X
patents	X				X
start-ups	X		X		
TOOLS					
instrument development	X	X		X	
websites	X	X	X	X	X
shared software			X		X

Building Strength

NSF Doctoral Investment

- Graduate students supported by CHE:
1,600 at \$29M
- Graduate students supported by NSF:
21,000 at \$330M

Idealized Graduate Research Experience

Create Knowledge

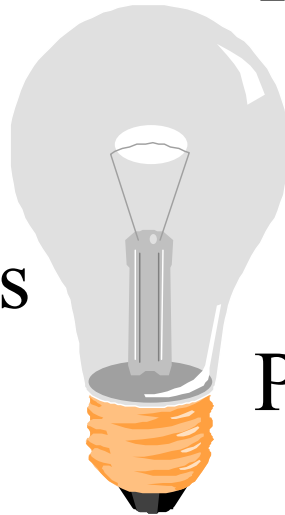
Context

Experimental Design

Experiments

Interpretation of Results

Peer Review



Communicate Knowledge

Introduction/References

Experimental Section

Results

Discussion

Publication/Presentation

Idealized Graduate Professional Development

Advisor(s) and research group

Tools/techniques

Skills

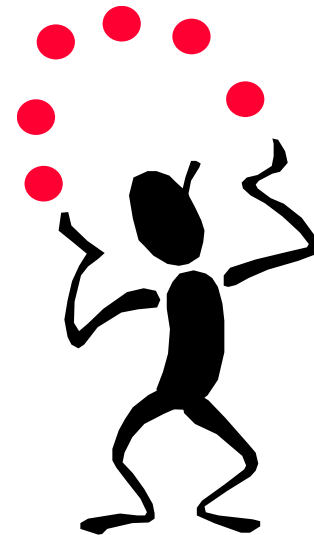
Industry

Global awareness

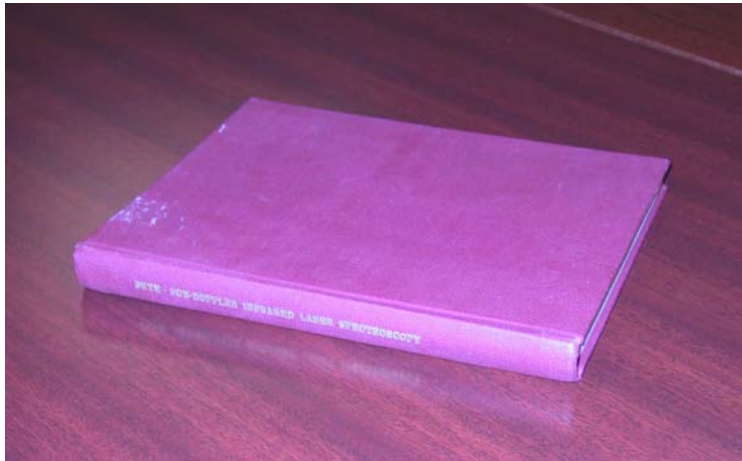
Proposal preparation

Teaching preparation

Technology

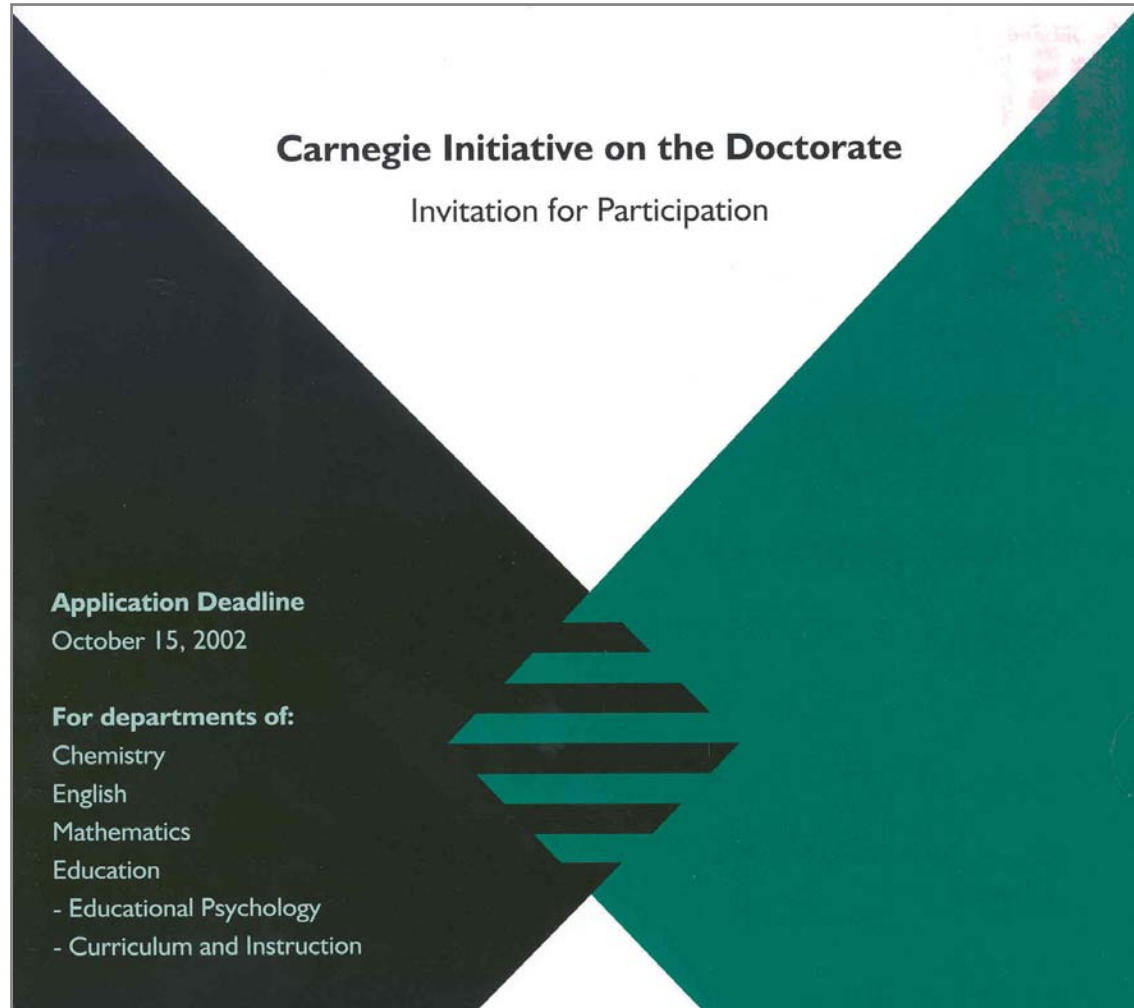


“Thesis Plus”



- Education and outreach activities
- International activities
- Co-op programs

New Doctoral Models

The poster features a central graphic of two hands shaking, rendered in dark blue and teal. The background is split diagonally from the top-left to the bottom-right, with the top-left half being dark blue and the bottom-right half being teal. The text is centered in the white space between the hands.

Carnegie Initiative on the Doctorate
Invitation for Participation

Application Deadline
October 15, 2002

For departments of:
Chemistry
English
Mathematics
Education
- Educational Psychology
- Curriculum and Instruction

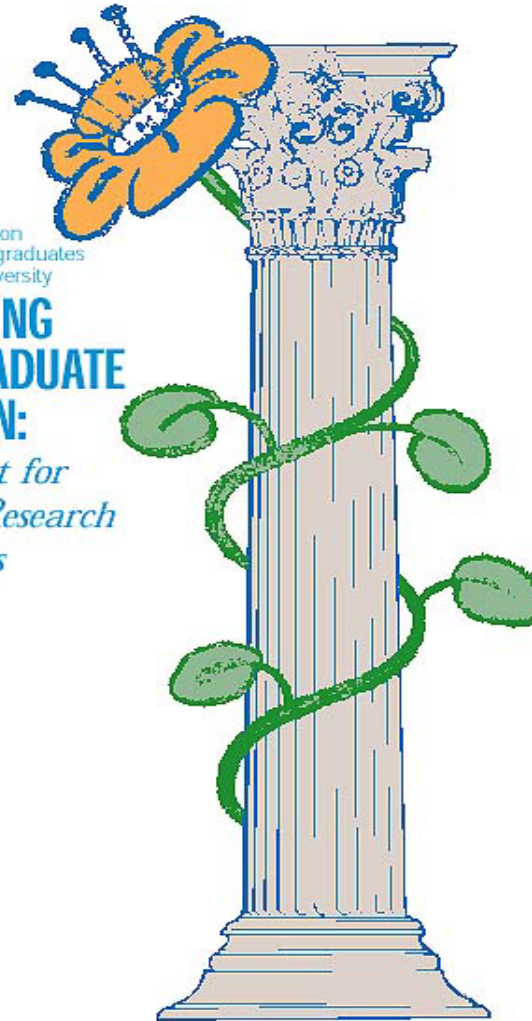
Building Strength

The Carnegie Challenge

The Boyer Commission
on Educating Undergraduates
in the Research University

REINVENTING UNDERGRADUATE EDUCATION:

*A Blueprint for
America's Research
Universities*



Rankings of
Undergraduate
Research

U.S. News and
World Report
2003

Nanotechnology in Undergraduate Education (NUE)

www.nano.gov

NUE Workshop Report is on the web

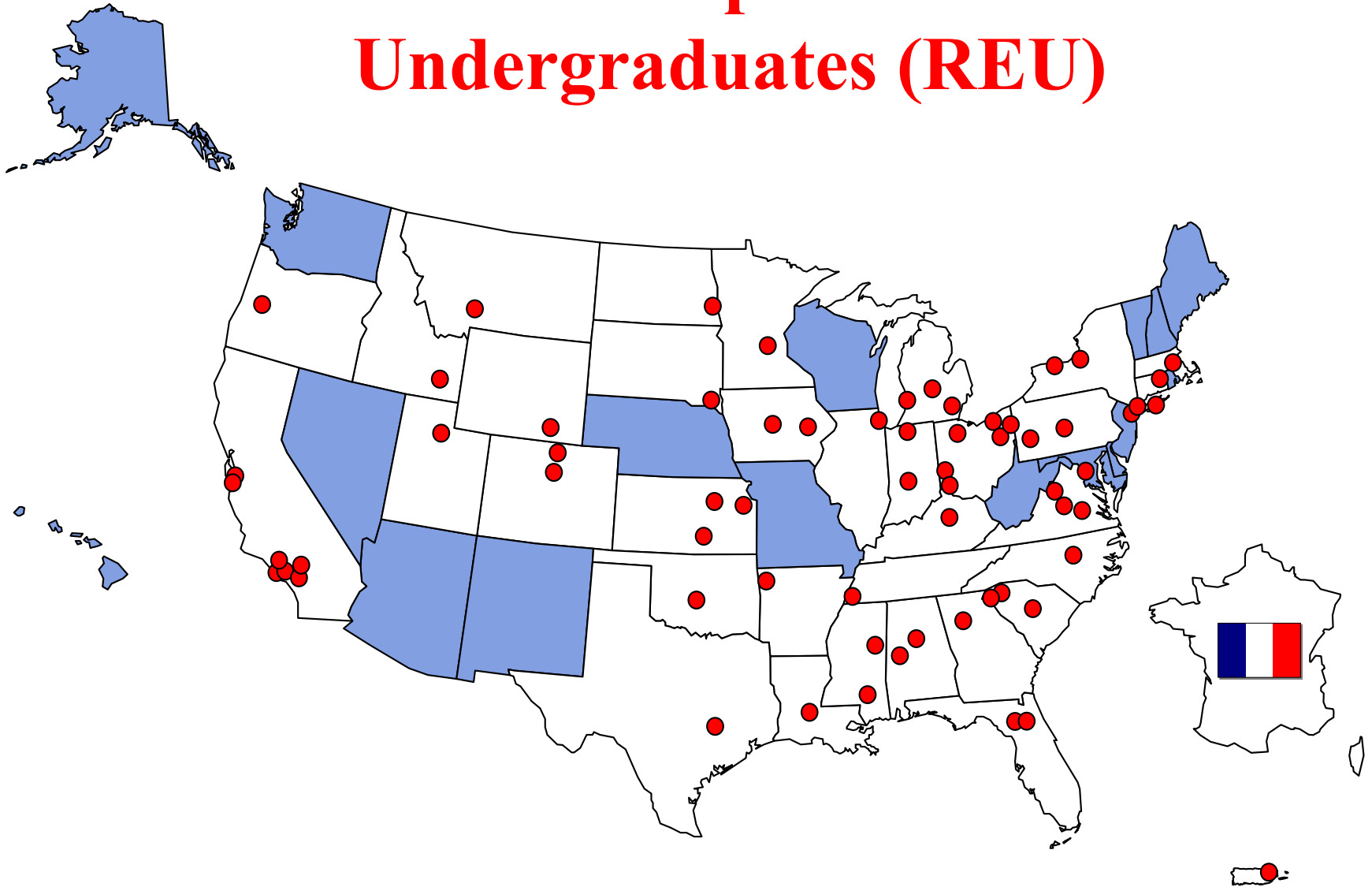
- ◆ Contact: Michael Clarke,
mclarke@nsf.gov

Building Strength

Access to Instrumentation



Research Experiences for Undergraduates (REU)



65 sites support some 675 students

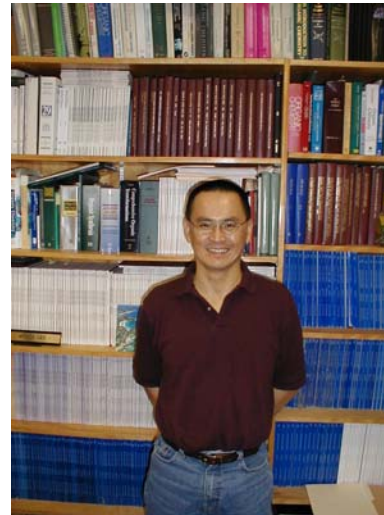
Undergraduate Research Centers Workshop

March 30 – April 1, 2003 at NSF

PIs

Jeanne Pemberton, Univ. Arizona

Moses Lee, Furman Univ.



Undergraduate Research Centers (URCs)

Teams of faculty and students

Cutting-edge research projects and tools

Freshmen through seniors

All undergraduate institutions

Mechanism to move research into courses

Spring workshop, March 30-April 1, '03 at NSF

Jeanne Pemberton, Univ. Arizona, PI

Moses Lee, Furman Univ., co-PI

URC Workshop Sessions

Broadening the scope of undergraduate research

Strengths and weaknesses of traditional models

Increasing the pool

Nuts and bolts

Resources

Assessment

Sustainability

Building Strength Postdoctoral “Discovery Corps”



Building national research infrastructure

Spring workshop; tentatively, May 11-13, 2003

Faculty Recruiting: Chembine?



Modern Language Association's
Annual Convention Job Service



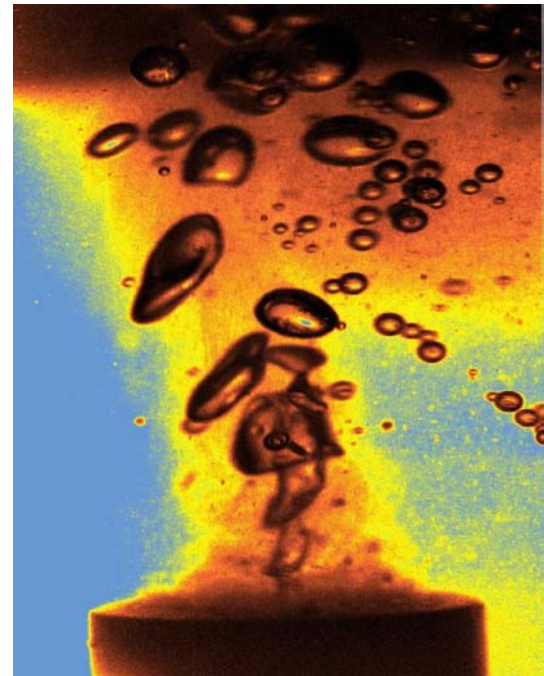
National Football League's
Combine

“Nuggets”

Text for non-specialists

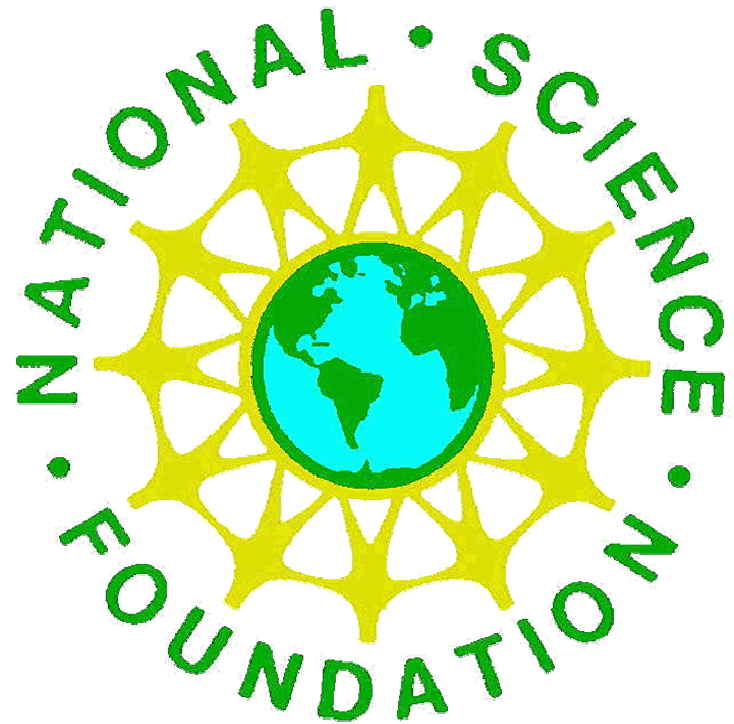
Graphic: still image, animation, movie

Narrated nugget:
PI and co-workers
discuss their work



Building Strength: Partnership Models

Partner equity
Shared resources
Sustainability
Adaptability
Effectiveness



Does the whole exceed the sum of the parts?