

Embedded Systems

**IAB Meeting**

June 12, 2012

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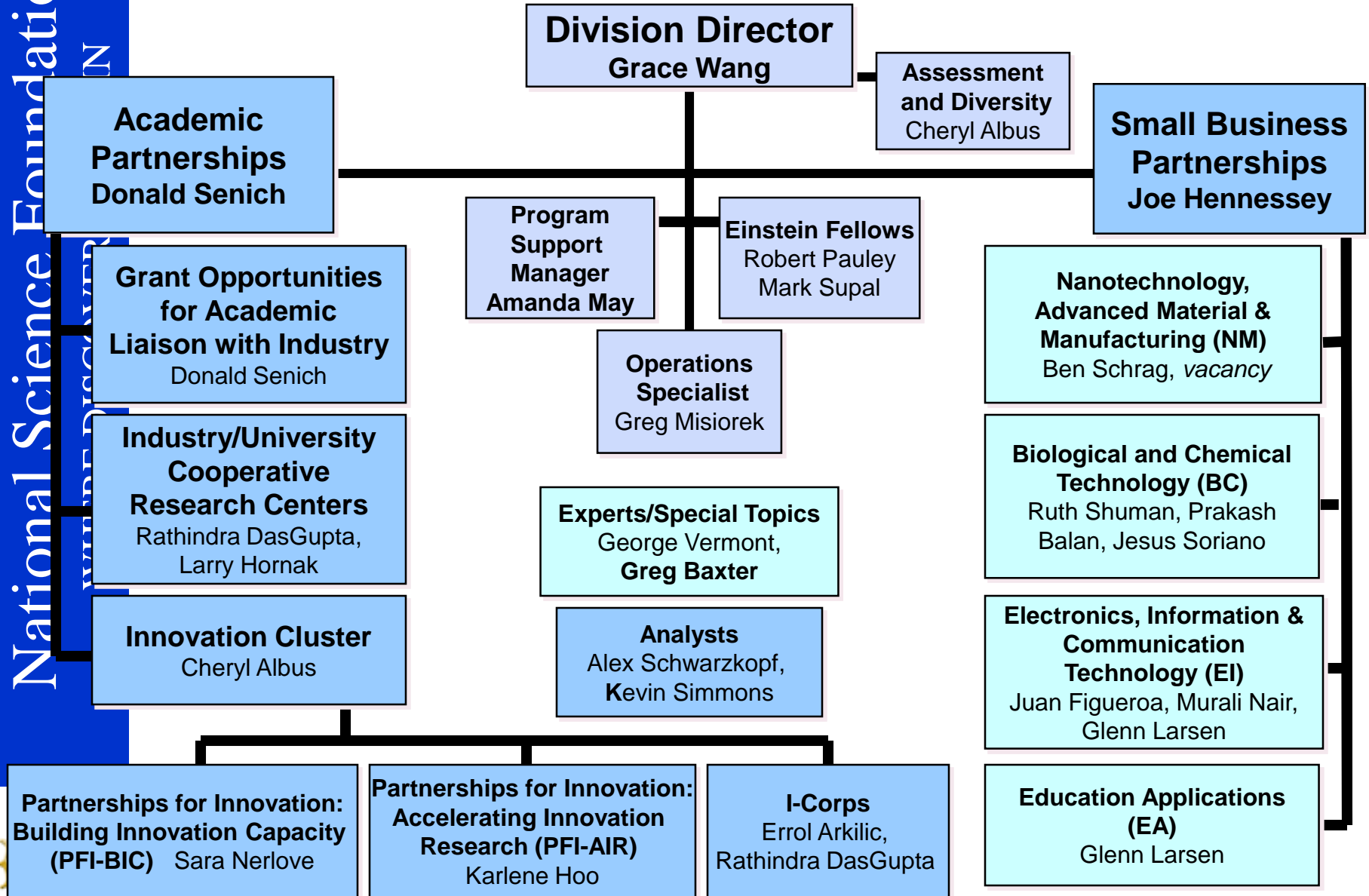
Rita Rodriguez, CISE

National Science Foundation

*Welcome to the Industry / University*

*Cooperative Research Centers*

# Industrial Innovation and Partnerships



# I/UCRC: Mission and Vision

## Mission:

- To contribute to the nation's research infrastructure base by **developing long-term partnerships** among industry, academe and government
- To **leverage NSF funds with industry** to support graduate students performing industrially relevant research

## Vision:

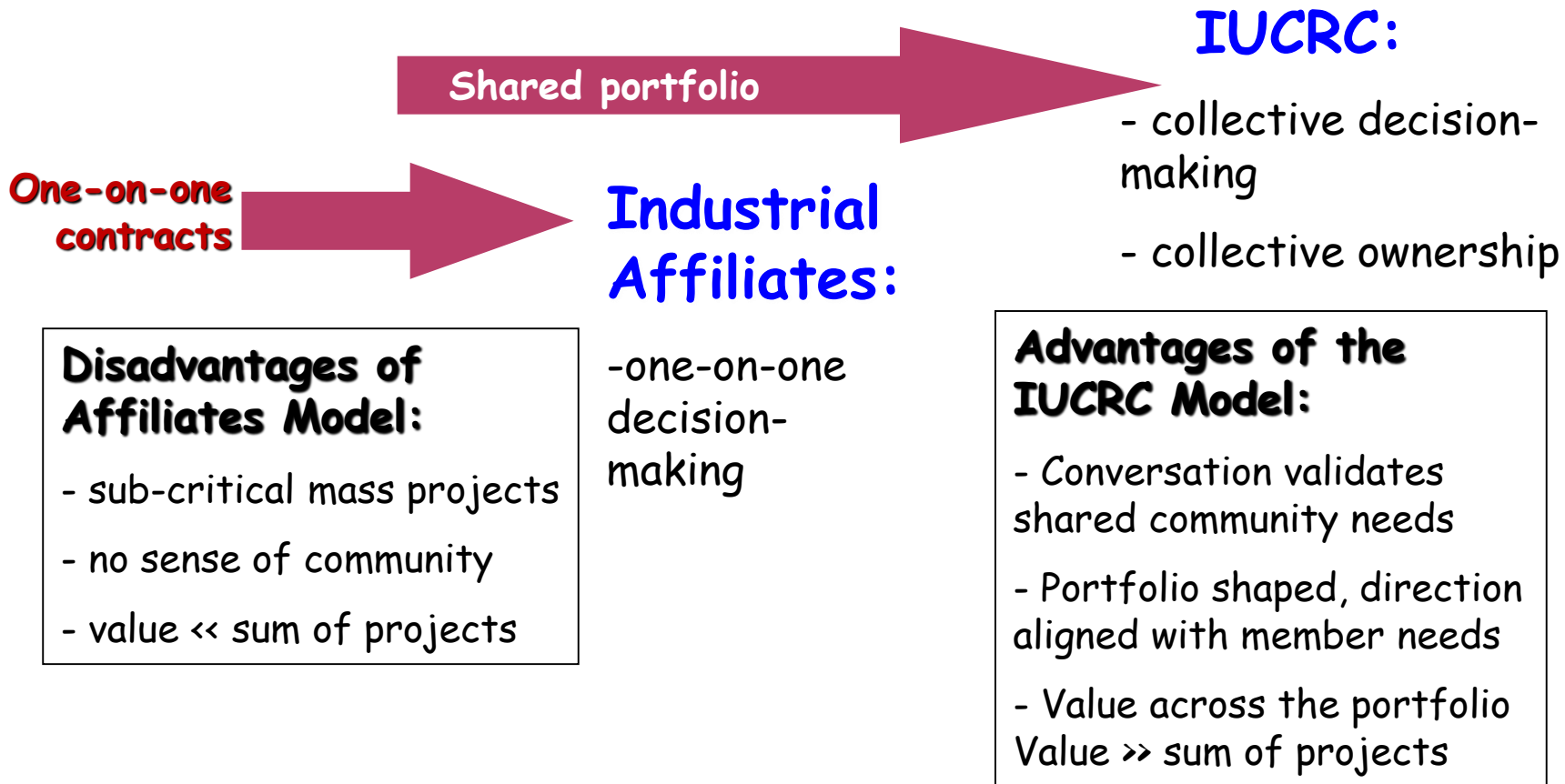
- To expand the innovation capacity of our nation's competitive workforce through partnerships between industries and universities

**I/UCRC Bedrock: Trusted, long-term relationships between industry and academia based on shared value**



# The IUCRC Model

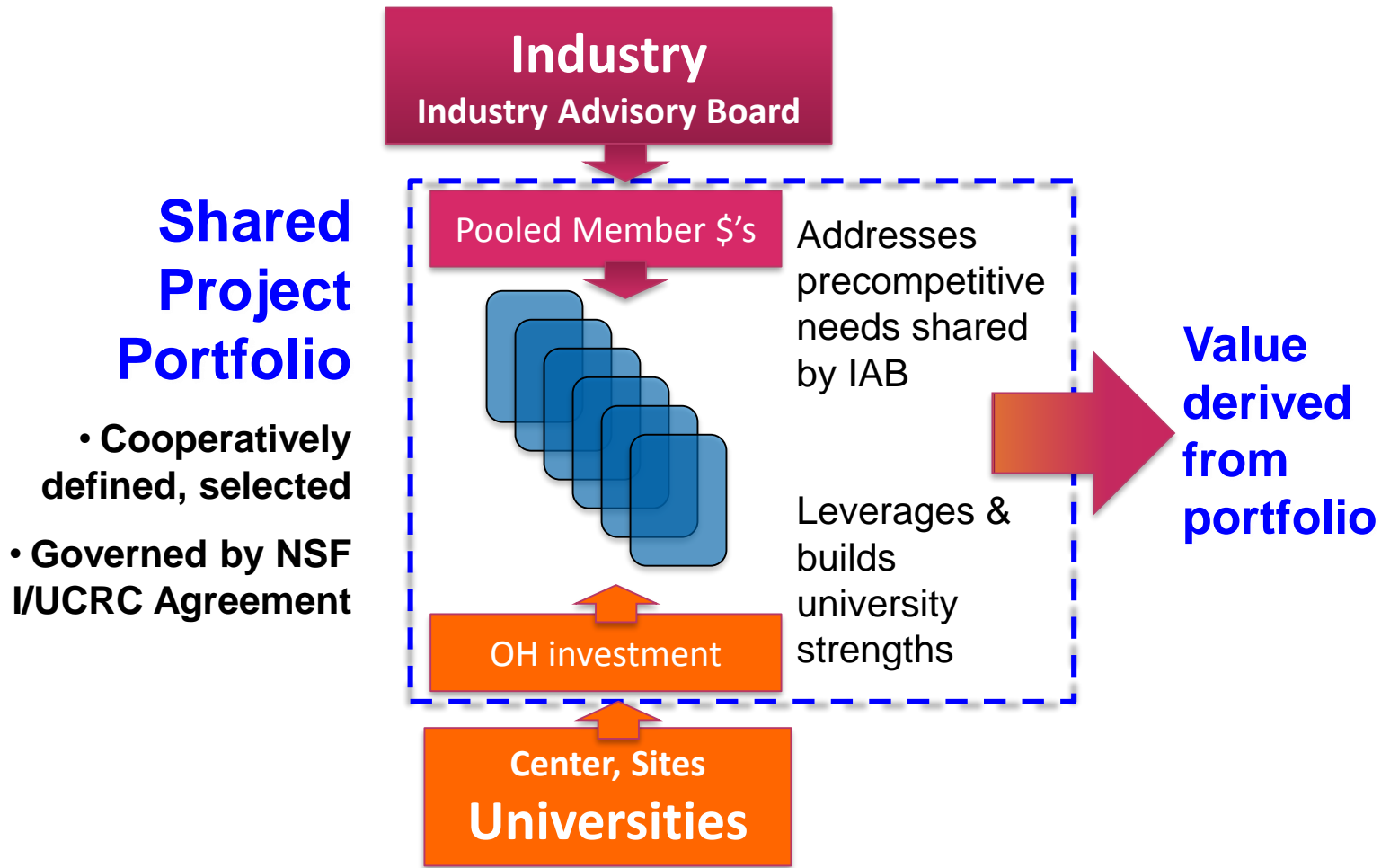
- IUCRC model moves away from a one-on-one contracts



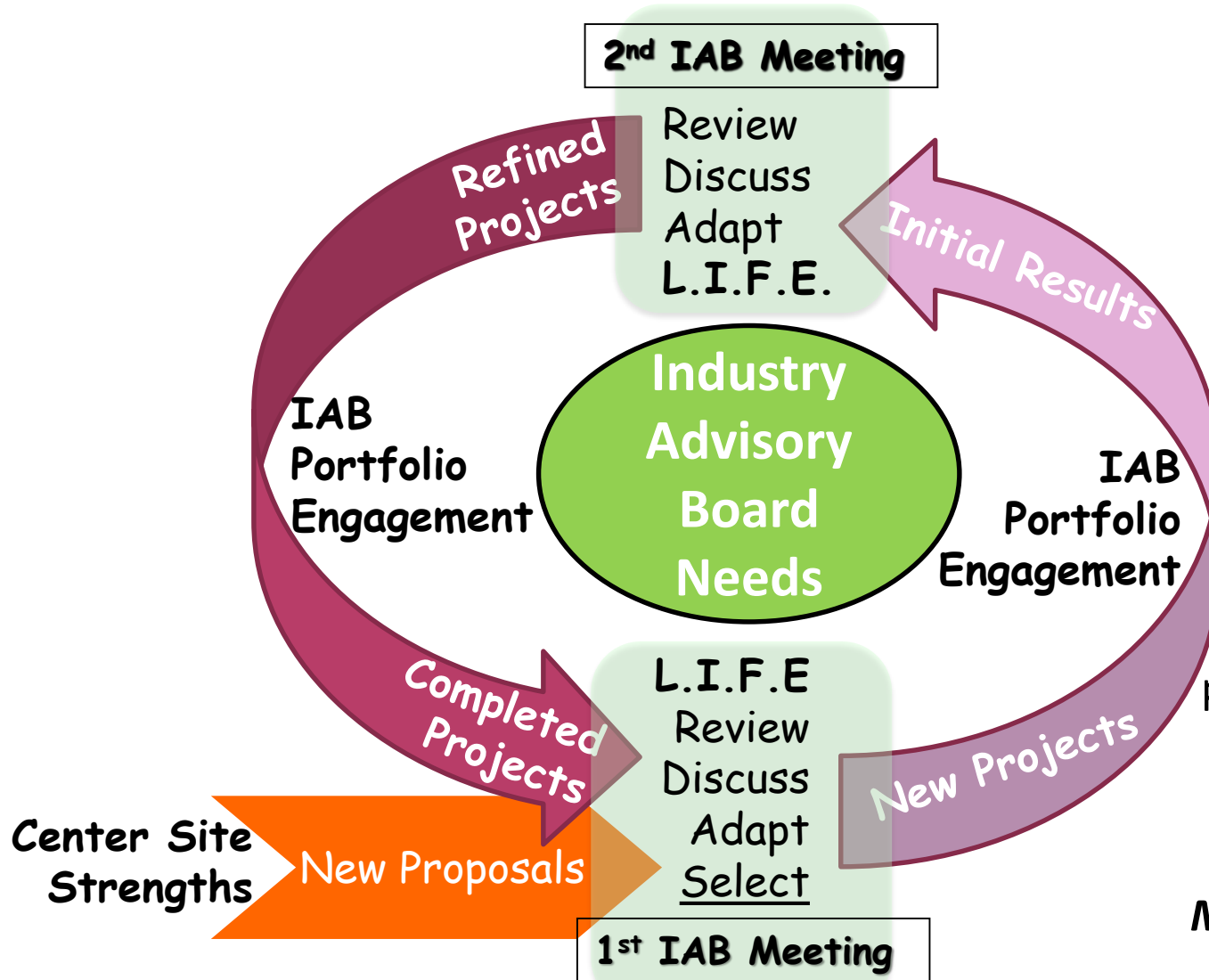
Much more than collective ownership: Collective Value



# I/UCRC Nucleus: A Cooperatively Defined, Funded & Shared Research Portfolio



# The IUCRC Shared Portfolio Cycle



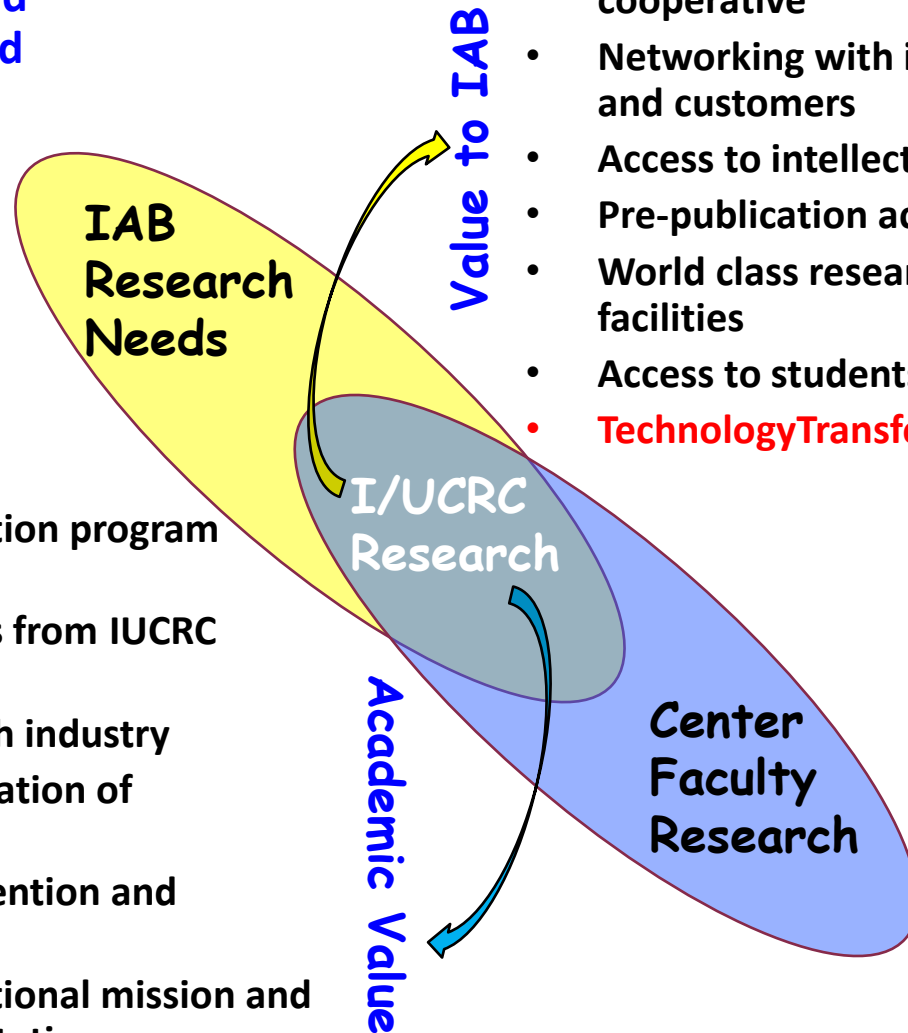
The co-operative process rapidly aligns the Shared Portfolio with **Member Needs** and **University strengths**



# What *value* does an I/UCRC offer?

Outcomes from a cooperatively defined and managed, shared portfolio of precompetitive research.

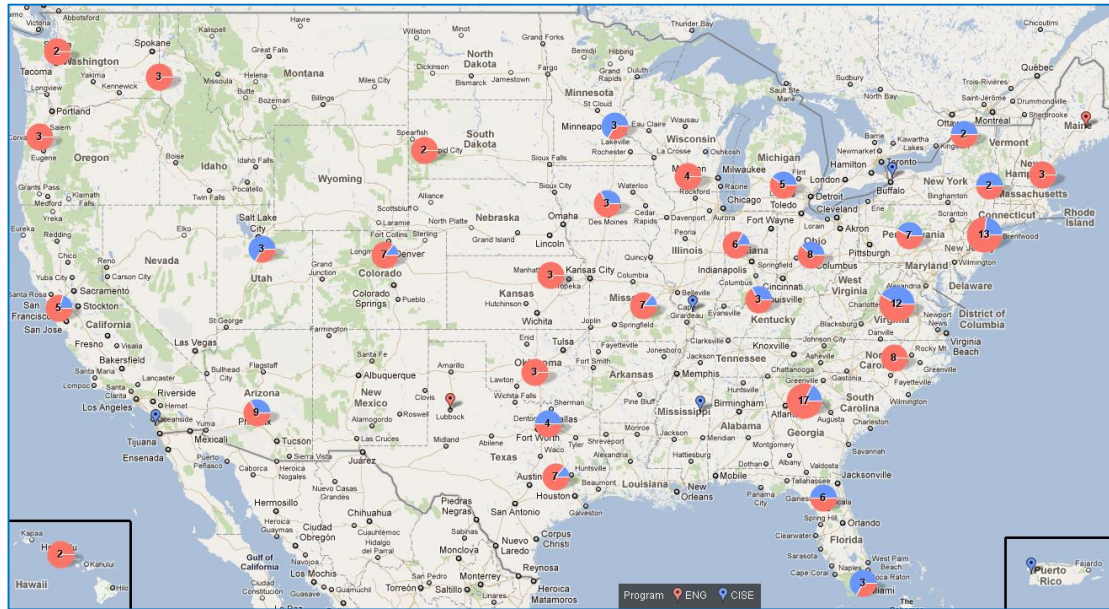
- New research and education program dimensions
- Leveraging of POC results from IUCRC projects
- Trusted relationships with industry
- Ready partners for translation of discoveries
- Student recruitment, retention and placement
- Means to achieve institutional mission and meet constituency expectations.



- Industry driven research projects
- Investment leveraging via cooperative
- Networking with industry peers and customers
- Access to intellectual property
- Pre-publication access to research
- World class researchers & facilities
- Access to students
- **TechnologyTransfer**



# I/UCRC Fast Facts – Snapshot



ENG  
CISE

## Program Funding

- \$15M in Program Funding (ENG, CISE)
- \$118M in Total Center Funding,
- Nearly 8:1 Leveraging of NSF funds, over 13:1 leveraging of ENG Program Funds

- 55% Large Business, 23% SB, 15% Federal Members

## Students

- 225 PhDs, 249 MS & 128 UGs graduated in 2010, trained in Center research
- Over 30% hired by members

## Centers Nationally:

- 61 Centers with 178 Sites
- Over 500 distinct organizations holding over 1000 Memberships

## Sustainability

- 44 Graduated I/UCRCs remain in operation in 2010 true to model





# Industry/University Cooperative Research Centers

## *ENG Multi-University Centers*

1. Advanced Forestry
2. Advanced Packaging and Processing (III)
3. Bio Energy R & D
4. Composites Infrastructure
5. Ceramics Composites Optical Materials Center
6. Computational Materials Design
7. Design of Analog Digital Integrated Circuits (III)
8. Electromagnetic Compatibility
9. Energy Harvesting
10. Friction Stir Processing
11. Fuel Cells
12. Grid-Connected Adv Power Elec
13. Health Org. & Transformation
14. Integrative Joining of Materials for Energy Applications
15. Laser and Plasma for Adv. Mfg.
16. Logistics and Distribution
17. Membrane Science, Engineering & Technology
18. Next Generation Photovoltaics
19. Particulate and Surfactants
20. Pharmaceutical Development

## *ENG Multi -University Centers*

21. Plug-In Hybrid Electric Vehicles
22. Power Systems Engineering Research Center (III)
23. Resource Recovery & Recycling
24. Sensors and Actuators (III)
25. Smart Vehicles Concepts
26. Silicon Solar
27. Advanced Space Technologies
28. Connection One
29. Water and Environmental Technology
30. Water and Equipment Policy
31. Wood Based Composites
32. Metamaterials
33. Biophotonic Sensors and Systems
34. Advanced Non-Ferrous Structural Alloys
35. Energy Efficient Systems
36. Child Injury Studies
37. Center for Tire Research
38. Center for Optical Wireless Applications
39. Sustainably Integrated Buildings & Sites

## *ENG Single-University Centers*

40. Agricultural, Biomedical, and Pharmaceutical Nanotechnology
41. Advanced Vehicle Electronics (III)
42. Electronic Micro-Cooling
43. Non-Destructive Evaluation (III)

**43 ACTIVE ENG CENTERS**



# Industry/University Cooperative Research Centers

## *CISE Multi-University Centers*

1. **Advanced Knowledge Enablement**
2. **Autonomic Computing**
3. **Dynamic Data Analytics**
4. **e-Design**
5. **Embedded Systems**
6. **Experimental Computer Systems**
7. **Hybrid Multicore Productivity**
8. **Identification Technology**
9. **Intelligent Maintenance**
10. **Intelligent Storage**
11. **Net-Centrics Systems**
12. **Reconfigurable Computers**
13. **Search & Rescue Robots**
14. **Security and Software Engineering Research Center**
15. **Surveillance Theory**
16. **Wireless Internet**
17. **Visual Decision Informatics**
18. **Unmanned Aircraft Systems**

**18 ACTIVE COMPUTER AND INFORMATION  
SCIENCE AND ENGINEERING (CISE) CENTERS**



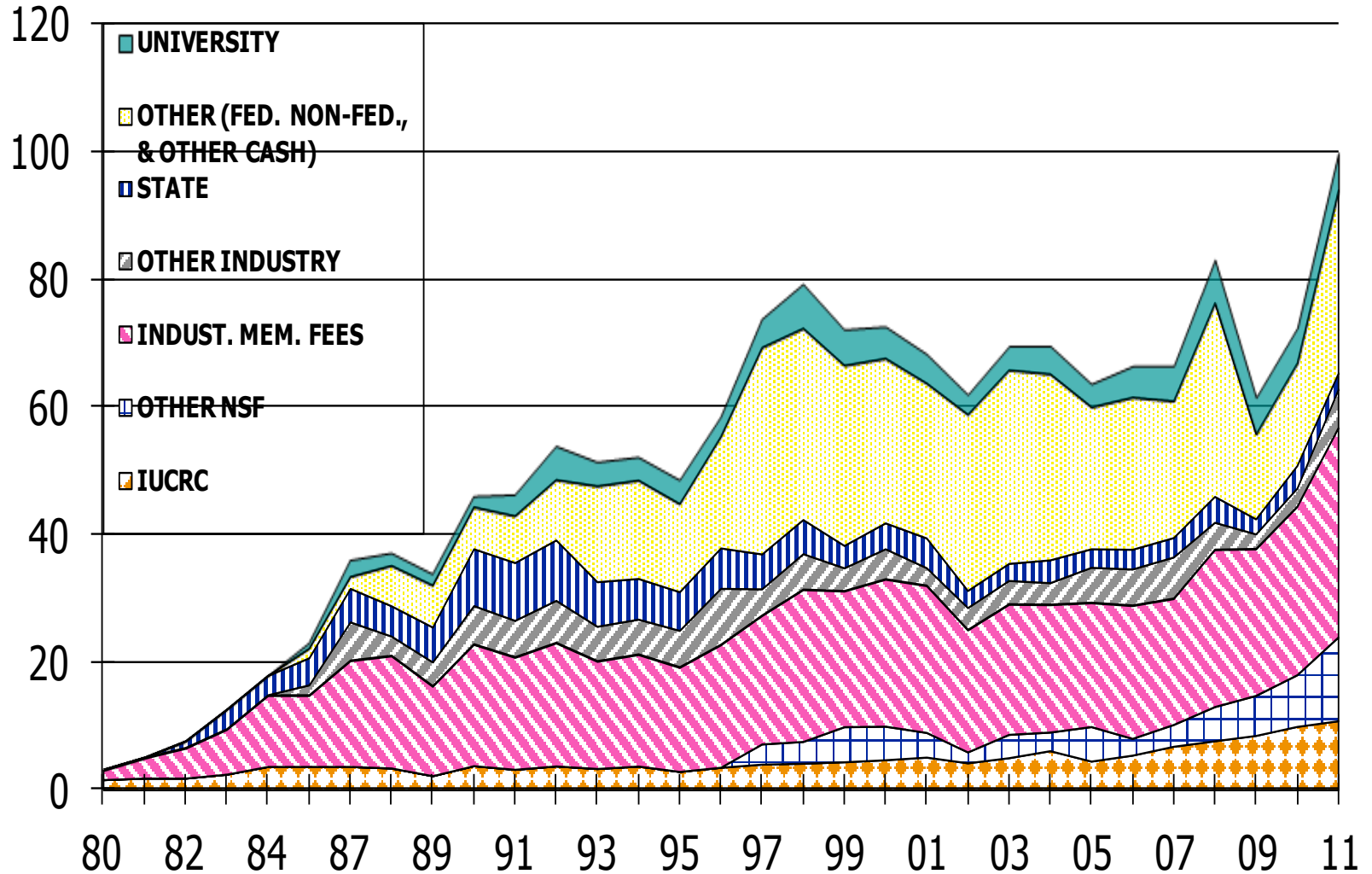
# I/UCRC Membership Agreement

- Membership fee structure
- Patent rights held by university, with royalty free, non-exclusive rights to center members
- Companies wishing to exercise rights to a royalty-free license pay for the costs of patent application
- If only one company seeks a license, that COMPANY may obtain an exclusive fee-bearing license
- March-in Rights
- Publication delay policy
- Industrial Advisory Board – one representative from each company per membership
- Indemnification clause

- Must sign the membership agreement form
- ONE center, and ONE membership agreement form



# Total Funding by Source by Year in Dollars



# NSF I/UCRC Funding Opportunities

Facilitate a Center environment in which long-term relationships between industry and academia can thrive.

- **CORBI Projects** – Between I/UCRC Centers (NSF matching!) – **New Dear Colleague Letter:**  
<http://www.nsf.gov/pubs/2011/nsf11074/nsf11074.pdf>
- **International Collaboration/Projects**
- **Fundamental Research Program (new solicitation underway)**
- **Research Experience for Undergraduate Students (REU)**
- **Research Experience for Veterans (REV)**
- **Research Experience for Teachers (RET)**
- **MIPR - Federal Gov Interagency Exchange of Funds**
- **SBIR/STTR Phase II Grantee Memberships**



# Partnerships for Innovation: Accelerating Innovation Research (PFI: AIR) **NSF 12-511**

- **Core**

- NSF-funded research alliance
- Others: another research entity, small business consortia, local/regional innovation entity
- **Third-party investment (1:1)**

- **Focus**

- Creates innovation ecosystem
- *Translates to transfer* of research discoveries to commercial reality
- Builds new partnerships
- Encourages spin-offs
- Develops entrepreneurial culture

- **Award**

- Up to \$800K/2-years
- Third-party investment (1:1) required
- Up to 25% in-kind, and the rest in cash
- PI Team (PI, partner, and 3<sup>rd</sup> party investor) must report on the year 1 accomplishments and plans for year 2

- **LOI**

- **Full proposal**



# LIFE Form for Project Feedback

The LIFE process ensures quality and stimulates continued interest in the program.

**Comments should include:**

- Precompetitive suggestions
- Applications & Industry Benefits
- Suggested changes
- Innovativeness of Research
- Industrial relevance
- Similar work done elsewhere
- Offers of help (mentoring?)

## Level Of Interest Feedback Evaluation (LIFE)

To facilitate scientific and technical interaction between Center Faculty and Industrial Member Representative, each company represented is requested to rank their company's level of interest and the research relevancy of each presentation. Please mark an X below to reflect the opinion of your company.

Level of Interest:

_____	Very Interested
_____	Interested
_____	Interested with Change
_____	Not Interested
_____	Abstain

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Comments, questions, and concerns from the transcribed LIFE forms are discussed during the IAB meeting prior to making project funding recommendations.

Bottom Line:

- What makes the project so “hot” or “transformational”?
- How can we improve this project?
- Real-time project revisions are encouraged if needed.



# I/UCRC tools help guide industrial relevant research

Centers provide industry with the right information to guide project selection including:

- Project description
- Research analysis
- Project duration
- Project cost
- Deliverables
- Milestones

## EXECUTIVE SUMMARY PROJECT OVERVIEW

PROJECT NAME: \_\_\_\_\_ PROPOSAL: \_\_\_\_\_  
 PROJECT MANAGER: \_\_\_\_\_  
 PROGRAM NAME: \_\_\_\_\_ NEW \_\_\_\_\_  
 PROGRAM MANAGER \_\_\_\_\_ CONT. \_\_\_\_\_

**DESCRIPTION:**

**EXPERIMENTAL PLAN:**

**RELATED WORK ELSEWHERE:**

**HOW OURS IS DIFFERENT:**

**RELATED WORK WITHIN THE CENTER:**

**MILESTONES:**

**DELIVERABLES:**

**BUDGET:**

**POTENTIAL MEMBER COMPANY BENEFITS:**





# National Science Foundation I/UCRC Contacts

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*for more information:* <http://www.nsf.gov>

*and:* <http://www.nsf.gov/eng/iip/iucrc>

Program phone: (703) 292-8383

Note: The best way to contact us is via e-mail. Many are on the road frequently

