

ENG Advisory Subcommittee on University-Industry Partnerships

Report to the ENG AdCom
Cherri Pancake

April 24, 2008

Charge to EAC-IUP Subcommittee

- In early 2007, R. Buckius formed subcommittee to
 - Recommend strategies to further strengthen NSF-wide efforts to promote industrial partnerships that advance the frontiers of research and promote technology innovation
- Objectives
 1. Define major technological challenges industry faces over the next 5-10 years, where accelerated investments in research could offer the potential for major breakthroughs
 - Subsumed by NAE's Grand Challenges for Engineering
 2. Review NSF's role in knowledge transfer and assessing the need for a more proactive approach

Members of Subcommittee

- E. Jennings Taylor, Faraday Technology Inc (Co-Chair)^{1,2,3}
- Cherri Pancake, Oregon State University (Co-Chair)¹
- Albert Johnson, Corning^{2,3}
- Wayne Johnson, Hewlett-Packard³
- Lesa Mitchell, Kauffman Foundation³
- Richard Pearson, National Center for Manufacturing Sciences
- Karthik Ramani, Purdue University²
- Winslow Sargeant, Venture Investors LLC

¹ - ENG AdCom

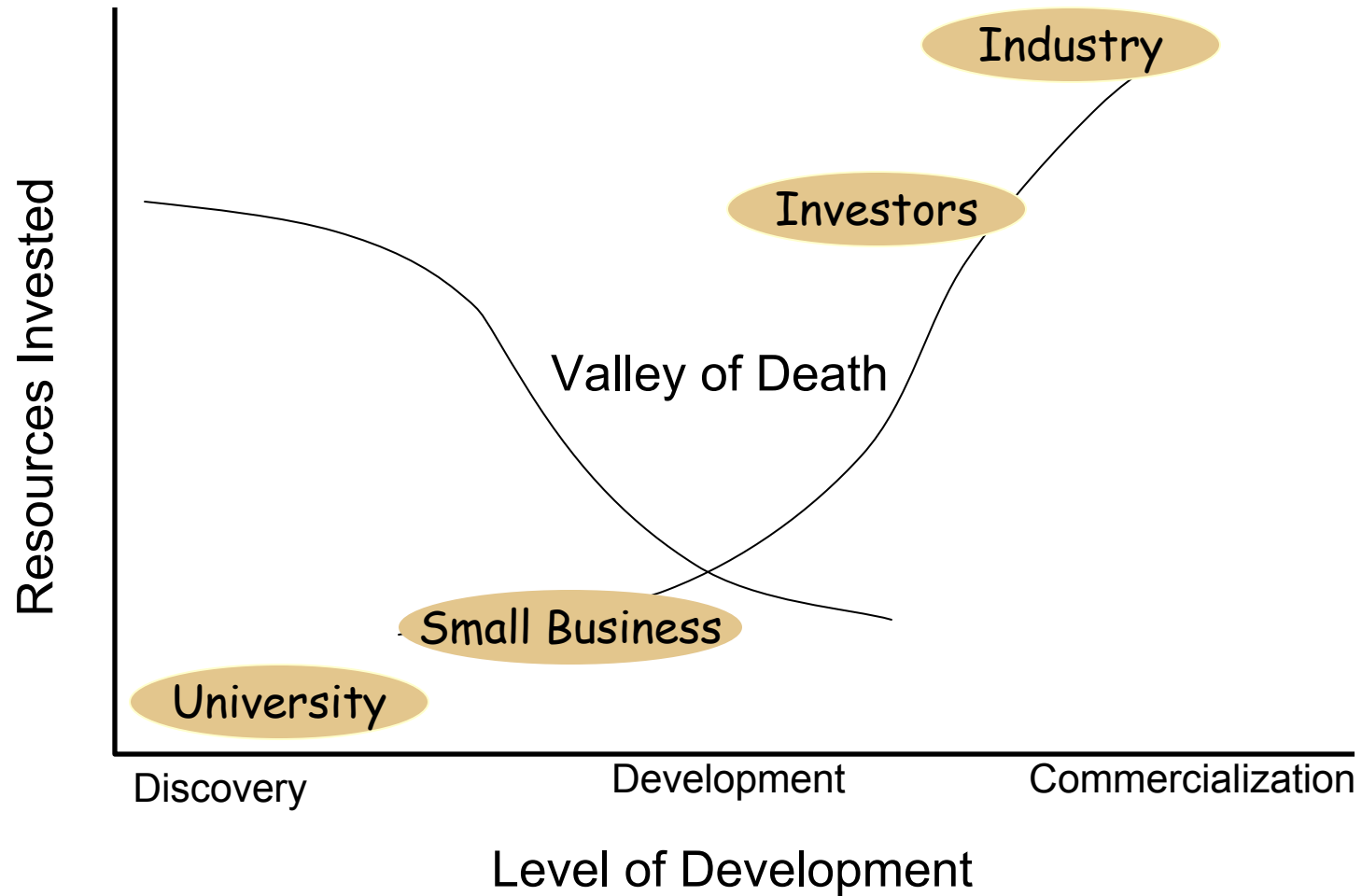
² - SBIR AdCom

³ - University/Industry Demonstration Project (UIDP), a standing committee of the National Academies Government University Industry Research Roundtable (GUIRR)

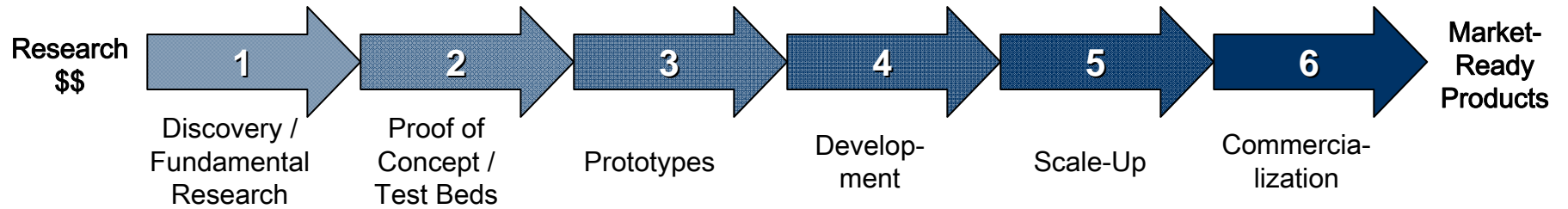
Process Followed

- Refined charge & scope; reviewed partnership landscape
 - May 17-18, 2007 at SBIR/STTR Grantees Conference
- Workshop to review history, challenges, and lessons learned from existing NSF partnership programs
 - August 20-21, 2007 at NSF
 - Also briefings on DARPA and NASA programs
- Review of industry cost-sharing practices and issues
 - November 29, 2007 at NSF
- Portfolio analysis of NSF investment in partnerships
 - February 4, 2008 (virtual meeting)
- Finalize recommendations to promote & increase partnership
 - April 2, 2008 at NSF

Motivation: Why Partnerships Are Needed



Our Perspective - Innovation Supply Chain



NSF

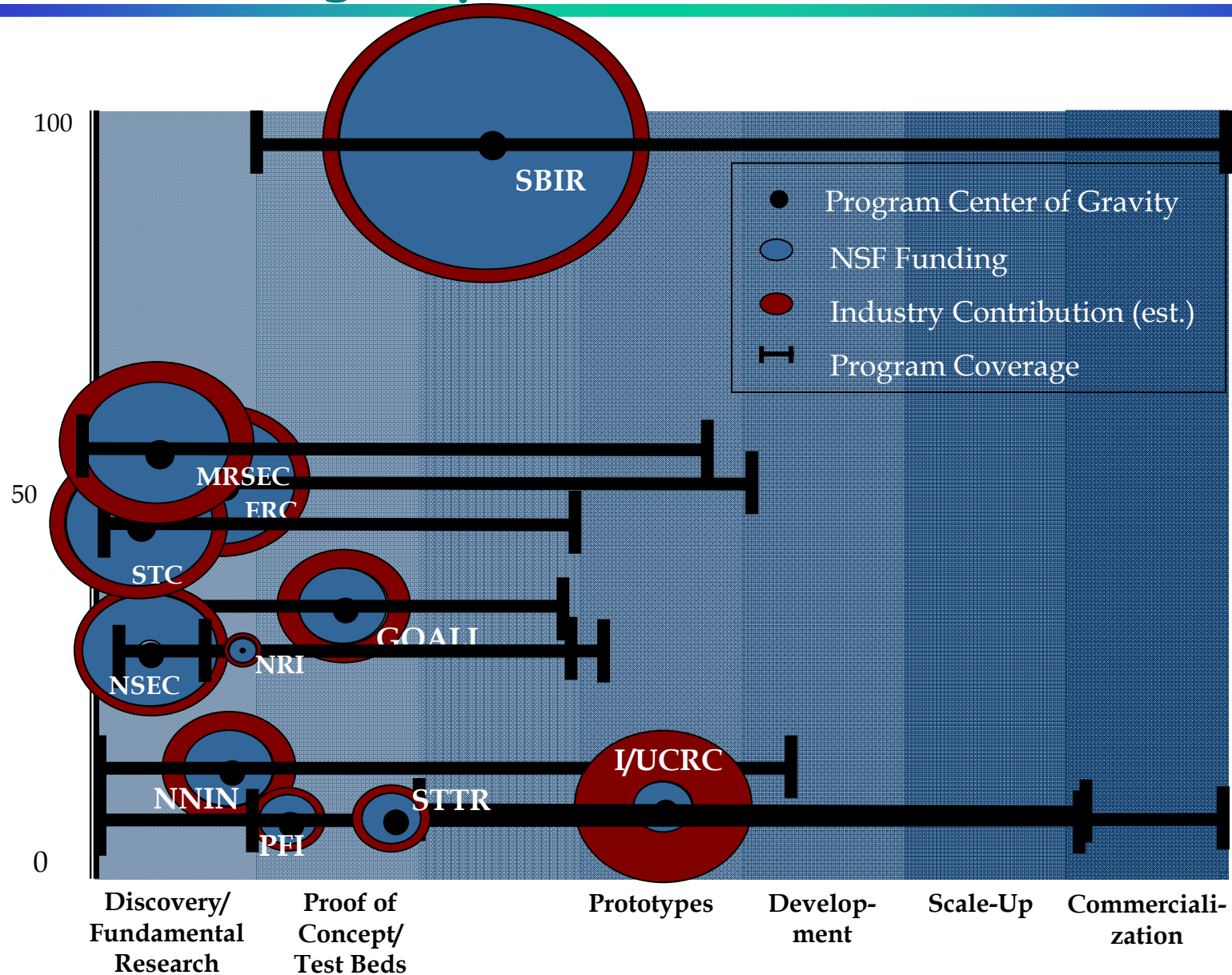
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Industry

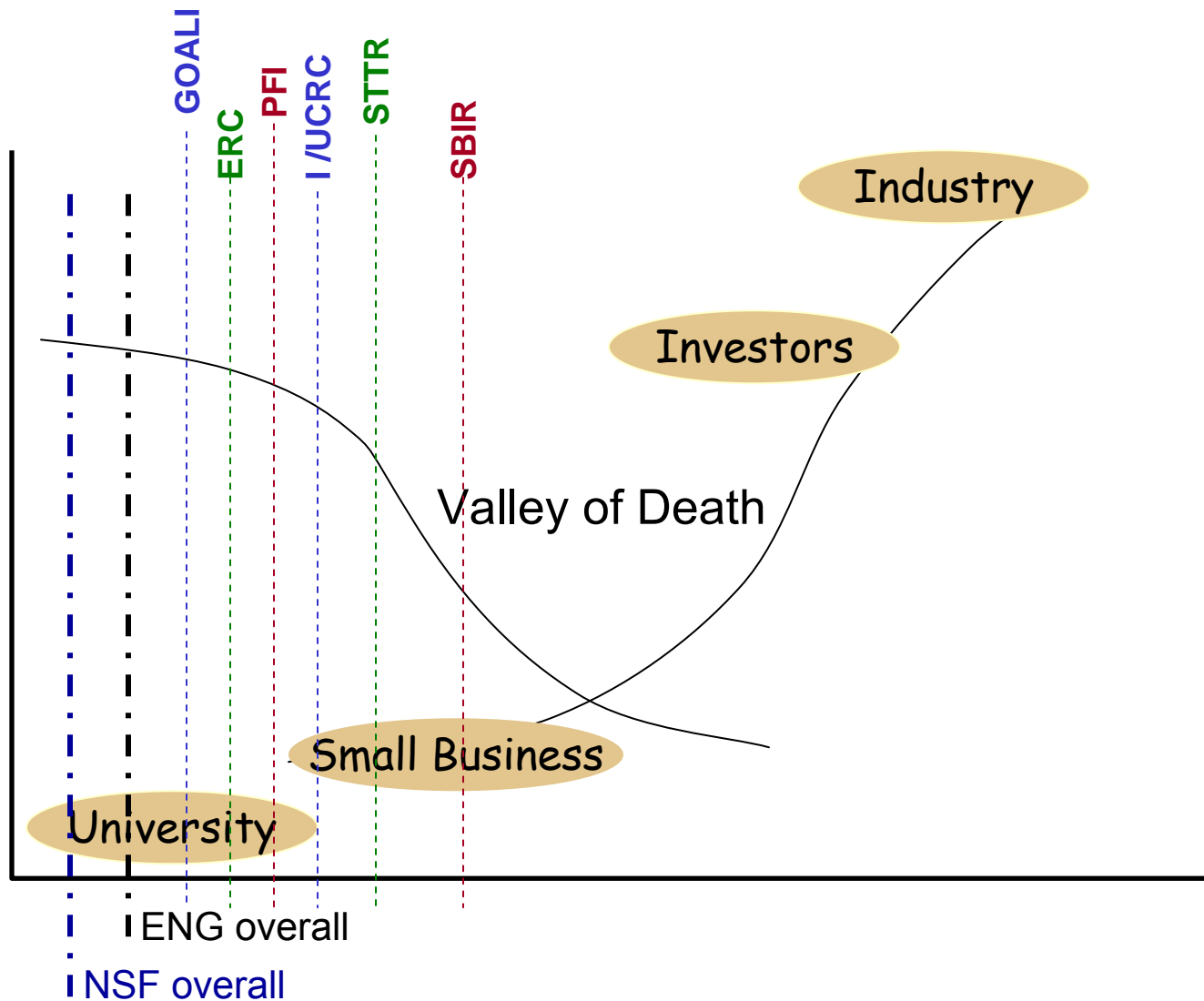
Perception Is the Primary Barrier to Partnership

- General perceptions on both sides (university and industry) that partnership is not worth the effort
- Changing R&D climate means it's essential to incentivize partnership by:
 1. Addressing gaps in NSF's current partnership portfolio
 2. Developing incentives for industry to make cash investments in university-industry partnerships
 3. Developing industry awareness of how partnership can add value to their strategic priorities
 4. Developing academic awareness of how partnership can benefit university research
 5. Developing opportunities for university-industry collaboration that are diverse enough to meet the needs of businesses and universities of all sizes

Filling Gaps in Current Portfolio



Filling Gaps in Current Portfolio (2)



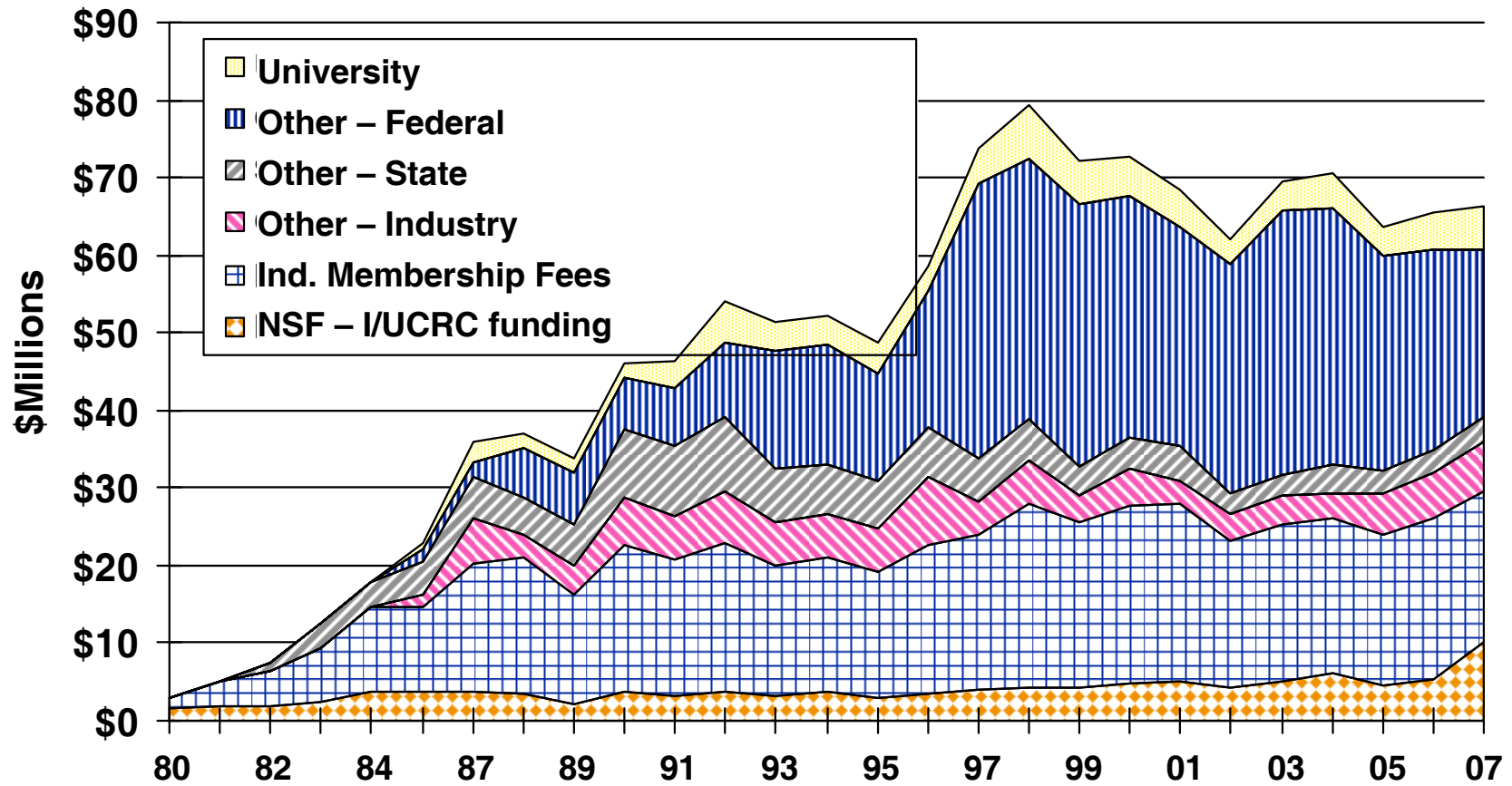
Filling Gaps in Current Portfolio (3)

- *Recommendation:* Expand existing partnership programs so as to better fill the university-industry landscape
 - Some programs are narrower than they need to be
 - E.g., GOALI would be an even better "learning arena" for academics if it were extended to prototype stage or beyond
- *Recommendation:* Pilot new partnering programs that address the remaining gaps in the university-industry landscape
 - E.g., programs to create linkages between SBIR and I/UCRC so that small businesses are included (to balance industry perspective on I/UCRC)

Incentivizing Cash Investment from Industry

- For collaboration to be truly meaningful to industry, must be integrated into company's strategic processes
 - Otherwise, role degenerates from "active research partner" to "interested bystander"
 - Cash investment ensures company things deeply about partnership - and continues it long term
 - Not to say that in-kind contributions aren't valuable - but don't carry same weight as monetary investment
- Currently, I/UCRC is only program where industry invests more than NSF
 - Excellent example of how industry \$\$ can lead to further leveraging

Incentivizing Cash Investment (2)



Incentivizing Cash Investment (3)

- *Recommendation:* Expand mechanisms to motivate/reward industry financial investment in NSF-sponsored projects, by extending matching-funds supplements to other ENG programs
 - SBIR matches industry investment (1:2)
 - Benefits both academic and industry participants
 - Sends clear message that cash investment is valued
 - Like REU, the supplements could be made available to all ENG award recipients
 - Would encourage academics to seek industry partners

Helping Industry Understand Partnership

- Many companies are unfamiliar with benefits of partnership
 - Wary due to perceived difficulty of negotiating IP
- Others don't know how to initiate partnerships
 - Unaware of programs to help fund academic participation
- Three recommendations address these gaps in awareness
 - *Recommendation: Continue participating on the National Academies' UIDP*
 - Expedite software to assist in negotiating partnership IP
 - *Recommendation: Be proactive in making companies aware of how/why to invest & participate in NSF-sponsored research*
 - Case studies and testimonials from industry viewpoint
 - *Recommendation: Mount an awareness campaign with the goal of helping companies understand NSF's partnership programs*

Helping Academics Understand Partnership

- Academics, too, are generally unaware of benefits of partnership
 - NSF is in unique position to get the attention of both faculty and administrators
- Two recommendations
 - *Recommendation:* Take proactive role in making faculty aware of how/why to partner with industry
 - Case studies and testimonials from academic viewpoint
 - *Recommendation:* Mount an awareness campaign with the goal of helping university administrators and faculty understand NSF's partnership programs

Diversifying Opportunities for Partnership

- No single model for industry participation that applies equally well
 - To large & small businesses
 - For partnering with all types of universities
- Two recommendations
 - *Recommendation:* Champion (at NSF) the need for many types of partnership mechanisms
 - Encourage broader adoption so they are available to much wider cross-section of faculty researchers
 - Don't eliminate industry cost-sharing - make it more flexible
 - *Recommendation:* Continue monitoring progress of all partnership mechanisms (NSF wide) & periodically re-assess
 - Ensure number/type of opportunities meet the diverse needs of academic & industry constituencies

Special Thanks to NSF Staff

Kesh Narayanan

Jo Culbertson

and the many Program Directors from ENG, OIA, OLPA, OCI, CISE,
MPS who provided information - and insight!