



The NSF and Innovation: SBIR and Partnerships Programs

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Areas of Emphasis in Engineering at NSF

- Students and young investigators
- Potentially transformative research
- Innovation and translational research





Young Investigators

- Research Experiences for Teachers
- Research Experiences for Undergraduates
- Graduate Research Fellowships
- CAREER awards



RET teachers introduce girls to infrastructure renewal concepts. *Credit: Univ. of Cincinnati College of Engineering and College of Applied Science.*



Student researchers sample contaminated sediment. *Credit: Karl Rockne, Univ. of Illinois at Chicago*



Potentially Transformative Research

- Emerging Frontiers of Research and Innovation
- Interdisciplinary research



Growing microalgae for renewable fuel. *Credit: Phillip Savage, Univ. of Michigan*



An anatomically correct testbed hand. *Credit: Ellen Garvens, University of Washington*



Engineers examine the scoured trench behind the concrete floodwall next to the catastrophic levee breach at the west end of the Lower Ninth Ward of New Orleans. *Credit: Rune Storesund*



Innovation

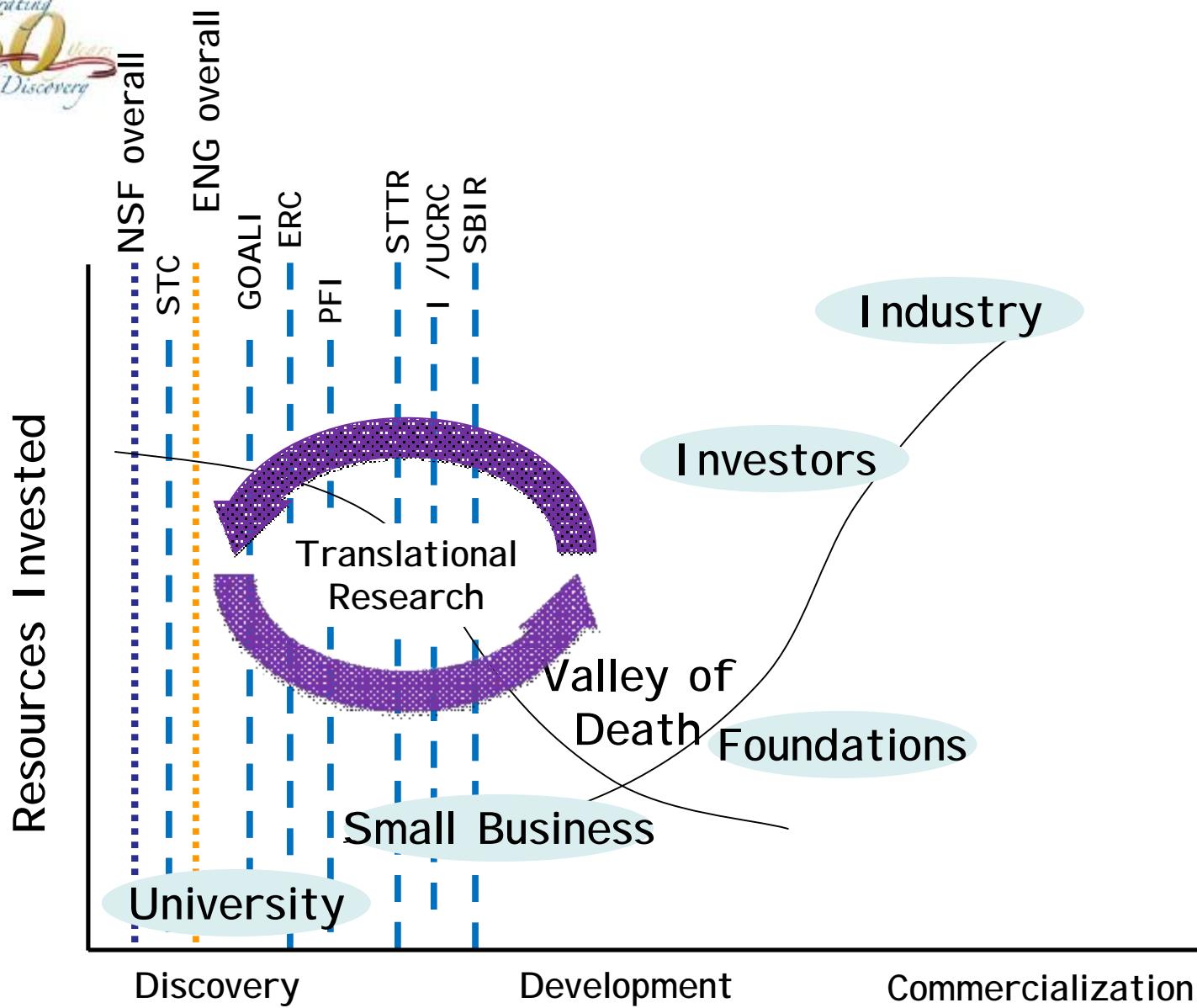
- Engineering Research Centers
- Industry/University Cooperative Research Centers
- Partnerships for Innovation
- Small Business Innovation Research/Small Business Technology Transfer



The leaves of *Artemisia annua*, the sweet wormwood tree, are the source of artemisinin. Credit: Lawrence Berkeley National Laboratory



Celebrating
60
Years of Discovery





NSF and SBI R Program

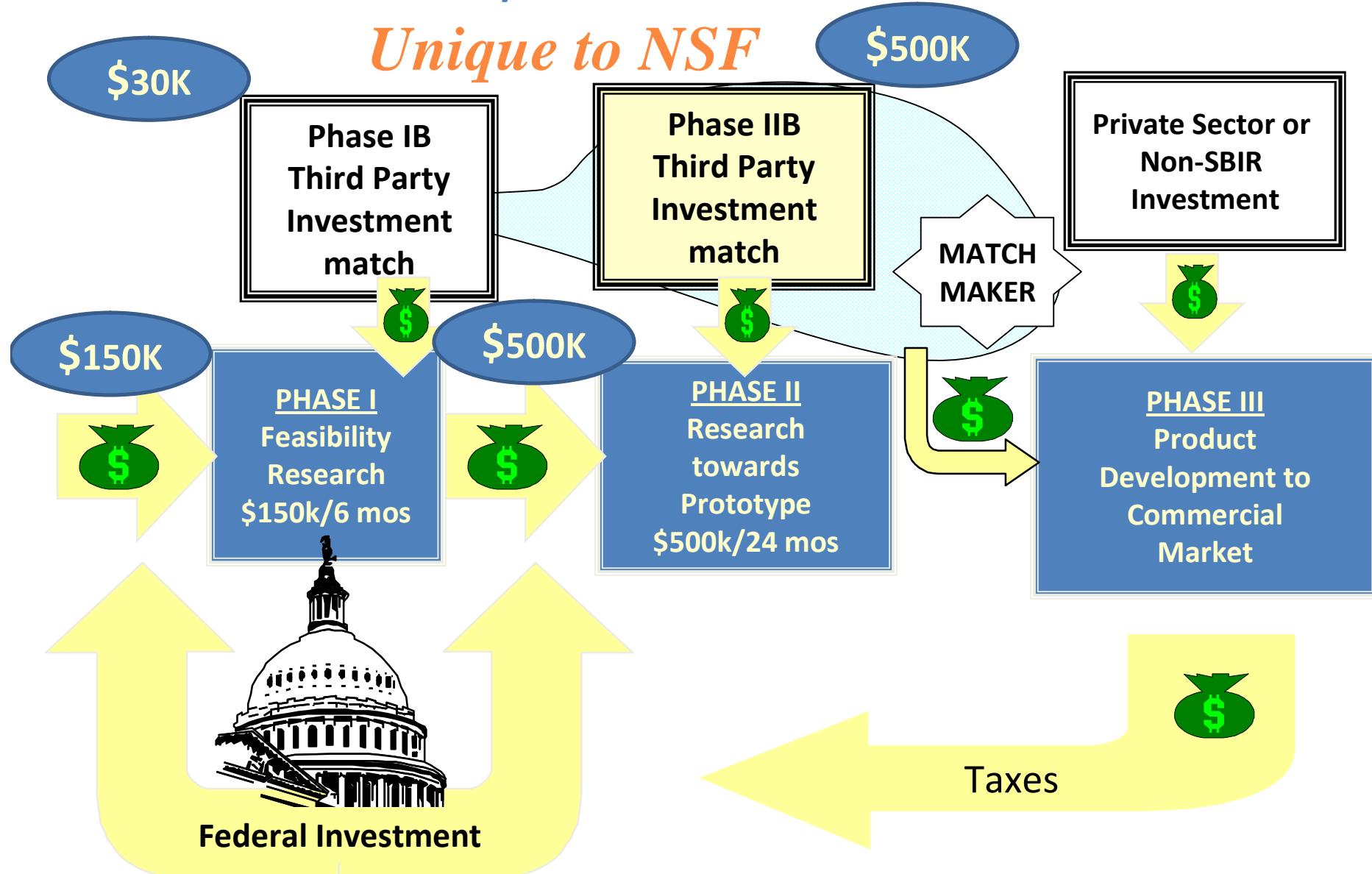
- NSF piloted Small Business Innovation Research (SBI R) Program in 1977
- Congress legislated the Small Business Innovation Research Act in 1982
 - Currently covers 11 federal agencies
- NSF SBI R program emphasizes Translational Research to achieve Technological Innovation



NSF SBIR Program and Academic Linkages

- Approximately 60% of NSF SBIR (and 100% of STTR) awardees have active collaboration with universities through:
 - Spin-offs from academic research
 - IP licensing from universities to small businesses
 - Subcontracts to the university
 - Faculty Consultant arrangements
 - University facility use or services

NSF SBIR/STTR Innovation Model



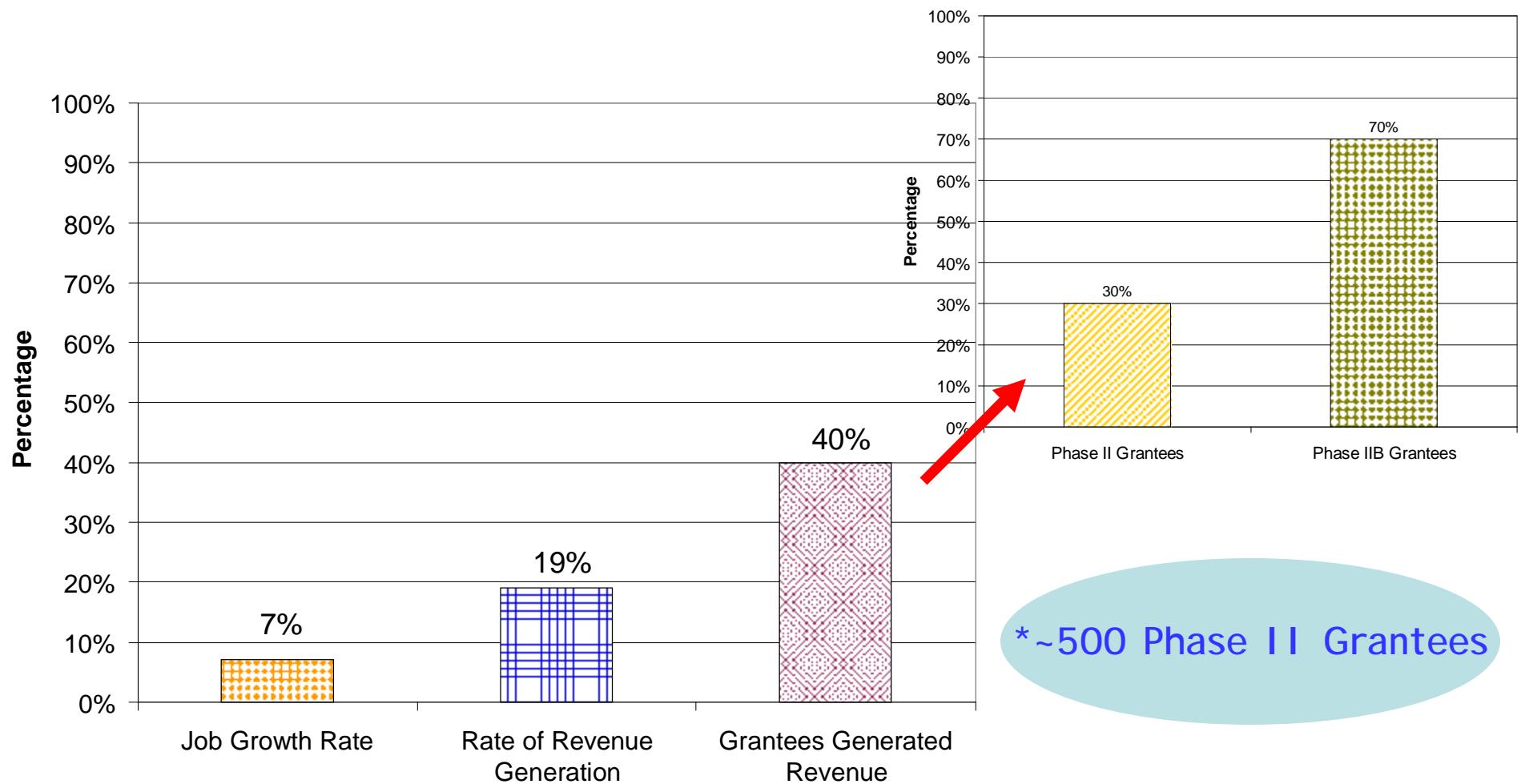


Innovation through Partnerships with Investors and Industries

- Phase IIB Third Party Investments
 - 2008: 21 companies / \$23M
 - 2009: 37 companies / \$44M
- SBIR Mergers and Acquisitions (M&A)
 - 2006: 17 SBIR firms
 - 2007: 19 SBIR firms
 - Estimated average value of an acquisition:
between \$10 and \$20 Million



SBIR/STTR Commercialization Record





NSF expanding Academic Partnerships

- NSF-funded collaborative research centers spur innovation and provide a fertile synergy between universities and industry
 - Engineering Research Centers (ERC)
 - Industry/University Cooperative Research Centers (I /UCRC)
- ERC and I /UCRC require substantial industry involvement, SBI R firms benefit from the expertise of industry members and talent of the students and faculty at these centers
- NSF offers opportunities to Small Business awardees to join NSF-funded centers:
 - I /UCRC memberships
 - 2008: 23 companies
 - 2009: 25 companies
 - ERC memberships
 - 2009: 7 companies



The NSF Small Business Motto

*Research is the transformation
of money into knowledge —
Innovation is the transformation
of knowledge into money!*