NSF's Small Business Programs: Providing Seed Funding for Small Businesses to Bring Innovative, High-Impact Technology to Market

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The SBIR/STTR Program

Small Business Innovation Development Act of 1982

Small Business Innovation Research (SBIR): Requirement to set aside 2.5% (now, 2.7%) for all agencies with > $100M of external R&D funding

Small Business Technology Transfer (STTR): Requirement to set aside 0.3% (now, 0.4%) for all agencies with > $1B of external R&D funding

Congress designated 4 major goals:

- Stimulate technological innovation in the private sector
- Use small business to meet federal R&D needs
- Foster and encourage participation by minorities and disadvantaged persons in technological innovation
- Increase private-sector commercialization innovations derived from federal R&D

2012 Reauthorization

2012 National Defense Authorization (HR 1540):

http://www.gpo.gov/fdsys/pkg/BILLS-112hr1540enr/pdf/BILLS-112hr1540enr.pdf

Key changes:

- Set-aside increasing from 2.5% to 3.2% by 2018
- Potential for eligibility of majority VC-owned firms
- Administrative funds pilot program (3%)
- Award size caps increased ($150k / $1M)

http://www.sbir.gov/about/about-sbir

SBIR / STTR Funding

TOTAL $2.25B

FY 2009

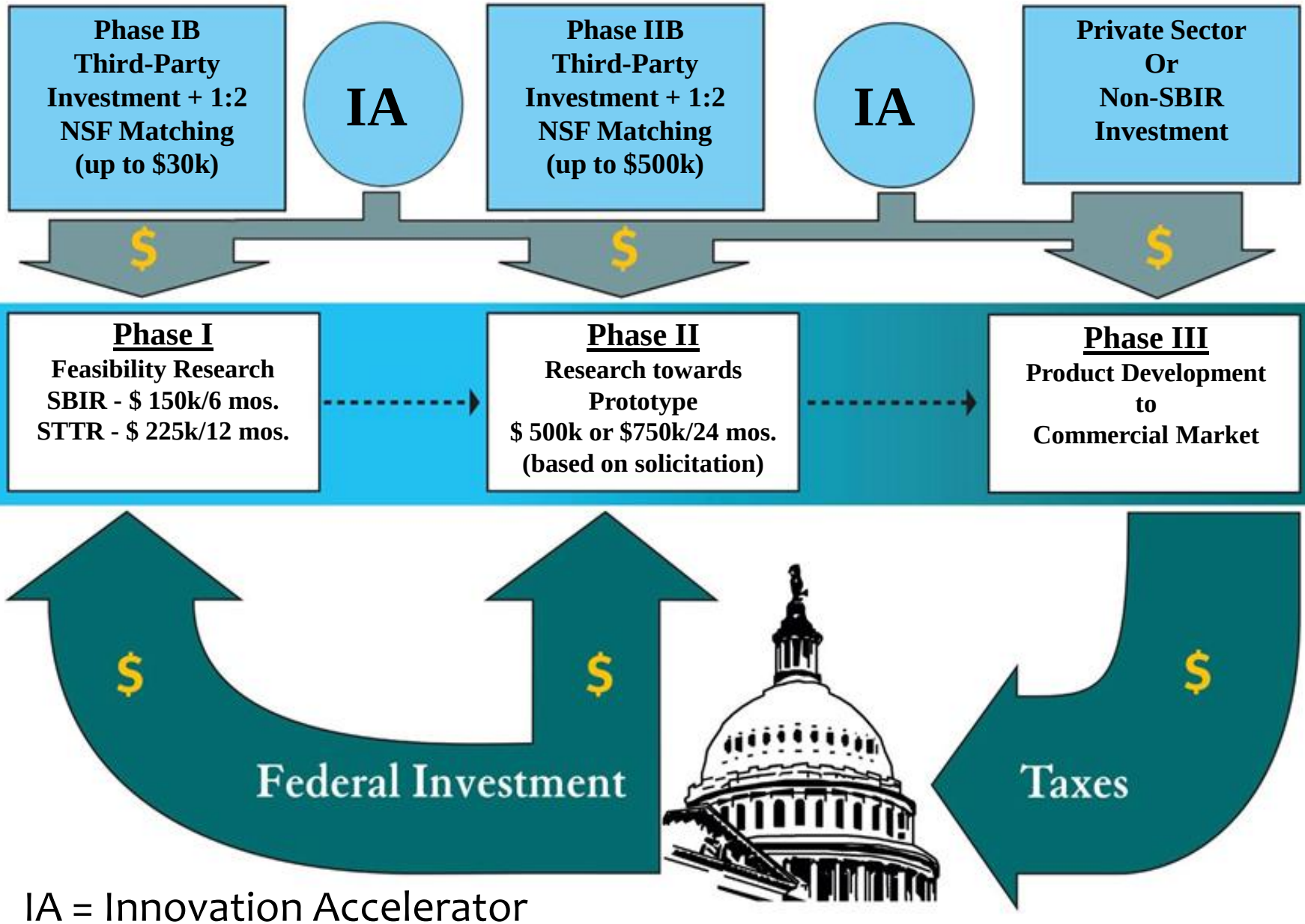
Department of Defense	**SBIR/STTR**	**$1.17B**
National Institutes of Health	**SBIR/STTR**	**$608M**
National Science Foundation	**SBIR/STTR**	**$144M**
Department of Energy	**SBIR/STTR**	**$139M**
NASA	**SBIR/STTR**	**$118M**
Department of Homeland Sec.	SBIR	$23M
USDA	SBIR	$19M
Department of Commerce	SBIR	$12M
Department of Education	SBIR	$8M
Environmental Prot. Agency	SBIR	$4M
Department of Transportation	SBIR	$4M

Source: http://sbir.gov/awards/annual-reports

Key Considerations for SBIR/STTR

- Non-dilutive funding (but, if a contract, there may be deliverables)
- Grantees keep their technology and resulting IP
- No unified process or timeline, document-driven
- Lead times (esp. until “the big money”) can be long
- Drivers are toward higher funding levels, and higher emphasis on commercialization (esp. private-sector)

NSF SBIR/STTR Innovation Model



IA = Innovation Accelerator

Specific NSF SBIR Program Features

- **Funds set-aside for SBIR**
  - $152 million at NSF in FY2012 (for SBIR Phase I, II, and IIB combined)
- **Broad topical areas**
  - Four very wide topical areas intended to allow proposers the ability to align their proposed project with the company's commercial goals
- **Three-phase approach:**
  - PHASE I – Feasibility Research (6 months - $150,000/$225,000)
  - PHASE II – Research Toward Prototype (24 months - $750,000)
  - PHASE IIB – Matching funds against outside investment (12 to 24 month extension, up to an additional $500,000)
  - PHASE III – Product Development to First Revenues (non-SBIR/STTR funding)

NSF: Program Vision & Mission

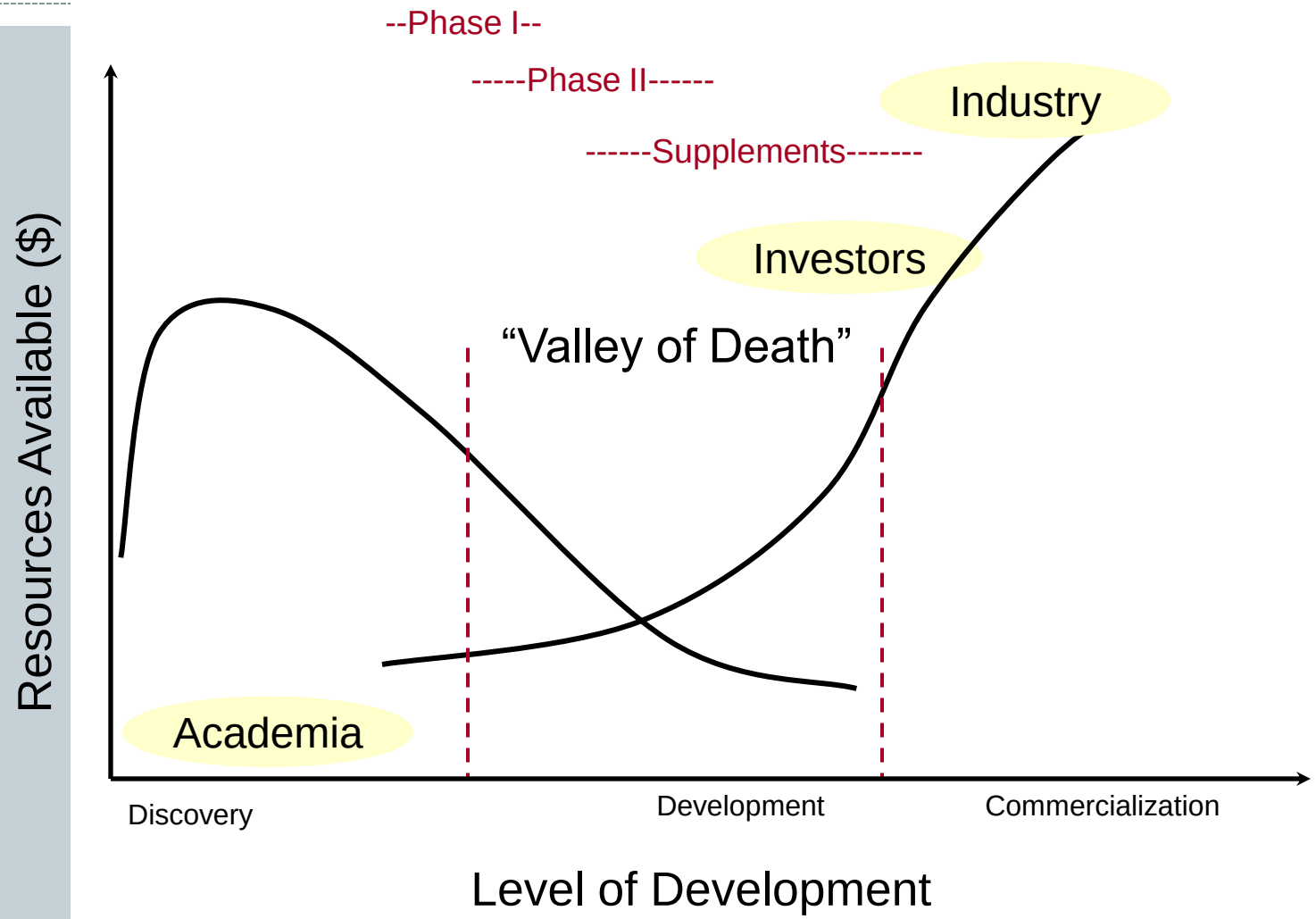
- Vision - To be the pre-eminent federal resource driving the expansion of our nation's innovation capacity by stimulating partnerships among industry, academe, investors, government and other stakeholders

- Mission – To enhance our nation's economic competitiveness by catalyzing the transformation of discovery into societal benefits through stimulating partnerships and promoting learning environments for innovators

NSF Funding Criteria

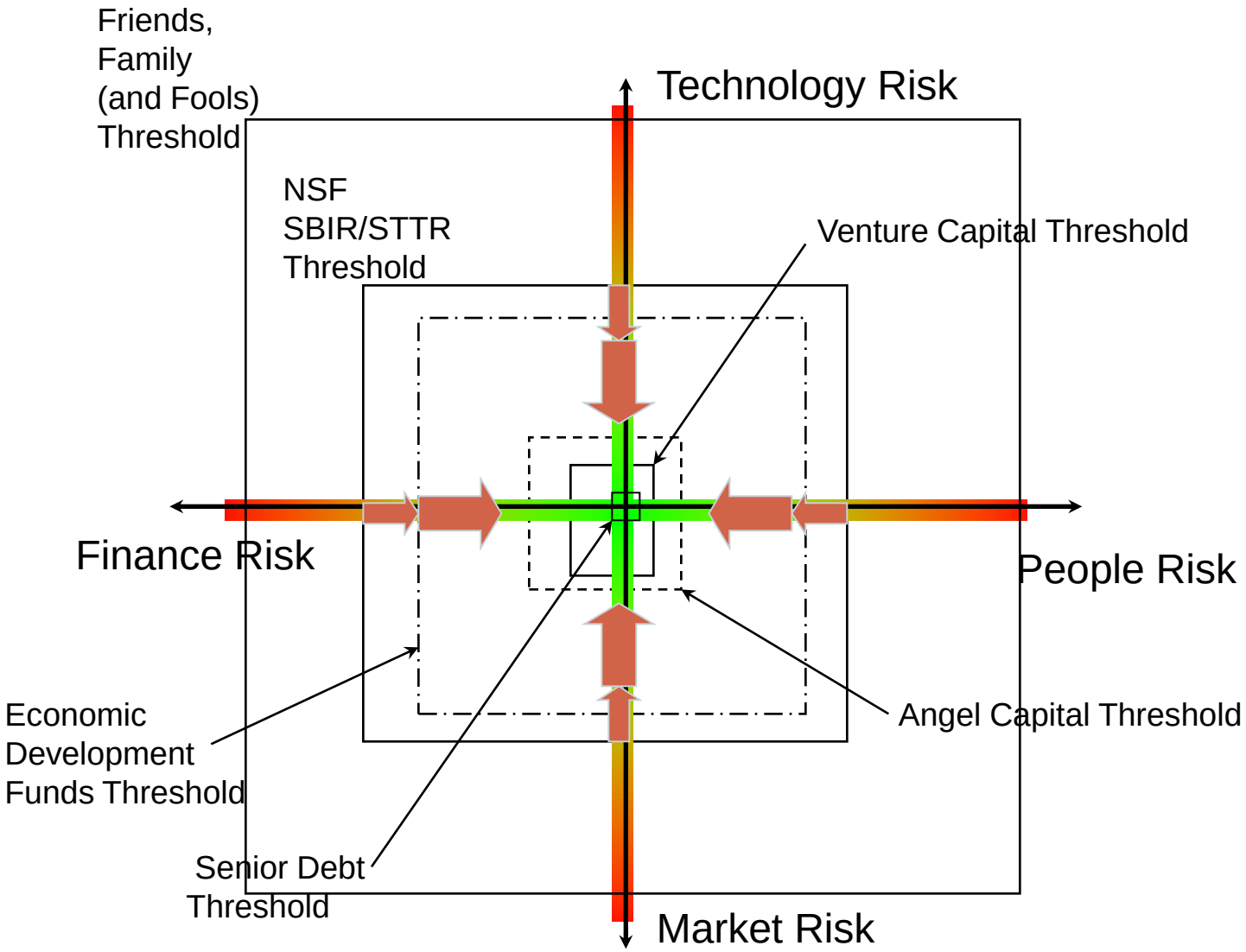
- Must be high-payback innovations involving high risk and commercial potential
- Demonstrate strategic partnerships with research collaborators, customers and equity investors
- NSF investment is to fund R&D ONLY
- We do NOT fund
  - Evolutionary optimization of existing products and processes or modifications to broaden the scope of an existing product, process or application
  - Analytical or “market” studies of technologies

Innovation Spectrum



From Angus Kingon

NSF SBIR funding philosophy



Technical Review Criteria

- **Intellectual Merit**
  - Is the proposed plan a **sound approach** for establishing technical and commercial feasibility?
  - To what extent does the proposal suggest and explore **unique or ingenious concepts or applications?**
  - How **well qualified is the team** (the PI, other key staff, consultants, and subawardees) to conduct the proposed activity?
  - Is there **sufficient access to resources** (materials, supplies, analytical services, equipment, facilities, etc.)?
  - Does the proposal **reflect state-of-the-art** in the major research activities proposed? (Are advancements in state-of-the-art likely?)
  - **As a result of Phase I, did the firm succeed in providing a solid foundation for the proposed Phase II activity?**

Commercial Review Criteria

- **Broader Impacts**
  - What may be the **commercial** and societal benefits of the proposed activity?
  - Does the proposal **lead to enabling technologies** (instrumentation, software, etc.) for further discoveries?
  - Does the outcome of the proposed activity lead to a **marketable product or process**?
  - Evaluate the **competitive advantage** of this technology vs. alternate technologies that can meet the same market needs.
  - How well is the proposed activity positioned to **attract funding from non-SBIR sources** once the SBIR project ends?
  - Can the product or process developed in the project advance NSF's goals in research and education?
  - Does the proposed activity broaden the participation of underrepresented groups (e.g. gender, ethnicity, disability, geography, etc)?
  - Has the proposing firm **successfully commercialized SBIR/STTR supported technology** where prior awards have been made?

Topic Clusters

Four topical “clusters”:

1. Nanotechnology, Advanced Materials & Manufacturing (NAM)
2. Biotechnology and Chemical Technology (BC)
3. Electronics, Information & Communication Technology (EI)
4. Education Applications (EA)

→ Topical fit is much less important than the technical and commercial requirements of the solicitation!

NSF SBIR/STTR Logistics

- SBIR solicitation released twice per year (in Sept. and March)
- STTR solicitation once or twice per year
- Proposal deadlines are ~ 3 months after solicitation release

- All proposals are externally-reviewed by domain experts
  - Reviewers: Academics, investors, industry, entrepreneurs
  - Review criteria: Technology and commercial aspects
- Dialog encouraged throughout the process

- Decision made 4-5 months after proposal receipt
- Cash in the bank 6 months after proposal receipt
- Post-award, immersion in the NSF network and support from associated resources (Phase I - Commercialization Assistance Program, Phase II – Innovation Accelerator program)

Awardee Demographics

Company data from FY 2012 Phase I awardees:

- 86% of Phase I awardees have 10 or fewer employees
- 90% of Phase I awardee companies were incorporated since 2007
- 73% of Phase I awardees have never had a Phase II award from any agency

University ties and lineage of Phase II projects (National Academies Study, 2007):

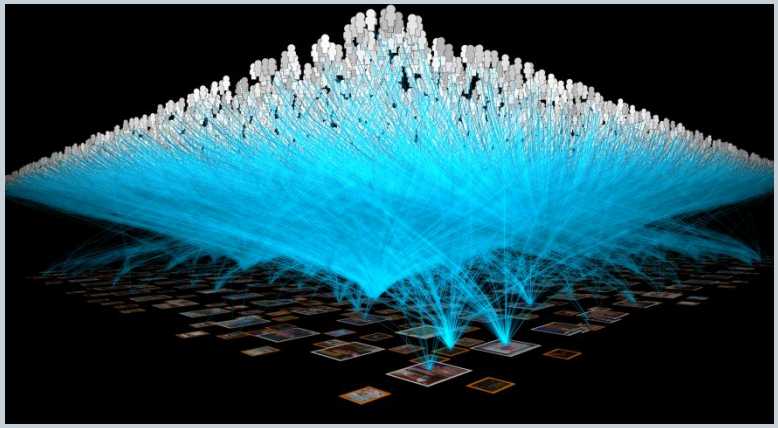
- 37% involve faculty members
- 27% involve graduate students
- 25% rent/use university facilities
- 17% issue a subcontract to a university

Program Statistics

- Phase I: Average of 338 awards made. Average of 2112 proposals received per year (16% funding rate).
- Phase II: Average of 118 Phase II awards made. Average of 303 proposals per year (39% funding rate).
- About 10-15 acquisitions of Phase II grantees per year
- Leverage: for FY2012, the Phase IIB awards made by the program (48) in total were based on $94 million in third-party investment (the vast majority private funds)
- High-profile successes: Qualcomm, Symantec, Intralase received NSF SBIR support very early

Outcomes: Bluefin Labs (0923936)

- MIT spin-out (Prof. Deb Roy of Media Lab was co-founder)
- First funding to create the company from NSF SBIR (Awards #0810428 and #0923926)
- Follow-on funding from venture and strategic investors: Redpoint Ventures, Time Warner, etc.
- Acquired by Twitter Feb. 2013, media reports estimate transaction value of ~ $100 million.



Media Decoder

Behind the Screens, Between the Lines

February 5, 2013, 7:26 pm | Comment

Twitter Buys Company That Mines Chatter About TV

By BRIAN STELTER

Twitter confirmed on Tuesday that it was acquiring Bluefin Labs, a company that analyzes online chatter about TV shows and companies and sells its

Bluefin Labs @bluefinlabs 6 Feb

RT @dkroy: Thanks to Errol Arkilic & NSF SBIR for original seed funding to create Bluefin! nsf.gov/eng/iip/sbir/

Expand

Outcomes: Ecovative Design (1058285)

- Founded by two RPI engineering undergraduates in 2007
- Grow materials based on mycelium using agricultural waste as a substrate – styrofoam replacement
- Company had 3 employees at Phase I submission (2009), now has 53
- Recently opened a 25,000-square foot manufacturing plant
- WEF Technology Pioneer, 2011

Ecovative, Sealed Air Ink Agreement to Accelerate Commercialization of Eco-Friendly Packaging Material

Published on June 22, 2012 at 3:26 AM

By Nick Gilbert

NSF: Key takeaways

- NSF places much less importance on “topical fit” – we are more or less “topic agnostic”
- Communication is encouraged throughout the process
- NSF is not a customer, we are an investor
- Funding is ONLY for R&D, so successful proposals stress the importance of R&D on company/product viability
- Long-term success metrics are largely commercial: revenues, job growth
- Every SBIR program is different!

More Info

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Program website:
http://www.nsf.gov/eng/iip/sbir/

Follow us on Twitter: @NSFInnovateSBIR

Current solicitations (due June):
SBIR: http://nsf.gov/pubs/2013/nsf13546/nsf13546.htm
STTR: http://nsf.gov/pubs/2013/nsf13547/nsf13547.htm