FREE MONEY
FEDERAL SBIR/STTR PROGRAMS

AMERICA'S SEED FUND™

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Swartz Center for Innovation
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Ralph Hershberger SBIR CV

- Graduated from CMU in 1973 in Metallurgy & Material Science (Material Science & Engineering).
- MBA from Wharton in 1981.
- Entered the start-up world in 1990.
- Active in 3 startups with a 2-1 record.
- NSF SBIR commercial reviewer since 2001.
- Member of the NSF I-Corps pilot team.
- SBIR writer since 2005.
- Small Business columnist for the Arizona Daily Star.
- Member of Desert Angels and Maine Angels.
- Invested in 5 start-ups.
- Former Mentor-in-Residence at the AZ Center for Innovation.
- Past President of the Southern Arizona chapter of SCORE.

SBIR SEMINAR TOPICS

- 1. History, Purpose, Participants, Definitions, Funding Continuum, Reasons to Consider
- 2. Proposal Mechanics, Registrations, Agency and Domain Selections, Awards
- 3. Proposal Review Process, Reviewers, Helpful hints
- 4. FAQ

SBIR/STTR HISTORY

- Government side-aside program, administered by the SBA, that requires 3.2% of an agency's award budget goes to small businesses
- Started in 1977 by NSF.
- 11 Federal Agencies participate with multiple entities.

SBIR/STTR HISTORY

- SBIR (Small Business Innovation Research) are for company and individual researchers. 87% of awards are for SBIRs.

- STTR (Small Business Technology Transfer) is a cooperative effort to expand public-private partnerships that usually involves universities.

GENERAL REQUIREMENTS FOR AN SBIR.

- To be defined as a small business the grantee must:
  - Established as a for profit organization.
  - 500 or fewer employees.
  - Principal Investigator (PI) must be employed by the company.
  - Must be U.S. majority owned.
  - Cannot be majority owned by VC, hedge fund, or private equity firm.

PARTICIPATING AGENCIES ranked by 2019 award $

Defense (14)
Health & Human Services-NIH (30), CDC
Energy
NSF
NASA
Agriculture
Homeland Security
Education
Commerce (2) NIST, NOAA
EPA
Transportation

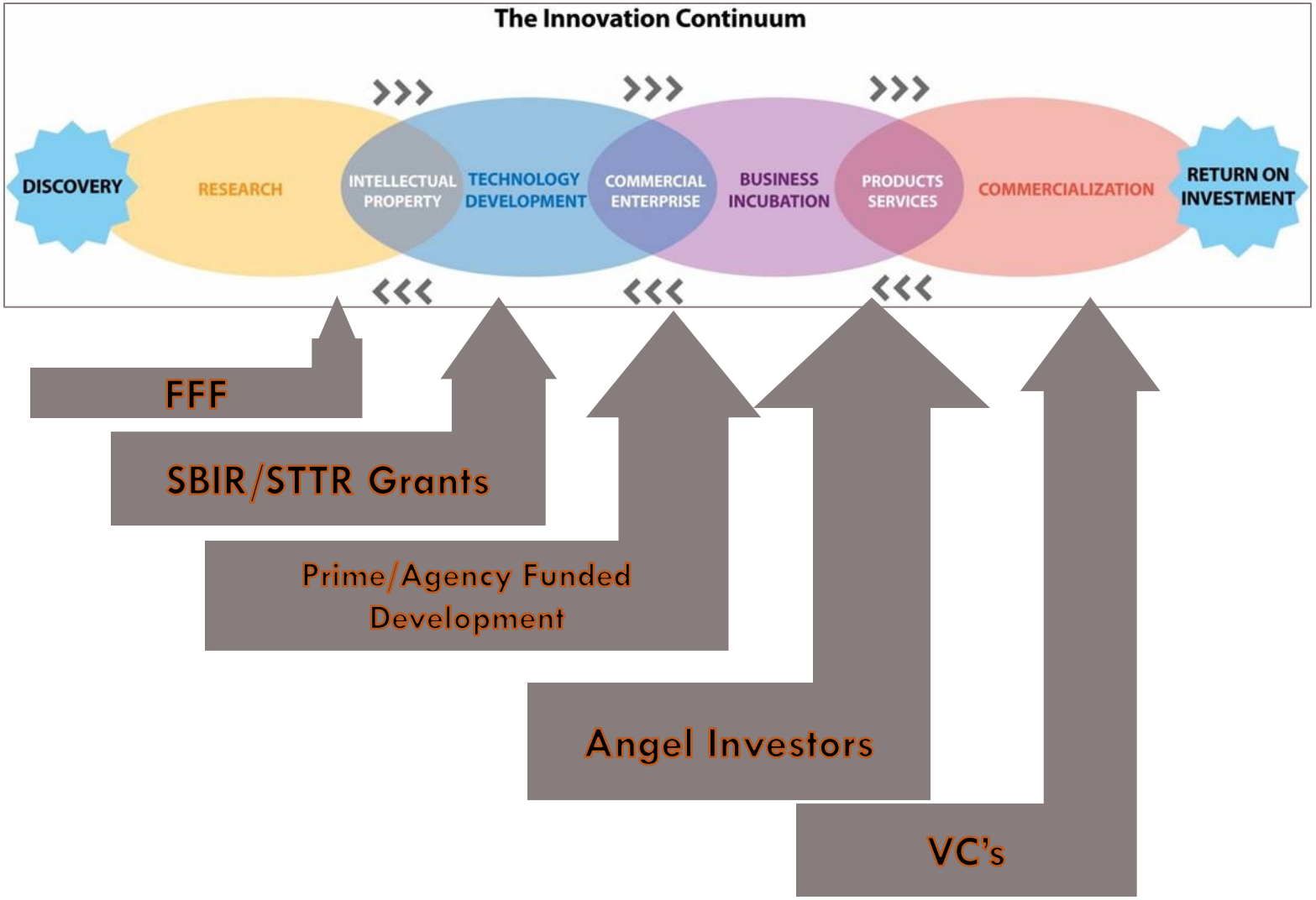
PARTICIPATING AGENCIES ranked by award cycles/year

1X Agriculture
Health & Human Services
EPA
Education
Homeland Security
NASA
NIST, NOAA
Transportation

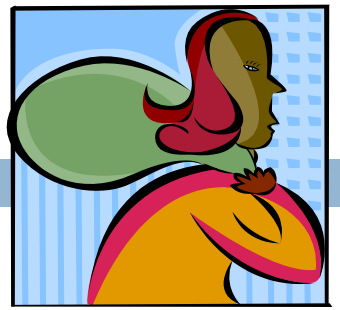
3X Energy, DOD, NIH

4X NSF (rolling quarterly)

THE INNOVATION CONTINUUM

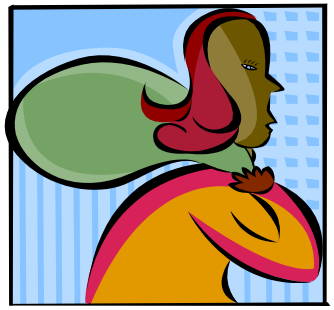


WHY DO THIS?



- SBIR programs fill a gap.
- What are the traditional sources of funding?
  - FFF – limited amounts.
  - Banks – reduce exposure, want 3 years of statements.
  - Angel investors – equity dilution, favored verticals
  - Venture capital – selective & moved to mezzanine financing
  - SBA loans – insured by the SBA but local bank determines approval, rates, and terms. They want collateral.
  - Microloans-Loans for small amounts.

WHY DO THIS (NSF)?

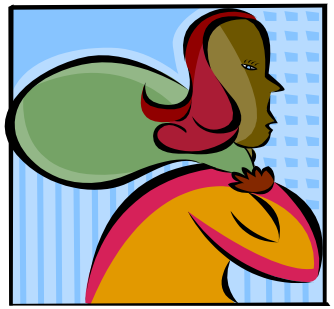


- All phases=$1.756MM grant
  - Phase 1 = $256,000
  - Phase II = $1,000,000
  - Phase IIB = $500,000 @ 50%

- PLUS, the $1MM raised to secure the "B" money.

WHY DO THIS (NIH)?

- All phases=$1,932,000 grant



  - Phase 1 = $ 256,000
  - Phase II = $1,680,879

WHY DO THIS?

There are two compelling reasons to consider an SBIR.

1. It's a grant, not a loan.
2. SBIR awards are non-dilutive.

HOW DO I GET STARTED?

- Create a corporate entity e.g., LLC
- Obtain an E.I.N.
- Register for a DUNS number
- Register in SAM
- Register in SBA website
- Register in appropriate agency websites e.g., grants.gov, FASTLANE
- Review agency SBIR websites for an appropriate domain.

DOMAIN SELECTION

- NIH & NSF are open solicitations i.e.
  - They are not the end customer.
  - Select a relevant domain
  - You define the problem and propose a solution.

- Most other agencies have determined what problem they want solved. You are proposing a solution.

NSF DOMAINS (13)

- Biomedical Technologies and Medical Devices
- Advanced Analytics, AI, Cyber Security, Cloud Computing
- Chemical Technologies, Energy Technologies, & Distributed Ledgers
- Pharmaceutical Technologies
- Augmented and Virtual Technologies
- Advanced Materials, Nanotechnology, Photonics, Power Management, Semiconductors, & Other Topics

NSF DOMAINS

- Environmental Technologies
- Advanced Manufacturing & Mobility
- Pharmaceutical Technologies
- Digital Health
- IOT, Robotics, Space Technologies, & Wireless Technologies
- Biological Technologies
- Instrumentation, & Hardware Systems

ARE YOU READY?

- Phase I - $256K (NSF)
  - Technology Elements
    - Research to establish innovation
      - Review prior awards/awardees
    - Proof of Concept
      - Do the critical experiment!
    - A realistic work scope (12 months).
    - Qualified team & facilities.

ARE YOU READY?

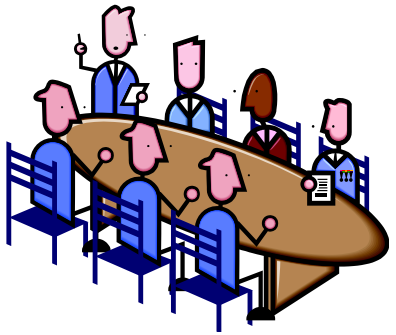
- Phase I
  - Commercial Elements
    - Business Plan
    - Potential Customers
      - Letters of support
    - Early-stage financing
      - Explore all options
    - Prior commercial experience

Unique Aspects of NSF SBIR/STTR

- Must be high-risk, high-payback innovations with the potential for commercialization.
- NSF does 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.
  - Combinations of existing technologies.

THE AUDIENCE (NSF)

- You are writing for two groups.



  - Domain Area Program Directors
  - Panel Reviewers

THE AUDIENCE

- PANELISTS
  - NSF & NIH use outside experts.
  - Panel consists of 6-10 reviewers divided between technical and commercial expertise.
  - Technical reviewers are academics, heads of R&D, CTO, or CEO of start-ups.
  - Commercial reviewers are business development pros, CEO, strategic & commercial leads from corporations & start-ups, and VC's.
  - Some may have in-depth knowledge, but the proposal should include a tutorial element.

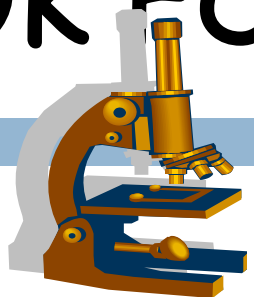
REVIEW DYNAMICS

- At least 2 technical & 2 commercial panelists perform a deep dive review of each proposal.
- Prior to the panel meeting, reviewers rate prop
  - Receive abstracts and select the subject are that are within their expertise.
  - Comment on the complete proposal based on a template of issues (www.nsf.gov).
  - Excellent, very good, good, fair, poor.

WHAT DO WE LOOK FOR?

- Tell me a story.
  - Best to start with an identified market need v. a better mouse trap looking for a home.
  - Impress me. NSF wants a homerun. Incrementalism is fatal.
  - Context - a review of existing technology, patents, and products in the marketplace.
  - Reviewers will check your claims of needs, uniqueness, and patent coverage.
  - DIFFERENTIATION

WHAT DO WE LOOK FOR?



- Phase 1
  - Phase 1 emphasizes the proof of concept.
  - Perform the critical experiment.
  - Emphasize innovation, clarity of proposal, acknowledgement of key challenges.
  - Evidence/validation of market need.
    - Third party Letters of Support from potential partner companies, alternative funding sources.

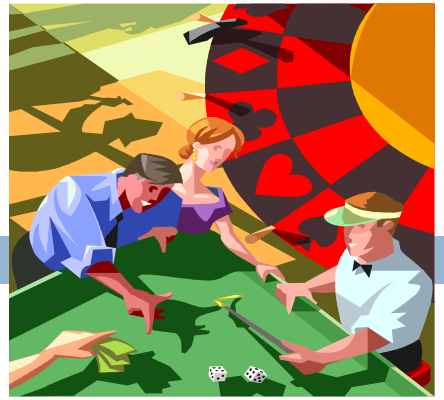
REVIEW DYNAMICS

Meet at NSF to review proposals and rate them as:

- HR – Highly recommended
- R – Recommended
- DNC – Do not consider.

- PD's make final selections and recommendations to senior NSF Engineering Directorate staff.

FAQ
WHAT ARE THE ODDS?

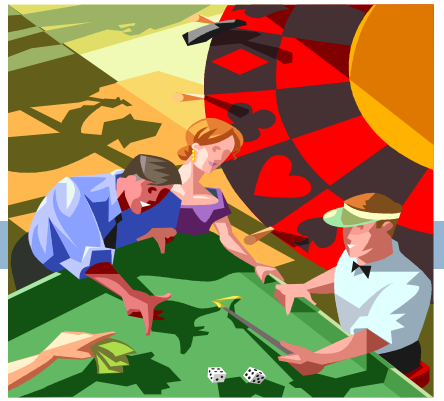


- DOD-2020-
- # of Phase 1 awards: 2,344
  - Phase 1 awards ranged from $111,000 to $256,000 for 12 months.
  - 2020 selection rate for Phase I was 19%.
- # of Phase 2 awards
  - Phase II awards range from $1,000,000 to $1,250,000 for 24 months.
  - 2020 selection rate of Phase II was 69%
  - Source: sbir.gov/awards/annual-reports

FAQ
WHAT ARE THE ODDS?

- NIH-FY2020
- # of Phase 1 awards: 827
  - Phase 1 awards are $252,131 for 12 months.
  - 2020 Phase I success rate was 13.6%.
- # of Phase 2 awards
  - Phase II awards are up to $1,680,579 for 24 months.
  - 2020 Phase II success rate was 30.1%.
  - Source: sbir.gov/awards/annual-reports

FAQ
WHAT ARE THE ODDS?



- NSF-2020 # of Phase 1 awards: 388
  - The current NSF Phase 1 review cycle has an award pool of $18,750,000. Awards are a max. of $256K so.
  - The success rate for Phase 1 proposals is 11%. This is entirely dependent on the quality and the number of proposals submitted.
- Phase 2 awards: 120
  - Success rate is 53%.
  - Source: sbir.gov/awards/annual-reports

FAQ
IS MY IDEA WORTHY?

- That's the purpose of the Project Pitch (NSF) or 3-page Executive Summary (NIH) sent to the relevant agency or PD/PM. If they believe the idea has merit, you will be invited to submit a full proposal.

FAQ-What's the Downside?

- Timing
  - Proposal preparation can take 100+ hours.
  - It's a government program.

    Compliance matters as much as content.

    Solicitations and instructions are not user friendly.
  - Delayed response.

    Proposal submission to receipt of money is about 6 months.

FAQ-WHAT CONSTITUTES A COMMERCIALIZATION PLAN?

- The key element is validation of customer interest.

- You must approach potential customers and discuss your concept. Use the "hypothetical product' approach. Try to answer:
  - Does it solve any of their problems?
  - If so, what is it worth to them?
  - How many would they buy over time?

FAQ-Can A Rejected Proposal be Resubmitted?

- Varies by Agency
  - NSF Phase 1-Yes
    Phase 2-No
  - NIH Phase 1-Yes
    Phase 2-Yes

Each proposal receives a detailed set of reviewers' comments that explains pros and cons of the proposal and suggestions to include for a resubmission.

FAQ: Is Shark Tank an Accurate Depiction of an Angel Pitch Process?

- It is an entertainment program.
- Valid elements:
  - Quick fire questions.
  - Investor focus on the problem-solving aspects of an offering.
  - Valuation squeeze.
- Non-valid aspects
  - Superficial pitches.
  - Rapid decisions by investors.
  - Large stakes by 1 or 2 investors.

FAQ-What about State Funds?

- The federal government also supports state and county start-up funds.
  - usgrants.org/pennsylvania/small-business-grants.
- PA Dept. Of Community and Economic Dev. focuses on site redevelopment.
  - dced.pa.gov/program/
- Ben Franklin Technology Partners
  - benfranklin.org