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# Workshop I

# SBIR Grant Overview

— Leveraging SBIR Opportunities —

August 13, 2024

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# Welcome

## Introductions:

- Wiley Larsen, Director, SBIR/STTR & University Partnerships, Arizona Commerce Authority
- Dan Suhr, Independent Platform

## Goals of Workshop:

- Understand the SBIR Program - Differences Among Agencies.
- Align Projects with Strategic Investment Needs.
- Harness the Power of Partnering.
- Craft a Compelling Concept Write-up - the foundation of SBIR proposals.
- Support AZ Entrepreneurs in Proposal Submission.

# Agenda Workshop I

- SBIR overview
- Key points to adopt grant strategy
  - The “Right” Topic, The “Right” Partners, Keep It Simple, Persistence
- Strategic investment for the company
- Registrations - needed
- Topics/program managers
- Concept writeup

# SBIR/STTR Policy Goals

The mission of the SBIR/STTR program is to support scientific excellence and technological innovation through the investment of Federal research funds in critical American priorities to build a strong national economy.

The program's goals are four-fold:

- Stimulate technological innovation.
- Meet Federal research and development needs.
- Foster and encourage participation in innovation and entrepreneurship by socially and economically disadvantaged persons.
- Increase private-sector commercialization of innovations derived from Federal research and development funding.

# SBIR Participating Agencies

## \$4.0 Billion Annual Investment

Each year, Federal agencies with extramural research and development (R&D) budgets that exceed \$100 million are required to allocate 3.2 percent of their R&D budget to these programs. Currently, 11 Federal agencies participate in the SBIR program:

**Department of Agriculture** ● Department of Commerce ● Department of Defense ●  
Department of Education ● Department of Energy ● **Department of Health and Human  
Services** ● Department of Homeland Security ● Department of Transportation ● Environmental  
Protection Agency ● National Aeronautics and Space Administration ● **National Science  
Foundation**

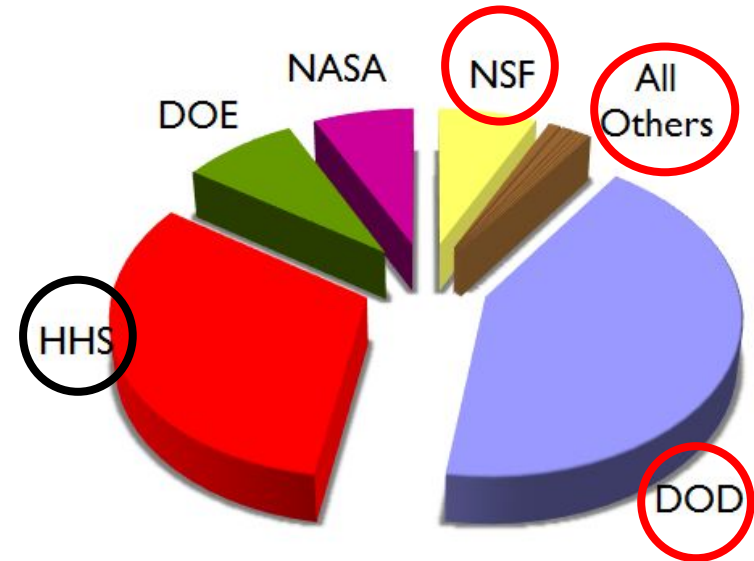
# SBIR Agency Allocation of Research Funds

Two Agencies dominate SBIR funding:

- DOD (\$2.0 billion)
- HHS [NIH/CDC/FDA] (\$1.3 billion)

Other target agencies include:

- NSF (\$250 million)
- USDA (\$30 million)



SBA, October 2015

# SBIR - Why bother? Success Rates ...



Highcharts.com

# Benefits of Receiving SBIR Award

- **Money:** Phase I (Feasibility Study/Prototype) awards generally are for targeted research up to \$306,000 over 6 months. Phase II (Fully R&D) awards are up to \$1.8 million over 24 months. Each agency is different!
- **IP Control:** The funding agency has very limited rights to IP created!
- **Credibility:** Receiving awards adds credibility with investors and potential partners for the company's concept because the proposals are peer reviewed (most agencies - some exceptions like the DOD).
- **Customer:** In some cases (DOD, DHS, DOT, NASA), the awarding agency can be the end customer (What is called Phase III money) for the product. SBIR Data Rights become very important.



# But that's not all...additional sources of funding

- **Phase 0 Funding:** Many states and agencies offer Phase 0 funding and support programs to help local businesses prepare SBIR/STTR proposals. These programs may include workshops, mentoring, and financial assistance to offset proposal preparation costs.
- **State SBIR Matching Funds:** Several states offer SBIR matching funds to support small businesses that have received federal SBIR or STTR awards.
- **State R&D Tax Credits:** SBIR companies can leverage state R&D tax credits to offset their research and development expenses, effectively reducing their overall tax liability or, potentially selling those credit to companies that can use the credits.

# SBIR/STTR Key Terms

- **Eligibility:** Requirements to submit proposals.
- **SBIR/STTR:** Small Business vs. Small Business + Research Institute
- **Grant/Contract:** Flexible vs. Ridgid Requirements
- **RFA/Solicitation:** Formal request for proposals or research applications.
- **Award Type:** Phase I, Phase II, FastTrack, Direct to Phase II, Outliners: Commercialization Readiness Program, Sequential Phase II, Administrative Supplement, Diresity Supplement.
- **Phase III:** Commercialization - Anyone else's money besides SBIR/STTR.
- **Principal Investigator:** Lead researcher executing project work.
- **Program Manager/National Program Leader/Technical Program Officer/Program Director:** Key contact points for different agencies.
- **Indirect Cost:** Overhead expenses not directly attributable to project.
- **Fee:** Profit margin allowed for small business participants.

# SBIR Eligibility

To qualify for SBIR/STTR funding, a business must be:

- for-profit U.S. company with 500 or fewer employees, and
- majority-owned and controlled by U.S. citizens or permanent resident aliens, plus
- VC/Hedge Fund participation is allowed with certain restrictions  
*(This doesn't happen very often so let's discuss offline if you have an outlier situation.)*

# SBIR vs. STTR

Feature	SBIR	STTR
Collaboration	Collaboration with a research institution is optional. Small business must complete 2/3 of the "work".	Requires collaboration with a U.S. research institution. Small business must complete a minimal of 40% of the "work". Research institution can complete up to 60% of the "work".
Principal Investigator	Must be primarily employed by the small business.	May be employed by either the small business or the research institution.
Intellectual Property Rights	Newly created intellectual property <u>should</u> belong to the small business.	Usually the small business and research institution negotiate how rights will be shared.
Focus	Focus on small businesses conducting research.	Focus on technology transfer from research institutions to the marketplace.

*In this case "work" and budget are interchangeable terms*

# Grants vs. Contracts

Feature	Grants	Contracts
Purpose and Flexibility	More flexible, allowing the recipient to define the research objectives and methods. They support exploratory research with broader goals determined by the applicant.	Specific to government-defined needs and deliverables. They are less flexible, with stringent requirements and objectives set by the government.
Selection Process	Awarded based on scientific merit and potential impact.	Awarded based on fulfilling specific agency needs.
Intellectual Property Rights	Intellectual property generated remains with the small business, with the government having a license to use it for government purposes.	SBIR contracts typically include specific terms for data rights and deliverables. The government has certain rights to use the data. (See SBIR Data Rights)
Legal Nature	Not legally binding, providing more freedom in project execution.	Legally binding agreements with obligations and deliverables that must be met.

# RFA/Solicitation (READ THE INSTRUCTIONS!):

Typically includes the following components:

- **Purpose/Objectives:** Description of the program's goals and the types of projects or research areas that are being targeted.
- **Eligibility Requirements:** Criteria that applicants must meet to qualify for funding, such as being a small business with certain capabilities or experience.
- **Funding Details:** Information on the available funding, including budget limits for type of awards and topics.
- **Proposal Submission Instructions:** Detailed guidance on how to prepare and submit proposals, including deadlines, formatting requirements, and evaluation criteria.



# Award Types

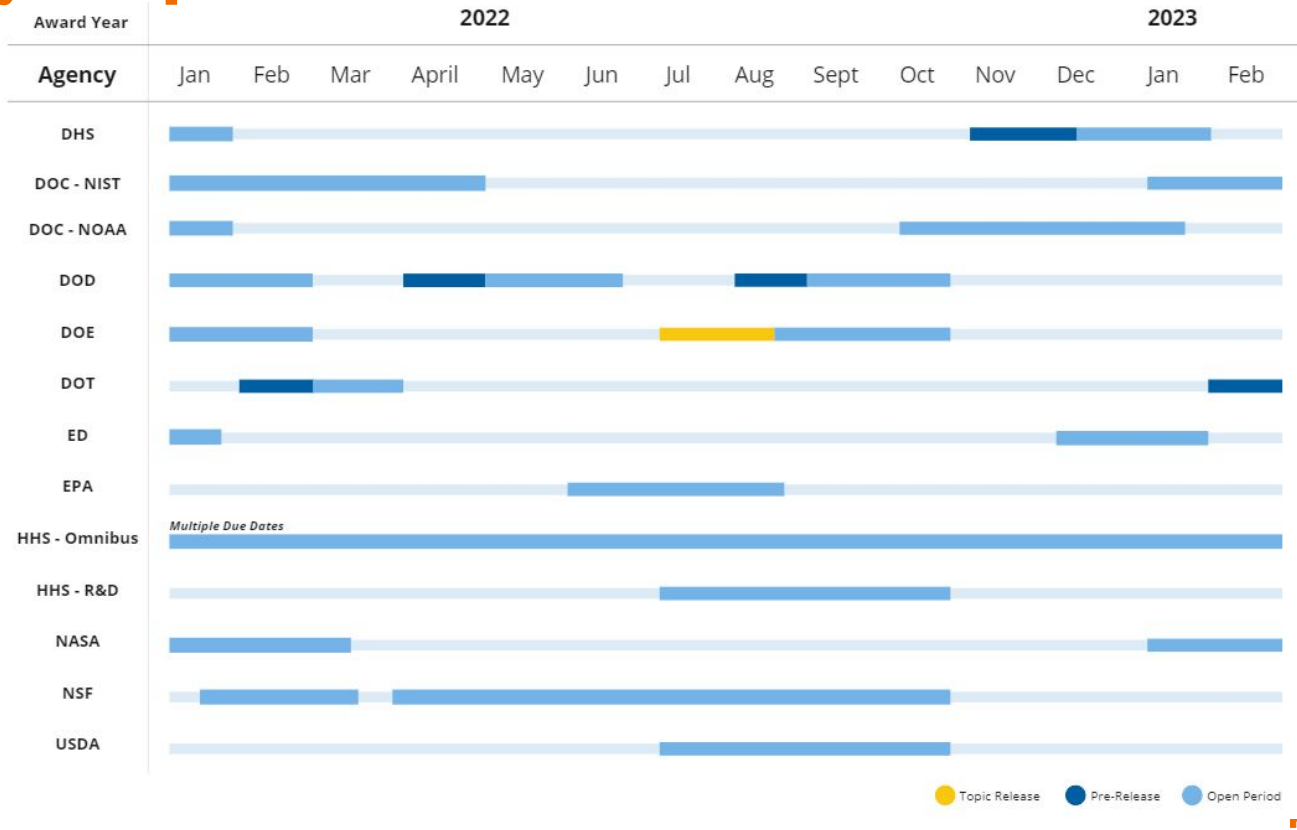
Phase I	Feasibility study to evaluate the scientific and technical merit of an idea. It usually lasts 6-12 months with funding up to \$306,000.
Phase II	Continuation of Phase I, focusing on R&D and commercialization. It typically lasts up to 24 months with funding up to \$2 million.
FastTrack	Combined application for Phase I and II, intended for projects with strong potential for commercialization, expediting the transition between phases.
Direct to Phase II	Allows companies to bypass Phase I if feasibility has already been demonstrated, moving directly into the development stage.
Supplemental Awards	Additional funding provided to support further development or address specific needs that arise during the project.
Commercialization Readiness Program	Provides additional support to advance the commercialization efforts of Phase II awardees, including partnerships and market entry strategies.

# Agency Differences - Changes Rapidly - Read RFA

Agency	Total Funding	Phase I Funding	Phase II Funding	SBIR/STTR Available	Type
Department of Agriculture (USDA)	\$32M	\$125-175K	\$600K	SBIR/STTR	Grant
Department of Commerce (DOC)	\$15M	\$100K	\$400K	SBIR	Grant
Department of Defense (DOD)	\$1.9B	\$50K-\$250K	\$0.8-\$1.83M	SBIR/STTR	Contract
Department of Education (ED)	\$10M	\$250K	\$1M	SBIR	Contract
Department of Energy (DOE)	\$315M	\$200K	\$1.6M	SBIR/STTR	Grant
Department of Homeland Security (DHS)	\$18M	\$150K	\$1M	SBIR	Contract
Department of Transportation (DOT)	\$9M	\$200K	\$1M	SBIR	Contract
Environmental Protection Agency (EPA)	\$5M	\$100K	\$400K	SBIR	Contract
Health and Human Services (HHS)	\$1.2B	\$306K	\$1.83M	SBIR/STTR	Grant
National Aeronautics and Space (NASA)	\$174M	\$150K	\$1M	SBIR/STTR	Contract
National Science Foundation (NSF)	\$215M	\$275K	\$1M	SBIR/STTR	Grant

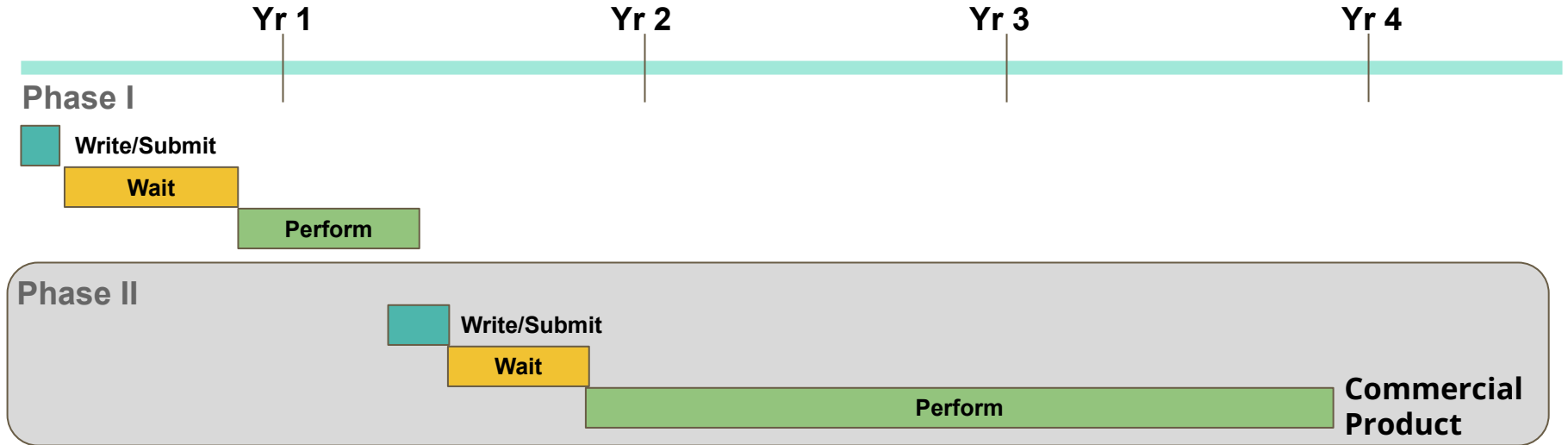


# Agency Proposal Schedule (Source <https://www.sbir.gov/topics>)



# Grants are Long-Term Strategies

Grants take a long time to work out. The idea being pursued must be a viable idea for marketplace adoption 3 or more years in the future.



# SBIR Success Stories

These companies are success stories for the SBIR program. Some of them, like Children's Progress Inc., retained development support for one product that went on to gain significant commercial adoption. Others, like Qualcomm, used the SBIR program to leverage components into systems over time.

Qualcomm	Symantec
iRobot	Genzyme
Nimble Systems	NanoMech
Lift Labs	Adaptec
Ecovative Design	Children's Progress Inc
JENTEK Sensors	SQUID

# SBIR Success Story

## Ecovative Design Llc

Private Funding through  
2011 - 2024: ~\$200 million

### Address

70 Cohoes Ave, Ste 103  
Green Island, NY, 12183-1525  
US

UEI: YV71BZMVX1F6

Number of Employees: 38 160

HUBZone Owned: No

Woman Owned: No

Socially and Economically

Disadvantaged: No

### SBIR/STTR Involvement

NSF (5), EPA (8), USDA (6)

Year of first award: 2009

11

Phase I Awards

8

Phase II Awards

72.73%

Conversion Rate

\$1,129,775

Phase I Dollars

\$3,010,170

Phase II Dollars

\$4,139,945

Total Awarded

# Key Grant Strategy Points - The “Right” Topic

The “Right” Topic is the topic that fits the company’s product strategy. The money is useless unless it is advancing the product, or a key component of the product that is necessary for success. Some agencies (contract agencies specifically like NASA or DOD) are very specific about topic deliverables. Think twice about changing your concept to fit a topic unless it still advances the product.

*What problem is being solved?*

# Key Grant Strategy Points - The “Right” Collaborators

Who are the key or “Right” collaborators necessary to advance the product? These are partners you can leverage for credibility with the agencies. There is also an opportunity to gain credibility from the process of pursuing the grant with potential partners.

Following are categories of collaborators listed in order of importance for a proposal:

- **Customer** - This is a partner that will be the end customer. (Market Cred)
- **Investor** - These are resources that think the idea is investable. (Sustainability Cred)
- **Foundation (specific to the problem)** - (Idea/Investment Cred)
- **Researcher** - People or institutions supporting the idea. (Idea Cred)

*Who thinks this is a viable solution to an urgent problem?*

# Key Grant Strategy Points - Keep It Simple

Can the topic be addressed in a narrow enough way to show understanding of the complexity of the problem? The most common reviewer comment is the proposal is over scoped - the proposer is unrealistic about what can be accomplished with the budget and timeframe constraints. The best way to keep the scope in check is through the workplan and budget.

- **Workplan** - Are the specific aims/objectives well defined and reasonable?
- **Budget** - Which resources are completing which tasks? As an example, over 6 months assuming a \$306K budget.

*Can the work described be completed in time/budget?*

# Key Grant Strategy Points - Persistence

Some say no whining until 6 proposals have been submitted and rejected.

Most critical reviews are a result of providing an inadequate explanation of the problem or solution. Or maybe the solution that was presented is too far ahead of the reviewers' frame of reference. One interesting fact is for NIH the success rate for resubmissions is more than double the rate for initial submissions (35% v. 15%). That says a lot. Take the reviewers' comments, adjust the proposal and resubmit a stronger proposal.

Keep talking to potential partners. Maybe there are opportunities outside the SBIR process that could be leveraged with the right partner.



## Fine Print:

Plan on your SBIR team spending 150-500 hours over 8 weeks to complete a compelling SBIR Phase I application.

# Questions?

# Let's take a 5 minute break

# So, you're not scared away?

Let's discuss the initial steps needed between now and the next workshop.

# Initial Steps - Let's Go

- Registrations
- Technical Research
- Market Research
- Concept Write-up
- Dream Team Identification

# SBIR Registrations (Check RFA)

This can take weeks! NIH requirements follow:

- **PRIORITY SAM (System for Award Management):** required to do business with the U.S. government. An UEI will be issued and serves as the organization identifier in other systems
- **eRA Commons:** – required to do business with HHS
- **Grants.gov:** required to submit grant applications through the federal-wide grant portal
- **SBA (Small Business Administration):** required to participate in SBIR and STTR federal funding programs

# Technical Research

- Prior awards/Previous topics
  - <https://www.sbir.gov/awards>
- Reach out to technical point(s) of contact
- Review topic references, topic author publications
- Review Agency research and strategic plans
- Scientific/Technical trades, peer-reviewed journals
- IP Actions/Roadmap

# DOD-ARMY Certify Properties of Infrared Optical Materials

## DESCRIPTION

The topic task is to investigate and then demonstrate an apparatus and a process to economically certify the index of refraction of infrared optical materials in the sellable "lens blank" form, which is typically a flat disk or rectangle.

## PHASE I

The Phase I objective shall be to conceptualize and mathematically substantiate the operating principles of an economic method to certify the temperature and wavelength dependent index of refraction of a flat disk-shaped sample of infrared optical material. Note the term "certify" does not necessarily require absolute value measurements of the material index, and could for example rely upon relative comparisons to reference standards. In any case, the certification accuracy must be to the third decimal place of the index of refraction values over wavelengths from 3.5 - 12.0 microns and temperatures from -40° to +71° C. Note again that absolute measurements across the full temperature and spectral ranges may not be required if other data can provide adequate statistical correlation to reference standards. The method shall be capable of certifying at least the following infrared optical materials: Ge, ZnS, ZnSe, GaAs, BaF<sub>2</sub>, AMTIR-1, IRG-26, and IRG-24.

## PHASE II

The objective of the Phase II effort is to develop a working laboratory apparatus and associated operational procedure which executes the certification process described in the Phase I task. The apparatus shall be evaluated for acquisition and maintenance costs as well as time efficiency during use, with the intention of transitioning the technology for "in-line" use at optical material points of manufacture. Certification data shall be collected and evaluated for proof of performance using samples of at least the following materials: Ge, ZnSe, and BaF<sub>2</sub>.

## PHASE III DUAL USE APPLICATIONS

- Per research, there are three methods [1, 2, 3] that provide novel ways to test infrared (IR) refractory indices: infrared interferometry, infrared ellipsometry, and infrared spectroscopy.
- IR interferometry uses interference patterns created by splitting an IR beam to measure its optical path
- IR ellipsometry measures the change in polarization state of an IR light

# Contract Topic Example

# USDA-Conservation of Natural Resources

The goal of the Conservation of Natural Resources topic area is to commercialize innovative technologies that are developed with the purpose to conserve, monitor, improve, and/or protect the quality and/or quantity of natural resources and reduce potential waste streams while sustaining climate-smart, optimal farm and forest productivity and profitability. The objective of this topic area is the conservation of soil, water, air, and other natural resources on landscapes that produce agricultural, natural, and forest/rangeland goods and services. New technologies and innovations applying circular agriculture principles that will make use of waste or byproducts, help improve soil health, reduce soil erosion, improve water and air quality, improve nutrient management, and conserve and use water more effectively are encouraged.

## Grant Topic Example

# Market Research

- Investigate topic-identified commercialization areas
- Investigate Phase III commercialization collaborators
  - Customers, Distributors, Associations,
- DREAM = Conditional order/investment or Transition to operations (DoD as customer)



# Concept Write-up

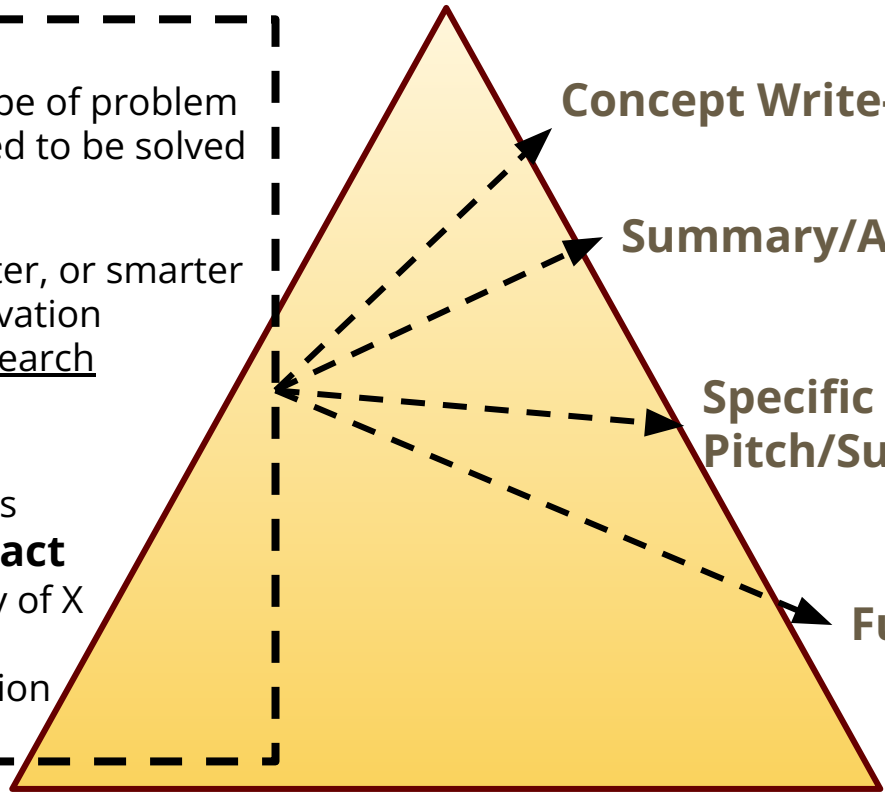
The most effective way to communicate with grant officials and collaborators.

Key components:

- Short, 250-words that can be included in the body of an email.
- Start the write-up with the **problem** - “Did you know that X million people are afflicted with Y with a cost of Z billion dollars a year?”
- Next talk about the **innovation** - “The purpose of the proposed research is to prove the feasibility of X.”
- To prove the feasibility of X, the following **work plan** will answer these 1 to 3 questions...
- When we do, the **outcome/impact** to the world is Y . . .

# Proposal Structure

- **Problem**
  - Stats about scope of problem
  - Why does it need to be solved
- **Innovation**
  - Why better, faster, or smarter
  - Context of innovation
  - Preliminary Research
- **Work Plan**
  - Team
  - Objectives/Tasks
- **Outcome/Impact**
  - Prove Feasibility of X
  - Phase II efforts
  - Commercialization



**Concept Write-up (1/2 Page)**

**Summary/Abstract**

**Specific Aims/Elevator Pitch/Summary (1 Page)**

**Full Proposal (7-20 Pages)**

# SBIR Proposal Outline - 3 Different Agencies

DoD (20 Pages)	NSF (15 Pages)	NIH (7 Pages)
1 Identification/Significance of Problem	Project Summary	Specific Aims
2 Phase I Technical Objectives	Project Description	Research Strategy
3 Phase I Statement of Work	- Intellectual Merit	- Significance
4 Related Work	- Technical Solution	- Innovation
5 Relationship with Future R&D	Company/Team	- Approach
6 Commercialization Strategy	Broader Impacts	• Team
7 Key Personnel	Commercialization Potential	• Objectives
8 Foreign Citizens		• Description of Tasks
9 Facilities/Equipment		
10 Subcontractors/Consultants		
11 Current, or Pending Support		

- **Summary**
- Problem
- Innovation
- Workplan
- Outcome/Impact

Problem

Innovation

Workplan

Impact

Team

# Dream Team Identification (Borrowing Credibility)

- **Collaborators:** Identify academic institutions, research organizations, or industry experts with relevant experience to enhance technical capabilities. Their role is to support research and development efforts.
- **Customers (Distributors):** Engage potential customers early to provide feedback and validation for your product. This can help tailor development efforts to meet market needs effectively.
- **Industry Associations:** Can enhance SBIR proposals by providing expertise, facilitating networking with stakeholders, offering credibility, and granting access to resources. This strengthens technical approaches and boosts project feasibility and market relevance.

# Activity - Between Workshop I and Workshop II

Send to Dan:

- Registration(s)
- Concept Write-up (250 Words)
- Technical Research (Summary)
- Market Research (Summary)
- Dream Team List (Summary)

**Dan Suhr**

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# About Dan Suhr

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## Director of Research and Development/Co-Founder

Dan's roles at Independent Platform include overseeing company projects and coordinating technical staff. In addition he is a proposal/plan writing workshop instructor, Coach of startup clients, and moderator of topic-specific workshops. Dan specializes in addressing: Innovation Research, Partner Search, Research/Work Plans, Strategic Alliances, Roadmaps, Finance/Forecast, and Project Evaluation.

Dan's early experience was in the financial industry working for a Boston investment firm. He was subsequently drawn to the finance/cost accounting sciences in manufacturing organizations. These roles transitioned to strategic management and global mergers and acquisitions (M&A) efforts. Dan was founder of an internet startup and raised more than \$2M in capital for the venture. He has written and performed on grant awards since 2006.

Dan has a PhD in Political Science (Social Research) along with a MBA and his undergraduate Finance degree. Dan was adjunct faculty, teaching Strategic Management Capstone courses at Southern New Hampshire University's graduate school.