# SBIR & STTR – Applying to NSF

PHASE I APPLICATIONS





### About SBIR/STTR Assistance

The Nevada Governor's Office of Economic Development provides assistance to companies in the preparation and submission of SBIR/STTR proposals

The goal is to increase the number of proposals submitted and grants awarded under the SBIR/STTR program to Nevada technology-based small businesses

APIO Innovation Transfer (APIOiX) works in partnership with UNLV's SAGE program (<a href="https://www.unlv.edu/econdev/sagesouth">https://www.unlv.edu/econdev/sagesouth</a>) to assist technology-based small businesses (<a href="https://apioix.com/sbir-assistance">https://apioix.com/sbir-assistance</a>)

- Assessment of the business concept
- Guidance for registration of the company
- Review and input on project pitches and proposals
- Assistance in submitting the proposals



### About APIOiX

### Programs, Services, and Solutions to Accelerate Innovation Ecosystems

APIOiX accelerates innovation through business development, training, and technical assistance to innovators and inventors at universities, small businesses, and government entities across the globe.





### Eligibility for SBIR/STTR Funding

"America's Seed Fund"

Technology based

Diverse portfolio

Commercial application

Non-dilutive funding

STTR requires partnership with a research institute

The Nation's largest source of early stage/high risk funding for start-ups and small business

• In the words of program founder Roland Tibbetts: "to provide funding for some of the best early-stage innovation ideas; ideas that, however promising, are still too high risk for private investors, including venture capital firms."

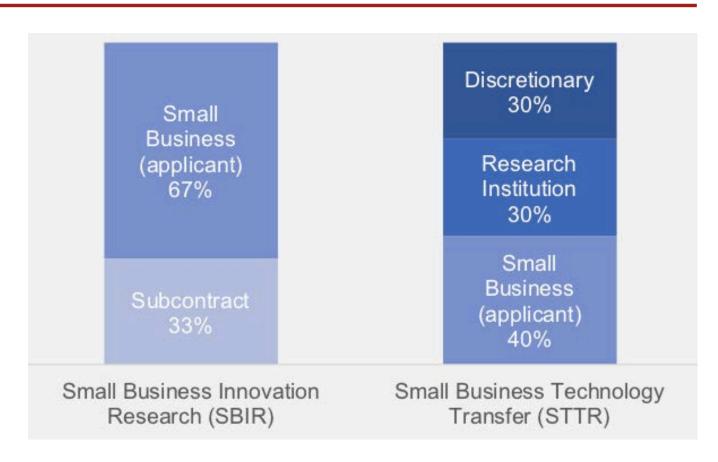




### Small Business Technology Transfer Program (STTR)

An STTR project requires the small business, to be teamed with a non-profit research institution

- The applicant is always the small business
- However, the PI for the project can be from the research institution
- The small business and the research institutions must be US based
- The narrative should clearly state what work is done where
- Each entity will need their budgets and budget justifications entered separately





# Preparing your Company

Incorporate (LLC is most common followed by "C" Corp.)					
Apply for and obtain EIN					
Register in SAM.gov and obtain UEI (Unique Entity ID) -					
https://www.sbir.gov/sites/default/files/Company_Registration_Guide.pdf					
ADDITIONAL REQUIRED REGISTRATIONS AND SUBMISSIONS					
	NASA	HHS	NSF	DOE	DOD/DARPA
Electronic Handbook (EHB)					
eRA Commons					
GRANTS.gov					
NSF Fastlane					
Portfolio Analysis and Management System (PAMS)					
FEDCONNECT.gov					
Funding Accountability and Transparency ANCT					
Subaward Reporting System					
DOD Submission Website					



### Preparing your Company – Common Errors

Find the right FOA / study section

Find the right instructions

- The FOA and associated guide need to be followed
- Forms may vary from one FOA to another
- Follow font and margin requirements
- Biosketch format needs to be followed

Upload the right documents to the right place

Ensure that all required documents are included



# Preparing your Company – General Tips

SBIR/STTR awards are not academic grants

Eligible to receive award

Product definition – unfulfilled need/customer/market

Right team to develop the product

Resources and time to write the proposal

• Be prepared for writing (150 to 450 hours of work) – Success rate is about 15%

Fits the business objectives

Fit with a specific funding opportunity announcement (FOA)

- Understand the goals of the program/solicitation and the review criteria
- Talk to agency program managers

Phase I or Phase II or Fast Track



# National Science Foundation (NSF)

### National Science Foundation — SBIR/STTR

America's Seed Fund - ~\$200 Million awarded to companies each year

"We support research and development of deep technologies - those that are based on discoveries in fundamental science and engineering. As we review applications, we consider your technology's innovativeness, commercial potential, and possible societal impact."

"Our seed funding is for R&D that involves a good amount of technical risk. If you're already sure that your product is technically feasible, this program isn't a good fit for you."



## NSF – SBIR/STTR Phases

#### Project Pitch: Invitation to Submit

• Award Amount: \$0

• Duration: Three weeks

#### Phase I: Feasibility, Proof of Concept

• Award Amount: \$256,000 Max

• Duration: 6 - 12 months

#### Phase II: Continue Development

• Award amount: \$1,000,000 Max

• Duration: Two years (additional Phase II awards possible)

#### Phase III: Commercialization

- Non SBIR/STTR federal funds, private funds
- No time limit



### NSF – SBIR/STTR Solicitation Schedule

NSF currently works on a rolling quarterly schedule

Application Due Date: March 05, 2020. June 04, 2020. September 03, 2020. December 03, 2020.

Topics are amended on a yearly basis; some topics are recycled from year to year



### NSF – SBIR/STTR

### **Program Basics**

Funding is in the form of grants (not contracts)

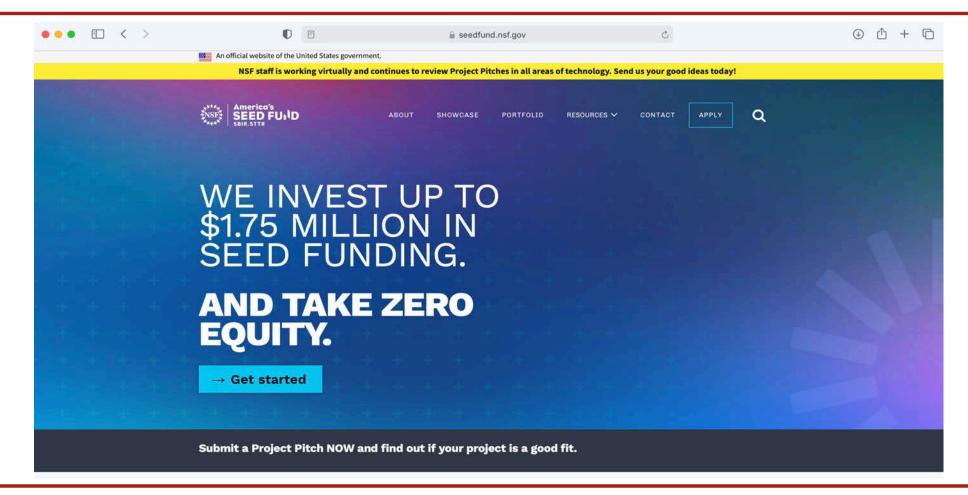
#### Phase I funding Objectives

- Explore product-market fit
- Determine your technology's feasibility
- Design and test prototypes
- Identify any relevant legal or regulatory issues
- Develop a plan to scale and market your technology



# NSF – SBIR/STTR

**NSF SBIR & STTR** 





## NSF – SBIR/STTR Funding Opportunities

#### **CURRENT TOPIC AREAS**

Advanced Manufacturing (M)

Advanced Materials (AM)

Artificial Intelligence (AI)

Biological Technologies (BT)

Biomedical Technologies (BM)

Chemical Technologies (CT)

Digital Health (DH)

Distributed Ledger (DL)

Energy Technologies (EN)

**Environmental Technologies (ET)** 

Information Technologies (IT)

Instrumentation and Hardware Systems (IH)

Internet of Things (I)

Medical Devices (MD)

Nanotechnology (N)

Other Topics (OT)

Pharmaceutical Technologies (PT)

Photonics (PH)

Power Management (PM)

Quantum Information Technologies (QT)

Robotics (R)

Semiconductors (S)

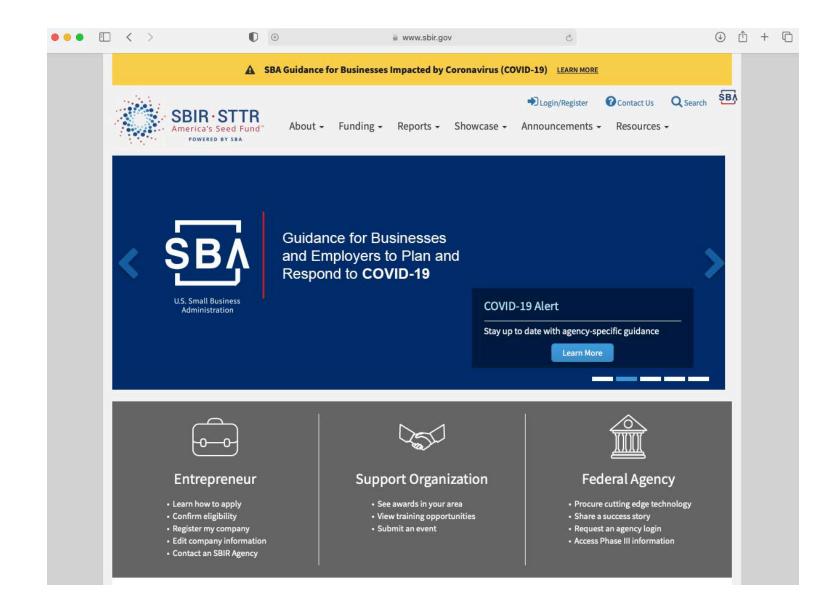
Space (SP)

Wireless Technologies (W)



SBIR.GOV

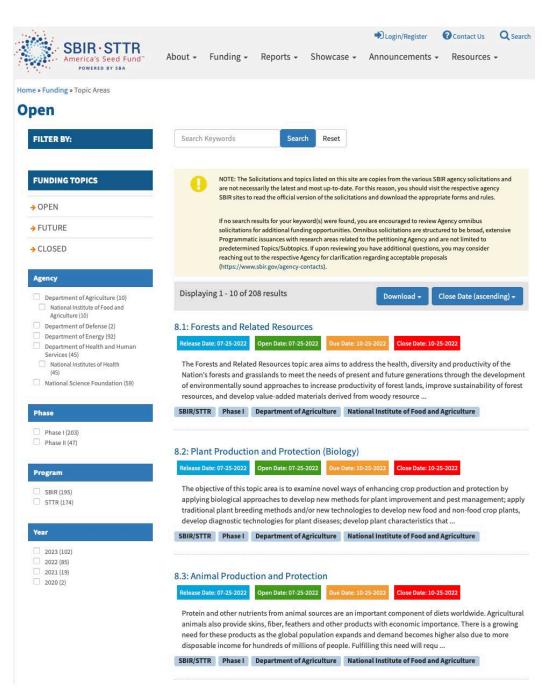
http://sbir.gov





# Search for Topics

SBIR.gov





### NSF – Topic Example

Topic solicitations are categorized by major headings (i.e. Wireless Technologies), but often there are also subheadings such as devices & components, systems, and Other.

Generally, there is one program manager for each major topic area Wireless Technologies (W)

> BOTH | Phase | | 2 olicitation: Topic Number

• NOTE: The Solicitations and topics listed on this site are copies from the various SBIR agency solicitations and are not necessarily the latest and most up-to-date. For this reason, you should use the agency link listed below which will take you directly to the appropriate agency server where you can read the official version of this solicitation and download the appropriate forms and rules. The official link for this solicitation is:

https://www.nsf.gov/pubs/2022/nsf22551/nsf22551.htm

Release Date: Open Date: Application Due Date: Close Date: uary 11, 2022 tober 26, 2022 (closing in 16 days)

The Wireless topic involves next-generation wireless communication technologies requiring systems with high data rates, low cost, and that support a wide variety of applications and services, while maintaining full mobility, minimum latency, and long battery life. Devices and subsystems that increase data throughput rates via cell density, increased spectrum, multiple input, multiple output (MIMO), massive MIMO, and new "antenna" concepts. NSF welcomes proposals involving modulation and demodulation techniques for signal generation and reception through spectral efficiency, noise immunity, jamming immunity, and power efficiency: radio frequency (RF) pollution; device and circuit; processing algorithms/3D spatial control; high efficiency devices such as micro-TWT, smart dust, and inductive couplers. NSF seeks proposals in the areas of spectrum-related research and development activities that improve the efficiency by which the radio spectrum is used, and the ability of all members of the public to access spectrum-related services. Mobile and automotive radar, smart solar panels, on-panel DC-AC converters, openRAN-related devices and applications, and self-testing and self-networking devices are also of interest.

#### NSF Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR) Programs Phase I (SBIR/STTR Phase I)

#### PROGRAM SOLICITATION

NSF 22-551

REPLACES DOCUMENT(S): NSF 21-562, NSF 21-563



Directorate for Technology, Innovation and Partnerships Translational Impacts

Submission Window Date(s) (due by 5 p.m. submitter's local time):

January 11, 2022 - March 03, 2022

March 04, 2022 - June 30, 2022

July 01, 2022 - October 26, 2022

Small businesses can submit a Project Pitch at any time. Small businesses that have been invited to submit a full proposal can submit a proposal based on that Project Pitch at any time during one of the submission windows listed above (up to one year).

#### IMPORTANT INFORMATION AND REVISION NOTES

A small business must receive an official invitation via the Project Pitch process to submit a full proposal to this solicitation. The Project Pitch must outline the project objectives, technological innovation, and associated technical risks. The Project Pitch gives NSF the ability to review for appropriateness to the NSF Small Business Innovation Research (SBIR)/Śmall Business Technology Transfer (STTR) Phase I programs prior to the full proposal submission process, ensuring that proposers do not expend time or resources preparing full proposals that are not aligned with the program requirements. Details regarding this process as well as how to submit a Project Pitch can be found in section V.A of this

Invited proposers may submit one Phase I proposal to either the NSF SBIR or STTR program. SBIR and STTR proposals are nearly identical but differ in the amount of work required to be performed by the small business (as noted in the budget). Proposers must note whether they are applying for SBIR or STTR on the NSF proposal Cover Sheet. More details regarding the Cover Sheet and how to submit an NSF SBIR/STTR proposal can be found in section V.A of this document.

NSF SBIR Phase I proposals submitted to this solicitation that meet all the requirements of an NSF STTR Phase I proposal may, at NSF's discretion, be considered for award as an STTR Phase I, If recommended for an STTR Phase I award, the small business proposer will need to complete a Cooperative Research Agreement (CRA) between the small business and the research institution prior to award. NSF may also, at its discretion, convert NSF STTR Phase I proposals to NSF SBIR Phase I proposals; the award mechanism for either will be a fixed price grant.

The NSF SBIR/STTR programs have three submission windows. Unlike deadlines, submission windows allow small businesses the flexibility to submit a full proposal at any time during the specific dates listed at the top of this document. The proposal submission system (FastLane) will shut down at 5:00 p.m. proposer's time on each submission window closing date, but, with the exception of the final submission window which closes in October, the system will then reopen for new submissions the following morning. After the final submission window closes in October, it is anticipated that a new or updated solicitation will be posted shortly thereafter.

The NSF SBIR/STTR programs provides non-dilutive, grant funding for the development of deep technologies, based on discoveries in fundamental science and engineering for societal and economic impacts, and welcomes the submission of Project Pitches and full proposals (from companies invited to submit) in nearly all technical areas,

NSF proposals are confidential and will only be shared with a small number of reviewers and NSF staff (as appropriate). All of these individuals have agreed to maintain the confidentiality of the proposal content. Proposals to NSF do not constitute a public disclosure. If selected for a Phase I award, a company will be prompted to write a publicly available project summary and an abstract that summarizes the intellectual merit and broader impact of the project.

NSF requires that all proposals include Biographical Sketches and Current and Pending Support documents using a new format specific for NSF SBIR/STTR proposals. For NSF SBIR or STTR proposals, follow the guidance provided in Section V.A of this solicitation (Proposal Preparation and Submission Instructions). Step-by-step guidance can also be



### NSF – SBIR/STTR

### For applicants

If you're interested in applying for funding, we encourage you to watch our videos, join us at an event, or reach out directly to our program directors to learn more about the program and what we hope to see in your proposal.

#### **Virtual Office Hours**

Thinking of applying for Phase I funding? Ask all your application-related questions during our Virtual Office Hours or watch a recorded program overview or a recorded how to apply overview. (We offer a PDF version of program basics 2, too.)

### **Startup profiles**

Get to know our awardees better — we've got video profiles of startups and small businesses that have received NSF funding ...

### **Project Pitch**

Wondering if your idea is a good fit? The first step in the process is to submit your written <a href="Project Pitch">Project Pitch</a>. Startups or entrepreneurs who submit a Project Pitch will learn if they meet the program's objectives and be invited to submit a full proposal.

### **Apply**

Once you've received an invitation to submit a proposal (via the Project Pitch process), we encourage you to dig into the following resources to support you as you create your SBIR/STTR proposal.

APPLY

Step by step guide

Review guidelines

Watch the videos

THE BASICS

PROJECT PITCH

FULL PROPOSAL

#### **Get started**

GET STARTED

Learn how startups can get up to \$2 million to develop deep technologies. We'll walk you through our process and timeline, how to submit a Project Pitch and what to expect along the way.



PROPOSAL REVIEW & DECISION

#### **Process Overview**





### NSF – Project Pitch

The required Project Pitch allows startups and small businesses to get quick feedback at the start of their application for Phase I funding

The Project Pitch is a <u>short three-page online form</u>

The Technology Innovation (Up to 500 words)

- The Technical Objectives and Challenges (Up to 500 words)
- The Market Opportunity (Up to 250 words)
- The Company and Team (Up to 250 words)

Feedback is given within three weeks of submission

A successful Project Pitch allows the applicant to submit a Phase I application

Only one Project Pitch is allowed at any given time, with a maximum of two total per quarter



### NSF Project Pitch

#### Section 1: The Technology and Innovation (500 words)

- Provide a general overview of the following (do not get detailed here give an "elevator pitch" style explanation):
- Explain the origins of the innovation.

#### Section 2: The Technical Objectives and Challenges (500 words)

- Describe the proposed R&D/technical work, either step-by-step or by aims. Include details about technical specifications or challenges to success.
- Discuss the technical risks of the project with emphasis on aspects that meet the NSF mandate.
- Explain specifics of how the work will:
- Describe how this work will impact commercially feasibility and viability.

#### Section 3: The Market Opportunity (250 words)

- Describe the customer profile. What is the market and what is type of customer in the market that needs this product or service?
- What are the "pain points?" Why does the customer (or society) need this product or service?

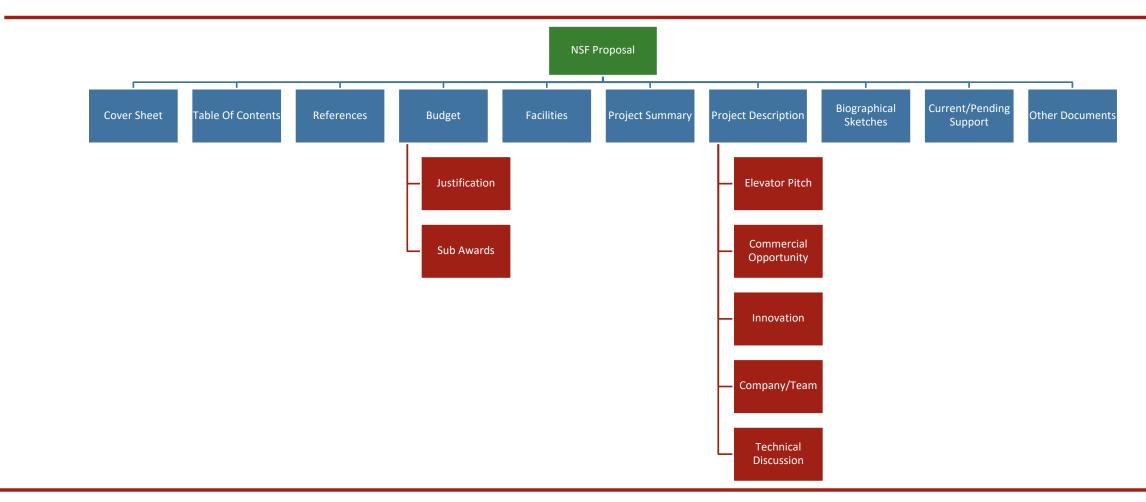
#### Section 4: The Company and Team (250 words)

- Describe the company's background and the key team members that will lead the technical and/or commercial efforts?
- What is the current status of the company.

#### Detailed rubric and instructions available at APIOiX



# Components of a Proposal to NSF – Phase I





## Components of a Proposal to NSF – Phase I

Cover Sheet and Certification

Project Summary – 1 page **maximum** – <u>no proprietary information</u>

Project Description – 10 pages minimum, 15 pages maximum

- Elevator pitch: 1 page or less
- The commercial opportunity: 2 -4 pages
- The technical solution: 1-3 pages
- The company/team: 1-3 pages
- Intellectual merit, technical discussion, and R&D plan: 5 (min)-6 pages
- Broader impacts: 1 page

References Cited

Biographical sketches

Budget, subaward budget

Budget justification



#### Elevator pitch (1 page or less)

- The Customer who, why, what unmet need
- The Value Proposition why would they buy it, benefits to the customer, difference from competition, societal value
- The Innovation description, novelty, differentiate from currently available solutions



### Commercial opportunity (2-4 pages)

- Total market, addressable market
- Market drivers, barriers, economics
- Market opportunity validated, customers, business model, competitive landscape (now and projected)
- Commercial risks
- Commercialization approach revenue potential, underlying assumptions
- Resources what is needed, plans to acquire



#### Technical solution (1-3 pages)

- Description of solution and the technology stage of development
- Key technical challenges and risks what risks are you mitigating in Phase I
- Intellectual property background, foreground, plan to protect
- NSF lineage\* roots in non-SBIR/STTR NSF funding
- I-Corps lineage\* Participation in an I-Corps cohort



### The company/team (1-3 pages)

- Founders & key personnel level of effort, backgrounds and experience relevant to undertake the project
- Vision, mission, and objectives
- Business fit
- Revenue history (if applicable) includes funding from all sources
- Consultants & subawards role, qualifications, expertise



- Intellectual Merit, technical Discussion and R&D Plan (5 (min)-6 pages)
  - Detailed description of innovation why, benefits, additional background
  - Key objectives phase I aims that address <u>technical & commercial</u> feasibility
  - Milestones key technical goals
  - R&D plan timeline, objectives, experiments, computations, etc. need to reflect key objectives



#### Broader impact (1 page)

- Societal and economic benefit (American Innovation and Competitiveness Act (P.L. 114-329, Section 102))
  - Increasing the economic competitiveness of the United States.
  - Advancing of the health and welfare of the American public.
  - Supporting the national defense of the United States.
  - Enhancing partnerships between academia and industry in the United States.
  - Developing an American STEM workforce that is globally competitive through improved pre-kindergarten through grade 12 STEM education and teacher development, and improved undergraduate STEM education and instruction.
  - Improving public scientific literacy and engagement with science and technology in the United States.
  - Expanding participation of women and individuals from underrepresented groups in STEM.



**References Cited** 

Biographical sketches

Budget, subaward budget

Budget justification



### NSF – Project Description Summary

#### **Elevator Pitch (no more than one page)**

Concisely describe the customer, value proposition, and innovation

#### The Commercial Opportunity (recommended length: 2-4 pages)

 Describe your commercialization approach. Discuss the potential economic benefits associated with your innovation, and provide estimates of the revenue potential, detailing your underlying assumptions

### The Innovation (recommended length: 1-3 pages)

• Briefly describe the innovation, status and intellectual property

### The Company/Team (recommended length: 1-3 pages)

 Describe the company founders or key participants in this proposed project. What level of effort will these persons devote to the proposed Phase I activities

#### Technical Discussion and R&D Plan (minimum length: 5 pages, recommended length: 5-7 pages)

 Describe the innovation in sufficient technical detail for a knowledgeable reviewer to understand why it is innovative and how it can provide benefits in the target applications. Supplement this description with any necessary background information



### Commercialization Assistance (TABA)

Funds (beyond the funds for R&D) are provided to assist with commercialization efforts for Phase II ONLY

• Phase II: \$50,000 Max

TABA funds are required to be spent with a third-party service provider (individual or institution)

TABA funds can't be spent on employee salaries, company travel or other internal company expenses

The TABA request must include specific information about the activities to be undertaken, service provider profile, expected outcomes, and letter of commitment/statement of work



### Most Frequent Errors

Serious Errors (Applications Ineligible for Review or Administratively Declined)

- Failed to update SAM registration early—unable to submit application to FastLane by deadline
- Failed to submit a Project Pitch and/or failed to secure an invitation
- Failed to accurately calculate level of effort (for SBIR and/or STTR)
  - Use Level-of-Effort worksheet to assist you with the calculation
- Failed to meet Principal Investigator hours requirement
  - 51% or greater commitment from the PI

Other Errors (may limit funding eligibility or delay award processing, if recommended for award)

- Failed to properly mark proprietary data
  - See FOA for instructions
- Failed to complete budget form(s) correctly
  - Amounts should be rounded to the nearest dollar and only include funds requested for the grant
  - Amounts listed on the budget form should match the amounts listed on the budget justification
  - Include a completed subaward budget form for each subaward
- Failed to include Letter(s) of Commitment
  - Submit a Letter of Commitment for each Consultant and Subaward



### NSF SBIR/STTR Current Statistics

NSF Current Statistics
(as of October 10, 2022)

### **Active awardees:**

#### Phase I active awardees ~

Active awardees are those who are still conducting research outlined in their proposals and who haven't yet reached the estimated end dates.

293

Number of companies with active awards

Phase I seed funding

\$253,767

Average amount of funding awarded for each company

43

Total states and territories

59%

of the companies from the most recent 2017 cohort are <3 years old



### Resources

APIOiX Small Business and Technical Assistance: <a href="https://apioix.com/sbir-assistance">https://apioix.com/sbir-assistance</a>

Provide general information and email link to obtain additional information

SBIR / STTR Tools & Resources: <a href="https://apioix.com/tools-resources">https://apioix.com/tools-resources</a>

 Links to finding grant solicitations, examples of successful proposals (Phase I, Phase II, Fast Track), NSF Project Pitch rubric, budget templates for NIH and NSF Phase I proposals, budget justification templates for NSF and NIH

APIOiX Learning Center: <a href="https://apioix.com/learning-center">https://apioix.com/learning-center</a>

 Access to presentations on SBIR/STTR topics such as budgeting basics, subcontracting, how to write a winning proposal, basics of customer discover, and agency specific requirements.

SBIR presentations and slides: <a href="https://www.sbir.gov/tutorials/accounting-finance/">https://www.sbir.gov/tutorials/accounting-finance/</a>

Salary validation: <a href="https://www.bls.gov/oes/current/oes\_nat.htm#11-0000">https://www.bls.gov/oes/current/oes\_nat.htm#11-0000</a>

NIH annotated SF424: <a href="https://grants.nih.gov/grants/ElectronicReceipt/files/Annotated\_Forms\_SmallBus\_forms-e.pdf">https://grants.nih.gov/grants/ElectronicReceipt/files/Annotated\_Forms\_SmallBus\_forms-e.pdf</a>



### Thank You



Arundeep S. Pradhan, MS Pharm Ad., RTTP has been engaged in technology transfer for over 30 years; was at the forefront of creating the biotech burst in Salt Lake City; helped develop the first biotech roadmap for Colorado; and, helped create the first biotech incubator and the first translational research development center in Portland, Oregon. Mr. Pradhan served on the AUTM Board, was the AUTM President in 2009, and AUTM Foundation President and Board Chair in 2011. He was the interim CEO of a research tools startup and currently serves as the president of Apio Innovation Transfer (APIOiX) and as the CEO and the vice-president for business development of Practical Biotechnology, an oncology therapeutics startup. Mr. Pradhan managed technology transfer offices at the University of Utah, Colorado State University Research Foundation, and Oregon Health and Science University. He continues to work with clients across the globe. <a href="mailto:arundeep@apioix.com">arundeep@apioix.com</a>



Ray Wheatley, MS CLP(E) is former Director for Technology Commercialization in the Office for Technology Development at the University of Texas Southwestern Medical Center, retiring in 2015 with 31 years of service. Mr. Wheatley and his staff evaluated over 2,500 new invention disclosures which led to more than 650 issued US patents and hundreds of foreign patents. These efforts resulted in more than 900 negotiated option agreements, license agreements and intellectual property management agreements generating more than \$178 million in license revenues. In addition, over 30 start-up companies were created. He has worked with US and foreign companies, including major pharmaceutical companies, venture capital firms and leading medical device manufacturers. He has been an invited speaker at many national and international meetings and has spoken on a variety of topics, most notably on negotiation skills and advanced licensing topics, ray@apioix.com



Michael Batalia, PhD is a serial entrepreneur and an expert in academic technology commercialization. He is also a member of the Mission II Team for the Perlan Project, an effort to fly engineless aircraft to the edge of space. He has over 16 years of experience in academic technology transfer, intellectual property management, and licensing at Wake Forest University as executive director of commercialization and North Carolina State University as associate director then director of technology transfer. Dr. Batalia is active regionally and internationally in support of technology transfer and biotechnology. He has served on the Boards of the Association of University Technology Managers, the North Carolina Biotechnology Center, the Biotechnology Advisory Committee of Piedmont Triad, and the North Carolina Center of Innovation for Nanobiotechnology. He is a co-founder of Wide Eyed Technologies and the CSO for Arctic, Inc. michael@apioix.com

