U.S. DEPARTMENT OF ENERGY | Office of Science

The DOE Nuclear Physics SBIR/STTR Program

SBIR/STTR Exchange Meeting
August 13-14, 2020
via Zoom

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Office of Nuclear Physics

Outline

- Expectations for Professional Conduct
- DOE SBIR/STTR goals, funding, organization, and administration
  - The Sequential Phase IIA and IIB awards
- The Nuclear Physics (NP) Program Missions
  - Supporting these missions within the NP SBIR/STTR program
- Exchange meeting goals and agenda
- NP SBIR/STTR applications and awards metrics (FY 2020)
- The NP Mission and how it translates into SBIR/STTR Topics/Subtopics
- The DOE NP SBIR/STTR Program in FY2021
  - Commercialization and outreach efforts
- Presentation Notes
- Conclusions

The SC statement on Diversity, Equity & Inclusion

The direct link is:

https://science.energy.gov/sc-2/research-and-conduct-policies/diversity-equity-and-inclusion/

“The DOE Office of Science (SC) is fully committed to fostering safe, diverse, equitable, and inclusive work, research, and funding environments that value mutual respect and personal integrity. Effective stewardship and promotion of diverse and inclusive workplaces that value and celebrate a diversity of people, ideas, cultures, and educational backgrounds is foundational to delivering on the SC mission. The scientific community engaged in SC-sponsored activities is expected to be respectful, ethical, and professional.

The DOE SC does not tolerate discrimination or harassment of any kind, including sexual or non-sexual harassment, bullying, intimidation, violence, threats of violence, retaliation, or other disruptive behavior in the federal workplace, including DOE field site offices, or at national laboratories, scientific user facilities, academic institutions, other institutions that we fund, or other locations where activities that we support are carried out…”

The DOE SBIR/STTR Program

SBIR: Small Business Innovation Research STTR: Small Business Technology TRansfer.

- SBIR: Set-aside program for U.S. small businesses (SB) to engage in Federal Research and Development (R&D) with potential for commercialization. (Participations: SB: minimum 66 % for Phase I and 50% for Phase II, Research Institution (RI): optional)
- STTR: Set-aside program to facilitate cooperative R&D between SB and U.S. RI with potential for commercialization. (Participations: SB: minimum 40%, RI: minimum 30%)
- "Both": submitted for consideration as SBIR or STTR (both). Must satisfy the minimum participation requirements listed above for both SBIR and STTR.
- Congressionally-mandated programs, funded by a small percentage of the extramural R&D budget set aside within each DOE technical program that participates.
- 2016 reauthorization bill has provided funding for the program until September 2022

	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	-----	FY2022
SBIR	0.028	0.029	0.030	0.032	0.0320	0.0320	----	0.0320
STTR	0.004	0.0045	0.0045	0.0045	0.0045	0.0045	----	0.0045
Total	**3.20%**	**3.35%**	**3.45%**	**3.65%**	**3.65%**	**3.65%**	----	**3.65%**

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The DOE SBIR/STTR Phases (FY20)

PHASE I: FEASIBILITY, PROOF OF CONCEPT
- Award Amount: $200,000 (guideline), $250,000 (max.)
- Project Duration: 12 months

PHASE II: CONTINUE R/R&D FOR PROTOTYPES OR PROCESSES
- Award Amount: $1,100,000 (guideline), $1,600,000 (max.)
- Project Duration: 2 years

SEQUENTIAL PHASE IIA OR IIB: CONTINUE R/R&D FOR PROTOTYPES OR PROCESSES
- **PHASE IIA: FOR CERTAIN PROTOTYPES, PRODUCTS, OR PROCESSES THAT NEED MORE DEVELOPMENT**
- **PHASE IIB: FOR R&D FUNDING REQUIRED TO TRANSITION AND/OR INNOVATION TOWARDS COMMERCIALIZATION.**
- Award Amount: $1,100,000
- Project Duration: 2 years

PHASE III: COMMERCIALIZATION
- Federal or Private Funding (non-SBIR/STTR funds)
- No dollar or time limits

- New Sequential Phase IIC to help increase commercialization potential

Slide modified from M. Oliver, SBIR/STTR Office

Phase I Funding Opportunity Announcements Participating DOE Programs (FY 2020)

Phase I Release 1

- Office of Advanced Scientific Computing Research (ASCR)
- Office of Basic Energy Sciences (BES)
- Office of Biological and Environmental Research (BER)
- **Office of Nuclear Physics (NP)**

Phase I Release 2

- Office of Cybersecurity, Energy Security, and Emergency Response (CESER)
- Office of Defense Nuclear Nonproliferation (NA)
- Office of Electricity (OE)
- Office of Energy Efficiency and Renewable Energy (EERE)
- Office of Environmental Management (EM)
- Office of Fossil Energy (FE)
- Office of Fusion Energy Sciences (FES)
- Office of High Energy Physics (HEP)
- Office of Nuclear Energy (NE)

Modified from a slide originally from M. Oliver, SBIR/STTR Office

FY20 SBIR/STTR award funding levels and requirements on Research Institution participation

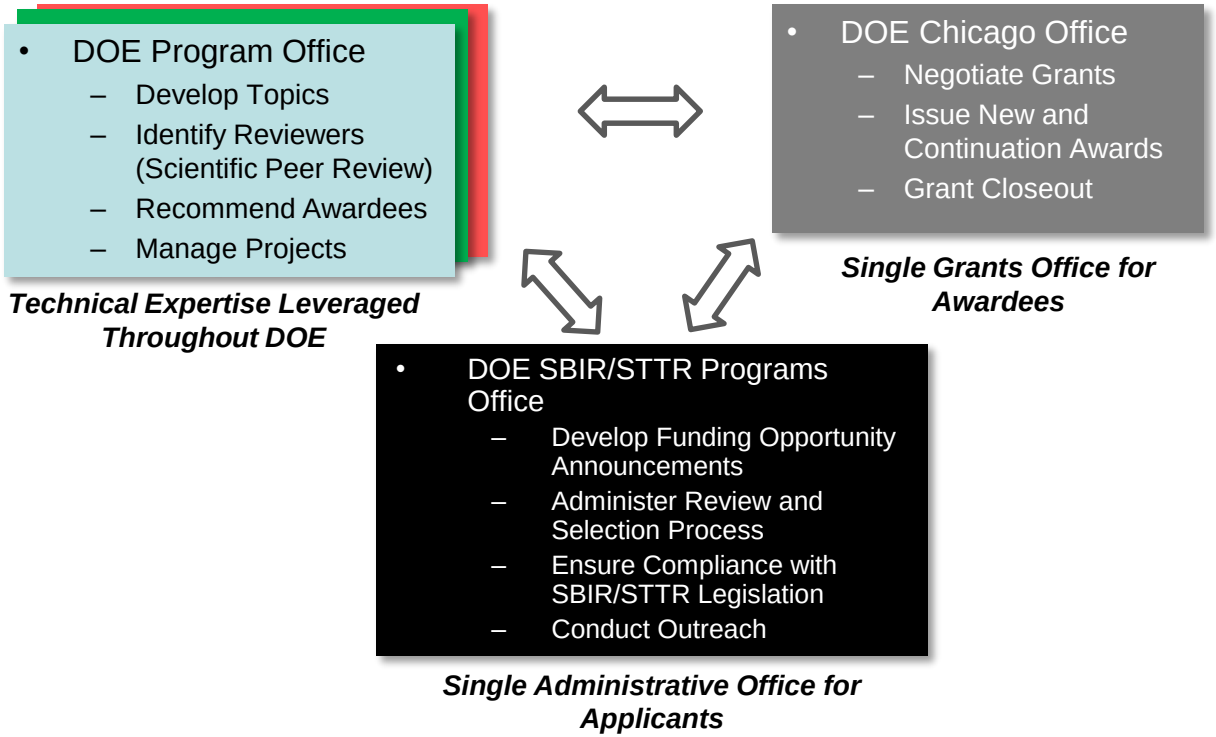
Phase I

Grant	Max award ($k)	Small Business (Level of Effort)	Research Institution (Level of Effort)
SBIR	200	Min 66%	Optional
STTR	200	Min 40%	Min 30%

Phase II (including Sequential phases)

Grant	Max award ($k)	Small Business (Level of Effort)	Research Institution (Level of Effort)
SBIR	1100	Min 50%	Optional
STTR	1100	Min 40%	Min 30%

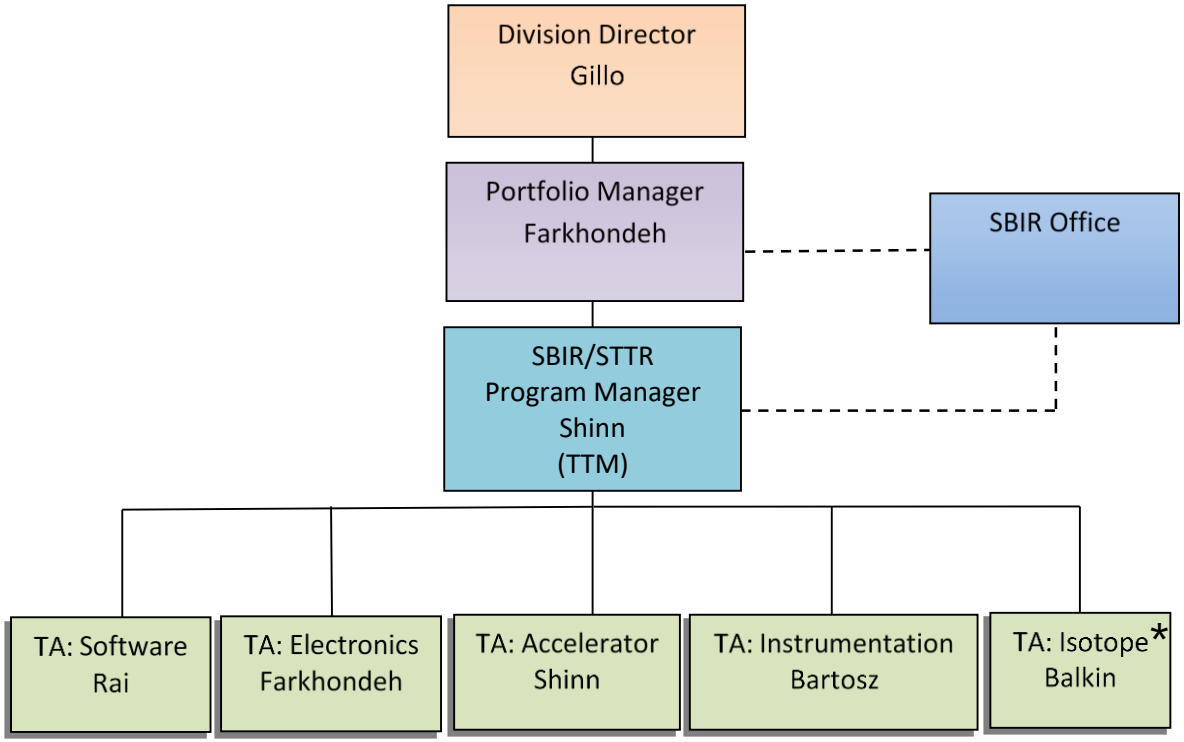
Organization of the DOE SBIR and STTR Programs



- NP recommends what R&D gets funded, but is otherwise freed of much of the administration of those funds.

Slide courtesy M. Oliver SBIR/STTR Office

NP SBIR/STTR Org. Chart 10/01/2018



Technical Topic Manager (TTM) Activities

- Communicate w/ SBIR Office
- Prepare annual solicitation
- Chair 1st step panel review
- Organize & Chair Exchange Meeting
- Rank proposals
- Recommend funding
- Visit companies
- Read progress and final reports
- 2nd year continuation

Topic Associate (TA) Activities for Assigned Topics

- Provide input to annual solicitation
- *Assign reviewers
- *Assess proposals
- Manage assigned grants
- Read reports assigned

*Time Sensitive tasks

- *In 2020 the DOE Isotope Program became its own Office
- It will not participate in the SBIR/STTR program
- Active Ph I and Ph II awards will still have the opportunity to apply for future award
  - *e.g.*, Ph I → Ph II

Sequential II A, B, and C

2012 SBIR/STTR Reauthorization permitted agencies to issue sequential Phase II awards

- 15 USC 638 (ff) Additional SBIR and STTR awards. (1) Express authority for awarding a sequential Phase II award. A small business concern that receives a Phase II SBIR award or a Phase II STTR award for a project remains eligible to receive 1 additional Phase II SBIR award or Phase II STTR award for continued work on that project.
- Only Phase II awardees are eligible
- Only 1 additional sequential Phase II award may be made per Phase II project

Invitation needed →

Phase IIA: For certain prototypes, products, or processes that need more than a single Phase II award. Starts immediately upon completion of the Phase II.

- *DOE NP Program Managers will select the topics/subtopics for which Phase IIA applications will be accepted (By subtopic invitation only)*

No Invitation needed →

Phase IIB: For R&D funding required to transition an innovation towards commercialization. Starts immediately after completing a Phase II or up to 1 year later.

Phase IIC: An R&D to improve commercialization outcome – requires equal match in funding (up to $1.1M) right after either a Phase IIA or Phase IIB

In the FY 2020 Phase II cycle: NP received 5 Ph IIAs, 3 Ph IIBs, and 1 Ph IIC applications. We funded 2 Ph IIAs and 1 Ph IIC, the first for DOE! As sequential IIA,B, and C compete with new Phase II applications, the success rate is usually lower.

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Sequential Phase II timing

Sequential Phase IIA

Sequential Phase IIB

A Phase IIC immediately follows the Phase IIA or IIB

Slide: Courtesy of Dr. Manny Oliver

No Fund Extensions and Sequential Phase II Eligibility

- A company can only receive a Sequential Phase II award if their Phase II project has completed.
  - Phase IIA applicants should not request no fund extensions
  - Phase IIB applicants should not request no fund extensions if they are still working on their Phase II project at the time of application.

Slide: Courtesy of Dr. Manny Oliver

The NP SBIR/STTR Exchange Meeting

- NP is seeking to effectively assess the performance of NP supported SBIR/STTR projects in contributing to the NP mission and goals. Started in FY2010, the Exchange Meeting is designed to serve that purpose and to achieve the following goals:
  - To **provide a platform** for small businesses to present the status of NP-supported Phase II grant work to the NP community and Federal Program Managers.
  - To offer an opportunity to **exchange information** regarding the **companies' capabilities** and the technical needs of the NP programs.
  - To **strengthen the ties** of the SBIR/STTR businesses **with the community** and enhance the possibilities for commercialization.
- For this year's meeting, all Phase II awardees at the end of Year-1,Year-2 (started in FY19 and 18) and awards still active or recently concluded under "no cost extension" are invited. A total of 37 SBIR/STTR PI presentations will be given in 2 days, 30 in the General Session and 7 in Session B.
- There is also a 3rd "room", the "Lobby", where groups may have meetings – ask the host
- <u>FY 2020 Phase II awardees are invited as participants only and will be invited to present in the next two year's meetings.</u>
- Also included are three keynote talks related to the NP user facilities, their capabilities and needs in view of the NP SBIR/STTR program.
- <u>A talk by Dr. Manny Oliver, Director of the DOE SBIR/STTR Program Office</u> will be on the 2nd day of the meeting.

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2020 Exchange Meeting Agenda (Day 1)

Meeting Agenda-Day 1

Rows in blue font will be held in the Session B room

Time	Dur. (min)	Grant Title	Speaker	Organization	NP SBIR/ STTR Topic	Grant Status
Thursday, August 13, 2020						
10:00 AM	5	Welcome and Introductory Remarks	Gillo, Jehanne	DOE, Office of Nuclear Physics		
10:05 AM	5	Welcome and Introductory Remarks	Farkhondeh, Manouchehr	DOE, Office of Nuclear Physics		
10:10 AM	35	NP SBIR/STTR Program Overview	Shinn, Michelle	DOE, Office of Nuclear Physics		
10:45 AM	20	Manufacturing and Packaging of Reliable Bialkali Photocathodes via Sputtering	Bhandari, Harish	Radiation Monitoring Devices, Inc., MA	Accelerator	End Year 2
11:05 AM	20	HOM Absorber Design for eRHIC ERL Cavity	Schultheiss, Thomas	TJS Technologies, NY	Accelerator	End Year 1
11:25 AM	15	**Coffee Break**				
11:40 AM	35	NP Low Energy Facilities and the SBIR/STTR Program	Chipps, Kelly	Oak Ridge National Laboratory		
12:15 PM	20	Techniques for Energetic Ion Assisted in-situ Coating of Long, Small Diameter, Beam Pipes with Compacted Thick Crystalline Copper Film	Custer, Arthur	Poole Ventura Inc, CA	Accelerator	End Year 2
12:35 PM	20	Development of Gen-II LAPPDTM Systems For Nuclear Physics Experiments	Foley, Michael	Incom Inc., MA	Instrumentation	End Year 1/Ph IIA
12:55 PM	35	**Lunch Break**				
1:30 PM	35	Jefferson Lab and the NP SBIR/STTR Program	Spata, Michael	Thomas Jefferson National Accelerator Facility		
2:05 PM	5	**Break - allow movement between sessions as needed**				
2:10 PM	20	Nuclear Physics Gamma-ray Imaging System for Real-Time Rare Isotope Harvesting, Monitoring and Radiochemical Separation	Hull, Ethan	PHDs Co., TN	Instrumentation	End Year 2
2:10 PM	20	Multi-scale Modeling for Beam-beam Depolarization	Zilberter, Ilya	Tech-X Corporation, CO	Accelerator	End Year 2/NCE
2:30 PM	20	Accurate Spin Tracking on Modern Computer Architectures for Electron-Ion Colliders	Nash, Boaz	RadiaSoft LLC, CO	Accelerator	End Year 2
2:50 PM	5	**Break - allow movement between sessions as needed**				
2:55 PM	20	IP Access Gateway	Radulescu, Radu	Telluric Labs, NJ	Electronics	End Year 2
2:55 PM	20	A Novel Injection-locked Amplitude-Modulated Magnetron at 1497 MHz	Neubauer, Mike	Muons, Inc., IL	Accelerator	End Year 2/NCE
3:15 PM	20	Distributed Digital Data Acquisition System with Network Time Synchronization	Henning, Wolfgang	XIA LLC, CA	Software	End of Year 2
3:35 PM	20	Dynamic Friction in Magnetized Electron Coolers for Relativistic Beams	Bruhwiler, David	RadiaSoft LLC, CO	Accelerator	End Year 1 Ph IIA
3:55 PM	20	Radiation Hard High Speed Camera System for Accelerator Beam Diagnostics	Engelman, Matt	Alphacore Inc, AZ	Instrumentation	Year II/PH IIA
4:15 PM	5	**Break - allow movement between sessions as needed**				
4:20 PM	20	A Multi-channel Radiation-tolerant, Low power, High-speed, and Resolution Analog-to-Digital Converter for Nuclear Physics Detectors	Gui, Ping	TallannQuest LLC, TX	Electronics	End Year 1
4:20 PM	20	Software-Driven Network Architecture for Synchronous Data Acquisition	McMillian, Gary	Crossfield Technology LLC, TX	Software	End Year 2/NCE
4:40 PM	20	Automated Preparation of 211AT for Targeted Alpha Theraphy Applications	Marshall, Graham	Global FIA, Inc., WA	Isotope	End Year 1
5:00 PM	5	**Break - allow movement between sessions as needed**				
5:05 PM	20	Low Cost Data Acquisition Synchronization for Nuclear Physics Applications	Skulski, Wojtek	SkuTek Instrumentation, NY	Software	End Year 1
5:05 PM	20	A Magnetized Injector for Electron Cooling Applications	Smolenski, Karl	Xelera Research LLC, NY	Accelerator	End Year 2/NCE
5:25 PM	20	Modeling Plasma Discharge Cleaning of SRF Cavities	Leddy, Jarrod	Tech-X Corporation, CO	Accelerator	End Year 1
5:45 PM	0	**Adjorn**				

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2020 Exchange Meeting Agenda (Day 2)

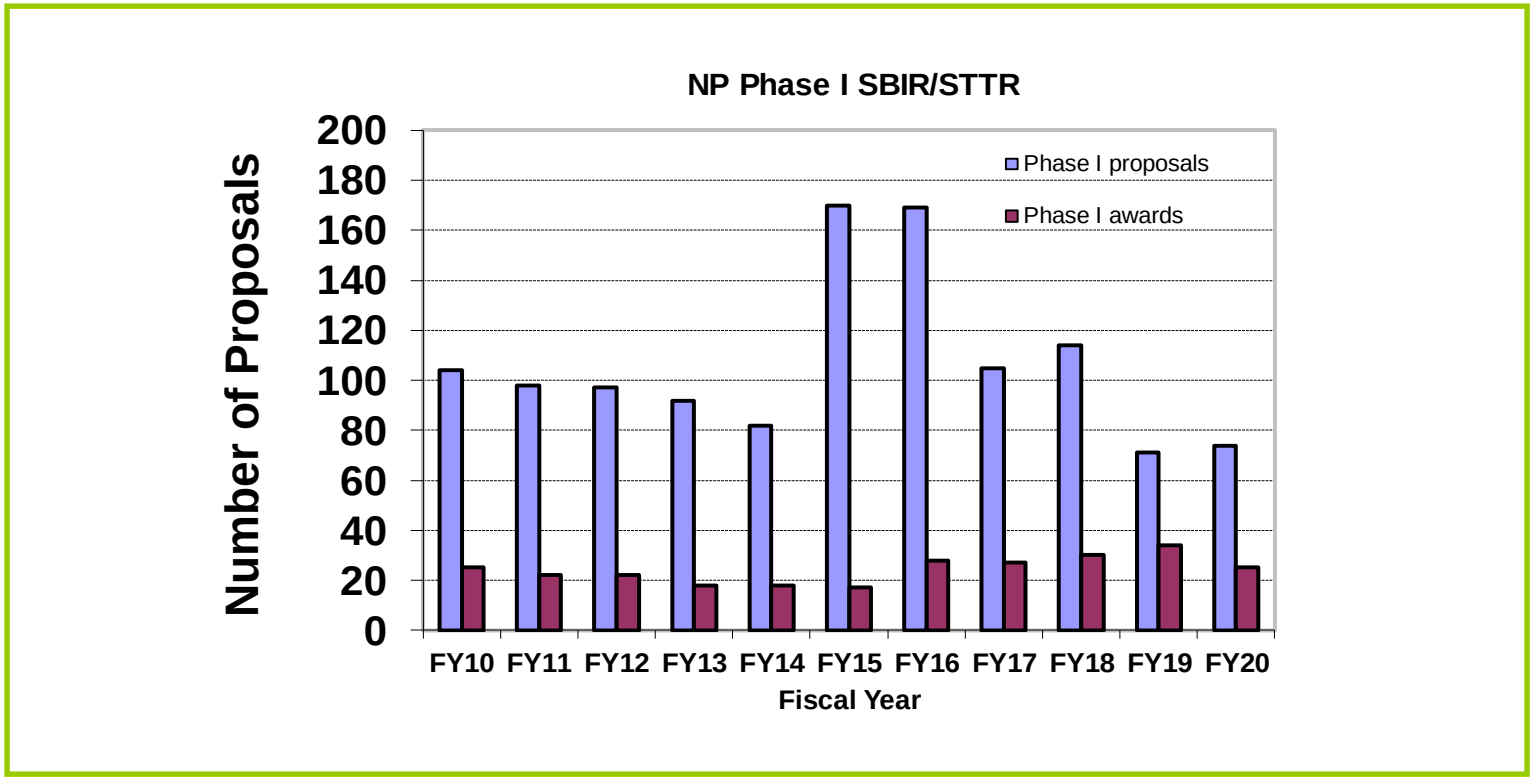
Meeting Agenda-Day 2

Rows in blue font will be held in the Session B room

Time	Dur. (min)	Grant Title	Speaker	Organization	NP SBIR/ STTR Topic	Grant Status
Friday, August 14, 2020						
10:00 AM	20	A Scalable Additive Manufacturing Technology For Large Area Printed Circuit Boards	Kumar, Nalin	UHV Technologies, Inc., KY	Electronics	End Year 2
10:20 AM	20	Scintillating Bolometer Crystal Growth and Purification for Neutrinoless Double Beta Decay Experiments	Squillante, Michael	Radiation Monitoring Devices, Inc., MA	Instrumentation	End Year 1/Ph IIA
10:40 AM	20	Boron Nitride Nanotube Vibration Damping for SRF Structures	Whitney, Roy	BNNT, LLC, VA	Accelerator	End Year 1
11:00 AM	15	**Coffee Break**				
11:15 AM	20	Long-Term Radiation Rugged Rotary Vacuum and Water Seals in Heavy-Ion Accelerators	Lalli, Jennifer	NanoSonic, Inc, VA	Instrumentation	End Year 2
11:35 AM	35	The Relativistic Heavy Ion Collider Facility and its SBIR/STTR Opportunities	Minty, Michiko	Brookhaven National Laboratory		
12:10 PM	20	12-bit 32 Channel 500MSps Low Latency ADC	Baranauskas, Dalius	Pacific Microchip, CA	Accelerator	End Year 2
12:30 PM	20	Radiation Hardened Opto-atomic Magnetometer	Choi, Jae	Hedgefog Research Inc., CA	Instrumentation	End Year 1
12:50 PM	35	**Lunch Break**				
1:25 PM	20	Multi-Channel Readout IC for Nuclear Physics Experiments	Bikkina, Phaneendra	Alphacore Inc., AZ	Instrumentation	End Year 2
1:25 PM	20	Long length Welded NbTi CIC Superconducting Cable for Accelerator Applications	Tomsic, Michael	Hyper Tech Research, Inc., OH	Accelerator	End Year 2/NCE
1:45 PM	20	Resonant Polarimetry and Magnetometry.	Roberts, Brock	Electrodynamic, NM	Accelerator	End Year 2
2:05 PM	35	Update on the Department of Energy SBIR/STTR Program, Q/A	Oliver, Manny	DOE, SBIR/STTR Office		
2:40 PM	20	High Power Extremely Narrow Linewidth Diode Laser for Polarizing ^{3}He Target	Lu, Steven	Raytum Photonics, VA	Instrumentation	End Year 2
3:00 PM	5	**Break - allow movement between sessions as needed**				
3:05 PM	20	Low RF Loss DC Conductive Ceramic for High Power Input Coupler Windows for SRF Cavities	Freemire, Ben	Euclid Techlabs LLC, OH	Accelerator	End Year 2 PH IIB
3:05 PM	20	Design and Fabrication of the ASoC: a System-on-Chip Data Acquisition System	Mostafanezhad, Isar	Nalu Scientific, LLC, HI	Electronics	End Year 2/NCE
3:25 PM	15	**Coffee Break**				
3:40 PM	20	Graphene Backing for Radioisotope Targets	Fink, Richard	Applied Nanotech, Inc., TX	Instrumentation	End Year 2
4:00 PM	20	An ASIC with a Low Power Multichannel ADC for Energy and Timing Measurements	Karnitski, Anton	Pacific Microchip Corporation, CA	Instrumentation	End Year 1
4:20 PM	20	Radiation Hardened Infrared Focal Plane Arrays	Chang, Yong	Epir, Inc., IL	Instrumentation	End Year 1
4:40 PM	20	Precise and Ultra-stable Laser Polarization Control for Polarized Electron Beam Generation	Guo, Bo	Raytum Photonics LLC, VA	Instrumentation	End Year 1
5:00 PM	5	**Break - allow movement between sessions as needed**				
5:05 PM	20	Low Cost, High-Density Digital Electronics for Nuclear Physics	Skulski, Wojtek	SkuTek Instrumentation, NY	Electronics	End Year 2 Ph IIB
5:05 PM	20	A Novel Ionizing Particle Beam Fluence and Position Detector Array using the Micromegas Technology with Multi-coordinate Readout	Galyaev, Evgeny	Radiation Detection and Imaging Technologies, LLC, AZ	Instrumentation	End Year 2/NCE
5:25 PM	0	**Adjourn**				

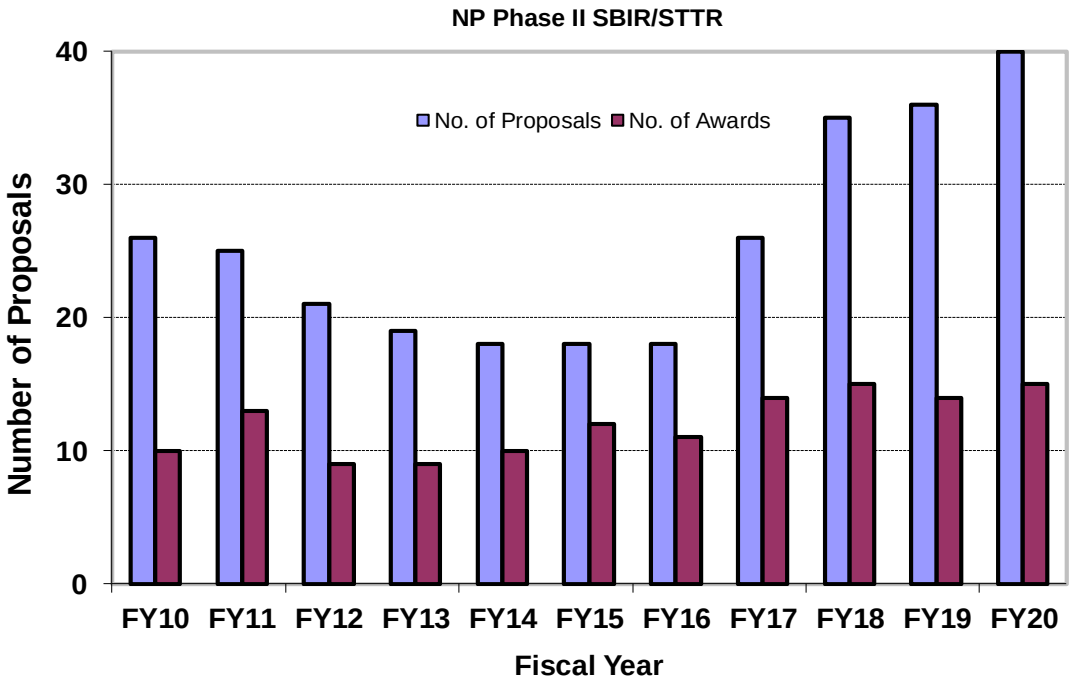
NP Phase I SBIR/STTR Applications and Awards

- NP received a Total of **144** LOI and **79** phase I proposals in FY 2020, with **458** review requests for a total of **181** mail reviews. Total of **25** proposals funded (*cf* 34 in FY19) due to increased amount of awards



NP Phase II SBIR/STTR Applications and Awards

- The increased number of Phase I awards in FY19 is reflected in the increased number of FY20 Phase II proposals. Only by adjusting the Phase I/Phase II funding percentages were we able to keep the number of Phase II awards from decreasing.



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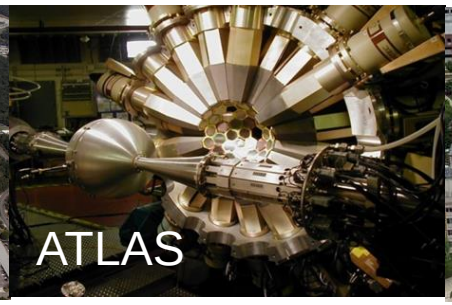
Nuclear Physics Mission

Discovering, exploring, and understanding all forms of nuclear matter

The Scientific Challenges

- The existence and properties of nuclear matter under extreme conditions, including that which existed at the beginning of the universe
- The exotic and excited bound states of quarks and gluons, including new tests of the Standard Model
- The ultimate limits of existence of bound systems of protons and neutrons
- Nuclear processes that power stars and supernovae, and synthesize the elements
- The nature and fundamental properties of neutrons and the neutrino and their role in the evolution of the early universe



How the NP Mission translated into programs for FY20

- NP's major program areas are:
  - Heavy Ion Nuclear Physics
  - Medium Energy Physics
  - Nuclear Structure-Nuclear Astrophysics
  - Fundamental Symmetries
  - Nuclear Theory
  - Isotope Development and Production for Research and Applications

Nuclear Structure-Nuclear Astrophysics and Fundamental Symmetries } Low Energy Nuclear Physics

- Accelerator Science and Technology is a major component that facilitates all of the NP subprograms.

NP SBIR/STTR Topics for FY20 supported these programs

- Software and Data Management
- Electronics Design and Fabrication
- Accelerator Technology
- Instrumentation, Detection Systems and Techniques
- Isotope Science and Technology

- Every year there is subtopic revision, based on community input.

Our Topic narratives reflect areas of NP strategic importance – our "brand"

- Within each Topic, our subtopics reflect the following strategy,
- Use SBIR/STTR funding of small businesses to maintain leadership in technology areas where NP has unique needs.

  - SRF accelerators and related technologies (*e.g.* cryogenics)
  - Polarized sources
  - CW RF sources
  - High current ion sources
  - Detectors with emphasis on particle identification
  - Microelectronics for extreme environments *e.g.*, high rad from a range of heavy ions, cryogenic (≤2 K)

- We are interested where applicable in R&D that advances the recently published DOE Initiatives on AI/ML, Large-Scale Instrumentation, Microelectronics, and QIS
- https://www.energy.gov/science/initiatives

Our SBIR/STTR Program → NP mission and strategic priorities are tied to our community and its facilities

- The 2016 National Academy of Sciences review of the DOE SBIR/STTR Phase II program had several recommendations. Two of significance are:
  - DOE should seek to develop programs linking Laboratories' procurement actions with relevant SBIR/STTR projects.
  - DOE should examine from a strategic perspective how the relationship of SBIR/STTR with the National Laboratories works today.

- We believe that the adoption by a Lab of the product from a finished grant more likely is to ask that a prototype or method be ready for testing in a NP application by the grant's conclusion
  - This increases the likelihood there will be hardware that can be rapidly purchased and deployed to fulfill the NP community's needs.
  - Which should lead to higher rates of commercialization

Subtopic requests must be right-sized & timed

- Match Facility Accel. Improvement Projects and Capital Equip. activities and mid-term upgrade plans to 3 year SBIR/STTR funding cycle.
  - Same for universities or other collaborations working on detectors.

- Coordinate with other Offices to not duplicate efforts unless a particular technology is synergistic.
  - An example might be lower cost SRF cavity fabrication that would benefit from additional investment.

- Projects must be of sufficient value to the NP community to justify the investment

FY19 Commercialization Outcomes

- The DOE SBIR-STTR Office collects Ph III (other Federal funding) outcomes for sales to US National Laboratories
- When writing PIs, we also expanded this request to include sales to other US and foreign research institutions
- Collected responses beginning with the 2018 fiscal year
  - Not everyone responded, so the numbers represent a lower bound
  - Will be an annual process

- FY19 Phase III & other worldwide sales was ~ $5.5M
  - Increased ~40% over FY18, primarily due to increased sales to other research institutions, both US and foreign
- Sales to Labs roughly equal to other research institutions
- Accelerator sales, primarily in sources, magnet components, and diagnostics accounted for about 25% of the total
- The majority was in instrumentation – detectors and electronics
- Sales of hardware based on awards made over 5 years earlier
  - It underscores the fact it takes time for Phase II prototypes to become products

NP SBIR/STTR Program Updates – FY20/21

- We continue our efforts to better connect businesses to the NP community.
  - We provide the link to the SBIR/STTR Office awards page to all reviewers, as well as Lab and University Center points of contact
- We are co-funding awards with other SC Offices. In FY20, we contributed to ASCR, BES, and HEP awards
  - This permits you, the PIs, some flexibility. If you don't feel you need the maximum amount you need not feel compelled to ask for it
- DOE press releases on SBIR/STTR awards featured on our landing page News section
- Research Div. Program Managers asking their PIs to look at SBIR/STTR awards for possible collaboration or source of hardware/software
- We instituted changes to this meeting –
  - We've decided to stay at 20min oral talks, moving the PIs who are working under a NCE to a parallel session to keep the meeting at 2 days

Presentation Notes

- We have a tight agenda and must stay on time for each oral presentation.
- Sessions will start promptly at the time stated on the agenda.
- Make sure your presentation file is ready to display before the start of your talk. If you encounter problems, use Chat to let the hosts know so one of us can share your presentation.
- For Q&A sessions, please make your comments/questions short and use the coffee and lunch breaks for follow up by asking to go to the Lobby meeting room, or by using Chat with the presenter.
- The meeting hosts will stop sharing your screen at the end of your allotted time. A timer will be visible on your screen as an aid.

Total presentation (min)	Presentation (min)	Q&A (min)	5 minute warning (min)
35	29	6	24 & 27
20	17	3	12 &15

Conclusions

- NP uses the Congressionally-mandated SBIR/STTR Program –
  - To fund R&D that benefits the NP community
  - To build and sustain a US-based commercial infrastructure that serves society in areas other than nuclear science

- Five years of funding is equivalent to that of a large research effort
  - FY14-18 funding amounted to $81M
  - With input from NP Program Managers and the community, the NP SBIR/STTR program uses those funds for R&D that advances our core technologies as well as new initiatives

- NP uniquely fosters connections between its community and the small businesses that serve it through this annual meeting
  - This is becoming evident in the collaborations springing up between the PIs