#### The DOE Webinar will begin shortly . . .

#### • Why is there no sound?

 Once you logged into the webinar, you were provided two options to listen to this broadcast. The first option is through your computer speakers, the second option is via dialing the phone number provided to you upon login to the webinar. If you chose to listen through your computer speakers, you may need to turn your speaker volume on or up.

#### • Will DOE provide access to the recorded webinar after the meeting?

 Yes, all those who registered will receive a link to the slides and to the recorded webinar soon after the meeting. It will also be available on the DOE SBIR/STTR web site.

#### • Where can I find the Topics being discussed today?

 This link will take you to the Funding Opportunity Announcement (FOA) page that lists the FY 2020 Phase I Release 1 Topics: <u>https://science.osti.gov/sbir/Funding-Opportunities</u>

#### • What if my question was not answered at today's webinar?

- Please contact the point of contact that follows each subtopic in the document listed above for further clarification.
- If you have a question about the grant application process, please send us an email at: <u>sbir-sttr@science.doe.gov</u> or call us at (301) 903-5707.



## DOE SBIR/STTR Phase I Release 1Topics Webinar

Topics associated with the FY 2020 Phase I Release 1 Funding Opportunity Announcement

### **Topics 01-24**

**DOE SBIR/STTR Programs Office** 

July 22, 2019

## **TODAY'S AGENDA**

<b>Topics Introduction</b>	DOE SBIR/STTR Programs Office – Chris O'Gwin
Topic 01	Office of Science
Topics 02 – 08	Office of Advanced Scientific Computing Research
Topics 09 – 24	Office of Basic Energy Sciences



## FY 2020 Phase I Schedule

		Release 1		Release 2
Topics Issued		Monday, July 15, 2019		Tuesday, November 12, 2019
Webinar(s)		Week of July 22, 2019		Week of November 18, 2019
FOA Issued		Monday, August 12, 2019		Monday, December 16, 2019
Webinar(s)		Friday, August 19, 2019		Friday, December 20, 2019
Letters of Intent (LOI) Du	ie	Tuesday, September 3, 2019		Monday, 6 January, 2020
Non-responsive LOI Feedback Provided		Tuesday, September 24, 2019		Tuesday, January 27, 2020
Applications Due		Tuesday, October 15, 2019		Monday, February 24, 2020
Award Notification		Monday, January 6, 2020		Monday, May 18, 2020



## Phase I Funding Opportunity Announcements <u>Participating DOE Programs (FY 2020)</u>

Phase I
Release 1

- Office of Advanced Scientific Computing Research
- Office of Basic Energy Sciences
- Office of Biological and Environmental Research
- Office of Nuclear Physics
- Office of Science
- Office of Cybersecurity, Energy Security, and Emergency Response
- Office of Defense Nuclear Nonproliferation

Phase I Release 2

- Office of Electricity
- Office of Energy Efficiency and Renewable Energy
- Office of Environmental Management
- Office of Fossil Energy
- Office of Fusion Energy Sciences
- Office of High Energy Physics
- Office of Nuclear Energy



## Funding Opportunity Announcement (FOA) Webinar

- FY20 Phase I Release 1 FOA will be issued on August 12<sup>th</sup>
- Join our Mailing List this field is on every DOE SBIR/STTR web page
  - Following the issuance of the FOA, look for an email with a link to the FOA
- Webinar with Q&A for this FOA on August 19th
  - Overview of the FY 2020 DOE SBIR/STTR Programs
    - Following the issuance of the FOA, look for an email announcing this webinar



## **Topic Basics**

- Topics are created by DOE program managers and define important technology breakthroughs needed in R&D areas that support the DOE mission
- Topics are organized by DOE Program Office, e.g., EERE, BES, etc.
- DOE program managers are listed with each subtopic
  - Questions to DOE program managers are limited to clarification of the topic and subtopic (including references)
  - Clarification is provided to help *you* determine whether your technology fits within the topic and subtopic
  - You may communicate with these topic managers from the release of topics until the grant application due date
  - The decision to apply is **yours**



# **Example Topic**

- Topic & Subtopic
  - You must specify the same topic and subtopic in your Letter of Intent and grant application
- Topic Header
  - Lists the maximum award amounts for Phase I & Phase II and the types of application accepted (SBIR and/or STTR)
- Program Manager
  - Each subtopic lists the responsible DOE program manager
- "Other" Subtopic
- References

#### 12.INSTRUMENTATION FOR ADVANCED CHEMICAL IMAGING

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

The Department of Energy seeks to advance chemical imaging technologies that facilitate fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels. The Department is particularly interested in forefront advances in imaging techniques that combine molecular-scale spatial resolution and ultrafast temporal resolution to explore energy flow, molecular dynamics, breakage, or formation of chemical bonds, or conformational changes in nanoscale systems.

Grant applications are sought in the following subtopics:

a. High Spatial Resolution Ultrafast Spectroscopy

Chemical information associated with molecular-scale processes is often available from optical spectroscopies involving interactions with electromagnetic radiation ranging from the infrared spectrum to x-rays. Ultrafast laser technologies can provide temporally resolved chemical information via optical spectroscopy or laser-assisted mass sampling techniques. These approaches provide time resolution ranging from the breakage or formation of chemical bonds to conformational changes in nanoscale systems but generally lack the simultaneous spatial resolution required to analyze individual molecules. Grant applications are sought that make significant advancements in spatial resolution towards the molecular scale for ultrafast spectroscopic imaging instrumentation available to the research scientist. The nature of the advancement may span a range of approaches including sub-diffraction limit illumination or detection, selective sampling, and coherent or holographic signal analysis.

Questions - Contact: James Rustad, James.Rustad@Science.doe.gov

b. Time-Resolved Chemical Information from Hybrid Probe Microscopies

Probe microscopy instruments (including AFM and STM) have been developed that offer spatial resolution of molecules and even chemical bonds. While probe-based measurements alone do not typically offer the desired chemical information on molecular timescales, methods that take advantage of electromagnetic interactions or sampling with probe tips have been demonstrated. Grant applications are sought that would make available to scientists new hybrid probe instrumentation with significant advancements in chemical and temporal resolution towards that required for molecular scale chemical interactions. The nature of the advancement may span a range of approaches and probe techniques, from tip-enhanced or plasmonic enhancement of electromagnetic spectroscopies to probe-induced sample interactions that localize spectroscopic methods to the molecular scale.

Questions - Contact: James Rustad, James.Rustad@Science.doe.gov

c. Other

In addition to the specific subtopics listed above, the Department invites grant applications in other areas that fall within the scope of the topic description above.

Questions - Contact: James Rustad, James.Rustad@Science.doe.gov

#### References:

- U.S. Department of Energy, 2006, Office of Science Notice DE-FG01-05ER05-30, Basic Research for Chemical Imaging, BES Chemical Imaging Research Solicitation. (<u>http://science.energy.gov/~/media/grants/pdf/foas/2005/DE-FG01-05ER05-30.pdf</u>].
- National Research Council, 2006, Visualizing Chemistry, The Progress and Promise of Advanced Chemical Imaging, National Academies Press. (<u>http://www.nap.edu/catalog.php?record\_id=11663</u>).



# Topic 01: TECHNOLOGIES FOR MANAGING AND ANALYZING<br/>COMPLEX DATA IN SCIENCE AND ENGINEERING

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,600,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Application Area 1: Advanced Data Analytic Technologies for Systems Biology and Bioenergy
- b. Application Area 2: Technologies and Tools to Integrate and Analyze Data from Multiple User Facilities, Community Resources, Instruments and Data Systems
- c. Application Area 3: Capabilities for Integrating, Managing, Mining and Extracting Knowledge from Chemical Databases
- d. Application Area 4: Capabilities for Management, Mining and Knowledge Extraction from Materials Databases

Questions: Subtopics a & c – Ramana Madupu, <u>Ramana.Madupu@Science.doe.gov</u> Questions: Subtopic c – Raul Miranda, <u>Raul.Miranda@science.doe.gov</u> Questions: Subtopic b – Paul Bayer, <u>Paul.Bayer@science.doe.gov</u> Questions: Subtopic d – Matthias Graf, <u>Matthias.Graf@science.doe.gov</u> or James Davenport, <u>James.Davenport@science.doe.gov</u>

#### Topic 02: HPC CODE AND SOFTWARE TOOLS

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,600,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Hardening of R&D Code or Software Tools
- b. Other

Questions: Subtopics a & b – Laura Biven, <u>Laura.Biven@science.doe.gov</u>

#### Topic 03: HPC CYBERSECURITY

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,600,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Cybersecurity Technologies
- b. Other

Questions: Subtopics a & b – Robinson Pino, <u>robinson.pino@science.doe.gov</u>

#### **Topic 04: INCREASING ADOPTION OF HPC**

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,600,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Turnkey HPC Solutions
- b. Other

Questions: Ceren Susut, <u>Ceren.Susut-Bennett@science.doe.gov</u>

#### Topic 05: NETWORK AND TRANSPORT LAYER PROTOCOL DEVELOPMENT

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,600,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Network Layer (IP) Protocol Development
- b. Transport Layer (TCP, UDP, SCTP, DDCP) Protocol Development
- c. Other

Questions: Richard Carlson, <u>Richard.Carlson@science.doe.gov</u>

#### Topic 06: TRANSPARENT OPTICAL QUANTUM NETWORK TECHNOLOGIES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,600,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

a. Photonic Quantum Network Components

Questions: Thomas Ndousse-Fetter, <u>Thomas.ndousse-fetter@science.doe.gov</u>

#### **Topic 07: TECHNOLOGIES FOR EXTREME-SCALE COMPUTING**

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,600,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Algorithms for Scientific Applications
- b. Software Technologies
- c. Other

Questions: Richard Carlson, <u>Richard.Carlson@Science.doe.gov</u>

#### Topic 08: TECHNOLOGY TO FACILITATE THE USE OF NEAR-TERM QUANTUM COMPUTING HARDWARE

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,600,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Compact Integrated Ion Traps
- b. High-density Integrated I/O for Superconducting Qubits with Active Multiplexing of Quantum Signals
- c. Quantum Control Optimization Methods
- d. Exemplar Applications for Small Quantum Processors

Questions: Claire Cramer, <u>Claire.Cramer@science.doe.gov</u>

#### Topic 09: HIGH PERFORMANCE CATHODES FOR ULTRA-BRIGHT ELECTRON SOURCES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Ultra-smooth, Crystalline Alkali Antimonide Photocathodes
- b. Encapsulated Photocathodes
- c. Other

Questions: Eliane Lessner, <u>eliane.lessner@science.doe.gov</u>

#### **Topic 10: NEXT GENERATION BUNCH SHAPE MONITORS**

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Development of 2-dimensional (2D) Bunch Shape Monitors
- b. Other

Questions: Eliane Lessner, <u>eliane.lessner@science.doe.gov</u>

#### Topic 11: SEMI-AUTONOMOUS INTELLIGENT CONTROL FOR SYNCHROTRON AND FEL X-RAY SOURCES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Development of "Human-in-the-Loop" Semi-autonomous Intelligent Control Systems for Real-time Synchrotron and FEL X-ray Tuning and Experimentation
- b. Other

Questions: Eliane Lessner, eliane.lessner@science.doe.gov

#### Topic 12: LARGE DIFFRACTION-GRADE SINGLE CRYSTAL DIAMOND FOR APPLICATIONS AT NEW GENERATION SYNCHROTRON AND FEL X-RAY SOUCRES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Development of Large Diffraction Grade Single-Crystal Diamonds
- b. Other

Questions: Peter Lee, <u>peter.lee@science.doe.gov</u>

#### **Topic 13: ADVANCED X-RAY OPTICS USING CAPILLARIES**

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Development of Capillary Optics Optimized for Soft and Hard X-ray Nanofocusing
- b. Other

Questions: Peter Lee, <u>peter.lee@science.doe.gov</u>

#### Topic 14: IMPROVED SINGLE PARTICLE INJECTION AND DIAGNOSTICS FOR HIGH-REPETITION RATE X-RAY FEL SOURCES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Offline and In Situ Diagnostics for Particle Beam Transport
- b. Increased Droplet Generation Efficiency
- c. Other

Questions: Peter Lee, <u>peter.lee@science.doe.gov</u>

#### **Topic 15: MULTI-DIMENSIONAL ELECTRON MICROSCOPY**

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Stable Helium Temperatures Cryo Stage Development for (Scanning) Transmission Electron Microscopes
- b. Ultra-Low Temperature Liquid Helium Side Entry Electron Microscopy Holder
- c. Continuous Rotation Tomography Holder for Transmission Electron Microscopy Imaging and In Situ Transformation Experiments
- d. Other

Questions: George Maracas, <u>george.maracas@science.doe.gov</u>

#### Topic 16: PHOTOCONDUCTIVE METASURFACES FOR ULTRAFAST OPTOELECTRONIC SWITCHES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Photoconductive Metasurfaces For Ultrafast Optoelectronic Switches
- b. Other

Questions: George Maracas, <u>george.maracas@science.doe.gov</u>

#### Topic 17: GAS DELIVERY SYSTEM FOR TRANSIENT KINETICS SPECTROSCOPIC MEASUREMENTS IN SURFACES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Well Defined and Reproducible Gas Pulses
- b. Well Defined and Reproducible Gas Pressure Modulation
- c. Gas Delivery Systems that Combine the Capabilities Described in Subtopics a and b
- d. Other

Questions: George Maracas, <u>george.maracas@science.doe.gov</u>

#### Topic 18: INSTRUMENTATION AND TOOLS FOR MATERIALS RESEARCH USING NEUTRON SCATTERING

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Advanced Sample Environments
- b. Advanced Detectors
- c. Beam Conditioning Optics
- d. Other

Questions: P. Thiyagarajan (Thiyaga), P.Thiyagarajan@science.doe.gov

#### **Topic 19: MEMBRANES FOR ELECTROCHEMICAL APPLICATIONS**

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Ion-Selective Membranes for use with Non-Traditional Electrolytes in Advanced Electrical Energy Storage
- b. Polymeric Membranes for Solar Fuels Generators
- c. Other

Questions: Subtopic a – Craig Henderson, <u>Craig.Henderson@science.doe.gov</u>
Questions: Subtopic b – Chris Fecko, <u>Christopher.Fecko@science.doe.gov</u>
Questions: Subtopic c – Craig Henderson, <u>Craig.Henderson@science.doe.gov</u>
or Chris Fecko, <u>Christopher.Fecko@science.doe.gov</u>

#### Topic 20: QUANTUM INFORMATION SCIENCE FOR TECHNOLOGY IN MATERIALS AND CHEMICAL SCIENCES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Hybrid Quantum-Classical Computing
- b. Other

Questions: Matthias Graf, <u>matthias.graf@science.doe.gov</u> or Tom Settersten, <u>Thomas.Settersten@science.doe.gov</u>

#### Topic 21:DEVELOPMENT OF LIGHT SOURCE X-RAY DETECTOR AND SPECTROMETER SYSTEMS FOR ADVANCED MATERIALS RESEARCH TECHNIQUES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. ePix Detector and Spectrometer Systems for X-ray Scattering
- b. Other

Questions: Lane Wilson, Lane.Wilson@science.doe.gov

#### Topic 22: HIGH PERFORMANCE MATERIALS FOR NUCLEAR APPLICATION

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Bimetallic Structures for Liquid-Cooled, High Temperature Reactor Systems
- b. Ceramic Composites
- c. Material Development and Compatibility for Molten Salt Thermodynamic Reference Electrodes
- d. Other

Questions: Subtopics a, b &d – Sue Lesica, <u>sue.lesica@nuclear.energy.gov</u> Questions: Subtopic c – Stephen Kung, <u>Stephen.Kung@nuclear.energy.gov</u>

#### Topic 23: IMPROVEMENT OF SUBSURFACE SIGNALS VIA ADVANCED COMPUTATIONAL METHODS AND MATERIALS DESIGN

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Geothermal
- b. Oil and Gas
- c. Carbon Storage
- d. Other

 Questions: Subtopic a – William Vandermeer, <u>william.vandermeer@ee.doe.gov</u>
Questions: Subtopic b – Olayinka Ogunsola, <u>olayinka.ogunsola@hq.doe.gov</u> or William Fincham, <u>William.fincham@netl.doe.gov</u>
Questions: Subtopic c – Darin Damiani, <u>darin.damiani@hq.doe.gov</u>
Questions: Subtopic d – James Rustad, <u>James.Rustad@science.doe.gov</u>

#### **Topic 24: ADVANCED FOSSIL ENERGY TECHNOLOGY RESEARCH**

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Advanced Technology Development of Oxygen Separation from Air for Small, Modular Systems
- b. Supercritical Fluid Extraction Using CO2
- c. Other

Questions: Subtopic a & c – Jai-woh Kim, jai-woh.kim@hq.doe.gov Questions: Subtopic b – Andrew Hlasko, andrew.hlasko@Hq.Doe.Gov

#### Topic 25: TECHNOLOGY TRANSFER OPPORTUNITIES: BASIC ENERGY SCIENCES

Maximum Phase I Award Amount: \$200,000	Maximum Phase II Award Amount: \$1,100,000
Accepting SBIR Phase I Applications: YES	Accepting STTR Phase I Applications: YES

- a. Technology Transfer Opportunity: Catalytic Polymer Upcycling
- b. Technology Transfer Opportunity: NbTi High Performance Superconducting Undulator

Questions: Subtopic a – Raul Miranda, <u>Raul.Miranda@science.doe.gov</u> Questions: Subtopic b – Eliane Lessner, <u>eliane.lessner@science.doe.gov</u>

## DOE SBIR/STTR Programs Office Contact Information

- SBIR/STTR Web: <u>www.science.energy.gov/sbir</u>
- Email: <u>sbir-sttr@science.doe.gov</u>
- Phone Assistance Hotline: 301-903-5707
- DOE Phase 0 Assistance Program: <u>http://www.coming.soon</u>

<u>)m/doephase0/</u>

DOE Application Assistance: <u>https://science.osti.gov/SBIRLearning</u>

