

2021 DARPA Discover DSO Day Summary and Best Practices to Engage

Lewis-Burke Associates LLC – June 30, 2021

The Defense Advanced Research Projects Agency (DARPA) Defense Sciences Office (DSO) hosted its virtual 2021 [DARPA Discover DSO Day](#) on June 23, aimed at familiarizing and informing potential proposers on scientific and technical research topics of interest to DSO program managers. DSO is one of six technical offices at DARPA and is commonly referred to as “DARPA’s DARPA” due to its goal of revolutionary high-risk and high-payoff research to advance U.S. national security. DSO’s current research thrust areas, which remain unchanged from last year, include:

- Frontiers in math, computation, and design
- Limits of sensing and sensors
- Complex social systems
- Anticipating surprise

[Dr. Stefanie Tompkins](#), DARPA’s new Director, launched DARPA Discover DSO Day by providing background on DARPA’s history, mission, and organizational culture. [Dr. Valerie Browning](#), Director of DARPA DSO, followed Dr. Tompkins’s remarks, giving an overview of DSO’s trends and challenges. Dr. Browning discussed DSO’s priorities including the threat from globalization of technology development, especially among competitors and adversaries. Dr. Browning also discussed the speed and complexity of modern military engagement and the need to develop better sensors and computational methods to make decisions. In addition, Dr. Browning highlighted DARPA DSO’s push to help warfighters in ungoverned or undergoverned spaces. Lastly, Dr. Browning spoke about DSO’s focus on building resilient systems, especially in the face of increasing attacks on critical infrastructure. These four trends and challenges identified by DSO complement and crosscut the office’s four research thrusts listed above.

DSO program managers provided prospective directions on research topics, such as revolutionary ideas in quantum computing including fault tolerance and visualization of information; the use of AI in novel situations and environments such as rules-of-engagement, and in complex knowledge processing; improving AI ability to better understand human and social systems; and the use of allostatic cognitive science in suicide prevention, credibility determination, and skill acquisition. Other topics DSO program managers expressed interest in were systems logistics, especially food systems; ways to secure chemical supply chains through automation and AI; and new systems to secure strategic materials, among others. DSO program managers also welcome thoughts on how to help transition these ideas into new programs.

The event noted that the 2021 Young Faculty Award (YFA) Program, which identifies rising stars in junior research positions, should be released in late summer or early fall. Lewis-Burke recommends researchers who are interested in applying for a YFA to engage with program managers to discuss potential research topics prior to the program’s release. More information on the YFA program can be found at <https://www.darpa.mil/work-with-us/for-universities/young-faculty-award>. Lewis-Burke’s

previous 2020 YFA information and analysis can be found at https://old.lewis-burke.com/sites/default/files/funding_opportunity_-_darpa_releases_young_faculty_award.pdf.

The event also highlighted DARPA DSO's Disruptioneering program which allows the office to engage in rapid acquisition and development. Performers are expected to start work on Disruptioneering awards no later than 90 days from its announcement. DSO notes that the program has been highly successful since its introduction in 2017 and has seen interest from other offices in the program within DARPA. DSO's 2021 Disruptioneering program announcement can be found at <https://sam.gov/opp/13b47041a06d4820b5ff17e56c46c8cf/view>.

As with all DARPA technical offices, DSO recommends that potential proposers, who are interested in engaging with DSO program managers and applying to funding opportunities, to consider the following research questions, known as the Heilmeier Questions:

- "What are you trying to do?"
- How is it done today and who does it? What are the limitations of the present approaches?
- What is new about our approach, and why do we think it will succeed?
- If we succeed, what difference will it make?
- How long do we think it will take?
- What are our mid-term and final exams?
- How much will it cost?"

While all seven questions are important for a successful proposal, Dr. Browning highlighted the first four questions as especially important for a strong proposal.

The full list of research topics of interests DSO program managers are exploring can be found at <https://www.darpa.mil/work-with-us/what-are-we-exploring-now>. The Heilmeier Questions can be found at <https://www.darpa.mil/work-with-us/heilmeier-catechism>.

Best Practices

Lewis-Burke recommends the following best practices for interacting with DARPA:

- Engage program managers early on in their time at DARPA. Program managers usually are in their position for three to five years, so it is best to engage early on to help influence future programs and opportunities.
 - Program managers use the Heilmeier Questions to justify proposing new programs.
 - Researchers can engage with program managers until submitting proposals.
 - Lewis-Burke maintains a database of program managers, including their research interests, start dates, and programs.
- DARPA is a mission-driven agency, so research ideas and proposals should be concise but adaptable to the program managers' visions.
- Keep in mind that DARPA is focused on enabling revolutionary capabilities through high-risk, high-reward research rather than incremental capabilities.

Sources and Additional Information

- Presentations from the DARPA Discover DSO Day webinar, including the doing business with DRAPA and contracting 101 presentations can be found at https://www.darpa.mil/attachments/DiscoverDSODayPresentations_no_video.pdf.

- DSO Program Managers' bios, program information, and contact information can be found at <https://www.darpa.mil/work-with-us/interact-with-DSO>.
- DARPA's current list of project portfolios can be found at <https://www.darpa.mil/work-with-us/what-is-our-current-investment-portfolio>.
- To receive DSO News Updates via Constant Contact, sign up at <https://www.darpa.mil/about-us/offices/dso>.