

# SBIR/STTR TRANSITIONS

2019 Winter



## FROM THE DIRECTOR

### Together We Can Pivot Faster

We're enthusiastic about 2019, and we want to enlist all of you in helping us to achieve some important goals in the coming year.

First, we are all connected to each other, and can add value across the full spectrum of our DoN SBIR/STTR efforts. Through collaboration, everyone in our enterprise can increase value-added synergy across the ecosystem. That's a fairly broad objective; but as a more specific goal, we are going to especially focus on increasing collaboration between primes and universities in 2019.

Second, we want to increase our focus on readiness and sustainment. We are not turning away from new capabilities; but we want to find new and better ways to maintain, sustain and improve the fielded capabilities we already have. We want to work with you to apply your creativity to existing systems and platforms. If we

work together, we can pivot faster, and have an immediate impact for our warfighters.

And finally, we need to have better and more tangible alignment to leadership priorities. That means we need to communicate those priorities to you so that together we can lean forward to meet those challenges quickly, and with impact. We need to speed up our discovery process so we can learn about and understand opportunities we may not even be aware of. Faster decision making will lead to more rapid delivery, and through collaboration we can reduce the time between decision and deployment. Together, we can pivot faster.

#### **2019 Forum for SBIR/ STTR Transition**

We're excited about conducting the 2019 Forum for SBIR/ STTR Transition (FST) at UMass Lowell (UML) in

Massachusetts. Situated in the middle of the New England technology corridor, the area has a strong history of adopting innovative technology. 200 years ago small companies harnessed the power of rivers to grow their factories and businesses in what we today call the "Industrial Revolution." Innovation still abounds here. Some of America's great academic institutions, an important military presence and cutting-edge research centers are here in Eastern Massachusetts, and as a result, a huge number of small and large tech companies have blossomed, including some of America's leading defense contractors.

The FST is a national event, but in some respects, it has a regional focus. The goal is to introduce innovative SBIR-funded technologies to industry, small companies, investors, potential partners, government

## FROM THE DIRECTOR...continued

Program Managers and acquisition professionals, and prime contractors.

UML and the UML Research Institute exemplify the quality resources available to small companies across the full spectrum of SBIR. There are other academic partnerships in the region. The National Institute for Undersea Vehicle Technology (NIUVT) at the University of Connecticut (UCONN), and the Southeast New England STEM Coalition with UCONN at the University of Rhode Islands are two more examples. They are helping solve problems for the Navy, and helping bring in innovative technology. There are a number of university-led organizations across the nation that are helping entrepreneurs and developing start-ups, as well. And it goes beyond engaging with research or making testing facilities available. These organizations help with everything from writing your first Phase I proposal to business planning, marketing and licensing—and they can help you get your technology in front of primes. We can help you connect with them. Maybe your local university is your first partners, but there are others, too.

Moving the FST outside the Washington, DC area is a bold step, but represents a new opportunity. And isn't that is the hallmark of SBIR? The success of this event

could result in subsequent Navy-led national SBIR events held in other regional technology clusters in other parts of the country, or even regional additional events beyond the annual FST.

We'll also be hosting our annual Partnering Summit (formerly Primes Summit) in conjunction with the FST. This is an important meeting for us to address the primes and their SBIR representatives, along with the Deputy Program Managers (DPMs) who are charged with ensuring their programs are taking advantage of the appropriate SBIR-developed technology. As always, this is a two-way conversation. We are very much in the listen-mode to hear from the primes and DPMs about how we can facilitate the transfer of your technology.

And just like the early innovators in Lowell, Mass., there are stories in this issue of Transitions that demonstrate the positive, perhaps unanticipated, and often inspirational results of SBIR efforts. Read about Mayflower Communications and their GPS anti-jam antenna technology that has moved beyond the Navy to the other services and commercial customers. Learn about Propel, a company that has leveraged its initial Navy SBIR investment to develop stitchless technology that has resulted in contracts with the Navy and other



Bob Smith, Director DON SBIR/STTR, talking with SBIR exhibitors at the FST

services. There's also an article about the SBIR team at the Program Executive Office for Integrated Warfare Systems, and how they look for ways to apply available funding to existing, often unrelated, and even expired SBIR contracts to help meet requirements.

We keep coming back to the common theme in all of this—collaboration! We need to change our culture to be more agile. But if there's a program that can show the way ahead to do it better and faster, it's SBIR!

Sincerely,

A handwritten signature in black ink, appearing to read "Robert L. Smith".

Robert L. Smith  
Director DON SBIR/STTR



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# Stitchless Clothing Tailor Made for Navy Garments

By Edward Lundquist

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**P**ull the thread on the history of mass-produced textiles and you will find that it all started in Pawtucket, Rhode Island, where innovator Samuel Slater opened the first textile mill in 1790. The result was the industrial revolution.

Today another textile revolution may be underway, thanks to a Navy SBIR investment in Propel LLC; which has developed stitchless technology that has the potential to transform Navy clothing.

Founded in 2006, Propel LLC, a woman-owned small business, is a product innovation company focused on the development, sales and marketing of textile driven technologies and products, with a primary focus on the fire service and military markets.



Clare King, President & Owner of Propel

Propel recently completed a Phase II SBIR to assess the feasibility of stitchless techniques to assemble Navy uniforms. The topic was issued by the Naval Supply Systems Command to reinvent the Navy parka using stitchless seam engineering instead of the original sewn garment. The Navy parka was selected as the demonstration prototype because it is one of the most expensive uniform items issued.

Propel worked with the Navy Clothing and Textile Research Facility (NCTRF), co-located at the Army's

Natick Labs in Massachusetts. NCTRF reports to the Navy Exchange Service Command—NEXCOM—which is responsible for the Navy Uniform Program.

Amy Brayshaw, Supervisory Textile Technologist, Organizational & Protective Clothing Team Technical Warrant Holder (TWH) for General Purpose Organizational Clothing at NCTRF, said that SBIR contractors need to work with the Navy's technical point of contact (TPOC) to help them understand the Navy's uniform requirements.

According to Brayshaw, the contractor should have a sense of how its proposed innovative technology will benefit the Navy by either filling a capability gap, or replacing or updating an antiquated or obsolete item by improving performance or reducing cost. For the Navy parka, the goal was to reduce weight and improve comfort while maintaining cost.

"Our technical managers at NCTRFs have been highly engaged. They could see ways of using the technology we developed fairly quickly. All along, they were talking with us about 'what's next,'" said Propel President Clare King.

## Picking Partners

Propel partnered with Peckham Inc., an Ability One company (which provides employment and job training for people with disabilities) with very large manufacturing facilities for clothing and textile systems in Lansing, Michigan. "They are heavily involved in military contracting," said King, "and highly interested in new technologies. They set up a rapid prototyping facility for stitchless garments to support the Phase II. This was important to the success of Phase II and the transition beyond Phase II."

Propel also teamed with outdoor apparel company, Patagonia, which makes extreme weather clothing for special operations forces. "Patagonia provided

## Stitchless Clothing ...continued

invaluable insights into performance design and testing,” said King.

A third key partner was Rix Haus, a Bozeman, Montana-based product design company with whom Propel has collaborated on more than one SBIR.

King said small companies need to carefully pick partners for collaboration. “We look for solutions. The projects are multidisciplinary, so we pull together the right team, because no one company can have all the skills needed to get to success.”

### Phase III

Propel is now entering into new follow-on efforts for other services to design garments specific to their needs, using the stitchless technology developed under the Navy’s SBIR investment. The U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC) is developing a new cold weather system and will evaluate stitchless garments to be developed by Propel under a Phase III contract. In addition, Propel is currently negotiating with the Air Force and Marine Corps for a follow-on Phase II SBIR to develop new garment systems based on the Navy’s SBIR effort.

The Office of Naval Research (ONR) Tech Solutions program funds efforts to fix problems suggested by Sailors in the fleet, and during the Phase I SBIR efforts awarded a Phase III contract to Propel to develop a new “Steam Suit” to replace the existing HAZMAT suits for use by damage control personnel on submarines. The new suit uses Propel’s stitchless engineering and is significantly lighter in weight, more comfortable and flexible, and can be put on faster than the legacy system. The Naval Sea Systems Command (NAVSEA) nominated the new Steam Suit for a 2017 Secretary of the Navy Innovation Award.

King said her team applied human centered design thinking to reinventing the system for submariners. She said it’s important to get as much user input



Sponsored by the Office of Naval Research’s TechSolutions Program, the new steam suit was developed by the Naval Sea Systems Command Navy Clothing and Textile Research Facility, and Propel, Inc.. Photo: U.S. Navy/John F. William.

and feedback as possible. “We wanted a suit that allowed the user to do their job in greater comfort”

Weight is an important factor. The old suit weighed 19 lbs. The new one weighs 11. “If you can take weight out, you can work longer in the same conditions,” King said.

NCTRF tested the suit at the U.S. Army Research Institute of Environmental Medicine (USARIEM) to evaluate the garment for thermal stress. They confirmed that the Propel stitchless suit outperformed the legacy system.

The Steam Suit completed testing on all four classes of U.S. nuclear submarines in 2017-2018, and is expected to transition to acquisition starting in 2019.

### Wearable Electronics

Propel is developing other promising clothing technologies, including “Smart” electrically-enabled textiles and garments. Propel was awarded a Phase I SBIR by the Navy in 2015 related to the Navy’s “ship of the future.”

“We’re looking at how we can integrate technology into uniforms to connect crewmembers with their ship,” King said. “Think of an individual Sailor as a node in the ship’s network, with the connecting technology embedded in the Sailor’s clothing. It’s



wearable technology inside the garment's textile," King said. "We're just about to complete Phase II, and we're highly confident that we'll develop technologies that will transition to acquisition."

The demonstration prototype for the Smart textile Phase II is a next-to-skin shirt that records and transmits the wearer's heart rate. "We have a 4-lead textile sensor system with the connecting electrical circuit knit into the garment - so that it is transparent to the wearer." The next step will be to develop the system so that it can be worn underwater by operators such as Navy SEALs.

For both of their Phase II SBIRs, Propel is already looking for sales beyond the domestic market. One target market for the steam suit is other friendly nations that have nuclear submarines. Propel also recently attended the Future Forces Forum in the Czech Republic to identify opportunities with NATO member militaries for both the stitchless seam engineering and for Smart textiles.

"We will continue to focus on approaches that can translate quickly to product," King said. "In all of our SBIR efforts - Phase I, II and III, our goal is a high manufacturing readiness level--not just a high technology readiness level--by the end of Phase II."

### *THE PEO IWS SBIR TEAM WORKS TOGETHER TO MATCH TECHNOLOGY WITH NEEDS*

## A SUCCESSFUL START BEGINS WITH A PLAN FOR A SUCCESSFUL CONCLUSION

By Edward Lundquist

According to SBIR Technology Manager for PEO Integrated Warfare Systems (PEO IWS), Douglas Marker, one of the major goals is to help SBIR companies succeed in transitioning their technologies, and that measure of success goes beyond PEO IWS.

Marker explained that transition success requires regular periodic reviews. IWS has 125-150 active Phase I and Phase II contracts at any given time. "We conduct Phase I reviews with each contractor at the 3-month and 5-month marks; and we conduct a review with each one of the IWS Phase II contractors every six months."

The reviews are a team effort that include the contractor, the technical point of contact (TPOC), the technical warrant holder at the NAVSEA level (who must approve the technology before it goes into the Fleet), and acquisition representatives from the IWS Science and Technology Integrated Product Team (S&T IPT). "We have the right people at the table when we do the reviews," he said.

Some of the Phase I companies have never done an SBIR or worked with the Navy; let alone IWS. "For Phase I efforts, I want to see the spend plans and budgets estimated through Phase II. We coach them on how to interface with IWS," he said. "This helps the small business in developing their Phase II initial proposal."

In the Phase II reviews, Marker said he wants to know if the TPOC is doing his or her job, whether the technology is progressing as it should, and if there is a plan for a seminal transition event. "We want to know what the deliverable will be, and if we can see a progression in TRLs," he said.

"Our approach is to let the company know right up front that we have a need, and we have a platform or a program where that technology can land, and there is a funding strategy at the end of that SBIR contract to use their technology if it is successful," he said. "When we conduct our six month reviews, the transition is the most important thing I look for. If we don't see that

clearly, then we look to see how we can strengthen the transition strategy; whether it be directly into an IWS program or a program outside of IWS (e.g., a prime or the commercial sector).”

“In some cases another SYSCOM, like NAVAIR, or another service such as the Army or the Air Force, have utilized the technology, and it may have been from one of our IWS SBIRs from several years ago. “We want to see them get funding, and those dollars could come from anyone. Because the IWS team doesn’t always know if a Phase I or Phase II has ultimately transitioned,” said Marker. Marker’s teams ask contractors during the reviews if they have received any funding other than SBIR dollars for their innovative technology. “It’s amazing how often we find that’s the case,” he said.

With respect to another IWS approach to transitions, Marker said his SBIR budget was significantly increased one year. His team reviewed their existing needs, as well as some of the older topics, and looked at SBIRs from other systems commands or services that might be relevant to PEO IWS. “These were contracts that closed a year or more ago,” said Marker. “With our additional funding, we could use that technology, or modify it to meet some of our needs through CRPs or reach backs.”

The people at PEO IWS are looking for opportunities to reenergize existing SBIR efforts, or even ones that are closed, that could address new or other requirements, and receive additional funding. “Even after an SBIR is over,” Marker said, “There are still “reach back” opportunities that can revive an SBIR and help it transition, or achieve additional success.”

For example, the PEO IWS team might find synergies from otherwise disparate efforts. “We talked with a prime who told us they needed a way to evaluate their software on a major IWS program. We had three SBIR contractors, all with different capabilities. We

pulled together the program managers associated with that Navy system, our S&T IPT representative, the three companies, and the prime. We were able to identify previous contracts the small businesses had with us, as well as the funding. This turned out to basically be a very successful ‘reach back,’ Marker said.

“In this case, there were unrelated SBIR efforts that contributed to solving a need in one way or another. But we were able to use SBIR funding to fit everything together,” said Marker. “Reach backs keep SBIR technology alive longer.” The PEO IWS SBIR team brought together those incremental technologies to help solve a larger overarching problem, and through a combination of SBIRs, came up with a bigger, improved solution. “The TPOCs worked together with their individual SBIR contractors to solve the larger problems,” said Marker.

Changing the subject, by involving the IWS IPT in all of the SBIR efforts, new and different programs can benefit. “We might go outside our own organization to find another place for the landing,” Marker said. There was an example where an SBIR didn’t go forward within the military; but, the technology was transitioned to the computer gaming industry where it was very successful,” he said. “Even if it doesn’t benefit PEO IWS, we can look at it as a success.”

If transition is a measure of success, then IWS has an impressive record. The Phase II to Phase III typed funding has typically been near 50%, with a high of 55% during the second quarter of FY18.

“Success is a team effort,” he said. “We have a culture where we all know what each other is doing, and we look for additional ways to involve our technologies. We want to make sure these SBIRs transition. It benefits everyone. Especially the Fleet.”



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# NAVY'S SBIR INVESTMENT IN GPS ANTI-JAM ANTENNA TECHNOLOGY EXPANDS TO BENEFIT THE ARMY, AIR FORCE, COAST GUARD AND COMMERCIAL SECTOR

By Edward Lundquist

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In the Spring 2018 issue of Transitions, we introduced our readers to Bedford, Massachusetts-based Mayflower Communications and their Multi-Platform Anti-Jam GPS Navigation Antenna (MAGNA). The initial Navy-sponsored SBIR technology found interest from the Army and the Air Force. And it's coming full circle.

Responding to a 2007 Broad Area Announcement (BAA) managed by the Navy's Space and Naval Warfare Systems Command (SPAWAR) and sponsored by the U.S. Air Force GPS Directorate, a small company in Massachusetts developed the Small Antenna System (SAS) to be mounted on U.S. Army space-constrained rotary wing aircraft. Mayflower Communications, located in Bedford, Massachusetts, was one of six companies offered a Phase I SBIR, and the only one of the six to move on to a Phase II.

Mayflower's SAS technology caught the eye of the Navy's submarine community-which also has an interest in a very small size weight and power (SWaP) GPS antenna for the OE-538B submarine antenna mast. The Navy funded a program called Submarine Anti-Jam GPS Enhancement (SAGE). Mayflower is currently under contract with Lockheed Martin to support the SAGE program, and SAS is currently flying in an operational environment.

In order to build on the success of the SAS and SAGE Program, the Navy funded a Rapid Innovation Fund (RIF) program in 2014 to develop a high performance Anti-Jam system that could meet multiple platform types, and invited other services and programs to its

development. From there, the Multi-Platform Anti-Jam GPS Navigation Antenna (MAGNA) program was created. Following the Navy RIF Program, the Army PEO Aviation saw an immediate need for their rotary wing, fixed wing and UAS platforms and awarded Mayflower a Phase III SBIR to productionize the MAGNA anti-jam systems.

The baseline Navy equipment was made to fit on a ship; but, the Army needed something smaller that would fit on helicopters and drones. "Mayflower demonstrated the ability to adapt to Army helicopter requirements," said Jeff Coffman, Assistant Product Manager for Navigation Programs with the Army's PEO Aviation/PM AME.

Through a Navy-sponsored Rapid Innovation Fund (RIF) effort, the product was demonstrated to meet program requirements, and as a result, the system is now flying aboard Air Force Special Operations Command (AFSOC) missions. "Mayflower has other Air Force programs asking about MAGNA as is the Coast Guard," Coffman said.

Now the Navy is looking at placing the system on small SWAP-C vessels for the Navy, Military Sealift Command and the Coast Guard-meaning limited space, weight, power and cost, and working with the Army to coordinate testing.

There are two separate products. The MAGNA Federated System (MAGNA-F), which consists of two separate pieces, an antenna and the antenna electronics; as well as the MAGNA Integrated System

(MAGNA-I), with all of the associated GPS anti-jam electronics located right inside of the antenna.

A substantial portion of MAGNA-I requirements are common to aviation platforms for all services. The Navy has a small set of additional test requirements to qualify for shipboard use. "The Army is funding and managing the common requirements while the Navy is funding additional shipboard qualification tests through the Army SBIR phase 3 contract," said Coffman. "The Navy is an active participant in, and supporter of MAGNA development."

"We can learn from the existing testing conducted by the Army," said Bill Joo, Science and Technology Assistant Program Manager for GPS Positioning, Navigation and Timing System in the Communications and GPS Navigation Program Office (PMW/A 170) at Navy Program Executive Office C4I and Space Systems. "We're working with them to make sure their testing accommodates the Navy's environmental conditions. We're not starting from scratch."

A small business has to be able to transition from proof of concept and limited production to large-scale production design and support. "Mayflower solved this by finding suitable production partners and did so in a way that met production demands and quality requirements of multiple services and missions," said Coffman.

Armen Kurdian, a retired Navy captain now with Mayflower, advises small companies to be flexible in their design. "If you can tailor your design to what the government needs or wants, it provides an avenue for future work or partnerships, even leading an effort as the prime, as we are for MAGNA. Solve the performance requirements first. Don't worry too much about the design up front. And don't get married to your design. The SWAP needs at the outset may not be the final parameters. The government may ask you to meet a new SWAP requirement while continuing

to meet the performance criteria. In other words, if it works, they may ask you to make it smaller, and still work. That utilization, adaptation and manipulation of your IP will lead to a useful design that can be fielded."

Mayflower's anti-jam antenna systems have continued to evolve. One effort made the antenna smaller, from two pieces into one; but that made it more difficult and costly to build. So now, the Army wants Mayflower to make it function the same, but make it easier to produce. "The design will change as we work on the produceability," said Kurdian.

"The SBIR company needs to work with the TPOC to find those partners that have both the ability to conduct tests and the desire to get access to the technology," said Joe Thomas, Director of Government Programs with Mayflower Communications.

There may be some ITAR restrictions that limit foreign sales, but there is an opportunity for direct commercial sales when the FAA certifies the system for civil aircraft. Mayflower plans to build a commercial-off-the-shelf product which they will list through GSA.

"We're close to finish line," said Thomas. "We had multiple test events, because people across the services were able to see the capabilities of the system, and how it could fit into one of their programs. Now we have units fielded, flying, and demonstrating their capability."

"Your technology doesn't have to be revolutionary," said Joe Schneckner, Deputy Technical Director for Alternative Positioning, Navigation and Timing at PMW/A 170. "It can be more evolutionary. Maybe you can reduce the life cycle costs, and that saves money on the tail end. Maybe it's easier to repair, or affordable so you can just replace it without worrying about fixing it. Our goal is a sustainable piece of hardware that can become part of the program of record."



## RAYTHEON UMass LOWELL RESEARCH INSTITUTE (RURI)

# RAYTHEON AND UMASS LOWELL ACCELERATE INNOVATION

By Edward Lundquist

The Raytheon UMass Lowell Research Institute (RURI) was established in 2014 to accelerate the development of printed and flexible RF electronics. The 6,000 square-foot facility, which occupies the 4th floor of the Saab Emerging Technologies Building at the University of Massachusetts Lowell (UML), is the first Raytheon facility located on a college campus. This allows close collaboration between Raytheon and UML experts, performing directed research with a focus on technology transition. Along with the UML-led Printed Electronics Research Collaborative (PERC), RURI is helping to establish the supply chain for additive RF and flexible electronics by addressing gaps in design, fabrication and characterization tools, materials and processes. PERC currently has 15 member companies that work in various elements of the supply chain for additive and printed electronics. UML students (undergraduate and graduate) and PERC staff have an opportunity to work closely with Raytheon engineers on a day-to-day basis.

*“This close partnership between academia and industry provides students with real-world experience and feeds the pipeline for industry’s next generation electrical, RF, mechanical and materials engineers,”*

*Mary Herndon*

*Raytheon Engineering Fellow and RURI Co-Director.*

According to Mary Herndon, Raytheon Engineering Fellow and RURI Co-director, Raytheon is known for its technological innovation and is focused on helping to meet the needs and create capabilities that support our customer’s missions. “Raytheon’s approach to challenging problems harnesses our



The new Raytheon-UMass Lowell Research Institute will be housed in the Mark and Elisia Saab Emerging Technologies and Innovation Center.

systems engineering strengths that are developed in the defense sector and applied in the form of innovative, cutting-edge solutions.”

Raytheon is an industry leader in working with small businesses to bring innovative technologies and solutions to federal programs. Led by Engineering and in collaboration with Supply chain, Raytheon partners with small businesses both through awarding subcontracts and through federally funded programs such as Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR) and Rapid Innovation Fund (RIF).

RURI has significant federal funding from the DoD agencies and Manufacturing USA Institutes (America Makes and Nextflex), and it is an ITAR facility. RURI and PERC expect to have close collaboration with the newly-formed UMass Lowell Research Institute in support of the defense agencies.

“This close partnership between academia and industry provides students with real-world experience and feeds the pipeline for industry’s next generation electrical, RF, mechanical and materials engineers,” Herndon said. For more information on RURI go to: <https://www.uml.edu/research/perc/ruri/>

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*LOWELL HAS A LEGACY OF INNOVATION*

# UMASS LOWELL TO CO-HOST 2019 FST

By Edward Lundquist

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The Department of the Navy (DoN) Forum for SBIR/STTR Transition (FST) will be held April 10-11, 2019 at the Tsongas Center in Lowell, Mass., co-hosted by the UMass Lowell Research Institute (UML RI).

Lowell's heart and soul is innovation. It's a city where some of the first major textile mills opened in the mid-1800s, triggering America's industrial revolution. Today Lowell is situated in one of the nation's largest technology clusters.

UML RI, located near Hanscom AFB in Lincoln, Mass., is emerging as a leader in bridging the gap between research and solutions that change people's lives and provide world-class, cutting-edge technology to our warfighters.

"This is a significant area for technology and innovation," said Matthew McSwain, UML RI's executive director. "There are number of high-tech companies in Massachusetts and throughout New England that draw upon the many universities in the area. There are defense technology clusters in the region, supporting all of the warfighting domains, as well as a growing number of small businesses and startups. The proximity to major defense installations, and the presence of the top defense contractors, encourage collaboration and innovation."

To assist with drawing major defense contractors to the FST, the DoN SBIR Program Office has scheduled the annual SBIR Prime Summit for the two days preceding the FST (April 8-9 April).

UML RI has close ties with the Army's Natick Laboratories, and Hanscom AFB, which hosts the Air Force Life Cycle Management Center and supports the Federally Funded Research and Development Centers (FFRDCs) MIT Lincoln Laboratory and MITRE. In partnership with MITRE, the state has also established the Massachusetts Innovation Bridge to connect local businesses, nonprofits, and academic institutions with federal opportunities.

UML is home to the Printed Electronics Research Collaborative (PERC) which is a strategic partnership between industry, university and government. Massachusetts-based Raytheon Company and UMass Lowell have established the Raytheon-UMass Lowell Research Institute (RURI), a joint research facility focused on the advancement of innovative technologies including flexible and printed electronics (see page 8 for more on RURI).

Attendees at the FST can learn about the UMASS SBIR Center of Excellence (COE), which assists small companies in entering and succeeding in the SBIR process. The SBIR COE can provide consulting services to overcome any barriers to entry, including reducing the cost of access to IT services, technology assistance, and manufacturing and management consulting.

"We have everything an SBIR company would need, from concept inception to full commercialization," McSwain said. "Because we have a grant from DoD, access to our consulting

*"This is a significant area for technology and innovation."*

*Matthew McSwain,  
UML RI's Executive Director*



## UMASS LOWELL TO CO-HOST 2019 FST... continued

service is available at a reduced rate. We want to keep the threshold for those small businesses with brilliant ideas as low as possible.”

McSwain said the FST at UML will provide small companies with access to primes, program managers and procurement professionals. “We’ll have PEOs, and senior level acquisition professionals, along with that all important

transactional layer of GS-14s and 15s. There will be directors of SBIR programs from government and the large primes.”

“We want to facilitate setting up meetings and sidebar discussions with the small business that come here and the FFRDCs, primes, and other tech companies,” said McSwain. “The FST is an ideal venue to do that.”

## UPCOMING EVENTS

Jan. 28-30	12th Operational Energy Summit 2019 <a href="https://www.tacticalpowersourcessummit.com/">https://www.tacticalpowersourcessummit.com/</a>	Alexandria, VA
Feb. 3-5	2019 Tactical Wheeled Vehicles Conference <a href="http://www.ndia.org/events/2019/2/3/tactical-wheeled-vehicles-conference">http://www.ndia.org/events/2019/2/3/tactical-wheeled-vehicles-conference</a>	Monterey, CA
Feb. 5-7	30th Annual SO/LIC Symposium and Exhibition <a href="http://www.ndia.org/events/2019/2/5/30th-annual-solic-symposium">http://www.ndia.org/events/2019/2/5/30th-annual-solic-symposium</a>	Arlington, VA
Feb. 6-7	Military Additive Manufacturing Summit 2019 <a href="http://militaryam.dsigroup.org/">http://militaryam.dsigroup.org/</a>	Tampa, FL
Feb. 13-15	West 2019 <a href="http://www.westconference.org/West19/Public/Enter.aspx">http://www.westconference.org/West19/Public/Enter.aspx</a>	San Diego, CA
Feb. 27-Mar. 1	Air Warfare Symposium <a href="https://www.afa.org/events/calendar/2019/02/27/air-warfare-symposium">https://www.afa.org/events/calendar/2019/02/27/air-warfare-symposium</a>	Orlando, FL
Mar. 2-9	IEEE Aerospace Conference 2019 <a href="https://aeroconf.org/">https://aeroconf.org/</a>	Big Sky, MT]
Jun. 17-19	SBIR/STTR Spring Innovation Conference <a href="https://www.techconnectworld.com/SBIRSpring2019/">https://www.techconnectworld.com/SBIRSpring2019/</a>	Boston, MA
Jun. 17-21	AIAA Aviation Forum “Shaping the Future of Flight” <a href="https://aviation.aiaa.org/">https://aviation.aiaa.org/</a>	Dallas, TX

# Join us at FST 10-11 April 2019 Lowell, Massachusetts



## WHAT TECHNOLOGIES WILL YOU SEE AT THE 2019 FST?

Over 130 Navy-funded SBIR/STTR technologies, from 108 innovative small businesses will be on exhibit at the 2019 FST. Which ones will you want to see? Here is an easy way to get a look at what interests you!

**STEP 1:** • Use the Checklist below to identify the Technology Category(s) of interest to you

✓ Your Areas of Interest	Technology Categories Represented at FST
	<b>Advanced Electronics</b> - Technologies for processing of information; detection of chemical, biological, radiological and nuclear threats; radio frequency (RF) and electro-optical/infrared (EO/IR) sensing, transmission, communication; and motion detection
	<b>Air Platforms</b> - Technologies related to fixed and rotary wing platforms, aircraft propulsion, hypersonic systems, aircraft power and thermal management, and manned, unmanned, and optionally manned future air system
	<b>Autonomy</b> - Technologies enabling autonomous systems
	<b>Battlespace Environment</b> - Technologies for forecasting and modeling of ocean, lower atmosphere, and terrestrial battlespace environments
	<b>Biomedical</b> - Technologies to sustain and improve responsiveness to medical readiness and warfighting needs
	<b>Command, Control, Communications, Computers &amp; Intelligence</b> - Technologies related to advanced C4I software, hardware and systems; Human Computer Interfaces for decision making; information collection/management; and robust and resilient networks and communications systems
	<b>Cyber</b> - Technologies to dominate cyberspace through agile, resilient, and integrated defensive and offensive operations
	<b>Electronic Warfare</b> - Technologies using Electro-Magnetic and directed energy to control the EM Spectrum, or to attack the enemy while protecting friendly systems
	<b>Energy and Power Technologies</b> - Technologies that enable intelligent power & energy management to enhance operational effectiveness
	<b>Engineered Resilient Systems</b> - Technologies that provide engineering, warfighting, and the acquisition decision-makers with the capability to evaluate a multi-dimensional tradespace with full and consistent information throughout the life-cycle of the systems
	<b>Ground and Sea Platforms</b> - A broad range of platform technologies for both ground and sea systems—stressing concepts in modularity, survivability and mobility
	<b>Human Systems</b> - Technologies that allow sharing of information, ideas, and best practices; identifying opportunities; measuring progress; and joint planning and coordinating across Department of Defense (DoD) programs
	<b>Materials &amp; Manufacturing Processes</b> - Technologies for advanced materials and manufacturing processes for structures and protection; propulsion and extreme environments; sensors, electronics, and photonics; power and energy; readiness; individual warfighter; civil engineering; and corrosion
	<b>Modeling and Simulation Technology</b> - Technologies that support interoperability of simulations across a broad range of DoD simulations and live C4ISR systems
	<b>Sensors</b> - Technologies related to Radio Frequency, Acoustic, Seismic, Magnetic, and Electro-Optical/Infrared sensors
	<b>Space</b> - Technologies related to Satellite Communications; Positioning, Navigation and Timing; Intelligence, Surveillance and Reconnaissance, and Space and Terrestrial Environmental Monitoring
	<b>Weapons Technologies</b> - Technologies related to guidance navigation & control and data links, ordnance, propulsion, undersea weapons, high energy lasers; radio frequency weapons, non-lethal weapons, missiles, bombs, rockets, artillery, mortars, torpedoes, mines, guns, launchers, and projectiles

**STEP 2:** • Go to the 2019 FST Virtual Transition Marketplace at: [www.navyfst.com/vtm](http://www.navyfst.com/vtm)

**STEP 3:** • Click the “BY CATEGORIES” filter box, and refer to your Checklist to select a technology category  
 • Click on the “DETAIL” tab of a company  
 • If you like what you see, add the company to your Briefcase (requires you to generate a password)  
 • Use the arrows to scroll through other technologies in this category

*Tomorrow's Technology, Today*

