UNITED STATES AIR FORCE

TECHNOLOGY TRANSFER PROGRAM

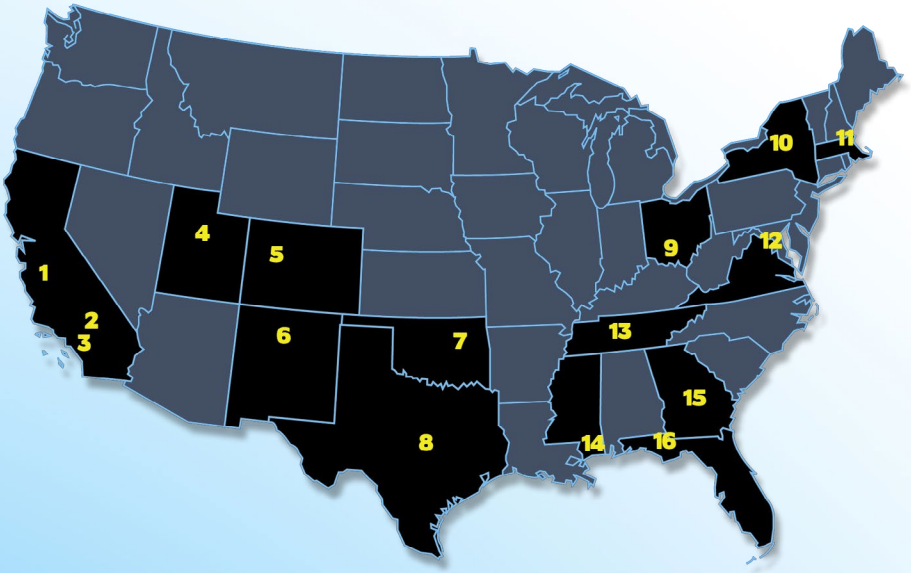
LINKING TECHNOLOGY

WITH THE MISSION AND MARKETPLACE

2016

SUCCESS STORIES

LOCATIONS WITH CURRENT TECHNOLOGY TRANSFER AGREEMENTS



CALIFORNIA
1. TRAVIS AFB
   - 60th Medical Group
     David Grant Medical Center
2. EDWARDS AFB
   - Air Force Flight Test Center
3. SPACE & MISSILE SYS CNTR

UTAH
4. HILL AFB
   - Ogden - Air Logistics Center

COLORADO
5. US AIR FORCE ACADEMY

NEW MEXICO
6. KIRTLAND AFB
   - Directed Energy
   - Space Vehicles

OKLAHOMA
7. TINKER AFB
   - Oklahoma City - Air Logistics Center

TEXAS
8. LACKLAND AFB
   - 688th Information Wing
   - 59th Medical Wing
     Wilford Hall Medical Center
   - Civil Engineering Center

OHIO
9. WRIGHT-PATTERSON AFB
   - Aerospace Systems
   - Air Force Institute of Technology
   - ISR & Special Operations Forces
   - Materials and Manufacturing
   - Program Development & Integration
   - Sensors
   - Wright-Patterson Medical Center
   - 711th Human Performance Wing

NEW YORK
10. ROME AFB
   - Information

MASSACHUSETTS
11. HANSCOM AFB
   - Battlefield Management
   - Command, Control, Communications and Intelligence (C3I) & Networks

VIRGINIA
12. ANDREWS AFB
   - Air Force Surgeon General
   - Ft. Detrick
     Air Force Medical Evaluation Support Activity
   - Linthicum, MD
     DoD Cyber Crime Center

TENNESSEE
13. ARNOLD AFB
   - Arnold Engineering and Development Center

MISSISSIPPI
14. KEESLER AFB
   - 81st Medical Group
     Keesler Medical Center

GEORGIA
15. ROBINS AFB
   - Warner Robins - Air Logistics Center

FLORIDA
16. EGLIN AFB
   - Munitions
   - Hurlbert Field
     AFSOC (720th STG)

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Keith Quinn

U.S. Air Force Technology Transfer Program Manager

The Air Force Technology Transfer (T2) Program was created to link technology and the Air Force mission with the marketplace by ensuring that Air Force science and engineering activities are transferred or shared with state and local governments, academia and industry. The exchange of knowledge, expertise, equipment, and testing facilities leverages the Department of Defense research and development investments.

These are exciting times as Air Force intellectual property continues to grow and we expand our collaborative projects with industry and academia. One of our newest initiatives is bolstering our marketing and communications efforts. Earlier this fall we distributed our first quarterly newsletter, ConnecT2, and added a LinkedIn page to our social media efforts. In addition, we have been working to steadily produce T2 success stories and spread the word about our program in the media. This success story book is a collection of the stories written in the last two quarters of Fiscal Year 16 (FY16). It contains a sampling of stories about new agreements as well as established agreements with significant achievements.

We are excited to showcase the Air Force T2 program in this way and welcome any ideas for future success story books.

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AIR FORCE T2 AGREEMENTS FOR FY16

These tables show the total number of agreements that were signed in FY16 and those that were signed previously but remain active in FY16. CRADAs and EPAs remain in the forefront of our technology transfer efforts, with an increased focus on PLAs moving forward.

Agreements per Transfer Mechanism, FY16, Status: STARTED

TRANSFER MECHANISM	AGREEMENT COUNT
Commercial Test Agreements	4
CRADAs	96
Educational Partnership Agreements	76
Information Transfer Agreements	71
Material Transfer Agreements	6
Patent License Agreements	36

Agreements per Transfer Mechanism, FY16, Status: ACTIVE

TRANSFER MECHANISM	AGREEMENT COUNT
Commercial Test Agreements	21
CRADAs	719
Educational Partnership Agreements	401
Information Transfer Agreements	94
Material Transfer Agreements	29
Patent License Agreements	102

NATIONAL ECONOMIC IMPACT

License agreements in effect through the **Air Force T2 Program** generate a measurable impact on the national economy. In a study* from 2000-2014, T2 contributed to new economic activity and job creation in the U.S. while driving the transition of new technology to U.S. military use.

**This economic-impact study was conducted by TechLink, a federally funded technology transfer center at Montana State University, Bozeman, in collaboration with the Bureau of Business and Economic Research at the University of Montana, Missoula. Since 1999, TechLink has served as the DoD's principal national "partnership intermediary," helping to develop technology transfer partnerships between DoD laboratories and U.S. industry nationwide.*

CRADA

A Cooperative Research and Development Agreement (CRADA) provides quick, unique access to extensive government-funded research and development resources that can be leveraged to yield powerful research results, while providing intellectual property protection as companies move swiftly toward commercialization.

GLOBAL HAWK GETS INNOVATIVE ISR PAYLOAD ADAPTER

By Bill Hancock, 88th Air Base Wing Public Affairs Wing

Northrop Grumman
Falls Church, Virginia

WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- Using a Cooperative Research and Development Agreement (CRADA), the Air Force Life Cycle Management Center, partnering with Northrop Grumman and Air Combat Command, has developed an innovative solution to the tricky problem of how to connect existing and future information gathering sensor capabilities, not currently designed for the Block 30, RQ-4, Global Hawk high altitude long endurance Unmanned Aircraft System, to link with the airframe system. Through the CRADA, the ISR Payload Adapter (IPA) was conceived and flown within seven months.

"The IPA allows the RQ-4 to adapt and go beyond its current sensor capabilities. An example is the recent successful flight, for the first time ever, of an Air Force legacy system, the Senior Year Electro-Optical Reconnaissance System-2 (SYERS-2) intelligence gathering sensor on the Global Hawk," said Col. Darien Hammett, Global Hawk program Director, "This flexibility permits us to communicate to potential future interested vendors, how to physically and electronically connect sensor platforms to the Global Hawk. Allowing adaptability in payloads, increased range and the achievement of the highest National Imagery Interpretability Rating Scale available. With the development of the IPA, our Block 30 airframes will gain further capability in supporting future and current information gathering sensor systems availability."

The current Global Hawk Block 30 aircraft is capable of carrying systems such as the Enhanced Integrated Sensor Suite, Airborne Signals Intelligence Payload. These electro-optical, infrared, radar, and SIGINT sensors enable Remotely Piloted Aircraft (RPAs) to detect movements, assist with humanitarian operations, and find the enemy. Increasingly, current and future military RPAs use multi-intelligence sensor payloads to perform those missions. As the demand for capability increases and component technology proliferates it is very important that sensor information payloads be adaptable and flexible in design to allow increased ability and option of choices.

With the success of the SYERS-2 flight, there are now plans to demonstrate the Optical Bar Camera sensor, and fully integrate the next generation UTC Aerospace Systems (UTAS) MS-177 on the Global Hawk.

"The IPA allows vendors to use some or all of the 17 physical attachment points on the IPA, know how much power is available and make crucial data exchanges with the aircraft. Basically everything needed to design, build and mount a sensor on a Global Hawk," said Hammett. "Opening up the architecture of the air system will provide added sensor technology opportunities through increased competition, which is our goal."

Global Hawk (U.S. Air Force photo)

USAFSAM WORKING TO HELP BATTLEFIELD AIRMEN BEAT THE HEAT

By Kim Bowden, AFRL, 711th Human Performance Wing

Gawi Healthcare, LLC
Phoenixville, Pennsylvania

WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- Of all the threats facing Battlefield Airmen and other special operations forces, heat doesn't typically come to mind. However, heat-related illness is a critical factor for personnel operating in extreme temperatures.

Dr. Reginald O'Hara and his Exercise Physiology Research Team at the United States Air Force School of Aerospace Medicine (USAFSAM), part of the Air Force Research Laboratory's 711th Human Performance Wing, are working to reduce that heat stress.

"Military personnel exposed to excessive heat for an extended period of time may experience reductions in both physical and cognitive performance," O'Hara said. "Those reductions could severely limit their ability to carry out their duties during intense ground and flight operations."

Essentially, if battlefield airmen are working at decreased capacity, the risk of mission failure increases.

Though there are many effective ways to mitigate high temperatures, most are not realistic solutions for the battlefield. For example, most devices are heavy and bulky, adding too much weight for troops to practically carry. What's more, many require a power source or a means of "re-cooling," which might not always be available, and they are often too noisy to safely use in the field.

Working under a Cooperative Research and Development Agreement with Gawi Healthcare, LLC, the USAFSAM team has developed an alternative -- a small, lightweight, passive cooling technology. Under the three-year Technology Transfer collaboration with Gawi, which had acquired the assets of Arctic Ease, USAFSAM hopes to develop and commercialize a variety of hydrogel cooling technologies.

O'Hara and his fellow researchers have started testing two variations of the technology to date. One is an Air Force-invented cooling sleeve or wrap for the water bladder that battlefield airmen and other special ops forces carry, and one is cooling inserts for a specially-designed undershirt.

"The devices act through a form of conduction," O'Hara said, "transferring heat from the water in the hydration pack bladder or the airman to the hydrogel.

The team conducted field-based testing of the sleeve to see if it would maintain or even reduce the temperature of the water during extended exposure to high heat and humidity, making it more palatable and thereby encouraging airmen to drink more and stay hydrated.

"The sleeve was tested during 60-minute marches in 90 degree F temperatures and 40 percent humidity, and it successfully demonstrated a 20 degree drop in drinking water temperature," O'Hara said. "Subjects drank up to two liters more cooled water when compared to non-cooled water."

Additional test plans include incorporation of quick-dissolve amino acid supplements to enhance hydration, energy and performance during training.

Testing of the shirt inserts had similarly positive results, according to O'Hara. Subjects wearing the special undershirt with cooling inserts experienced lower core body temperature and significantly lower peak body temperature after a 70-minute weighted vest treadmill walking test than subjects in the standard undershirt with no inserts.

"During sustained operations, even a few degrees can make a tremendous difference," O'Hara said. "If these cooling devices can lead battlefield airmen and other special ops forces to drink more or help keep them from over-heating, the risk of heat stress and other heat-related illnesses goes down. And that means their focus can be on accomplishing the mission."

An Air Force-invented cooling sleeve for a water bladder and cooling inserts for a specially-designed undershirt are two ways that Dr.Reginald O'Hara and his research team at the USAFSAM hope to help Battlefield Airmen and other special operations forces avoid heat-related illness while in hot, humid conditions. (Courtesy photo)

USAFSAM TO STUDY POTENTIAL TRANSFER OF NOVEL VIRUSES VIA BED BUGS

By Mindy Cooper, Air Force Technology Transfer Program Office

University Hospitals of Cleveland
Cleveland, Ohio

WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- The U.S. Air Force School of Aerospace Medicine (USAFSAM) recently signed a limited-purpose Material Transfer Agreement Cooperative Research and Development Agreement (MTA-CRADA) with the University Hospitals of Cleveland, Ohio. This unique agreement doesn't include a financial contribution, rather the hospital is providing USAFSAM with frozen bed bugs collected from patients with symptomatic illness for testing and evaluation. In return, USAFSAM will share the test data with the hospital.

Bedbug infestation has become a national problem. Although traditional testing has shown that the insects do not transfer known viruses to humans, further testing needs to be done to detect the possible transfer of novel viruses.

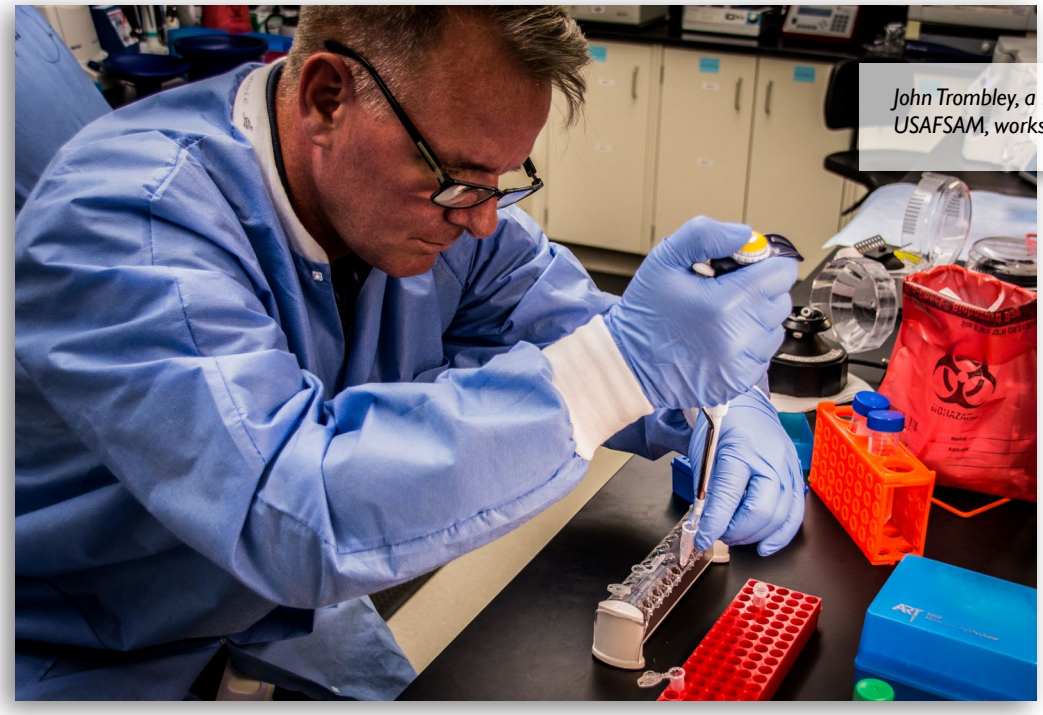
As part of the Air Force Research Laboratory, 711th Human Performance Wing (HPW), USAFSAM strives to continually work towards detecting new and emerging pathogens. With the material from the hospital, the lab plans to utilize next generation sequence testing (Illumina miSeq and the Pacbio) to investigate sequences that aren't in current databases.

"ER doctors report seeing many patients with bed bug bites that have symptoms of infections," said Dr. Clarise Starr from USAFSAM. "But testing for the known viruses comes up negative. At USAFSAM, we have the capability to do virus hunting in a way that can benefit both the military and civilian populations. This testing is one such instance."

The goal of the initial round of testing is to identify unusual sequences that may exist and compile data that may support further studies.

"Material transfer agreements are one type of limited-purpose CRADAs that allow for quick collaboration with the Air Force," said John Schutte, 711th HPW technology transfer specialist. A CRADA is a legal agreement between a federal laboratory and one or more nonfederal parties such as private industry and academia. CRADAs offer both parties the opportunity to leverage each other's resources when conducting research and development that is mutually beneficial.

"It is our goal to expand our bio-surveillance capabilities so that we will get to a point where we can screen for all organisms in any environment in which our airman work," said Starr. "We want the ability to identify any risks before people are symptomatic."



John Trombley, a biomedical lab technician at the USAFSAM, works on exome sequencing. (Courtesy photo)

AIR FORCE SIGNS FIRST CRADA TO ASSESS NON-DEFENSE MILITARY AIRCRAFT

By Bill Hancock, 88th Air Base Wing Public Affairs Wing and Antoinette Smith from Secretary of the Air Force, Public Affairs

Textron AirLand LLC
Witchita, Kansas

WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- Under a new Cooperative Research and Development Agreement (CRADA) between the Non-DoD Military Aircraft (NDMA) Office and Textron Airland, LLC, the U.S. Air Force Airworthiness Office will provide an airworthiness assessment of Textron's M 530 Scorpion.

"This is the first of its kind; we have never had a partnership with industry to assess aircraft that are not under an Air Force acquisition contract," said Jorge F. Gonzalez, USAF Technical Airworthiness Authority.

The NDMA office opened in April 2016 and will execute CRADAs with any interested industry partner on a first-come, first-served basis. For these new agreements, the Air Force and industry partners will work together to define a set of evaluation criteria using MIL-HDBK-516.

When the assessment criteria has been established the Air Force will perform an independent compliance assessment using design, analysis and test data provided by the industry collaborator. At the end of the process, the Air Force will produce a comprehensive risk analysis document, called an airworthiness assessment report.

The process will enable the Air Force to gain a much deeper understanding of the state of civil aviation, while providing industry with an expert, independent evaluation of the safety and reliability of their products. Over time, these collaborations will help the Air Force better understand commercial innovations and support its broader research and development goals.

"Allowing the Air Force to collaborate with non-defense aircraft partners for the first time is a big deal. This agreement and similar agreements benefit both government and industry partners," said Keith Quinn, Air Force Technology Transfer Program Office program manager.

Industry partners benefit by using the Air Force's valuable expertise to receive an assessment of the company's aircraft type design against applicable military airworthiness criteria. This helps to reduce design risk and also results in an official assessment that may be advantageous to future foreign customers. While the assessment procedure follows the Air Force airworthiness certification process to its fullest extent as outlined in Air Force policy and guidance, the aircraft will not receive an airworthiness certification.

The airworthiness process is fact-based and data-driven. The standard CRADA period of performance is two years, but can be completed early, terminated by either party at any time or extended as necessary upon agreement from both parties. Government costs for the assessments are fully reimbursed by industry for all expenses incurred under the agreement.

"This is a win-win for the Air Force, industry, and our national defense," said Camron Gorguinpour, the Air Force's director of transformational innovation. "Not only are we gaining insight into technical innovation, we're also finding innovative ways to collaborate with industry to our mutual benefit."

At table, from left, Dr. Kenneth W. Barker, USAF Deputy Technical Airworthiness Authority; Mr. Jorge F. Gonzalez, USAF Technical Airworthiness Authority; Tom Hammoor, President, Textron Aviation's defense company; and Bill Anderson, President Textron AirLand LLC., sign the first ever Collaborative Research and Development Agreement for the Non-DoD Military Aircraft Office while surrounded by their respective team members from the NDMA office and Textron AirLand Inc. (U.S. Air Force photo/Bill Hancock)

AIR FORCE AGREEMENT ALLOWS IONOSPHERIC RESEARCH TO CONTINUE

By Jaclyn Knapp, Air Force Technology Transfer Program Office

University of Alaska Fairbanks
Fairbanks, Alaska

KIRTLAND AIR FORCE BASE, New Mexico -- Because of a recent Cooperative Research and Development Agreement (CRADA) between the Air Force Research Laboratory's (AFRL) Space Vehicles Directorate and the University of Alaska Fairbanks (UAF), more than twenty-five years of science and atmospheric research will continue with the High Frequency Active Auroral Research Program (HAARP).

Although the Air Force will not be funding maintenance of the HAARP facility or other research efforts, this agreement allows ionospheric research to continue. UAF will maintain the facility and will be offered access to government-funded resources to continue existing ionospheric research.

"The objective of the joint Air Force and Navy HAARP was to conduct basic, exploratory, and advanced development research programs leading to the use of emerging ionosphere/radio science technology for next-generation systems by characterizing the physical processes produced in the ionosphere and space via interactions with high-power radio waves," said Dr. Craig Selcher, senior research physicist and former Air Force HAARP program manager. "With the completion of these efforts for the Department of Defense on the horizon, handing the torch to the UAF Geophysical Institute allows for the continuation of the ground-breaking research that only the HAARP facility can perform."

The HAARP facility is located in Gakona, Alaska, and includes a high-frequency radio transmitter that directs its energy upward into the ionosphere and space, as well as a suite of optical and radio diagnostics instruments. The research involves the space environment beginning at about 100 km altitude (~60 miles) out to tens of thousands of kilometers, far above the jet stream or the atmosphere that affects terrestrial weather.

According to Dr. Robert McCoy, director of the Geophysical Institute at UAF, "HAARP is one of four active ionospheric facilities in the world and by far the most powerful and flexible. The first science campaign is planned for February 2017. Scientists around the world have been making proposals to government funding agencies to support research at HAARP.

"The unique attributes of HAARP are its demonstrated ability to create ionospheric perturbations in a small region over the facility and stable, long-lived ionospheric layers even in the absence of auroral activity. Its superior location in the subarctic enables over-the-horizon radar experiments, and utilization of the ionosphere as a large antenna to generate extremely low-frequency waves for a number of applications."

The Air Force Technology Transfer (T2) Program Office facilitated the CRADA agreement. Air Force T2 was created to link technology, the Air Force mission, and the commercial marketplace by ensuring that Air Force science and engineering activities are transferred or intentionally shared with state and local governments, academia and industry.

View of HAARP array with Mount Drum in the distance. (Courtesy photo/Jessica Matthews)

AIR FORCE AGREEMENT ENABLES COLLABORATION ON AIRCRAFT ANTI-ICING TECHNOLOGY

By Jaclyn Knapp, Air Force Technology Transfer Program Office

Battelle
Columbus, Ohio

WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- The Air Force Life Cycle Management Center (AFLCMC) and Battelle Memorial Institute established a Cooperative Research and Development Agreement (CRADA) to develop affordable, light-weight, easily-adaptable ice protection technology.

In order to achieve maximum operational performance, unmanned aircraft systems (UAS) must be able to complete missions in adverse weather conditions, such as light to moderate icing. Decreased flight performance and aborted missions occur when a UAS is unable to meet these challenges.

For the Air Force, this agreement supports research and development efforts for discovering an ice protection system that contributes to enhanced performance and less aborted missions. These types of agreements also allow the Air Force to explore technological developments without committing funding.

"From a traditional viewpoint, technological advancements achieved as a result of this collaboration would not have been made possible without structured and formalized research and development agreements," said Maj. Andrew Soine, Chief, Intelligence, Surveillance and Reconnaissance Technology Development. "These agreements allow the Air Force to express a mutual interest in the future of the technology as both parties collaborate for a solution by utilizing resources other than taxpayer money."

The collaborative partners for this CRADA are AFLCMC at Wright-Patterson Air Force Base, Ohio, and Battelle Memorial Institute in Columbus, Ohio.

"Access to government furnished equipment allowed Battelle to validate multiple modeling and simulation tests and brought developments to the current integration stage on operational aircraft," said Randy Johnson, Battelle's program manager. "This agreement will also allow the Air Force to provide us with detailed technical information required for the actual integration."

As of recently, the final stages for developing a cutting edge ice protection system that uses a carbon nanotube dispersant as a resistive heater for anti-ice/de-ice capability are being conducted by Battelle. Coupled with an autonomous, intelligent, closed-loop controller, the system provides the lowest size, weight, and power electro-thermal solution available.

In addition, this agreement will allow Battelle to continue to test and validate their research and development efforts on test wings and engine air inlets from operational systems. Battelle will also leverage their collaboration with the Air Force for acquiring additional external funding through various proposals and grants.

The Air Force Technology Transfer Program was created to link technology, the Air Force mission, and marketplace by ensuring that Air Force science and engineering activities are transferred or intentionally shared with state and local governments, academia and industry.

Leading edge of RQ-4 aircraft wing surface with and without using an active ice protection system. (Courtesy photo/Battelle)

AFTAC AGREEMENT AIMS TO IMPROVE CLOUD COMPUTING FOR LARGE DATA SETS

By Mindy Cooper, Air Force Technology Transfer Program Office

Florida Institute of Technology
Melbourne, Florida

PATRICK AIR FORCE BASE, Florida -- The Air Force Technical Applications Center (AFTAC) and the Florida Institute of Technology (FIT) established a Cooperative Research and Development Agreement (CRADA) to explore efficient cloud computing for processing large data sets.

A CRADA is a government agreement allowing for research and development (R&D) collaborations between federal laboratories and nonfederal parties. CRADAs provide quick, unique access to extensive government-funded R&D resources that can be leveraged to yield powerful research results, while providing intellectual property protection as you move toward commercialization.

"By engaging the CRADA process, we hope to enable 'best value' solutions for the Air Force," said Dr. Glenn Sjoden, AFTAC's chief scientist.

Cloud computing and big data analytics are becoming a key offering in government practices because it enhances the mission and reduces costs. Existing computer programs and algorithms developed for traditional computing may not be adequate to be efficiently and cost-effectively implemented in cloud computing solutions. As the Air Force modernizes its information technology architecture and leverages cloud computing, it must also evaluate the efficiency, effectiveness and compatibility of existing data processing and analyses techniques/algorithms with these new capabilities.

This CRADA provides a vehicle for sharing technical expertise, ideas, data and information in a protected environment that will focus on improving the capability to process large data sets associated with global nuclear treaty monitoring. Under the agreement, AFTAC will be able to leverage FIT's academic faculty expertise in analysis methods and algorithms to address critical mission needs. The FIT team will use AFTAC facilities, expertise, and equipment with an estimated value of nearly $100M. This includes Air Force expertise in geophysics, nuclear physics and nuclear engineering, chemistry and electro-optical engineering.

"CRADAs are mutually beneficial to the Air Force and our partners. The Air Force benefits from the knowledge and skill sets of our partner while experiencing a cost savings in the cloud computing effort while the FIT team has access to Air Force expertise and state-of-the-art facilities and equipment," said Keith Quinn, Air Force Technology Transfer program manager.

It is estimated that it would require four man-years to complete development of a cloud-computing capability. The Air Force estimates savings of more than $500,000 by establishing this agreement with a university team devoted to the effort.

Dr. Glenn Sjoden (left), chief scientist for the Air Force Technical Applications Center, shakes hands with Dr. T. Dwayne McCay, president and chief executive officer of Florida Institute of Technology, after the two organizations entered into a cooperative research and development agreement Aug. 3, 2016 at FIT's Melbourne, Florida, campus to explore high performance cloud computing, modeling and simulation. (U.S. Air Force photo/Susan A. Romano)

PIA

Many federal laboratories have Partnership Intermediary Agreements (PIAs) with entities that facilitate joint projects and accelerate technology transfer between the lab and private companies. They help companies identify federal technologies that can be licensed and commercialized.

MEDICAL SPONGE INVENTION HAS POTENTIAL TO SAVE THOUSANDS OF LIVES BOTH ON AND OFF THE BATTLEFIELD

By Jaclyn Knapp, Air Force Technology Transfer Program Office

RevMedX, Inc.
Wilsonville, Oregon

WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- The Air Force Medical Support Agency partnered with a private medical company that developed life-saving technology for use on and off the battlefield.

XStat, which was developed by RevMedx, Inc., is a device filled with 92 sterile, compressed mini sponges that when injected into a wound expand up to 10 times their size when in contact with blood or fluid.

According to Army research, excessive blood loss has reportedly been linked to 90 percent of potentially avoidable deaths from wounds sustained on the battlefield. XStat, which was created with guidance from U. S. Special Operations Command military medics, is a unique hemorrhage control device designed to control severe bleeding in junctional areas, such as the armpit or groin, where tourniquets or other methods are not successful. The device was cleared for use on the battlefield by the Federal Drug Administration in April 2014.

"This potentially life-saving device enables military medics and first responders to dress and pack a wound two to three minutes faster than traditional means, such as preparing and applying pressure with both hands to a tourniquet or packing" a wound with gauze. This free hand can then tend to a patient's vitals and other injuries as the sponges naturally expand and control bleeding in the wound in a matter of seconds," according to Tricia Randall, Air Force Technology Transfer Program Office.

Sgt. Maj. Kyle Sims, a combat medic with U.S. Special Operations Command, said XStat has been used in the field.

"They couldn't get the bleeding to stop in his leg and they ended up using the XStat dressing," Sims said, adding that the surgeon on location had never seen the device. "He was quite impressed and he ended up pretty amazed that it worked as effectively as it did."

For hemorrhages in areas with major blood vessels like the shoulder and groin, where XStat is intended for use, Sims says it's a tough art to pack a wound using traditional methods like gauze to stop the bleeding.

"It might take four to five minutes to get that wound taken care of, whereas with XStat, it takes 10 to 20 seconds to get all the dressing in place," Sims said.

The sponges can remain in the patient for up to four hours or until they reach definitive care. As with all severe wounds requiring surgery, the XStat sponges can be removed by a surgeon using standard instruments. All sponges contain a radiopaque marker that is clearly visible with standard X-ray to ensure proper removal prior to closing the wound.

Because of its proven effectiveness in testing, the FDA cleared it for civilian use in December 2015, with civilian market availability beginning in February 2016.

The Air Force Medical Support Agency is providing technology transition assistance to RevMedx, Inc. to assist with improving the manufacturing capacity for XStat. This assistance is made possible through the DoD Partnership Intermediary Agreement between the Air Force Research Laboratory and Montana State University/MilTech. As a Partnership Intermediary Agreement (PIA), MilTech supports DoD Technology Transfer across the United States.

The XSTAT, developed by RevMedX, Inc. Inset photo depicts sterile compressed mini sponges. (Courtesy photos)

AFRL ESTABLISHES NEW PARTNERSHIP INTERMEDIARY AGREEMENT WITH PURDUE UNIVERSITY

By Mindy Cooper, Air Force Technology Transfer Program Office

Purdue Research Foundation, Purdue University
West Lafayette, Indiana

WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- The Air Force Research Laboratory (AFRL) and Purdue Research Foundation signed a new partnership intermediary agreement (PIA) in order to expedite the technology transfer process of AFRL technology into the commercial market. The foundation will work with AFRL, the Air Force Technology Transfer Program Office, Wright Brothers Institute, The Entrepreneur Center, student teams and companies to identify technologies that are available for licensing and commercialization. This type of agreement allows the Purdue Research Foundation to facilitate joint projects and technology transfer between the Air Force and private companies.

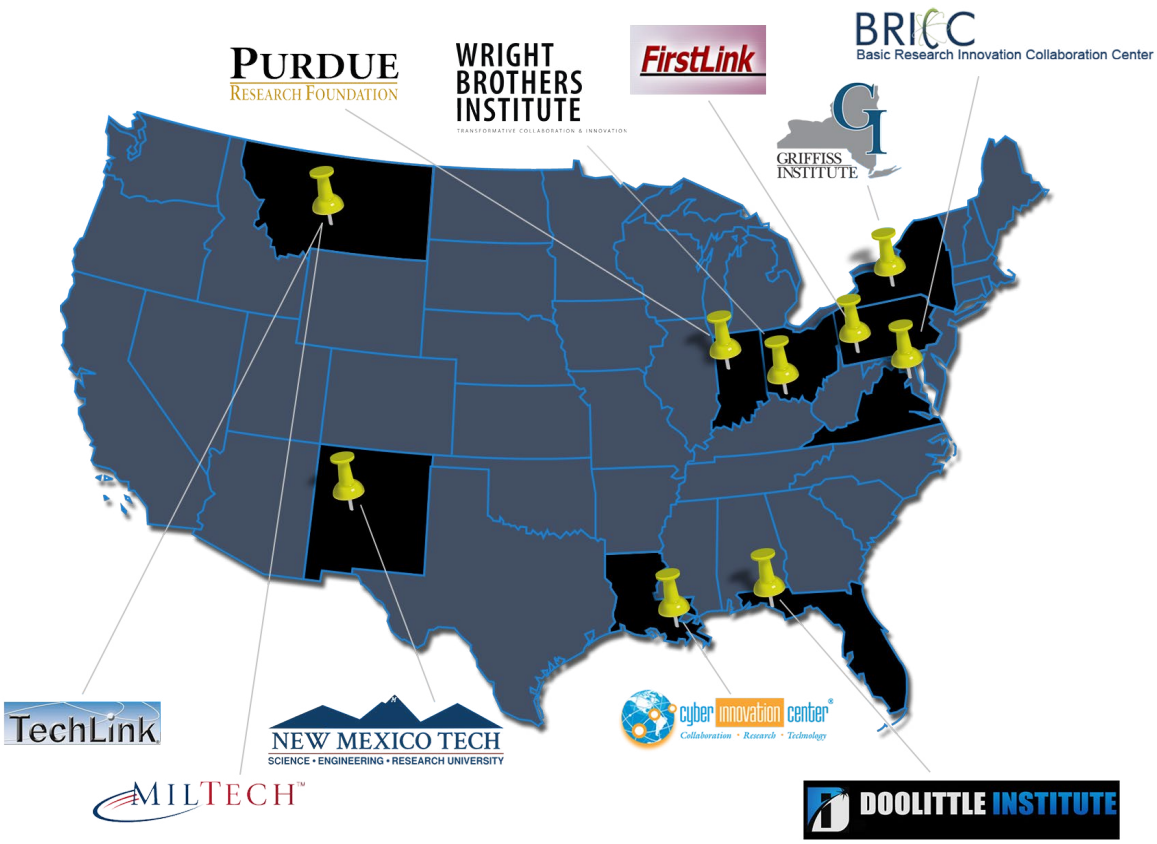
Working with their partners, Purdue Research Foundation will help teams establish sound business plans and market their products – thus opening new commercial outlets for AFRL technology. In addition, Purdue Research Foundation will share best practices in commercialization training, outreach and marketing.

"The goals of this agreement include implementing our established technology translation processes and to expand the commercialization channels for Purdue and AFRL," said Chad Pittman, vice president of the Purdue Office of Technology Commercialization. "Because we share so many similar disciplines and industries, the successful marketing and commercialization methods we utilize will fit well with the innovations and technologies that AFRL has developed and patented. We are excited to begin this endeavor with the Air Force."

According to the Purdue Research Foundation, Purdue uses various marketing tools that have proven immensely successful, including a monthly e-newsletter with 100,000 subscribers and Flintbox, an online tool that promotes innovations. With this agreement, AFRL technology is going to benefit from the foundation's successful marketing practices to increase transfer to the commercial market.

"Agreements like this are one of the cornerstones of a successful technology transfer program," said Keith Quinn, Air Force Technology Transfer Program Office Program Manager, "Purdue has many successful methods for quickly commercializing products. We are eager to see what they can do with AFRL technology."

PARTNERSHIP INTERMEDIARIES



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EPA

An Educational Partnership Agreement (EPA) is a formal agreement between a defense laboratory and an educational institution to transfer and/or enhance technology applications and to provide technology assistance for all levels of education (pre-kindergarten and up).

EDUCATION PARTNERSHIP AGREEMENT PROVIDES COLLABORATION OPPORTUNITIES

By Jessica Casserly, 66th Air Base Group Public Affairs

George J. Kostas Research Institute for Homeland Security
Burlington, Massachusetts

HANSCOM AIR FORCE BASE, Massachusetts -- A recently signed Education Partnership Agreement (EPA) between Hanscom and the George J. Kostas Research Institute (KRI) for Homeland Security at Northeastern University grants new research and educational collaboration opportunities for the Air Force Life Cycle Management programs here.

The three-year agreement allows Hanscom and KRI to collaborate in multiple areas, including research, education and workforce development.

"We are grateful to our partners at Northeastern's Kostas Research Institute as we team up on projects in multiple disciplines," said Dr. Tim Rudolph, AFLCMC chief technology officer. "The mission of Kostas aligns well with AFLCMC missions across multiple functional areas. Together, we are already beginning to see how this mutually beneficial relationship on homeland and national security supports students and professors at Kostas, as well as Hanscom personnel."

When AFLCMC reached out to Northeastern University with this opportunity, KRI CEO Peter Boynton recognized it as a chance to implement their namesake Dr. George J. Kostas's "three-legged stool" approach.

"[Dr. Kostas] saw the almost magic that can happen if you can successfully co-locate the 'three-legged stool,' the academic researchers, the industry experts and the government programs, in a way that takes leading research and translates it into usable technology," Boynton said. "We are thrilled that we've found an arm of the government, in Hanscom, which understands the importance of partnering with academia and industry. That's what is so key to us, a willing and capable government partner."

Miller agrees that the ability to work with a diverse group of experts will be a key component of this partnership's future successes.

"This initiative provides the necessary catalyst leading to sharing and integration of assets and capabilities with not only university and academic communities, but also with industry, other government agencies," Miller said. "This allows technology and business innovation to come together and create, develop, and realize cost-effective solutions to problems of national importance."

AFLCMC programs at Hanscom are already capitalizing on the new partnership to enhance current projects.

"The EPA with KRI offers an opportunity to improve the cybersecurity of acquisition efforts at Hanscom," said Joseph Pridotkas, AFLCMC Acquisition Intelligence division chief. "What we've asked KRI to research is how to further integrate cyber threat information into systems security engineering, which is a key aspect of the DoD risk assessment process. We expect the KRI effort will help us further understand how cyber threat information can better support risk assessment and system design decisions within acquisition program offices."

Boynton and his team at KRI are looking forward to continued partnership development with Battle Management and other AFLCMC programs at Hanscom.

"The more you interact, the more you can put faces with a name and the easier it is to pick up a phone and think about how we can do things together," Boynton said.

Peter Boynton, the George J. Kostas Research Institute for Homeland Security CEO, speaks to a group of Hanscom Community Partnership Committee members in KRI's materials and devices laboratory during a facility tour in Burlington, Massachusetts. (Courtesy photo)

ADVANCED STRUCTURAL HEALTH MONITORING TECHNOLOGY FOR WEAPON SYSTEMS IS ONE GOAL OF NEW AFRL AGREEMENT

By Mindy Cooper, Air Force Technology Transfer Program Office

Iowa State University of Science and Technology

Ames, Iowa

EGLIN AIR FORCE BASE, Florida -- A new agreement between the Air Force and academia will help advance critical technologies, such as those used to reliably monitor structures of the next-generation munitions airframes and other weapons systems.

The Air Force Research Laboratory Munitions Directorate (AFRL/RW) recently signed an educational partnership agreement (EPA) with Iowa State University of Science and Technology. The 28-month agreement will allow AFRL/RW to collaborate with the university on the development of basic research programs that support the Air Force mission. The agreement also provides a unique and beneficial experience for students of the university to gain hands-on experience working on real-world defense laboratory research projects.

"The partnership agreement with Iowa State University gives the Air Force an amazing opportunity to establish a formal collaboration with excellent young professors whose technical expertise and background can supplement AFRL researchers in the development of future Air Force technology," said Dr. Jacob Dodson, AFRL/RW research mechanical engineer and technical program manager for the EPA.

One focus area of this latest collaboration is the development of microsecond structural health monitoring systems for high-speed structures such as weapon systems and weapon airframes. Current inspection methods cannot be used as they are only implemented when the systems are not in operation.

Structural health monitoring (SHM) would integrate sensor networks and structures to autonomously examine and detect damage during operations. While SHM systems allow for continuous measurement of gradually changing structures on the order of milliseconds to minutes, there is a lack of real-time methods that can detect, and characterize, damage in the microsecond time scales. The development of SHM into microsecond structural health monitoring (μSHM) systems is critical for the reliable operation of next generation high-speed complex structures (e.g. hypersonic air vehicles and weapon airframes). The ability to continuously monitor the structural integrity and predict remaining life weapon systems is vital to monitoring the response of these systems, increase functional reliability and decrease maintenance costs. Iowa State may use this technology as a stepping stone for development of methods to apply to civil structures, future aircraft, and spacecraft.

"Collaboration with academic partners is key to growing the unique technical area addressing μSHM," Dr. Dodson said.

Under the agreement, Dr. Jacob Dodson and Dr. Simon Laflamme, associate professor of Civil, Construction, and Environmental Engineering at Iowa State and the program manager for the university, have collaborated on proposals dealing with the development of μSHM technology. Dr. Dodson has also visited the university and met with other engineering faculty to discuss further potential collaborations.

The laboratory will also assist the university in developing a program under which students may be given academic credit for work on defense laboratory research projects. AFRL/RW personnel may also teach courses at both the undergraduate and graduate level, as well as assist in the course and material development for Iowa State University of Science and Technology. Currently, Dr. Dodson is serving on the Ph.D. committee of a graduate student.

"This agreement opens the door for continuing collaborations in various technology areas, while promoting a key tenant of technology transfer in leveraging partnerships to efficiently advance the state of the art. Partnerships with universities are a critical component in maintaining our leading edge in science and technology, directly impacting our national security," said Lynn Zanow, AFRL/RW technology transfer specialist.

AIR FORCE TECHNOLOGY TRANSFER CONTACT INFORMATION

Air Force Technology Transfer agreements are facilitated by the Air Force Technology Transfer Program Office and its affiliated Office of Research and Technology Applications (ORTA). An ORTA is embedded at many Air Force research locations.

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The Air Force Technology Transfer Program Office is presently supporting several organizations such as the Air Force Nuclear Weapons Center, Air Force Weather Service, National Air and Space Intelligence Center, and the Space and Missile Center.

ACRONYMS

	ACRONYM	UNABBREVIATED
A		
	AFB	Air Force Base
	AFLCMC	Air Force Life Cycle Management Center
	AFRL	Air Force Research Laboratory
	AFTAC	Air Force Technical Applications Center
	AFT2PO	Air Force Technology Transfer Program Office
	APU	Auxiliary Power Unit
C		
	CEO	Chief Executive Officer
	CRADA	Cooperative Research and Development Agreement
D		
	DoD	Department of Defense
E		
	EPA	Educational Partnership Agreement
F		
	FIT	Florida Institute of Technology
H		
	HAARP	High Frequency Active Auroral Research Program
	HPW	Human Performance Wing
I		
	IPA	ISR Payload Adapter
	ISR	Intelligence, Surveillance, and Reconnaissance
K		
	KRI	Kostas Research Institute
L		
	LLC	Limited Liability Corporation
M		
	MTA	Material Transfer Agent
N		
	NDMA	Non-DoD Military Aircraft
O		
	OMEP	Oregon Manufacturing Extension Partnership
P		
	PIA	Partnership Intermediary Agreement
R		
	R&D	Research and Development
	RPAs	Remotely Piloted Aircraft
	RW	Munitions Directorate
S		
	SHM	Structural Health Monitoring
	SIGINT	Signals Intelligence
	SYERS	Senior Year Electro-Optical Reconnaissance System
T		
	T2	Technology Transfer
U		
	UAF	University of Alaska Fairbanks
	UAS	Unmanned Aircraft Systems
	USAFSAM	United States Air Force School of Aerospace Medicine
	USAF	United States Air Force
	UTAS	UTC Aerospace Systems

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