

Tiltrotor Test Rig prepared for NFAC test

AEDC instrumentation engineer Dan Pruyn works on the Tiltrotor Test Rig in preparation for a test in the 40-foot by-80-foot wind tunnel at the National Full-Scale Aerodynamics Complex, the AEDC wind tunnel testing site located in California. TTR is a horizontal axis rig and rotates on the test section turntable to face the rotor into the wind at high speed, or fly edge-wise at low speed (100 knots), or at any angle in between. It is designed to accommodate a variety of rotors. (U.S. Air Force photo/Jeffrey Johnson)



AEDC engineer an International Test and Evaluation Association "Young Gun"

By Deidre Ortiz
AEDC Public Affairs

George Moraru, test engineer at Hypervelocity Wind Tunnel 9 has been selected to speak at the International Test and Evaluation Association conference about his experiences as a young engineer working in the field of hypersonic technology.



George Moraru, Tunnel 9 project engineer

Moraru is a graduate from the Palace Acquire (PAQ) program, which readies engineering students for future careers in T&E.

Early workforce development and his own personal story behind how he

first began working at Tunnel will be one of his talking points.

"I was a targeted hire through the Air Force Palace Acquire program while I was pursuing a Master's Degree in the area of hy-

personics boundary layer transition under the guidance of Dr. Steven Schneider at Purdue University," Moraru said. "The leaders at Tunnel 9 specifically sought out a future employee with knowledge in an area critical to the success of future hypersonic systems."

It was the PAQ program that made it possible for Moraru to achieve valuable on-the-job knowledge at Tunnel 9 while completing his master's degree working on relevant problems and technologies, and then return as a fully-prepared test engineer ready to tackle the challenging workload.

See **SPEAKING**, page 3



Tunnel 9 project engineer George Moraru examines the illuminated temperature sensitive paint coating on a large 7-degree cone prior to the test program. Moraru will speak as part of an upcoming International Test and Evaluation Association panel on his experiences in testing at Tunnel 9. (U.S. Air Force photo/A.J. Spicer)

Guimond recognized as computing Hero

By Raquel March
AEDC Public Affairs

AEDC Scientist and Engineer Stephen Guimond recently received the 2016 Hero Award for Up and Coming within the Department of Defense High Performance Computing Modernization Program, or HPCMP.

The award recognizes outstanding individuals who conduct and support research that contributes to the overall mission of the DOD and the program. The name of the award, "Up and Coming," reflects the type of personnel chosen for the award, who are computational engineers with less than two years of experience in the area of DOD HPCMP computational engineering.

Guimond is recognized for his contributions to the design and replacement of rotor blades for the AEDC Propulsion Wind Tunnel 16-foot Transonic Wind

Tunnel compressor using the Computational Research and Engineering Acquisition Tools and Environments Program software, also known as CREATE™. The HPCMP CREATE™- AV Kestrel product is a computational science and engineering tool used for acquisition programs.

His nominators, engineers Bonnie Heikkinen and Jason Klepper, stated that his outstanding contributions were essential to meeting the projects goals and schedule.

Guimond's background is in mechanical engineering. While earning his bachelor's and master's degrees at the University of Central Florida, he worked with computational fluid dynamics in biomedical engineering and aerospace engineering.

He began working at AEDC in 2015 and currently works under the AEDC Technical and Management Advisory Services Range Task Order contract.



AEDC Scientist and Engineer Stephen Guimond (center) accepts the 2016 Hero Award for the Up and Coming within the Department of Defense High Performance Computing Modernization Program, or HPCMP, from Dr. Kevin Newmeyer (left), chief of staff of the DOD HPCMP, Oct. 17. Accompanying Guimond is the Air Force Test Center, AEDC Chief Technologist Dr. Edward Kraft. (U.S. Air Force photo/Jacqueline Cowan)

In This Issue....

Air Force quarterly awards announced

...Page 3



HIGH MACH



Arnold Engineering Development Complex
An Air Force Test Center
Test Complex

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Commander

Jason Austin
Chief,
Public Affairs



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General Manager,
National Aerospace
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- People. We have a mission-focused, inclusive workforce who have a diverse skill set, are committed to success, demonstrate innovation and have a can do attitude.
- Culture. Our team is proud of our diversity, inclusiveness, and collaborative work environment. We are proud of what we do and how we do it.
- Relationships. We build positive, long-term business relationships through trust, respect, and collaboration.
- Innovation. We overcome challenges through creativity, perseverance, technology, and flexibility. We actively seek to continually improve.
- Sustainability. We plan and act for the long term benefit of our communities and our environment.

The importance of Veterans Day

By **Gen. Ellen M. Pawlikowski**
*Air Force Materiel Command
Commander*

WRIGHT-PATTERSON AIR FORCE BASE, Ohio – In 1954, President Dwight D. Eisenhower signed a bill establishing Nov. 11 as Veterans Day. He stated, "I do hereby call upon all of our citizens to observe Nov. 11 as Veterans Day. On that day let us solemnly remem-

ber the sacrifices of all those who fought so valiantly on the seas, in the air and on foreign shores, to preserve our heritage of freedom ..."

There are more than 21 million U.S. veterans currently living in our country, representing every conflict from World War II through the current War on Terror. Selflessly, they have served in an unfathomable capacity to ensure that our families and our way of life are secure. Together,

we take this time to reflect on their sacrifice, and the sacrifices made by their families, in the course of their military service. We celebrate their contributions throughout our nation's history and pay thanks to them in kind.

To all our veterans and their family members, thank you for your service. Thank you for your sacrifice. Thank you for answering your nation's call.

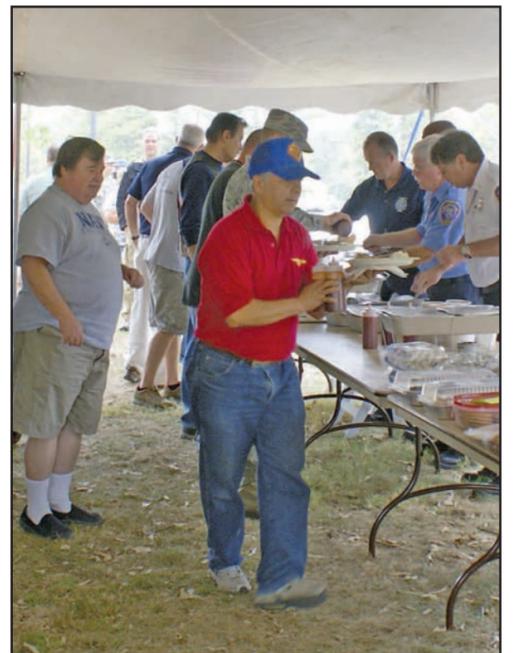


Gen. Ellen M. Pawlikowski

2016 AEDC VA Picnic



(Courtesy photos)



Smoking Policy

- The following revised Arnold AFB smoking policy is effective immediately and applies to all individuals on Arnold AFB.
- Traditional Tobacco products (e.g. cigars and cigarettes):**
 - Smoking is permitted solely in Designated Tobacco Areas (DTAs) identified by designated signage. If no signage exists, smoking is not permitted in that area. It is the responsibility of all smokers to keep DTAs clean of cigarette butts.
 - Tobacco use on the Arnold AFB Golf Course is permitted, but discouraged based on the health hazards of tobacco use and secondhand smoke. No smoking is permitted within 50 feet of golf course buildings except in the approved DTA.
 - Smoking in government-owned/leased vehicles is strictly prohibited. Personnel are allowed to smoke in their personal vehicles at any time; however, at no time will personnel discard cigarette butts outside their vehicle.
 - For government employees, the fact that a person smokes has no bearing on the number of breaks they may take. Breaks should be taken in accordance with the current supervisory and personnel policies that afford all employees the same break opportunities consistent with good work practices and accomplishment of the mission.
- Smokeless Tobacco products (e.g. snuff and dip):** Smokeless tobacco products are not to be restricted to DTAs. Smokeless tobacco use will be permitted in all workplace areas (inside and out) subject to reasonable safety and sanitary conditions. Specifically, containers of tobacco waste product, including sealed containers, must not be left unattended or disposed of in trash receptacles. Users of smokeless tobacco must flush tobacco waste down the toilet.
- Electronic Cigarettes (also known as "e-cigs"):** Pursuant to Air Force Instruction (AFI) 40-102, Tobacco Free Living, e-cigs are considered to be equivalent to tobacco products; however, e-cigs are not restricted to DTAs and are allowed to be used outdoors at a minimum distance of 25 feet from building entry/egress points. (This policy is dated July 27, 2016)

Action Line

Team AEDC

I believe in free and open communications with our Team AEDC employees, and that's why we have the Action Line available. People can use the Action Line to clear up rumors, ask questions, suggest ideas on improvements, enter complaints or get other issues off their chests. They can access the Action Line via the AEDC intranet home page and by calling 454-6000. Although the Action Line is always available, the best and fastest way to get things resolved is by using your chain of command or by contacting the organization directly involved. I encourage everyone to go that route first, then if the situation isn't made right, give us a chance.

Col. Rodney Todaro
AEDC Commander

AEDC quarterly award winners announced



2nd Lt. Thomas Julian
Company Grade Officer of
the Quarter



Tech. Sgt. Beverly Spademan
Non-Commissioned
Officer of the Quarter



Master Sgt. Jason Kanipe
Senior Non-
Commissioned Officer of
the Quarter



Capt. Hedison Doe
Honor Guard of the
Quarter



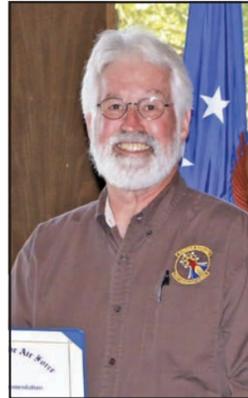
Shannon Allen
Civilian of the Quarter
Administrative



Kyle Todd
Civilian of the Quarter
Scientist/Engineer



Anne Hoyt
Category II, Non-
Appropriated Fund
employee of the Quarter



Maurice May
William M. Dunne
People's Choice Award

Photo unavailable for:
Jacky Payne –
Category I,
Non-Appropriated
Fund employee of the
Quarter

AEDC Briefs

Volunteers needed for FIRST® LEGO® League tournament

By AEDC Science, Technology, Engineering and Math Center

The FIRST® LEGO® League Regional Qualifying Tournament will be held at Tullahoma High School Dec. 17.

Volunteers are needed for judging robot competitions, project presentations and wrangling kids to their various events.

Call 454-4495 to volunteer.



College Street Elementary students Cole Fowler and Natalee Putman watch their robot perform its programmed tasks at the 2015 Regional Qualifying Tournament for the FIRST® LEGO® League of Middle Tennessee Dec. 5, 2015 at Tullahoma High School. The students' coach Capt. Chance Johnson (back left), AEDC Commander Col. Rodney Todaro (back center), and AEDC STEM Educational Outreach Specialist Jere Matty (back right), look on as the competition judges take notes. (U.S. Air Force photo/Holly Fowler)

Bike and horse trails closed at AEDC for hunting

By AEDC Natural Resources

Bike and horse trails at AEDC are closed when hunting is in progress on the AEDC Wildlife Management Area.

Hunting is in progress on the following dates: Nov. 11, 12, 13 and Nov. 25, 26, 27.

All non-hunters must stay out of the area on these dates. Do not ignore the "CLOSED" signs or flagging.

For more information, call (931) 967-6101.

AEDC Fitness Trail closed for weekend, holiday hunting

By AEDC Natural Resources

The AEDC Fitness Trail will be closed for deer hunting Saturday – Sunday, now through Jan. 15, 2017.

The trail will also be closed during the holidays which dates include Nov. 11, Nov. 24, Dec. 26 and Jan 2, 2017.

Small game, waterfowl, turkey and deer hunting will also take place on AEDC Wildlife Management Area (WMA), which is on much of the remaining 32,000 acres of Arnold AFB, through Jan. 15, 2017.

The WMA is managed by Tennessee Wildlife Resources Agency and more information about hunting opportunities, hunting regulations and bag limits can be found at <https://www.tn.gov/twra/article/region-2-wmas>.

2016-2017 AEDC Weapons Range Deer Hunt Briefs scheduled

By AEDC Natural Resources

Mandatory pre-season deer hunting meetings will be held at the Arnold Lakeside Club Nov. 10 at 4 p.m. and in the A&E Building 100, room B-313 Nov. 15 at 7 a.m.

Hunters must attend one of these meetings or they will not be allowed to hunt. There will be no additional hunt briefs this season so make plans to attend.

Hunting Permits can be purchased at the Arnold Services Community Center (Outdoor REC) on any day of the week, except Wednesday, prior to the briefs.

All hunters must have the appropriate State hunt-

ing licenses, purchase a hunting permit for \$22, attend a briefing, and sign the Hunter Information sheet to be allowed to hunt within the Weapons Range area.

Persons authorized to hunt are limited to those with permanently assigned AEDC photo badges; active duty military, DOD civilians, contractor employees (including temporary employees of the primary contractor), Tennessee Army National Guard employees working at the Volunteer Training Site - Tullahoma, and their spouses and dependent children. Spouses and dependents must reside with authorized participants.

AEDC Medical Aid Station holds open house

By AEDC Medical Aid Station

The AEDC Medical Aid Station will hold an open house today at 3:30 – 5 p.m. to provide patients with the latest information and services available for active duty military and their dependents, and retirees.

Snacks and refreshments will be provided in addition to a question and answer session that will wrap up the open house.



SPEAKING from page 1

"I think such programs are vital to the development of the next generation of T&E workforce," he said. "With the current workforce aging, it is important to bring young, smart, motivated engineers into the T&E community and ensure an adequate training overlap in order to minimize knowledge gaps."

Moraru said he's been fortunate to become part of the team at AEDC Tunnel 9 and have the opportunity to work on exciting, cutting-edge technologies.

"Two of the programs I worked on were highly successful Test Resource Management Center High Speed Systems Test Tech-

nology-funded tests at Mach 10 and 14 with the goal of obtaining physics-rich datasets and analyses towards improving the understanding of hypersonic boundary-layer transition and validating new modeling and simulation tools. The success of both programs relied upon extensive collaborative efforts between the T&E community, industry and academia.

"As the hypersonic community moves towards the mindset of an acquisition program, I believe it's critical to obtain and implement complex physics-based knowledge to ensure system success. This will require successful integra-

tion and collaboration of the T&E and S&T [science and technology] communities in order to identify, develop and implement the technologies that will enable us to obtain the required datasets to ensure the success of our future hypersonic systems."

Tunnel 9 Technical Director John Lafferty spoke highly of the PAQ program for enabling Tunnel 9 to hire on Moraru prior to the completion of his graduate studies and focus his research on a test and test data of mutual interest to AEDC Tunnel 9 and his advisor at Purdue University.

"This was a win-win for everyone involved," he

said.

He added that Moraru dove head-on into the testing environment, working in boundary layer transition, and showed promise from the very beginning.

"George was thrust into a situation where he was asked to run a test that was funded by the CoTE (Center of Testing Excellence) program at Tunnel 9 at a very early stage," Lafferty said. "He has performed extraordinarily well and by the end of his time in the PAQ program he has become a fully qualified test engineer. Again, a win for all involved."

Dan Marren, Tunnel 9 site director, echoed the

same sentiments as Lafferty regarding Moraru's enthusiasm.

"George has shown aptitude to tackle this challenging area, drive to learn test engineering and poise to present at this level in only his fourth month as a full-time employee at Tunnel 9," he said.

Marren noted that Moraru's success is a "pure AEDC success story" and thanked several others for having a hand in using the PAQ program as a recruiting tool.

"Kudos to Tom Sizemore and our extremely talented DP [Personnel Division] team for helping to identify an acquisition

strategy for new talent," he said. "Kudos to John Lafferty and Eric Marineau for creating an atmosphere of skills development and finding world-class partners to help develop our skills. Kudos to Joe Coblisch for helping to develop the testing skills for a new journeyman engineer to execute a complete test project in his first year! And kudos to the Hypersonic Center for Testing Excellence team for identifying funding and advocacy for such efforts to flourish.

"Once again I am truly humbled by and excited to be associated with this fine team and claim unearned credit for their success."

Motorists warned to watch out for deer

By AEDC Safety

Deer-related crashes are more likely during the months of October through December due to deer mating season and hunting season.

In Tennessee, between 2011 and 2015, 22 percent of deer-related crashes occurred on interstate highways. Last year there were 6,953 deer-related crashes, including 351 that involved injuries. That was up by 8 percent from the previous year.

If a deer is struck but not killed by a vehicle, keep a distance as deer may recover and move on. In the event of a deer crash, move the vehicle as far off the road as possible, and dial *THP (*847) from an available cell phone for assistance. The call will be connected to the nearest THP Communications Center and a State Trooper will be dispatched to the location.

Below are some motorist safety tips to avoid deer crashes:

- Drive at safe speeds and always fasten your seatbelt.
- Be especially cautious during the first few hours of darkness, when deer are most active.
- Use high beams as much as possible at night, especially in deer-active areas.
- Don't swerve your vehicle to avoid a deer. Swerving can cause motorists to

lose control and travel off the road or into oncoming traffic.

- Motorcyclists should avoid night and low-light riding periods. A rider's best response when encountering a deer is to use both brakes for maximum braking and to keep your eyes and head up to improve your chances of keeping the bike up. If a crash is imminent, and there is enough space to swerve around the deer without leaving the roadway, use maximum braking and just before impact, attempt a swerve in the opposite direction the deer is traveling. Riders are encouraged to wear full face helmets and full protective gear to prevent injury or death in a crash. High visibility gear can assist other driver's in seeing you better; whether it's while making an evasive maneuver to avoid a deer or laying on the roadway after impacting a deer.
- Don't count on deer whistles or deer fences to deter deer from crossing roads.
- Watch for the reflection of deer eyes and for deer silhouettes on the shoulder of the road. If anything looks slightly suspicious, slow down.
- Decrease speed in areas known to have a large deer population – such as areas where roads divide agricultural fields from forest land; and whenever in for-



(AEDC file photo)

- Deer do unpredictable things – they stop in the middle of the road when crossing; cross and quickly re-cross back; and move toward an approaching vehicle. Blow horn to urge deer to leave the road. Stop if the deer stays on the road, don't try to go around it.

Tennessee law allows deer killed in a collision to be taken and used as food, as long as you contact the nearest Tennessee Wildlife Resources Agency regional office and report the accident within 48 hours. For TWRA regional offices, visit the TWRA website at www.tnwildlife.org.

AFRL system revolutionizes research process

By Marisa Novobilski
Air Force Research
Laboratory

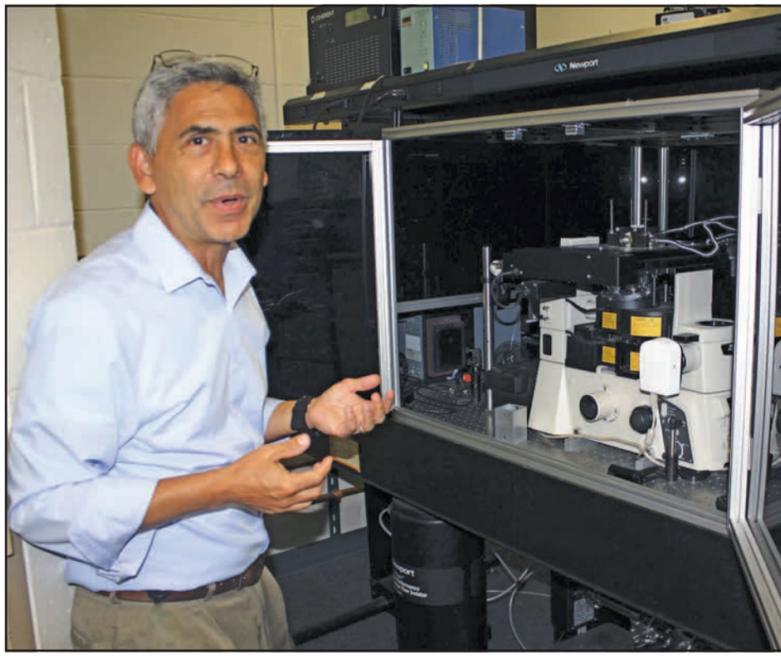
WRIGHT-PATTERSON AIR FORCE BASE, Ohio (AFNS) – The Autonomous Research System (ARES) may not look like “Johnny Five,” the famous robot from the 1986 movie “Short Circuit,” but this robot’s ability to integrate robotics, artificial intelligence (AI) and data science is altering materials research in a big way at Air Force Research Laboratory.

The AFRL Materials and Manufacturing Directorate’s ARES can design, conduct and evaluate experimental data without human intervention, revolutionizing the materials

research process as it is today.

“To our knowledge, ARES is the first of its kind to link autonomous robotics, artificial intelligence, data science and in situ experimental techniques for materials development,” said Dr. Benji Maruyama, a senior materials research engineer at AFRL’s Functional Materials Division. “Not only does it allow us to be faster and smarter in how we do experiments, we can get to a scientific understanding in a shorter amount of time.”

Traditional materials science research is a time-consuming, human-centered process that takes a certain kind of individual



Dr. Benji Maruyama, a senior materials research engineer at the Air Force Research Laboratory's Functional Materials Division, stands by the AFRL's Autonomous Research System, which uses artificial intelligence to design, execute and analyze experiments at a pace much faster than traditional scientific research methods. The robotic research machine is revolutionizing materials science research and demonstrates the benefits of human-machine interaction for rapid advancement and development of knowledge today. (U.S. Air Force photo/Marisa Novobilski)

with the knowledge, patience and understanding to design, conduct, analyze and interpret experimental data, and then decide what to do next, Maruyama said. A typical research team may only conduct one or two experiments per day using traditional research routines.

ARES, on the other hand, can complete upward of 100 experiments per day, expediting the materials discovery process.

“We are in the dark ages in the way we do experi-

ments, yet we are inventing such high-tech materials. There is a disconnect between the research process and the high-end technology output,” Maruyama said. “ARES combines the best of hardware experimentation, and modeling and simulation with an AI planner that proposes what to do next. We can get feedback faster.”

ARES’ robotic expertise was tested by Maruyama’s team in the field of carbon nanotube growth, an area of materi-

als research that is traditionally poorly controlled and not very well understood. Carbon nanotubes are extremely valuable in materials science, as they are strong, light weight and have an ability to conduct heat and electricity. Nanotubes can be used in a number of different applications, from airplane wings to lightweight, flexible conductor wires, ballistic materials, computer chips and even for drug delivery.

ARES conducted more

than 600 experiments in autonomous mode, with the computer “brain” determining experimental conditions to achieve an objective maximum growth rate for the nanotubes. Human scientists set the objective growth rate, which ARES used to execute the research. Each new experiment performed by the robot resulted in new knowledge, which ARES incorporated into the design of future experiments. As the number of experiments increased, the results became more constant, converging on predicted growth rates for the carbon nanotubes, indicating the AI system learned to grow carbon nanotubes and applied the intelligence with scientific success.

Though ARES is capable of conducting scientific research autonomously and can generate rapid results, the role of the researcher remains extremely important, said Maruyama.

“ARES will not replace humans, but rather the success of ARES depends strongly on the partnership between the human researcher and the robotic system – a human-machine trust,” he said.

ARES frees the researcher from tedious bench-level experiment activities, such as instrument preparation, monitoring and cleaning, and allows them to undertake the creative, insightful, higher-level thinking that can lead to new discoveries, Maruyama said.

“The beauty is that it makes us more efficient. We are able to be faster and smarter in how we do experiments and can get to a new state of understanding,” he continued.

While ARES proved itself in carbon nanotube growth, autonomous research robots have the potential for use in a number of scientific research areas. Kevin Decker, a software engineer from UES, Inc., is working with the ARES team to program the AI software to allow ARES to be a generic research tool, enabling it to work on other materials research problems.

See RESEARCH, page 5

Do you have an ethics question or concern?



NAS

Ethics HelpLine
helpline.bechtel.com
or call: 1-800-BECHTEL
(1-800-232-4835)

Bechtel prohibits retaliation for raising questions or concerns.

Taking the fight to the cyberspace frontier

By Dave Smith

21st Space Wing
Public Affairs

PETERSON AIR FORCE BASE, Colo. (AFNS) – In a highly secure, underground facility in Colorado Springs, crews of operators in a room full of computers keep an ever vigilant eye, protecting worldwide U.S. assets around the clock.

This facility is not underneath tons of granite in the midst of Cheyenne Mountain, like a more well-known part of the 21st Space Wing. It is located below street level in a building on Peterson Air Force Base, protecting a different part of space – cyberspace.

The 561st Network Operations Squadron, headquartered at Peterson AFB, manages and defends the Air Force enterprise network for 108 installations. The squadron has detachments in Montana and Illinois. The 960th NOS, an Air Force Reserve unit trained for the same tasks, also adds to the forces protecting more than one million networked computer systems.

What many people don't realize about the squadron is that it is a \$10 billion weapons system, said Thomas Exline, the Cyber Security and Control System operations manager. The system is designed for 24/7 network operations, as well as supporting defensive operations within both classified and unclassified Air Force networks.

"If our systems go down, C-130s don't fly and Cheyenne Mountain Air Force Station doesn't function," Exline said.

The 561st NOS is not the same as the 21st Communications Squadron. They don't do maintenance, rather they work on the back side of things. More than classified and unclassified email networks command the squadron's attention. Aircraft, via the airborne net, are connected to the Air Force network. Remotely piloted aircraft work across the network too.

"If we don't keep things going, then they do not operate," said Capt. Michael Russell, the 561st NOS section commander. "If it doesn't work properly, it can affect a lot of things."

Those "things" include permanent changes of station and getting paid, he said, among other daily, mundane tasks undertaken by people to carry out their missions. All they do is important-to-base programs, whether people notice it or not.

"Look at what goes out in the press," said Senior Master Sgt. Joseph Druke, the 561st NOS operations flight superintendent. "You hear about North Korea and other places hacking something, but you don't hear about it happening in the military because of the people in this building."

By conservative estimates there are more than a million attacks on the U.S. Air Force network every day. Some are dealt with automatically by security software, but other attempts are not so easily repelled. Nation-states trying to infiltrate the network are a battle fought by 561st NOS operators on a regular basis.

Addressing those nation-state and in-nation threats led to changes in how the 561st NOS runs, Exline said. It has gone from what he called a "backshop unit" to an operational crew alignment. Mirroring a standard operations group, each crew has all the specializations within the 561st NOS, providing support at all times.

"We are combat mission ready similar to what they have in the flying world," Exline said.

In the midst of large-scale hacking attempts from other nations, one of the biggest vulnerabilities in the network happens on a more personal level.

"It's phishing," said 1st Lt. Derik Dietel, the 561st NOS alpha crew commander. "It usually happens when people click something in their email."

Phishing is defrauding an online account holder of personal information by posing as a legitimate business. Exline

said just one click on such a link causes a cascade effect of the network. As many as a dozen groups are required to respond and eradicate the impact of a phishing incident.

"The (561st) NOS has to scour over 800,000 computers," he said. "If (a threat) is not from within the military, it is hard to block."

Other common threats come from personal external devices such as cell-phones and hard drives. Insider threats from disgruntled employees seeking to cause harm are other possible concerns Airmen from the 561st NOS face daily. They can use any help they can get fight-

ing them, too.

"People are sensors," Exline said. "If you see something that isn't right, you should say something."

The squadron uses the confidentiality, integrity and availability model to guide organizational information security policy. It can be a challenge balancing security and usability for almost one million computers.

"We want to make it seamless for the end user," said Staff Sgt. Cory Smith, a 561st NOS vulnerability assessment operations instructor. "If we are doing our job right, nobody will know we are there."

AFOSI: Play it safe with cyber security

By Senior Airman
Ty-Rico Lea

325th Fighter Wing
Public Affairs

TYNDALL AIR FORCE BASE, Fla.

(AFNS) – In this day and age, hackers and scammers are finding new ways to exploit unsuspecting victims using various illegal cyber techniques.

Internet crimes like phishing, spamming, cyber terrorism, cyber bullying, online identity theft and cyber stalking have been constant concerns on the Defense Department's agenda.

Another dangerous cyber concern is sextortion, which generally refers to using sexual images (obtained either through enticement or malicious code) in order to extort money from unsuspecting military and civilian victims.

"Sextortion, or cybersex extortion, refers to a

cybercrime of using sexual images or videos in order to extort money from victims," said Scott Mills, the Air Force Office of Special Investigations Detachment 223 commander. "Sextortion cases are on the rise worldwide and there have been reports of DOD personnel being targeted. Internet sites such as Facebook and dating sites have been used to target individuals."

The Justice and State Departments identified online dating and romance scams as a significant concern to all U.S. citizens.

The majority of victims are young men – or in the case of the military, junior enlisted service members – who are away from home and maintain an active online footprint that includes publicly viewable profile information.

According to a previously published Air Force Office of Special Investi-

gations report on sextortion, it is not known how many DOD personnel have been victimized by this type of scam, though in November 2012, the security team for Facebook identified a major sextortion ring operating out of the Philippines.

The ring, involving 21 employees of a Philippines-based web portal solutions company, reportedly targeted hundreds of U.S. Army and Navy members for a period of more than a year.

The numbers have grown since it was first brought to the agency's attention.

"While there are almost certainly more Air Force victims of sextortion," Mills said. "AFOSI has documented approximately 40 victims of sextortion in the past three years, totaling approximately \$14,000 in losses."

See **SECURITY**, page 6

RESEARCH from page 4

In the future, the direction of ARES will be to explore chemical and physical phenomena autonomously.

"There are multiple types of machine intelligence that work for different areas and specific problems," Decker said. "We are working to develop software that incorporates multiple different types of AI that will allow us to determine the most suitable strategy for an experimental problem."

According to Maruyama, ARES is a "disruptive tool" that is changing the research ecosystem.

"Research is core to what we do in the Air Force. We are trying to cause a disruptive improvement to the process of research wherein not only can we do research 100 times faster, but 100 times smarter and more economically," he said. "We ask ourselves, 'How can we reengineer the research process to make research better and more cost effective?'"

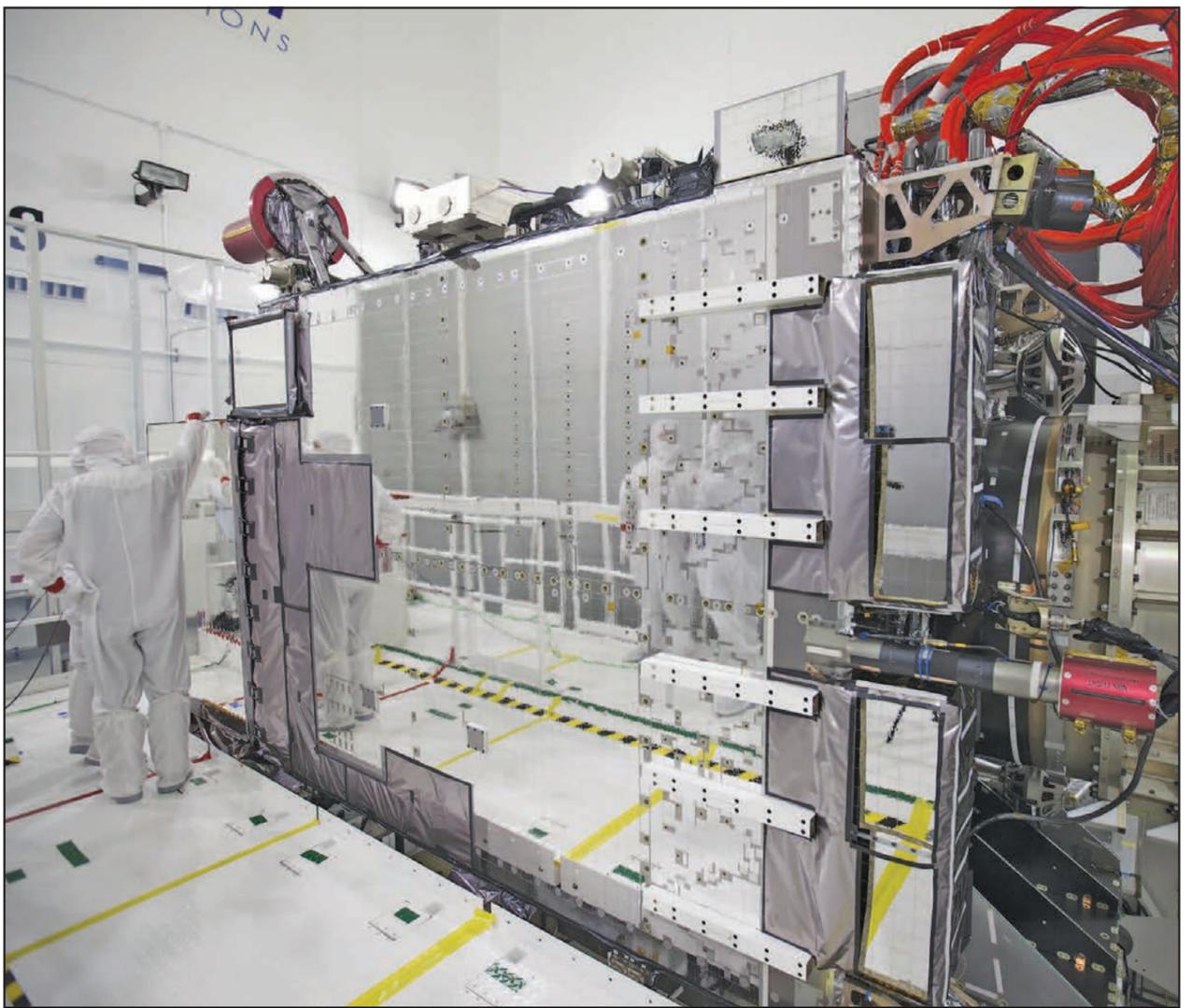
As ARES shows, robots and machine intelligence may be the answer.



A materials researcher examines experimental data on the Autonomous Research System artificial intelligence planner. The ARES was developed by the Air Force Research Laboratory and uses artificial intelligence to design, execute and analyze experiments at a faster pace than traditional scientific research methods. (Courtesy Photo)

Latest GOES satellite prepares for launch

GOES-R, the first in a series of NASA-built advanced geostationary weather satellites, is seen here during an optics test held Aug. 31 inside the Astrotech payload processing facility in Titusville, Florida. The satellite is scheduled to launch aboard a United Launch Alliance Atlas V rocket on Nov. 16. Once in geostationary orbit, GOES-R will be known as GOES-16 and will provide images of weather patterns and severe storms as regularly as every five minutes or as frequently as every 30 seconds. These images can be used to aid in weather forecasts, severe weather outlooks, watches and warnings, lightning conditions, maritime forecasts and aviation forecasts. It also will assist in longer term forecasting, such as in seasonal predictions and drought outlooks. In addition, space weather conditions will be monitored constantly, including the effects of solar flares to provide advance notice of potential communication and navigation disruptions. It also will assist researchers in understanding the interactions between land, oceans, the atmosphere and climate. (Credits: NASA/Ben Smegelsky)



DARPA transfers advanced space debris Telescope to AF

By Cheryl Pellerin
DoD News, Defense Media Activity

WASHINGTON (AFNS) – The Defense Advanced Research Projects Agency has worked with the Air Force to develop an advanced telescope that already is revolutionizing space situational awareness and helping prevent potential collisions with satellites or Earth.

During an event Oct. 19 in New Mexico, DARPA formally transitioned its Space Surveillance Telescope (SST) from an agency-led design and construction program to ownership and operation by Air Force Space Command, which has announced plans to operate

the telescope jointly with the Australian government at a site in Western Australia.

“Space is congested with tens of thousands of manmade objects as well as micro-meteors, asteroids and other natural satellites,” Lindsay Millard wrote in a post on the DARPA website. “(And) space is contested by a range of manmade threats that may have adverse effects on satellites.”

First light

Millard, the program manager of DARPA’s tactical technology office, also wrote, today, deep space telescopes don’t give a comprehensive picture of all objects in orbit around the Earth.

Existing search tele-

scopes have relatively narrow fields of view and can’t reliably detect and track faint objects, including small objects in geosynchronous orbits – about 22,000 miles above the Earth. Millard said hundreds of thousands more pieces of debris and asteroids may be too faint to track with current sensors.

The telescope achieved first light in February 2011. Two years later, then-Defense Secretary Chuck Hagel and Australian Defense Minister David Johnston signed a memorandum of understanding agreeing to relocate the SST from the White Sands Missile Range in New Mexico to Harold E. Holt Naval Communication Station in Western Australia.

DARPA officials said Australia offers a uniquely beneficial vantage point for testing, and a place to demonstrate SST’s enhanced algorithms and camera.

Wide field of view

NASA is already leveraging SST’s ability to see very faint objects in a wide field of view and to help warn against asteroids and other near-Earth objects, DARPA officials said in a recent press release.

With 2.2 million asteroid observations in 2014, 7.2 million in 2015 and hopes for 10 million in 2016, SST has become the most prolific tool for asteroid observation in the world. SST has also discovered 3,600 new asteroids and 69 near-Earth objects, including four that carry a risk of hitting Earth, DARPA says.

“With its amazing capabilities,” said Brad Touseley, the director of DARPA’s tactical technology office, “SST joins a prestigious list stretching back decades of game-changing space situational awareness programs on which DARPA and (AFSPC) have collaborated.” Touseley’s office oversees SST.

On Oct. 18, DARPA transferred ownership of the telescope to the Air Force and the SST will make the move to Australia to be operated and maintained by the Australian government. The SST will be a dedicated sensor in the U.S. Space Surveillance Network, operated by the AFSPC.

Redefining what telescopes can do

SST has increased space situational awareness from only a few large objects at a time to a view with 10,000 objects at a time, each as small as a softball, DARPA officials said. The telescope can also search an area larger than the continental U.S. in seconds and survey the entire geosynchronous belt in its field of view – a quarter of the sky – multiple times in one night.

DARPA officials also said technological firsts in SST’s development are helping redefine what telescopes can do.

SST uses the most steeply curved primary telescope mirror ever made, for example, and the mirror lets the telescope collect more light to see images across a wider field of view than any other space surveillance telescope.

To hold the mirror, DARPA says that SST uses an innovative Mersenne-Schmidt design, which allows for a much more compact construction than traditional telescopes. SST is the largest telescope ever to use the design, making it the world’s quickest and most nimble large telescope.

Even SST’s camera includes advances, DARPA officials said. The SST team developed the first curved charge-coupled device (CCD) to provide clear imagery across the telescope’s wide field of view because current digital cameras with flat CCDs can’t record images from

such highly curved mirrors without distortion.

The camera also has the world’s fastest telescope camera shutter and takes thousands of pictures a night. DARPA recently upgraded the camera, faint-object detection algorithms and search speed to make it even more effective.

Eye on the sky

SST’s eye on the sky sees objects around Earth, in the solar system and universe beyond.

“DARPA looks forward to seeing what the Air Force will do with SST,” Walker said. “And we will continue to work with them as DARPA pushes the technological envelope on space situational awareness with our Hallmark and OrbitOutlook programs.”

From Australia, DARPA said SST will provide space situational awareness information from the southern hemisphere – an area of the geosynchronous belt that now is sparsely observed – to the U.S. Space Surveillance Network.

The telescope also will continue to give NASA and the scientific community surveillance data on events like supernovas and potentially hazardous near-Earth asteroids.

“DARPA has worked closely with the Air Force since the agency’s creation to boldly invest in high-impact technologies so the United States can be the first to develop and adopt the novel capabilities made possible by such work,” Walker said.

SECURITY from page 5

DOD members could pose a target for online criminals because they may be perceived as more vulnerable to blackmail and extortion.

“The DOD and the Air Force have online computer-based training that focus on cybersecurity and AFOSI created a cybersecurity sextortion pamphlet to address the dangers of sextortion, how to identify sextortion

and how to report it,” said Linda Card, an Air Force Office of Special Investigations spokesperson.

All DOD members should be vigilant in protecting their personal information and limit what information they divulge on social networking sites.

If you or someone you know identifies suspicious activity or is being targeted, cease all communication with the indi-

vidual and contact your command and your local AFOSI detachment. You may also call the AFOSI hotline at 1-877-246-1453.

Additionally, victims of these scams can file a complaint with the Internet Crime Complaint Center at a joint task force established between the FBI and the National White Collar Crime Center, at www.IC3.gov.

Weapons squadrons integrate combat skillsets



Capt. Lance Adsit, the 20th Bomb Squadron aircraft commander, and Lt. Col. Erik Johnson, the 340th Weapons Squadron commander, fly a B-52 Stratofortress above the Gulf of Mexico Oct. 13. Two B-52s from Barksdale Air Force Base, La., and two B-1 Lancers from Dyess AFB, Texas, flew together and performed more than 200 simulated missile launches as part of a weapons school integration exercise. (U.S. Air Force photo/Senior Airman Curt Beach)

By Senior Airman
Curt Beach
2nd Bomb Wing
Public Affairs

BARKSDALE AIR FORCE BASE, La. (AFNS) – From 28,000 feet above the Gulf of

Mexico, Capt. Lance Adsit and Lt. Col. Erik Johnson, B-52 Stratofortress pilots, looked out

their cockpit window to the right and see a fellow bomber aircraft soaring through the clouds; two

B-1B Lancers shared the airspace far to the south. The four aircraft were on a mission to destroy more than 200 digital enemy targets with simulated missile launches.

“Destination 28 in zone,” said navigator Capt. Alex Barwikowski, as he signaled to the crew that the weapon was in the launch acceptability region. “Weapon away in two, one, weapon away,” he said, simulating a weapon release from the aircraft’s left wing. Then, 30 seconds later, the same sequence of events was repeated.

This was the scene from the skies as aircrew from the 77th and 340th Weapons Squadrons combined their capabilities as part of an integration exercise at Barksdale Air Force Base from Oct. 10-14.

At the beginning of the week, Gen. Robin Rand, the Air Force Global Strike Command commander, addressed the exercise’s participants.

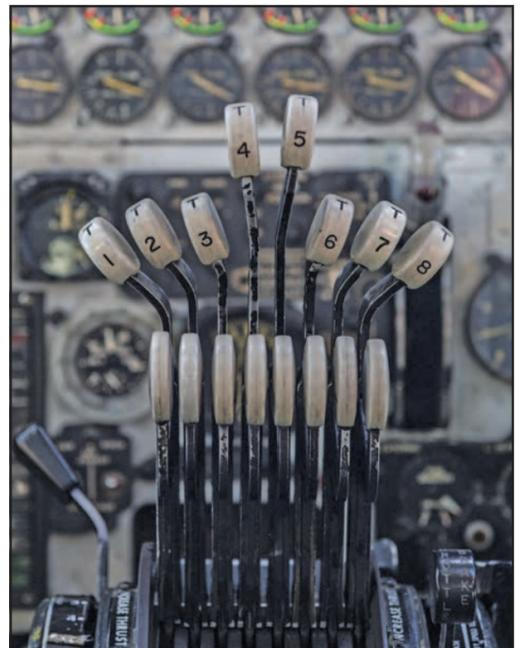
“We want to make you the best of the best in your particular weap-

on system,” he said. “I call the weapons school the greatest leadership laboratory in our Air Force. There’s no other institution like it where we concentrate more on warfighting or where we test you physically and mentally in your leadership skills. We need you, our Air Force needs you, and our country needs you.”

The integration was the capstone phase of a six-month training course, involving extensive communication planning across more than 10 agencies within the bomber community, followed by a live-fly exercise with two B-1Bs from Dyess AFB, Texas, and two B-52s from Barksdale AFB.

“We provide a scenario to the students that allows them to train as realistically as possible for standoff weapons employment – not just from the weapons side of the house, but also space, cyber and air,” said Maj. Mike Perry, the 340th WPS standoff weapons role manager.

See **WEAPONS**, page 9



Eight throttles control the engines of a B-52 Stratofortress from Barksdale Air Force Base, La., 28,000 feet above the Gulf of Mexico Oct. 13. The B-52 is a long-range, heavy bomber that can perform a variety of missions. The bomber is capable of flying at high subsonic speeds at altitudes up to 50,000 feet. It can carry nuclear or precision-guided conventional ordnance with worldwide precision navigation capability. (U.S. Air Force photo/Senior Airman Curt Beach)

AEDC Milestones



Alice Ford
35 Years, NAS

30 YEARS

Jerry Bean, NAS
Richard Gunn, FSS
Troy Haywood, OBXtek
Greg Holcomb, nLogic
Kent Kingery, NAS
Glenda Perry, NAS
William Shappley, nLogic

25 YEARS

Richard House, NAS
Keith Robinson, NAS
Rocco Simeri, NAS

20 YEARS

Daryl Osteen, NAS

Vickie Seaton, NAS

10 YEARS

Joshua Diller, NAS
Terrence Kearney, NAS

RETIREMENTS

Ernest Hargis, NAS
Randy Harwell, NAS
Tony Mason, NAS

NEW HIRES

Elizabeth Battin, NAS
Jory Boudreaux, AF
Shane Brown, FSS
Calvin Caldwell, AF

Annie Clements, AF
Adam Foret, AF
Gary Gale, NAS
Amy Genry, NAS
Kara Giltner, NAF
Andrew Godwin, NAF
Norma Hallmann, NAF
Autumn Horton, NAF
Travis Killen, NAS
Bryant Langford, NAF
Fred Lee, FSS
David Miller, NAS
Taylor Moll, NAF
Erik Mosca, NAF
Erika Motlow, AF
Wende Pepper, NAF

Savanna Pressley, NAF
Mary Trail, NAF
Cynthia Young, AF

PROMOTIONS

Seth Dean, nLogic
Douglas McGary, nLogic
James Rogers, nLogic
Jonathan Shadrack, nLogic

CERTIFICATES

Randy Sloan, Certified Information System Security Professional (CISSP)

WEAPONS *from page 8*

Standoff weapons, such as joint air-to-surface standoff missiles, are designed to be launched from outside of the combat area, allowing crews to strike distant targets with extreme accuracy without exposing themselves to potentially deadly enemy fire.

During the integration flight, the objective of the aircrew's simulated airstrikes was to whittle down an enemy's air defenses.

"We integrate a lot of different capabilities to try to confuse the enemy to the extent that we can get those missiles to their intended targets. This, hopefully, will have chipped away at the enemy defense system, making it more manageable and safe to send manned aircraft into that kind of a threat environment," said Maj. Kevin Johnson, a 77th WPS B-1B instructor.

As combat capabilities continue to evolve, so must the integration of scenarios from one weapons class to the next.

"We've come light-years from a tactics development standpoint, most of which progress has come in the form of timeliness, such as the decrease in the amount of time it takes to come up with a solution to a tactical problem," Perry said. "We increase the difficulty of the scenario from class to class because we have to continue to push the boundaries to make sure we're always on the leading edge of tactics development."

Johnson spoke on the importance of standoff weapons.

"It's a critical mission set that we need to be able to execute in order to hold our enemies at risk because as threat systems become more and more advanced, they have the

ability to push us further and further away," he said. "Standoff weapons permit us to attack from a distance, making the enemy have very little capability to reach out and harm the aircrew delivering those weapons."

Before coming to Barksdale AFB, the students of the 77th WPS spend the majority of their six-month course at Dyess AFB. After this integration period, both squadron's students will head to Nellis AFB, Nevada, for the final stage. These movements allow the students to create new networks they can use throughout their careers.

"I've never sat down with a B-52 or B-2 (Spirit) guy and talked with them on this level of larger force integration," said Capt. Jon Scott, a 77th WPS student. "I'm a B-1 guy, and I know quite a bit about B-1s, but I didn't know the full extent of what the other platforms bring to the fight. Just in a few days, we've learned so much from each other. If you want to talk about an exponential curve, it's near vertical after this week."

While each bomber plat-



From the cockpit of a B-52 Stratofortress from Barksdale Air Force Base, La., a fellow B-52 can be seen flying over the Gulf of Mexico Oct. 13. The B-52s were participating in an integration exercise between Barksdale's 340th Weapons Squadron and the 77th WPS from Dyess AFB, Texas. The integration was the capstone event of a six month training course, involving extensive communication planning across more than 10 agencies within the bomber community, followed by a live-fly exercise. (U.S. Air Force photo/Senior Airman Curt Beach)

form has different capabilities, there are operations that can be done more efficiently using the integration skills they used during this scenario.

"When we're called on by a combatant commander to do this real

world, we won't be learning then for the first time, we've already been learning, preparing, we have

the experience," Johnson said. "I think the integration, especially with respect to standoff weap-

ons, is definitely something that will pay off for years and years to come for our students."

Past, present, future: AF Memorial 10th anniversary

By Staff Sgt. Janelle McRae
*Secretary of the Air Force
 Public Affairs*

WASHINGTON (AFNS) – For the last decade, the Air Force Memorial stood boldly in the skyline of the nation’s capital, inciting pride and honor, and recognizing the dedication and sacrifices of Airmen who have served. Members of industry, Airmen and media attended a ceremony in celebration of the monument’s 10th anniversary under its spires in Arlington, Virginia, Oct. 14.

Depending on one’s perspective, the towering memorial – made of three spires reaching 270 feet – can symbolize the Air Force core values, a bomb burst maneuver or the three of four planes performing a missing man formation.

Air Force senior leaders spoke during the ceremony – themed “past, present and future” – paying homage to veterans who paved the way, those who are currently serving, and the Airmen of the future.

Air Force Secretary Deborah Lee James, who was also named an honorary Tuskegee Airman at the event, spoke to the bright future of the Air Force.

“Airmen of today and those of tomorrow are all standing on the backs of the giants of the past,” James said. “It’s now up to all of us, and those who follow us, to preserve and carry forward that legacy into the future, and that is precisely what we will do.”

According to Air Force Chief of Staff Gen. David L. Goldfein, the Airmen of today stand watch for America across the globe, delivering global reach, global vigilance and global power.

“Standing watch ... is what we do,” he said. “So, how appropriate that this powerful, moving memorial stands watch over our fallen at Arlington Cemetery.”

The solemn place to honor the pioneers of the past inspired Chief Master Sgt. of the Air Force James A. Cody to reflect on the freedom it represents.

See **MEMORIAL**, page 11



A four-ship formation performs a flyover during the Air Force Memorial’s 10th anniversary ceremony in Arlington, Va., Oct. 14. (U.S. Air Force photo/Scott M. Ash)



Bob Schieffer, a broadcast journalist and Air Force veteran, speaks during the Air Force Memorial’s 10th anniversary ceremony in Arlington, Va., Oct. 14. (U.S. Air Force photo/Scott M. Ash)



Secretary of the Air Force Deborah Lee James receives her honorary Tuskegee Airman award in Arlington, Va., Oct. 14. (U.S. Air Force photo/Scott M. Ash)

MEMORIAL from page 10

“It is truly an honor as you think about celebrating the history of it all,” he said. “You think about two brothers with big dreams at the turn of the 20th century to the Doolittle Raiders, to the Tuskegee Airmen, to all the legends who have gone before us and shoulders we stand on that make this Air Force so great.” Since its dedication, over 2 million people have visited the memorial in reverence of tradition, heritage and esprit de corps, stated the memorial’s director. “The Air Force memorial is a living, breathing monument,” said retired Chief Master Sgt. Barbara Taylor, the Air Force Memorial managing director. “This isn’t something you just drive by and say it’s nice; it is a place where Airmen come to celebrate Airmen.”

From history to resiliency, the majestic site is in the crossroads of heritage and the future, inspiring today’s Air Force mission. “The spires of our memorial reach to the sky, just as our Airmen reach for the sky everyday as we fly, fight and win,” James said.

2016



November

Information subject to change. Please call to verify.

ALC – Arnold Lakeside Center, 454-3350
 Café – Café 100, A&E, 454-5885
 ODR/ITT – Outdoor Recreation, 454-6084
 RRRP – Recycling, 454-6068
 Marketing/Sponsorship – 454-3128
 Barber Shop – 454-6987

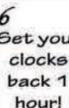
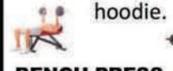
GC – Arnold Golf Course, 454-GOLF
 MG – Mulligan’s Grill, GC, 454-FOOD
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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
		1	2	3 Café 100 National Sandwich Day Combo \$6  Movie: Ben-Hur PG-13	4 ALC Jam Night 6pm	5	ALC Dining Room Hours Thu 5-8pm Fri 5-9pm Sat NO open dining Sat available for special functions only
		8 Café 100 National Cappuccino Day Venti \$3 Grande \$2.75 					
6 Set your clocks back 1 hour! 	7	Autumn Dinner by the Lake M \$23 NM \$25 Age 12 & under \$10.50 5:30 PM Outdoor Thanksgiving dinner overlooking the lake behind the ALC with live guitarist and fire pits. Top Round and Roasted Turkey carving station, baked potato and salad bar, desert, and drink. Sign up by Nov. 11 Call 931-454-4003		10 Movie: Jason Bourne PG-13	11 Veteran’s Day Arnold Lakeside Center- <i>Closed</i> Barber Shop- <i>Closed</i> Café 100- <i>Closed</i> Fitness Center- <i>Open 8-4</i>	12	
13	14			16 FC Triple Threat Challenge First 20 participants get a T-Shirt. Lift 1000 lbs. and get a hoodie.  BENCH PRESS BACK SQUAT DEADLIFT	17 JEWELRY FAIR Café 100 7am-1pm	19	Wingo Inn welcomes both military and civilians, friends and family to be our guests! Call 931-454-3051 
20	21	22	23 Barber Shop Open 8-12	24 Holiday Closures: Arnold Lakeside Center Barber Shop Café 100 Fitness Center Golf Course Outdoor Rec 	25 Holiday Hours: Arnold Lakeside Center- <i>Closed</i> (No trivia) Barber Shop- <i>Closed</i> Café 100- <i>Closed</i> Fitness Center- <i>Open 8-4</i>	26	
27	28	29 Fitness Center Kettlebell Class  Tuesdays and Thursdays 11-11:45am	30	 <p>CLUB MEMBER APPRECIATION Thank You!</p>			

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