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THE AFIT ENGINEER

Air Force Institute of Technology

ABOVE AND BEYOND

AFIT Enters Second Century of Education as United States Space Force Takes Shape



By Todd I. Stewart, Ph.D.
 Director and Chancellor
 Air Force Institute of Technology

Welcome to this edition of the AFIT Engineer newsletter. We hope you will find all of the articles both interesting and informative.

2019 in Review

2019 marked AFIT's centennial year: 100 years of excellence in defense-focused education. We celebrated this historic milestone with a number of exciting events. In February, we held a Centennial Symposium, with the keynote presented by Dr. Richard Joseph, the Air Force Chief Scientist. In March, we were honored to host General David Goldfein, 21st Chief of Staff of the Air Force, as the commencement speaker at the annual graduation ceremony. Throughout the year, we also hosted a number of great speakers, including Ms. Gwynne Shotwell, President and Chief Operating Officer of SpaceX. In November, the entire Institute paused to celebrate AFIT's 100-year anniversary with a number of events, including a panel of AFIT alumni who are former astronauts, dedication of a time capsule and an awards banquet, at which we recognized a number of distinguished AFIT alumni.

Without question, the most significant event affecting AFIT and the entire Department of Defense happened in December, with the establishment of the United States Space Force, under the Department of the Air Force, as the nation's sixth military service.

The Second Century: 2020 and Beyond

This year – 2020 – marks the start of AFIT's second century. It promises to be equally exciting, with numerous opportunities and challenges. We start the year with more than 1,000 full-time and part-time graduate students enrolled in AFIT's degree and graduate certificate programs. We will hold our 2020 graduation ceremony in March, featuring General John "Jay" Raymond, the nation's first Chief of Space Operations and leader of the new United States Space Force, as our commencement speaker.

To provide focus and direction, Secretary Barrett, General Goldfein and General Raymond recently issued a set of four strategic priorities for the Department of the Air Force. These priorities include: (1) Build the United States Space Force; (2) Modernize the Air and Space Forces We Need; (3) Grow Strong Leaders and Resilient Families; and (4) Strengthen our Allies and Partners. Each of these strategic priorities has significant implications for the teaching, research and consulting to be accomplished by the faculty in the Graduate School and AFIT's three other professional continuing education schools.

In October, AFIT will undergo its 10-year reaccreditation by the Higher Learning Commission. While this assessment includes the entire Institute, much of the focus will be on the credit-awarding programs activities of the Graduate

School. The faculty and staff have been preparing for this reaccreditation for well more than a year.

I conclude with a most sincere congratulations and thank-you to the faculty, staff, students and alumni of the Graduate School, for their accomplishments and continued commitment to excellence in serving the Department of Defense and our nation. It's a privilege to serve with them.

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AFIT Graduate School Proudly Acknowledges Our 2019 STEM Award Winners

Welcome to the March 2020 issue of The AFIT ENgineer, the inaugural issue of which was published in June 2019. We continue to receive rave reviews for the contents and design of the quarterly newsletter. Kudos to our Outreach Specialist, Ms. Stacy Burns, for her dedication and proactive strategies to ensure that our accomplishments are heard loud, clear, and consistently both internally and externally.



Dr. Adedeji Badiru

The month of March is always an exciting and busy time at AFIT. March is when we have the major commencement exercise of the academic year. It is the month when we send our newly-minted ambassadors back into operational settings throughout the Air Force. Each year our progressive intellectual footprints and operational fingerprints continue to permeate the most critical areas of need in support of national defense. This year, on March 26, 2020, we will be graduating approximately 250 students with advanced degrees (MS and PhD).

On the subject of the value that AFIT brings to the Air Force, this issue of The AFIT ENgineer is especially timely. We just received an announcement from the Office of the Chief Scientist and the Acting Deputy Assistant Secretary for Science, Technology, and Engineering for the 2019 Science, Technology, Engineering, and Mathematics (STEM) Awards. Three of the celebrated awardees are from AFIT and two are AFIT alum. Please join me in congratulating and saluting the following just-announced AFIT winners of the 2019 STEM Awards:

Air Force Outstanding Science & Engineering Educator Award

Dr. Marc D. Polanka, Professor of Aerospace Engineering, Department of Aeronautics and Astronautics

Exploratory/Advanced Technology Development Award

Dr. Scott L. Nykl, Assistant Professor of Computer Science, Department of Electrical and Computer Engineering

Engineering Technician Award

Mr. Sean K. Miller, Systems and Electrical Engineer, Department of Aeronautics and Astronautics

AFIT Systems Engineering Award

Capt Jonathan D. Poole, AFIT Alum (MS Systems Engineering 2019), Director of Engineering, 31st Test & Evaluation Squadron, Edwards AFB, California

Air Force Research and Development Award

Maj Gordon E. Lott, AFIT Alum (PhD Applied Physics, 2017 & MS Applied Physics, 2012), Program Manager, Quantum Sensing and Timing, Air Force Research Lab, Kirtland AFB, New Mexico

I am delighted that these individuals represent AFIT exceptionally well. They have done great things and we expect more of the same from them as they continue their services to AFIT, Air University, Air Education and Training Command, the U.S. Air Force, the Department of Defense, and the nation.

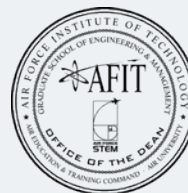
We look forward to more recognitions and accolades as we move our mission forward in imagination, innovation, invention, and implementation. As you have heard me say before, AFIT is adept and responsive to the current and future needs of the Air Force through education, research, and operational consultation. AFIT's institutional structure includes four schools (Graduate School of Engineering and Management, Civil Engineer School, School of Systems and Logistics, and School of Strategic Force Studies), which all work in consonant with Civilian Institutions to provide a wide span of coverage for advanced educational needs of the Air Force. As we continue to celebrate the excellence of AFIT, we teach what we research and we research what we teach.

Respectfully presented,

Adedeji B. Badiru, Ph.D., PE, PMP, FIIE
Dean, Graduate School of Engineering and Management

EN OUTREACH

The AFIT ENGINEER is an official publication of the Air Force Institute of Technology, Graduate School of Engineering and Management.



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RESEARCH MODEL

AFIT's Model Fabrication Shop Supports Student and Faculty Research Projects

The Air Force Institute of Technology's Model Fabrication Shop is a fully-equipped machine shop with highly-skilled machinists who build one-of-a-kind products in support of sponsored research projects for AFIT students. The AFIT Model Shop mission is to support students and faculty in modeling, prototyping, and preparing projects and specimens for experimental testing in laboratory research.

The model shop team prides itself on being student-friendly by understanding that not every student is a design engineer. Team members educate the student customers to inform fabrication decisions such as material selection, required tolerances, and necessary design alterations. From simple brackets to advanced 5-axis milling, welding and fabrication to post processing additively manufactured products, the AFIT Model Shop has a wealth of resources to aid students and faculty in their scientific experimentation.

"Not only can you present the team with a blueprint and get exactly what you want, you can bring in a scribble on a napkin from lunch and the team can aid in creating a working, tangible product that functions even better than expected," explained Brian Crabtree, Model Fabrication Shop Supervisor. "While it is possible to procure this type of assistance from an outside source, it is both expensive and time consuming. The ability to work with an on-site machine shop where you can request design adjustments while the part is physically being machined is unheard of anywhere else," Crabtree continued.

While the model shop has been especially beneficial to Graduate School students within the Aeronautics and Astronautics and



The AFIT Model Fabrication Shop team from left: Joe Owings, Dean Harshman, Brian Crabtree, Dan Ryan and Chris Harkless. The compressor for the first ROSE engine test (right).

Engineering Physics programs, the shop also provides support to AFIT's various research laboratories. In 2019, model shop team members executed 217 work requests which translated to over 9,000 man-hours of work.

Two of the AFIT Model Shop's notable projects in 2019 are the Responsive Open Source Engine (ROSE) project and AFIT's Space Object Self-Tracker (SOS).

ROSE made U.S. history as the first gas-turbine engine designed by the Air Force, with engineers assigned to the Air Force Research Laboratory (AFRL) and AFIT. The engine is designed to operate in a thrust class, not available in the commercial market, at a price that supports expendable vehicle operation. The model shop used their 5-axis milling capability to manufacture the turbine and compressor for the first ROSE engine test. The model shop saved the program approximately \$40K, and allowed testing one month sooner than if an outside machine shop had made the parts.

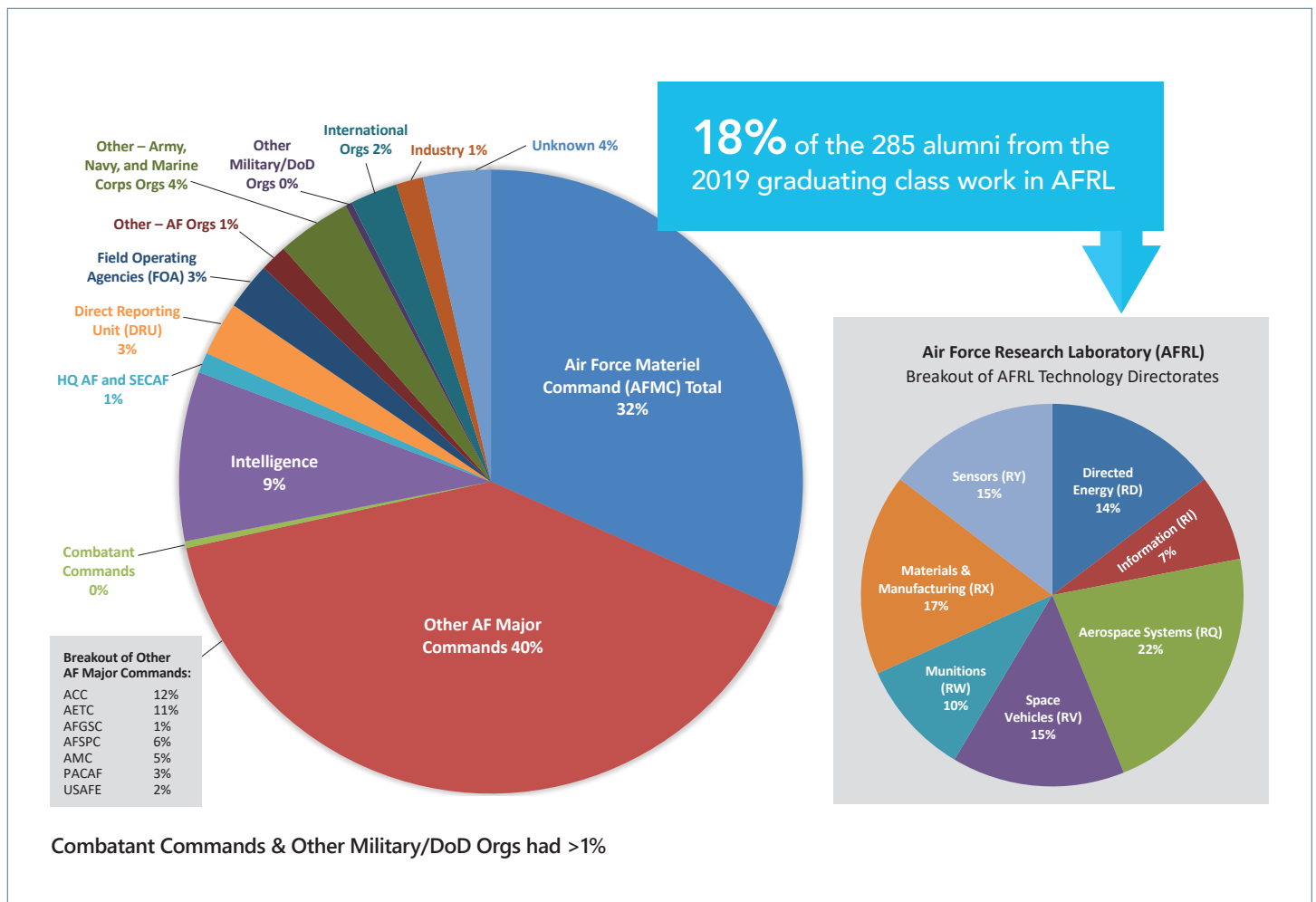
In June 2019, a SpaceX Falcon Heavy rocket successfully launched AFIT's SOS, a precision tracking experiment, into low Earth orbit. AFIT's Center for Space Research and Assurance developed the satellite payload in 2014. Instead of being an independent satellite, SOS was integrated on the National Aeronautics and Space Administration's Green Propellant Infusion Mission spacecraft. The AFIT Model Shop was instrumental in the success of SOS due to several design iterations the payload had to endure before the final design was complete. As a result of the model shop's capabilities and quick turnaround time, SOS remained not only on schedule, but also ahead of other hosted payloads.

AFIT's Model Shop team offers almost 100 years of experience in various disciplines in the machining and manufacturing worlds to accommodate experimental projects like the ROSE and SOS, and looks forward to supporting Graduate School students and faculty with future design solutions.

AY 2018-2019

POST-GRADUATION STUDENT ASSIGNMENTS

The post-graduation student assignments chart details MS and PhD graduates' assignments immediately following graduation. Percentages reflect the percent of the graduating class who were placed into the specified organization. This data was gathered from 285 AFIT alumni from academic year 2018-2019.



Source: AFIT Alumni Affairs and Institutional Advancement Office.

Wetland Display Model Supports Ecological Systems Engineering

By Adedeji B. Badiru, Ph.D.

Dean, Graduate School of Engineering and Management

Sensitivity to the environment, from a systems perspective, is one worthy project management undertaking. Recent projects deserving a systems approach include, but are not limited to, the following: Wind energy, Industrial Hygiene, Occupational Safety, Health Engineering, Occupational Health Nursing, Health Science, Renewable energy installations, Clean-energy projects, and electric power generation, transmission, and distribution. AFIT, through its educational programs in environmental science and engineering, industrial hygiene, and systems engineering, is on the cutting edge of these important environmental issues and concerns.

Removal of water pollutants in wetlands is covered in several current course offerings in the Department of Systems Engineering and Management including ENVR 640 (Groundwater Hydrology and Contaminant Transport), ENVR 646 (Water Treatment in Rural and Austere Conditions), and ENVR 643 (Environmental Transport Processes). These courses teach students how to understand, predict, and engineer the underlying steps that are responsible for the removal of dangerous pollutants from water. Wetlands have a particular relevance to contingency settings, because they can serve as wastewater treatment systems for fighting forces located at forward operating bases. Wetlands also have the potential to address urgent present-day Air Force priorities. For example, numerous research teams world-wide have now shown that properly designed wetlands can attenuate and degrade many emerging water pollutants, including the per- and polyfluoroalkyl substances (PFASs) that are now the subject of intense debate.

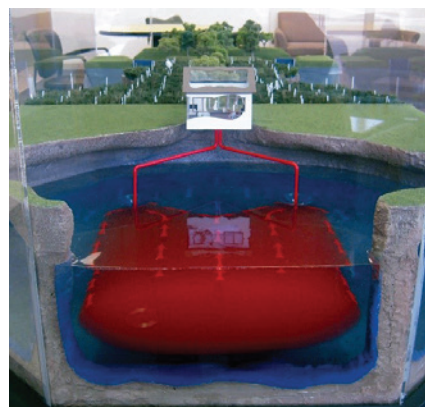
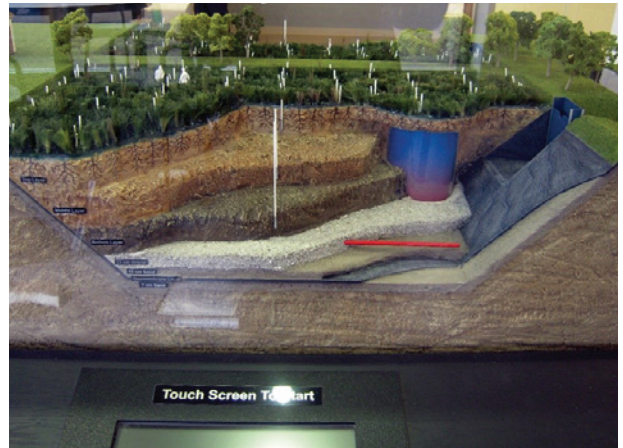
A relevant illustration of this topic is found in a case study of a 2010 wetlands project between Wright State University and the Air Force Institute of Technology (AFIT) that has national environmental implications.

Collaborating scientists from both institutions conducted an experimental project to demonstrate how wetlands can help clean up the environment by removing toxic compounds from the groundwater and soil. Their findings show that microbes are destroying very toxic chlorinated, organic compounds in the selected research site.

The goal of the project has significant economic implications. Chlorinated organic compounds are widespread groundwater contaminants that cause most of the groundwater pollution. This contamination affects drinking water quality at hundreds of thousands of sites. Since the cost of cleaning up these sites by existing techniques range in tens of billions of dollars, a passive treatment approach by natural processes using the wetland is a cost-effective approach for groundwater remediation and site cleanup.

As an analogy, in humans, kidneys function to filter out the toxins from the body. In the environment, researchers are finding the wetland to be nature's kidneys that filter out toxic pollutants present in the water passing through it. In essence, wetlands are nature's way of cleaning up many contaminants in the environment.

The contaminated water in the experimental wetland flows upwards to optimize the treatment process. Some 200 monitoring points were established within the wetland and a team of scientists from diverse disciplines investigated the process of pollutant destruction in the shallow soil and groundwater, using a systems engineering ecological model.



An interactive display model at AFIT cogently demonstrates the wetland process from the standpoint of teaching and research.

The researchers looked at the interactions between microbes and soil and water from a chemical and biological perspective. Microbes are present everywhere in the soil and water, but they are more active in a wetland environment, probably because of the greater availability of food and moisture content the swampy areas possess. The microbes are an integral part of the environmental system, which must be managed from a project systems perspective. In terms of cost implications, over time the systems-based project would save billions of dollars for industry, business, and the government.

Sustainability is not just for the environment. Pursuits of green building, green engineering, clean water, climate research, energy conservation, eco-manufacturing, clean product design, lean production, and so on remind us of the foundational importance of sustainability in all we do.



For additional information about graduate or post-doctoral degrees in astronautical engineering or space systems, contact AFIT's Center for Space Research and Assurance:



<https://www.afit.edu/CSRA/>



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CIVILIAN EDUCATION AT AFIT

Astronautical Grad Student Credits AFIT for Improving Work Quality

By Jaclyn Knapp
Air Force Institute of Technology
Center for Space Research and Assurance

When choosing a graduate school, National Air and Space Intelligence Center civilian employee Justin Becker chose the Air Force Institute of Technology so he could continue working while attending school part-time.

"AFIT has and will continue helping me with my work, which is what I was looking for when furthering my education," said Becker, masters of science astronautical engineering student.

In regards to his overall experience at AFIT, Becker has made many friends and never met professors "so willing to help." He enjoys the smaller class sizes since they facilitate a more personable learning experience for asking questions and getting to know peers.

"I have had a great experience and would suggest other students attend. AFIT is a place that encourages group learning, communication and working together," said Becker.

Civilians in the Department of Defense interested in attending AFIT can apply to the Civilian Development Education program. CDE provides education and leadership opportunities that will prepare Air Force civilians to successfully meet

challenges across the wide range of operations and missions.

For program requirements, eligibility and current information, visit the Civilian Force Development page on myPers. Select "Civilian Employee" from the myPers drop-down menu and search for "developmental education."

"Finding solutions to the growing challenges facing operations in the Space Domain requires the participation of both our military and civilian personnel," said Maj. Robert Bettinger, deputy director, AFIT's Center for Space Research and Assurance.

"AFIT offers a unique and unparalleled environment in which students are immersed in cutting-edge space technology development, science, and space experiments," said Maj. Bettinger.

The Air Force Institute of Technology, or AFIT, located at Wright-Patterson AFB, Ohio, is the Air Force's graduate school of engineering and management as well as its institution for technical professional continuing education. AFIT is committed to providing defense-focused graduate and professional continuing education and research to sustain the technological supremacy of America's air, space, and cyber forces.

AFIT Graduate School Civilian Enrollment by Degree

FALL 2019
Civilian Enrollment

Students counted once for each enrolled degree.

46

Doctoral Students



84

Master's Students



77

Certificate Students



52

Non-degree Students





AFIT alum Dr. Guy Bluford (center) accepts the Ohio Distinguished Service Medal from Governor DeWine (right) at the Ohio Statehouse in February.

Source: www.governor.ohio.gov

Ohio Distinguished Service Medal Presented to AFIT Alum

Ohio Governor Mike DeWine presented the Ohio Distinguished Service Medal to Col. Guion Bluford, United States Air Force (Retired), for his lifetime achievements in service to the state and nation. Col. Bluford, of Westlake, flew 144 combat missions in South Vietnam as a pilot in the United States Air Force. He went on to earn a master's degree and doctorate degree in aerospace engineering at the Air Force Institute of Technology at Wright-Patterson Air Force Base. Col. Bluford later entered the space program at NASA and became first African American astronaut to travel to space in 1983.

"Your commitment and dedication over the course of your career in aviation are a tremendous inspiration to generations of Ohioans," said Governor DeWine during the medal presentation at the Ohio Statehouse. "As NASA prepares for future missions to space, the next generation of astronauts will be looking to follow in your footsteps."

The Ohio Distinguished Service Medal is Ohio's highest non-combat decoration for service.

Alum is 2019 Presidential Rank Award Recipient

Dr. Joseph W. Nichols, a senior-level executive, is a recipient of the 2019 Presidential Rank Award - Meritorious Senior Professional category. This award is presented to individuals for sustained professional, technical, and/or scientific achievement recognized on a national or international level. Nominations are evaluated by boards of private citizens and approved by the president. Only 5 percent of Senior Executive Service and Senior Professionals may receive the Presidential Meritorious Rank Award.

Dr. Nichols earned a master's degree in Aeronautical Engineering from the Air Force Institute of Technology in 1987. Dr. Nichols is the Technical Advisor for Flight Test and Evaluation, Air Force Test Center, Edwards Air Force Base, CA. In this role he is the senior technical advisor to the AFTC Commander regarding health and suitability of airframe, avionics, installed propulsion, and electronic warfare flight and supporting ground test capability across AFTC's test ranges and facilities valued at more than \$31 billion, including 116 aircraft and 164 ground test facilities.

Alumni Nominated for Appointment to Rank of Brigadier General

Secretary of Defense Mark T. Esper announced on 13 Jan 2020 that the president nominated 35 Air Force colonels for appointment to the rank of brigadier general. Included on the list are two AFIT alumni listed below. If confirmed, they will join 27 additional current general officers (1 Lt Gen, 5 Maj Gen, and 21 Brig Gen) who are also AFIT Graduate School alumni.

Air Force Col. Daniel A. DeVoe (Master of Air Mobility, 2008) is currently serving as the vice commander, 618th Air Operations Center, Tanker Airlift Control Center, Air Mobility Command, Scott Air Force Base, Illinois.

Air Force Col. William H. Kale (M.S. Engineering & Environmental Management, 2001) is currently serving as the chief, House Liaison Office, Office of the Legislative Liaison, Office of the Secretary of the Air Force, Pentagon, Washington, District of Columbia.

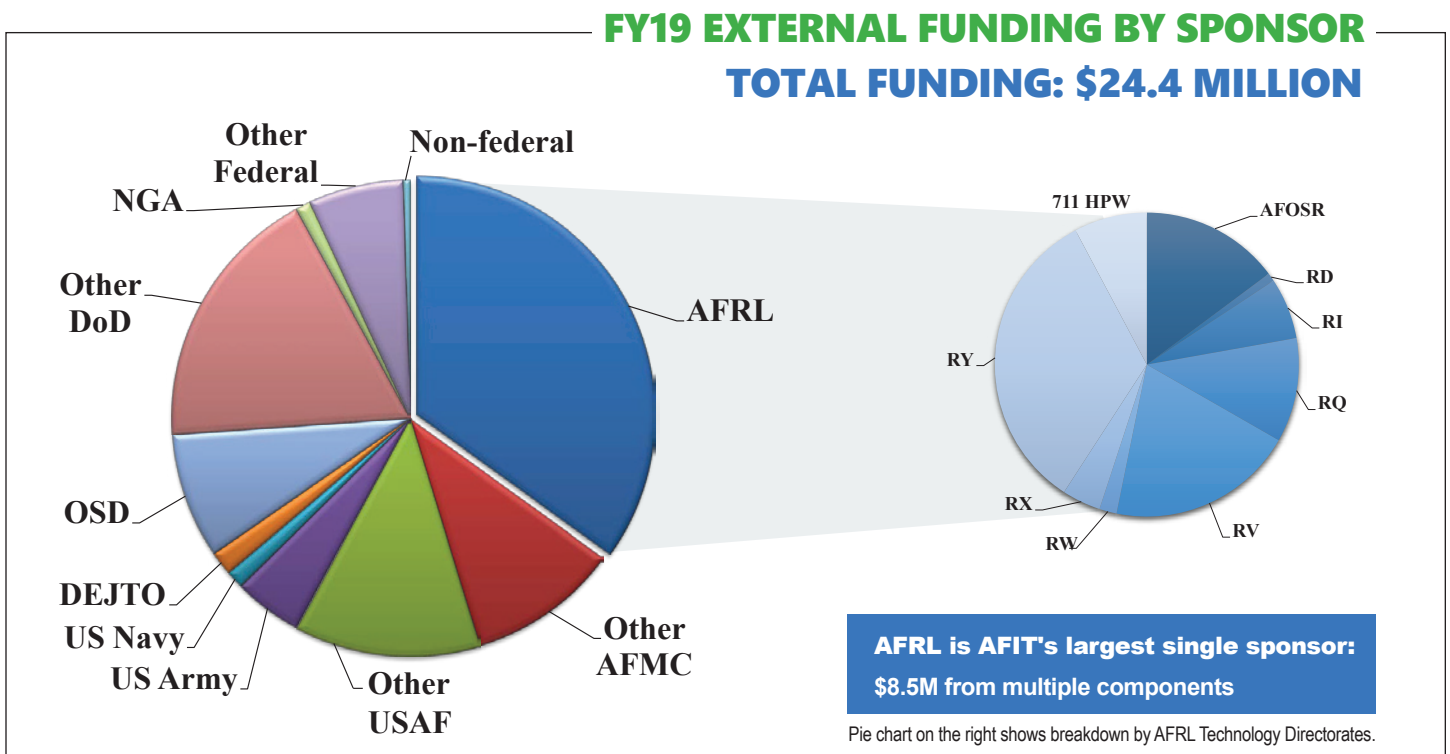
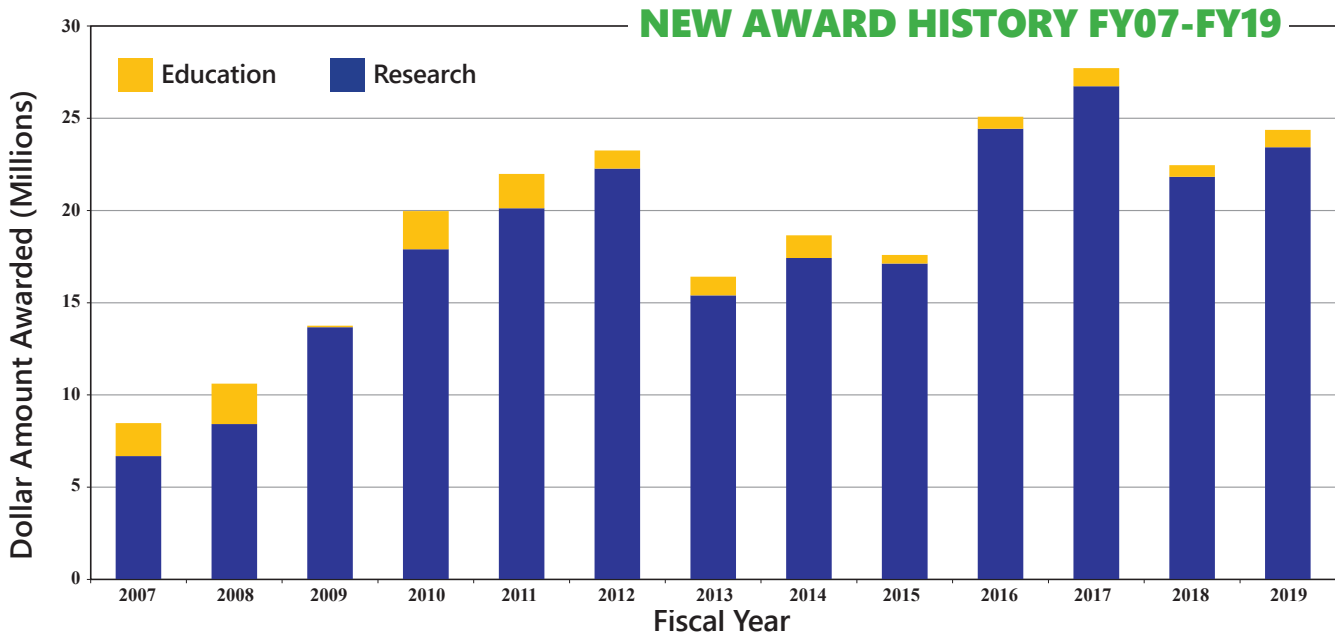
Texas Aviation Hall of Fame to Induct Alum

The Lone Star Flight Museum (LSFM) announced the selection of four new inductees into the Texas Aviation Hall of Fame including Air Force Institute of Technology (AFIT) alum George W.S. Abbey.

With a master's degree in electrical engineering from AFIT, George W.S. Abbey flew both helicopters and fixed-wing aircraft, logging more than 5,000 hours in the air. Serving as the USAF technical liaison at Boeing on the Dyna-Soar, SST and Lunar Orbiter projects, he was later detailed to NASA in 1964. In 1967, Abbey left the Air Force and was named technical assistant to the Johnson Space Center Director during the Apollo, Skylab and the Apollo-Soyuz programs. Abbey later served as director of the Johnson Space Center from 1996-2001.

Graduate School External Sponsor Funding

Many of the Graduate School of Engineering and Management's theses and research projects completed under faculty supervision are funded in part by other Air Force, DoD and government units and agencies. Often, this funding results from collaboration between faculty and thesis sponsors and occurs when the research project can be leveraged by the purchase of equipment or services not otherwise available. The bar chart directly below summarizes FY07-FY19 sponsor funding. The pie charts at the bottom of this page and the table on the next page summarize external funding by sponsor and external funding/research expenditures for FY19.



ON THE RESEARCH RADAR

FY19 EXTERNAL FUNDING & RESEARCH EXPENDITURES

DEPARTMENTS	Newly Awarded Research Projects		Newly Awarded Education Projects		Total FY19 Newly Awarded Projects		Total FY19 Research Expenditures
	#	\$k	#	\$k	#	\$k	\$k
Mathematics & Statistics (ENC)	11	827	0	0	11	827	1,308
Electrical & Computer Engineering (ENG)	43	5,946	3	347	46	6,293	8,915
Engineering Physics (ENP)	45	5,625	0	0	45	5,625	6,995
Research & Sponsored Programs (ENR)	1	75	0	0	1	75	-
Operational Sciences (ENS)	21	6,105	7	300	28	6,405	6,928
Systems Engineering & Management (ENV)	15	975	2	243	17	1,218	1,445
Aeronautics & Astronautics (ENY)	58	3,874	2	49	60	3,923	8,845
TOTAL	194	23,427	14	939	208	24,366	34,436

RESEARCH CENTERS	#	\$k	#	\$k	#	\$k	\$k
Autonomy and Navigation Technology (ANT)	24	3,969	3	347	27	4,316	5,048
Center for Cyberspace Research (CCR)	10	746	0	0	11	746	1,823
Center for Directed Energy (CDE)	23	2,615	0	0	28	2,615	3,107
Center for Operational Analysis (COA)	8	1,465	2	96	10	1,561	3,175
Center for Space Research and Assurance (CSRA)	29	2,589	1	15	39	2,604	3,195
Center for Technical Intel Studies & Research (CTISR)	12	2,027	0	0	23	2,027	2,181
TOTAL	106	13,411	6	458	143	13,869	18,529

Note: Total research expenditures reported include institutional cost sharing, which is not included in newly awarded projects. Numbers reported to the ASEE and NSF research expenditure surveys vary somewhat due to differences in definitions. All center funds are also included in departmental funding. Numbers displayed in \$1,000's.

AFIT Signs MOA with AFWERX

In November 2019, a Memorandum of Understanding (MOU) was signed between the Air Force Institute of Technology (AFIT) and AFWERX in order to establish a formal collaboration and TDY program. The TDY program will provide a personnel exchange where AFIT faculty members will work at one of the AFWERX Hubs as technical Subject Matter Experts (SMEs) and research collaborators increasing communication between the two organizations. The former USAF Secretary Heather Wilson established AFWERX in 2017 to enlist experts from industry and academia to rapidly address issues relevant to the operational Air Force, and AFWERX is now a key component enabling flexible and rapid acquisition. A delegation from the Austin, Las Vegas, and DC Hubs of AFWERX will be touring AFIT and holding a presentation in March 2020.



Space Research MOA Signed

The Department of Defense (DoD) Space Experiment Review Board (SERB) approved the Air Force Institute of Technology's (AFIT) 6U Space Vehicle Demo (Grissom-1) CubeSat, leading to a DoD Space Test Program (STP) offer to launch Grissom-1 aboard their STP-S28 mission. Subsequent coordination between AFIT and STP through the summer and fall of 2019 culminated in the 04 February 2020 signing of a Memorandum of Agreement (MOA) formalizing this collaborative effort.

Expanding Artificial Intelligence Research Activities

Dr. Aihua W. Wood, AFIT Graduate School of Engineering and Management Professor of Mathematics, recently visited Carnegie Mellon University (CMU) where experts from industry, government, and academia were brought together for the Workshop on Artificial Intelligence and the Future of STEM and Societies on 2-3 Dec 2019.

According to the CMU website, the workshop focused on exploring current and future AI technologies that could potentially help personalize learning and enhance the efficiency in which individuals attain knowledge and skills, both in academia and industry.



"The workshop was well structured and the CMU student-led poster session was very interesting in that it allowed me to see how graduate students at a top civilian engineering university compare to our own. AFIT has a great deal to offer in the area of AI, but the field is evolving rapidly, and its resource requirements are ever-increasing. Workshops like this highlight the importance of collaboration with other institutions in this exciting field," stated Dr. Wood upon completion of the workshop.

Subsequent to her attendance at the workshop, Dr. Wood and AFIT are participating in a CMU-led collaborative proposal for the National Science Foundation's (NSF) National AI Research Institutes (NAIRI) program (which is jointly sponsored by the USDA, DHS, DOT, and the VA). According to the NSF, NAIRI aims to "advance AI research and create national nexus points for universities, Federal agencies, industries, and nonprofits."

The proposal involves the use of AI in the area of personalized STEM education. If awarded, Dr. Wood and her AFIT research team will apply machine learning techniques to the problem of identifying and categorizing pre-existing STEM data to create libraries of "building blocks" to be used for generating personalized content. The CMU AI workshop was sponsored by the NSF Undergraduate Education (DUE): grant 1941782.

TECHFEST 2020

Sinclair Community College

Dr. Amy Magnus, Research Assistant Professor of Engineering Physics and Director of the Quantum Autonomy Research Group, and Mr. Dan Ryan, AFIT Model Shop, represented AFIT at the annual TechFest event at Sinclair Community College, 15-16 February 2020. TechFest is designed to engage local K-12 students and families interested in STEM learning with hands-on exhibits and live presentations. TechFest is a great annual opportunity for AFIT faculty members and researchers to showcase the possibilities of STEM education to local youth and their parents.

Dr. Amy Magnus (right) and Mr. Dan Ryan (below) provide information and demonstrations on STEM learning at TechFest 2020.



AWARDS AND RECOGNITION

2019 Award Winners Announced

2019 AETC Air Force Analysis Team Award

The AETC winner of the 2019 Air Force Analysis Award is the **AFIT Scientific Test & Analysis Center of Excellence (STAT COE) Team**.



AFIT STAT COE team's leadership and outstanding support of AETC's mission has earned them this prestigious recognition. The winning team will represent AETC at the Air Force level.

Congratulations to STAT COE team members Darryl K. Ahner, Professor of

Operations Research, Director of COA and STAT COE, Civilian, USAF (Team Leader); Steven N. Thorsen, Civilian, USAF; Andrew K. Klein, Civilian, USAF; Gina S. Sigler, Contractor, ALION; Sarah E. Burke, Contractor, The Perduco Group; and Aaron Ramert, Contractor, The Perduco Group.

2019 AETC Nuclear Deterrence Operations Team Award

The AETC winner of the 2019 Nuclear Deterrence Operations Award is the **AFIT Nuclear Expertise for Advancing Technologies Center for Specialized Research (NEAT CSR)**. The Nuclear Deterrence Operations Award recognizes the outstanding accomplishments of Airmen contributing to nuclear deterrence operations. The NEAT Center won the 2019 professional team award at the AETC level



and is in the running for the Air Force-level award. NEAT CSR was recognized for its long list of accomplishments since the center became official on 1 May 2019.

Congratulations to NEAT CSR team members Dr. James Petrosky, Professor of Nuclear Engineering and Director of NEAT

CSR, (Team Leader); Maj James Bevins, PhD; Dr. Abigail Bickley; Dr. Anna Bucy; Lt Col Michael Dexter, PhD; Lt Col Lee Hobbs, PhD; Dr. Darren Holland; Dr. John McClory; Mr. Curtis McGiffin; Col Craig Narasaki, PhD; Ms. Amy Nida; Dr. George Peterson; Dr. Gaiven Varshney.

AFIT 4th Quarter Awards

Civilian Category III Award:

Mr. Christopher Lomanno, Department of Aeronautics and Astronautics, Graduate School of Engineering and Management.

AFIT Annual Awards

Civilian Category IV Award:

Dr. Carl Hartsfield, Assistant Professor of Aerospace Engineering, Graduate School of Engineering and Management.

Team Award:

The Center for Space Research and Assurance, Graduate School of Engineering and Management.

Additional Awards

2018 AU FGO of the Year:

Maj Steven Schuldt, Assistant Professor of Engineering Management, Graduate School of Engineering and Management.

AETC Civil Engineer Annual Awards

Maj Gen Fox Award (Senior Military Manager):

Maj Justin Delorit, PhD, Assistant Professor of Engineering Management, Graduate School of Engineering and Management. Congratulations Maj Delorit for continuing on to win at the Air Force level.

Faculty Receive Best Paper Awards

2019 Omega Best Paper Award

Dr. Brian Lunday and **Dr. Matthew Robbins**, Associate Professors of Operations Research, Department of Operational Sciences, received the 2019 Omega Best Paper Award for their work titled "Collaboratively-developed vaccine pricing and stable profit-sharing mechanisms." Their paper was one of seven selected for this recognition out of 138 articles published in Volumes 82-89 of the journal during 2019.

Omega International Journal of Management Science reports on developments in management, including the latest research results and applications. Omega has an impact factor of 5.341 and a 5-year impact factor of 6.318.

2020 Best Research-oriented Paper Award

Maj Justin Delorit, PhD, Assistant Professor of Engineering Management, received the 2020 Best Research-oriented Paper Award from the Journal of Water Resources Planning and Management (ASCE). The award-winning paper titled "Using Seasonal Forecasts to Inform Water Market-scale Option Contracts" focuses on the area of human-natural system models. The Journal of Water Resources Planning and Management is primarily focused on socioeconomic, environmental and other policy-oriented research which is aimed at the sustainable use and conservation of water resources.

Faculty Published in Air & Space Power Journal

Dr. Robert Fass, Assistant Professor, Department of Systems Engineering and Management, and **Dr. Jonathan Ritschel**, DG & Assistant Professor and Director, Cost Analysis Graduate Program, Department of Systems Engineering & Management (along with Capt Michael J. Brown, AFIT alum) authored "A Case for Open Mission Systems in DOD Aircraft Avionics," which appeared in the *Air & Space Power Journal*, Volume 33 Issue 4, Winter 2019 edition.

UPCOMING EVENTS

MARCH 2020

AFIT Commencement Ceremony

National Museum of the U.S. Air Force, WPAFB, OH | 23 Mar 2020

AFIT Graduate School Spring Quarter Classes Begin

AFIT Campus, WPAFB, OH | 30 Mar 2020

APRIL 2020

MDO Education Summit

WPAFB, OH | 22-23 Apr 2020

WPAFB TechExpo

Hope Hotel & Conference Center, WPAFB, OH | 29 Apr 2020

MAY 2020

AFIT Graduate School Summer Quarter Registration Opens

AFIT Campus, WPAFB, OH | 4 May 2020

JUNE 2020

AFIT Graduate School Spring Quarter Classes End

AFIT Campus, WPAFB, OH | 5 Jun 2020

AFLCMC Annual Life Cycle Industry Days

Dayton Convention Center, Dayton, OH | 17-19 Jun 2020

AFIT Graduate School Spring Graduation (No Ceremony)

AFIT Campus, WPAFB, OH | 18 Jun 2020

AFIT Graduate School Summer Quarter Classes Begin

AFIT Campus, WPAFB, OH | 29 Jun 2020

AY 2019-2020 Faculty Excellence Showcase Online

To learn more about Graduate School faculty members, view the academic year 2019-2020 AFIT Graduate School of Engineering and Management Faculty Excellence Showcase online at:

www.afit.edu/EN/facultyexcellence



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