National Defense and Arizona State University

March 2016
Arizona State University is an “all in” national defense university, with a proud history of embracing our Nation’s veterans, their families and those who continue to serve on active duty, in the National Guard or Reserves. ASU’s faculty, students and staff contribute to national security through a multitude of defense-related research and military support initiatives. As the New American University, the men and women of ASU are doing work larger than themselves and positively impacting the world around them.

ASU Charter

ASU is a comprehensive public research university, measured not by whom it excludes, but by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves.

In fiscal year 2014, ASU researchers submitted $117.2 million in proposals to the Department of Defense, received $38.1 million in award obligations, and reached over $32 million in DoD-funded research expenditures. According to the most recent National Science Foundation HERD survey (FY2014), ASU ranks 34th among universities in the nation for DoD-funded research expenditures.
Over the last decade, ASU has become one of the fastest-growing research enterprises in the world among research institutions with more than $100M in annual research expenditures.

- **#1 most innovative school in the country**
  (U.S. News & World Report)
- **#10 in the nation for research expenditures among institutions without a medical school**
  (National Science Foundation HERD Survey, FY 2014)
- **#6 for social sciences research expenditures**
  (National Science Foundation HERD Survey, FY 2014)
ASU is committed to veteran success in education and has been named a “Military Friendly School” by G.I. Jobs magazine seven years in a row. ASU was also among the nation’s first higher education institutions to embrace “8 Keys to Success” – federal government guidelines for encouraging veteran students on campus and improving their employment outcomes.

The university offers numerous support services to more than 5,200 military, veteran and family member students. These include the Pat Tillman Veterans Center and VetSuccess on Campus, a joint program with the Department of Veteran’s Affairs.

**#3 in the nation for best online graduate business programs for veterans**

**#2 in the nation for best online graduate criminal justice program**

**#4 in the nation for best online MBA program for veterans**

(U.S. News & World Report, 2015 Best Online Programs for Veterans)
Research Supports Veterans’ Wellness

ASU has established a new, interdisciplinary Center for Veterans’ Wellness to conduct research and help vets affected by combat-related stress and trauma, such as post-traumatic stress disorder (PTSD). The center draws together experts from a variety of disciplines across the university and its partner organizations to expand their work and develop new ideas.

The center is founded on four primary pillars:

• basic science research  
• prevention and intervention research  
• policy research  
• education and outreach
The Pat Tillman Veterans Center provides academic resources and transition services to help veterans navigate and succeed at ASU, in the spirit of service and dedication that is the legacy of Pat Tillman. The center ensures that ASU student veterans receive Department of Veterans Affairs (VA) educational benefits. It also offers a place for veteran students to congregate, as well as receive information and referrals for housing, health services, career services, disability resources and more.

**Director: Steven Borden, Captain, US Navy (Retired)**

In 2008, the Pat Tillman Foundation established the Tillman Military Scholars program to support educational opportunities for service members and military families by bridging the financial gaps left by the Post-9/11 GI Bill®.

**Veteran Support**

- **Office for Veteran and Military Academic Engagement** integrates veterans to scholastic life.
- **Salute to Service** honors military each year with staff, faculty and student-organized events across all Phoenix metropolitan area campuses.
- **VetSuccess on Campus** program features on-site Veterans Affairs counselors.
- **Yellow Ribbon Program** helps Post 9/11 GI Bill® recipients and, typically, family cover cost difference between resident and nonresident tuition.
- **Veterans Upward Bound** program helps low income or first-generation veterans improve academic skills through free federally-funded prep courses.
- Available scholarships: Veterans Education Fund, Arizona Tuition Waiver, Marine Corps Scholarship, Online Military Scholarships, Tillman Military Scholars
- Credit accepted for successfully completed military courses or training, DANTES and CLEP testing
- In-state tuition for honorably discharged veterans since 2011
- Priority registration for veterans and military-affiliated students after first semester
Veterans’ Stories and Songs

ASU students and U.S. veterans are sharing their experiences of war and service with the community in “The Veterans Project,” a performance initiative designed by Erika Hughes, assistant professor in the School of Film, Dance and Theatre, and Boyd Branch, visiting assistant professor in the School of Film, Dance and Theatre.

ASU’s Music Therapy Clinic and the Phoenix Chapter of Guitars for Vets teamed up in 2013 to train veterans from the local area. As they built musical skills and relationships, they also discovered new ways to cope with stress and improve their quality of life after military service. The partnership was facilitated in part by Mark von Hagen, director for ASU’s new Office of Veteran and Military Academic Engagement.

Big Numbers

5,200 veterans and military family members served by Pat Tillman Veterans Center. That’s 63.39 military-affiliated students per every 1,000.

<table>
<thead>
<tr>
<th>School</th>
<th>Military-affiliated students per 1,000</th>
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<tbody>
<tr>
<td>Arizona State</td>
<td>63.39</td>
</tr>
<tr>
<td>Texas A&amp;M</td>
<td>46.09</td>
</tr>
<tr>
<td>Ohio State</td>
<td>31.03</td>
</tr>
<tr>
<td>Syracuse</td>
<td>27.59</td>
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<tr>
<td>Columbia</td>
<td>18.41</td>
</tr>
<tr>
<td>Purdue</td>
<td>12.68</td>
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<tr>
<td>Texas</td>
<td>10.40</td>
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ASU Leading the Way

National Ranking in DoD Funded Research Expenditures
Data from FY2014 NSF HERD Survey

<table>
<thead>
<tr>
<th>Institution</th>
<th>2014 Rank</th>
<th>DOD Expenditures</th>
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</thead>
<tbody>
<tr>
<td>Johns Hopkins University</td>
<td>1</td>
<td>$734,989,000</td>
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<tr>
<td>...</td>
<td></td>
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<tr>
<td>Vanderbilt University</td>
<td>29</td>
<td>$36,816,000</td>
</tr>
<tr>
<td>UCLA</td>
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<td>$35,587,000</td>
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<tr>
<td>UC Berkeley</td>
<td>31</td>
<td>$34,888,000</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>32</td>
<td>$34,146,000</td>
</tr>
<tr>
<td>U.S. Air Force Academy</td>
<td>33</td>
<td>$33,392,000</td>
</tr>
<tr>
<td><strong>Arizona State University</strong></td>
<td><strong>34</strong></td>
<td><strong>$32,759,000</strong></td>
</tr>
<tr>
<td>Princeton University</td>
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<td>$31,889,000</td>
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<tr>
<td>California Institute of Technology</td>
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<tr>
<td>Cornell University</td>
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</tr>
<tr>
<td>Woods Hole Oceanographic Institution</td>
<td>38</td>
<td>$29,049,000</td>
</tr>
<tr>
<td>Purdue University, West Lafayette</td>
<td>39</td>
<td>$28,539,000</td>
</tr>
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**ASURE Research Enterprise**

A not-for-profit organization that performs applied research to deliver real-world solutions for the Defense Department, intelligence community and federal government agencies.

ASURE brings the intellectual capital of the university’s more than 1,900 faculty to reimagine, test and invent ground-breaking solutions.
Innovation

Entrepreneurship

Solutions-focused

Societal Outcomes

Transdisciplinary

Awards and Recognition

#1 Top School
Military Advanced Education & Transition Magazine

#1 Veteran-friendly Aerospace & Aeronautical Engineering School
College Factual

#1 Veteran-friendly School for Political Science
College Factual

#2 Top 10 Best Colleges for Vets
College Factual

#7 Best Online Bachelors Programs for Vets
U.S. News & World Report
ASU’s **Global Security Initiative** is a university-wide interdisciplinary hub for global security research that focuses on openness, inclusiveness and connections to the global defense, development and diplomacy communities. The initiative addresses emerging global challenges characterized by complex interdependencies and conflicting objectives, where there may not be obvious solutions. GSI is ASU’s primary interface to the Department of Defense and the Intelligence Community.

GSI’s **Center for Cybersecurity and Digital Forensics** takes a novel and proactive approach toward cybersecurity. With collaborative research teams experts in computer science, law, business, psychology and digital humanities, GSI is designing solutions for our industry and government partners.

The **Human Security Collaboratory** complements and builds on ASU’s existing global security capacity and computational technologies. HSC engages collaborators from multiple disciplines, with a particular emphasis on the Arts and Humanities. Initial focus areas include Digital Civil Rights, Data Disenfranchisement and Equity in Technology.

**Decision Making and Complexity.** Global challenges in security are increasingly complex and interconnected. GSI investigates new approaches for planning and decision making around climate impact, cyber and digital security, water/food/energy nexus, particulary in context of national security and Phase 0 operations.

**Climate Impact and Policy.** Climate impact on global landscapes and human welfare create exceptional complexities for policy makers. GSI examines how climate change affects resources and subsequently contributes to political and social unrest.
ASU is developing silicon-chip-based technology to detect infectious diseases, primarily to help military personnel avoid them. Researchers, though, believe the technology will help civilians, too.

In 2015, the United States Navy announced $1.5 million in seed grants for its NEPTUNE pilot program to support six ASU energy-related research projects that will involve veterans and active-duty military members.

Center on the Future of War
Collaboration between ASU & New America; examines social, political, economic and cultural implications of the changing nature of war and conflict. The center is focused on developing new paradigms for understanding and addressing conflict and systemic violence, and to develop creative and context-appropriate policy frameworks. Past projects include the use of military and civilian drones in relation to conflict transformation, law and policy. Currently, center experts are working a project on non-state actors use of force—linking case studies and developing a database to establish foundations for evaluating and improving non-state actor compliance with laws of war and shared norms to protect civilians in conflict areas.

In addition to GSI, ASU’s contribution to national security is reflected through other strategic-level initiatives.

Flag Officer Advisory Council
Created in 2014, the council provides advice and perspective to ASU President Michael M. Crow on matters of national significance. Members include fourteen active duty and retired military generals and admirals from the U.S. Army, Marine Corps, Navy and Air Force. These distinguished leaders have served at the highest levels of government, both at home and abroad, to combat terrorism, respond to national disasters, and defend the homeland. They have developed strategy, led diverse organizations, and worked with national and international counterparts to address the nation’s most complex and critical problems. Their vast areas of expertise include complex decision making, strategic planning, business development, operational management, communications, health policy, disaster and crisis management, supply chain, leadership and character development, ROTC and student mentorship, veteran legal advice, and serving as subject matter expert lecturers.

Center for Strategic Communication
Interdisciplinary think-tank combining study of a range of faculty to bring in-depth understanding of human power & communication in peace, persuasion and conflict. CSC is supporting ASU’s Foresight Initiative and will help study how climate change affects resources and contributes to political unrest. In 2009, the Office of Naval Research awarded a $4.3 million grant for CSC to study Islamist extremist strategic communication and methods to counter it. The work continues today.
ASU offers technology and expertise that can help policy makers and other leaders make informed, evidence-based decisions on issues that affect security and human well-being.

The **McCain Institute for International Leadership** in Washington, D.C., is a non-partisan “do tank” dedicated to advancing character-driven global leadership based on security, economic opportunity, freedom and human dignity – in the U.S. and around the world. The institute promotes humanitarian action, human freedom and democracy, national security, and embraces technology in producing better designs for educated decisions in national and international policy. The institute is supported by a $9 million gift from the McCain Institute Foundation, a charitable trust funded by Arizona Senator John McCain.

*Director: Kurt Volker*
The Decision Theater Network helps leaders visualize solutions to complex problems through advanced modeling and simulation technology. With nodes in Tempe, Arizona and at the McCain Institute in Washington, D.C., the network connects researchers from all disciplines with national and international policy makers.

The Decision Theater’s immersive visualization environments include:

- seven-screen panoramic HD displays
- high-performance computation for analysis and simulation
- large-capacity data storage
- remote sites to allow sharing of expertise
- collaborative software for sharing applications across platforms

Executive director: Benjamin Freakley, special advisor to ASU president Michael Crow, Leadership Initiatives

Lieutenant General Benjamin Freakley retired from the U.S. Army after more than 36 years of active military service, and was serving as commanding general, U.S. Army Accessions Command, at the time of his retirement. He was responsible for worldwide recruiting for the active duty and reserve components as well as overseeing the nation’s junior and college ROTC programs. His awards include the Distinguished Service Medal, Legion of Merit, Bronze Star for Valor and Army Commendation Medal for Valor.
Making electronics flexible opens up a world of possibilities—from video screens embedded in soldiers’ uniforms to X-ray detectors that can wrap around natural gas pipes to detect leaks.

ASU’s Flexible Electronics and Display Center has produced the world’s largest flexible X-ray detector and the world’s largest flexible organic light emitting display, using mixed oxide thin film transistors. FEDC was launched in 2004 through a cooperative agreement with the U.S. Army. It was renewed in 2009, bringing the Army’s total investment to $100 million.

- More than 40 industry partners, from small startups to large corporations
- 14 patents issued for technologies developed at FEDC
- CNN cited FEDC among its top 10 ideas of 2013

FEDC is located in the MacroTechnology Works building at the ASU Research Park. This unique facility enables ASU to advance research in partnership with private industry. FEDC has a dedicated pilot line that mirrors industry leaders in terms of tools used and quality of products created.
ASU’s Biodesign Institute addresses critical global challenges in healthcare, sustainability and security. Researchers from many disciplines collaborate to develop solutions inspired by natural systems and translate those solutions into commercially viable products and clinical practices. Health researchers in Biodesign are advancing early detection of disease and other threats, and novel treatment methods after exposure.

Charles Arntzen, an ASU Regents’ Professor and founding director of the Biodesign Institute, hit on an unlikely combination of using tobacco as a way to make and deliver a promising, high-risk experimental treatment for the Ebola virus. Arntzen worked with Mapp Biopharmaceutical for 15 years on the idea of plant-based vaccines, eventually focusing on the Ebola virus with funding from the U.S. Army. Mapp subsequently selected the monoclonal antibodies to include in the ZMapp therapeutic antibody cocktail. DARPA then chose a Kentucky firm to build a facility for the pharmaceutical manufacturing of that drug and others.

The goal was to deliver an Ebola therapeutic that could be stockpiled for use in the event of a natural outbreak or a bioterrorism attack. The work progressed over several years when, suddenly, two Americans became infected in the worst outbreak of Ebola yet. Both received the experimental treatment and both recovered fully.

BARDA

ASU partnered with Life Technologies Corporation on a $9.33 million phase of a five-year, $33 million U.S. DHHS-funded project for commercial development of technologies to rapidly assess radiation dose in the event of a nuclear incident. The project was led by Joshua LaBaer, M.D., director of Biodesign’s Virginia C. Piper Center for Personalized Diagnostics. His team is focused on discovery and validation of molecular fingerprints of disease (biomarkers), which can provide early warning for cancer, diabetes and other conditions.

DTRA

Stephen Johnston, George Poste and Neal Woodbury led a four-year, $30 million contract from DTRA to develop a novel diagnostic technology called immunosignaturing for rapid detection of exposure to infectious disease agents before symptoms occur. HealthTell Inc., a spinout company based on the technology, was co-founded by Woodbury and Johnston and focused on early disease detection. HealthTell was selected as the Start-up of the Year at the 2012 Arizona Governor’s Celebration of Innovation.
ASU is a national leader in bringing humanistic, technological, and artistic knowledge to addressing a variety of societal challenges, including our national security efforts.

The Center for the Study of Religion and Conflict combines demography and geography with deep knowledge of how religion works in cultures to help us understand “hot spots” around the world. For example, “Finding Allies: Mapping Counter-Radical Muslim Discourse” is a research project examining what Muslims in West Africa, Western Europe and Southeast Asia are doing to counter and thwart the advance of radicalization. The project is funded by $4.9 million from the DoD’s Minerva Initiative.

*Director: Linell Cady, professor, School of Historical, Philosophical and Religious Studies*

ASU’s DoD-funded Chinese Language Flagship Program incorporates language courses at ASU with specialized courses from other disciplines to educate undergraduates in a wide variety of topics such as history, politics, literature, religion, economics and culture. It includes intensive summer study in the US, China and Taiwan. It also involves a capstone year with enrollment in a Chinese university and an internship in China. The students emerge as successful professionals in a globalized world.

Funded by Defense Language and National Security Education Office, the Melikian Language Training Center provides customized language training for DoD members in Russian, Farsi and Arabic.

The ASU Human Machine Integration Lab is designing the world’s most cutting edge robotic exoskeletons and systems. The lab has created five workable, wearable exo suits, including two with jet packs to make wearers run faster. Funded by the U.S. Air Force, the lab created a “Spiderman suit” to allow an individual to scale any surface through the use of air-tight seals, worn on hands and feet, that can stick to a wide variety of wall textures.
In 2014, ASU was awarded $1 million from the DoD to create a new **Pracademic Center of Excellence in Technology Transfer (PACE/T2)** to leverage ASU’s proven method and record of success to support technology transfer and commercialization from DoD laboratories. The center is a collaboration led by ASU’s Entrepreneurship and Innovation Group, in association with other ASU units including **Arizona Technology Enterprises (AzTE)**. AzTE is ASU’s exclusive intellectual property management and technology transfer organization.

#3 for invention disclosures

#7 for startups

#8 for licenses and options

#12 for issued patents

per $10 million in research expenditures among institutions with more than $300 in expenditures, according to the latest (FY2013) available data from the Association of University Technology Managers.
Building Future Leaders

Public Service Academy
Established in 2015, the PSA aims to advance civilian-military collaboration while promoting public service and developing cross-sector leadership skills. Next Generation Service Corps students learn and train alongside their Reserve Officer Training Corps counterparts to promote early, mutual understanding.

ROTC
ASU’s ROTC programs provide students access to military careers as commissioned officers in the U.S. Army, Navy, Air Force and Marine Corps. Currently, over 500 ROTC cadets are enrolled at ASU.

Degree Programs
ASU has earned the distinction of being an Academic Center of Excellence in Information Assurance Education, a designation bestowed by the National Security Agency/Central Security Service. The university’s programs in areas such as aerospace, robotics and foreign area studies have launched graduates to the military and homeland security, but several degree programs focus specifically on fields that keep the nation safe.

• **Master of Arts**, Emergency Management and Homeland Security
• **Master of Public Administration**, Emergency Management concentration
• **Bachelor of Science**, Public Service and Public Policy (Emergency Management and Homeland Security)
• **Undergraduate certificate**, Homeland Security

Defense & Homeland Security Careers
In addition to ASU graduates who joined the various branches of the Armed Forces last year, Sun Devils received job offers from:

- U.S. Department of Defense
- U.S. Department of Justice
- U.S. Department of Homeland Security
- FBI
- U.S. Department of State
- Diplomatic Security Service
- U.S. Border Patrol
- U.S. Customs and Border Patrol
- Immigration and Customs Enforcement
- U.S. Marshals Service
- Interpol
In November, 2015, ASU and Starbucks expanded their innovative education partnership so that veterans who work for the coffee company can not only get a tuition-paid college education through ASU Online, but also extend that benefit to a spouse or child.

The ASU and Starbucks partnership, launched in 2014, embodies the university’s charter mission to expand access to a high quality education. Starbucks employees – and, for veterans, their spouse or child – can either finish a college degree or complete an entire degree from among ASU Online’s more than 50 bachelor’s programs. Veterans, and all others in the program, have a dedicated enrollment coach, academic advisor and team financial aid counselors to support them through graduation.

The expansion to include a veteran’s spouse or child helps support Starbucks’ goal of hiring 10,000 veterans by 2018.