Arizona State University: a leader in national defense
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.
ASU and the U.S. Department of Defense

A commitment to serving veterans

ASU research excellence

Target: emerging threats

Strategic decision-making

Solving security challenges

Stopping pandemic threats

Security: a critical human issue

Forging tomorrow’s leaders

ASU and Starbucks

Taking technology to market
Arizona State University's charter and values are in step with the U.S. Department of Defense, the nation’s largest employer and oldest federal agency. With matching commitments to inclusivity, research focused on the public good and a shared fundamental responsibility for the overall health of our communities, ASU and the DOD have worked together to tackle a wide range of societal challenges. ASU proudly provides transformative, all-inclusive educational experiences, including research and training opportunities, for the nation’s 1.3 million men and women serving on active duty, 826,000 in the National Guard or Reserves, millions of lifelong-learning veterans and their families.

ASU’s faculty, students and staff are making significant contributions to our country’s safety and security and protecting our natural resources through a multitude of defense-related research and military initiatives. As a New American University re-examining and reshaping the very idea of what a university should be, ASU acts as a positive force to better our communities, state and nation.
In fiscal year 2016, ASU researchers submitted $192 million in proposals to the DOD, received more than $31 million in award obligations and reached more than $32 million in DOD-funded research expenditures. According to the 2015 National Science Foundation HERD survey, ASU ranks 32nd in the nation for DOD-funded university research expenditures.

### National ranking in DOD-funded research expenditures

Data from FY 2015 NSF HERD Survey

<table>
<thead>
<tr>
<th>Institution</th>
<th>2015 rank</th>
<th>DOD expenditures</th>
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<tbody>
<tr>
<td>Johns Hopkins University</td>
<td>1</td>
<td>$794,397,000</td>
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<tr>
<td>Northwestern University</td>
<td>29</td>
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</tr>
<tr>
<td>Ohio State University, The</td>
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<td>UC Berkeley</td>
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<td>Arizona State University</td>
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<td>Purdue University, West Lafayette</td>
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<td>Wake Forest University</td>
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</table>
ASU offers numerous support services to more than 6,500 military members, veterans and their family members enrolled here.

**Pat Tillman Veterans Center**

The Pat Tillman Veterans Center provides comprehensive transition services, connections and academic resources to help veterans navigate and succeed at ASU and beyond.

Pat Tillman’s legacy was shaped at ASU, where he was an All-PAC-12 and All-Academic student-athlete. After graduating with honors, he was drafted by the NFL Arizona Cardinals. Tillman gave up his football career after four seasons to serve in the U.S. Army after 9/11. He was killed in action in Afghanistan in 2004.

In the spirit of service and dedication that is the Tillman legacy, the center empowers veterans to follow their honorable service with exemplary academic performance and connect with meaningful employment for their post-military careers. The center ensures that ASU student veterans receive U.S. Department of Veterans Affairs education benefits in a timely and professional manner. It also offers a place for student veterans to congregate, study and engage in the student community, and receive information to assist them in all facets of their transition from the military to the academic environment.

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. ASU has been a Tillman Partner University since 2011.
ASU values the student veteran as an integral component of the university community and is committed to veterans’ success in education as well as finding meaningful careers after graduation. ASU has been named a “Military Friendly School” by G.I. Jobs magazine seven years in a row for its immersion and online programs of study. The university is one of the nation’s first higher education institutions to embrace “8 Keys to Success” and serve as a role model for implementation of the Executive Order on Principles of Excellence related to veterans’ services in higher education.

Steven Borden, director

Steven Borden is the founding director of ASU’s veterans center, which opened in 2011. He is a retired Navy captain, having served over 29 years on active duty. His final assignment in the Navy brought him to Arizona, serving as the original commanding officer and establishing the Naval Reserve Officers Training Corps at ASU in 2010.

Awards and recognition

Best for Vets 2017
U.S. Military Times
#1

Top School
Military Advanced Education & Transition Magazine
#1

Best colleges for Veterans for Urban & Regional Planning
U.S. News & World Report
#1

Best College for Veterans for Construction Management
College Factual
#1

Best College for Veterans for Legal Professions
College Factual
#2

Best College for Veterans for Computer Science
College Factual
#3

Best Online Bachelor’s Programs for Veterans
U.S. News & World Report
#3

Best Online MBA Programs for Veterans
U.S. News & World Report
#3

Top Colleges for Veterans
College Factual
#7
The Office for Veteran and Military Academic Engagement integrates veterans into scholastic life, assists staff and faculty in understanding the veteran mindset, and helps create research opportunities that benefit veterans by providing valuable hands-on experience.

Salute to Service, ASU’s annual weeklong series of events honoring military service, features staff-, faculty- and student-organized events across all Phoenix metropolitan campuses.

VetSuccess on Campus, a joint program with the U.S. Department of Veterans Affairs, features on-site counselors for veterans and their family members.

The Yellow Ribbon Program helps Post-9/11 GI Bill recipients and their families cover the cost difference between resident and nonresident tuition.

Available scholarships include the Veterans Education Fund, Arizona Purple Heart Tuition Waiver, Marine Corps Scholarship Foundation, online military scholarships for individuals using tuition assistance and the Tillman Military Scholars program.

In-state tuition has been offered to all honorably discharged veterans since 2011.

Priority registration is available for veterans using benefits after their first semester.

Credit is applied for successfully completed military courses or training, and for DANTES and CLEP testing.

The Veterans Upward Bound program helps low-income or first-generation student veterans improve their academic skills through free federally funded college preparation courses.
Research supports veterans’ wellness

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

The Veteran Cognition and Academic Success Project provides a comprehensive assessment of attention and memory abilities in veterans with service-related TBI, PTSD or anxiety. Training sessions offer personalized cognitive coping strategies to participants.

VA Nursing Academic Partnership program

This five-year, $4-million initiative funds three faculty positions at ASU’s College of Nursing and Health Innovation and seven in the Phoenix VA Health Care System. The partnership provides nursing students with clinical experience working directly with U.S. veterans, while affiliated faculty study diabetes, mental health and PTSD.

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 faculty 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 build musical skills and relationships, participants also discover new ways to cope with stress and improve their quality of life after military service.
ASU leads in enrollment among military-friendly schools

With more than 6,600 veterans and military family members served by the Pat Tillman Veterans Center, ASU is a top choice and leader in enrollment among the nation’s most military-friendly schools. The numbers prove it, with 65.65 military-affiliated students per every 1,000 at the university.
ASU is the fastest-growing research enterprise in the U.S. among universities with more than $100 million in annual research expenditures.

ASU’s annual research growth 1995-2016

- #10 in the nation for research expenditures among institutions without a medical school, ahead of Caltech, Princeton and Carnegie Mellon
- #11 for NASA-funded research expenditures, ahead of Stanford, Georgia Tech and UCLA

National Science Foundation HERD Survey, 2015
ASU’s Global Security Initiative (GSI) serves as a university wide hub for addressing emerging security challenges, including borderless threats such as cybersecurity, health security and resource security. These challenges are often characterized by complex interdependencies and present conflicting objectives requiring multidisciplinary research and collaboration.

GSI also serves as the university’s interface to the DOD and intelligence community, as well as to ASU Research Enterprise (ASURE), an off-campus, classified-capable research facility.

Approximately 150 GSI faculty affiliates collaborate across disciplines to conduct research on a wide variety of security-related topics. GSI research also provides insights on new learning approaches to create and sustain the national security workforce needed to maintain a competitive edge in the global knowledge economy.

Through GSI’s DARPA Working Group, ASU supports junior faculty in securing highly prestigious DARPA Young Faculty Awards. Over the last few years, ASU has rapidly advanced its award status, from no ranking in 2006 to No. 8 out of 115 national universities in 2016, ahead of Carnegie Mellon, Caltech and Columbia University.

Comprehensive cybersecurity

GSI’s Center for Cybersecurity and Digital Forensics (CDF) offers expertise in identity management, privacy issues, malware attribution, secure mobile devices, predictive analytics and cyberthreat intelligence – including the dark web, where hackers buy and sell exploits to attack cyber-systems. CDF also creates custom education, internship and training platforms. Supported by grants from the Intelligence Advanced Research Projects Activity (IARPA) and Office of Naval Research (ONR), dark web research at ASU has led to a spinoff company called CYR3CON™, which provides cyberthreat intelligence about malicious hackers and darknet/deep web risky behavior.
Robots and autonomous systems

No longer limited to science fiction, robots now play a critical role in military operations, working physically and cognitively with humans. ASU is at the forefront of research in this burgeoning field. Inspiration from nature, combined with the power of technology, leads to strategic military advantage.

ASU faculty study insect behavior to create uniquely functional swarms of robots, both on the ground and in the air. One GSI affiliate is working on a flexible robotic octopus for the Office of Naval Research. Another has designed a robot that can win a free-throw contest. ASU’s work in brain-machine interface has led to a prototype capability that allows a pilot to steer a swarm of drones.

The Human Machine Integration Lab is designing the world’s most advanced robotic exoskeletons and systems. The lab has created workable, wearable exoskeleton suits, including two with jet packs that make it possible to run faster. Funded by the U.S. Air Force, the lab created a “Spiderman” suit that allows an individual to scale any surface through the use of airtight seals worn on their hands and feet that can stick to a wide variety of wall textures.

Engaging veterans in energy research

Collaborating with the U.S. Navy, ASU is participating in the Naval Enterprise Partnership Teaming with Universities for National Excellence (NEPTUNE) initiative to address key energy challenges and to aid military veterans in their career pursuits and research interests. Through this unique program, veterans are pursuing research and training on topics ranging from cyberthreats and critical infrastructure to self-organizing microgrids and underwater optical communications.

Humanities for security

GSI’s Human Security Collaboratory (HSC) 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.
ASU offers technology and expertise to help guide policymakers and others toward informed, evidence-based decisions in key areas that impact security and human well-being.

Decision Theater Network

The Decision Theater Network helps leaders visualize solutions to complex problems through advanced modeling, visualization and simulation technology. With nodes in Tempe, Arizona, and at The McCain Institute for International Leadership in Washington, D.C., the network provides the latest expertise in collaborative computing and display technologies. The network addresses complex local, national and international issues by drawing on ASU’s cross-disciplinary expertise. The Decision Theater’s immersive visualization environment includes:

- Seven-screen panoramic Quad full high-definition displays
- High-performance computation for analysis and simulation
- Large-capacity data storage
- Remote sites to foster expertise sharing
- Collaborative software for sharing applications across platforms

Benjamin C. Freakley, executive director

Lt Gen. Benjamin C. Freakley is the professor of practice of leadership for ASU and a special advisor to ASU President Michael Crow for leadership initiatives. Additionally, he serves at The McCain Institute. He 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.
Center on the Future of War

An ASU and New America collaboration, the center explores the social, political, economic and cultural implications of the changing nature of war and conflict. It connects ASU faculty with policymakers and national media, organizes collaborative research projects, produces reports and publications, and designs and implements innovative educational programming.

These activities are designed to describe the future of warfare as it evolves, predict its likely impact on society, and develop new paradigms for understanding and addressing conflict and systematic violence. The work is part of a larger effort to help the U.S. evolve beyond the post-9/11 state of perpetual war through innovative research and analysis and creative and context-appropriate policy frameworks.

Flag Officer Advisory Council

Created in 2014, the council provides advice and perspective to ASU President Michael M. Crow, faculty and staff on matters of national significance. Members include 14 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 leadership, communications, health policy, disaster and crisis leadership, supply chain, leadership and character development, ROTC and student mentorship, veteran legal advice, and serving as subject matter expert lecturers.

The McCain Institute for International Leadership

Guided by the values that have driven the McCain family for generations of public service, The McCain Institute at ASU is a non-partisan “do tank” dedicated to advancing character-driven, responsible global leadership based on security, economic opportunity, freedom and human dignity – in the United States and around the world. The institute is committed to achieving this through: sustaining strong American leadership in the world; upholding freedom, democracy and human rights as universal human values; and serving causes greater than one’s self-interest.

Kurt Volker, executive director

After serving as a U.S. ambassador to NATO in 2008–2009, Kurt Volker has been involved with a variety of think-tank and business consulting activities. He remains active as a senior advisor to the Atlantic Council and senior fellow with the Center for Transatlantic Relations at Johns Hopkins University’s School of Advanced International Studies.

National defense and Arizona State University
From classified research capabilities to manufacturing pilot lines, ASU offers the tools, facilities and expertise needed to develop viable solutions for security and defense challenges.

Flexible electronics and systems

Making electronics flexible opens up a world of possibilities – from video screens embedded in soldiers’ uniforms to X-ray detectors that can be used on the battlefield. ASU’s Flexible Electronics and Display Center (FEDC) was launched in 2004 through a cooperative agreement with the U.S. Army and has received more than $115 million in Army investment to date.

Building on their success at developing flexible displays, FEDC researchers were able to quickly create a flexible X-ray detector in collaboration with the Defense Threat Reduction Agency. These lightweight devices will soon be used by explosive ordnance-disposal specialist soldiers to investigate suspicious objects in the field. In a similar way, sensors for detection and identification of other weapons of mass destruction are now being explored.

FEDC’s unique facility enables ASU to collaborate with government and industry partners to bridge the high-risk, resource-intensive gap between innovation and product development. The center offers manufacturing pilot lines in a Class 10 clean room, and provides an information-secure environment for process, tool and materials development, and evaluation.

Research and development for defense industry challenges

The ASU Research Enterprise (ASURE) is the nonprofit applied research, development and consulting affiliate of ASU. ASURE specializes in conducting classified and midrange technology readiness-level services for the defense and security industry. ASURE connects the DOD, intelligence community and other agencies with the unsurpassed intellectual resources of more than 3,000 ASU faculty members to develop solutions for near- and longer-term security and defense needs.
DOD funding in the earliest, high-risk stages of research is being translated into solutions that help curtail global health threats while offering profound civilian health benefits. The Biodesign Institute’s platform technologies are now playing a key role in combating nerve agents, Dengue fever and recent Ebola and Zika epidemics.

**Detect early, deter harm**

Biomarkers that can provide an early warning for cancer, diabetes and other conditions are a core ASU technology. In partnership with Life Technologies Corporation, a five-year, $33-million, BARDA-funded project is now commercializing technologies to rapidly assess radiation dose in the event of a nuclear incident.

Biodesign researchers also led a four-year, $30-million contract from the DOD to develop a novel diagnostic technology called immunosignaturing for rapid detection of exposure to infectious disease agents, even before symptoms occur. HealthTell Inc. is a spinoff company based on the technology, which can be used to monitor an individual’s personal health status, and for the early detection of more than 50 diseases from a single drop of blood.

Recently, HealthTell became one of seven core companies in the Digital Life Alliance, a $400-million investment launched to detect meaningful signals about health, disease and aging, and deliver a personalized guide for living a healthy life.

**Ebola treatment**

ASU played a key role in developing ZMapp, the first successful treatment against the Ebola virus during the largest outbreak in history. And should new cases of Ebola arise, industry partner Mapp Biopharmaceutical has received funding from the U.S. Biomedical Advanced Research and Development Authority to offer ZMapp to patients.

ASU’s Biodesign Institute scientists are helping to stay one step ahead of infectious diseases by developing a comprehensive research portfolio to detect and deter emerging pandemic threats.
ASU is a national leader in bringing expertise from the humanities, arts and social sciences to bear on a variety of societal challenges, including our national security efforts.

Human-machine teams
The ASU Cognitive Engineering Research on Team Tasks Lab is forging a path in the growing field of human systems engineering. The lab focuses on human-machine interaction and variations of teaming, such as a human remotely operating a drone. This work holds promise in many areas of national defense amidst dramatic changes in robotics, remote operations and sensor data exploitation.

Narrative and framing
Is it possible to know whether areas are prone to conflict before violence starts? ASU professors from the Global Security Initiative and Center for Strategic Communication are looking for ways to see “the bubble before the boil.” Their work involves a collaboration with Lockheed Martin’s Advanced Technology Lab to identify emerging themes in media that could signal impending instability and conflict.
Religion and conflict

Religion wields extraordinary influence in public affairs. This rich reservoir of values, principles and ideals is also a powerful source of conflict and violence as diverse traditions collide. The ASU Center for the Study of Religion and Conflict promotes interdisciplinary research and education on the dynamics of religion and conflict with the aim of advancing knowledge, seeking solutions and informing policy.

Real-time. Contextual. All ideologies. All actors. All events. The Online Social Movements Tracker is a powerful data analytics “looking glass” tool that can be used to measure the spread of extremist and counter-extremist influence online. With funding from the DOD, ASU researchers are using the tool’s machine learning capability to retrieve, categorize and analyze vast amounts of data across the Internet in order to evaluate “information cascades” – or how a message “goes viral.”

Mastering languages for global leadership

ASU’s DOD-funded Chinese Language Flagship Center 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 U.S., China and Taiwan and a capstone year with enrollment in a Chinese university and an internship in China.

Funded by the Defense Language and National Security Education Office, the Melikian Language Training Center at ASU provides customized language training in Russian, Farsi and Arabic for DOD members.
Forging tomorrow’s leaders

ASU develops military and civilian national service leaders armed with the skills, networks and experience to work side-by-side in taking on our most complex challenges.

Public Service Academy

Established in 2015, the ASU Public Service Academy advances civilian-military collaboration while promoting public service and developing cross-sector leadership skills. The academy brings together Next Generation Service Corps students to learn and train alongside their Reserve Officer Training Corps counterparts with the goal of promoting early, mutual understanding. The newest addition to the specialized program is the Veterans Fellowship Corps, which aims to leverage student veterans’ unique military experience and skills to elevate their capacity to lead in the civilian world.

ROTC

ASU hosts ROTC programs representing the four branches of U.S. military service, including the nationally ranked Army ROTC, which has been a campus mainstay for more than 80 years. ROTC students have the same college experience as their peers with one significant difference — upon graduation, they will be commissioned as officers in the Army, Navy, Air Force or Marines. Qualified students participate in a combination of academics, military-specific courses, physical fitness and summer training. Through a common ASU and DOD goal of developing success-driven leaders, there are multiple opportunities to earn a commission and may include full-tuition benefits, payment for fees and books, and a monthly stipend.
Defense and homeland security careers

In addition to ASU graduates who joined the various branches of the U.S. armed forces last year, Sun Devils received job offers from a wide variety of defense-related government agencies and corporations, including:

- Aerojet Rocketdyne
- BAE Systems
- Bechtel
- Boeing
- Booz Allen Hamilton
- Central Intelligence Agency
- Defense Contract Management
- Defense Intelligence Agency
- Federal Bureau of Investigation
- General Dynamics Mission Systems
- Honeywell International
- Lockheed Martin
- L-3 Communications
- National Security Education Program
- Orbital ATK
- Raytheon
- Textron
- U.S. Department of Defense
- U.S. Department of Homeland Security
- U.S. Department of Justice
- U.S. Department of State Diplomatic Security Service
- U.S. Department of the Treasury
- U.S. National Guard Homeland Response Force
- U.S. National Geospatial Intelligence Agency
- U.S. Nuclear Regulatory Commission
- United Technologies

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 international studies have launched graduates into military and homeland security careers. Several degree programs focus specifically on fields that prepare graduates to help maintain national security:

- 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
In November 2015, ASU and Starbucks expanded their innovative education partnership, the Starbucks College Achievement Plan, so that veterans who work for the coffee company can not only receive 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 (partners) — and, for veterans, their spouse or child — can either complete a college degree or pursue a degree from start to finish from among ASU Online’s more than 60 undergraduate degree programs. Participants have access to a dedicated enrollment coach, academic advisor and team financial aid counselors to support them through graduation. By the end of summer 2017, Starbucks and ASU will have graduated nearly 1,000 Starbucks partners from ASU Online. At present, nearly 7,000 partners are participating in the Starbucks College Achievement Plan.

The expansion to include a veteran’s spouse or child helps support Starbucks’ goal of hiring 10,000 veterans by 2018 and the ASU and Starbucks commitment to graduate 25,000 partners by 2025.
Arizona Technology Enterprises (AzTE) is the exclusive intellectual property management and technology transfer organization for Arizona State University. AzTE works with faculty, investors and industry partners to translate ASU innovation into broad societal impact.

In one year alone, ASU faculty worked with AzTE to submit 269 invention disclosures, launch 13 startup companies and issue 60 U.S. patents. AzTE also facilitated $16.7 million in industry-sponsored research. Since its formation in 2003, AzTE has received more than 2,500 invention disclosures from ASU researchers and executed more than 775 licenses and options.

To date, more than 100 startups have launched based on ASU innovations. These companies and their sublicensees have attracted more than $650 million in funding from venture capital firms and other investors. In FY 2016, ASU-linked startup companies, including Fluidic Energy, HealthTell, Heliae and Zero Mass Water, received more than $96 million in venture capital funding.

**Veteran entrepreneurship**

The ASU Venture Vets program supports entrepreneurial student, faculty and community veterans. Participating ventures are matched with startup mentors who provide regular, ongoing support. An online Venture Devils course and in-person Venture Development School provide the critical educational component to challenge and advance the venture development process.

“Research universities are one of the strongest assets America can use to compete in the age of innovation.”

(Milken Institute, 2017)