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
Detecting weapons and explosives
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 reexamining 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 2019, ASU researchers submitted $186 million in proposals to the DOD, received more than $50 million in award obligations and reached more than $36 million in DOD-funded research expenditures. According to the 2017 NSF HERD Survey, ASU ranks 44th in the nation for DOD-funded university research expenditures.

### National ranking in DOD-funded research expenditures

Data from FY 2017 National Science Foundation HERD Survey

<table>
<thead>
<tr>
<th>Institution</th>
<th>2017 rank</th>
<th>DOD expenditures</th>
</tr>
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<tbody>
<tr>
<td>Johns Hopkins University</td>
<td>1</td>
<td>$1,097,143,000</td>
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<tr>
<td>Princeton University</td>
<td>40</td>
<td>$30,085,000</td>
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<tr>
<td>Woods Hole Oceanographic Institution</td>
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<td>$29,637,000</td>
</tr>
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<td>North Carolina State University</td>
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<td>$28,753,000</td>
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<td>Yale University</td>
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<tr>
<td>Arizona State University</td>
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<td>Vanderbilt University</td>
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<td>University of Florida</td>
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<td>University of Alabama, Birmingham</td>
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<tr>
<td>University of Virginia, Charlottesville</td>
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<td>$25,008,000</td>
</tr>
<tr>
<td>Air Force Institute of Technology</td>
<td>50</td>
<td>$24,955,000</td>
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</table>
ASU offers numerous support services to more than 9,000 active duty members, veterans and their family members enrolled at the university.

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 postmilitary 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 military to academic life.

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 gap 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 diverse 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 and Military Spouse magazine nine 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 more than 29 years on active duty. His final Navy assignment brought him to Arizona, where he served as the original commanding officer and established the Naval Reserve Officers Training Corps at ASU in 2010.

Veteran success in the classroom

To enhance student veterans’ academic success, 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.

Music for veterans

ASU’s Music Therapy Clinic and the Phoenix chapter of Guitars for Vets teamed up in 2013 to train local area veterans. 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.

Awards and recognition

<table>
<thead>
<tr>
<th>Award</th>
<th>Rank</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Best for Vets Colleges 2019</td>
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<td>Best Online Bachelor’s Programs for Veterans</td>
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<tr>
<td>Military Friendly Silver Award 2019–20</td>
<td>#10</td>
<td>Top Colleges for Veterans</td>
</tr>
<tr>
<td>#3</td>
<td>Best Online MBA Programs for Veterans</td>
<td>#3</td>
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</table>
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, provides on-site counselors for veterans and family members using GI Bill benefits.

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 available 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.
Military families

ASU understands the important complexities surrounding military families. It is with this understanding that the T. Denny Sanford School of Social and Family Dynamics created the Working with Military Families Certificate. Students who complete the certificate program gain valuable insight into human development, marital and familial relationships, and family dynamics in the context of military culture.

Veterans, society and service

A new program from ASU’s College of Liberal Arts and Sciences is the Veterans, Society and Service Certificate. Created by ASU’s Office for Veteran and Military Academic Engagement, the program draws from history, politics, psychology, sociology, social justice and the arts to prepare students to understand, address and reduce the military-civilian divide. The certificate program prepares students to pursue research and transform society for and with veterans.

Transitioning veterans toward success

ASU continuously seeks opportunities with external partners to find pathways for student veteran success. One of the newest initiatives is the energetic hands-on CORE (Career Opportunity Redefinition and Exploration) Fundamentals workshop. Led by professional services company Deloitte, the workshop teaches student veterans, community servicemembers and local veterans how to find the right career fit by translating their leadership skills into a business context. Veterans learn to understand their individual strengths, target career opportunities based on their personal brand, network and succinctly communicate their story to potential employers.

Engaging veterans in energy research

Collaborating with the U.S. Navy, ASU LightWorks® 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.
**ASU leads in enrollment among military-friendly schools**

With more than 9,000 veterans, active duty and military family members served by the Pat Tillman Veterans Center, ASU is a top choice and leader in enrollment among the nation’s schools recognized as the most military-friendly.
ASU research excellence

ASU is one of the fastest-growing research enterprises in the U.S. among universities with more than $100 million in annual research expenditures.

ASU’s annual research growth 1997-2018
ASU’s Global Security Initiative (GSI) serves as a universitywide hub for addressing current and emerging security challenges, including how to leverage advances in data analytics, artificial intelligence and other technologies to improve national security, and how to combat borderless threats such as cyberattacks and disinformation.

GSI also serves as the university’s primary interface with the defense, intelligence and homeland security communities. More than 150 affiliated faculty members collaborate across disciplines to produce tools, technologies and systems that are impactful, timely and useful to policymakers and implementers.

Comprehensive cybersecurity

GSI’s Center for Cybersecurity and Digital Forensics (CDF) is forging powerful new capabilities by developing the next generation of cyber reasoning systems, which can automatically find vulnerabilities, synthesize exploits and create patches of real-world software. CDF is also taking a hands-on approach to building a new generation of talent — from deep technical experts to savvy organizational thinkers and cyber-intelligent policy architects. CDF faculty members are leaders in the competitive hacking space. Exposure to such events helps students develop the critical thinking and problem-solving skills necessary to identify vulnerabilities and find solutions.
Human-AI-robot teaming

No longer limited to science fiction, robots and autonomous agents now play a critical role in military operations, working physically and cognitively with humans. ASU stands at the forefront of research in this burgeoning field, gleaning lessons from teaming science to develop synthetic agents that enhance and complement human skill sets.

Improving homeland security operations

The Center for Accelerating Operational Efficiency (CAOE) develops and applies advanced analytical tools and technologies to enhance planning, information sharing and real-time decision-making in homeland security operations. Led by ASU, CAOE was established as a Center of Excellence by the Department of Homeland Security (DHS) Science and Technology Directorate. Research at CAOE helps the DHS improve efficiency and security at our national borders, ports and airports through better prediction and response to emergencies.

GSI’s Center for Human, Artificial Intelligence and Robot Teaming is developing and deploying tools and technologies on the composition, management, training and evaluation of heterogeneous teams of humans, AI and robots. Application areas include search and rescue missions, explosive ordnance detection and disposal, disaster response and other uses.
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**

Decision Theater (DT) is an enabling research tool for informed, data-driven decision-making. DT models, visualizes and simulates complex local, national and international issues and systems to provide decision-makers greater understanding and opportunities to forecast consequences before decisions are made.

DT’s expert staff combines team science and decision science with capabilities such as high-performance computing, data analytics, software development, real-time modeling, gaming and data visualization. Subject matter experts from the university and around the globe collaborate to address and convene influencers and decision-makers in an immersive, visualized environment. Remote sites, including ASU’s Decision Theater in Washington, D.C., foster expertise sharing.

**Benjamin C. Freakley, executive director**

Lt. Gen. Benjamin C. Freakley is the professor of practice of leadership for ASU and a special adviser to ASU President Michael M. Crow for leadership initiatives. Additionally, he serves at the McCain Institute for International Leadership. 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.
Flag Officer Advisory Council

Created in 2014, the council provides advice and perspective to President Michael M. Crow, faculty, staff and students on matters of national significance. Council members include retired military generals and admirals from the U.S. Army, Marine Corps, Navy, Air Force and Coast Guard.

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.

The McCain Institute for International Leadership

Inspired by the leadership of Sen. John McCain and his family’s legacy of public service, the McCain Institute implements programs and initiatives aimed at making a difference in people’s lives across a range of critical areas: leadership development, human rights, rule of law, national security, counterterrorism and combatting human trafficking.

Kurt Volker, executive director

Ambassador Kurt Volker is a leading expert in U.S. foreign and national security policy with some 30 years of experience in a variety of government, academic and private sector capacities. He is also a nonresident senior fellow at the Center for Transatlantic Relations at Johns Hopkins University’s School of Advanced International Studies, a senior adviser at the Atlantic Council and a trustee of IAU College in Aix-en-Provence, France. He is an international business consultant, a member of Capital Guardian Funds Trust board of directors and previously served as managing director, international, for BGR Group. Since July 2017, Volker has served as U.S. Special Representative to Ukraine.

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. The center convenes more than a dozen faculty, 15 research fellows, 140 affiliated ASU faculty and more than 30 affiliated New America experts. It connects ASU with policymakers and national media, organizes collaborative research projects, produces reports and publications, and designs and implements innovative educational programming, including the online Master of Arts in global security in the School of Politics and Global Studies.

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 seeks to help the U.S. move beyond the post-9/11 state of perpetual war through innovative research and analysis as well as creative and context-appropriate policy frameworks.
ASU researchers leverage unique biological signatures to detect and track weapons of mass destruction and their precursors, and to assess exposure to threats ranging from radiation to infectious diseases.

Tracking weapons with pollen

Pollen is literally everywhere and sticks to everything, making it an invaluable tool to use for tracking movement. With support from a DOD Multidisciplinary University Research Initiative grant, ASU researchers are using forensic palynology to improve the U.S. government’s ability to identify where and when weapons of mass destruction are moving. Led by ASU’s Center for Spatial Reasoning and Policy Analytics, the project cross-pollinates ideas and methods from the social, spatial, ecological and biological sciences to improve models of pollen diffusion and enhance accuracy in tracking objects of interest for the military and law enforcement.
Testing exposure through epigenetics

People’s environments can leave marks on their DNA that modify how genes are expressed. This is a process known as epigenetics. The changes can provide a record of what an individual has been exposed to, including biological agents, radiation, chemicals and explosives. Scientists at ASU’s Biodesign Institute are harnessing the power of epigenetics to develop a field-deployable, diagnostic device that will determine in 30 minutes or less if a person has been exposed to weapons of mass destruction or their precursors. Their work is supported by a DARPA grant award.

Rapid radiation assessment

Biomarkers that can provide an early warning for cancer, diabetes and other conditions are a core ASU technology. In partnership with Thermo Fisher Scientific’s Life Sciences Solutions Group, a five-year, $33-million BARDA-funded project is now commercializing technologies to rapidly assess radiation absorption in the event of a nuclear incident.

Immunosignatures help pinpoint disease

Biodesign Institute researchers led a multiyear $9 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. This technology, which is able to monitor personal health status and provide early detection of more than 50 diseases, is the platform for HealthTell, a spinout company.
ASU is a national leader in bringing expertise from the humanities, arts and social sciences to bear on a variety of societal challenges, including national security.

**Narrative, disinformation and strategic influence**

Is it possible to know whether areas are prone to conflict before violence starts? In today’s ambiguous environment of geopolitical tension, is it possible to perceive changes in adversary information tactics that might warn of an elevation from competition to conflict? This is at the heart of the “gray zone” problem.

ASU researchers in the Global Security Initiative and Center for Strategic Communication are looking for ways to see “the bubble before the boil.” They’re collaborating 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 transdisciplinary research and education on the dynamics of religion, conflict and peace with the aim of advancing knowledge, seeking solutions and informing policy.

Center researchers specialize in the study of culture and counter-extremism. With funding from the DOD, researchers developed a patented tool for tracking the influence and diffusion of online social movements. The center maintains an extensive network of international partners and field researchers to advance this work.

Mastering languages for global leadership

ASU’s DOD-funded Chinese Language Flagship Center incorporates the university’s language courses with specialized courses from other disciplines to educate undergraduates in a wide variety of topics such as history, politics, literature, religion, economics and culture. The program includes intensive summer study in the U.S., China and Taiwan, and a capstone year with enrollment in Nanjing University or National Taiwan University and an internship in China or Taiwan.

With support from DOD initiatives, ASU’s Melikian Center offers two distinctive summer programs in critical languages. Project Global Officer (Project GO) trains motivated ROTC cadets in Indonesian and Russian, including immersive overseas programs in Bali and the Kyrgyz Republic. The Startalk program introduces high school students to Russian. The center also supports Arizona National Guard’s State Partnership Program with Kazakhstan, providing cultural orientation for units participating in the annual Steppe Eagle exercise.
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 to promote early, mutual understanding. The academy answers our nation’s call for a new type of leader, a character-driven leader armed with the courage to cross sectors, connect networks and ignite action for the greater good.

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 U.S. 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.
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.

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- and security-related government agencies and companies, including:

- Arizona Department of Emergency and Military Affairs.
- BAE Systems Inc.
- Bechtel Marine Propulsion Corporation.
- Boeing.
- Federal Bureau of Investigation.
- General Dynamics Mission Systems.
- Johns Hopkins University, Johns Hopkins Applied Physics Laboratory LLC.
- L-3 Technologies.
- Lockheed Martin Corporation.
- Naval Submarine League.
- Northrop Grumman Corporation.
- Nova Technologies.
- Puget Sound Naval Shipyards and Intermediate Maintenance Facility.
- Raytheon.
- Raytheon, Space and Airborne Systems.
- Sierra Nevada Corporation.
- U.S. Department of Defense.
- U.S. Department of Energy Naval Nuclear Laboratory.
- U.S. Department of Justice.
- U.S. Department of State.
- U.S. Department of Veterans Affairs.
- U.S. Secret Service.
- Veterans Health Administration.
- Virginia Systems and Technology Inc.
The ASU and Starbucks partnership, launched in 2014, embodies the university’s charter mission to expand access to a high-quality education. The Starbucks College Achievement Plan offers partners (employees) 100% tuition coverage for the more than 80 undergraduate programs offered through ASU Online.

In November 2015, ASU and Starbucks expanded their innovative education partnership so that veterans who work for the coffee company can participate in the Starbucks College Achievement Plan and extend that benefit to a qualified family member.

Partners enrolled in the program have access to a dedicated enrollment coach, academic adviser and team of financial aid counselors to support them through graduation. As of August 2019, more than 12,000 Starbucks partners are currently participating in the Starbucks College Achievement Plan and more than 3,000 have graduated from ASU, toward the goal to graduate 25,000 partners by 2025.
Veteran entrepreneurship

Venture Vets invites members of the military community (active duty, reserve and veteran) and active duty military spouses to launch their ideas through ASU’s Venture Devils program. The program provides access to funding opportunities, mentoring from experienced entrepreneurs, venture development training and co-working spaces.

Applied R&D for defense industry

The ASU Research Enterprise (ASURE) is a nonprofit affiliate of ASU with the mission of driving academic innovations into both government missions and commercial markets. ASURE spans the boundaries of academic, public and private sectors and provides stakeholders with access to ASU’s vast intellectual resources. ASURE supports the national security sector with innovation challenges, dual-use startup acceleration, contract services, workforce development and secure infrastructure.

ASU is ranked top 10 among universities worldwide for U.S. patents issued. (National Academy of Inventors and Intellectual Property Owners Association)

Skysong Innovations is the exclusive intellectual property management and technology transfer organization for ASU. Skysong Innovations works with faculty, investors and industry partners to translate ASU innovation into broad societal impact.

In fiscal year 2019, ASU faculty worked with Skysong Innovations to submit 301 invention disclosures, launch 18 startup companies and secure 129 U.S. patents. Since its formation in 2003, Skysong Innovations has received more than 3,800 invention disclosures from ASU researchers and executed more than 1,100 licenses and options.

To date, more than 140 startups have launched based on ASU innovations. These companies have attracted more than $833 million in funding from venture capital firms and other investors.