# THE UNIVERSITY OF ARIZONA
# DEFENSE AND NATIONAL SECURITY
## PORTFOLIO BRIEF

## RESEARCH

**#20** Public research university

**418** total U.S. patents issued

**Top 20** Research, Arizona's Land Grant University, HSI, AAU, Carnegie R1

**#5** In physical sciences

**1,878** invention disclosures

World-class research enterprise with **$770M** in research activity

**#1** in astronomy and astrophysics

### HYPERSONICS

- Nationally unique combination of wind tunnels up to Mach 5 supporting industry, government, and academic research
- Recent $10M investment in high-speed wind tunnel infrastructure by DoD and the state of Arizona
- Unique capabilities in high temperature alloys, ceramics, manufacturing, and testing
- $6.5M in new funding from the University Consortium for Applied Hypersonics (UCAH)
- Newly established Arizona Research Center for Hypersonics (ARCH)

### DIRECTED ENERGY

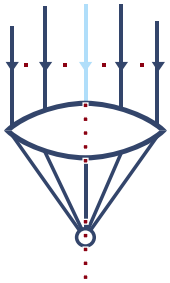
- Center for Directed Energy for test, evaluation, and workforce development for engineers trained in laser weapons
- Integration of hypersonics and directed energy and materials testing
- Use of existing high-energy lasers at 1 micron and fabrication of new high energy lasers at 2 micron
- USPL (ultrashort pulse lasers) as illuminators
- High-power counter-measure lasers for deflecting missiles

### FUTURE OF DATA/COMPUTING

- New Institute for the Future of Data and Computing, broad scope focus for wide range of existing activities
- Build infrastructure needed for research, including workforce, technology capabilities, and policies
- Application-inspired, fundamental research in the foundations of advanced computing and information sciences focused on exploration supporting virtuous cycles
- Opportunities: Immersive (human in the loop) technologies, information assurance, information protection

### QUANTUM NETWORKING

- The Center for Quantum Networks (CQN) is developing an error-corrected quantum network that can simultaneously connect multiple user groups at a rate of 10 Mqubits/sec over 100 km
- Networked quantum sensors that can detect fine differences in gravity waves and potentially permit observations underground or through the ocean, synchronized atomic clocks, and GPS-independent navigation
- Quantum methodology enables unconditional future-proof security of transmissions
- Quantum-secure LPD/LPI signal preventing detection of transmission by the quantum-enabled adversary



## PHOTONIC INTEGRATION

- Photonic Integer Circuits (PICs) for persistent battlefield communication
- Leverages advances in Photonic Integrated Circuits (PICs)
- SWAPc advantages and highly mobile
- Persistent PNT capability in GPS-Denied Environments


## CYBER

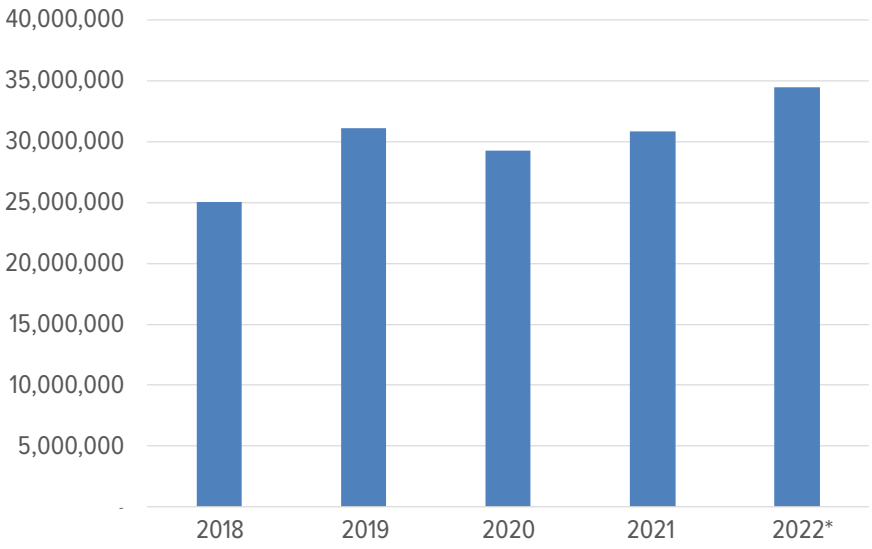
- Recognized in 2021 as the #1 online undergraduate degree by Academic Impressions
- One of only 24 NSA Centers of Academic Excellence in Cyber Operations (CAE-CO)
- Selected by DIA and Office of the Director of National Intelligence as their #1 Intelligence Center of Academic Excellence (IC CAE) program
- A founding University Champion for the Department of State's FAIT Fellowship program

## SPACE DOMAIN AWARENESS

- Air Force Research Laboratory's Space Vehicles Directorate awarded $7.5M to UArizona researchers for cislunar object tracking and identification project
- Space Domain Awareness Lab positively identified the presumed SpaceX Falcon 9 rocket booster that hit the moon March 4 was actually a Chinese booster from a rocket launch in 2014
- Provided observations to NASA's JPL to pinpoint the location of the booster's impact on the moon to be imaged and verified by NASA's Lunar Reconnaissance Orbiter
- Experts in visible wavelength spectral data (0.35-1.0 µm) identification of space objects
- Stood up Space Safety, Security, and Sustainability (S4) Center to support AFRL SVD and USSF requirements in Cis-Lunar
- Telescopic and laboratory spectral characterization of space materials
- Cyber infrastructure for big data

# DEFENSE RELATED RESEARCH EXPENDITURES

DOD HERD Expenditures FY18-22




* 2022 is preliminary

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THE UNIVERSITY OF ARIZONA
Research, Innovation & Impact