



COLLEGE OF ENGINEERING

Aerospace &  
Mechanical Engineering

AEROSPACE ENGINEERING GRADUATE STUDIES

*The sky is no limit*



Perform research in a unique combination of wind tunnels ranging from low speed to hypersonic, or Mach 5.

### HYPERSONIC CAPABILITIES

Faculty expertise in computations, experiments and theory related to hypersonic flight.

### RESEARCH FOCUS AREAS

- Dynamics and Control
- Fluid Dynamics
- Solid Mechanics
- Thermosciences

### DEGREES

- PhD Aerospace Engineering
- MS Aerospace Engineering
- ME Aerospace Systems

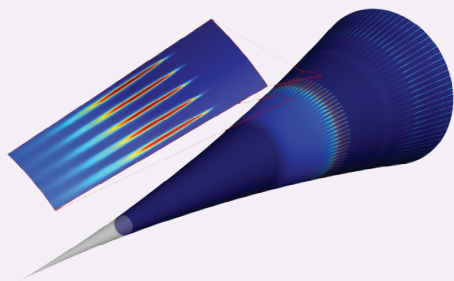
### PROGRAM RANKING

# 27

aerospace engineering  
graduate programs  
(U.S. News & World Report 2022)



“ This is a great opportunity for students to get hands on experience building a spacecraft and running a space mission. Everyone is so involved and gets to see every step of the way. ”  
- Tanner Campbell, PhD student



Boundary-layer transition simulation

FUNDING OPTIONS  
THROUGHOUT DEGREE  
LIFECYCLE

### APPLICATION DEADLINES

- Fall: January 1
- Spring: June 1

### CONTACTS

**Samy Missoum**, Associate Head of Graduate Studies  
smissoum@arizona.edu

**Eniko T. Enikov**, Director of Master of Engineering Program  
enikov@arizona.edu

**Stephanie Amado**, Coordinator, Graduate Programs  
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COLLEGE OF ENGINEERING

## Aerospace & Mechanical Engineering

“ Having these researchers, pillars in their fields, under the same roof gives our department an edge in being able to bridge gaps in knowledge and best prepare our faculty and students to solve problems. ”

- Alex Craig, assistant professor

### Faculty Expertise

**Majid Beidaghi** – beidaghi@arizona.edu

discovery and synthesis of advanced functional materials • energy storage materials and devices (batteries and supercapacitors) • synthesis and characterization of MXenes and other 2D materials • advanced manufacturing of energy storage devices, sensors, and membranes

**Eric A. Butcher** – ebutcher@arizona.edu

spacecraft GNC • astrodynamics • nonlinear dynamics, vibration and control • stability, control and estimation in periodic, delayed and fractional systems

**Cho Lik Chan** – cholik@arizona.edu

heat transfer • materials processing • boundary elements methods

**Stuart A. Craig** – sacraig@arizona.edu

aerodynamics • stability and laminar turbulent transition of supersonic and hypersonic boundary layers • experimental fluid mechanics • hydrodynamic stability

**Eniko T. Enikov** – enikov@arizona.edu

dynamics of charged particles and macro-ions • control of processes driven by electrostatic forces • neural-network-based self-learning methods for control of human-machine interfaces

**Hermann Fasel** – faselh@arizona.edu

computational fluid dynamics • hydrodynamic stability • laminar turbulent transition • turbulent flows • hypersonic flows • flow control • nonlinear dynamics • aerodynamics • UAVs • flight experiments • autonomous flight

**David Hahn** – dwhahn@arizona.edu

thermal sciences • laser-based diagnostics • renewable energy • combustion • biophotonics • laser-material interactions • plasma-material interactions

**Kyle Hanquist** – hanquist@arizona.edu

hypersonics • nonequilibrium flows • molecular gas dynamics • computational fluid dynamics • low-temperature plasmas • rarefied gas and optimization

**Qing Hao** – qinghao@arizona.edu

heat transport inside lithium-ion batteries • high-power electronics • thermal insulation materials • thermoelectrics • measurement and applications of graphene and other two-dimensional materials

**Kavan Hazeli** – hazeli@arizona.edu

materials design • human-centered design • mechanical behavior of materials • multi-functional materials • failure analysis • fatigue • thermo-mechanical properties • biomaterials design and characterization

**Jeffrey W. Jacobs** – jwjacobs@arizona.edu

experimental fluid dynamics • hydrodynamic instabilities, including Richtmyer Meshkov and Rayleigh-Taylor instabilities • turbulent mixing

**Daniel Larsson** – dlarsson@arizona.edu

autonomy • decision-making under uncertainty • path-planning • information-limited control • information-theoretic abstraction • representations for autonomous systems • artificial intelligence • optimization, inference and estimation

**Peiwen 'Perry' Li** – peiwen@arizona.edu

renewable energy • heat mass transfer in gas turbines and HVACR systems • electrolyzers • energy-water nexus • fuel cells • hydrogen storage and generation • energy and power systems

**Erdogan Madenci** – madenci@arizona.edu

prediction of deformation and failure modes in metallic and composite materials • characterization of mechanical properties of materials

**Farzad Mashayek** – mashayek@arizona.edu

turbulent reacting flow • plasma flow • electrostatic atomization • solid ion batteries • computational methods • machine learning applications

**Samy Missoom** – smissoom@arizona.edu

design optimization • probabilistic design, reliability and risk assessment • vibrations • advanced finite element modeling

**Bernard Parent** – bparent@arizona.edu

reactive flows • re-entry flows • plasma-assisted combustion • plasma-based fuel reforming • plasma aerodynamics • computational fluid dynamics • scramjets • lightning

**Hossein Rastgoftar** – hrastgoftar@arizona.edu

decision-making under uncertainty • human-robotic interaction • swarm robotics • system autonomy • UAS traffic management • intelligent transportation • formal specification and verification • finite-state abstraction of dynamical systems

**Sergey Shkarayev** – svs@arizona.edu

aerodynamics • fluid-structure interactions • unmanned aerial vehicles

**Jekan Thanga** – jekan@arizona.edu

space robotics • CubeSats and sensor-networks • machine learning applied to dynamics and control of swarms • small satellite propulsion • autonomous systems • power and thermal systems

**Xiaoyi Wu** – xwu@arizona.edu

tissue engineering • biomechanics • biomaterials and computational biomaterials

**Israel Wygnanski** – wygy@arizona.edu

aerodynamics related to fixed-wing and rotary aircraft • control of separation • high-lift devices • drag reduction • aeroacoustics, particularly jet noise, cavity noise and screech

**Vitaliy Yurkiv** – vyurkiv@arizona.edu

multi-physics modeling and machine learning calculation of energy storage and conversion technologies • ab-initio density functional theory calculations • phase-field modeling • thermal measurements of rechargeable batteries • thermal runaway assessment in electric vehicles

**Olesya Zhupanska** – oiz@arizona.edu

micromechanics of composites • structural composites in extreme environments • low velocity impact of composites • PDE-constrained optimization with applications to mechanics • contact mechanics

**Yitshak Zohar** – zohar@arizona.edu

biomicrofluidics and microscale manipulation of biospecies, such as proteins, cells and tissues in microfluid systems