



COLLEGE OF ENGINEERING



Mechanical and Aerospace Engineering

Our Graduate Programs provide advanced education and research opportunities in specializations from our signature areas of rocket propulsion and computational modeling of combustion and plasma dynamics to the emerging area of sustainable energy conversion and energy storage. With over 230 enrolled students, nearly half of whom are professionally employed at Redstone Arsenal, Marshall Space Flight Center, or Cummings Research Park, our graduate program is an integral part of the vibrant high-technology community of northern Alabama.



Degree Programs:

Master of Science in Engineering

- Mechanical Engineering

Master of Science

- Aerospace Systems Engineering

Doctor of Philosophy

- Mechanical Engineering
- Aerospace Systems Engineering

Research Labs & Affiliated Centers:

- Propulsion Research Center
- Adaptive Structures Laboratory
- Applied Aerodynamics & Flow Control Laboratory
- Autonomous Tracking Optical Measurement Laboratory (ATOM)
- Charger Advanced Propulsion and Power Laboratory (CAPP)
- Electrochemical Energy Diagnostics & Design Laboratory (EEDD)
- Plasma and Electrodynamics Research Laboratory (PERL)
- Transport, Reaction, and Energy Conversion Laboratory

Program Coordinators:

Aerospace Systems Engineering

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Mechanical Engineering

Dr. George Nelson
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MAE DEPARTMENT RESEARCH THRUSTS

Rocket Propulsion and Plasma Engineering:

R. FREDERICK, Professor and Director of the Propulsion Research Center: solid, liquid, and hybrid propulsion, combustion instability, missile design

J. CASSIBRY, Associate Professor: Fusion propulsion, pulsed electromagnetic plasma, accelerators, smoothed particle hydrodynamics

K. G. XU, Associate Professor: electric propulsion, plasma dynamics

Combustion and Turbulence Modeling:

K. FRENDI, Professor: computational fluid mechanics, acoustics, chemically reacting flows, supersonic and hypersonic turbulent flows

S. MAHALINGAM, Professor and Dean of the College of Engineering: direct and large-eddy simulations of turbulent combustion, wildland fire behavior

B. SHOTORBAN, Professor: direct and large-eddy simulations of multiphase flows, plasma dynamics, and wildland fires

S. RANI, Associate Professor: computational transport phenomena, combustion, radiative heat transfer

Unmanned Vehicles:

F. FAHIMI, Associate Professor: control theory and robotics applied to autonomous ground, marine, and aerial vehicles

C-K. KANG, Associate Professor: fluid-structure interactions, flapping-wing aerodynamics

K. KANISTRAS, Assistant Professor: active Flow Control, wing design, aircraft performance

N. ADURTHI, Assistant Professor: estimation, multi-sensor fusion, Control and coordination for multi-agent unmanned systems

Materials Engineering and Solid Mechanics:

J. SCHNEIDER, Professor: mechanical behavior and characterization of materials, polymeric composites, friction stir welding, additive manufacturing

M. LIN, Associate Professor: smart materials, actuators and sensors, health monitoring of composite material systems

G. WANG, Associate Professor: adaptive structures, structural dynamics and health monitoring

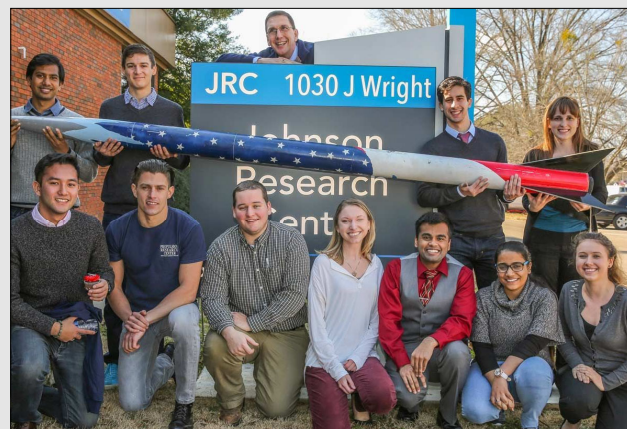
Energy Conversion, Transport, and Storage:

D. K. HOLLINGSWORTH, Professor and Department Chair: convective heat transfer, two-phase flows, liquid crystal thermography

P. LIGRANI, Professor and Eminent Scholar in Propulsion: gas turbine heat transfer, shock wave/boundary layer interaction, microfluidics

G. J. NELSON, Associate Professor: transport phenomena applied to electrochemical energy storage and conversion devices, energy systems modeling

G. ZHANG, Assistant Professor: transport phenomena and reaction kinetics in electrochemical energy systems, control strategies and system packaging



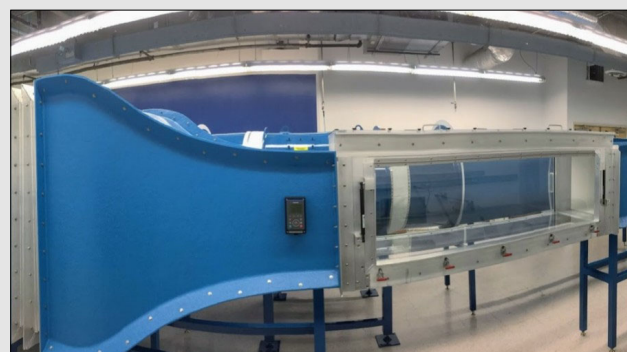
Propulsion Research Center



Charger Advanced Propulsion and Power Laboratory



Supersonic Wind Tunnel Laboratory



Closed-circuit subsonic wind tunnel



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