

# MECHANICAL & AEROSPACE ENGINEERING



## EXPLORE MAE at UAHuntsville

*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 NEARLY TWO-HUNDRED ENROLLED STUDENTS, OVER 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

- Mechanical Engineering
- Aerospace Systems Engineering

#### Doctor of Philosophy

- Mechanical Engineering
- Aerospace Systems Engineering

### Research Labs and Affiliated Centers:

- Propulsion Research Center
- Charger-1 Pulsed Fusion Power Lab
- Autonomous Tracking Optical Measurement (ATOM) Lab

### Distinctions:

- Assistant Professor Jeffrey Evans received the National Science Foundation Faculty Early Career Development (CAREER) Award in 2012.

### Partners:

- The Boeing Company
- Marshall Space Flight Center
- UAHuntsville Rotorcraft Systems Engineering and Simulation Center

**UAHuntsville MAE Department**  
**Dr. D. Keith Hollingsworth**  
**Professor and Chair**

301 Sparkman Drive  
 Technology Hall Room 274  
 256.824.6154 ph 256.824.6758 fax  
<http://www.uah.edu/eng/mae>

# 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: pulsed electromagnetic plasma thrusters, MHD modeling, smoothed particle hydrodynamics

**K. G. XU**, Assistant 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**, Assistant Professor: direct and large-eddy simulations of multi-phase flows, plasma dynamics, and wildland fires

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

## Unmanned Vehicles:

**D. B. LANDRUM**, Associate Professor: aerodynamics, propulsion, vehicle design

**N. SLEGRS**, Associate Professor: dynamical modeling and control theory applied to micro air vehicles and unmanned air vehicles

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

## Materials Engineering and Solid Mechanics:

**J. A. GILBERT**, Professor: experimental stress analysis, optical measurement techniques

**V. M. KARBHARI**, Professor and Provost: mechanics and manufacturing of composites, durability of composites and polymers

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

**K. ZUO**, Associate Professor: physics-based constitutive modeling of the response of materials and structures to high-rate loading

**J. L. EVANS**, Assistant Professor: mechanical behavior of high-temperature materials, fatigue and fracture mechanics, corrosion and oxidation behavior

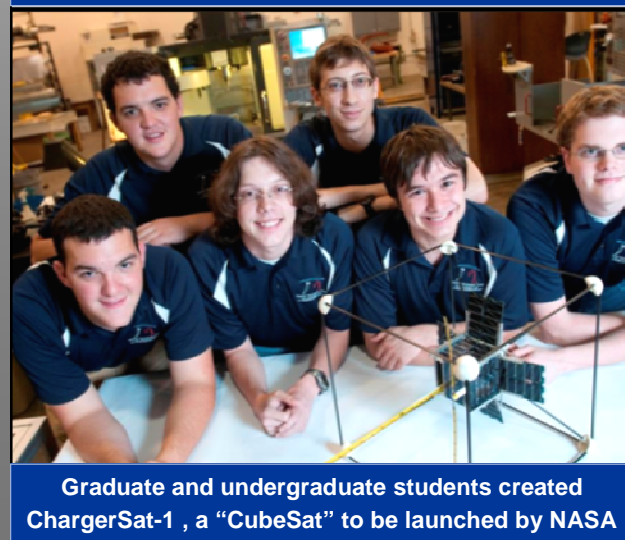
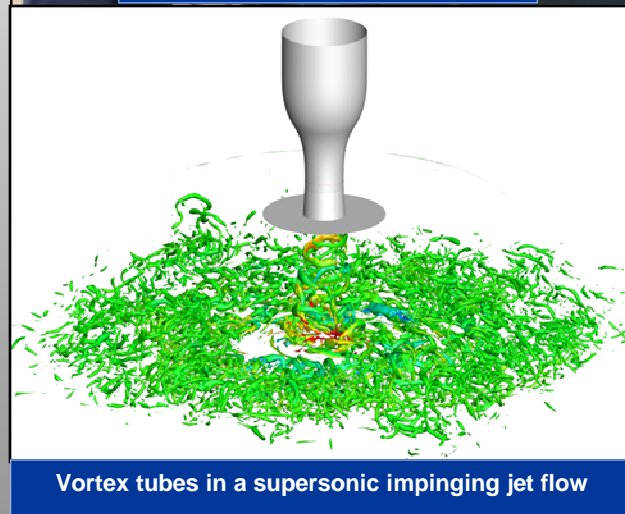
**G. WANG**, Assistant Professor: adaptive structures, structural dynamics and health monitoring

## Energy Conversion, Transport, and Storage:

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

**F. C. WESSLING**, Professor: heat transfer and energy conversion, design of apparatus for use in microgravity, rocketry

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



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