

Propulsion & Combustion

The School of Aerospace Engineering at Georgia Tech understands that the improvement propulsion and energy systems is a major challenge for engineers, both today and in the future. The School trains next-generation researchers to tackle these issues, offering world-class research and academic programs in propulsion and combustion.

The AE Propulsion and Combustion (PC) group focuses on the interplay between complex fluid dynamics and high-temperature chemical and plasma energy conversion processes that underpin propulsion and energy systems. PC research includes aircraft turbine engines and augmenters, scramjets, chemical rockets, in-space electric propulsion systems, ground power gas turbines, thermal processing, energetics and explosions.

AE grad students learn in one of the most productive and well-respected combustion and in-space electric propulsion research programs in the world. Working closely with a faculty adviser, research engineers and other students, AE grad students tackle multidisciplinary problems sponsored by industry and government agencies. The PC faculty includes experts in unsteady combustion and combustion instability, combustion control, electric propulsion, plasmas, development and application of advanced diagnostic and sensor technology, and computational modeling and simulation approaches. Along with traditional goals such as improving thrust or efficiency, students focus on issues related to emissions, robustness and reliability. For example, a key challenge in combustion is developing

systems compatible with the current energy and propulsion infrastructure that still allow for reduced net carbon emissions. Similarly, our development of efficient high-power thrusters can revolutionize in-space electric propulsion applications. For computational modeling, tools are being developed to exploit both current petaflop and future exaflop resources to simulate full-scale engines and meet the challenges of Big Data processing. Research in propulsion and combustion at Tech involves close collaboration between these computational and experimental efforts.

At GT-AE students have access to state-of-the-art facilities and instrumentation that are not available at other university labs. The School's extensive experimental combustion facilities include sophisticated, high-pressure and high-temperature systems, which allow students to work on systems ranging from table-top experiments to full-scale burners. Students also work with state-of-the-art instrumentation like high-speed laser imaging systems capable of resolving real-time flow variations. The School has two vacuum test facilities to support experiments in high-power plasma propulsion and plasma physics at pressures, flow rates and powers relevant to full-scale devices. Students working in these facilities work with a wide range of diagnostics, including probes and optical methods. For full-scale simulations, students have access to supercomputing facilities at the School that can sustain more than 25 Teraflops at peak performance level.





Faculty



Krishan Ahuja
Regents Professor
krishan.ahuja@gtri.gatech.edu



Suresh Menon
Hightower Professor
suresh.menon@ae.gatech.edu



Mitchell Walker
Associate Professor
mitchell.walker@ae.gatech.edu



Jeff Jagoda
Professor
jeff.jagoda@ae.gatech.edu



Jerry Seitzman
Professor
jerry.seitzman@ae.gatech.edu



Vigor Yang
William R. T. Oakes Professor
vigor@ae.gatech.edu



Tim Lieuwen
Professor
tim.lieuwen@ae.gatech.edu



Wenting Sun
Assistant Professor
wenting.sun@ae.gatech.edu



Ben Zinn
Regents Professor, *retired*
zinn@ae.gatech.edu

Find out more: www.ae.gatech.edu/directory/faculty

Georgia Tech  **School of Aerospace Engineering**

www.ae.gatech.edu □ info@ae.gatech.edu
404.894.6046