Distinguished Faculty

Sushil Atreya, Fellow, American Association for the Advancement of Science; Academician, International Academy of Astronautics

Stephen Bougher, Andrew F. Nagy Collegiate Research Professor

Michael Combi, Distinguished University Research Professor

R. Paul Drake, Henry S. Carhart Collegiate Professor of Space Physics; Fellow, American Physical Society

Lennard A. Fisk, Thomas M. Donahue Distinguished University Professor of Space Science; Former Chair, NAS Space Studies Board; Member, National Academy of Sciences; National Associate, National Research Council; Fellow, American Geophysical Union; Electe Member, International Academy of Astronautics; UM-CoE Award Attwood Excellence in Engineering; Henry Russel Lecturer

George M. Gloeckler, Member, National Academy of Sciences; Fellow, American Geophysical Union; Fellow, American Physical Society; Member, American Association for the Advancement of Science; Elected Member, International Academy of Astronautics

Tamas I. Gombosi, Rollin M. Gerstacker Professor of Engineering; Fellow, American Geophysical Union; Elected Member, International Academy of Astronautics; UM-CoE Award Attwood Excellence in Engineering; Inaugural Recipient, American Geophysical Union Space Weather Prize

Christiane Jablonowski, Recipient, Department of Energy Early Career Award

Margaret Kivelson, Member, National Academy of Sciences; Member, American Academy of Arts and Sciences; Fellow, American Geophysical Union; Recipient, European Geophysical Union Alfvén Medal; Recipient, American Geophysical Union Fleming Medal

Janet Kozyra, George Carignan Collegiate Research Professor; Fellow, American Geophysical Union

Mark Moldwin, Recipient, National Science Foundation CAREER Award

Andrew Nagy, Fellow, American Geophysical Union; Elected Member, International Academy of Astronautics; UM-CoE Award Attwood Excellence in Engineering.

Joyce Penner, Ralph J. Cicerone Distinguished University Professor of Atmospheric Sciences; Fellow, American Geophysical Union; Contributor, UN Intergovernmental Panel on Climate Change; Co-recipient, ’07 Nobel Peace Prize

Richard Rood, Fellow, American Meteorological Society; Recipient, World Meteorological Organization Norbert Gerbier-Mumm International Award

Christopher Ruf, Fellow, Institute of Electrical and Electronics Engineers; Recipient, IEEE Resnick Field Award

Perry Samson, Arthur Thurnau Professor; Recipient, Teaching Innovation Prize; Michigan Distinguished Professor of the Year

Allison Steiner, Recipient, National Science Foundation CAREER Award; Recipient, Henry Russel Award

Thomas Zurbuchen, Recipient, Presidential Early Career for Scientists & Engineers Award; Member, NRC Space Studies Board

Research Areas

Atmospheric Science Research Areas

Atmosphere – Biosphere Interactions
Atmospheric Chemistry, Aerosols & Air Quality
Atmospheric Dynamics
Climate, Climate Modeling & Climate Change
Clouds & Precipitation
Paleoclimate, Ice Dynamics

Atmospheric & Space Science Research Areas

Numerical Methods & Scientific Computing
Planetary Atmospheres
Statistical Methods & Data Assimilation
Radiative Transfer, Remote Sensing & Instrumentation

Space Science Research Areas

High Energy Density Physics/Laboratory Astrophysics
MagnetoSpheric & IOnosphere/Thermospheric Physics
Planetary Magnetospheres
Solar & Heliospheric Physics
Space Weather
Aeronomy

For Faculty involved in these research areas: http://aoss.engin.umich.edu/pages/research
**Program Description**

In our increasingly technical world, master’s degrees are becoming the minimum accepted level of education in industry. The AOSS SGUS program offers breadth, depth and hands-on experience in the area you select and optimizes your career opportunities. The SGUS program can open doors that a BSE degree alone cannot.

SGUS students are allowed to “double count” nine credit hours for the two degrees, bachelor’s and MEng. Each degree is awarded upon completion of the requirements. A total of 128 total credits are required for the BSE and 31 credits are required for the MEng degree. Please be sure to speak with an advisor as early as possible.

Students typically enter the SGUS program by provisional enrollment in the junior year. Once you are within six credit hours of completing the required undergraduate degree, you must officially enroll in the AOSS MEng program for a minimum of two full terms, normally the last two semesters, and pay full graduate tuition for these two terms.

Developed with Aerospace Engineering and Electrical Engineering and Computer Science, the AOSS Space Engineering SGUS program teaches the systems approach to conceiving, designing, managing and operating complex space systems and provides you with practical experience in space system design, project development and management — the very combination of knowledge and skills that the space industry is looking for when hiring new graduates.

Please note: You must be a current University of Michigan student to be admitted into the SGUS program.

**Program Objectives**

- To provide a comprehensive knowledge of space science and engineering and their interrelationship.
- To increase depth beyond the baccalaureate level in a space-related discipline.
- To teach the systems approach to conceiving, designing, manufacturing, managing, and operating complex space systems.
- To provide practical experience in space system design, project development and management.

**Sample Areas of Concentration**

While your specific concentration curriculum will be decided through discussion with your program advisor suggested programs have been developed. You will need a minimum of 31 credits for graduation.

- Space Science Concentration Program
- Propulsion Concentration Program
- Plasma Electrodynamics & Sensors
- Instrumentation & Sensor Payloads
- Launch Vehicles
- Telemetry & Spacecraft Communication
- Astrodynamics
- Computer Control & Data Handling

**Program Advisor**

Prof. Nilton Renno
nrenno@umich.edu

**AOSS Partners in Research and Education (select list)**

- Aerospace Corporation
- Air Force Research Laboratory
- Boeing Corporation
- Environment Canada
- European Space Agency
- Goddard Space Flight Center
- Great Lakes Environmental Research Laboratory
- Jet Propulsion Laboratory
- Johns Hopkins Applied Physics
- Johnson Space Center
- Lawrence Livermore National Laboratory
- Lockheed Martin
- Los Alamos National Laboratory
- Marshall Space Flight Center
- Michigan Department of Environmental Quality
- Michigan Department of Natural Resources
- NASA
- National Solar Observatory
- National Center for Atmospheric Research
- NOAA
- Northrup Grumman
- NSF
- Rice University
- Space Physics Research Laboratory
- Stanford University
- UC-San Diego
- University of Arizona
- University of New Hampshire
- US Department of Defense
- US EPA

“As an MEng student in AOSS, I’m managing the development of Michigan’s first nanosatellite, which includes managing both student teams at U-M and a professional engineering team in California and corresponding directly with NASA — all as a student!”