**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. Cartier Collegiate Professor of Space Physics; Fellow, American Physical Society
- **Lennard A. Fisk**, Thomas M. Donohue 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; Elected 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, NASA 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/Thermosphere Physics
- Planetary Magnetospheres
- Solar & Heliospheric Physics
- Space Weather
- Aeronomy

For Faculty involved in these research areas: [http://aoss.engin.umich.edu/pages/research](http://aoss.engin.umich.edu/pages/research)

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**Master of Engineering**

**Space Engineering**

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**Atmospheric, Oceanic and Space Sciences**

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- Space Research Building
- 2455 Hayward Street
- Ann Arbor, MI 48109-2143
- [aoss_um@umich.edu](mailto:aoss_um@umich.edu)

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- Mark J. Bernstein, Ann Arbor
- Denise Ich, Birchway Farms
- Julia Connover Darlow, Ann Arbor
- Andrea Fischer Newman, Ann Arbor
- Laurence G. Delich, Birchway Farms
- Andrea C. Kohler, Graceville Farms
- Shauna Ryder Ogles, Gross Private
- Katherine E. White, Ann Arbor
- Mark Schielein, ex officio

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**Program Description**

The successful integration of the scientific, engineering, and management considerations in space systems requires highly capable professionals. In particular, managers at all levels must have a broad interdisciplinary background: they must be able to see branches, trees, and the entire forest at the same time.

The A OSS MEng program in Space Engineering combines strong emphasis on both theoretical and applied aspects with extensive hands-on experience at all levels. Designed to provide a broad interdisciplinary education in the scientific, engineering and management aspects of complex space systems, the program enhances disciplinary skills and provides insight and education in the systems engineering and management area.

If you are interested in studying the scientific, engineering and management aspects of space engineering, this program, developed with Aerospace Engineering and Electrical Engineering and Computer Science, allows you to structure the program to your specific area of interest. Suggested programs have been developed to assist you in designing your program.

There are three levels of courses required of AOSS graduate students:

- **Departmental Core Courses**: Required of all AOSS graduate students.
- **Program Core Courses**: Required courses in the program or concentration of your choice.
- **Further courses relevant to research**: A minimum of three AOSS courses plus other non-AOSS courses that are worthwhile and support your area of research.

**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

**The Michigan Difference**

At the University of Michigan College of Engineering, students and researchers apply technology to shape the future. Empowered with knowledge and inspired by a tradition of accomplishment across disciplines, Michigan Engineers excel at solving the world’s most challenging problems. The College of Engineering is consistently ranked among the best engineering schools internationally for education and research. Michigan Engineering has become a favorite school for companies seeking well-rounded people who can solve problems, lead teams and apply their knowledge creatively across functional boundaries.

Continuing to define the great public university, the University of Michigan offers an unrivaled combination of history, resources and people in a collaborative and intellectually challenging environment. Home to 19 colleges, schools and divisions, all ranking among the top in their fields, Michigan thrives on the phenomenal intellectual scope of its scholars.

As an AOSS student, you’ll enjoy all of the resources and support of a world-class research institute, the University of Michigan.

**Program Advisor**

Prof. Nilton Renno
nrenno@umich.edu

“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!”