GRADUATE PROGRAMS
SPACE STUDIES
TO OUR PROSPECTIVE STUDENTS

As the first program of its kind in the world, the UND Master of Science degree in Space Studies is a unique and valuable educational experience, both for those seeking to enter this exciting field and for the aerospace professionals who wish to expend their breadth of knowledge. The program features internationally and nationally recognized faculty with degrees in planetary science, engineering, history, policy and law. The six full-time Ph.D.-level faculty have over 160 years of combined teaching and active research experience. Space Studies also includes Adjunct Professors, experts in their own fields drawn from across the country, who contribute to teaching specialized topics. We have nurtured success for over 30 years, as indicated by the JSC Certificate of Appreciation for 25 years of outstanding leadership in university education in space studies, presented by NASA Johnson Space Center. Faculty and students produce publications in their diverse fields of expertise and maintain an outstanding record of service to the space community and the nation. Space Studies is home to the only analogue planetary surface habitat in the United States, and has a fully-operational, multi-instrument observatory conducting a wide variety of astronomical research. Our graduates have found professional success throughout the space industry, to include NASA and other federal agencies, academia, science museums, planetariums, and aerospace companies, both large and small.

Welcome to UND Space Studies.
SPACE STUDIES
MASTER OF SCIENCE

The department of Space Studies was the first to offer a first multi-disciplinary space education at the graduate level. The M.S. program combines planetary science, space engineering, and life support systems as well as space-related aspects of policy and law, history, business and management. Students are required to take courses across this wide range of disciplines to meet the breadth of knowledge required for leadership positions in the space industry.

• Online/ Campus Programs
• Thesis/ Non-thesis Options

Admission Requirements:
• 3.0 Bachelor’s GPA
• Transcripts
• Statement of Purpose
• Letters of Recommendation
• Pre-requisite Coursework
• ESL applicants must submit English Proficiency scores
AEROSPACE SCIENCES

DOCTOR OF PHILOSOPHY

The department of Aviation and Space Studies jointly offer a Ph.D. in Aerospace Sciences. The mission of the Aerospace Sciences Ph.D. program is to provide interdisciplinary teaching and research at the highest academic level. The program’s goal is to provide highly educated scholars and leaders with the skills necessary to mix technology and science with an understanding of the politics and economics of the aerospace fields. The program is taught in a synchronous online learning environment. The program accepts students every fall with an application deadline of February 1st.

Admission Requirements:
• 3.25/4.00 Masters GPA and GRE score
• GRE scores
• Transcripts
• ESL applicants must submit English Proficiency scores
• Professional Resume or Curriculum Vitae
• Statement of Purpose
The Human Spaceflight Laboratory, under the leadership of Dr. Pablo de León, provides relevant, real-world experience in human spaceflight systems. Students receive hands-on training through graduate/undergraduate research positions, NASA projects, and activities related to human spaceflight.

The main focus of research is the design and production of space suits and planetary habitat prototypes. UND is the first university with a NASA-funded laboratory dedicated to designing and constructing space-exploration and planetary surface exploration suits. The first suit, the North Dakota Experimental-1 (NDX-1), was designed for use on the surface of Mars. The second suit, the North Dakota Experimental-2 (NDX-2) suit, was designed for testing in lunar simulations.

Recent efforts also involve the design, construction, and testing of an Inflatable Lunar/Mars Habitat concept demonstrator, the Inflatable Lunar/Mars Analog Habitat (ILMAH), Pressurized Electric Rover (PER) and four dedicated science modules. The ILMAH is used to perform analog missions, routinely testing systems, experiments, and protocols that will be needed in the near future as NASA and commercial providers venture into deep space.
The UND Space Studies Observatory, under the direction of Dr. Sherry Fieber-Beyer offers diverse observing-based research opportunities in the fields of planetary science and astrophysics.

UND Space Studies Observatory’s primary objectives include:

- Maintaining and operating a multi-telescope, multi-wavelength facility for the conduct of research and education projects
- Conducting complementary research projects that assist research programs at national observatories
- Offering research and educational opportunities for astrometry, photometry, spectroscopy, and astrophotography.
- Promoting science, technology, engineering, and mathematics (STEM) education in North Dakota’s colleges and K-12 schools.

Current and expanding astronomy research efforts in North Dakota include asteroid near-infrared (NIR) spectroscopic research, broadband asteroid and variable star photometry, asteroid astrometry, visible wavelength stellar spectroscopy, exoplanet transits, and astrophotography. Through partnership with the North Dakota Space Grant Consortium (NDSGC) and the North Dakota NASA EPSCoR programs, the UND Space Studies Observatory promotes a primary Research Focus Area (RFA) in North Dakota, which is to increase and expand astronomical and planetary science research in the state.
AREAS OF RESEARCH

Asteroids, and Early Solar System History
Asteroids, Space Resources and Hazards
Astronomy, Photometry & Visible Wavelength Spectroscopy
Characterization of Near-Earth Asteroids
Educational Initiatives in Space-Related STEM Fields
Extravehicular Activity Systems
High Altitude Balloon Payload Development
High Reliability Organizations

Human Performance in Extreme Environments
Human Space Flight
International and Domestic Space Law
Limits for Plant Physiology in Space
Near-Earth Plant Physiology in Space
Near-Earth Object Mission Design
Near-IR Reflectance Spectroscopy of Main-Belt Asteroids
Orbital Mechanics
Planetary Habitats

Planetary Industrial Sites
Remote Sensing Law and Regulations
Search for Meteorite Parent Bodies
Small Spacecraft Development
Space History and Space Policy
Space Politics
Spacesuit Design
Spacecraft Design
Spacecraft Simulators
FACILITIES

Our facilities include lab space for the investigation of terrestrial rocks and meteorites, planetary reflectance spectral data, research into life support technologies and human factors in space, and an astronomical observatory. The observatory currently includes three remotely-controllable optical telescopes (two 16-inch and one 10-inch aperture) which can acquire astrometric, photometric, and spectroscopic data for planetary and stellar sources. Space Studies is also home to the Human Spaceflight Laboratory, the Spacecraft Simulator Facility that features both a vertical and a horizontal space simulator, and the Inflatable Lunar-Mars Analog Habitat (ILMAH).
ANNUAL STATS

8
NASA internships funded each summer

> 7,000
community members reached through outreach events

>300
K-12 educator participants in professional development

9
student research fellowships awarded

96%
of NDSCG funded students pursue a STEM career or higher degree

$103,000
in scholarships awarded
NORTH DAKOTA
SPACE GRANT & NASA EPSCoR

The North Dakota Space Grant Consortium (NDSGC) and North Dakota NASA EPSCoR (Established Program to Stimulate Competitive Research) are NASA programs affiliated with the Department of Space Studies at UND. These programs provide and support opportunities for students and faculty across the state to pursue research and participate in educational programming in STEM fields. The NDSGC has 18 affiliate institutions including public colleges, Tribal colleges, research universities, and informal education institutions. ND NASA EPSCoR is also affiliated with these postsecondary institutions.

NDSGC

The NDSGC competitively awards funding for students to participate in NASA internships each summer. The NDSGC also offers funding for industry internships in STEM or NASA-relevant fields. Students may apply for research funding each semester (fellowships and graduate assistantships), to complete a project under a faculty mentor, while enrolled in courses. Students may also be eligible to apply to one of the NDSGC’s scholarship opportunities.

Students may also participate as STEM Ambassadors, conducting outreach events in both informal and K-12 settings, across the state, inspiring the next generation to enter the STEM workforce. Travel grants are available to students presenting their research at conferences or attending professional development workshops in their field of study.

Student competition teams are also supported by the NDSGC (NASA Robotics Mining, FSAE Racecar, AIAA Design/Build/Fly, etc.). The NDSGC has a robust high altitude ballooning program that completes research at the college level as well as K-12 outreach initiatives. The NDSGC also participate actively in educator professional development for K-12 teachers across the state.

More information on each of these opportunities can be found at ndspacegrant.und.edu

ND NASA EPSCoR

ND NASA EPSCoR competitively awards research grants to faculty across ND. Research areas include topics such as: human space exploration, spacecraft structures, and atmospheric and earth sciences. ND faculty and students have been able to make lasting connections across the country with both industry partners and NASA centers through ND NASA EPSCoR. Funding opportunities include seed grants under Research Infrastructure Development (RID) awards as well as Cooperative Agreement Notice (CAN) awards.

More information on each of these opportunities can be found at ndnasaepscor.und.edu
SPACE STUDIES

GRADUATE FACULTY

The Department of Space Studies is a three-time recipient of the UND Foundation McDermott Award for Departmental Excellence in Teaching. The Space Studies faculty has included two Chester Fritz Distinguished Professors. Faculty have won awards for excellence in research, advising, and contributions at university and national levels.

PROFESSOR
DEPARTMENT CHAIR
DIRECTOR ND SPACE GRANT CONSORTIUM
DIRECTOR ND NASA EPSCOR

DR. JAMES CASLER

Ph.D., 2000, Engineering, North Dakota State University
M.S., 1977, Aeronautical Systems, University of West Florida
M.B.A., 2006, Florida Institute of Technology
B.S., 1970, Engineering Physics, South Dakota State University

RESEARCH INTERESTS: Management of Space Enterprises; Risk Management; Planetary Industrial Operations; High Reliability Organizations; and Performance in Isolated and Confined Environments.

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PROFESSOR
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RESEARCH INTERESTS: Human Space Flight; Space Suit Design; Spacecraft Design; EVA Systems; History of the Space Age; Experimental Rocketry; History of Latin American Space programs; and Commercial Space Flight.

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ASSISTANT PROFESSOR
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ASSOCIATE PROFESSOR
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Ph.D. 2006, Planetary Sciences, University of Arizona

M.S. 1996, Mathematics, University of North Dakota

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RESEARCH INTERESTS: Small Spacecraft Development; Orbital Mechanics; Near-Earth Object Mission Design; High-Altitude Balloon and Sounding Rocket Payload Development; Space Communications and Ground Station Operations; Asteroid and Comet Spectroscopy.

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RESEARCH ASSISTANT PROFESSOR
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Ph.D. 2010, Earth System Science and Policy, University of North Dakota

M.S. 2006, Physics, University of North Dakota

B.S. 2003, Physics & Astronomy, Minnesota State University-Moorhead

RESEARCH INTERESTS: Photometry; VNIR spectroscopy; Asteroids; Comets; Meteorites; and Small-body mineralogy/petrology.

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CHESTER FRITZ DISTINGUISHED PROFESSOR

DR. MICHAEL GAFFEY


M.S. 1970 Geology, University of Iowa

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RESEARCH INTERESTS: Planetary Geology; Asteroids and Meteorites; Telescopic Observations / Spectroscopy; Early History of the Solar System; Space Resources; Origin of Life on Earth; Dinosaurs; and Impacts and Extinctions.

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“I’m a space launch vehicle engineer working in the Aerospace sector. While I have a strong foundation of the technical engineering fundamentals that go into my day-to-day job, I realized I lacked a breadth in the whole picture of a space campaign. I’ve been pretty excited in my Space Studies curriculum, it’s been opening up my perspective and allowing me to branch into other areas within my career field.”

JULIAN MARTINEZ | ORCUTT, CALIFORNIA