

A woman wearing a white space suit is suspended in the air by a harness and cables. She is looking towards the camera. Two men are standing in front of her, one on the left and one on the right, both looking at her. The setting appears to be a laboratory or a training facility with a red and black color scheme and various equipment.

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 eight 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.

Pablo de León
Department Chair, Space Studies

SPACE STUDIES

GRADUATE PROGRAMS

First and global leader in interdisciplinary graduate studies

Master of Science (M.S.)

The department of Space Studies was the first to offer a 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:

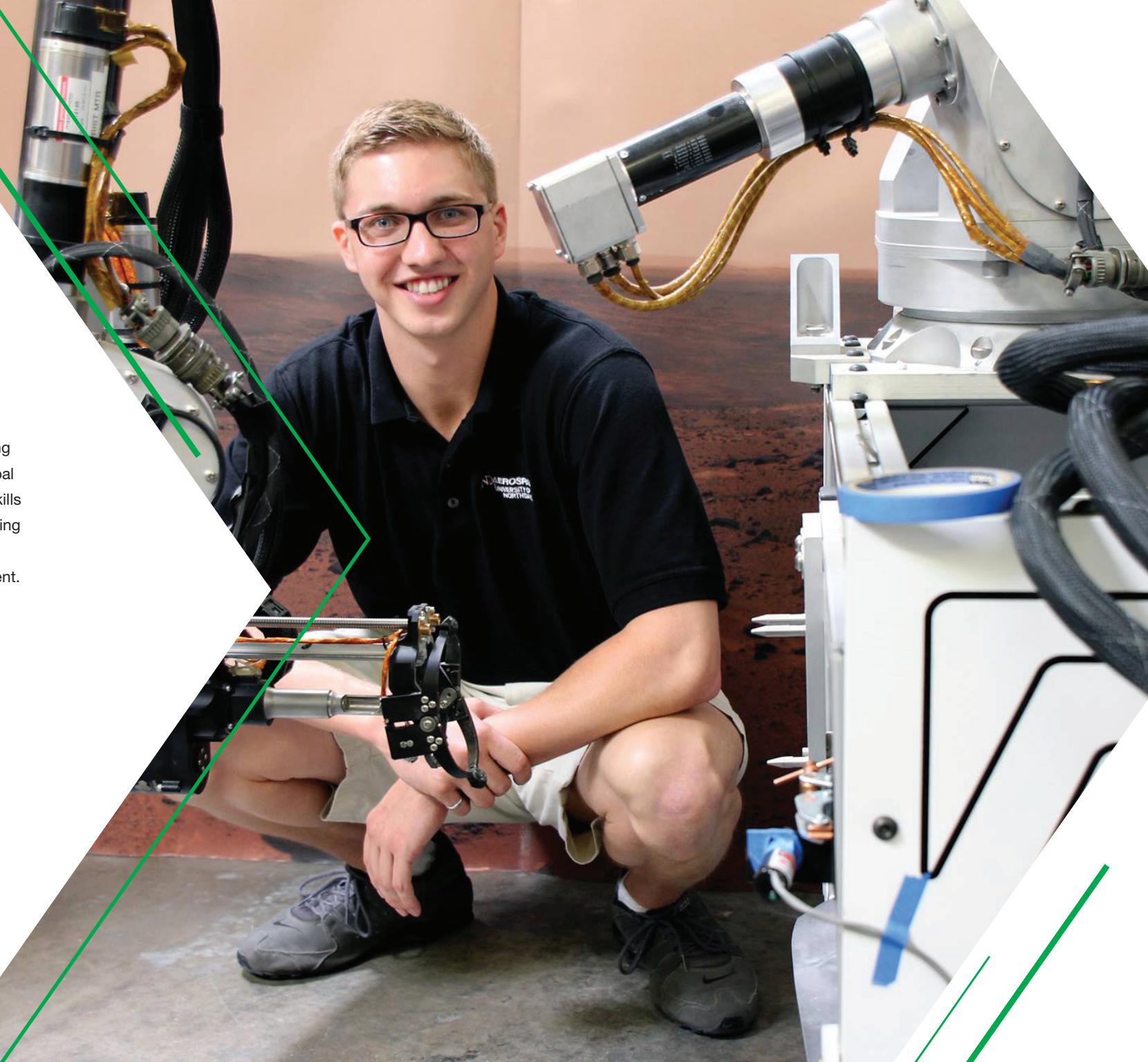
- 3.0 Bachelor's GPA
- Transcripts
- Statement of Purpose
- Letters of Recommendation
- Pre-Requisite Coursework
- ESL applicants must submit English Proficiency scores

Doctor of Philosophy (PH.D.)

The departments 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:

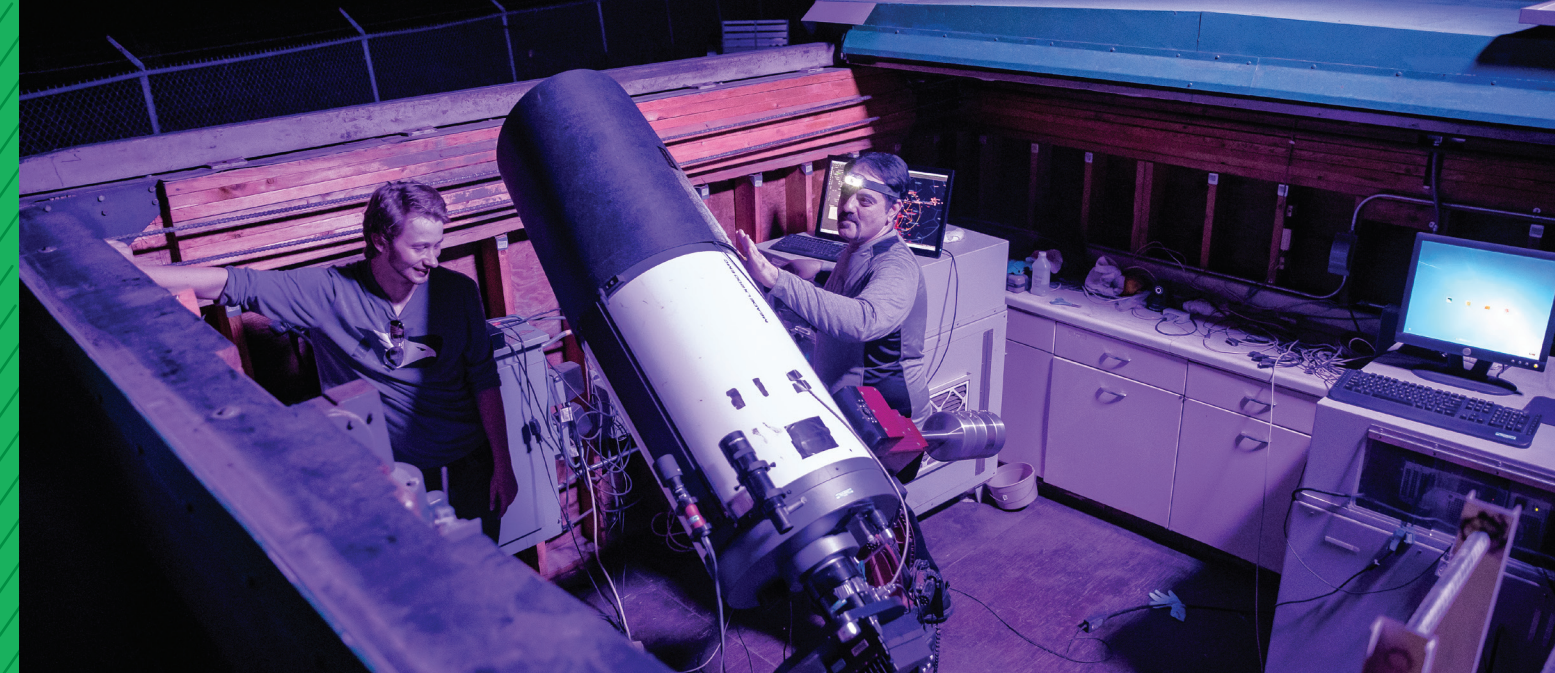
- 3.25/4.00 Masters GPA and GRE score
- GRE scores
- Transcripts
- ESL applicants must submit English Proficiency scores
- Professional Resume or Curriculum Vitae
- Statement of Purpose
- Letters of Recommendation
- Industry Experience Preferred



WHAT WE OFFER

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 focused on spacesuit design and construction, the Spacecraft Simulator Facility that features both a vertical and a horizontal space simulator, the Inflatable Lunar-Mars Analog Habitat (ILMAH) and a new Space Propulsion Lab.



Observatory

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.

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.

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.



Human Spaceflight Laboratory

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 Human Spaceflight Laboratory is funded through NASA to develop new manufacturing solutions for future space suits. Using 3D printing technologies we are designing and manufacturing prototypes for the space explorers of tomorrow.

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
- Human Centered Design
- Human Performance in Extreme Environments
- Human Space Flight
- International and Domestic Space Law
- Space Agriculture
- Space Nutrition
- Near-Earth Object Mission Design
- Near-IR Reflectance Spectroscopy of Main-Belt Asteroids
- Neutral Buoyancy Micro/Variable Gravity Simulation
- Orbital Mechanics
- Planetary Habitats
- 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





ANNUAL STATS

8

NASA internships funded each summer

< 7,000

community members reached through outreach events

> 300

K-12 educator participants in professional development

96%

of NDSGC-funded students pursue a STEM career or higher degree

9

student research fellowships awarded

\$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 year. 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. The NDSGC also offers the fellowship bridge program, a flexible entry-level research program, designed to introduce student transfers into the research in their new program. Scholarship opportunities are also available. Students may also participate as STEM Ambassadors, conducting engagement 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 with research initiatives at both the college and K-12 levels. The NDSGC also actively conducts 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



Department Chair | Professor | Human Spaceflight Laboratory Director

DR. PABLO DE LEÓN

Ph.D. 2013 History (of Science and Technology) University of San Andres, Buenos Aires, Argentina

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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Associate Professor | Director of Graduate Studies

MICHAEL DODGE, J.D., LL.M.

LL.M. 2011, McGill University

RESEARCH INTERESTS:

International Space Law; United States Space Law; General International Law; Space Policy & History; Remote Sensing Law; International Aviation Law; and United States Aviation Law & Regulation.

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Assistant Professor

DR. KEITH CRISMAN

Ph.D., 2020, Human Centered Design, Florida Institute of Technology

RESEARCH INTERESTS:

Human Centered Design, Microgravity Medical Systems and Procedures Architecture, Microgravity & Off-planet Habitation Simulation, Neutral Buoyancy Microgravity Analogs, Safety and Rescue Diving & Additive Manufacturing.

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Associate Professor

DR. RONALD A. FEVIG

Ph.D. 2006, Planetary Sciences, University of Arizona

RESEARCH INTERESTS:

Small Spacecraft Development; Orbital Mechanics; NearEarth 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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Assistant Professor | Director of UND Observatory | Director of Undergraduate Studies

DR. SHERRY FIEBER-BEYER

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

RESEARCH INTERESTS:

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

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Assistant Professor

FRANCISCO DEL CANTO VITERALE, PH.D.

Ph.D. 2014, International Studies, University of Deusto, Spain

RESEARCH INTERESTS:

Social Science and Space Studies; International Scientific Relations; International Space Relations, Geopolitics of Space, Space Diplomacy, Space Hubs, Space Policy, Global Space Economy, Comparative Politics, Critical Thinking, Systems Models, Interdisciplinary Approach, Social Science Methods.

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Assistant Professor

MARCOS FERNÁNDEZ-TOUS, PH.D.

Ph.D. 2022, Aerospace Sciences, University of North Dakota

RESEARCH INTERESTS:

Aerospace engineering: Rocket propulsion systems, Electric Propulsion, Hypersonic Aerodynamics, Aerospace Structures, Thermal Systems, Aerodynamic Reentry, Guidance and Control.

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Assistant Professor

DAVID KUGLER, PH.D.

Ph.D., 2015, Aerospace Sciences, University of North Dakota

RESEARCH INTERESTS:

Military Space Programs, Spacepower Theory, Space Policy and History, Project Management and Public Administration of Space Technology, General Aviation Safety.

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Learn more about
the graduate Space
Studies program

aero.UND.edu/space



Schedule Your Visit

See UND Aerospace up close and ask all the questions you want! An in-person visit is a great way to see what awaits you at UND.



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