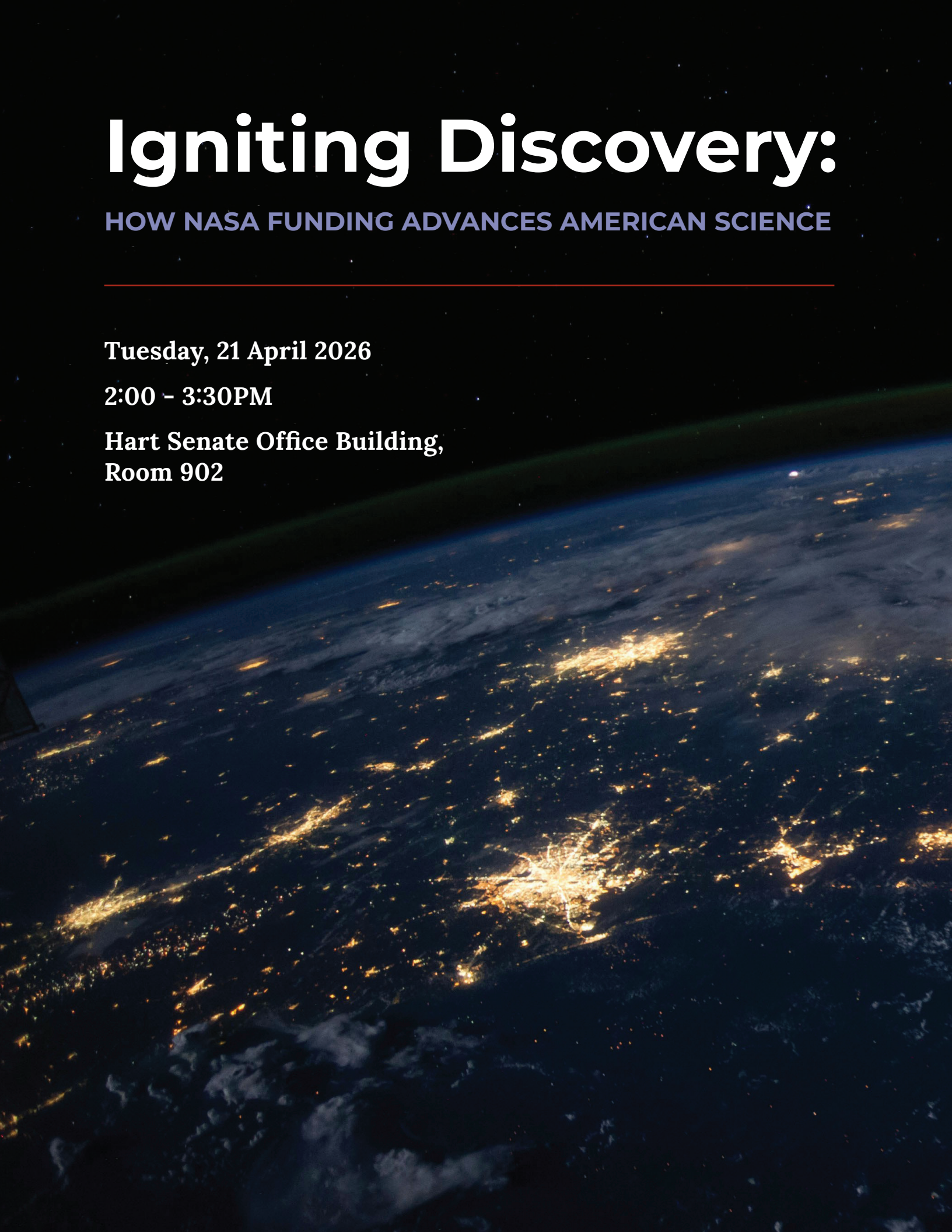
Igniting Discovery:

HOW NASA FUNDING ADVANCES AMERICAN SCIENCE

Tuesday, 21 April 2026

2:00 - 3:30PM

Hart Senate Office Building,
Room 902



NASA's Science Mission Directorate (SMD) has enabled American leadership in the Earth and space sciences for decades. Through NASA SMD, American researchers have revolutionized humanity's fundamental understanding of the universe, provided data essential to national security and weather forecasting, and spurred commercial development.

The pace of global investment in space science is accelerating, and maintaining American leadership in this arena requires sustained commitment to the fundamental research that has always set the United States apart. Research funded by NASA represents that commitment, and creates economic activity in every state in the nation, by creating new industries, supporting high-paying jobs, and driving technological innovations in every field.

Today's showcase highlights the breadth and ambition of NASA-funded science, bringing together researchers from across the country to share their work with policymakers and advocates who believe in its importance.

Exhibits

Arizona State University, School of Earth and Space Exploration

Exploring the Universe at Arizona State University

- **Presenters: Luis Welbanks, Rhonda Stroud, Anna Sophia Kulenguski, Joseph Kulenguski, and Gwyneth Gordon**
- ***Supported by*: NASA *Astrophysics Division & Biological & Physical Sciences Division***

Explore the past, present, and future of life in the Universe—from distant worlds to our own.

See how the James Webb Space Telescope probes the atmospheres of exoplanets and their potential to support life. Then connect that story to our solar system by touching real samples of the Moon and Mars—and discover how ASU advances astronaut health to enable sustained human exploration.

At Arizona State University's School of Earth and Space exploration,, this work is part of a broader set of NASA Science Mission Directorate–relevant efforts, spanning planetary origins, astrobiology, and human spaceflight for future Moon and Mars missions.

Blue Marble Space

OpenSpace: From Ocean to Space Exploration

- **Presenter: Sarah Treadwill**
- ***Supported by*: NASA *Biological and Physical Sciences Division, Earth Science Division, and Planetary Science Division***

OpenSpace uses NASA data to connect space, ocean, and Earth science in planetariums and classrooms. It helps people see real data, understand how different sciences work together and inspires the next generation to explore and solve problems.

Boise State University

Measuring Snow from Space for Water Resources

- **Presenter: H.P. Marshall**
- ***Supported by*: NASA *Earth Science Division***

Seasonal snow provides water for over 2 billion people worldwide, and is over 70% of water supply in the Western U.S. The value of seasonal snow is shown through an interactive website across the west, and we show examples of spaceborne approaches to monitoring this natural reservoir, along with standard field measurement tools used for validation.

California Institute of Technology (Caltech) and Jet Propulsion Laboratory (JPL)

Science at the Frontiers of Exploration

- **Presenters: Jonathan Lunine, Jessie Christiansen, Dimitri Mawet, and Shouleh Nikzad**
- ***Supported by*: NASA *Astrophysics Division, Earth Science Division, & Planetary Science Division***

Journey from the Moon to distant worlds with scientists, engineers, and technologists from Caltech and JPL as they reveal the projects, instruments, and discoveries driving America's leadership in space exploration. From autonomous, rocket-powered drones that scout lunar and Martian terrain to precision tools that tease the light of exoplanets out from the glare of their parent stars to the search for life's origins in cosmic samples, you'll discover how NASA science pushes the frontiers of exploration — and deepens our understanding of humanity's place in the universe.

Colorado University Boulder/ Laboratory for Atmospheric and Space Physics (LASP)

SmallSats to Space Weather: National Implications

- **Presenters: Aimee Merkel and Adrian Bryant**
- ***Supported by: NASA Astrophysics Division, Earth Science Division, & Heliophysics Division***

The exhibit will highlight NASA-funded research crucial for maintaining U.S. competitiveness in space and training the next generation of STEM professionals. One active research area is space weather, which has the potential to affect the daily lives of Americans. This includes impacting navigation, communication, and electronic systems in airplanes, increasing airline passengers' exposure to radiation, disrupting the electrical grid, and increasing atmospheric drag on satellites, which can impact or destroy GPS and other satellites. To better understand space weather and its impacts, LASP researchers are studying atmospheric gravity waves and the variability of auroras to improve models of how space weather affects Earth's atmosphere. Another active research area is learning how to fly SmallSats lower and faster in Very Low Earth Orbit. Understanding space weather is critical to this approach, which has key national security implications. The exhibit will also highlight LASP's student flight controller program, through which undergraduates are rigorously trained to operate NASA missions.

Columbia University/ NASA-GISS

Biogeochemical Impacts of Collapsing Currents

- **Presenters: Paul Lerner, Jonathan Hickman, Christine McCarthy, Sophia Sowinski**
- ***Supported by: Earth Science Division***

As the Earth warms, the Atlantic Meridional Overturning Circulation, major system of currents in the global ocean, is at risk of collapsing. If it does, the biogeochemical repercussions will be severe, including reductions in ocean carbon uptake, marine oxygen content and productivity that sustains fisheries. The NASA-GISS Earth System Model is used here to determine when and how the AMOC will collapse, how quickly the biogeochemical repercussions will occur, their severity, and whether such impacts can be reversed. The model shows that this collapse happens even before the end of the 21st century, and the biogeochemical consequences that follow can be rapid and irreversible in some regions, particularly in the Northern Hemisphere. Further development of Earth System Model capabilities, in conjunction with continuation and expansion of the NASA satellite missions, will help better constrain the consequences of AMOC collapse and other tipping points in the Earth System.

Georgia Institute of Technology

Europa's Interaction with Jupiter's Magnetospheric Plasma

- **Presenters: W. Jud Ready and Alvaro Romero-Calvo**
- ***Supported by: NASA Planetary Science Division***

Europa's asymmetric, time-varying atmosphere is not fully constrained by observation. Using a hybrid model, we demonstrate that ion energy spectrograms can reveal asymmetries in the moon's neutral profile. This work will contextualize data collected by JUICE and Europa Clipper. GOAL: understand how the morphology of Europa's atmosphere affects the local plasma interaction that can obscure the moon's induction signal.

Space Plumbers: Mastering Fluids in Space

- **Presenters: Alvaro Romero-Calvo and W. Jud Ready**
- ***Supported by: NASA Biological and Physical Sciences Division & Planetary Science Division***

Fluids in space are driven by capillary forces. Their behavior defies intuition, and their study is both a rich area for fundamental research and an urgent necessity for space exploration. Fluids impact propellant management systems, in-orbit biology, in-situ resource processing, and even humans. Our projects with NASA BPS seek to understand how to properly model and utilize fluids in space to enable exploration.

Lunar Dust Mitigation for Human Exploration

- **Presenters: Alvaro Romero-Calvo and W. Jud Ready**
- ***Supported by*: NASA *Biological and Physical Sciences Division & Planetary Science Division***

Lunar dust is sharp, highly abrasive, and hard to remove from landing pads and astronaut suits. Under the NASA SSERVI CLEVER center at Georgia Tech, our team is developing electrostatic dust shielding technologies to protect astronauts and equipment at the lunar surface.

Johns Hopkins University

Forecasting Drought, Flood, and Health risks

- **Presenter: Ben Zaitchik**
- ***Supported by*: NASA *Earth Science Division***

NASA Earth Observations provide essential information on weather, water, ecosystems, and human systems relevant to health and well-being. Here, we present examples of NASA-informed forecast of hydrologic extremes in the Americas. These forecasts are applied to monitor and predict risks to hydropower, agriculture, wildfire, and the spread of infectious disease.

Johns Hopkins Applied Physics Laboratory (APL)

Dragonfly Spacecraft in Augmented Reality

- **Presenters: Blake Schreurs and Nick DeMatt**
- ***Supported by*: NASA *Planetary Science Division***

This demo shows an interactive augmented reality (AR) model of the Dragonfly spacecraft, allowing users to explore it as if it were right in front of them. By placing the spacecraft in the real world through a headset, viewers can walk around it, view key components up close, and better understand how it is designed to operate on another world. The experience highlights how modern visualization tools can make complex space missions easier to understand, support design discussions, and improve communication with both technical teams and the public.

Lamont-Doherty Earth Observatory, Columbia University

Innovative Platform for Volcanic Hazard Modeling

- **Presenter: Sophia Sowinski**
- ***Supported by*: NASA *Earth Science Division***

We present the Volcanology Infrastructure for Computational Tools and Resources (VICTOR), a platform designed to modernize hazard modeling and data access in volcanology and related fields. Accessible via web browser, VICTOR provides code for modeling volcanic processes, analyzing NASA's satellite images, and visualizing data, amongst other functions. The platform includes a plethora of example use cases, allowing researchers with less programming experience to adapt to rapid technological development in the field. In addition to being used for research, VICTOR is quickly becoming a great resource for educators, helping to train the next generation of scientists. Access to the platform, as well as supporting educational materials, including labs, procedural guides, and YouTube tutorials, are currently free for all users. Providing a wide array of accessible and efficient hazard models with associated documentation promotes open science and allows innovations in the field to easily be shared nationwide. From professors in New York City to observatory scientists in Hawaii, VICTOR empowers researchers, educators, and stakeholders in volcanic hazard science across the United States.

Lockheed Martin Space

50 Years of Deep Space Exploration

- ***Supported by:* NASA *Astrophysics Division, Biological and Physical Sciences Division, Earth Science Division, Heliophysics Division, & Planetary Science Division***

The spacecraft and systems Lockheed Martin has designed, built and operated for NASA Science over the last 50 years have taken humanity to every planet in our solar system. They have touched down on Mars, explored asteroids, and charted the Kuiper Belt — the most distant frontier ever reached by a spacecraft. Our integrated, mission-proven architectures allow for a safe cruise, keeping even the most delicate trajectories on target, and our entry, descent and landing systems ensure spacecraft can land on planetary surfaces safely. The scientific instruments we engineer for these missions gather priceless samples – from solar wind particles to asteroids and comets – and the data we bring back allows scientists to analyze and enable future exploration. The lessons learned from these robotic missions do more than expand our knowledge of the solar system; they lay the groundwork for the next bold chapter of deep space exploration — sending humans to the Moon and eventually on to Mars to build the infrastructure that will launch a thriving new space economy.

Planet Labs

NASA Science with Commercial Earth Observation

- **Presenter: Jeff O'Neil**
- ***Supported by:* NASA *Earth Science Division***

Planet operates the largest fleet of commercial Earth Observation satellites in the world. With support of NASA's Commercial Satellite Data Acquisition Program, Planet data can be leveraged by the federally funded scientific community to advance key Earth science and applications questions that help communities make better decisions.

Planetary Science Institute

- **Presenters: Amanda Hendrix, Eddie Baron, Gareth Morgan, Kirby Runyon**
- ***Supported by:* NASA *Astrophysics Division & Planetary Science Division***

Planetary Science Institute (PSI) is an independent nonprofit company headquartered in Tucson, AZ, with a satellite office in Lakewood, CO. With some 130 planetary scientists on staff, located in 38 states across the country, PSI is one of the largest planetary science employers in the world. Our scientists work on topics across the solar system (and beyond), on nearly all NASA Planetary Science Division missions, and more. We look forward to sharing our exciting science.

Purdue University

Purdue's Giant Leaps in Space Exploration

- **Presenters: Ali Bramson and Mariana Blanco-Rojas**
- ***Supported by:* NASA *Astrophysics Division, Biological and Physical Sciences Division, Earth Science Division, & Planetary Science Division***

Purdue University, located in Northwest Indiana, is known as the "Cradle of Astronauts" because of its extraordinary influence on the U.S. space program. One-third of all U.S. crewed space flights have had at least one Purdue graduate aboard, such as alumni Neil Armstrong, Gus Grissom, Eugene Cernan, Janice Voss, Drew Feustel, Beth Moses, and Loral O'Hara.

Purdue plays a pivotal role in space exploration and NASA science. Activities of our professors, staff, students, and alumni include:

- Planning the routes for the Mars rovers to safely navigate the Martian terrain while maximizing science return,
- Discovering supernovae and protoplanetary disks using the Hubble Space Telescope and James Webb Space Telescope,
- Monitoring Earth's surface, potential hazards, and resources using satellites launched into orbit,
- Training NASA astronauts on the geology they will encounter during their missions, (cont.)

- Developing the next instruments and missions to launch to the Moon, Mars, and beyond.

Purdue's work with NASA Science contributes to the enduring legacy in expanding humankind's understanding of the cosmos.

Rocket Lab

Rocket Lab: The End-To-End Space Company

- **Presenter: Conor Noonan – Rocket Lab**
- ***Supported by*: NASA *Planetary Science Division***

Rocket Lab is an end-to-end space company delivering reliable launch services, complete spacecraft design and manufacturing, satellite components, flight software, and more.

University of California, Irvine

Discovery of Earth-like Exoplanets

- **Presenters: Paul Robertson and Clair Rogers**
- ***Supported by*: NASA *Astrophysics Division***

We are developing groundbreaking instrumental and data analysis techniques to detect minuscule signals from small, Earth-like planets ("exoplanets") orbiting the nearest stars in the Galaxy. We are particularly focused on small, rocky planets orbiting within the "habitable zone," the range of orbital distances from the host stars where planets receive the right amount of starlight to potentially host liquid water--and perhaps life--on their surfaces. These planets will be the targets of next-generation telescopes such as NASA's Habitable Worlds Observatory, which will characterize exoplanetary atmospheres and surfaces, searching for signs of life outside the Solar System.

University of California, Los Angeles

Predicting Space Weather

- **Presenter: Dominique Stumbaugh**
- ***Supported by*: NASA *Heliophysics Division***

We present a machine learning based model trained on a data set that uses the global coherent nature of the radiation belts to reconstruct electron flux measurements near the geomagnetic equator. We show that the model performs well for data it was not trained on giving confidence that it can effectively predict fluxes. Our current work demonstrates that we can monitor in situ radiation belt fluxes using only relatively smaller and cost-effective satellites with a neural network model instead of the more traditional high-altitude satellites. The ability to predict radiation belt dynamics, and thus space weather, has become increasingly important for the broader society due to an increasing satellite infrastructure that is vulnerable to energetic electrons.

University of Central Florida

Exploring the Moon and Other Worlds at UCF

- **Presenters: Ryan Ogliore, Philip Metzger, Christian Vincent, Emmanuel Urquieta**
- ***Supported by*: NASA *Planetary Science Division***

Scientists at the University of Central Florida are building advanced robotic systems to explore the Moon, investigating the effects of the space environment on human health, and analyzing extraterrestrial samples in the lab to reveal the ancient history of small and large worlds of the Solar System.

University of Florida

Microbes Ease Animal Stress in Space

- **Presenters: Jamie Foster**
- ***Supported by: Biological and Physical Sciences Division***

As humans continue exploring space, it's important to understand how the harsh environment affects the helpful microbes that live in and on our bodies. In this study, we asked whether living in space could change how animals and their beneficial microbes communicate. To explore this question, we worked with Hawaiian bobtail squid and a beneficial glow-in-the-dark bacteria called Vibrio fischeri. By sending these squid and bacteria into space, we could determine whether microgravity changed the ability of beneficial microbes to colonize animals and alter the normal partnership. We looked at changes in gene activity, chemical makeup, and lipids in both the squid and bacteria over time. Our findings show that, even in space, these beneficial microbes can lower the stress responses of the squid at the molecular level and help them grow and develop normally. For instance, we saw support for regular processes like the growth of nerve cells and the shaping of tissues. The study overall suggests that beneficial microbes still manage to attach to new tissues inside animals in space, and they help animals stay healthy and keep their normal development, even in space.

University of Maryland, Baltimore County (UMBC)

UMBC Research: Earth, the Moon, and Beyond

- **Presenters: Karl Steiner, Crocetta Argento, Zhibo Zhang, Mehdi Benna, and Brent McBride**
- ***Supported by: NASA Astrophysics Division, Earth Science Division; Heliophysics Division, & Planetary Science Division***

At our table, explore life-size models of deep-space instruments. We are using these missions to answer fundamental questions about the lunar environment, measure moonquakes, and locate resources like water to help prepare for safe human missions to Mars.

University of Nebraska at Omaha (UNO)

Recyclable Antimicrobial Materials

- **Presenter: Liliana Delgado**
- ***Supported by: NASA Space Technology Mission Directorate***

This project focuses on developing new materials that can be used to safely make medical tools in space. Astronauts on long missions may get sick or injured, but it is difficult to carry all the supplies they might need. This work aims to solve that problem by creating materials that can be reused and that help prevent the growth of harmful bacteria.

The team will design special plastics that can be used in 3D printers to make items like finger braces or basic surgical tools. These materials are designed to be strong, safe for the human body, and able to kill germs. They will be tested on Earth and compared to items made in space to make sure they perform well in both environments.

By allowing medical devices to be made on demand, this project could improve astronaut health and safety during long missions. It may also lead to new ways of producing medical tools in remote or emergency settings on Earth.

West Virginia University

Compact Plasma Spectrometer for Heliophysics

- **Presenter: Earl Scime**
- ***Supported by: NASA Heliophysics Division***

We will bring samples of a novel approach to fabricate space plasma instruments specifically designed for science missions involving large numbers (> 100) of spacecraft.