School of Earth and Space Exploration
Arizona State University

August 2022

Dear Friends,

Welcome to the Fall Semester 2022! In this month's newsletter we welcome our returning students as well as our first year and transfer students to the ASU community! We are so looking forward to our students continuing their academic journey of education and research at the School of Earth and Space Exploration.

We also welcome several new faculty members this semester. Professor **Rhonda Stroud** will join us as Director of the Buseck Center for Meteorite Studies. She comes to us from the US Naval Research Lab in Washington DC. Her research portfolio blends materials physics, planetary science and electron microscopy to address the origin and properties of materials ranging from nanodiamond stardust to quasicrystals to aerogel nanocomposites.

Professor **Larry Nittler** comes to us from the Carnegie Institution for Science in Washington DC. He is a cosmochemist who studies the origin and evolution of stars, the Galaxy, and the Solar System, both through laboratory analysis of extraterrestrial materials like meteorites and returned comet and asteroid samples and through planetary remote sensing via spacecraft.

In addition, we welcome **Damian Grundle**, **Eric Hochberg** and **Nicholas Bates** who will be jointly appointed in the new School of Ocean Futures (in the College of Global Futures) and SESE. Assistant Professor Grundle is a biogeochemical oceanographer whose research primarily focuses on nitrogen cycling from marine surface waters to oxygen minimum zones of coastal and open ocean regions. Associate Professor Hochberg is a reef systems ecologist whose main research centers on the interaction between light and the function of tropical and subtropical shallow water ecosystems, particularly coral reefs. Professor Bates is a chemical oceanographer who investigates marine carbon, nutrient cycling, and ecosystem function by integrating studies of the physical, chemical, and biological factors that influence these.

SESE researchers **Chelsea Scott** and **Chris Mead** were recently appointed as Assistant Research Professors. Dr. Scott has broad research interests in the areas of tectonic geomorphology and structural geology and Professor Mead's primary research theme is digital teaching and learning, particularly techniques for bringing active learning into more settings. We are delighted to have these new faculty members and I hope you all will have a chance to meet them in the near future.

I must also regretfully share the sad news of the loss of a beloved member of the School of Earth and Space Exploration, Karin Valentine, our incredibly dedicated and talented Media and Marketing Manager. In honor of Karin, we are creating an endowment fund to recognize the efforts of SESE students who have made a noteworthy contribution to science communication. Please consider contributing to this fund so that we can **honor Karin's legacy of science communication** and advocacy.

I hope you enjoy this newsletter featuring our research news, announcements, and events. For more information, we have included links to social media at the end of this newsletter.

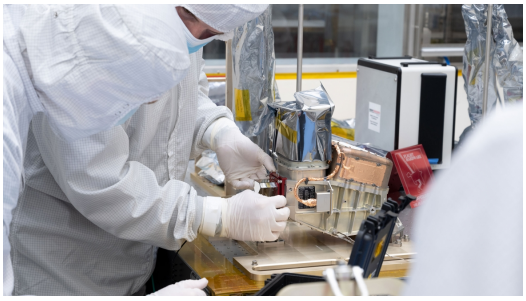
Be well and keep safe,

Meenakshi (Mini) Wadhwa
Director of the School of Earth and Space Exploration

In the News

ASU-designed instrument will peer into the permanently shadowed craters of the moon

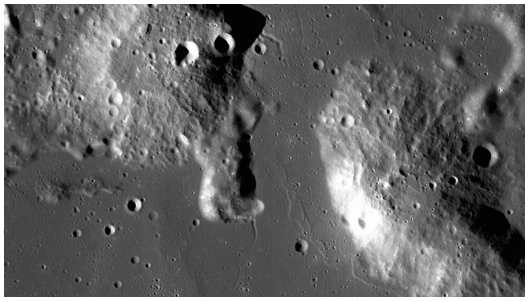
Congratulations to Professor Mark Robinson and team on the successful launch of the ASU-led ShadowCam onboard the Korean Pathfinder Lunar Orbiter (KPLO) earlier this month. We are looking forward to amazing images and data that ShadowCam will provide of our Moon's permanently shadowed craters to search for signs of water ice, measure the composition of lunar regolith and capture high-res images. **Learn more about ShadowCam**



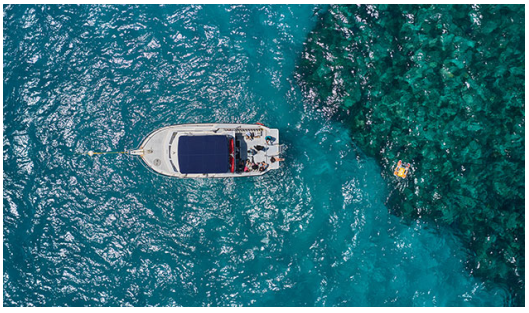
Long journey to Europa, an icy moon of Jupiter, begins for ASU-built camera

ASU scientists and engineers building the Europa Thermal Emission Imaging System (E-THEMIS) led by Regents Professor Philip Christensen for NASA's Europa Clipper has arrived at NASA's Jet Propulsion Laboratory in Southern California. Europa Clipper, a NASA mission to investigate Jupiter's moon Europa, is planned to launch in October 2024 and arrive at Jupiter in 2030. It will study this icy moon through a series of flybys while in orbit around Jupiter to investigate whether it could harbor conditions suitable for life. **Read more and watch the video**

ASU chosen to help solve geologic mystery on the moon



On the surface of the moon stand two large geological domes of unique composition, but how they formed remains a mystery. A new NASA space mission involving ASU aims, for the first time, to answer key questions about how these formations came to be. "This will be the first time that we have investigated these types of features up close on the surface of another planetary body," said Craig Hardgrove, co-investigator of the Lunar Vulkan Imaging and Spectroscopy Explorer (Lunar-VISE) mission. Associate professor Hardgrove will develop an instrument that will be part of Lunar-VISE. **Read more**



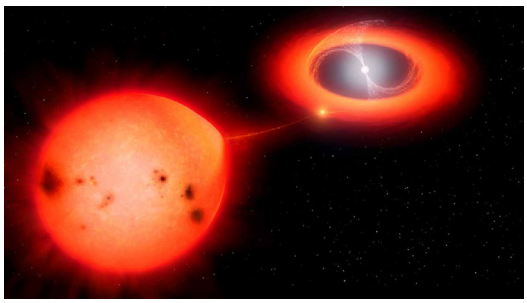
MARINE Innovation and the Next Generation

A collaboration between ASU and Bermuda Institute of Ocean Sciences (BIOS) resulted in an exciting learning opportunity for Bermudians this summer. The overall goal of the workshop was to highlight the various types of technologies that are used to understand data collected from the ocean, with a focus on coral reef mapping projects while providing students with hands-on experience building, deploying, and programming a variety of technologies,

including aerial and underwater drones, autonomous boats and underwater vehicles, and remotely operated vehicles. Facilitation and instruction included three members from SESE: Aravind Adhith Pandian Saravanakumaran, graduate research assistant in robotics and autonomous systems; Jnaneshwar Das, laboratory director; and Rodney Staggers, Jr. a recent mechanical engineering graduate from ASU. **Read more**

How climate change is affecting our forests

Due to climate change's impact on ecosystems, wet locations such as forests are acting more like dry systems such as deserts. Professor Heather Throop has co-authored a piece on these changing ecosystems and why it's critical to understand the processes that occur in deserts and what the long-term implications might be. **Read more**

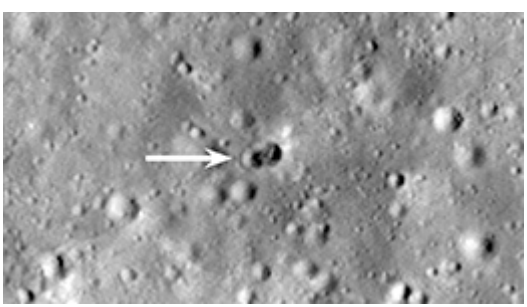


There in a flash: A weird star produced the fastest nova on record

Astronomers are buzzing after observing the fastest nova ever recorded. The unusual event drew scientists' attention to an even more unusual star. The research team led by Regents Professor Sumner Starrfield, co-authored a report published in the Research Notes of the American Astronomical Society. As they study it, they may find answers to not only the nova's many baffling traits, but to larger questions about the chemistry of our solar system, the death of stars and the evolution of the universe. **Read more**

How ASU researchers patent a new industrial-scale chemical method using geomimicry

A team from the School of Molecular Sciences and the School of Earth and Space Exploration at ASU has now developed a method for the production of isooctane from common feedstock molecules that uses just water, heat, and the inexpensive, Earth-abundant metals iron and nickel. The process is inspired by the chemical processes that occur naturally within the Earth's crust. The process of learning from geology to develop new chemical processes is a strategy the ASU team calls "geomimicry," the geologic equivalent of better-known biomimicry. **Read more**

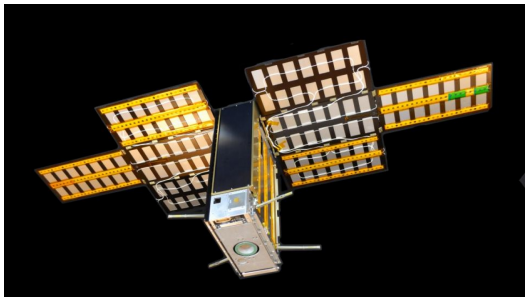


Mystery rocket body found and two new craters

Astronomers discovered a rocket body heading towards a lunar collision late last year. Through a series of observations, they predicted the time of impact and its location (to within 100 kilometers). The identity of the rocket body remains unclear. Surprisingly the crater is actually two craters, an eastern crater superimposed on a western crater. **Read more from LROC** and **Read full story from New York Times**

Events

LunaH-Map: Ready for launch!



The **ASU-led LunaH-Map** spacecraft will fly as secondary payload onboard NASA's Artemis I mission targeted for launch **Monday, August 29 at 8:33 a.m. EDT/5:33 a.m. AZ time**. Join us at the Marston Theater at 5:00 am. to watch the **LIVE** launch or **register to participate online with NASA**. Stay up to date on the latest information including any launch postponements on the **NASA Artemis I website**.

Virtual Night Sky

Join the ASU Marston Exploration Theater presenters on **Wednesday, September 7 and 21 at 7 p.m.** for a live planetarium presentation. Learn about the planets and stars visible in the night sky from your own backyard and the latest events in space exploration! Be sure to register in advance for these FREE Zoom on our **Events webpage**.

Interplanetary Fall Transmission webinar

You're invited to the Interplanetary Initiative's Fall Transmission webinar **September 29, 11 a.m. AZ/PT**. Hear exciting updates from across the initiative and see how our learning programs, Laboratory projects and partnerships are advancing their missions! **Register for this FREE webinar**.

Alumni Announcements

New graduates: Join the ASU Alumni Association

As an ASU grad, you are an important and valued member of one of the strongest alumni networks in the country and around the world — half a million strong! As a recent grad taking the next steps in your personal and professional life, ASU is a powerful partner, each step of the way. Wherever you are, make the most of your career, family, activities and more. Join us on **LinkedIn**, **update your contact information** and learn more about the **Alumni Association**.