PURDUE UNIVERSITY | Department of Earth, Atmospheric, and Planetary Sciences

EAPS WEEKLY NEWSLETTER

April 4, 2022

Facebook Twitter LinkedIn Instagram Website

EAPS MEETINGS & EVENTS

EAPS FACULTY MEETINGS 3-5pm

- **April 12** (College of Science Faculty Meeting)
- **April 19**
- **May 3** (Primary Committee)
- **May 10 (tentative)**

PURDUE CALENDAR 2021-22

EAPS K-12 OUTREACH CALENDAR OF EVENTS

REPORT YOUR OUTREACH AND ENGAGEMENT ACTIVITIES

OUTREACH NEWS

This semester we are scheduling live events for K-12 students again! For both our Hands-on Purdue Science programs (HOPS and AP Fridays) we are offering classrooms the following themes

Wednesdays and Fridays in April: Atmospheric Chemistry

Wednesdays and Fridays in May: Investigating Water Quality

Check out the online labs and resources outreach has created.

Social sites:

TikTok SuperHeroesofScience
Facebook EAPS Outreach
Facebook Superheroes of Science
Twitter EAPS departmental outreach web page
Instagram

Like to learn new things about Science? A new **1 minute science video** is released every Monday – Friday on the Superheroes of Science YouTube channel and on our TikTok.

The 1 minute video with the most views is EAPS grad student Angela Burke *Why some planets have seasons*

Students want to know what you study in your major. Record a **vertical** video that is under 1 minute and send the video to Steven Smith (mrsmith@purdue.edu). You can use your phone or get with Steven and he can record/edit for you in the outreach lab! **Let's take a minute and tell the world what we study!**

PUBLICATIONS

- **Grey, Logan**, **Alexandria V. Johnson**, Tom Matthews, L. Baker Perry, Aurora C. Elmore, Arbindra Khadka, Dibas Shrestha, Subash Tuladhar, Saraju K. Baidya, Deepak Aryal, and Ananta P. Gajurel (2022): Mount Everest's photogenic weather during the post-monsoon. *Weather*. https://doi.org/10.1002/wea.4184
- Zachary P. Meyers, Laura K. Rademacher, Marty D. Frisbee, Sara R. Warix,"Extending classical geochemical weathering studies through the mountain block: The effect of increasing scale on geochemical evolution in the Sierra Nevada (CA)": https://www.sciencedirect.com/science/article/pii/S0009254122001255

NEWS/OPPORTUNITIES

EAPS QUARTER ZIPS FOR SALE- $50 TO HELP SUPPORT THE GRADUATE STUDENT ASSEMBLY

Quarter-zip sweaters with the Purdue EAPS logo, great for representing Purdue at conferences and beyond, for sale to benefit the Graduate Student Assembly. *The sweaters come in men's and women's cuts this year.* Please fill out the order form link or email Hunter Vannier.

They cannot accept Venmo payments this semester, so **cash or check is preferred.** If there are issues with being in person or a need for apparel to be mailed, please email Hunter to work something out. **Please order by Friday, April 8**. Delivery expected before the end of April, but there is some flexibility with that date. For questions, please see Hunter Vannier.

ATMOSPHERIC SCIENCE CLOUD MODELING SPECIAL SEMINAR

DR. MICHAEL DIAMOND, CIRES Post-Doc Visiting Fellow NOAA Chemical Sciences

Website Curriculum Vitae

Public Seminar: What can inadvertent aerosol perturbations teach us about clouds and Earth's climate?

Date: April 4, 2022 Time: 10:30 AM - 11:30 AM
Location: HAMP 2244

Zoom link

Abstract: Clouds confound our understanding of Earth's climate: They are the largest sources of uncertainty in quantifying present-day and future climate change. The magnitude of the cooling effect due to the interactions between clouds and aerosols (tiny particles suspended within the atmosphere) has been particularly difficult to pin down due to the difficulty of disentangling aerosol effects from other phenomena like meteorological variability. Natural experiments, in which a phenomenon of interest may be separated from other sources of variability, offer promising means to better understand causality in aerosol-cloud interactions (ACI). Ship tracks are the quintessential example of natural experiments in ACI. However, prior studies have failed to detect large-scale cloud changes from shipping. In Part I, I attribute increased cloud reflectivity within a major shipping corridor to anthropogenically enhanced cloud droplet numbers on climate-relevant spatiotemporal scales. Using relationships derived within the shipping corridor, I estimate the global radiative forcing due to ACI due to all sources of pollution since the pre-industrial era. Smoke from agricultural burning and wildfires creates another natural laboratory in which aerosol-radiation and aerosol-cloud interactions co-occur in a complex mix. In Part II, I discuss modeling work inspired by recent field campaigns looking at smoke-cloud interactions in the southeast Atlantic Ocean, off the western coast of Africa. By forcing large eddy simulations with meteorology from regional climate models with and without smoke radiative effects, we show that large-scale circulation changes caused by smoke absorption can strongly modulate marine cloud transitions.

Bio: Dr. Michael Diamond is currently a CIRES Postdoctoral Visiting Fellow working at NOAA's Chemical Sciences Laboratory and CU Boulder's Department of Atmospheric and Oceanic Sciences. His research focuses on how the interactions between clouds and pollution particles affect Earth's climate. He earned his doctorate in Atmospheric Sciences at the University of Washington, Seattle.

Co-Host Contact: Lisa Welp and Matt Huber.

PURDUE UNIVERSITY COLLEGE OF SCIENCE DISTINGUISHED ALUMNI AWARD

DR. BIN WANG

Director of Research and Development, TGS

SPECIAL SEMINAR: APRIL 8, 10-11 A.M., HAMP 1252

INVERSION-BASED SEISMIC IMAGING: FROM LSM TO FWI IMAGING

To create a subsurface image from seismic data, we use wave theory to move (or migrate) seismic signals to their correct subsurface location. This requires knowledge of the earth velocities through which the seismic signals pass. Thus, conventional seismic imaging technology has two major steps: 1) velocity model building and 2) seismic migration. However, this conventional methodology is not adequate to address the imaging challenges of a complex geological environment. In the past decade, industry has adopted new inversion-based approaches to address these challenges. An inversion-based algorithm aims to estimate models of subsurface properties by ensuring that computer-simulated synthetic seismic data matches the measured field seismic data. This makes fewer assumptions about the subsurface and thus can give a more accurate image.

Full-Waveform Inversion (FWI) is an inversion-based algorithm to build high-resolution velocity models, and Least Squares Migration (LSM) is an inversion-based, high-quality imaging alternative to conventional migration. An even more recent industry trend is the convergence of FWI and LSM methodologies: FWI is not only being used as a velocity update tool, but has expanded to include LSM as a direct imaging tool. This technology, which we call FWI Imaging, thereby achieves two key imaging goals, namely, refining

the velocity model and deriving a better-quality seismic image.
In this presentation, we first give a brief overview of LSM and FWI, and then compare and contrast the LSM and FWI workflows. This will provide the background for us to describe the essence of FWI Imaging and its significance as a single, unified imaging method.
Bin Wang received his B.S. and M.S. in Electrical Engineering from Beijing University in China, and a Ph.D. in Geophysics from Purdue University in USA. He also received a M.S. in Computer Science from University of Texas at Dallas, and a MBA from Southern Methodist University (SMU) in Dallas, while working for Mobil Oil.
Bin started his Geophysical career with Mobil Oil in 1993, and worked for CGGVeritas before joining TGS as a research manager in 2007. He is now the director of research and development at TGS. Bin authored and co-authored over 100 technical papers in the areas of velocity model building, migration, inversion, and signal processing, including five award winning papers. He was named as one of the Distinguished Lecturers by EAGE (European Association of Geoscientists and Engineers) in 2010. In 2013, he was selected as the EAGE e-lecturer for Least Squares RTM. In 2019, he was the Keynote Speaker for the first EAGE workshop on Least Squares Migration in Rio of Brazil. He was awarded an SEG (Society of Exploration Geophysicists) Life Membership award in 2014.

APOPHIS T-7 YEARS: KNOWLEDGE OPPORTUNITIES FOR THE SCIENCE OF PLANETARY DEFENSE

Call for Abstracts and Registration Now Open!
May 11-May 13, 2022
Virtual

The Apophis T-7 Years: Knowledge Opportunities for the Science of Planetary Defense virtual workshop is scheduled for May 11--13, 2022.
This workshop will explore the dynamic details and corresponding science opportunities presented by the April 13, 2029, near-miss passage of the asteroid Apophis.
Registration: Registration fees are being collected for this virtual workshop. Only registered attendees will receive an email from Houston Meeting Info with virtual connection information.
Registration is available through May 13, 2022.
For more information, contact: Meeting and Publication Services, USRA/Lunar and Planetary Institute meetinginfo@hou.usra.edu

LEAPS LAB OUTREACH VOLUNTEERS NEEDED

The Laboratory Studies of the Evolution of Airless Planetary Surfaces (LEAPS) in EAPS is looking for **four volunteers** to help with an outreach activity (pasta rovers) that will be held at the Boys and Girls Club in Lafayette on Monday, April 11th from 4:00 - 5:30 pm. If you're interested in participating you can sign up here.

JUDGES NEEDED FOR POSTERS AND RESEARCH TALKS – APRIL 12

Currently seeking faculty, staff, post-docs, and graduate students to help in judging posters and research talks both in-person and virtually as included in this Purdue Today article. We have almost 90 research talks and almost 400 posters with many students wanting to take the opportunity to present in-person for the first time since fall 2019. Those who are interested and available, should indicate their interest using the Qualtrics link on the Judging Registration website. **Individuals can sign up to judge in-person posters in morning (9:30-noon) or afternoon (1-3:30) sessions on April 12**, research talks in one-hour availability increments on April 14, and/or virtual presentations that can be judged throughout the week. Attached is the judging recruitment flier. The judging process is very important for the Spring Conference in helping determine awards and providing valuable feedback to undergraduate students who have worked diligently on presenting their projects.

EAPS GRAD STUDENT RESEARCH OPPORTUNITIES

If you are interested in an EAPS grad research opportunity, click here for more information.

MS AND PHD EAPS STUDENTS BROADEN YOUR GRAD EXPERIENCE

For those MS and PhD students in EAPS that would like to broaden their graduate experiences while at Purdue, EAPS is affiliated with the Computational Interdisciplinary Graduate Programs (CIGP) at Purdue. While working toward a graduate degree in EAPS, graduate

students can also have a concentration (specialization) in the area of Computational Science and Engineering (CSE). For more information, click here. A short video about the CIGP/CSE program can be found here.
Fall Application Deadline: October 1
Spring Application Deadline: March 1

METEOROIDS 2022 CONFERENCE

June 13-17, 2022
Virtual

The Meteoroids 2022 local organizing committee has closely watched ongoing developments of the COVID-19 pandemic and met to reconsider in-person delivery in Huntsville, Alabama. Given the recent sharp increase in positive cases and the unpredictable appearance of new variants, the committee has decided to shift the conference from in-person to fully virtual. Although it is disappointing not to be able to meet in person, the health and safety of all participants is our top priority.
Registration deadline - June 17, 2022
Visit the Registration page at the conference website for more information. Before the conference, registered attendees will receive an email from Houston Meeting Info with virtual connection information.
Meteoroids 2022 is the eleventh international conference in a triennial series of meetings on meteoroids, their origins, and their associated phenomena. Past conferences have featured a combination of invited and contributed talks and posters covering topics such as meteor observational techniques, meteorite recoveries, meteoroid stream dynamics, ablation physics and airbursts, impacts on airless bodies, the production of dust and meteoroids by asteroids and comets, space missions, and spacecraft anomalies.
We look forward to planning a successful conference and to seeing you virtually!

APOLLO 17 – ANGSA WORKSHOP

October 26–28, 2022
Lunar Planetary Institute
Houston, Texas

The 3-day workshop is currently planned as an in-person workshop, October 26–28, 2022, at the Lunar and Planetary Institute in Houston, Texas.
The 50th anniversary of the Apollo 17 mission is in Dec. 2022. By every metric, this mission to the Taurus-Littrow Valley (TLV) was the most accomplished of any of the Apollo missions to the moon, leading to 50 years of extensive, continuing analytical investigations of its observations, samples, photography, and geophysical data.
The goals of this workshop are:

- revisiting the TLV by integrating new geologic and exploration context, new ANGSA sample data, orbital observations, and the full breadth of data sets from all six Apollo landed missions for a fuller understanding of the moon, the sun, and the earth
- establishing links among multiple generations of lunar scientists and engineers as we prepare for our future on the moon
- focusing on scientific and design lessons learned from both Apollo and from ANGSA in preparation for near-term human exploration of the moon.

We will also focus on specific topics, with short reports expected from the breakout groups and presented during the workshop. Presentations and results of the workshop will form the basis of a special issue in a peer-reviewed journal. Manuscripts for this special issue will be due within three months after the workshop.

ANNUAL MEETING OF PLANETARY GEOLOGIC MAPPERS

June 22–23, 2022
Flagstaff, Arizona/Virtual

The Annual Meeting of the Planetary Geologic Mappers is scheduled to be held on June 22–23, 2022, at the Northern Arizona State University in Flagstaff, Arizona, with virtual participation available.
The annual meeting will bring together community members to report progress on geologic mapping projects, discuss a wide range of mapping strategies, and coordinate map-based scientific investigations of planetary surfaces at multiple scales. Specific attention will be focused on how geology-based site characterization can support human exploration. Abstracts are solicited for topics, including progress reports on active mapping investigations, mapping strategies, mission support, community resources, and education. Group discussions will address map data standardization and dissemination, map-based investigations of geologic processes, ways to modernize and improve geologic maps for human and robotic exploration, and the use of geologic maps to support exploration.
Important: To be added to the mailing list to receive additional information about this meeting, submit an indication of interest.

SCIENCE OBJECTIVES FOR HUMAN EXPLORATION OF MARS WORKSHOP

NEW DATES: May 4-6, 2022
Denver, Colorado

The Science Objectives for Human Exploration of Mars Workshop will be delivered on May 4--6, 2022 (new dates) in Denver, Colorado, with some components available virtually.

The workshop is co-sponsored by NASA's Science Mission Directorate and the Human Exploration and Operations Mission Directorate to actively engage the scientific community to determine what science could be done by human crews on the Martian surface and how it can be achieved. This workshop will discuss the highest priority science objectives for a first human mission to Mars and then develop several different possible concepts of operation that will enable that science. With the Artemis missions, humans will return to the Moon using innovative technologies to explore the lunar surface. We will use what we learn on and around the Moon to send the first astronauts to Mars. A human mission to Mars will be a landmark achievement and a golden opportunity to conduct groundbreaking science on Mars. The potential scope of the science activities is extraordinary.

In-Person registration deadline - April 20, 2022
Virtual registration deadline - May 6, 2022

Registration fees are not being collected for this workshop, but registration is required. Before the workshop, registered attendees will receive an email from Houston Meeting Info with virtual connection information.

WORKSHOPS ON IN SITU EXPLORATION OF THE GIANT PLANETS II

July 12-14, 2022
Johns Hopkins Univ. Applied Physics Laboratory, Laurel, Maryland

The Workshop on In Situ Exploration of the Giant Planets II will build upon the results of the Workshop for In Situ Exploration of the Ice Giants held in Marseille in February 2019 addressing in situ exploration of the ice giants.

Call for Abstracts: Deadline - April 28, 2022, 5:00 p.m. U.S. Central Daylight Time (GMT -5)

Registration: Registration on-site will be limited to 100 attendees, with pre-registration required. No onsite registration will be available. Registration details will be posted at a later date. Registered attendees will receive an email from Houston Meeting Info with virtual connection information. For more information, contact: Meeting and Publication Services, USRA/Lunar and Planetary Institute, meetinginfo@hou.usra.edu

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BRINES ACROSS THE SOLAR SYSTEM: ANCIENT BRINES

September 12–15, 2022
Reno, Nevada

The Brines Across the Solar System: Ancient Brines conference will focus on integrating diverse fields of study, including but not limited to geology, mineralogy, (astro)biology, chemistry, planetary science, and physics. Of particular interest are the intersections of these fields as they apply to understanding the formation, location, and potential habitability of ancient brines on planetary bodies and any possible biosignatures that may be observed today. Thematically, the conference is focused on four main topics:

1. Evidence for ancient brines
2. Formation of brines on early planetary bodies
3. Habitability of ancient brines
4. Role of brines in the origins of life

Important: To be added to the mailing list to receive additional information about this conference, **submit an Indication of Interest by May 16, 2022. More info here.**

POSITIONS AVAILABLE- CAREER OPPORTUNITIES

METEOROLOGIST POSITIONS AVAILABLE

TEGNA

Multiple meteorology positions are open with TEGNA. **Betsy Kling**, Chief Meteorologist and an anchor for WKYC-TV The Land (Cleveland), is also a Weather Team leader and the lead weather talent recruiter for Tegna, her station's parent company, that owns more than 60 stations across the country. She hoping to make connections now that can be beneficial to those soon-to-be meteorologists as well as the stations in her company looking for budding talent. She is happy to answer any questions you might have about the industry or the job search. She is an AMS-CBM and NWA sealed four-time Emmy winner now in her 25th year in the business.

GEORGIA TECH EAS

Non-tenure track lecturer

The School of Earth and Atmospheric Sciences (EAS) at Georgia Tech invites applications for a non-tenure-track Lecturer position. The lecturer will play a significant role in the first-year courses taught in EAS. This program provides over 1500 students each year with lecture and laboratory instructions. The successful candidate will be expected to provide direct lecture and laboratory instruction to undergraduate students, develop curricula, and advise undergraduate students. An MS degree in Atmospheric Sciences or other related fields is required. More info and how to apply.

MRCC HIRING TWO CLIMATE DATA PROGRAMMERS

External Link Internal Link

Job Summary

The Midwestern Regional Climate Center (MRCC) is an operational climate services center supported primarily by a federal contract with the National Oceanic and Atmospheric Association. Its primary role is to provide historical and near-real-time climate data through informational resources that can be applied to a broad range of decision-making stakeholders. Online data monitoring, delivery, and decision-support tools are the most visible means of communicating climate services throughout the 9-state MRCC region that includes Minnesota, Wisconsin, Michigan, Iowa, Illinois, Missouri, Indiana, Ohio, and Kentucky.

Stakeholder engagement is critical for the MRCC to continually meet the climate services needs of the region, promote climate data resources and information, and solicit ideas for how the MRCC can continually improve its stakeholder support. Applied climate research and monitoring by the MRCC helps support the evolving understanding of the regional climate and its impacts on society. Under the guidance of the MRCC / Indiana State Climate Office Director, you will build scientific decision-support and informational tools, modify and enhance pre-existing code and scripts at the MRCC, and work with climate data for the MRCC website, presentations, and relevant reports. You will also contribute to the development of figures and diagrams, perform statistical data analysis, and contribute to other computational needs within the MRCC. Additional duties will include:

- Create and/or modify programming and visualization code that can manipulate atmospheric and environmental datasets (both gridded and station/point).
- Create climatologically relevant figures and diagrams using atmospheric and environmental datasets
- Perform statistical analyses on atmospheric and environmental data using statistical software and programs
- Contribute to the technical / scientific reports for service and / or research projects as needed
- Help support website development and design

Required:

- Bachelor's degree in either an atmospheric or computer science discipline
- 4 years of relevant experience with at least (1) of those years working with observational scientific data that utilized statistical and exploratory data analysis skills
- Development of online tools and/or resources that utilized observational scientific data
- Demonstrated ability to follow and/or develop deadlines and follow through in timely and efficient manner
- Contribute to overall project deliverables

Preferred:

- Master's degree in atmospheric science or related discipline
- 3 years of experience working with observational atmospheric data that utilized statistical and exploratory data analysis skills
- *Development of online tools that utilize data access routines (e.g., APIs) and JSON, GRIB, and netCDF formats
- Experience with JavaScript libraries like HighCharts or Tableau and Tablesorter
- Webpage development
- GIS Server skills
- MySQL (or SQL) database experience

BRYAN ENVIRONMENTAL CONSULTANTS

Homewood, IL

SEEKING PART-TIME TO FULL-TIME POSITIONS

- Bachelor's or Master's degree in environmental engineering, civil engineering, geotechnical engineering, geology
- Knowledge of State and Federal environmental regulations a plus
- Experience with Phase I and II Environmental Site assessments a plus
- Strong writing skills
- Proficient in all Microsoft Office applications
- Must have cell phone and computer (laptop)
- Valid Driver's License

WANG ENGINEERING

SEEKING Engineering Geologists, Geotechnical Engineers

Contact: Cornelia Lidia Marin, PG

POST-DOC OPPORTUNITY - AIR FORCE SCIENCE & TECHNOLOGY FELLOWSHIPS

The National Academies of Sciences, Engineering, and Medicine administers postdoctoral and senior research awards at the U.S. Air Force Research Laboratory (AFRL), the U.S. Air Force Institute of Technology (AFIT), and the U.S. Air Force Academy (USAFA) under the Air Force Science & Technology Fellowship Program (AF STFP).
Seeking highly qualified candidates who are U.S. citizens and hold, or anticipate earning, a doctorate in a variety of fields of science or engineering.

Application deadline dates (four annual review cycles): February 1, May 1, August 1, November 1

Awardees have the opportunity to:

- Conduct independent research in an area compatible with the interests of the Air Force laboratories
- Devote full-time effort to research and publication
- Access the excellent and often unique Air Force research facilities
- Collaborate with leading scientists and engineers
- Awardee benefits:
- Base stipend starting at $76,542; may be higher based on experience
- Health insurance (including dental/vision), relocation benefits, and a professional travel allowance

Applicants should contact prospective AFRL, AFIT and USAFA Research Adviser(s) at the lab(s) prior to the application deadline to discuss their research interests and funding opportunities.
For detailed program information, to search for AFRL, AFIT, and USAFA Research Opportunities, and to contact prospective Research Adviser(s), visit www.nas.edu/afstfp.

PURDUE ENVISION CENTER (UNDER ITAP) RECRUITING EAPS STUDENTS

At the Envision Center looking to recruit EAPS students with background and interest in weather visualization. Details on the job opening can be found here.

ASTROCAMP

AstroCamp is looking for graduating students (undergraduate or graduate) for a full-time program instructor position for physical sciences and astronomy concepts at their outdoor science school in California. Link to job here.

POSITIONS AVAILABLE IN METEOROLOGY AND ATMOSPHERIC SCIENCE

View current career listings

AGI GEOSCIENCE JOB CENTER

Check listings here.

GRADIENT CORP

MULTIPLE OPPORTUNITIES

Please feel free to contact Qianlai Zhang if you are interested in applying and/or have any questions about the company and the opportunities.

POSTDOC IN STABLE ISOTOPES AND REACTION KINETICS – INDIANA UNIVERSITY

Applications are invited for a Postdoctoral Research Associate at Indiana University, USA. The project aims using non-traditional stable isotopes to measure reaction rates and understand the mechanisms of mineral-aqueous solution reactions. See our recent publications for details (Zhu et al., 2016, Chemical Geology; Zhu et al, 2020, 2021, GCA). The project will employ a combined experimental, analytical, theoretical, and modeling approach.
The successful candidate will hold a Ph.D. in earth sciences or a closely related field. A strong background in either stable isotopes or kinetics and thermodynamics is required. Experience performing aqueous geochemical experiments, and using geochemical equilibrium and kinetics models is highly desirable.
Salary is competitive and includes fringe benefits. The initial appointment will be for one year, with the expectation of renewable for another two years, subject to performance and funding availability. The candidate will be based on the Bloomington campus of Indiana University, and will have access to an extensive suite of analytical tools, including MC-ICP-MS, TIMS, ICP-OES, ICP-MS, FESEM, and FETEM.

NATIONAL WEATHER SERVICE POSITIONS AVAILABLE

Check here for available positions with the National Weather Service.

NEWSLETTER INFO

IMPORTANT NOTICE ABOUT THIS NEWSLETTER

This newsletter is used as the primary information source for current and upcoming events, announcements, awards, grant opportunities, and other happenings in our department and around campus. Active links to additional information will be provided as needed. Material for inclusion in the newsletter should be submitted to Cheryl Pierce **by 5:00pm on Thursday of each week for inclusion in the Monday issue.**

For answers to common technology questions and the latest updates from the EAPS Technology Support staff, click here. As an additional resource for information about departmental events, seminars, etc., see our departmental calendar.