

LARAMIE HIGH TIDINGS

ANNUAL NEWSLETTER OF THE DEPARTMENT OF ATMOSPHERIC SCIENCE

AUTUMN 2025



The new NSF UW King Air Research Aircraft shortly after its arrival at the UWYO Flight Facility

UPDATE ON THE NEW NSF-UW KING AIR

The last year and half have been busy for the new NSF UW King Air Research Aircraft. As many of you know, the new King Air was delivered to the University in late summer, 2024. With all of the major modifications complete, we held a celebration in late fall 2024 that included an Open House, a dinner with invited speakers, and an official Ribbon Cutting with guests from the upper University Administration and the Board of Trustees.

The dinner included alumni and friends of the department, retired faculty and staff, Program Managers from NSF, and representatives from Avcon (the company that partnered with the University to design and complete the modifications). The celebration included presentations from several individuals that have played a pivotal role in

airborne atmospheric research at the University of Wyoming since the early days of the department. A recording of the presentations from that evening can be found here:

<https://youtu.be/lct1VJHeVNc>

Another major milestone was accomplished in mid-2025 when we received the FAA certification (STC; Supplemental Type Certificate) for the modified aircraft. This was a major milestone and the single biggest risk/unknown in the development phase for the new aircraft. With the certification behind us our engineering and science teams have been focused on readying the aircraft for its first test flights. This fall, research infrastructure such as cabling, power distribution cabinets, data system and displays, etc., are being installed and certified. Some of the standard facility

instruments to measure temperature, winds, pressure, and aircraft state are scheduled to be flight tested at the end of this year and the plane will then be ready for preparation and equipment installations leading up to its first research field campaign scheduled for summer of 2026.

Progress with the next-generation UW King Air can be tracked at

www.uwyo.edu/atsc/uwka/



The official ribbon cutting for the NSF UW King Air. VP for Research Parag Chitnis, President Ed Seidel, Chairman of the Board of Trustees Kermit Brown, and ATSC Department Head Jeff French celebrate the arrival of the new King Air.



Jeff French cracks a bottle of champagne across the nose of the aircraft as part of the Ribbon Cutting ceremony. (Photo courtesy of Tony Bergantino)



HOW TO GIVE TO THE UW DEPARTMENT OF ATMOSPHERIC SCIENCE

Click [here](#). Choose your amount and make sure to check the Department of Atmospheric Science! Please contact us (jfrench@uwyo.edu) if you'd like to further discuss donating to the Department. Make the difference you like to see. Thanks!

MESSAGE FROM DR. JEFF FRENCH, DEPARTMENT HEAD



Greetings and welcome to the 2025 addition of the Laramie High Tidings, the newsletter from the University of Wyoming Department of Atmospheric Science. After a one-year hiatus, we are back to report on the many exciting happenings and developments within the department. The department continues to grow, at the beginning of fall 2025, we were home 58 individuals that

included 24 MS/PhD graduate students, 7 tenure-track/tenured faculty, and 27 post-docs, research scientists, engineers, technicians, and other professional staff. We anticipate growing even more as we move into 2026 with the addition of more post-docs and research scientists. To support all of these positions, the department continues to be very successful in attracting competitive grants at the state and national level, some of these projects you will read about in this issue.

Over the past two years there have been many exciting happenings in the department. Some of these include the arrival and certification of the new NSF UW King Air Research Aircraft, the revitalization of the Elk Mountain Observatory, and the US CLIVAR workshop, all highlighted in this newsletter. We have also seen the successful completion and awarding of 16 graduate degrees, including 6 PhDs, with our students going on to private companies, public service, and prestigious academic and government agencies across the world. Other measures of our students' success include awards that our students receive, many of which you will read about this issue. Of course, when we're not working on new projects, publishing papers, and making new discoveries, we are enjoying all of the wonderful things that Laramie and Wyoming have to offer, such as beautiful fall weather to enjoy our annual Picnic/Pig Roast!

Over the past year, I've had an opportunity to meet many of the friends and alumni of the department. Some I've been able to reconnect with as old friends and colleagues, while others I've met for the first time. I encourage all of you to reach out and tell us how you're doing, drop by our department table at the career fair at the upcoming AMS Annual meeting, or stop in the department if you happen to be passing through Laramie. Finally, I want to thank all of you who have supported the department with donations in the past years. These funds help support student activities such as travel to national conferences, internal student awards, renovations of department space, and activities to develop a positive department culture. If you would like to support the department now or in the future, you'll find two links at the end of this newsletter, one for a direct donation and another to purchase department branded-gear.

NSF ASCEND

By Bart Geerts
Professor

In early 2024, a consortium of universities in the Front Range and the U. Wyoming won a 10-year, \$160M Engine award from the NSF Technology, Innovation, and Partnerships Directorate.

Asst. Prof. Stefan Rahimi and Prof. Bart Geerts, in collaboration with CSU (Prof. Kristen Rasmussen) were awarded a one-year seed grant from this CO-WY Engine, called NSF ASCEND, to help CO and WY build resilience to weather and water extremes in a globally warming climate. This grant, plus heavy use of the Wyoming allocation on the NCAR Wyoming Supercomputer, enabled us to build a 1.3 km resolution climate reconstruction across the Rocky Mountain region (RM1.3), 1985-2062, with future conditions informed by a CMIP6 ensemble mean global climate model (GCM) dataset, as well as several CMIP6 GCM dynamic downscalings across the West and the continental US.

NSF ASCEND supports research that has the potential to address real community needs and to translate into commercial applications. Through ASCEND, we landed a contract to build the 2026 Colorado Climate Preparedness Roadmap for the CO Governor's Office, and more use-inspired projects are in the pipeline.



ELK MOUNTAIN GOES TO THE BOARD OF TRUSTEES

By Daniel McCoy
Assistant Professor

and Tony Bergantino (Figure 3), live video and meteorology from Elk Mountain are available for the public at

<https://www.uwyo.edu/atsc/research-facilities/emo.html>.



Scouting the road to the top as the first snows melt in July.

It has been an extremely eventful year for the efforts to revitalize Elk Mountain. We started the year with the observatory building firmly in mothball with no electrical power, no connectivity, and an unclear path towards revitalization. We ended the year with the first data streams in two decades coming down

from the observatory and an encouragement from the UW Board of Trustees to revitalize the observatory. This was enabled by a generous seed grant from the Science Initiative (SI) and volunteered time from ATSC faculty and staff.

The SI seed grant enabled us to hold an August workshop of external experts from academia, national labs, industry, and philanthropy as well as faculty across UW units to pose the question “should we revitalize Elk Mountain”. The answer was an enthusiastic yes with applications across atmospheric science, hydrology, geology, ecology, and botany suggested by attendees.

Encouraged by the workshop, we delivered a full report to the UW administration and set to work starting remote weather measurements. Following Herculean efforts by Matt Burkhart



Matt Burkhart set to install instrumentation on the Schaeffer Ridge tower under the watchful gaze of the department chair and VP Chitnis.

Following widespread enthusiasm from the university community and support from VP of Research Parag Chitnis, Interim Dean Danny Dale, and Interim Associate Dean for Research and Technology Saman Aryan, we submitted a request to present to the Board of Trustees during their November meeting. This was met with strong encouragement from the Board of Trustees to move forward with

revitalization efforts and return in spring to present a full budget to support updating facilities alongside plans for a faculty science director and support staff.

We are working actively with operations to develop a full picture of revitalization costs and are developing a proposal for research and education center to utilize the unique opportunities provided by Elk Mountain.



Attendees at the summer 2025 workshop to scope the revitalization of Elk Mountain.

SCIENTISTS CONVENE IN LARAMIE TO DISCUSS THE IMPACT OF MICROSCALE PROCESSES ON MACROSCALE UNCERTAINTY

By Daniel McCoy
Assistant Professor

Reliable predictions of what the planet will look like months to years in the future is a critical need for decision makers. This is the purview of Earth system models (ESMs). Due to their prediction time scale, ESMs have a spatial resolution on the order of 10s to 100s of kilometers. Simultaneously, the majority of prediction uncertainty in ESMs originates at the microscale with processes like falling snow flakes and nucleating aerosol particles. How do we bridge this scale gap? Supported by US-CLIVAR, 120 scientists gathered in Laramie in October 2024 to grapple with this problem. The workshop titled Micro2Macro: Origins of Climate Change Uncertainty lasted 2.5 days and asked questions ranging from “How do we explore model uncertainty space?” to “How do we plan field campaigns?” and many more in between. The workshop report was delivered by the co-chairs Daniel McCoy and Rob Wood to federal program managers from NSF, DOE, ONR, and NOAA and will be available online in typeset form at <https://usclivar.org/meetings/micro2macro> in early 2026.



MDR-NOW

By Masanori Saito
Assistant Professor

Dr. Masa Saito has been awarded a four-year grant totaling \$1,080,636 from the National Science Foundation to study the optical properties of mineral dust aerosols. Mineral Dust Research in Nevada, Oklahoma, and Wyoming (MDR-NOW) is an inter-jurisdictional collaborative EPSCoR project with a total budget of \$5.2M, and researchers and students will not only study how mineral dust aerosols interact with light; they also will consider how that knowledge can be applied to real-world problems.

“What this project adds is a focus on how the specific

mineral composition and shape of each dust type changes the way it interacts with sunlight and laser light -- information that’s critical for characterizing dust from satellites, forecasting dust storms and understanding its role in heating or cooling the planet,” Saito says. The research is a bridge between basic science of dust and real-world applications for health alerts, climate prediction and infrastructure protection. The UW team will capitalize on strengths in theoretical light-scattering simulations and particle morphology modeling of dust particles. This work will feed into collaboration across states, drawing on the specific strengths of each partner in the project. The other participating institutions in the project are the Desert Research Institute and Truckee Meadows Community College, both in Nevada, the University of Oklahoma, and Central Wyoming College.

PROCEED RENEWED FOR \$3M

By Daniel McCoy and Dana Caulton

Following an initial \$1M seed grant from DOE, Perturbed Physics Ensemble Regression Optimization Center for ESM Evaluation and Development (PROCEED) has been selected for the first of two renewals for a total of \$3M over two years. Through this renewal in funding PROCEED will continue to deliver on its mission of improving our understanding of seasonal to decadal predictability in the DOE Earth System Model (ESM) by leveraging Atmospheric Radiation Measurement (ARM) data. Grant Co-PIs Caulton and McCoy are joined by Shane Murphy as well as core research scientists Aerenson, Brown, and Nugent who participated in the renewal process as well as external collaborations, with the University of Hawaii at Manoa (Jennifer Griswold and Giuseppe Torri), the Pacific Northwest National Lab, and the Lawrence Livermore National Lab. While phase 1 of PROCEED focused on building computational infrastructure and piloting techniques studying aerosol-cloud interactions, phase 2 will deliver on questions ranging from atmospheric oxidants to extreme weather.

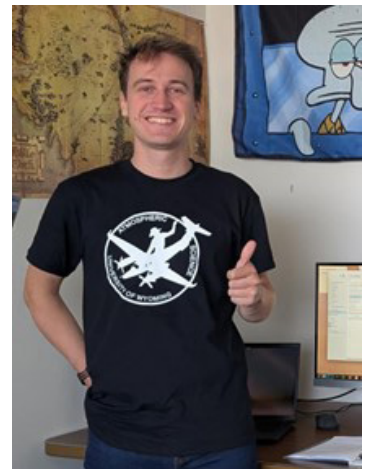


A STUDENT FROM GERMANY VISITED ATSC IN THE SUMMER

By Masanori Saito
Assistant Professor

Thomas Oppermann, a PhD student at the Leibniz Institute for Tropospheric Research (TROPOS) in Germany, visited the department from July 14 to October 17, 2025, as a Visiting Scholar. He worked with Dr. Masa Saito, an Assistant Professor, on the optical properties of mineral dust particles for use in remote sensing applications, through a collaborative project between UW and TROPOS. "It was my pleasure working with Thomas. During the three months of visit, I have always been impressed by his motivation, dedication to the project, and hard work," Saito says.

Thomas also enjoyed interactions with people in the department and outdoor activities in Laramie and neighboring areas. He looks back on his fulfilling three-month stay as follows: "This summer, I had the wonderful opportunity to visit the University of Wyoming. Not only was this joint project very productive and instructive for my future work, but also I enjoyed living in Laramie. I met a lot of nice people, visiting local bars or enjoying the nearby outdoors in Wyoming and Colorado with them. I especially enjoyed going climbing or scrambling in Vedauwoo and visiting Medicine Bow Peak with other grad students from the department. I want to thank everyone from the department for the hospitality."



ALUMNI NEWS

We always like to hear from you. If you have something new to share with the Department and other alumni, post it on our FaceBook page, or email Charlotte While at cfoster6@uwyo.edu.



Graduate student Victoria Wright aboard the DC-8.



Dana Caulton and Victoria Wright in Seoul, South Korea.



The ASIA-AQ team in between the NASA G-III and DC-8.

ASIA AQ FIELD CAMPAIGN

By Dana Caulton
Associate Professor

The University of Wyoming participated in the international ASIA-AQ (Airborne and Satellite Investigation of Asian Air Quality) field campaign, a major multi-agency effort led by NASA in partnership with national organizations across Asia to improve understanding of urban and regional air pollution. The campaign took place from January through early April 2024, with aircraft and ground-based measurements conducted in the Philippines, Taiwan, South Korea, and Thailand. Dr. Caulton served as the principal investigator for UW's probes, overseeing UW's ethane measurements aboard the now-retired NASA DC-8. Ethane is a valuable

tracer for distinguishing anthropogenic fossil-fuel emission sources, making these observations an important component of the mission. Over 25 instrument groups participated in the mission quantifying hundreds of unique compounds creating a rich dataset that can be analyzed for years to come. Victoria Wright participated in the full campaign, gaining extensive field experience and collecting the dataset that now forms the core of her thesis research. She is currently in her third year of her PhD and will present her ASIA-AQ results in a talk at the 2026 AMS Annual Meeting.

NEWS FROM AROUND THE DEPARTMENT

NEWS FROM AROUND THE DEPARTMENT: WELCOMES, PROMOTIONS AND AWARDS

Since our last newsletter our department has grown significantly. We've welcomed a new pilot (Richard Roush) who joined our team in mid-2024 from Grand Junction Colorado, and two new aircraft mechanics (Tom Pierce and John Bryant), who join in mid- and late-2024, respectively. Some of you might remember Tom, as he worked for the department in the early 2000's. He spent more than a dozen years with L3 working on King Airs prior to returning to UW. John, a Wyoming native, joined us from Straight Flight based out of Centennial Airport in Denver.

Our research science team also grew with the addition of Adam Majewski and Owen Cruikshank. Adam received his PhD from our department in late 2023 and is now leading the effort on cloud physics measurements on the new King Air. Owen completed his PhD at Montana State University in Bozeman where he worked on the development of the NCAR/EOL MicroPulse DIAL (Lidar). Owen is leading the effort in the development and deployment of the King Air Facility Lidars.

Several post-doctoral researchers joined the department over the last two years: Travis Aeronson (PhD, U Washington), Hunter Brown (PhD, U Wyoming), and Jacqueline Nugent (PhD, U Washington) are all working with Asst. Professor Daniel McCoy and Assoc. Professor Dana Caulton. Jeff Nivitanont (PhD, U Wyoming) is working with Professor Shane Murphy, Weichen Liu (PhD, U Science and Technology of China) and Fanghe Zhao (PhD, Georgia Institute Tech) are working with Asst. Professor Stefan Rahimi.

Finally, there have been three promotions in the department over the last two years, Dr. Shane Murphy was promoted to Full Professor beginning September 2024, Dr. Jeff French was promoted to Full Professor beginning September 2025, and Dr. Dana Caulton was promoted to Associate Professor with Tenure beginning September 2025. In addition to the promotions, Drs. Caulton and McCoy each received the UW Scholarly Achievement Award for early-career faculty and Dr. French received the UW Presidential Scholarly Award.

STUDENT AWARDS

By Victoria Wright and Eden Koval

Over the past year or so, numerous students in the department have received recognition for their work done at UW. Those students and their awards are listed below.

External Awards:

Brianna Hauke received the **2025 Inaugural Marian H. Rose Scholarship**.

August Mikkelsen received the **DOE Office of Science Graduate Student Research Award**.

Conference Presentations:

Shane Martrich received an **Honorable Mention in the Poster Presentation Category of the 2nd symposium on Cloud Physics at the 2025 AMS Annual Meeting** – “Evaluation of Liquid Water Content Measurements and Survey of Phase Partitioning in Marine Boundary Layer, Cold-Air Outbreak Clouds during CAESAR”.

Evan Newman received **2nd Place in the Oral Presentation Category of the 2nd Symposium on Cloud Physics at the 2025 AMS Annual Meeting** – “Airborne Observations of Polar Low Development During the CAESAR Field Campaign”.



Evan Newman's presentation at the 2nd Symposium on Cloud Physics at the 2025 AMS Annual Meeting

NEWS FROM AROUND THE DEPARTMENT

Victoria Wright received an **Outstanding Student Presentation Award** at the AGU 2024 Fall Meeting – “Airborne Observations of Ethane from Aerodyne’s Tunable Infrared Laser Direct Absorption Spectrometer during ASIA-AQ”.



Jeff French (right) presenting Francis Afrifa with the Sutter-Family Student of the Year Award.

Graduate Poster Award – “Long-term Methane Emissions in the Oil and Gas-producing Upper Green River Basin, Wyoming”.

Cam Cousino received the **University of Wyoming Atmospheric Science 2025 Fall Graduate Poster Award** – “Controlled Comparison of MPAS-A and WRF: Insights from a Cold Season Mid-Latitude Cyclone”.

Brianna Hauke received the **University of Wyoming Atmospheric Science 2025 Fall Graduate Poster Award**



(Far right) Jeff French presenting the 2025 Fall Graduate Poster Award to (left to right) Brianna Hauke, Cam Cousino, and Max Appelbaum

Internal Awards:

Francis Osei Tutu Afrifa received the 2024-2025 Sutter-Family Student of the Year Award for his excellent teaching assistance, hard work, and dedication to the UW ATSC Department.

Max Appelbaum received the **University of Wyoming Atmospheric Science 2025 Fall**

NEW AND GRADUATED STUDENTS

The following graduate students joined us this Fall semester:

- **Eliza Abbamonte**, B.S. from University of Illinois (Advisor: Masa Saito)
- **Kinsale Day**, B.S. from University of Wyoming (Advisor: Stefan Rahimi)
- **Kate Kwasnick**, B.A. from University of Colorado-Boulder (Advisor: Shane Murphy)
- **Grant Schlaff**, B.S. from Michigan Technical University (Advisor: Daniel McCoy)

The following students received their graduate degrees in 2024 - 2025.

MSc theses:

- **August Mikkelsen**, MSc, April 2024: Constraining Aerosol-Cloud Adjustments with Surface Observations. (Advisor: Daniel McCoy) Currently a PhD student in the Dept.
- **Nathaniel Oteng**, MSc, July 2024: Marine Cold Air Outbreak Convective Cell Life Cycle Study: Observation and Modeling. (Advisor: Bart Geerts) Currently a computer science teacher in the Denver School District.
- **Morgan Shimkus**, MSc, November 2024: A new design for the Wyoming droplet generator for laboratory testing and evaluation of airborne cloud probes. (Advisor: Jeff French)
- **Francis Osei Tutu Afrifa**, MSc, Dec 2024: A case study of cold-season emergent orographic convection and its impact on precipitation: Mesoscale analysis. (Advisor: Bart Geerts) Currently a PhD student in the Dept.
- **Kaitlin Smith**, MSc, Dec 2024: Evaluation of CONUS404 cold-season precipitation and snowpack over the mountainous western United States. (Advisor: Bart Geerts) Currently a PhD student in the Dept.
- **Eden Koval**, MSc, March 2025: Airborne Observations

NEWS FROM AROUND THE DEPARTMENT

of Secondary Ice Production Amidst Supercooled Freezing Drizzle in a Shallow Precipitating Frontal Cloud. (Advisor: Jeff French) Currently a PhD student in the Dept.

- **Evan Newman**, MSc, April 2025: Airborne Observations of the Vertical Structure of a Shallow Polar Low in the Norwegian Sea. (Advisor: Bart Geerts)
- **Nathan Ribar**, MSc, May 2025: Characterization of Aeris Ultra CH₄/C₂H₆ and N₂O/CO Analyzers. (Advisor: Dana Caulton) Currently working for Trihydro Corporation.
- **Ebenezer Boakye Yiadom**, MSc, Jul 2025: Development of a Lidar Simulator for the Characterization of the Vertical Profile of the Microphysical Properties of Mineral Dust Plumes. (Advisor: Masa Saito) Currently a PhD student in the Dept. of Earth, Environmental, and Geographical Sciences at the University of North Carolina Charlotte.
- **Zakkary Trader-Gough**, MSc, November 2025: Evaluation of Drone-Based Techniques to Quantify Methane Emissions from Oil and Natural Gas Facilities. (Advisor: Shane Murphy)
- **Elena Goodspeed**, MSc, December 2025: Source Apportionment of Particulate Matter in Yellowstone National Park. (Advisor: Shane Murphy)

PhD dissertations:

- **Kristen Pozsonyi**, PhD, June 2024: Quantification of Methane and Hazardous Air Pollutants from U.S. Oil and Natural Gas Basins. (Advisor: Shane Murphy). Now at Colorado Department of Public Health and the Environment.
- **Jeffrey Nivitanont**, PhD, April 2024: Bridging the Gap: Reconciling Top-Down Methane Measurements with Bottom-Up Inventories in Oil and Natural Gas Production. (Advisor: Shane Murphy). Now a Postdoctoral researcher in the Dept.
- **Chris Hohman**, PhD, August 2025: Interactions of Glaciogenic Seeding with Wintertime Orographic Clouds.

(Advisor: Jeff French). Now a Postdoc at ETH Zurich.

- **Ci Song**, Understanding aerosol-cloud interactions using models and observations. (Advisor: Daniel McCoy). Now a Postdoc with Casey Wall at Stockholm University.
- **Geethma Werapitiya**, The role of the hydrological cycle on the cloud feedback. (Advisor: Daniel McCoy). Now a postdoc with Florent Brient at Laboratoire de Météorologie Dynamique in Paris.



Don't forget to check out the Wyoming Water Resources Data System and State Climate Office for all of your Wyoming climate and water resources!

<https://www.wrds.uwyo.edu/>

The Water Resources Data System (WRDS) is a clearinghouse of hydrological and climatological data for the State of Wyoming. WRDS is funded by the Wyoming Water Development Office and is a part of the Department of Atmospheric Science at the University of Wyoming.

WRDS serves as the Wyoming State Climate Office (SCO) and, as such, we provide a variety of services ranging from the development of enhanced drought-monitoring products to the online dissemination of water resources publications. WRDS/SCO also supports a variety of stakeholder groups by assisting in the development of the State Water Plan and helping to coordinate long-term monitoring efforts throughout the region.



Find more information and updates at <https://www.uwyo.edu/atsc/>

THE ANNUAL WELCOME BACK PICNIC/PIG ROAST

Many of our alumni and former employees fondly remember attending the fall 'Welcome Back Picnic' which traditionally includes a pig roast, and for those hardier folks, a campout the night before, at the Happy Jack recreation area just east of town. This year's event was held on a beautiful mid-September day. More than 60 people attended including current students, employees (current and former), and some of the nearby alumni. At right are some photos from the event,



CHECK OUT OUR NEW ONLINE GEAR STORE!

Support Atmospheric Science through wearables- proceeds go to supporting student activities and breakroom snacks. All orders are delivered on-demand (i.e. no wait for the order to finalize) and the online store is open year-round.



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<https://atscuw.printful.me/>