UNIVERSITY OF NORTH DAKOTA ATMOSPHERIC SCIENCES

NORTHERN LIGHTS

Issue 12

FALL 2024

Wanda Seyler, Editor

Letter from the Interim Chair, Matt Gilmore

Welcome to the Fall 2024 edition of our yearly newsletter. This has been a year of positive changes with the hiring of 6 assistant professor faculty; obtaining research grants; and providing experiential learning opportunities to students in both the classroom and research realms. It was also a sad year as we said goodbye to our retiring Teaching Associate Professor, Fred Remer and Assistant Professor Jake Mulholland who has recently moved to the University of New York at Albany.

Departmental goals this coming year will be to recruit one tenure/tenure-track (open-rank) faculty member to begin in Fall 2025 so that we will be better able to teach the graduate courses listed in our catalog, as well as provide more GRAs for graduate students.

We welcome our recently-hired tenure-track Assistant Professors, Drs. Daile Zhang, Jordan Christian, Jake Carstens, & Jared Marquis and Research Assistant Professors, Drs. Marwa Majdi and Mounir Chrit and our new part –time instructor, Katie Sims.

Our faculty with help from undergraduate and graduate students made two trips chasing the eclipse and also held a Thunderstorm Chasing class.

We congratulate Dr. Aaron Kennedy on his being named a recipient of the Fulbright Iceland-National Science Foundation Artic Research Grant through the Fulbright U.S. Scholar Program for the 2024-2025 competition. He and his daughter, Zoey, will be spending the next nine months in Iceland.

In closing, we thank the generous contributions of our friends, alumni, and industry partners who have continued to fund our student scholarships, including the Leon F. Osborne Science in Society Award, the Carlton Bjerkaas scholarship, Frank Bavendick Meteorology Scholarship, the Science Engineering Associates Scholarship, and also donating to sponsor a weather balloon. For more information on how you can contribute to our program, please see the last page.

Matt

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104TH AMERICAN METEOROLOGICAL SOCIETY ANNUAL MEETING, STUDENT CONFERENCE AND CAREER FAIR

There were 29 faculty, students and staff representing UND Atmospheric Sciences at the 104th Annual Meeting of the American Meteorological Society held the end of January 2024 in Baltimore, Maryland. Administrative Secretary, **Wanda Seyler**, along with **Dr. Aaron Kennedy**, **Dr. Montana Etten-Bohm** and Ph.D. graduate student **Alec Sczepanski** covered the UND Atmospheric Sciences table at the Career Fair during the Student Conference visiting with prospective graduate students from all over the U.S. and Canada. Eight students and five faculty presented at AMS.

Dr. Aaron Kennedy presented two talks at the AMS Student Conference titled "*Convos with Professionals"* and *"Elevator Speech Workshop*". He presented a talk at the Annual Meeting titled "*Development of an affordable and lightweight particle imager for balloon and UAS deployments*" and presented a poster titled "*Particle Imaging on a Budget: Observations and Lessons Learned from OSCRE Deployments at SAIL and SPLASH"*. **Dr. Montana Etten-Bohm** presented a talk titled "*What is ungrading*?" **Dr. David Delene** presented a poster titled *"Cloud Observations and Processes in Sea Breeze Induced Convection over South-West Saudi Arabia"*. He was a co-author on many other presentations. **Dr. Marwa Majdi** presented a poster titled "*Automatic Fog Detection and Visibility Estimation from Camera Images Using Deep Learning Features for Aviation Operations Involving Uncrewed Aircraft Systems (UAS)"*. **Dr. Mounir Chrit** presented two talks titled "*Environmental Hazard Risk Assessment for Unmanned Aircraft System Operations"* and *"Toward Trustworthy Wind* and *Turbulence Predictions for Advanced Air Mobility"*.

Presentations by Ph.D. graduate students were a poster by **Alec Sczepanski** titled *"Synthesis of In Situ and Remotely Sensed Observations in North Dakota to Understand Northern Great Plains Ground Blizzards"*; a poster by **Blake Sorenson** titled *"Model- and Observation-Based Climatology of Arctic Aerosols and Their Climate Impacts";* a talk by **Christian Nairy** titled *"Chain Aggregate Particles in Mid-to-upper Tropospheric Clouds during IMPACTS – 15 January 2023 Case Study"*; and a poster by **Joseph Gufford** titled "*An Investigation Into Impacts of Microphysics Parameterization Schemes On Radiation Fog Within a Large Eddy Simulation Framework, to Small Unmanned Aircraft System Operations"*.

Presentations by M.S. graduate students were a poster by **Talia Kurtz** titled "*Meteorological Drivers of Blowing Snow Events at the ARM North Slope Alaska Site*"; a poster by **Taylor McHone** titled "*An Evaluation of NAAPS during the East Coast Smoke Event in June 2023*"; a talk by **Ethan Weisberger** titled "*Investigating Cold Pool Impacts on Supercell Thunderstorm Development and Updraft Characteristics*"; and a talk by **Clay Wooton** titled "*Investigating the Impact of Urban Areas on Quasi-Linear Convective Systems"*.

Undergraduate student **Blake Rafferty** presented a poster titled "*Improving Graphical Communication of Winter Storm Forecasts"*.

An Atmospheric Sciences Alumni Reception was held Tuesday evening at AMS with many alums in attendance along with current students and faculty. Administrative Secretary **Wanda Seyler** was the host of the reception.

Those in attendance from UND Atmospheric Sciences department were <u>*Faculty*</u>**, Drs. Aaron Kennedy, Montana Etten-Bohm and David Delene**, **Mounir Chrit** and **Marwa Majdi**; <u>*Staff:*</u> **Wanda Seyler**; <u>*Ph.D. Graduate Students*</u>: **Aaron Scott, Alec Sczepanski, Natalie Midzak**; **Christian Nairy;** <u>*M.S. Graduate Students*</u>: **Talia Kurtz, Taylor McHone, Lauren Vocke**, **Ethan Weisberger, Lynnlee Rosolino,** and **Joseph Gufford.** <u>*B.S. Students*</u>: **Audrey Bestland, Joseph Gonzalez, Norah Tomasouw, Jonathan Polmatier, Conrad Slad, Steven Sobus, John Tabor, Abbygail Wiekamp, Nicholas Camp, Shelby Ebertowski, Bryson Vetch, Elan Azriel, Addison Espy** and **Blake Rafferty**, UND Student Chapter of AMS President.

See you in New Orleans!

2024 AMS — Baltimore, Maryland
Atmospheric Sciences Career Fair

Front row L to R: Lauren Vocke, Alec Sczepanski, Joseph Gonzalez, Montana Etten-Bohm, Audrey Bestland, Shelby Ebertowski, Wanda Seyler, and Aaron Scott

Middle row: David Brannon with Bryson Vetch on his back, Norah Tomasouw, Jonathan Polmatier, Elan Azriel, Aaron Kennedy, Emily Maddox, Blake Rafferty and Abbygail Wiekamp

Back row: Nicholas Camp, Steven Sobus, Devin Bissell, David Singewald, John Tabor and Conrad Slad

2024 AMS — Baltimore, Maryland
Atmospheric Sciences Alumni Reception

Back Row L to R: *Kevin Mahoney Jr., Jason Naylor, Alex Zarnowski, Alec Sczepanski, Corey Amiot, Conrad Slad, John Tabor, Christian Nairy, Brian Horan, David Brannon, Steve Sobus, Blake Sorenson, Nick Anderson, Blake Rafferty, Aaron Kennedy, Joe O'Brien, Jason Anglin, Devin Bissell, Jamie Wolff, David Singewald, Andy Newman, Ashely Stanfield, Lance Wilson, Rob Handel, Joseph Gufford, Clay Wooton*

Front Row L to R: *Nicole Stevens, Taylor McHone, Emily Maddox, Lauren Vocke, Montana Etten-Bohm, Lynnlee Rosolino, Talia Kurtz, Shelby Ebertowski, Audrey Bestland, Erica Dolinar, Natalie Midzak, Trece Hopp, Kathryn Newman, Paul Kucera, Lance Wilson, Ethan Weisberger, Wanda Seyler* and *Artemis*, Trece's psychiatric service dog.

35th Annual Awards & Scholarship Banquet

The 35th Annual Atmospheric Sciences Awards & Scholarship Banquet was held on Friday, April 26, 2024. The speaker was **Dr. Robert Kraus, Dean of the John D. Odegard School of Aerospace Sciences.**

These awards were presented to the following undergraduates by the faculty:

- *Outstanding Freshman* – **Conrad Slad**
- *Outstanding Student Broadcaster* – **Leighton Lee**
- *Outstanding Undergraduate Teaching Assistant* – **Eli Schoenike & Reece Wagner**
- *Outstanding Graduate Teaching Assistant* – **Ethan Weisberger**
- *Outstanding Undergraduate Student Researcher* – **Nicholas Camp**
- *Outstanding Sophomore* – **Carson Turner**
- O*utstanding Junior* - **Kyra Bahls**
- *Bruce A. Smith Aerospace Scholarship* - **Payton Belzer**
- *John D. Odegard Aerospace Sciences Scholarship* – **Sarah Kempel, Tyler Stebbins & Abby Wyss**
- *Outstanding Graduating Senior* – **Kassidy Kjos**
- *Outstanding Service to the Department* – **Shelby Ebertowski**
- *Science Engineering Associates Scholarship*— **Conrad Slad & Kellie Thrower**
- *Carlton Bjerkaas Atmospheric Sciences Scholarship* – **Owen Meisner, Samuel Halvorson, Kade Ydstie & Jenna Post** (incoming Fall 2024 freshman)
- *Frank Bavendick Meteorology Scholarship* - **Quenton Haffner**
- *Leon F. Osborne Science & Society Award* – **Carson Turner**

The "*Faculty Award" to the Outstanding Undergraduate* was presented to B.S. senior **Blake Rafferty** in December 2023. This included a scholarship to be used for his last undergraduate semester at UND.

The ASGSA (AtSc Grad Student Association) gave out the following awards to graduate students:

- *Isallobar Award:* **Brady Adams -** Award given to the grad student who had the greatest pressure tendency to keep the Isobar stocked;
- *"Ope, You Betcha" Award:* **Cole Hood -** Award given to the grad student from out-of-state who acclimated quickest to life in North Dakota;
- *"Department StackOverflow"* **Award: Christian Nairy (PhD) and James Klinman (MS) -** Award given to the grad students who provided the most coding help;
- *Most Active ASGSA Member Award***: Deborah Hershey -** Award given to the grad student who attended the most ASGSA events;
- **"***Furthest, Most Adventured Traveler" Award:* **Levi Newell -** Award given to the grad student from out-of-state who traveled furthest to attend UND for grad school;
- *"Would-be Jeopardy! Champion" Award:* **Emily Gosney -** Award given to the grad student most likely to draw connections between different classes and academic fields;
- *"Sieve" Award:* **Patrick Britt -** Award given to the grad student with most UND team spirit;
- *"Snowflake Collector" Award:* **Alec Sczepanski -** Award given to the grad student most likely to get excited over the tiniest snowfall.

The UND AMS Student Chapter voted to give the following faculty awards:

- *Best Freshman/Sophomore Professor:* **Fred Remer**
- *Best Junior/Senior Professor:* **Jared Marquis**
- *Best Academic Advisor*: **Montana Etten-Bohm**
- *Golden Reamer Award:* **Fred Remer**
- *7/11 Most Available Professor:* **Fred Remer**
- *Best Graduate Student Teaching Assistant:* **Emily Gosney**
- *Quick Story Award:* **Bruce Lee**
- *Department Powerhouse Award:* **Sue McWilliams & Wanda Seyler**

Congratulations to all!

2024-2025 AMS Officers

L to R: Elan Azriel, Caroline Solseth, Owen Meisner, Carson Turner, Kellie Thrower, Yibo

Recent AtSc Graduates

December 2023 M.S. Graduate

Jennifer Moore Michael Willette

May 2024 B.S. Graduates

Audrey Bestland	David Brannon
Payton Braun	Nicholas Camp
Calista Jerome	Kassidy Kjos
Marisa Perez	Blake Rafferty
Steven Sobus	Alex Troxel
McCoy VandeHoven	Reece Wagner
Abbygail Wiekamp	

May 2024 M.S. Graduates

Taylor Dolan Andrew Kramer
Brianna Kump Aanan Schlief

May 2024 Ph.D. Graduate

Natalie Midzak

August 2024 M.S. Graduates

Taylor McHone
Ethan Weisberger

UND-AMS Officers 2024—2025

President: **Carson Turner**

Vice President: **Kellie Thrower**

Secretary: **Caroline Solseth**

Treasurer: **Owen Meisner**

Student Liaison to Undergraduate Program Committee: **Yibo Chen**

Social Media Coordinator: **Elan Azriel**

Faculty Advisor: **Dr. Jared Marquis**

Incoming Graduate Students

The Fall of 2024 we will have five new graduate students working on their Master's. and two graduating master's student will continue on for their Ph.D.

They are:

- **Evelyn "Ev" Bohlmann**, a 2024 B.S. graduate of Valparaiso University from Ozark, Missouri
- **Kyle Gillett**, a 2024 B.S. graduate of Central Michigan University from Jackson, Michigan
- **Kassidy Kjos**, a 2024 B.S. graduate of UND AtSc from Froid, Montana
- **Mark McGarry Jr**, a 2024 B.S. graduate of the University of Northern Colorado in Greeley, from Reno, Nevada
- **Sydney Walters-VanGorden**, a 2022 B.S. graduate of Ohio University, from Pataskala, Ohio. After graduating she has been working as a Marine Meteorologist at WeatherNews, Inc. in Norman, Oklahoma
- **Andrew Kramer,** Lockport, Illinois**,** is a 2024 M.S. graduate of the University of North Dakota and is continuing on at UND for his Ph.D. working with **Dr. Mark Askelson**
- **Aanan Schlief,** Lowry, Minnesota**,** is a 2024 M.S. graduate of the University of North Dakota and is continuing on at UND for his Ph.D. working with **Dr. Jianglong Zhang**

Welcome Students!

UND AMS — THE NORTH DAKOTA STUDENT CHAPTER OF THE AMERICAN METEOROLOGICAL SOCIETY

Fred Remer Retires

Fred Remer grew up in Matawan, NJ which is on the New Jersey Bayshore. Fred started taking flying lessons in high school and soloed when he was 16 years old.

Fred studied meteorology at the University of Oklahoma as an undergraduate between 1977 and 1981. While he was there, he was employed by the National Severe Storms Lab as an undergraduate research aid in which he wrote programs that unfolded radar data (punch cards!) and he also took Polaroid pictures of the Doppler radar display during chase activities. Fred earned his flight certificates (commercial, instrument, flight instructor) while at OU and worked part-time as a flight instructor during his junior and senior years.

Fred flew as a flight instructor and charter pilot for a year in Trenton, NJ before he decided to return to college to further his education.

He attended the University of Wyoming to earn a Master's in Atmospheric Sciences, graduating in 1990. While a graduate student he analyzed airborne data obtained from the UW King Air research airplane and also continued to provide flight instruction and mountain flying check outs.

During the summer of 1987, he participated in the Greek Hail Suppression Project where he was employed as a radar meteorologist based in Larissa, Greece. He lived on the beach and worked only when it rained!

Fred came to UND in 1989 at the suggestion of his UW professor Wayne Sand. He was hired as a lecturer in the Atmospheric Sciences Department to teach contract airline pilots basic weather theory. He continued flying at UND as a part-time flight instructor and stage check pilot.

He was promoted to assistant professor in the Aviation Department in 1994 and developed electronic media for the aerodynamics and multi-engine courses.

In the spring of 1997 Fred was hired as the chief meteorologist at Weather Modification, Inc. in Fargo, ND. He managed all domestic weather modification projects for WMI and wrote proposals for many international projects. As a 'fringe benefit', he delivered and shuttled many cloud seeding airplanes from Fargo to their US project bases. He left WMI in 1999 to become a weekend broadcast meteorologist at KXJB TV4 in Fargo, ND.

In 2000, Fred returned to UND as an assistant professor and the Undergraduate Program Coordinator in the Atmospheric Sciences Department. He continued to provide fill-in broadcast meteorologist duties on KXJB and KVLY during the summer and weekends between 2000 and 2007. He was promoted to Associate Professor in 2007. He was the advisor for the Weather Update students who produce two daily weather shows during the school year.

Fred hasn't had much time for hobbies but aviation is an avocation he is passionate about. Fred is one-third owner of a 1977 Mooney 201 which is a fast and economical four-place single-engine airplane. One of his proudest and most satisfying achievements is that he taught his daughter, Tori, to fly in 2015. Fred is also in the Civil Air Patrol. He's looking forward to having more time to restore his 1974 VW Super Beetle Convertible. His other project in retirement is to build a garden railroad in the backyard. More traveling is also on the horizon.

Fred's research interests are aviation weather hazards, including icing and wind shear. He also holds an operator's certificate issued by the Weather Modification Association. He is also a frequent webinar presenter for the FAA Safety Team.

Congratulations on your Retirement Fred!

Fred's Retirement Party

Current AtSc Faculty L to R:

Bruce Lee
Cathy Finley
Montana Etten-Bohm
Jake Mulholland
Fred Remer
Aaron Kennedy
Matt Gilmore
Andy Detwiler
Jianglong Zhang;
missing was David Delene.

Fred with former Weather Update students who are now on-air meteorologists based in Fargo, North Dakota. L to R:

Shelby Ebertowski, Current Weather Update President and intern at KVLY—NBC

Max Mueller, Lead Meteorologist at KVRR—Fox news

Lydia Blume, Morning Meteorologist at WDAY-ABC

Dillon Vogt, Meteorologist at WDAY –ABC

Connect up with Atmospheric Sciences through Social Media

We invite you to keep in touch with the Atmospheric Sciences department by finding us on the following social media platforms:

- https://www.facebook.com/UNDATSC
- https://www.youtube.com/UNDAtmosphericSciences
- https://twitter.com/UNDATSC/
- https://www.instagram.com/undatmosphericsciences
- Facebook: AtSc Atmospheric Sciences Alumni
- Website: https://aero.und.edu/atmos

ALUMNI NEWS WANTED

We are looking for news about you to share with other alumni in our upcoming newsletters (information about your current position, significant achievements, family activities, etc.). Also if you could please send us your current e-mail address and address changes it would be appreciated. If you have any ideas or comments about the newsletter, please send them to Wanda at: wanda.seyler@und.edu.

Department News

Dr. Aaron Kennedy, Associate Professor and Graduate Program Director in Atmospheric Sciences, has been named a recipient of the Fulbright Iceland-National Science Foundation Artic Research Grant through the Fulbright U.S. Scholar Program for the 2024-2025 competition. Dr. Kennedy's selection reflects his leadership and contributions to society.

Dr. Kennedy will conduct research in Iceland hosted by the Icelandic Meteorological Office (IMO) at their avalanche forecast located in Ísafjörður. The primary goal of his Fulbright project is to bring methods of studying falling and blowing snow he has developed to Iceland and improve hazardous weather forecasting for avalanches. This Fulbright opportunity will serve as a technological demo to guide future efforts at the IMO and a thorough test of Dr. Kennedy's instrumentation and methods in a new climate. This project will help Dr. Kennedy develop expertise in Artic maritime and mountainous environments and expand his research internationally.

As a Fulbright participant, Dr. Kennedy will research, share knowledge, and foster meaningful connections across communities in the United States and Iceland. Recipients of Fulbright awards are selected in an open, merit-based competition that considers leadership potential, academic and/or professional achievement, and record of service. Their careers are enriched by joining a network of thousands of Fulbright alumni, many of whom are leaders in their fields. Notable Fulbright alumni include 62 Nobel Prize laureates, 89 Pulitzer Prize recipients, 80 MacArthur Fellows, and 41 who have served as a head of state or government. The Fulbright Program is the world's largest and most diverse international educational exchange program.

Dr. David Delene and **Dr. Andrea Neumann-Skow**, (UND AtSc Alum) along with former NDCMP intern and current M.S. Graduate Student **Lynnlee Rosolino**, participated in the third Saudi Aerosol-Cloud-Precipitation Enhancement Campaign (SARPEC) field project in Saudi Arabia.

They made two trips to Saudi. The first was conducted between October 18 and November 25, 2023. The second was between March 15—April 26, 2024.

The SARPEC field project was based out of the Thumamah, Saudi Arabia airport (OETH) The field project obtained observations on 15 research flights that are useful for determining the effectiveness of operational cloud seeding techniques for rainfall augmentation within the arid climates of the Kingdom of Saudi Arabia. Cloud penetrations were conducted at various levels (-10 °C, -15 °C, -20 °C) above cloud base to determine how liquid water content properties vary with vertical development and to observe the effects of ice crystal aggregation processes. The cloud penetrations focused on the developing regions of convective storms and obtained measurements in cloud updrafts.

This photo, taken in the fall of 2023, captures the UND Department of Atmospheric Sciences team's view as the team conducts weather-modification research while flying into clouds over or near Saudi Arabia. Photo courtesy of UND's Odegard School of Atmospheric Sciences.

PASSING OF ALUM TARA JENSEN

Tara Lee Jensen, age 55, lost her yearlong battle with pancreatic cancer on Thursday, September 5, 2024. She died peacefully in her home surrounded by her daughter, sister, husband and pets. The world loss a bright light and heaven gained an incredible angel.

Tara graduated in 1987 from Bloomington Thomas Jefferson High School. She was a cross-country skier who joined the varsity ski team in 7th grade. She also participated in Jefferson's marching band and marched in the 1987 Rose Bowl parade. She continued her education at the University of North Dakota and graduated with a Bachelor of Science degree in 1991. Her emphasis was Meteorological Studies, and she spent many hours mentoring fellow meteorological and aviation students. Tara moved to Ft Collins where she obtained a Master of Science Degree in 1993 from Colorado State University with an emphasis in aerosol/cloud interaction. Tara went on to work on becoming a Doctor of Philosophy (Ph.D.) candidate in Cloud Physics and later Data Science with a focus on statistics, verification and machine learning. Tara was highly engaged and respected in the atmospheric science research community. She spent more than 30 years of her life working on the betterment of weather prediction.

She loved her family immensely and recently posted on her daughter's birthday, she wanted to start a fundraiser for the National Pancreas Foundation to help research pancreas disease and early detection of pancreatic cancer, so that others can enjoy their families as long as they can. In lieu of flowers, please donate to the National Pancreas Foundation at pancreasfoundation.org

A memorial service was held at Mount Olivet Lutheran Church, 5025 Knox Ave S, Minneapolis, on Monday, September 16 at 100pm (CT). They set up a livestream for all her family, friends, and colleagues throughout the world. The link is https://mtolivet.org/live-on-sundays/

Alumni Gathering in Colorado

Alumni gathering at the wedding of Devin Bissell and David Singewald near Estes Park, Colorado on August 3, 2024.

All are UND AtSc graduates except for Gretchen and Wanda.

Top row: **Aaron Scott** (Devin's Best Man, 2017 M.S., Ph.D. student; **Michael Willette**, groomsman, (2023 M.S.); **Andrew Kramer**, 2024 M.S., Ph.D. student;

2nd row from top: **Dillon Vogt**, (2022 B.S.); **Cassidy Holth**, Attendant, (2022 B.S.); **Matt Tuftedahl,** (2019 M.S.); **Evan Rys**, (2021 B.S. & & BSA Commercial Aviation); **Caitlin Connell**, Attendant, (2021 B.S.);

3rd row from top: **Gretchen Mullendore**, former faculty, now at NCAR; **Nick Gapp**, groomsman, (2016 B.S., 2019 M.S.);

Front row: **Alec Sczepanski**, (2021 M.S., Ph.D. student); **Wanda Seyler**, AtSc Administrative Secretary; **Devin Bissell**, (UND AtSc B.S. 2020 grad and 2022 M.S. grad) and **David Singewald**, (UND AtSc B.S. 2022 grad).

UND AtSc Alumni Reception at New Orleans

To be held at the Hilton Riverside on Tuesday, January 14, 2025. More details will be sent out at a later date. If you know you plan to attend, please let Wanda know and she will make sure you get all the information.

New Faculty Hires

The Department of Atmospheric Sciences is pleased to announce that **Dr. Mounir Chrit** and **Dr. Marwa Majdi** have been promoted to Research Assistant Professors. They earned their Ph.D's. in Atmospheric Sciences at École des Ponts ParisTech in France.

Mounir Chrit's research focuses on addressing weather needs for Unmanned Aircraft Systems using trustworthy Artificial Intelligence, risk assessment, Research to Operations processes and Data Assimilation. He previously worked as a Postdoctoral Research Fellow at UND with **Dr. Mark Askelson** on projects with the Research Institute for Autonomous Systems (RIAS) and the FAA's center of Excellence for UAS Research (ASSURE) and received multiple grants to support his research. His interests outside of work are family time and music.

Marwa Majdi previously worked as a Postdoctoral Research Fellow at UND with **Dr. David Delene** on writing proposals targeting funds from federal and non-federal agencies, conducting several research projects, and mentoring graduate and undergraduate students in their research projects. Her research interests include atmospheric aerosols, cloud/fog microphysics, weather data processing, multiscale modeling, machine learning, and weather forecasting. Marwa leveraged her 6-year career in atmospheric sciences to develop several machine learning models applied to aviation weather, mainly the visibility and cloud ceiling camera-based machine learning system for Unmanned Aircraft Systems (UAS) operations that estimates visibility and cloud ceiling from camera images without deploying high-cost instruments. Her thesis focused mainly on improving Chemistry Transport Models' capabilities to simulate the impact of wildfires on the particulate matter budget in the Euro-Mediterranean region. In her free time, Marwa enjoys playing the oud, reading books, taking and editing photos, testing new cake recipes, listening to music, and spending quality time with her family. Mounir and Marwa have a two-year-old son, Jude.

We are pleased to announce that **Dr. Jared W. Marquis** was promoted to a tenure-track Assistant Professor starting Fall 2024! Jared received his PhD from UND in 2021 and currently works as an Assistant Teaching Professor at UND where he has taught several undergraduate and graduate courses. During his time at UND, Dr. Marquis developed the combined undergraduate/graduate ATSC-420 "Advanced Forecasting" course in conjunction with the Fargo-Grand Forks NWS. Dr. Marquis' research includes satellite data assimilation and remote sensing. Recently, Jared has been funded to collect upper-air observations during the 2023 and 2024 solar eclipses and study the impact of future climates on crop breeding efforts in North Dakota. Dr. Marquis' interests outside of work include coffee, sports, playing with his dogs, and spending time with his wife and first child born this spring.

Katie Sims has joined the AtSc Faculty as a part-time instructor. She earned her BS in Meteorology from the Metropolitan State University of Denver. She has worked in aviation as a flight instructor, 141 ground instructor, simulator instructor, written test proctor, pilot shop manager, scheduler, and training coordinator.

In 1999, Katie's flying journey started with gliders in Boulder, CO. She moved to powered aircraft and as a pilot and flight instructor (CFI/CFII/MEI). She has over 2400 hours total time and over 1900 hours dual given. Katie attained her CFI in 2010 and instructed at various flight schools along the Colorado front range. Her last job was teaching Initial Flight Training for the military in Pueblo, CO.

Katie and her family came to North Dakota in 2021 from Colorado and started a hobby farm. She has been a stay-at-home mom to 4 kiddos for the last 7 years. Her husband, John, works as a mechanic for UND Aerospace repairing aircraft. This is her first year teaching the Aviation Meteorology course at UND. Her passion is teaching weather and flying so she's very excited to be instructing this course.

New Faculty Hires

We are pleased to announce that **Dr. Jake Carstens** has joined the AtSc faculty as a tenure-track Assistant Professor beginning in Fall 2024! Among his classes, Jake will be teaching ATSC-530: Numerical Weather Prediction (Spring 2025), ATSC-310: Introduction to Weather Forecasting (Spring 2025), and ATSC-315: Broadcast Meteorology (Fall 2025). He will serve as faculty mentor for the UND Weather Update student organization, and continue his national service with the American Meteorological Society on the Board for Early Career Professionals and Board on Continuing Professional Development.

Jake recently completed a 2-year appointment as a Postdoctoral Scholar in the Department of Meteorology and Atmospheric Science at Penn State University. There, his research was focused on tropical cyclone structure and processes in climate models, and he has contributed to the Weather World television show as a host, forecaster, and hurricane specialist. Jake earned his B.S., M.S., and Ph.D. from Florida State University, where he studied convective organization and tropical cyclone formation while helping to produce the student-led FSU Weather broadcast. He previously served as an AMS/NWA Local Chapter President and a member of the AMS Student Conference Planning Committee.

Outside the office, Jake plans to be a regular at UND sporting events and local golf courses, and has grown particularly fond of camping, photography, and cats. He moves to Grand Forks with his partner, Megan Moore, who earned her M.S. in Chemical Oceanography from FSU in 2023. Megan recently began a position with the Minnkota Power Cooperative after working for Florida's and Pennsylvania's Department of Environmental Protection.

You can learn more about Jake and his work at his personal website, https://carstensweather.com/.

We are pleased to announce that **Dr. Jordan Christian** has joined the AtSc faculty as a tenure-track Assistant Professor in Fall 2024! Jordan will be teaching ATSC-270 Computer Concepts and ATSC-405 Numerical Methods among his classes. He was recently a Postdoctoral Research Associate in the School of Meteorology at the University of Oklahoma.

His research interests include subseasonal-to-seasonal weather and climate extremes with an emphasis on flash drought. Jordan's recent studies have investigated flash drought frequency, evolution, drivers, and impacts on local to global scales by utilizing a combination of reanalysis data, satellite observations, and climate models.

Jordan's interests outside of work include running, hiking, traveling, watching the Oklahoma City Thunder, caring for a hyper Golden Retriever, and spending time with family.

Jordan is joined alongside his wife, Katy Christian, who works for the Warning Decision Training Division in Norman, Oklahoma and reports to the Grand Forks National Weather Service Forecast Office. She provides training to National Weather Service employees on warning operations and will be collaborating with the AtSc department.

We are pleased to announce that **Dr. Daile Zhang** has joined the AtSc faculty as a tenure-track Assistant Professor beginning in Fall 2024! Among her classes, Daile will be teaching ATSC-240: Meteorological Instrumentation, ATSC -450: Intro. to Cloud Physics Meteorology, and ATSC-575: Special Topics in Meteorology: Atmospheric Electricity.

Before joining UND, Daile was an Assistant Research Scientist at the Earth System Science Interdisciplinary Center (ESSIC), University of Maryland. Currently, she is working on evaluating and assessing lightning data from different lightning locating systems, including ground-based and satellite-based networks. Outside of her study, Daile plays piano and organ. Besides music, she also enjoys reading and traveling.

Thunderstorm Chasing Class—Spring 2024

The 2024 UND Storm Experience class was held between May 13-16. The class began with a couple days of intensive classroom exercises in which the 14 students enrolled in the class learned how to forecast where and when rotating thunderstorms prone to producing tornadoes, known as "supercell thunderstorms", were likely to occur. Following this forecasting "boot camp", the 14 students, 4 forecast assistants/drivers, and 2 instructors departed Grand Forks in two 15-passenger rental vans for their 10-day trip across the U.S. Great Plains.

The 14 students were broken into three different groups that rotated daily: (1) "forecast team", (2) "logistics team", and (3) "social media team". Each day began with breakfast and a morning weather briefing given by the "forecast team" of the day at the hotel. The goal of the "forecast team" was to determine when and where supercell thunderstorms were most likely to occur. Following discussion among everyone a "target city" was selected for the day. The "logistics" team would help navigate to this "target city" before supercell thunderstorms were expected to develop and also were in charge of pumping gas, cleaning the van windows, helping make hotel reservations, determining where meals would be, etc. The name of the game is "hurry up and wait" in storm chasing, and thus, many days were spent rushing to the "target city" to then patiently await supercell thunderstorm formation. If and when supercell thunderstorms developed, the "forecast team" would work with the instructors and forecast assistants to navigate into position to safely observe a storm's structure and also see if it produced a tornado. Throughout the day, the "social media" team would update the UND Storm Experience Facebook, Twitter/X, and Instagram accounts with location updates, pictures, videos, interviews, etc. On "down days" in which the group was not actively storm chasing, educational stops were included at places such as the National Weather Service in North Platte, NE, the National Weather Center/Storm Prediction Center in Norman, OK, and touring the Doppler-on-Wheels mobile radar trucks in Oklahoma City, OK.

Over the 10-day trip across the U.S. Great Plains, the group traveled over 5,500 miles across 7 states (North Dakota, South Dakota, Nebraska, Kansas, Colorado, Oklahoma, and Texas), observed numerous supercell thunderstorms, and one tornado in far southwest Oklahoma (near the Oklahoma -Texas border) on May 23rd that ended up producing an EF-2 tornado (winds between 111-135 mph) near the town of Eldorado, OK. This EF-2 tornado lasted around 53 minutes, tracked approximately 15 miles, and had a maximum width of around 2,000 yards. For many of the trip, this was their first-ever experience of a tornado, which thankfully, did not result in any reported injuries or fatalities. Many on the trip said that they learned more in these short two weeks than in any other full semester class!

Those participating were Instructors **Dr. Jake Mulholland** and **Dr. Montana Etten-Bohm;** Forecast Assistants/Drivers **Clay Wooton, Cole Hood, Levi Newell,** (grad students) and recent UND B.S. grad **Nicholas Camp;** and undergraduates **Addison Rustin, Benjamin Jacobson, Matthew Schrader, Benjamin Anderson, Kyra Bahls, Abbilyn Kaan, Kade Ydstie, Rebecca Jacoby, Abram Anderson, Andrew Schneider, Arsham Dionysian, Kathryn Bouslough, Brennen Andrusko,** and former student **Kent Klostreich.**

Doppler-on-Wheels mobile radar truck

Nationwide Eclipse Ballooning Project—October 2023 & April 2024

Eleven UND students hit the road for a 22-hour car ride with Atmospheric Sciences professor **Dr. Jared Marquis** in October 2023. Along for the ride were 30 balloons, radio equipment, cloth gloves and several canisters of helium. Dr. Montana Etten-Bohm joined them in Cortez after a brief conference in Boulder.

Their destination was Cortez, Colo., a small municipality nestled in the southwest corner of the state near New Mexico. Cortez and nearby Mesa Verde National Park fell in the thin strip stretching from Oregon to Panama where the annular solar eclipse (when the sun is partially covered, creating a "ring of fire" around the moon) was visible on October 14th.

Students that participated were undergraduates **Sam Halvorson, David Brannon, Julia McGee, Owen Meisner, Kellie Thrower, Carson Turner, Peyton Underwood, Anissa Kulzer, Elan Azriel, Jonathan Polmatier** and M.S. Graduate Student **Taylor McHone.** Marquis said UND will launch balloons as a part of the NEBP in April 2024, this time for a total solar eclipse. The team is considering Illinois and Indiana as possible destinations and anticipates many of the students will return for the spring launches. For more information check out the story here: https://blogs.und.edu/und-today/2023/11/sun-moon-and-balloons/.

Dr. Montana Etten-Bohm, two graduate students, and nine undergraduate students drove to Taylor University in Upland, IN in support of the NASA Eclipse Ballooning Project (NEBP) for the total solar eclipse. They were gone April 5-9 and the goal of the project was to observe the environmental response to the change in meteorological conditions during the eclipse.

The group studied this by launching 30 weather balloons (one every hour) around the eclipse, obtaining temperature and humidity characteristics vertically in the atmosphere. While the trip consisted of a nineteen-hour drive both ways, a very cramped van, late nights/overnight shifts, soaked shoes, and multiple hiccups during launches, it provided students with a once-in-a-lifetime experience and an opportunity to observe what they learn in the classroom in real life – experiential learning at its finest! The students have since been analyzing the data in Dr. Jared Marquis' class, offered in conjunction with the project, and have all agreed that this has been an invaluable experience all-around.

Students that participated were undergraduates **Sam Halvorson, Owen Meisner, Kellie Thrower, Carson Turner**, **Peyton Underwood**, **Kayla Kenow**, **Norah Tomasouw, Ishir Agarwal**, **Oliver Van Tiel,** M.S. Graduate Students **Emily Gosney** and **Taylor McHone.**

Above: October 2023 Eclipse Trip Group
To the right: April 2024 Eclipse Trip Group

Internships, Meetings & Conferences

Dr. Bruce Lee attended the 2024 Severe Storms & Doppler Radar Conference, March 27-29, 2024 in Ankeny, Iowa and was a co-investigator on **Nicholas Camp's,** B.S. May 2024 graduate, poster titled "*Analysis of Variations in Thermodynamic and Kinematic Properties within Supercell Inflow using Balloon Borne Radiosondes*" which Nick presented. Bruce also served on the Career Mentoring Panel for the conference.

Dr. Andy Detwiler, Adjunct Professor, presented a talk titled "*Cloud Observations and Processes in Convection over Central Saudi Arabia"* at the 2024 Weather Modification Association Annual Meeting, April 16 - 18, 2024 in Las Vegas, Nevada. M.S. graduate student **Lynnlee Rosolino** presented a talk at the meeting titled "*Analyzing the Effects of Cloud Seeding on Hail Suppression during the North Dakota Cloud Modification Project".*

FAA Safety Webinars

Fred Remer gave an FAA Safety Webinar for the Minnesota FAA Safety team. "Microbursts and Convective Wind Shear" was presented on Saturday, May 11th. Over 1,500 participants viewed the webinar. Fred is scheduled to provide more webinars this summer and fall for the Minnesota FAA Safety Team.

Dr. David Delene, along with Ph.D. graduate student **Christian Nairy** and M.S. student **James Klinman** attended a Cloud Probe Workshop and also the International Conference on Clouds and Precipitation 2024 (ICCP) in Jeju, South Korea in mid-July.

Dr. David Delene presented a poster titled "*Cloud Observations and Processes in Surface Inducted Convection over Central Saudi Arabia"*; **James Klinman** presented a poster titled "*Quantitative Interpretation of Polarimetric Radar Observations of Hail*" and **Christian Nairy** presented a poster titled *"Segregating Chain Aggregates using In-situ Cloud Particle Properties Observed in Winter Storms*". **Dr. Delene** also presented a poster for **Dr. Marwa Majdi** titled "*An Evaluation of a Convolutional Neural Network for Classifying Images from In-situ, High-resolution Cloud Probes".*

AMS FELLOW

Former Professor **Dr. Gretchen Mullendore** received the nomination and award of becoming an AMS Fellow at the 2024 AMS Annual Meeting.

Congratulations Gretchen!

Summer 2024 Internship

Abby Weiss, current undergraduate AtSc student, finished a summer internship at the NWS office in Chanhassen, MN.

Post-doc Position

Blake Sorenson, who will be a December 2024 Ph.D. AtSc graduate, has accepted a NRC Research Associate postdoctoral fellowship at the Naval Research Laboratory in Monterey, CA. He will be working in the data assimilation group and studying how forecasts of coastal convective initiation can be improved by assimilating non-standard height wind observations from tall observing towers and wind profilers around the Kennedy Space Center.

BABY NEWS

Congratulations to Dr. Jared Marquis and AtSc M.S. Alum Nikki Carson-Marquis on the birth of their son Garrett Frederick.

He arrived at 2:23 a.m. Saturday, April 20, 2024. Garrett weighed 6 lbs. 4 oz. and was 19" long.

Congratulations Jared & Nikki!

Research News

Principal Investigator **Dr. Marwa Majdi**, research assistant professor of Atmospheric Sciences, and Co-Principal Investigator **Dr. Jared Marquis**, assistant professor of Atmospheric Sciences with their senior mentor **Dr. David Delene**, a research professor at the atmospheric sciences department, presented their research project outcomes at the Early Career Award Program event that occurred on December 6th, 2023.

The multidisciplinary team received a $30,000 grant last Spring from the UND's Office of Research and Economic Development to develop prototype technology that assists operators of uncrewed aerial systems by automatically deriving the cloud ceiling— defined as the distance between the surface of the Earth and the lowest layer of clouds that cover a large portion of the sky. The team worked on creating a unique database needed to support future proposals.

The team also submitted two white papers to two different Federal agencies which are NASA under the Advanced Information System Technology program and The Federal Aviation Administration (FAA) under their Research Grant Program. The team submitted a proposal to NASA and is still working to submit a proposal to the FAA, in addition to looking at other sources of funding. Moreover, **Dr. Marwa Majdi** was also involved in another research project as Co-Principal Investigator with Principal Investigator **Hallie Chelmo**, assistant professor of Mechanical Engineering who presented the project's findings on the effect of exhaust from rockets on atmospheric composition. The team has submitted a proposal to the Air Force Office of Science and Research and is also working on submitting to grant programs from the National Science Foundation and NASA.

Jianglong Zhang and **Jared Marquis** are Co-Is for a recently awarded National Science Foundation (NSF) Regional Innovation Engines project titled "Food systems Adapted for Resiliency and Maximized Security (FARMS)". The competitive award funds programs that help solve food insecurity and expand economic opportunities. The NSF Engines program was authorized by the bipartisan CHIPS and Science Act of 2022 and will provide the FARMS project with federal investment of $15M for the next two years and potentially up to $160M over the next 10 years. The project includes several partnerships throughout the state including NDSU, the ND Tribal College System, Grand Farm, and UND. Drs. Zhang and Marquis will be leading a team examining crop sensitivity to climate parameters, determining the agricultural impacts of future climate for targeted breeding efforts, and developing data-centric agriculture analyses.

Research Scientist Hired

Shawn Wagner has joined the AtSc department as a Research Scientist as of June 2024. Shawn obtained his B.S. and M.S. in Atmospheric Science at UND, and is in the process of completing his Ph.D. in physics at the Karlsruhe Institute of Technology, in Karlsruhe, Germany. Shawn specializes in aircraft cloud measurements, and has participated in field campaigns such as CapeEx2019, CIRRUS-HL, and NASA IMPACTS. Shawn's most recent work involves the single scattering radiative and microphysical properties of complex ice crystals such as bull rosettes. At UND, Shawn will be continuing to analyze airborne measurements with Dr. David Delene. Outside the office, Shawn enjoys storm chasing, discovering new music, spending time with friends, and watching a good movie.

Welcome Back Shawn!

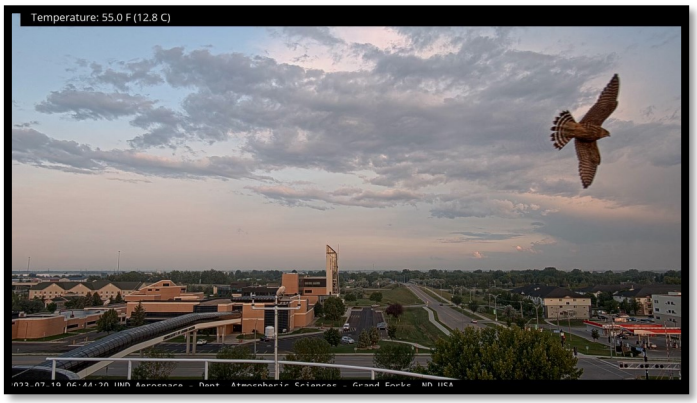
Atmospheric Sciences 6th Anniversary of the Skycams

September 2024 marks the 6th anniversary of the Dept. of Atmospheric Sciences Skycams! The west camera was originally installed in 2018 and upgraded in 2021. The original camera was then repurposed to provide an eastward facing view in the same year. The cameras are streamed live to YouTube. Since the inception of the project, our YouTube channel has gathered 1.7 million views, and has been watched for over 265 thousand hours! The cameras are routinely featured in local media, the Weather Channel, and WeatherNation broadcasts. Various timelapse videos have been posted over the years featuring events such as blizzards, severe thunderstorms, aurora, and more! Make sure to subscribe to our channel to receive updates.

They can both be found at:
youtube.com/undatmosphericsciences.

East:https://www.youtube.com/watch?v=Jq6C162vNkg

West:https://www.youtube.com/watch?v=mpcvRHLGBRw



Department of Atmospheric Sciences
Weather Balloons & Scholarships

As you can see in this newsletter there is a lot going on in the Department of Atmospheric Sciences and we have been able to celebrate many successes. We would not have been able to accomplish much of what we do without the support we have enjoyed from the University and from the Dean's Office in the Odegard School. Still, we have ongoing needs to further help our students and programs thrive. To improve the educational opportunities for our students, we have determined two specific priorities that would greatly benefit from additional funding support: student scholarships and academic equipment.

We would like to continue to highlight a fun opportunity for alumni to contribute to both our education and research efforts.

Through the Alumni Center, you may sponsor a weather balloon for $250, which is about what it costs for the materials to release a single/standard-sized weather balloon: parachute, balloon, instrument package, not including helium.

For each $250 that you contribute, you will receive a group photograph of faculty and students releasing the weather balloon. In the photo below, you can see one of the many launches conducted over this past year. Here is the link for the weather balloon donations: https://undalumni.org/weather-balloon

We are still hoping that friends, colleagues and former students of Leon Osborne are joining in to cement his legacy by contributing to a scholarship endowment in his honor. The Leon F. Osborne Science and Society Award endowment is providing scholarships to students enrolled in Atmospheric Sciences within the Odegard School. The Award targets students who have demonstrated an understanding of the importance of atmospheric science to society and who are pursuing a career that would provide a direct benefit to the needs of society by promoting enhanced applications of the atmospheric sciences to address societal issues. The Leon F. Osborne Science and Society Award has been given out yearly to a deserving student since 2020.

If you are able to help with these priorities, please contact Interim Chair Matt Gilmore or Jonathan Gehrke.

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