

ATMOSPHERIC SCIENCES



Faculty Spotlight: Don Wuebbles, professor

Prof. Donald J. Wuebbles retired from the department on Aug. 1, 2021 after a stellar 28 years as a professor of atmospheric sciences. The department will honor him with a special symposium in the Spring of 2022 (see atmos.illinois.edu/wuebbles_symposium for details).



Don has long been a renowned leader at both the national and international level, distinguished by his extensive research and notable accomplishments in the fields of atmospheric science and climate. His over 500 peer-reviewed publications encompass key contributions to understanding stratospheric

ozone depletion, tropospheric and stratospheric chemistry, the impact of human activities such as aviation and the chemical industry on atmospheric chemistry, and the contribution of greenhouse gases to both natural and anthropogenic forcing. He has significantly advanced the fields of multi-dimensional atmospheric chemical transport modelling, regional climate impact assessments, and climate-model downscaling. He has authored numerous chapters and reports for organizations ranging from the U.S. Department of Defense to the National Resources Defense Council. His most recent co-authored book, “Downscaling Techniques for High-Resolution Climate Projections: From Global Change to Local Impacts,” was published by Cambridge University Press in March 2021.

Don’s research was essential to the development of key international policies, including the Montreal and Kyoto Protocols. His early work on ozone-depleting chemicals led to the development of the concept of Ozone Depletion Potentials. As an IPCC author, he also participated in the development of Global Warming Potentials, a key metric used in every international climate treaty since Kyoto to quantify the contribution of radiatively-active substances to anthropogenic forcing and global emissions targets.

Don has led and contributed to regional, national, and international assessments. For many years, he served as a

lead author for the World Meteorological Organization’s Ozone Assessments. He was an author, lead author, and convening lead author on multiple Intergovernmental Panel on Climate Change reports. More recently, he has served as lead author and coordinating lead author on the Second, Third, and Fourth U.S. National Climate Assessments, the most comprehensive and up to date summaries of climate science outside the IPCC. In addition to these international and national assessments, he led or contributed to a host of regional assessments, from “Confronting Climate Change in the Great Lakes Region,” conducted in partnership with the Ecological Society of America and the Union of Concerned Scientists in 2002, to the upcoming Illinois Climate Impact Assessment to be published by The Nature Conservancy later in 2021.

Given these accomplishments, and his standing as a Fellow of the American Meteorological Society, the American Association for the Advancement of Science, and the American Geophysical Union, it was no surprise that Don was appointed Assistant Director for Climate Science at the Office of Science and Technology Policy in the Executive Office of the President for President Obama in 2015, a position that he retained until the end of the President’s term.

Don served as department head of the Department of Atmospheric Sciences at the University of Illinois at Urbana-Champaign; founder and director of the School of Earth, Society, and the Environment; Presidential Fellow; and the Harry E. Preble Professor of Atmospheric Sciences. He has testified to Congress on multiple occasions, and his insightful comments have appeared in a host of mainstream media outlets, in professional publications, and national media. Regardless of the venue, the science he communicates is consistently rigorous, passionate, and engaging as he shares the reality of a changing climate with all who are affected by it. In every aspect of his work, he continues to be an inspiration and an encouragement to all who know him.

From Jeff Trapp, department head



I ended last year's newsletter with my (deterministic) forecast that our [ATMS@Illinois](#) community would continue to thrive even in the face of the pandemic-associated adversity. I hope you'll allow me to begin this year's newsletter with a verification of this forecast:

In November 2020, I announced the thrilling news that the Doppler on Wheels (DOW) facility had joined the Department. The facility – which includes four mobile radars, three “mobile mesonet” vehicles, and other instrumentation – is already transforming our teaching, service, and research activities and elevating our profile. For example, my students in ATMS 314 (“Mesoscale Dynamics”) planned and executed data-collection missions on various precipitation events during March and April, and then analyzed their datasets as part of their semester projects. We've done some promotional work for the college and university, and are lining up outreach events for the coming months. And, pending final approval from the National Science Foundation, several of us will be using the facility in Spring 2022 and 2023 to collect data on QLCS tornado formation, as part of the PERiLS field campaign. If you see a big, blue radar truck with a block I parked on the side of the road, please stop by, and we'll give you a tour!

The department also has a fully operational broadcast meteorology facility! Thanks to Jessie Choate's hard work and her collaboration with the Center for Innovation in Teaching & Learning, the Visualization Lab in the Natural

History Building is now equipped with a green screen, a professional lighting system, camera, various computer monitors, and the associated software. This is allowing our students the opportunity to gain on-camera experience and produce demo videos; it is our hope that students and faculty will also use this facility to create outreach and other educational videos. See the article on page 4 for more details.

After multiple proposals to the university, and significant efforts by the faculty, the department has been approved to offer a graduate certificate and MS degree in *Weather and Climate Risk and Analytics*. The certificate and MS program will provide us with a means to share the unique expertise and knowledge of the ATMS faculty more broadly. More information on these fully online programs can be found on page 3 (and at [go.illinois.edu/atmsrisk](#)). We are taking applicants for the graduate certificate and MS program now – please help us spread the word!

In addition to celebrating these departmental-level achievements as well as those of our faculty and students (check out page 5!), we have two milestones during the 2021-2022 academic year worthy of special celebration. The first is the retirement of Prof. Don Wuebbles, who we will honor with a special symposium in Spring 2022. The second is the 40th anniversary of the department, which will be on April 29, 2022.

We hope to see you at these events in Spring 2022, at our AGU and AMS receptions in December and January, and during any other time you might be on campus. Keep in touch!

Save the dates

Alumni Reception at the AGU annual meeting will be **Monday, Dec. 13, 2021, from 6-8 p.m.** at Ruth's Chris Steak House, 525 Fulton Street, New Orleans, LA 70130.

Alumni Reception at the AMS annual meeting will be **Tuesday, Jan. 25, 2022, from 6-8 p.m.** in the main conference hotel in Houston, TX. The exact venue will be announced at a later date.

The Department of Atmospheric Sciences 40th Anniversary celebration will be held at the I-Hotel and Conference Center on the University of Illinois campus on **April 29, 2022**. A special symposium will be held during the day, followed by a banquet that evening. All alumni of the department are invited! More details will be announced in the near future.

Congratulations to the Graduating Senior class of 2020-2021

December 2020

Miguel Baeza, Victoria Wilson

May 2021

Nicholas Barker, Alison Crivlare, Joshua Elefante, Qikai Huang, Hailey Ledbetter, Justyna Luberd, Xiuqi Luo, Bridgette Mason, Kenneth Puleikis,

Andrew Reiser, Hannah Speers, Shelby Turner, Matthew Urbas, Song Zhang

August 2021

Tyler Allensworth

Congratulations to the recent graduate degree recipients of 2020-2021

December 2020

Benjamin Vega-Westhoff (PhD), Prateek Sharma (MS)

May 2021

Randy Chase (PhD), Maxwell Grover (MS), Geoffrey Marion (PhD), Douglas Miller (PhD), Sujun Pal (PhD), Megan Varcie (MS), Javier Villegas Bravo (MS)

August 2021

Piyush Garg (PhD), Shijie Shu (PhD), Matthew Woods (MS), Jun Zhang (PhD)

New graduate certificate and MS degree

After nearly four years of planning and development, the department has received approval to offer a MS degree and complementary Graduate Certificate in Weather and Climate Risk and Analytics. Both programs have been designed to meet the demand for atmospheric scientists with post-graduate education in the: (i) computational analysis/analytics of weather and climate data, (ii) implementation and use of predictive models for the weather-climate interface, and (iii) assessment of weather- and climate-related risk. This skill set is particularly desirable in the private sector, which is the fastest-growing employment sector in the atmospheric sciences. The certificate and MS program are online-only, which precludes the need for enrolled students to take an extended absence from a current position and/or familial

responsibilities, and otherwise maximizes learning flexibility. Because of their focus and online delivery, the complementary programs have required the creation of exciting online graduate courses, including “Data Science for the Geosciences” (ATMS 517), “Climate Analysis, Variability, and Prediction” (ATMS 521), “Weather and Climate Data Analytics” (ATMS 523), and “Risk Analysis in the Geosciences” (ATMS 526). These and the other courses have been approved and are also available to on-campus students. See [go.illinois.edu/atmsrisk](#) and help us spread the word about this new and unique opportunity for learning and career development!

New mobile radar and instrumentation facility at Illinois!

As you might have heard back in November 2020, the Doppler on Wheels (DOW) mobile radar and instrumentation facility has formally joined the Department of Atmospheric Sciences. The facility includes three DOWs, one C-band on Wheels (COW), three “mobile-mesonet” vehicles with meteorological sensors for near-surface measurements, three mobile radiosonde systems, and other rapidly-deployable meteorological observing systems (see also the recent article in the *Bulletin of the American Meteorological Society* by Wurman et al. 2021).

This will transform the Department's capabilities to perform novel scientific research, participate in field campaigns, and further its education, outreach, and inclusion missions. Undergraduate and graduate students in the department and across the university will have the opportunity to gain hands-on experience with this state-of-the-art observational equipment. For example, students in ATMS 314 (“Mesoscale Dynamics”) used the equipment in March and April 2021 to collect datasets for their semester projects.

The department will also facilitate the use of this equipment by other universities and organizations for their research and education deployments. This includes the WINTRE-MIX field campaign currently scheduled for early 2022, which will be followed immediately by PERiLS, an Illinois-led campaign to study QLCS tornadoes.

We hope that you share our excitement about this amazing opportunity for our department and university!



DOW8 south of campus, during a June 2021 convective storm event.



Alison Crivlare, Gabbie Cristo, Kaylee Heimes, and Anna Dennis operate DOW7 and discuss their ATMS 314 deployment plans with Prof. Jeff Trapp.

New Broadcast Meteorology Studio

Officially completed in Spring 2021, the department now has its own broadcast studio within the Natural History Building. We are incredibly excited to offer a new facility and tools to allow students to further explore all that the field of meteorology has to offer! Jessie Choate worked in conjunction with the Center for Innovation in Teaching & Learning and the SESE IT crew to build a broadcast studio from scratch within the Visualization Lab on the first floor of the Natural History Building. The studio is filled with state-of-the-art equipment including a 12-foot green-screen, professional-grade cameras, teleprompters, multiple computers for editing and forecasting, multiple screens for users to see themselves, microphones, and a TV-quality lighting system.

The studio was designed to be used in conjunction with the course *Introduction to Broadcast Meteorology*. This course aims to provide students with the basic knowledge of how to create a variety of weather forecasts on a range of different platforms. Students learn the important components of a forecast, the best ways to visually represent that forecast, and how to verbally communicate this information to the public. By the end of the course, students have the skills to be successful in a studio internship and have the beginning clips for a resume tape.

Although designed for a broadcast course, Jessie hopes the studio will be used for much more. The Visualization Lab is now fully equipped to provide everything needed for students who want to give their class project a little flare with a green screen, research groups who want to live stream a presentation, or instructors who want to revamp their online lectures with more engaging and visually appealing content.

Regardless of a student's interest in pursuing broadcast meteorology as a career, Jessie hopes that all students will explore the studio at some point during their academic careers to experience a new way of communicating.



Undergraduate Alison Crivlare tests out the new broadcast studio's green screen for weather forecasts.

Strong communication skills are a pillar of a successful career regardless of what sector of meteorology students decide to pursue. What better way to practice that skill than having fun in front of a green screen?

Field Studies of Convection Course

The University of Illinois Field Studies of Convection course returned to the Great Plains in May 2021 after a one-year absence. We were greeted by a consistently active weather pattern, and observed storms on a record 12 straight days from May 20-31. During this period, the group witnessed over a dozen supercell thunderstorms, along with shelf clouds, numerous wall clouds, breathtaking storm structure, and four tornadoes. Strangely, all of the tornadoes occurred in the early afternoon, before 4 p.m. local time.

After a long drive west, the first day of the trip brought a sunset shelf cloud in western Nebraska on May 20. Two days later, the group witnessed the first tornado of the trip near Akron, Colo., just after lunch. This marked the first tornado that four of the six students on the trip had ever seen. A slow-moving high-precipitation supercell delivered the best storm structure of the trip near Garden City, Kan., on May 24. May 26 was forecast to be the most active day of the trip. While many other storm observers drove away empty-handed, we managed to see three tornadoes along with a spectacular rotating wall cloud in north-central Kansas near Hays.

The end of the trip brought two close encounters of the

stormy kind, as the group was treated to two mothership supercells near the town of Roswell, N.M., on May 28 and 30. The extraterrestrials remained elusive, however. The last supercell of the trip formed in southern Texas on May 31 before crossing the Rio Grande River, affording us a view of a large wall cloud over northern Mexico and yielding a long two-day drive home from the border. The students are already looking forward to next year's adventures and the department is hopeful for increased



The Field Studies of Convection class poses in front of a high-precipitation supercell near Garden City, Kan., on May 24, 2021. Pictured, from left to right: Kaylee Heimes, Bridgette Mason, Drew Reiser, Jake Vile, Jessica Skocinski, Grayson Nelson, Max Claypool, Kevin Gray (TA), and Prof. Jeff Frame.

participation owing to two alumni-funded scholarships to help defray student costs.

Earth Week Celebration



The department hosted two virtual lectures during the Earth Week this year: the Annual Keeling Lecture, named for Charles David Keeling, a 1948 graduate of the Department of Chemistry at the University of Illinois who was renowned for making precise measurements of atmospheric carbon dioxide (CO₂); and the Annual Ogura Lecture, which is possible through the generosity of Emeritus Professor and Department Founder Yoshi Ogura.

The Keeling lecture, on April 19, 2021, featured **Dr. Alice Hill**, David M. Rubenstein Senior Fellow for Energy and



the Environment, Council on Foreign Relations, in Washington, D.C. Her lecture was entitled "Lessons from the Pandemic to Tackle the Climate Crisis." **Dr. Norman G. Loeb**, a Senior Research Scientist in the Climate Science Branch at NASA Langley Research Center, presented the annual Ogura Lecture on April 20, 2021, entitled "Tracking Earth's Energy Budget and Climate." The online participation in the virtual Earth Week events was outstanding and included many people beyond the Champaign-Urbana area.

Faculty Awards

- Professor Francina Dominguez was named a University Scholar.
- Professors Larry Di Girolamo, Bob Rauber, and Steve Nesbitt shared in the NASA CAMP2Ex Group Achievement Award.
- Professor Sonia Lasher-Trapp was awarded the American Meteorological Society's Edward N. Lorenz Teaching Excellence Award.
- Professor Cristi Proistosescu received a NASA New Investigator (Early Career) award.
- Professor Cristi Proistosescu was selected as Office of Risk Management & Insurance Research Fellow.
- Professor Bob Rauber received the Alumni Achievement Award from the Colorado State University Department of Atmospheric Science.
- Professor Nicole Riemer and Instructor and Academic Advisor Jessie Choate were separately awarded the 2020 College of Liberal Arts & Science Impact Award for their respective efforts in going beyond the call of duty in response the pandemic.
- Professor and Department Head Jeff Trapp was named a Fellow of the American Meteorological Society.
- Professor Zhuo Wang was named a Richard and Margaret Romano Professorial Scholar.
- Professors Don Wuebbles and Atul Jain are both on Reuters list of top 1,000 climate scientists.

ATMS 2020-2021 Donors

A special thanks to our supporters who donated to the Department scholarship funds in 2020-2021: Mr. Earl S. Barker, Dr. Huei-Ping Huang, Dr. Alexandra L. Jones, Prof. Sonia Lasher-Trapp, Prof. Bob Rauber, Prof. Jeff Trapp, and Dr. David W. Werth.

Graduate Student Awards

- Alexander Adams: Second Place, Poster, SESE Research Review, 2021
- Chuan-Chieh (Jay) Chang: Travel Award, AMS Conference on Tropical Meteorology
- Piyush Garg: Ogura Award for Outstanding Research Paper, 2021
- Scott James: Outstanding student poster award at the 2021 AMS Conference
- Scott James: First place, Poster, SESE Research Review, 2021
- SeungUk Kim: Third Place, Poster, SESE Research Review, 2021
- Geoffrey Marion: Ogura Award for Outstanding Teaching Assistant, 2021
- Itinderjot Singh: Best Student Poster: 19th Conference on Mountain Meteorology

Special LAS Impact Award During COVID-19

- Carolina Bieri, Divyansh Chug, Max Grover, Scott James, David Lafferty, and Troy Zarembo

Undergraduate Student Awards

- Zach Chalmers, Brandon Garcia, and Kyle Killion: Mankin Mak Scholarship recipients
- Brandon Garcia: Outstanding student poster award 2021 AMS Student Conference
- Bridgette Mason: Ogura Award for Outstanding Undergraduate Research, 2021
- Divya Rea: Outstanding student poster award 2021 AMS Student Conference
- Shelby Turner: Ogura Award for Outstanding Undergraduate Research, 2021
- Song Zhang: Ogura Award for Outstanding Senior, 2021
- Song Zhang: Ogura Award for Outstanding Undergraduate Research, 2021

Dynamic Duos: Alumni Couples

Dan and Kirsten (Gleicher) Harnos (2015 and 2015)



Dan and Kirstin met at the Department of Atmospheric Sciences graduate school orientation, on Aug. 18, 2008, became engaged on July 12, 2013, and were married Sept. 13, 2014 (all while at UIUC). After completing their PhDs in atmospheric sciences under

Steve Nesbitt, Dan and Kirstin (who got her MS with John Walsh) both started their professional careers as contract scientists supporting the NOAA Climate Prediction Center, in College Park, Md. Dan's work involved seasonal prediction of tropical cyclone activity and subseasonal temperature forecasting. Kirstin worked on interannual variability of the U.S. low-level jet and seasonal sea-ice prediction. In 2016, Dan was hired to be a federal meteorologist at the NOAA Climate Prediction Center, where he continues to issue subseasonal forecasts and develops associated forecast guidance. In 2019, Kirstin moved to the NOAA Weather Prediction Center as a research scientist for the Cooperative Institute for Research in Environmental Sciences (CIRES), where she is currently running the Winter Weather Experiment as part of the NOAA Hydrometeorology Testbed. The Harnos family resides in Maryland and welcomed a son in 2018 and their second child arrived this summer.

Lourdes Aviles (2004) and Dan Bramer (1998)

Lourdes and Dan met in 1996 when Lourdes arrived to start her PhD and Dan was in his second year of his MS. They married and had two children while in Champaign-Urbana, and while finishing their degrees. Dan finished his MS in 1998 then worked as a technical staff member in the department, co-creating, together with Dave Wojtowicz, the weather product maps and the ATMS weather products that were in ww2010. Lourdes finished her PhD in 2004 working with former faculty member Mingfang Ting. Lourdes and Dan left for Plymouth State University, where Lourdes has been on the faculty since 2004. Dan jointed Plymouth State University information Technology Services, where he has had various roles, including faculty support,



application development, and director of the group. Currently he is with the University System of New Hampshire Research Data Management group. As part of his job, he provides technical support for the Plymouth State University Meteorology program and facilities, including the development of weather products for their map wall and website. Lourdes is currently Program Chair for meteorology, supervising their meteorology, physics, and climate studies degree programs, and also serves as director of the Computational, Applied, Mathematical, and Physical Sciences Academic Unit. She teaches dynamic meteorology, atmospheric physics, tropical meteorology, air quality, and severe and hazardous weather. She authored a book on the Great New England Hurricane and is currently working on interdisciplinary book on the science and history of atmospheric optics. She chaired the AMS History Committee and is a member of the Board of Trustees of the University Corporation for Atmospheric Research, the first elected trustee from a non-PhD-granting institution.

Jason Tackett (2009) and Marilé Colón Robles (2006)

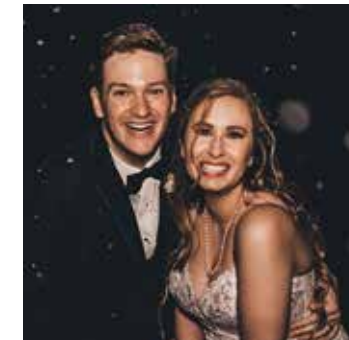


Jason and Marilé met when they were both examining aerosol and cloud data associated with the Rain in Cumulus over the Ocean (RICO) campaign. Jason was examining data from above using NASA's CALIPSO satellite data (advised by Larry Di

Girolamo), while Marilé used in situ data from RICO aircrafts (advised by Bob Rauber). In 2009, Jason got a research scientist position as part of the CALIPSO team at NASA Langley Research Center in Hampton, Va., with SSAI, while Marilé got a position as an education specialist at NASA Langley's then Office of Education in 2010. Marilé then moved to NASA Langley's Science Directorate in 2017 and became project scientist for the GLOBE (Global Learning and Observations to Benefit the Environment) program. Jason received the 2017 NASA Exceptional Scientific Achievement Medal for his work, and took the opportunity to become a civil servant in 2019 to not only continue on the CALIPSO mission, but also to work on NASA's next generation LIDAR instrument. In 2021, Marilé became the Principal Investigator of the NASA GLOBAL CLOUD GAZE project – part of NASA's Citizen Science program that involves surface observations contributed by citizens. The two of them are still studying clouds from above and below and raising two amazing children!

Zach Wienhoff (2013) and Jessie Choate (2016)

Zach and Jessie met in 2012 in Dr. Jeff Frame's Field Studies of Convection course when they were both undergraduate students within the Atmospheric Sciences Department. Zach finished his BS in 2013 and headed to the University of Oklahoma for graduate school where he studied tornado dynamics under Dr. Howie Bluestein. Jessie finished her BS in 2014 and continued her graduate work at UIUC researching mesoscale convective systems under Dr. Bob Rauber. Zach and Jessie reconnected in 2015, and, after completing her master's degree, Jessie began working at CIMMS/NSSL on the Warn-on-Forecast team in Norman, Okla., as a research associate. While in Norman, she also earned a master's in business administration from OU. In 2019, Jessie and Zach decided to move back to Illinois where Zach joined the Wind Engineering Lab team in the civil engineering department at UIUC, and Jessie joined the faculty in the atmospheric sciences department



as an instructor and academic advisor. Zach will graduate with his MS in structural engineering in December 2021 and hopes to pursue a career in engineering and meteorological forensics investigating extreme wind damage to civil infrastructure. Jessie and Zach got married January 2020. They saw rain, ice, and snow on their wedding day, which only two meteorologists wouldn't mind! They have two dogs, Audrey and Rookie, and are very happy to be back in Champaign where they met!

Lee and Marcia (Estrem) Cronce (2006 and 2005)



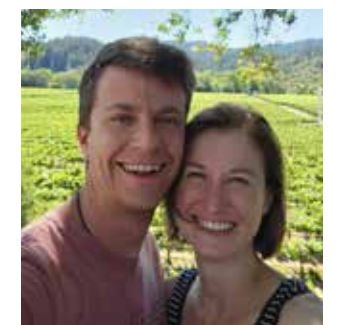
Lee and Marcia started graduate school in atmospheric sciences at UIUC in Fall 2002. Lee was a research assistant under Bob Wilhelmson and worked with modeling of severe storms, some of which was featured in a

PBS Nova show. Marcia was a teaching assistant for most of grad school, and also conducted a field experiment (PIOWS) with her advisor, Bob Rauber, that quantified the upward motion within mesoscale snow bands of winter storms. Marcia desired a career in forecasting and was hired at the National Weather Service in Marquette, Mich.,

a few months after graduating in Spring 2005. Lee finished grad school in Fall 2006. It was tough to find a weather-related job in that area, so Lee worked as a cable technician for a couple of long winters. In Summer 2008, Marcia was promoted to a forecaster at NWS Milwaukee in Sullivan, Wisc. She is the aviation program leader and enjoys the challenging Wisconsin forecasts. Through NWS connections, Lee was introduced to researchers at the University of Wisconsin/CIMSS and was hired as a research scientist in November 2008. He helped develop an algorithm detecting convective initiation based on satellite data that expanded into the ProbSevere program. Lee continuously updates and develops AWIPS software used by the NWS and many universities.

Patrick Edmonds (2013) and Kati Togliatti (2014)

Shortly after Kati graduated from UIUC in 2014, she and Patrick moved to Iowa for graduate school at Iowa State University. Patrick earned a master's degree in meteorology and is now working at ISU researching the sustainability of varied cropping systems and modeling the influences of changes in climate. Kati received both a master's degree and PhD in agricultural meteorology. Her research has taken her to the USDA-ARS where she analyzes eddy covariance data and is investigating how tree windbreaks affect land-atmosphere interactions between fields. They got married in October 2019 and have recently welcomed a puppy into their family.





DEPARTMENT OF ATMOSPHERIC SCIENCES

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Fall 2021 Atmospheric Sciences BBQ attendees in front of the Natural History Building.