UNIVERSITY OF WISCONSIN–MADISON • ATMOSPHERIC AND OCEANIC SCIENCES

MAKING WAVES

2014–2015

The Many Faces of Polar Research

Marian Mateling

During the fall of 2013 and spring of 2014, I was finishing up my last year as an undergraduate in the AOS program while working at the Antarctic Meteorological Research Center (AMRC). My research involved calculating estimates of latent and sensible heat fluxes using a tall tower on the Ross Ice Shelf in West Antarctica. Quantifying these estimates not only helped me understand the patterns we find in atmospheric boundary layers, but also the challenges scientists face while studying these climatically sensitive regions. I had just begun to find a fascination with the unique climate on this continent.

I began a senior thesis with Professor Tristan L'Ecuyer that same year, focusing on the radiation budget of both the Arctic and Antarctic in climate models. For this research, I compared observational and climate model fluxes in the CMIP5 (Coupled Model Intercomparison Project Phase 5) ensemble. For this project, I was awarded the Reid Bryson scholarship in the spring of 2014. The main goal developed into calculating the energy transport at the poles using these model-derived radiative fluxes. We continue this research today, and want to encourage the improvement of modeling the Arctic and Antarctic.

As I transitioned into my graduate education with SSEC Researcher and AOS Affiliate Faculty member Dr. Mark Kulie, my research shifted to satellite retrievals of snowfall. Space-borne snowfall retrievals are still in their infancy, but developing more accurate detection and quantitative snowfall estimates is extremely important to better characterize the global hydrologic cycle. While these retrievals were in no way limited to the polar regions, we've bounded our data to observe only especially cold surfaces that are typically found at higher latitudes. We are continuing to compare independent remote sensing databases to improve the algorithm that the Global Precipitation Measurement (GPM) satellite use for detecting and quantitatively estimating global snowfall. Using satellites to detect snowfall has immensely improved the research we are able to do, especially in these remote locations.

Despite these research avenues being completely separate, I've found many parallels that allow me to cultivate my understanding of the poles from every possible angle. I am especially grateful for the constant support and inspiration of my research advisors Mark Kulie and Professor Tristan L'Ecuyer, as well as the Principal Investigator of AMRC, Dr. Matthew Lazzara. They've taught me the valuable lessons in being collaborative and thinking like a scientist, which can only be taught through the experience of research. I hope to continue my investigation of the poles as a Ph.D. student in AOS here at UW-Madison. From tower measurements to climate models to satellite retrievals, I am proud to be part of the polar science community. ■

In the fall of 2012, Marian's first semester as a declared AOS major, she volunteered to help fill the weather balloon for her lab class. Conditions were sunny and windy. Also pictured is Erik Olson (SSEC), who generously assists with the balloon launch each Spring. *Photo credit: Grant Petty*

2016 Alumni Reception Scheduled

For those planning to attend the upcoming Annual Meeting of the American Meteorological Society in downtown New Orleans, we are happy to announce that the Robock Alumni Reception is scheduled for **Tuesday, January 12, from 6 to 9 PM** in the **River Room-Riverside Building** of the Hilton New Orleans Riverside hotel. As always, there will be good food and great conversation as we share memories and catch up on the news in each other's lives. We hope to see you there!

CHAIR'S COLUMN

BIG CHALLENGES AHEAD

Grant W. Petty

We have more than our usual share of big news to report. Much of that news is a pleasure to share; some of it is sobering. Please allow me get the bad news out of the way first. This past summer, our governor signed a budget that precipitously cut state support for the University of Wisconsin, effective last July 1, while simultaneously forbidding the University from raising undergraduate tuition to compensate for the sudden shortfall. As a consequence of the budget cut at the campus level, our department was informed that we must prepare to absorb a 10% cut to our own budget, almost all of which pays faculty and staff salaries. Thus, we're looking at an unavoidable further reduction in faculty and staff strength, adding to the previous reductions (from 18 to 12 faculty) that the department has already absorbed since the late 1990s.

The unrelenting loss of instructional staffing and of basic support for the department's activities is a source of tremendous concern as we contemplate the challenge of sustaining our renowned undergraduate and graduate programs. Our response must include finding creative ways to continue to offer a first-rate educational and professional experience to our students at all levels despite fewer instructors to teach high-impact courses.

Starting today, we will have to be less shy about asking you for your help with financial resources and with alumni networking to attract and retain top student talent to our program and to provide support for faculty innovation in the courses we teach and professional development we provide to our students.

Support from alumni and friends like you will be critical to our future success. Later this year, we will announce specific fundraising targets designed to strengthen the foundations of our program in the following ways:

- By recruiting the best: Endowed fellowships for top graduate students will reduce our vulnerability to the vagaries of state and federal funding;
- By showcasing our talent: Travel grants will permit more undergraduate and graduate students to attend professional meetings;
- By cultivating future leaders: Equipment, materials, and travel grants will allow more of our undergraduate and graduate students to participate in field work and professional development activities – whether in Wisconsin or else where in the United States or world.

The first of the above goals is also the most ambitious. To fund a single substantial fellowship requires an endowment on the order of $500,000. Our plan is to have several such fellowships in place as a permanent base of financial support for top students who might otherwise not be able to join our department. Simply put, the future strength of our department lies in successfully attracting the students who show the greatest potential today.

Just as important as your own financial contributions could be, your involvement in reaching out to fellow alumni and helping to rekindle a spirit of family membership – a family that spans the generations starting with the first graduates of the department in the 1950s and continuing through today's freshman class. Please email Jonathan Martin (jemarti1@wisc.edu), chair of our Alumni committee, if you would like to register your interest in being an ambassador to the department for your fellow alumni, and vice versa!

Let me now close with just a few of the *great* things that have happened over the past year.

- Last spring, one of our alumni enthusiastically and generously took advantage of a once-in-a-lifetime one-to-one match opportunity and funded not one, but *two* permanently endowed professorships for our department. The Ned P. Smith Professorships in Climatology and Meteorology will enable two of our faculty at any given time to support a graduate student and to develop new ideas and research directions.
- An astonishing *five* of our faculty were selected for a total of *six* major awards or other national recognition, including Don Johnson, Jonathan Martin, Ankur Desai, Michael Morgan, and Tracey Holloway.
- Our longtime IT specialist Peter Pokrandt, whom many of you undoubtedly know from your time here, was honored with an appointment to serve on the Unidata Users Committee.
- Several of our students received awards for presentations at national scientific conferences, including Jessica Gartzke, Jacola Roman, and Melissa Breeden.
- Steve Ackerman, Pete Pokrandt and our partners in SSEC, working with representatives from the National Weather Service, spearheaded the effort to get UW-Madison certified as a "StormReady" facility, a designation that recognizes the university's implementation of robust communication and response capabilities in the event of a major weather emergency.

In summary, the events of the past year have been both challenging and gratifying. I and my colleagues look forward to seeing many of you at the Leonard Robock Alumni Reception at the AMS Annual meeting, and we wish you and your families happy holidays! ■

Chasing A Giant

Jonathan Martin

Having just completed my 20th year on the faculty, I was eager for the first sabbatical of my career. I had decided to pursue biographical research on the life of Prof. Reginald C. Sutcliffe, a prominent British meteorologist of the mid-20th century. My original attraction to examining Sutcliffe's life arose from the fact that his intellectual fingerprints are literally all over synoptic-dynamic meteorology, the aspect of the broad field of meteorology that provided the impetus and the physical insights at the foundation of the most unheralded scientific revolution of the mid-20th century – the development of numerical weather prediction. My research began with a trip to Reading, England where Sutcliffe established the first meteorology undergraduate program in the United Kingdom in 1965. The Department of Meteorology at Reading has since become one of the leading departments in the world and they possessed a modest, though unexamined, collection of Sutcliffe's papers toward which I was the first person to ever direct research attention.

Upon returning from the trip the research continued through making contact with a host of libraries, churches, and public records offices in an effort to put the basic facts of his life into chronological and narrative order. These sources included the public records office at Malta, the Meteorological Office, the headquarters of the American Meteorological Society, various churches, Sutcliffe's grammar school, the University of Leeds, and the National Archives at Kew, even a wee church in Wales! All the while, in an attempt to make contact with family and thereby transform my project from a scientific biography of quite limited interest to a more personal study with a certainly broader appeal, I poured over birth records, without knowing the names of his two daughters or when they were born. The breakthrough came in mid-November through the effort of Ms. Catherine Turner, the librarian at the Department of Meteorology at Reading who, during my visit there, was immediately enthusiastic and ready to assist. She found the name of Sutcliffe's oldest daughter, Elin, appended to the end of his entry in a collection of biographies of Fellows of the Royal Society. Through Elin's daughter, Lucy, a business owner in Norfolk, I made contact with Elin and her husband Richard Bowes, for the first time. They were overjoyed that someone would be interested in pursuing research on her father's interesting life and were eager for me to visit them. I traveled to England again in early December, spending the first week at the National Archives and the last three days in Norfolk with the Bowes. The visit was phenomenally successful and I returned with a wealth of new, more personal information that utterly transformed the direction of my prospective biography.

Reginald Sutcliffe

I returned to England in early March and visited Sutcliffe's grammar school in his boyhood home of Cleckheaton, West Yorkshire, the University of Leeds, his birthplace in Wales and his wife's hometown in Wales where he is buried. The trip also included a visit with Elin and Dick, another productive visit to the National Archives and, perhaps most importantly, a visit to the home of Jenny and Jacques Bertoli, in Brittany, France. Jenny is Sutcliffe's younger daughter who was rumored, by her skeptical older sister, to have a lengthy autobiographical sketch in her father's hand. I was warmly greeted by Jenny and Jacques on March 14 and after dinner was shown her extensive collection of her father's artifacts. Among these treasures was a draft of Sutcliffe's Ph.D. from Leeds, several war medals, and, most remarkably, the rumored 59 page handwritten autobiographical sketch compiled in 1981! I immediately recognized that I was only the 3rd or 4th person in history to have ever seen this document and surely was among the two most interested. The collection of material acquired on the March trip, particularly the sketch, changed the prospective timeline of the project as well. Upon return to Madison I transcribed the autobiographical sketch and began to write my own first draft of the full biography which currently stands at nearly 170 pages and has reached the point where Sutcliffe has been made Senior Meteorological Officer at No. 3 Group Bomber Command in October 1940.

For years I have been educating my senior undergraduate and graduate students regarding his influence on the field. Having now learned an enormous amount about his life – his working class background in a mill town, the extraordinary serendipity surrounding his early education, the tremendous return England reaped on the investments it made in such education, his important, and sometimes harrowing, contributions to the development of meteorology during World War II, and his subsequent establishment of a meteorology program whose intentional international outreach reflected his desire that global conflict should be a thing of the past – all of this brings a rare human dimension to specialized study of a physical science. By infusing these discoveries into discussions of his scientific contributions, the important and specialized education our students receive in meteorology will occur within a broader, humanistic perspective. I am eager to provide this new perspective to our students as I am certain it will enhance, in quite unexpected ways, both the depth and the value of their liberal arts educations. ■

Recent AOS Graduate Joins Oceanographic Expedition

Amanda Fay (Ph.D. 2010*)*

Amanda Fay, one of Professor McKinley's graduates, aboard the NOAA P16N cruise

As an assistant researcher with the Space Science and Engineering Center in Wisconsin, telling people you study the ocean from the middle of the continent gets some strange looks and a lot of questions. It was with great pleasure that I was accepted to participate on the US GO-SHIP decadal reoccupation of the P16 line in the North Pacific this spring. During 5 weeks at sea we sampled the depth of the ocean at every half-degree of latitude. We were fortunate to have amazingly calm weather, allowing us to sample areas in the midlatitudes that hadn't been sampled since the 1980s.

My responsibility on the ship included prepping the rosette for deployment as well as assisting with sampling once it was back onboard. While the rosette was in the water, I was in charge of communications with the bridge and the winch operator to ensure both the downcast and upcast went smoothly. Additionally, I assisted with selecting the sampling depths for each of our deployments, with the goal of consistent coverage over the depth of the ocean for each of our sampling stations. It was an amazing experience and I look forward to the chance to go out again to learn more!

Feel free to read more about my time at sea on my website:

fayamanda.weebly.com ■

Social Media Accounts for our Alumni and Friends

AOS departmental Facebook page: facebook.com/uwaos. "Like" us to get news, updates, and interesting weather stories from the department.

AOS alumni Facebook group: facebook.com/groups/uwaosalumni. Join the group to stay in touch with us and with each other! Let us know what you're up to!

AOS network group on LinkedIn: linkedin.com/groups?gid=6563986 Join the group to share professional leads and advice with each other and with our current students.

AOS Twitter account. Follow us at @UW_AOS!

AOS Student Studies Air Quality in Boulder, CO

My name is Lauren Deanes, and I am a senior majoring in Atmospheric and Oceanic Sciences with certificates in Afro-American Studies and Environmental Studies. This past summer, I had the opportunity to intern with the Significant Opportunities for Atmospheric Research and Sciences (SOARS) Program through the University Corporation for Atmospheric Research (UCAR). I spent 11 weeks studying air quality in Boulder, Colorado with the help of engineers at the University of Colorado-Boulder. Air quality measurements were taken with a "U-pod", a device developed by CU-Boulder engineers, which measures atmospheric constituents such as ozone, carbon dioxide, and carbon monoxide. The goal of my research was to determine the small-scale (over approximately 1 kilometer) spatial variability of ozone in Boulder. We were motivated by this particular topic because large scale spatial variability (e.g. between Boulder and Denver) of ozone is very well studied, but these measurements fail to tell the story about how ozone levels vary between locations within cities, or on the scales that we live on every day. SOARS is a great program because it provides amazing opportunities to learn about how to perform sound research and to start building a community within the atmospheric science world. If you are interested in SOARS, I can provide more information. My email address is deanes@wisc.edu.

Lauren Deanes with a U-Pod. Photo courtesy of Bonnie Sizer, UCAR 2015.

Faculty Awards and Honors: An Exceptional Year

We have long felt immense pride in the contributions of our own faculty to the renown of our department for both teaching and research. But we have not always been assertive in seeking outside accolades for our colleagues. A new Awards Committee led by Prof. Liu was charged with changing that. And change it they did, with a series of nominations that proved unexpectedy fruitful, yielding several AMS awards in addition to a number of of other honors and distinctions that came to us without any prodding on our parts. The AMS awards will be formally bestowed at the AMS Banquet on January 13, 2016. We hope you can be there!

Associate Professor **Ankur Desai** will be the recipient of not one, but *two* AMS awards: The **Clarence Leroy Meisinger Award** and AMS's inaugural **Early Career Achievement Award**.

The Clarence Leroy Meisinger Award is given to an individual in recognition of "research achievement that is, at least in part, aerological in character and concerns the observation, theory, and modeling of atmospheric motions on all scales." The citation for Prof. Desai reads, "For innovative contributions toward improving the observation and modeling of biosphere-atmosphere exchanges across a range of spatial and temporal scales." The AMS Award for Early Career Achievement citation notes diverse examples of his "exceptional work ethic and innovative scientific applications since attaining [his] Ph.D."

Professor **Tracey Holloway** has been named **inaugural fellow of the AAAS Leshner Leadership Institute.**

The new Leshner Leadership Institute and fellowship program convenes mid-career scientists who combine demonstrated leadership and excellence in their research careers with interest in promoting meaningful dialogue between science and society. The intent is to help build their capacity for public engagement leadership. http://nelson.wisc.edu/news/story.php?story=2329

Professor **Jonathan Martin** will receive The **Edward N. Lorenz Teaching Excellence Award.** The Edward N. Lorenz Teaching Excellence Award is to given annually to an individual in recognition of sustained outstanding teaching and mentoring at the undergraduate and/or graduate or post-doctoral levels and the impact this individual has had on students The citation for Prof. Martin reads, "For outstanding teaching and mentoring that combine boundless enthusiasm with consummate skill to educate and inspire a generation of undergraduate and graduate students." Professor Martin has previously been the recipient of the Underkofler Excellence in Teaching Award (from UW System), the Mark H. Ingraham Distinguished Faculty Award, and was named by the Princeton Review as one of the nation's Top 300 Professors in 2013.

Professor **Michael Morgan** has been elected to the **UCAR Board of Trustees.** The UCAR board has 18 trustees who each serve three-year terms. They are elected by UCAR's 109 members.

According to the UCAR website, "The Trustees determine the overall direction of the corporation. They discharge their fiduciary responsibilities at their regularly scheduled meetings, and through a set of committees that recommend actions regarding UCAR scientific appointment, financial management, and audit matters.".

Emeritus Professor **Don Johnson** has been elected an **Honorary Member of the American Meteorological Society**, the AMS's highest honor in recognition of an individual's career accomplishments.

According to the AMS Constitution, "Honorary Members shall be persons of acknowledged preeminence in the atmospheric or related oceanic or hydrologic sciences, either through their own contributions to the sciences or their application or through furtherance of the advance of those sciences in some other way." Prof. Emer. Johnson is being honored for his lifelong contributions to research and education related to the study of the dynamics of the Earth's atmosphere. ■

Professor Morgan Returns from Four Years as Division Director at the National Science Foundation

Michael Morgan

From June 2010 until June 2014, I was on leave from UW-Madison to serve as Director of the Division for Atmospheric and Geospace Sciences (AGS) at the National Science Foundation (NSF). I am delighted to give a brief account of my experience in the hope that it will be useful to those whose work brings them into contact with the NSF.

The Atmospheric and Geospace Sciences Division is divided into three Sections with individual Programs within these Sections: the Atmosphere Section (Atmospheric Chemistry, Climate and Large-scale Dynamics, Paleoclimate, and Physical and Dynamical Meteorology programs), the Geospace Section (Aeronomy, Geospace Facilities, Magnetospheric Physics, Solar Physics programs), and the NCAR and Facilities Section (NCAR and Lower Atmospheric Observing Facilities programs).

As Division Director, I led an internal staff of 24. In addition, the Division relies on hundreds of volunteer staff – those in the research community that offer their time for providing thoughtful reviews of proposals. I was responsible for developing and executing the Division's $250 million annual budget that supports a spectrum of research and education via single and multi-investigator awards, support for Science and Technology Centers, and support for NCAR, the Foundation's single largest assistance award to its largest federally-funded research and development center.

Broadly speaking, my responsibilities included the advancement of the atmospheric and geospace sciences through support of people (principal investigators, post-doctoral researchers and students) and research infrastructure (models, observations, and computational facilities) by identifying, through a fair, merit review process the most intellectually meritorious and impactful proposals to fund. It was my responsibility to ensure that divisional processes were executed in concert with the Division being an effective, efficient, and vigilant steward of taxpayer dollars.

In addition, I served on the Directorate of Geosciences Executive Committee along with the Assistant and Deputy Assistant Directors for Geosciences and the other DD's in GEO's three other divisions: Earth, Ocean, and Polar Sciences. The Executive Team's responsibilities were to help develop GEO budget priorities, shape and review administrative policies, develop programmatic solicitations/initiatives, and oversee the staffing for these initiatives that often involved working closely with colleagues in other Directorates across the NSF.

The review and selection of science proposals for funding is at the core of what NSF does. Proposals are reviewed for compliance with NSF rules for intellectual merit and broader impacts in the field, and enhancing the diversity of the research community. Given the tight budget situation during my tenure as Director, we unfortunately were not able to fund many well-reviewed proposals .

One of the most rewarding aspects of serving at NSF was the opportunity to identify and respond to a community need and create a solution – sometimes in the form of a new funding opportunity to meet that need. Working with my staff, we were able to create the following opportunities:

- The AGS Postdoctoral Research Fellowship (PRF) program, a highly competitive funding opportunity for "newly minted" PhD's to apply as PIs to work in a laboratory of their choice. The AGS-PRF program also is one of the first ever NSF-funded opportunities that include parental and family leave options.
- A pilot "Visiting Scientist Opportunity" (VSO) to support the translation of research funded by AGS to operations at NOAA's National Centers for Environmental Prediction, a cooperative initiative we undertook together with Dr. Louis Uccellini (Director NOAA/NWS) and NOAA staff.

As noted above, AGS supports research infrastructure from individual Major Research Infrastructure (MRI) awards, to in situ observing systems, to radar and research aircraft. During my period of service, the Federal budget for research was at best level but often cut. This posed challenges in balancing the needs of individual investigators with support for deployable facilities and support for NCAR. After a thorough discussion with program directors and relevant section heads, I made the decision to investment in a new community observing platform: the A-10 Storm Penetration Aircraft despite a constrained budget environment, because this platform held the promise of significant research advances.

A few of the lessons I learned from my time at NSF are especially worth sharing with the broader scientific community:

Program directors want to help PIs. They are willing to discuss briefly a proposed project before submission to determine if the proposal is appropriate for NSF funding or for a specific program.

Read solicitations carefully! Prospective applicants should make sure to follow the solicitations to the letter to avoid having their proposal returned without a review for not complying with guidelines.

The reviewer community is important to NSF. The effectiveness of the NSF merit review process depends on a large and engaged pool of scientists willing to carefully review proposals, participate in site visits, and even to review the NSF's own proposal review process. Please contact a program director and volunteer as a reviewer. NSF needs you!

Continued next page

UW-Madison is Certified as StormReady

Left to Right: Steve Brueske (NWS), Bill Curtis (UW EM), Tim Halbach (NWS), Dr. Louis Uccellini (NWS), UW Chancellor Rebecca Blank, Dr. Steve Ackerman (CIMSS), Margaret Mooney (CIMSS), Shane Hubbard (CIMSS). *Photo Credit: Bill Bellon (SSEC)*

In September 2015, the University of Wisconsin-Madison took an important step toward weather-readiness by becoming the second StormReady University in the state of Wisconsin. This designation was awarded in a small ceremony in the Chancellor's office where National Weather Service (NWS) Director and AOS alumnus Dr. Louis Uccellini presented Chancellor Rebecca Blank with a commemorative plaque.

This achievement followed months of effort and coordination between the UW and the NWS, starting with an initial meeting between AOS Systems Programmer and department stalwart Pete Pokrandt and CIMSS EPO Director Margaret Mooney. Pokrandt and Mooney contacted Tim Halbach, the Warning Coordination Officer at NWS Milwaukee/Sullivan, to begin the process.

To be StormReady, a University must have a 24-hour warning center, have more than one way to receive weather warnings and alert staff and students, have a system that monitors weather conditions, a formal hazardous weather plan which includes training severe weather spotters and holding emergency exercises, and also, actively promote weather readiness on campus.

Pre-existing undertakings at AOS, CIMSS, and UW Emergency Management put the UW-Madison in good standing even before starting the application! However, strengths needed to be documented and weaknesses needed to be addressed which led Pokrandt and Mooney to CIMSS scientist Shane Hubbard because of his extensive history working with UW Emergency Management. From there, Shane took the lead, finished the application, and is now the primary StormReady point of contact for the UW-Madison.

StormReady designation is part of NOAA's Weather-Ready Nation initiative to galvanize communities to prepare and respond to severe weather events. It was only natural that this effort would originate within the UW-Madison Atmospheric, Oceanic and Space Science building from an AOS-CIMSS collaboration.

For more information on StormReady see http://www.stormready.noaa.gov/ ■

NSF, continued from previous page.

I would not have been able to serve as Director of the NSF AGS Division without the support of the AOS Department and the College of Letters and Sciences. I hope that my efforts and activities well-represented the Wisconsin Idea at a national level. I also acknowledge the dedicated staff I had the pleasure and good fortune to work with as Division Director. Their dedication to preserving the integrity of the review process and ensuring the health of the research community – even in challenging budget times –has been an inspiration. ■

Len Robock Lecture Spring 2015

Kerry Emanuel, a leading authority on hurricanes and climate, delivered the 6th Len Robock Annual Lecture March 24 at the University of Wisconsin-Madison.

Professor Kerry Emanuel

A professor of atmospheric science at the Massachusetts Institute of Technology, Emanuel is on the forefront of research linking changes in the frequency and intensity of hurricanes with changes in climate. His work has broad significance for policymakers and the public alike, especially given the continued growth — and vulnerability — of coastal populations and infrastructure in the U.S.

According to Emanuel, climate models suggest that hurricane activity is sensitive to climate, but this relationship is less clear when compared to historical data. Emanuel addressed the relationships between hurricane activity and climate change, including recent rumors heard in popular discourse.

Named one of Time magazine's 100 most influential people of 2006, Emanuel has published more than 100 peer-reviewed papers in leading scientific journals. He is the author of two books, *Divine Wind: The History and Science of Hurricanes,* and *What We Know About Climate Change*. Free and open to the public, the lecture was made possible through the Leonard Robock Endowment to the UW-Madison Department of Atmospheric and Oceanic Sciences.

Looking ahead to 2015-2016: Katharine Hayhoe, atmospheric scientist and associate professor of political science at Texas Tech University, gave a special jointly sponsored (with the *Tales from Planet Earth* film series) lecture on November 7, 2015 entitled "Climate Change and Religious Stewardship." David Archer, professor in Geophysical Sciences at the University of Chicago and noted expert in the global carbon cycle and its relation to global climate, will be our featured Robock speaker on March 3rd, 2016. ■

MILESTONES

Congratulations to Our Graduates

Ph.D. recipients

Summer 2014:

Yun Liu, *"Parameter Estimation in Coupled Ocean-Atmosphere General Circulation Model Using the Ensemble Based Filter Method." (Liu)*

William Smith, *"4-D Cloud Properties from Passive Satellite Data and Applications to Resolve the Flight Icing Threat to Aircraft." (Ackerman)*

Fall 2014:

John Rausch, *"Investigating the Application of a Spectrally Consistent Adiabatic Cloud Retrieval Method to MODIS." (Bennartz)*

Spring 2015:

Haidi Chen, *"Physical Drivers of Biogeochemical Cycles in the North Atlantic Subtropic Gyre." (McKinley)*

Summer 2015:

Megan C. Kirchmeier-Young, *"A Probabilistic Perspective for Statistical Downscaling of Climate Variables." (Vimont)*

Darren Pilcher, *"Drivers of Large Lake and Marine Carbon Cycling: A Regional to Global Perspective." (McKinley)*

Andrew Winters, *" The Role and Production of Polar/Subtropical Jet Superpositions in Two High-Impact Weather Events Over North America." (Martin)*

M.S. recipients

Summer 2014:

Tracey Dorian, *"Spatial and Temporal Variability of Latent Heating in the Tropics Using TRMM Observations." (L'Ecuyer)*

Erik Gould, *"Observational Challenges in Assessing the Aerosol in Direct and Semi-Direct Effect." (Bennartz)*

Kuniaki Inoue, *"Gross Moist Stability Assessment during TOGA COARE: Amplification and Decay of Convection." (Back)*

Peter Jzyk, *Non-Thesis Option, (Desai)*

Kyle Nelson, *"The Role of Optically Thin Liquid Clouds in the 2012 Greenland Ice Sheet Surface Melt Event." (Ackerman)*

Stephen Ogden, *"Finding Energy Pathways from a Tropical Energy Bubble to a Mid-Latitude Jet Using Wave Activity Flux Vectors." (Tripoli)*

Erica Scotty, *"Sensitivity of Atmospheric Pollutants to Changes in Modeled Natural and Anthropogenic Emissions." (Holloway)*

Fall 2014:

Ethan Nelson, *"A Warm Rain Latent Heating Algorithm for Cloud Sat." (L'Ecuyer)*

Charles Weibel, *Non-Thesis Option, (Desai)*

Spring 2015:

Aaron Letterly, *"The Influence of Winter Cloud on Summer Sea Ice in the Arctic." (Ackerman)*

Nicholas Ofstun, *"The Contributions of Shearwise and Transverse Quasi-Geostrophic Vertical Motions to Baroclinic Conversion." (Martin)*

Andrew Wentland, *"Evaluation of a Chemical Forecast Model Using Advanced Aircraft Measurements." (Holloway)*

Summer 2015:

Nicole Colasacco-Thumm, *"An Investigation of Surface Heat Fluxes During El Nino Southern Oscillation (ENSO) Evolution in Reanalysis." (Vimont)*

Michelle Feltz, *"Guidance for Stratospheric Temperature Products: Comparing COSMIC Radio Occultation and AIRS Hyperspectral Infrared Sounder Data." (Ackerman)*

Nicholas Neutkens, *"Passive Microwave Precipitation Retrievals Over Problem Surface Types: An Intercomparison." (Petty)*

Alexa Ross, *"Correlations of Horizontally Oriented Ice and Precipitation in Marine Midlatitude Clouds Using Collocated A-Train Observations." (Ackerman)*

B.S. recipients

Summer 2014

Nathaniel Loeb

Spring 2015

Ross Braatz
Rachel Down
Britta Gjermo
Andrew Goenner
William Hahn
Conner Hardesty
Samuel Hartwick
Alexander Haugstad
Daniel Knuth
Brandon Lipp
Eric Loken
Zachary Murphy
Joseph Nettesheim
Lindsey Nytes
Craig Oswald
Elizabeth Schenk
Rebecca Schultz
Ryan Tvedt
Tanner Verstegen
Mitch Ziesemer

Summer 2015

Cody Kuchinski
Maria Madsen

In Spring 2015, AOS hosted its own formal graduation event. Here, our new B.S. degreee recipients receive applause from families and friends in attendance. Congratulations Class of 2015!

Scholarships and Awards

Spring 2015 Departmental Awards

Kaitlyn Krzyzaniak *received the Horn Award for excellence in overall performance as an undergraduate.*

Kuniaki Inoue *received the Lettau Award for outstanding master's thesis.*

Zachary Handlos *received the Wahl Award for outstanding performance as a Teaching Assistant.*

David Loveless *received the Schwerdtfeger Award for excellent performance in the first year of graduate studies.*

Claire Pettersen *received the Colloquium Service Award for creative dedication to the intellectual life of the Department.*

Steven Fons *received the Sunkel Award for exceptional scholarly potential.*

Tyler Wright *received the Lettau-Wahl Award for excellence in overall performance as undergraduate.*

Jiang Zhu *received the Reid Bryson Graduate Award from the Center for Climatic Research.*

Jessica Gartzke *received the Reid Bryson Undergraduate Award from the Center for Climatic Research.*

2015 Poster Session Awards

Graduates

Megan Kirchmeier-Young *(winner)*
Andrew Winters *(winner)*
Zachary Handlos *(honorable mention)*
Jiang Zhu *(honorable mention)*

Undergraduates

Britta Gjermo *(winner)*
Sarah Benish *(honorable mention)*

Outside Awards

Two AOS students received awards at the 20th International TOVS Study Conferences (ITSC), which met in Lake Geneva, WI 28 October- 3 November.

In the category of oral presentations, the Gold was awarded to graduate student **Jacola Roman** for *"Measurement Requirements and Current Capabilities for Satellite Remote Sensing of Precipitable Water Vapor."*

In the category of poster presentations, the Silver was awarded to undergraduate **Jessica Gartzke** for *"Ten Years of CAPE Observations in the U. S. SGP from the AIRS Hyperspectral IR Sounder: Climatology, Validation, and Near-real Time Applications."*

Prof. Dan Vimont and Ph.D. recipient Megan Kirchmeier-Young.

Dr. Mark Kulie and Prof. Grant Petty congratulate Will Hahn on his B.S. degree.

ALUMNI NEWS

Breaking news–new Alumni Award goes to Dr. Louis Uccellini

Just as this newsletter was about to go to press, the AOS Awards Committee announced that it had selected Dr. **Louis Uccellini (BS '71, MS '72, PhD '77)**, current Director of the National Weather Service and past president of the American Meteorological Society, to receive our department's inaugural Alumni Award. The new award recognizes his distinguished service to the country and to the meteorological community as well as his longstanding loyalty and friendship to the department and to the UW-Madison campus. The occasion will be observed at the January 12 reception at the AMS Annual meeting. We hope to see you there! And please consider nominating one or more of your fellow alumni for future awards!

Bart Adrian (M.S. '81) *is an agricultural climatologist for the University of Georgia, working on communicating climate variability and change to farmers in the Southeast. Married to John Knox, PhD 1996, who is an associate professor in the Geography Dept. at the University of Georgia.*

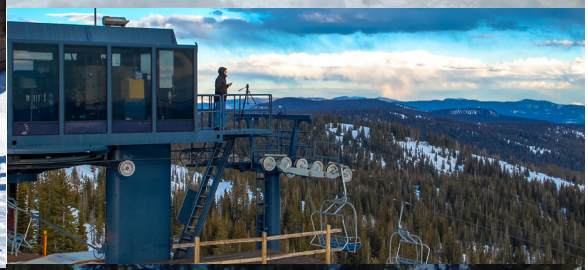
Carissa Bunge (B.S. '14) *has accepted a position as Public Affairs Specialist with the Science Policy department at the American Geophysical Union.*

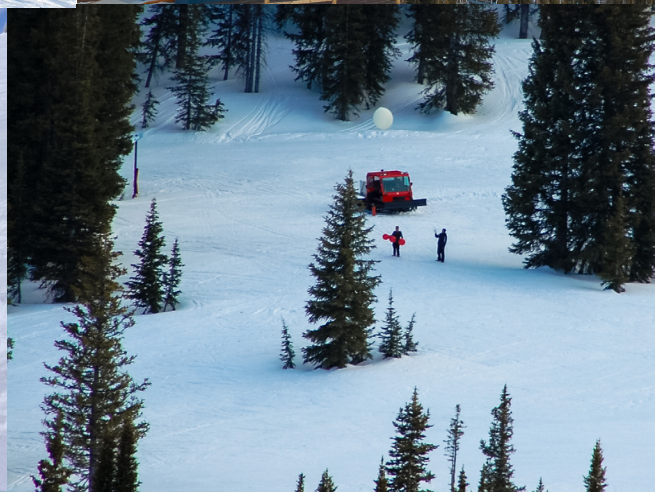
Leigh Orf (B.S. '89, Ph.D. '97) *now works as an Associate Scientist for SSEC (after 12 years at CMU)*

John Blank (B.S. '75) *retired from the National Weather Service after 41 year career as a forecaster*

Kyle Nelson (M.S. '14) *promoted to Ski Patrol Liaison for X Games 2016 in addition to promotion Advanced 1 patroller at Buttermilk Mountain in Aspen, CO.*

Storm Peak Lab Spring Break Trip 2015





Clockwise from upper left: 1) The UW-Madison team at Storm Peak Laboratory - Walter Sessions, Andrew Goenner, Josh Weber, Tanner Verstegen, Britta Gjermo, Joe Nettesheim, Will Hahn, Grant Petty. 2) Will and Joe dig a snow pit to learn about evaluating snow pack properties. 3) Prof. Petty prepares to track weather balloons with a digital camera. 4) Ian McCubbin (SPL) and Joe launch a radiosonde balloon from the valley floor. 5) Expert skier Britta prepares to deliver a weather station to its home for a week. 6) One of five professional quality logging weather stations that AOS acquired last year with the help of a generous donation from one of our alumni, deployed here "in the wild" for the first time. *Photo credits: 1) I. McCubbin, 2) G. Petty, 3-6) W. Sessions.*

We are fortunate to have great partners in Drs. Gannet Hallar and Ian McCubbin, Director and Site Manager, respectively, at Storm Peak Lab, located at 10,500 ft. elevation in the Steamboat Springs ski area in Colorado. Almost every Spring Break, an AOS professor travels with a group of 7–8 undergraduate students to live and work for a week on the mountain peak.

This year we were better equipped than ever before, thanks to an unusually generous donation by one of our alumni. We were able to upgrade our depleted instrument cabinet with a number of professional-quality instruments, including digital barometers and psychrometers, a radiosonde receiving station and weather balloon launching accessories, and, not least, five deployable weather stations that log temperature, humidity, wind, pressure, solar radiation, and precipitation.

We transported the five stations to the top of the mountain, and then each one was set up by students at 600 ft. vertical intervals along the side of the mountain. Several of the students' projects relied on the minute-by-minute weather records that were captured by all five stations. Among other things, we were able to observe the evolution of nighttime drainage winds as well as the transport of pollutants from the valley up the mountainside.

We are also grateful for several donations we received to help defray part of the students' cost of participation! ■

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o **AOS Department Fund - Unrestricted General Fund**

Our highest priority for new donations is our flexible Atmospheric and Oceanic Sciences Department Fund. This fund is used for a wide variety of high-priority needs established by the Chair in consultation with the faculty. Examples include

- Support for student travel to conferences and to participate in our Spring Break field observations and measurements course in Colorado.
- Repair and replacement of aging instructional equipment and rooftop weather instruments.
- Outreach and publicity activities, including the departmental newsletter as well as alumni events and special seminars.
- Up to six annual student awards for academic accomplishment or service to the department.

Undergraduate Financial Support

o **Warren E. Sunkel Scholarship in Meteorology Fund**

o **Lyle Horn Scholarship Fund**

o **Professors Heinz Lettau and Eberhard Wahl Scholarship Fund**

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Icicles in a cave, Apostle Islands National Lakeshore, Lake Superior, Wisconsin. January 2014. Photo by graduate student Walter Sessions