



# Making Waves

Fall 2010



SSEC

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## Greetings from the Chair

Jonathan Martin



I always seem to choose an auspicious meteorological day to sit down and write our annual greetings to you. Today (November 16) is the calendar day in Madison on which it becomes more likely that precipitation will fall as snow instead of rain. Thus, as winter begins, I hope you all have been well treated by the summer and fall – a particularly beautiful fall here in Madison.

It has been quite a year in our department and our department family. In June we were saddened by the unexpected passing of Prof. Chuck Stearns, a legendary mentor and colleague. We offer a brief review of Chuck’s career and reflections on his prodigious influence on so many students in this newsletter.

The Center for Meteorological Satellite Studies, under the leadership of Prof. Steve Ackerman successfully re-competed for a 5 year, \$60 M proposal to continue CIMSS world-class, remote-sensing based meteorological research. Remote sensing also played a central role on the night of April 14 when our rooftop webcam caught the suspected meteorite explosion over southern Wisconsin that spawned news inquiries from CNN, the New York Times, and NPR.

Professors Zhengyu Liu and Steve Ackerman were honored by the AGU and NASA, respectively, for outstanding scientific accomplishments. Professor Michael Morgan headed to NSF for a two year stint as Director of the Atmospheric and Geospace Sciences (AGS).

The Department is in the midst of recruiting a new member of the faculty while we anticipate the newly tenured status of some of our junior colleagues. It is, as always, an exciting time and we are propelled forward by the constant energy and industry of our faculty, staff, and students. More than once in the past year at faculty gatherings of one sort or another, a number of us have paused to consider how lucky we are to work in such a fantastic intellectual home.

Part of the splendor of our Department is its rich history and the vitality of its accomplished alumni. We hope to see many of you at our Annual Alumni Party at the AMS in Seattle this January – the details of which are contained within. At a time of fiscal challenge for the nation and the state, we are particularly grateful for your continued support of our enterprise as we continue, in the great Badger tradition – Forward!





## Faculty News

### Ackerman Receives NASA Medal



Professor Steve Ackerman, Director of the Center for Meteorological Space Studies, was selected to receive the NASA Exceptional Public Service Medal. The medal is “awarded to any individual who was not a Government employee during the period in which the service was performed. The award is given for exceptional contributions to NASA’s mission.” He received the award at a ceremony the week of May 10 in Washington, DC. We have included a snapshot of the medal given as part of the award. Congratulations Steve!



As Director of CIMSS, Steve also had the pleasure of announcing that CIMSS was successful in its re-competition proposal to keep CIMSS at UW-Madison. The 5 year, \$60 million proposal will enable over 100 CIMSS scientists and collaborators to continue research using remote sensing

systems for meteorological and surface-based applications. Congratulations to all involved in the process!

### McKinley Launches New Carbon Cycle Web Site



Professor Galen McKinley recently launched a website that explains the global carbon cycle and its links to climate change. The centerpiece of the site is a java applet in which users define the future trajectories of carbon sources and sinks, and quickly see the impact on the atmospheric CO<sub>2</sub> concentration. Check out the Carbon Cycle web site at <http://carboncycle.aos.wisc.edu>.

### Morgan Assumes Leadership of NSF's Atmospheric and Geospace Sciences (AGS)



Professor Michael Morgan began a two year stint as Director of the Atmospheric and Geospace Science Directorate at the National Science Foundation in June 2010. Since assuming that role, Michael has made a few trips back to Madison though not enough to ensure that he is around during exciting weather (he missed the October 26 cyclone/windstorm event, for instance). Those in the know realize that for Michael to not be a magnet for severe, impactful weather is rather unusual.

Though we miss him around here, it is good to have friends in high places and we wish him well. We are already eager for his return.

### Desai Leads Wind Farm Field Trip

Professor Ankur Desai led students in his Wind and Weather for Scientists and Engineers on a field trip to the Montfort wind farm in Dodgeville, WI on November 12. The farm consists of 20 wind turbines with a 30 megawatt capacity and has been operational since July 2001. The group examined both the construction and operation of the windmills while learning how operation of the farm is informed by weather forecast information. In the photograph below, Ankur (right) and colleague (both wearing the requisite hard hats) inspect the connector end of a large rotor measuring more than 50' in length.

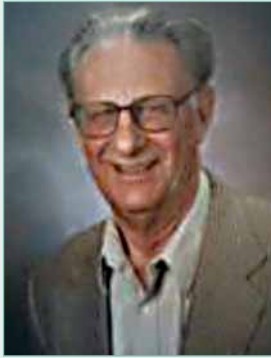


### Graduate Student Association (GSA) Honors Faculty with Teaching Award

At our Student Awards Day in April, the GSA honored Profs. Galen McKinley and Ankur Desai with its first ever GSA Teaching Award. In its nomination of Prof. McKinley, the GSA noted “Her organization, teaching skills, dedication, responsibility, and enthusiasm for the class set her apart.” In its nomination of Prof. Desai, the GSA noted, “The level of detail he provides when explaining how observations are made... is very helpful... The atmosphere of his class is refreshing and engaging.”



Professors Ankur Desai (left) and Galen McKinley (right) with Katherine Mozer (GSA President, center) receiving the inaugural GSA Teaching Award.



Professor Charles R. Stearns, esteemed colleague, father of the U.S. Antarctic Program's Automatic Weather Station system and a pioneer in polar meteorology, died on Tuesday, June 22, 2010 at 85 years of age.

Chuck's association with the University of Wisconsin spanned 64 years, beginning as an undergraduate in 1946, after his service as a U.S. Army infantryman in World War II (1943-1946), during which he participated in the invasions of Leyte and Okinawa. He earned all three of his degrees from the university – a Bachelor of Science degree (1950), a Masters of Science degree in meteorology (1952) and Doctorate of Philosophy in meteorology (1967). He served as a member of our faculty since 1965.

Chuck was the principal investigator on the Antarctic Automatic Weather Station (AWS) program for 28 years. He began the program at the University of Wisconsin in 1980 by acquiring the first AWS designed at Stanford University. These stations were then modified for deployment to Antarctica.

The AWS project represented the first large-scale meteorological instrumentation of Antarctica. Today, the program includes more than 60 stations across the continent, accounting for about half of all AWS units operating in Antarctica. The data from the AWS systems are transferred back to the University of Wisconsin for processing and distribution to the public free of charge. In 1992, Chuck envisioned another method of transforming the meteorological studies of the Antarctic – the generation and collection of satellite images – and created the Antarctic Meteorological Research Center. In the beginning, Stearns envisioned using the Man computer Interactive Data Access System (McIDAS) to combine various polar-orbiter and geostationary images into one image. The AMRC continues to generate these composites today, and they remain the hallmark of the project.

Chuck taught more than 11 classes during his career and was involved in more than nine field projects. He deployed to Antarctica 17 times. He was advisor to 30 students over his career, and provided significant assistance to a half-dozen other students in the United States and abroad with their research.

Professor Stearns was a deeply respected colleague and a generous spirit who spent a significant amount of his career exploring Antarctica's weather and climate and its impacts on the rest of the world. He will be sorely missed. For a collection of testimonials to Chuck, please visit <http://chuckstearnsmemorial.blogspot.com/2010/06/welcome.html>.

## Liu Elected a Fellow of the American Geophysical Union



AOS Professor Zhengyu Liu has been elected a Fellow of the American Geophysical Union! This election puts Liu in a rarified group, as only one in a thousand members is elected to Fellowship each year. Liu will receive his Fellows certificate at the Honor Ceremony during the AGU Fall Meeting in December 2010. Congratulations, Liu!



### Alumni News

*"Badgers, Badgers everywhere!"*

## Karnauskas Accepts Position at Woods Hole Oceanographic Institution



Dr. Kris Karnauskas (BS 2004) recently accepted a tenure track position as Assistant Scientist at the Department of Geology and Geophysics at Woods Hole Oceanographic Institution. Kris received his PhD in Atmospheric and Oceanic Science from the University of Maryland where he studied under Tony Busalacchi. Kris reports that he is teaching for the first time; a class called Climate Change and Society, to a group

of 70 undergraduates at Boston College. Apparently he has no problem keeping order in the classroom – not surprising given the accompanying photograph from his webpage. Congratulations, Kris!

## Samenow Named Climate Change Communicator of the Year



Mr. Jason Samenow (MS 2000), now chief meteorologist with the Capital Weather Gang in Washington, D.C., has been named the 2010 Climate Change Communicator of the Year, along with the BBC World Service Trust, by the George Mason University Center for Climate Change Communication. Jason is an environmental scientist working in the Environmental Protection Agency's Climate Change Division

where he has been instrumental in communicating climate change science through EPA's Internet Infrastructure, in particular through the launch and management (for several years) of EPA's Climate Change Website at <http://www.epa.gov/climatechange>. Read more about Jason's efforts at <http://www.climatechangecommunication.org/jason-samenow.cfm>. Congratulations, Jason!

## AOS Alumni Reunion Reception

The third annual UW-Madison Alumni Reception was attended by over 100 people at the Annual Meeting in Phoenix in January 2009. The next installment of this fabulous event will take place at the AMS Annual Meeting in Atlanta, Georgia on Tuesday January 19 from 6:30 - 9 PM. As you may know, Tuesday night is reception night at the AMS Meeting



where a number of schools host reunions for their alums. Ours has been, by far, the most heartily attended affair of all for three years running. We hope to see you on January 19 and don't forget to pick up your Bucky Badger pin when you stop by for food, drinks, and reminiscing with old friends and current colleagues.

## Knox Wins Research Award from the National Weather Association



Dr. John Knox (PhD 1996), an Assistant Professor in the Department of Geography at the University of Georgia, was awarded the T. Theodore Fujita Research Achievement Award from the National Weather Association at the NWA Annual Meeting in Tuscon, AZ on October 6. The award is presented to an NWA member whose research has made a significant contribution to operational meteorology and has been given annually since it was first presented to Fujita himself in 1978. John was honored for his research work on clear-air turbulence forecasting. Congratulations, John!

Dr. John Knox (PhD 1996), an Assistant Professor in the Department of Geography at the University of Georgia, was awarded the T. Theodore Fujita Research Achievement Award from the National Weather Association at the NWA Annual Meeting in Tuscon, AZ on October 6. The award is presented to an NWA member whose research has made a significant contribution to operational meteorology and has been given annually since it was first presented to Fujita himself in 1978. John was honored for his research work on clear-air turbulence forecasting. Congratulations, John!

## Schuenemann Accepts Position at Metropolitan State College



Dr. Keah Schuenemann (BS 2004) joined the faculty in the Department of Earth and Atmospheric Sciences at Metropolitan State College of Denver this past year. Keah went to graduate school at CU-Boulder, receiving her MS in 2006 and her PhD in 2008 studying under another UW graduate, Professor John Cassano (MS 1994). Keah currently works on creating a sea-level pressure climatology of the North Atlantic region using a self-organizing map algorithm to understand predicted changes in weather patterns and precipitation over the Greenland ice sheet. Congratulations, Keah!

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## Department Events

### Meehl Delivers Robock Lecture



Dr. Gerald Meehl, Senior Scientist in the Climate and Global Dynamics Division at NCAR delivered the second Annual Robock Lecture on September 16, 2010. An audience of more than 60 people enjoyed Jerry's fascinating presentation entitled "Weather Extremes in a Changing Climate." Jerry described how small shifts in average conditions can lead to large changes in extremes and demonstrated this principle specifically with reference to extreme temperatures. He emphasized that the current ratio of 2 to 1 for setting record daily maximum temperatures versus record daily minimum temperatures is symptomatic of an ongoing warming of average temperatures. This ratio is predicted to increase as the climate continues to warm with one estimate for the A1B emission scenario of about 20 to 1 by mid century and 50 to 1 by late century.

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Our annual Department Student Awards Day was held on Wednesday April 28, 2010. We gathered to honor excellence in both undergraduate and graduate student's performances as students in the classroom, teachers in the classroom, and researchers in the lab.



Amanda Fay and Mark Wehrenberg (above) received the Colloquium Student Service Award for their outstanding contributions to the organization and execution of our weekly Department Colloquium.



Dan Hartung (above) received the Lettau Award for the best MS thesis for his thesis *The Influence of an Evolving Wave Guide on the Life Cycle of an Undular Bore and its Interaction with a Shallow, Intense Cold Front* under the guidance of Professor Jonathan Martin.



*Jiaxu Zhang (above) received the Schwerdtfeger Award for best performance as a first year graduate student.*



*Erik Gould (above) received the Lettau-Wahl Award for excellence as a junior undergraduate as chosen by the Chair of AOS.*



*Andrew Winters (above) received the Horn Award for comprehensive excellence as a junior undergraduate.*



*Elise Garms (above) received the inaugural Sunkel Award as the junior undergraduate whose scholarly potential is considered exceptional.*



## Graduate Program Report

### Master of Science Degrees

#### Fall 2009 Master of Science Degrees

*Beitlich, Jacob, "Distribution of Hydrometeors Inside the Updrafts and Downdrafts of Simulated Thunderstorms." (Wang)*

*Hartung, Dan, "The Influence of an Evolving Wave Guide on the Life Cycle of an Undular Bore and its Interaction with a Shallow, Intense Cold Front." (Martin)*

*Miretzky, Brian, J., "A Model Based Analysis of the Synoptic and Mesoscale Processes Associated with Subsidence Into Western Great Lakes Wildfire Environment." (Martin)*

*Niebuhr, Emily, "A Coastally Trapped Wind Reversal Along the Gulf of Alaska." (Hitchman)*

*Park, Chang Hwan, "Assimilation of Radar Observations Using Approximate Background Error Covariances." (Bennartz)*

*Sulman, Benjamin, "A Comparison of Carbon Dioxide, Water, and Energy Fluxes at a Drying Shrub Wetland in Northern Wisconsin, USA with Nearby Wetland and Forest Site." (Desai)*

#### Spring 2010 Master of Science Degrees

*Ahue, William, "Regional Carbon Fluxes and Boundary Layer Heights From the Airborne Carbon in the Mountains Experiment." (Desai)*

*Cuzzone, Joshua, "The Role of Clouds in Influencing the Trajectory of the Arctic Climate." (Vimont)*

*Davis, Sarah J., "Model-Based Assessment of Orographic Bias in Surface Precipitation Measurements on Jan Mayen Island." (Petty)*

*Henz, Daniel, R., "A Modeling Study of the Tropical Tropopause Layer." (Tripoli)*

*Holman, Kathleen D., "Understanding Extreme Precipitation Events in Climate Simulations of the Twentieth and Twenty-first Centuries in Madison, Wisconsin." (Vimont) - continuing for PhD*

*Jaffe, Sharon, C., continuing for PhD "Synoptic-Climatology of Episodic, Sub-Seasonal Retractions of the Pacific Jet." (Martin)*



## Spring 2010 Master of Science Degrees

*Kolat, Utkan, "Re-evaluation of HIRS Detection of High Clouds." (Ackerman)*

*Obergfell, Courtney, Non-thesis option. (Vimont)*

*Razenkov, Ilya, "Characterization of a Geiger-Mode Avalanche Photodiode Detector for High Spectral Resolution Lidar." (Ackerman) - continuing for PhD*

## PhD Degrees

### Fall 2009 PhD Degrees

*Rogal, Marek, "Dynamical Redistribution of Column Ozone in the Southern Hemisphere." (Hitchman)*

### Spring 2010 PhD Degrees

*Kulie, Mark, "Active and Passive Microwave Remote Sensing of Higher Latitude Precipitation." (Bennartz)*

*Liu, Chian-Yi, "Remote Sensing of Stormy Lipper Tropospheric State Using High Spectral Resolution Measurements." (Ackerman)*

*Su, Shih-Hao, "A Numerical Study of Convectively Generated Gravity Waves Atop Thunderstorms." (Wang)*

*Wu, Longato, "Piecewise Potential Vorticity Inversion Diagnosis of the Development of Polar Lows." (Petty)*



## Undergraduate Program Report

### Undergraduate Degrees

#### May 2010 Bachelor of Science Degrees

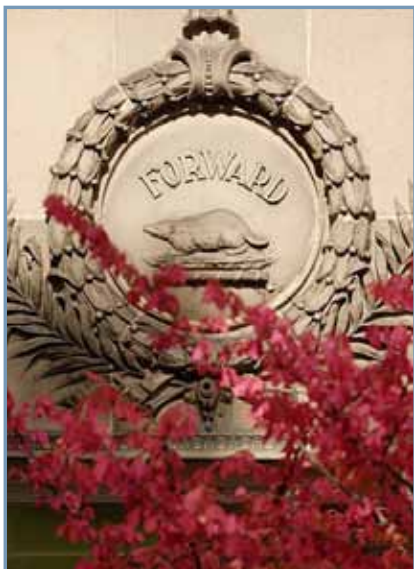
*Samantha Scott Ahrendt, Taylor Lee Austin Jr, Hannah Cecile Barnes, Daniel Thomas Clement, Ryan M Collins, Matthew James Duerst, Zachary James Handlos, Michael Jay Hiley, Michael George Karow, Kristin Ann Klingelutz, Nicholas Warren Kratzke, Bradley Wray Miller, Luke Daniel Schiferl, Lance Michael Vanden Boogart, Victoria Nijole Vasys, Andrew Ryan Wright*

## ❖ Alumni Contributors ❖

November 1, 2009 through November 22, 2010

*Barton J. Adrian, Richard K. Albrecht, Thomas J. Balousek, Gary T. Bates, Dan A. and Stacy E. S. Baumgardt, Daniel M. and Karen L. Baumgartner, Craig L. Berget, James S. Berman, Jerome B. Blechman, Christopher T. and Lori Bovitz, Jim D. Brader, David H. Bromwich, Larry H. Bruss, Melissa K. Carr, William W. and Felicia H. Chen, Sarah J. Corfidi, Alan C. Czarnetzki, Jon B. Davis, David M. Demeuse, Steven G. Decker, John E. Dietrich, Thomas E. Dillon, Claude E. Duchon, Patrick N. Graham and Dr. Susan Elston, Geoffrey M. Flint, Thomas J. Greenwald, Mary B. Hagedorn, Brian V. Hahn, Douglas G. Hahn, Donald A. Haines, Russell A. Hankins, Stefan Hastenrath, Leon E. Heller, Janet M. Hilts, Doris Hood, David D. and Barbara C. Houghton, Dale N. Hovland, William J. Hurlin, William H. Jasperson, Edward C. Johnston, Anton F. Kapela, Peter R. Keehn, David L. Keller, James F. Kimpel, Gary Scott Kirst, David L. Kleckner, Richard W. Knight, Thomas R. Knutson, Gisela and John E. Kutzbach, Thomas H. Kyle, Daphne Sue LaDue, Peter J. Lamb, Dennis A. and Marilyn B. Lawler, Matthew A. Lazzara, Anne M. LeBlanc, Laurence G. Lee, Cecil Sy-Sheau Lo, Nathan L. and Katherine L. Mahr, David W. and Linda L. Martin, Robert W. McLain, Edward J. Metzger, Shaima L. Nasiri, James P. Nelson III, Peter N. and Kristin A. Nines, Raymond G. O'Keefe, John C. Osborn, Jr., Byron A. Paulson, Thomas J. Phillips, Terrance Robert Rahman, James E. Ramer, Stephen J. Rigney, Kenneth R. Rizzo, Richard S. Ryrholm, Perry J. Samson, David A. Santek, Douglas H. and Karen I. Sargeant, Timothy J. Schmit, Kurt R. Schmitz, Todd J. and Dawn Shea, Eric D. Skyllingstad, Christopher C. and Karen L. Smallcomb, Phillip J. Smith, John J. Bates and Ms. Mara L. Sprain, Alfred J. and Mary V. Stamm, Michael J. Staudenmaier, Jr., William J. Steffen, Ronald Stewart, Mark J. and Kari S. Stokosa, Norton D. Strommen, Dennis W. Thomson, Daniel B. Thompson, William E. and Ruth M. Togstad, John C. and Ruby M. Turner, Louis W. and Susan Uccellini, Stephen J. Vavrus and Susan K. Swanson, Russell E. Walesh, Thompson Webb III, George A. Weidner, William E. B. Welsh, Donald E. Wuerch, Estate of Leonard I. Robock (c/o Alan Robock)*

# Thank You!



*Reddish foliage frames a view of state of the Wisconsin "forward" motto and an iconic image of a badger during autumn on Oct. 5, 2006. The architectural details are on the exterior of the Education Building at the University of Wisconsin-Madison.*

*— Photo by Jeff Miller/UW-Madison Communications.*





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*As dusk falls on Dec. 9, 2009, a snow-coated sign along Park Street near Library Mall at the University of Wisconsin-Madison warns of passing bicycle traffic. University classes were canceled and the campus was closed when a winter storm left 14-plus inches of snow. After an in-house discussion of the pending storm, Professor J. Martin called the Chancellor's Office on the afternoon of December 8 to suggest closing the University in the face of what appeared likely to be an historic snowstorm. We can't be sure what influence that call had, but University classes were canceled and the campus was closed as the AOS forecast verified and the campus received 14 inches of snow. — Photo by Jeff Miller/UW-Madison Communications.*



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