



AOS & CICS Newsletter

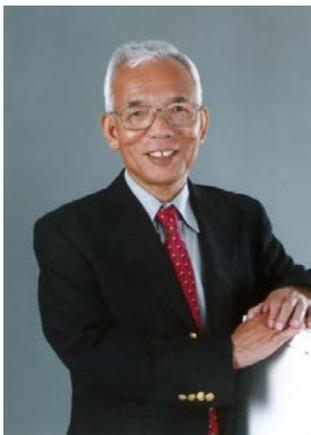
Winter 2015

Volume 9, Number 1

Syukuro Manabe Awarded Benjamin Franklin Medal in Earth and Environmental Science

Contributed by Maria Setzer, GFDL Communications Director

The Franklin Institute has announced that AOS Senior Meteorologist Syukuro (Suki) Manabe, will be awarded the 2015 Benjamin Franklin Medal in Earth and Environmental Science. Manabe is being recognized for “his pioneering research on the sensitivity of Earth’s climate to increasing carbon dioxide in the atmosphere and his development of global climate models, which have led to fundamental advances in the understanding of climate variability and to methods for predicting future climate change.” Awards will be formally presented to recipients at a ceremony on April 23, 2015 at The Franklin Institute in Center City, Philadelphia.



AOS Senior Meteorologist Syukuro (Suki)Manabe

Manabe’s pioneering work using computers to simulate global climate, and climate change, began at GFDL in 1958, when the lab was located in Washington, D.C. In the early 1960’s, he developed a single-column model of the atmosphere in radiative-convective equilibrium. His pioneering studies with colleagues at GFDL produced the first credible calculation of the role of greenhouse gases such as carbon dioxide, water vapor and ozone in maintaining and changing the thermal structure of the atmosphere. These studies were of vital importance for the development of comprehensive general circulation models, initially for the atmosphere and subsequently for the coupled atmosphere-ocean-land system. In 1967, Manabe coauthored a seminal paper that demonstrated that increasing atmospheric carbon dioxide concentrations would increase the altitude at which the earth radiated heat to space. In 1969, he and AOS Senior Meteorologist Kirk Bryan published the first simulations of Earth’s climate with coupled ocean and atmosphere models, establishing the role of oceanic heat transport in determining global climate.

His decades-long quest to develop a quantitative understanding of the climate system led to the development of models that enable the Intergovernmental Panel on Climate Change (IPCC) to inform policymakers about the changes in climate that lie ahead and their attendant impacts on nature and people worldwide.

Manabe spent most of his career at GFDL, helping to build it into the world’s premier laboratory for numerical simulation of the atmosphere and ocean. He retired from GFDL in 1997. He served on the AOS faculty as lecturer with rank of professor from 1968 to 1997 and as Director of the Global Warming Research Program, Frontier Research System for Global Change in Japan from 1997 to 2001.

Program in Atmospheric and Oceanic Sciences (AOS) & The Cooperative Institute for Climate Science (CICS)

Inside this issue:

- Benjamin Franklin Medal Awarded to Suki Manabe..... 1*
- Legg & Hallberg at Sea.....2*
- Zhang Appointed Lecturer.....3*
- Balaji Delivers Keynote.....4*
- Zanowski Takes to the Sea.....4*
- Legg Joins US CLIVAR Leadership...5*
- GFDL Winter Poster Expo.....5*
- NOAA EPP Forum.....6*
- AOS Faculty & GFDL Scientists Listed as Highly Cited Researchers6*
- Student/Postdoc Seminar Series.....7*
- AOS Applications Remain Near Record Number.....7*
- AOS & CICS News7*

In 2002, he returned to Princeton and has been a Senior Scientist in AOS since 2005.

TigerTransit/Shuttle Services
Operating Schedule:
<<http://www.princeton.edu/transportation/t/routes/ForrestalFall2014.pdf>>.



AOS Senior Scientists (L to R) Kirk Bryan & Suki Manabe – early collaborators on the development of the coupled ocean-atmosphere model, and former GFDL Director Joseph Smagorinsky

In addition to this honor, Manabe has been recognized through his election to the National Academy of Sciences and other professional groups. He is an honorary member of American Meteorological Society and other learned societies. Manabe was one of the first inductees to the Kyoto Earth Hall of Fame. He is the recipient of the first Blue Planet Prize, the Volvo Environmental Prize, the William Bowie Medal, as well as many other notable awards.

A symposium will be held in Manabe’s honor on April 20, 2015 from 9:00 am to 12:30 pm at the Friend Center on Main Campus. Details will be announced shortly.

One of the oldest, most prestigious, and comprehensive science and technology awards programs in the world, The Franklin Institute Awards Program has honored thousands of scientists, engineers, inventors and entrepreneurs since its inception in 1824. The list of Franklin Institute laureates reads like a "Who's Who" in the history of 19th and 20th century science, including Alexander Graham Bell, Pierre and Marie Curie, Thomas Edison, Niels Bohr, Max Planck, Albert Einstein and Stephen Hawking. To date, 113 Franklin Institute laureates also have been honored with a Nobel Prize. ■

****Save the Date***
Symposium to honor
Suki Manabe
April 20, 2015
Friend Center
9 am – 12:30 pm*

Legg and Hallberg: Collaborators at Sea

In early January, CICS Associate Director Sonya Legg and AOS Faculty Member Bob Hallberg joined a crew of fifteen aboard the Scripps ship *RV Roger Revelle* to take part in a NSF-funded experiment, dubbed T-TIDE, which set out to measure the breaking and dissipation of internal tides as they crash into the Tasmanian continental slope. This was the first leg of a three-legged project whose goal is to understand how the ocean’s internal dynamics -- specifically the hidden yet powerful and enormous tides and waves coming from the MacQuarie ridge near New Zealand -- interact with the atmosphere to influence our climate.

The task is easier said than done. The Tasman Sea, a spot notoriously nicknamed the “Roaring Forties” due to strong winds ripping from the west through the Southern Hemisphere, presents a real challenge to scientists since its massive, 30-story-high waves can travel hundreds of kilometers before breaking. By using a global simulation of internal tides to identify optimal regions to study these underwater swells, the T-TIDE team chose three spots to scrutinize in the region -- the point of wave birth near New Zealand, the point of wave propagation in the middle of the ocean, and the point of wave “death,” or where they break, on the Tasman Slope.



Sonya Legg with the instrument checklist during mooring deployment

“For the first 10 days we spent most of the time deploying subsurface moorings - lots of instruments on a cable anchored at the seafloor, and with a float and beacon at the top,” Legg said. She and Hallberg joined a team of about six technical experts to deploy the moorings, Hallberg assisting with the winches and line counter, and Legg with the instrument checklist and A-frame operation. The moorings, which varied in depth from about 3500 meters to only a few hundred meters at the top of the continental slope, will give the science team measurements of temperature, salinity, and currents at particular locations as a function of time over several weeks - important for understanding the tidal cycle, according to Legg. “We’ll only see if we were successful when the moorings (equipped with 400 sensors and instruments) are finally recovered in March, and all the data can be downloaded from the sensors,” said Legg.

Following the deployment of most of the moorings, the science party concentrated on around-the-clock CTD (conductivity-temperature-depth) operations. “The CTD, which measures salinity, temperature and pressure as it is lowered and raised on a wire from the ship, was used continuously, either in one spot for 12-24 hours (a “yo-yo”) or as the ship moved back and forth along a line every few hours (a “tow-yo”), to allow us to see the underwater motions over the tidal cycle,” Legg explained.



Bob Hallberg using a GoPro camera to videotape the CTD as it is lowered

To understand how the topography influences the breaking of the underwater wave on the continental shelf, examples of different types of topography were chosen.

“We were able to look at the CTD data we had collected each day and make decisions about where to go next based on that,” Legg said. The team also used an ADCP (acoustic doppler current profiler) to measure current velocities, in addition to specialized instruments for measuring turbulence.



Sonya Legg monitors incoming data from the Rosette. Credit: Julia Calderone

As an outreach project to demonstrate the effect of water pressure at depth, all of the elementary and middle school students at the Cambridge School in Pennington, NJ, decorated Styrofoam cups that Hallberg brought with him on the T-TIDE cruise. After being compressed by the pressure of 2500 meters of water, the cups were less than one third of their original size.

“Bringing these cups out to sea and then returning them to the kids is a great way to get these kids engaged in thinking about what the ocean environment is like and the challenges of observing it,” Hallberg said. A photo of Hallberg holding one of the miniature cups can be found at: https://scripps.ucsd.edu/projects/ttide/for_kids/.

Legg’s and Hallberg’s invitation to join the 25-day cruise was a direct result of their collaboration with several PI’s from the Internal Wave Driven Mixing Climate Process Team. That spirit of collaboration extended well beyond the shoreline, with every member of the science party pitching in whenever and wherever they were most needed. By the expedition’s end on February 3rd, the *Revelle* science team deployed a record 15 moorings in 10 days, and managed to recover two moorings (and re-deploy one of them) for a total of 16.

“For me, the most exciting part of the cruise scientifically, was seeing evidence of enhanced mixing associated with the

reflection of the internal tide from the continental slope,” Legg said.



Sam Fletcher (Scripps) and Bob Hallberg spool and mark the mooring line before it is loaded up. Credit: Julia Calderone

“This is something I’ve seen in numerical simulations - nice to see it in the real ocean, finally! Having six scientists poring over the data from the previous night’s CTD operations and discussing what it shows and what decisions to make next was exciting too.”

“As an ocean modeler, I spend a lot of time thinking about how to represent all of the processes that are observed to occur in the ocean, but being out on the ship and watching in real-time as the raw data came in gave me a whole new appreciation for the great richness of the ocean’s dynamics,” said Hallberg.

Ultimately, datasets from all three legs of the project will help scientists to develop realistic representations of the mixing due to the internal tide breaking on the continental slope, for use in GFDL’s ocean climate models, and for improving the accuracy and credibility of their climate simulations and projections. ■

Zhang Appointed Lecturer in Geosciences and AOS Program

Rong Zhang has been appointed a Lecturer in the Department of Geosciences and the AOS Program effective February 1, 2015. She will be teaching AOS 573 Physical Oceanography in the spring of 2016.



Geosciences and AOS Lecturer Rong Zhang

An oceanographer in GFDL’s Climate Change, Variability and Prediction Group, Zhang’s research interests include abrupt climate change and low frequency variability in the coupled ocean-atmosphere system, global teleconnections of climate change, the impact of Atlantic meridional overturning circulation (AMOC) on global and regional climate change (such as Sahel, Indian, and East Asian monsoon, hurricane activities, Arctic sea ice), and the mechanism and fingerprints of AMOC variability.

Zhang was recognized along with fellow contributors Tom Knutson, Andrew Wittenberg, and Fanrong Zeng as one of Foreign Policy’s Leading Global Thinkers of 2013 “for explaining the complex issues surrounding the extreme events in 2012 from a climate perspective” in a special supplement to the Bulletin of the American Meteorological Society. She was awarded the 2012 AGU Editor’s Citation for Excellence in Refereeing for Geophysical Research Letters. Zhang has authored numerous scientific publications and contributed to dozens of scholarly journals, both as an author and a reviewer.

“We are delighted to have Rong join our faculty. She is a great fit for our Program and will be of tremendous benefit to our students,” AOS Director Jorge Sarmiento said.

Zhang holds a Ph.D. in Climate Physics and Chemistry from the Massachusetts Institute of Technology (MIT). She earned her M.A. in Physics at Boston University and a B.E. in Electronic Engineering at Tsinghua University in Beijing, China. ■

V. Balaji Delivers Keynote at Workshop on High Performance Computing in Meteorology

The head of GFDL's Modeling Services, V. Balaji, an AOS and CICS scientist, was invited to deliver the keynote talk at the sixteenth Workshop on High Performance Computing in Meteorology, organized by the European Centre for Medium-Range Weather Forecasts. The workshop was held in Reading, England, from October 27- 31, 2014. Held biennially, this workshop provides a venue for the community to report on their experience and achievements, share plans for the future, and discuss new requirements for computing power.

Balaji delivered the keynote talk, "Climate Computing: the State of Play," before a packed house on October 29th. The talk covered trends in climate science which are driving models toward higher resolution, greater complexity, and larger ensembles, and the computing challenges that those present. In his talk, Balaji introduced a set of universal metrics that can be used for the comparative study of computational performance of Earth System models.

These measures could be used as a basis for a computational performance model inter-comparison project ("CPMIP") – ancillary to the <[Coupled Model Intercomparison Project](#)>.



V. Balaji presents Keynote address at ECMWF Workshop.

"It was an immense pleasure and honor for me to be asked to give the keynote talk at one of the premier venues in the field of climate and weather computing," Balaji said. "This biennial meeting is one of the hottest tickets around; I've been attending the meeting since 1998."

"For this talk it was great fun to go back and pull slides from my talks from 10-15 years ago to see where we've been," said Balaji. "By this retrospective look, we could see how the concerns remain the same though the technology has moved on: expressing the physics we're trying to model in elegant and intuitive ways while extracting the maximum performance from complicated and challenging high-end hardware."

An overview of Balaji's ECMWF HPC Workshop keynote address can be found at: <<https://www.youtube.com/watch?v=fkwhTwdE4ZQ>>. ■

AOS Graduate Student Zanowski Takes to the Sea

In early December, AOS Graduate Student Hannah Zanowski embarked on a journey from Cape Town, South Africa to the bottom of South America via Antarctica and the Weddell Sea. She joined a crew of international research scientists on board the German Research Icebreaker *Polarstern* as a representative of the recently-funded project known as Southern Ocean Carbon and Climate Observations and Modeling or SOCCOM. The project's goal is to understand the role that the Southern Ocean, a chronically under sampled region of the globe, plays in regulating Earth's climate system, as well as how human emissions of heat-trapping carbon dioxide gas are affecting that system.

The goal is an ambitious one given the wildly harsh conditions and remote location of the Southern Ocean. Yet, despite its challenges, including icy winds, tumultuous seas, and thick, rigid multi-year sea ice, a dozen biogeochemical floats -- out of a total of 200 to be deployed over the next five years -- were lowered into the crests of passing waves during the expedition.



A biogeochemical SOCCOM Float commences its multi-year mission in the Southern Ocean.

© Stefanie Klebe, AWI

Similar to thousands of floats already deployed through the Argo Program which measure temperature, pressure, and salinity, the SOCCOM floats collect additional data on nitrate, oxygen, pH, and chlorophyll. According to SOCCOM Director Jorge Sarmiento, these are key measures to understanding the larger processes in the ocean. Equipped with sensors to detect an ice ceiling, these floats will not surface until their path is ice-free and because they are battery operated can take measurements for up to five years. Most notably, they have a vastly reduced carbon footprint as compared to conducting similar research by ship.

While aboard the vessel, Zanowski joined Scripps Chemist Dan Schuller in a seemingly endless endeavor of taking samples and running the necessary analyses to obtain data for calibration of the SOCCOM floats. "I basically follow the CTD. When it's up, so am I. Any time of day or night is fair game," Zanowski wrote in her *Polarstern* blog entry. She and Schuller took nutrient samples at every CTD station in addition to collecting DIC, pH, alkalinity, and chlorophyll samples at each of the float stations. Salinity samples were also taken at the float stations, but the CTD team was responsible for their collection. As soon as the CTD reached the surface at these stations, she and Schuller deployed the designated float, and then collected water samples from the CTD. Every cast, sometimes three per day, brought water from 24 different depths which needed to be sampled and analyzed.

Schuller was responsible for all of the shipboard nutrient analyses while Zanowski took care of the salinity analyses. The rest of the samples were sealed, packaged, and are currently en route to Scripps for analysis there. Some of the data was relayed back to the research team via satellite for processing and publishing in near real-time <<http://www.mbari.org/soccom>>.



Zanowski contemplating the shelf (Credit: Dan Schuller)

The cruise was originally planned to end in Punta Arenas, Chile after two months, however, owing to an issue with one of the propellers, the crew and scientists sailed from Antarctica to Cape Town instead, arriving on February 1st. From there the *Polarstern* left for its home port in Bremerhaven, Germany where it will be repaired. The propeller issue developed mid-cruise, at the very end of December as the scientists were on their way to the ice shelf to begin refueling operations for the German research station, Neumayer III. After weeks of painful decision-making, the choice was made to sail to Cape Town instead of continuing across the Weddell Sea. The four SOCCOM floats intended to be deployed in the Weddell Sea were then deployed on the way back to Cape Town.

For Zanowski, a member of the Sarmiento Group, the experience was life-changing.

“Every day aboard the *Polarstern* brought with it new experiences,” Zanowski said. “For a brief time I lived in a place where the sun never set. I sailed through polynyas and watched waves nearly three times my height crash on deck. I saw enough types of ice to make anyone crazy, and I loved every minute of it.”



Zanowski touching the ice shelf from the side of the ship (Credit: Jan Rohde)

“I set foot on Antarctica on New Year’s Day,” said Zanowski. “I breathed some of the freshest air on the planet. I collected over 1,000 water samples and touched Southern Ocean water from 5000 meters below me (hint: it’s cold!). I deployed floats under the midnight sun and in quietly falling snow. I was awakened by ship rolls that nearly threw me from my bunk and wreaked havoc on my room. I hung out with penguins, whales, seals, and uncountable types of birds. I was repeatedly frozen and blown around by winds ripping up from the bow of the ship. I felt and heard the deep rumbles and metallic groans of the *Polarstern* as it crushed ice three meters thick like it was nothing. I made new friends, and picked up a few German words (mostly expletives, let’s be honest here) along the way. Whatever I imagined the Southern Ocean to be -- it was bigger. Whatever I imagined Antarctica to be -- it was better.” ■

Legg Joins US CLIVAR Leadership

CICS Associate Director Sonya Legg, an AOS faculty member and senior research oceanographer, has accepted an invitation to serve on the executive committee of the US Climate Variability and Predictability (CLIVAR) science steering committee (SSC), effective December 2014, for a three-year term. Legg will be one of three executive committee members on the nine person science steering committee along with six other members who serve as co-chairs of the individual panels.

The role of the SSC is to provide overall scientific and programmatic guidance for the program, develop science plans, and implement strategies to ensure US CLIVAR progresses toward achieving its scientific objectives.



CICS Director Sonya Legg

Comprised of representatives from the US community of climate scientists with expertise across a range of disciplines and research methods, Legg joins a group of community leaders with broad expertise. Legg’s research interests focus on turbulent mixing in the ocean, with primary tools being numerical simulation and theory. Particular processes of current interest include tidal mixing and mixing in overflows, and the representation of mixing processes in large-scale ocean models.

“Sonya’s unwavering commitment and extraordinary talents in this area will be a tremendous asset to the committee,” AOS and CICS Director Jorge Sarmiento said.

In addition to her role as CICS Associate Director, Legg serves as Chair of MPOWIR (Mentoring Physical Oceanography Women to Increase Retention), a nation-wide mentoring effort funded by NSF, NOAA and NASA, and on the advisory committee for the EarthCube project governance.

US CLIVAR research is currently supported by participating program within five Federal agencies including NASA, NOAA, NSF, DOE and the Office of Naval Research (ONR). ■

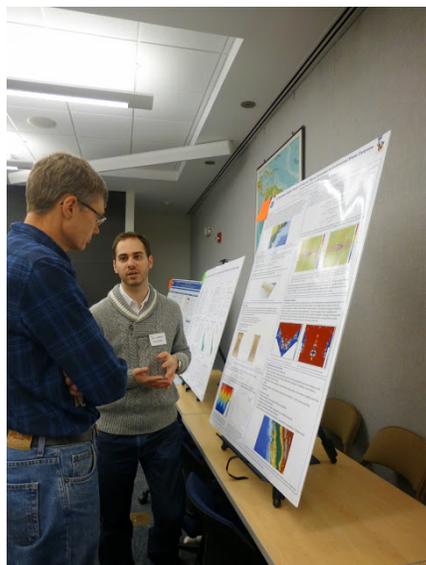
GFDL Hosts Winter 2015 Poster Expo

On January 28, 2015, GFDL held a Winter Poster Expo in the Smagorinsky Seminar Room as a follow-up to its successful inaugural event held in the summer of 2014. Despite residual snow and ice from the previous day’s storm, 30 posters were presented, with nearly half of them being presented by representatives of the AOS

Program and CICS, including graduate students, postdoctoral research associates, and research scholars. NOAA/GFDL was also well represented, as was the University, UCAR, and Engility.

As with the Summer Expo, the breadth of research within the broader GFDL/AOS community was on full display. Poster topics ranging from Internal Wave Dynamics in Continental Slope Canyons to Southern Ocean Heat Uptake Dynamics to Understanding Changes of the Tropical Tropopause under Global Warming, among others, made up the diverse research portfolio carried out by presenters at the Winter Expo. The event was a welcomed opportunity for presenters to share their research, explore the research of colleagues, and build relationships and possible cross-disciplinary collaborations.

In addition to the presenters, the event attracted over 40 attendees, among them GFDL scientists and colleagues from Rutgers and Princeton. In all, almost 80 people participated in the event. GFDL Physical Scientist Jasmin John, Fanrong Zeng, also a physical scientist at GFDL, and Cathy Raphael, a GFDL scientific illustrator, made up the organizing committee.



AOS Graduate Student Rob Nazarian discussing his research

“We enjoyed putting the Poster Expo together and were very pleased by the terrific turnout,” John said. “We hope the event will continue to draw both presenters and attendees and help foster interactions and collaborations with colleagues across multiple disciplines.”

Following the event, the committee distributed a survey to elicit feedback which will once again be used to guide the planning of future events.

Further details, including a listing of posters presented at the Winter Expo, can be found here:

<http://www.gfdl.noaa.gov/poster-expo>.

Mark Your Calendars ...



*First Week of November
2015*

*A Symposium to Celebrate
the “Diamond
Anniversary” of GFDL ...
details to follow*

CICS Represented at NOAA EPP Education & Science Forum

CICS Associate Director Sonya Legg represented the Institute, University, and GFDL at the NOAA Educational Partnership Program (EPP) 7th Biennial Education and Science Forum in late October. The Forum provides an opportunity to showcase results of collaborative research and education projects between scientists and students at NOAA EPP-funded academic institutions and NOAA scientists, to discuss new engagement opportunities, and to promote career opportunities for Science, Technology, Engineering, and Mathematics (STEM) graduates within academia, government, and the public/private sectors.



Winners of poster & presentation prizes at the NOAA EPP 7th Biennial Education and Science Forum

Legg participated in the round table mentoring and a couple of the panels, whose topics ranged from applying to graduate school to enhancing internships at NOAA, and was a judge for the science presentations. She was joined by former GFDL Scientist Marian Westley, an EPP alumna, who led the writing proposals discussion. “The best part of the forum was meeting all these enthusiastic students,” Legg said. “I encouraged them to apply for grad school or postdocs, as relevant, at Princeton!”

Jointly sponsored by NOAA and the University of Maryland Eastern Shore (UMES), the event was hosted by the NOAA Living Marine Resources Cooperative Science Center located at UMES, a minority serving institution located on the Delmarva Peninsula. The forum’s participants were students who are involved in NOAA EPP activities, including the EPP Cooperative Science Centers (CSCs) and the EPP scholars, as well as their advisers. ■

AOS Faculty & GFDL Scientists Listed among the World’s Most Influential Scientific Minds

**Contributed by Maria Setzer, GFDL
Communications Director**

Tom Delworth (GFDL/AOS), Paul Ginoux (GFDL), Isaac Held (GFDL/AOS), Larry Horowitz (GFDL/AOS), Jorge Sarmiento (AOS), Ron Stouffer (GFDL), and Gabriel Vecchi (GFDL/AOS) have been named to [Thomson Reuters Highly Cited Researchers](#) listing of the world’s leading scholars in Geosciences. This list of top

researchers around the globe have earned their distinction by publishing the highest number of articles that rank among those most frequently cited by fellow researchers.



For Geosciences, 159 scientists were determined to have coauthored the top 1% of the most highly cited papers. Sarmiento is the only scientist cited from Princeton's Department of Geosciences. Ten out of the 159 in Geosciences are NOAA scientists, and 6 of those 10 are with GFDL. They have also been listed in [<The World's Most Influential Scientific Minds: 2014>](#), produced by Thomson Reuters. ■

Student/Postdoc Seminar Series

During the academic year, the Sayre Hall Conference Room becomes home to an informal, weekly seminar series for graduate students and postdocs that has been a tradition in the AOS Program for approximately six years. In addition to providing a forum for student and postdoc presenters to gain valuable experience presenting their research in a supportive, collegial environment, the student-run series affords attendees the opportunity to expand their knowledge and skill sets in areas not covered by the AOS curriculum.

According to AOS Graduate Student Todd Mooring, the 2014-2015 series organizer, over 120 seminars have taken place since the series' inception. A broad array of topics has been presented over the years, limited only by the breadth of research being conducted in the Program.

"The seminar organizers are always open to contributed talks and other ideas for seminars," Mooring said. "One good source of contributed talks is the need to practice presentations to be given in more

important fora (e.g., general exams, final public orals, and conferences)."

To round out the series, organizers recruit GFDL scientists and other Princeton affiliates to present talks as a means of introducing topics that are of interest but are not necessarily covered in the current curriculum.

Thanks to Mooring and a well-regarded group of former series organizers, among them Andrew Ballinger, an AOS senior research specialist, and AOS Graduate Students Nick Lutsko and Spencer Hill, this AOS tradition will likely continue for years to come.

The spring 2015 student/postdoc seminars are being held on Tuesdays at noon in the Sayre Hall Conference Room. ■

AOS Applications Remain Near Record Number

The AOS Program received a near record number of applications for the 2015-2016 academic year, the second largest applicant pool in the Program's history.

The Program maintained its appeal to international students with 74% of the applicant pool coming from countries outside of the United States, an upward trend seen across the University over recent years. Among the total applicants, 50% were women.

"We strive to attract strong female applicants and to provide a welcoming environment when they get here," Sarmiento said. Through organizations, such as MPOWIR (Mentoring Physical Oceanography Women to Increase Retention), Princeton Women in Geosciences (PWIGS), and the GFDL Women's Caucus, women in the AOS Program and GFDL have taken an active role in supporting and mentoring women and early career scientists.

With the rigorous evaluation process completed, applicants notified of admission decisions, and student visits scheduled, it is only a matter of weeks until the Program discovers who will make up the incoming class for the upcoming academic year.

"It's always an exciting time in the Program," said Sarmiento. "I look forward to their decisions." ■

*Save the Date ...
Share Science in Your
Community
Friday, March 27, 2015
9:00 am – 5:00 pm
Robertson Hall, Bowl 016
Advance Sign-up Required*

AOS & CICS News

Outreach Opportunity

Ocean Fun Days -- an annual environmental public education event that provides interactive activities designed to promote the wise use of New Jersey's marine and coastal resources -- **Saturday, May 16th**, Island Beach State Park and **Sunday, May 17th**, NJ Sea Grant Consortium HQ, Sandy Hook -- Contact Sonya Legg for details.

Congratulations to AOS Graduate Student **Geeta Persad** who was awarded 2nd place in the student oral presentation competition at the Climate Variability and Change Conference at the 2015 AMS Annual Meeting. Geeta's talk was titled "The regional climate response to absorption-driven solar dimming over East Asia."

Geeta was also the recipient of an Outstanding Student Paper Award (OSPA), in the Atmospheric Sciences Section, by the American Geophysical Union (AGU) at the 2014 Fall meeting in San Francisco. Her presentation entitled, "Similarities in the Spatial Pattern of the Surface Flux Response to Present-Day Greenhouse Gases and Aerosols" was one of only 18 papers chosen for this distinction in the Atmospheric Sciences Section.

Congratulations to **Kityan Choi**, an AOS graduate student, who was selected as one of four early-career scientists to receive a best presentation award at the ENSO Workshop Australia 2015. Kit's presentation was titled "Nonlinear wind response to ENSO: Role of the zonal and

meridional shift of the ITCZ/SPCZ and the climatological precipitation."

Congratulations to **Amanda O'Rourke** who successfully defended her Ph.D. Thesis "Influence of Long and Short Planetary Waves on the Separation of the Eddy-Driven and Subtropical Jets" on November 24, 2014 . Amanda has accepted a postdoc position at the University of Michigan with AOS postdoc alumnus Brian Arbic.

Congratulations to **Claire Radley** who successfully defended her Ph.D. Thesis "Understanding the Dependence of Tropical High Cloud Amount and Radiative Flux on Sea Surface Temperature" on December 3, 2014. Claire has accepted a Junior Associate position at the Melbourne office of McKinsey & Company in Australia.

Congratulations to **Erica Staehling** who successfully defended her Ph.D. Thesis "The Influence of African Easterly Waves on Atlantic Tropical Cyclone Activity" on December 10, 2014. Erica continues in her current position as Associate Director of the Office of Science Teaching Activities at Florida State University.

Denise Mauzerall, an AOS associated faculty member, has been appointed to serve as a member of the U.S. Environmental Protection Agency's Science Advisory Board. The EPA SAB provides expert guidance that is essential to EPA's ability to protect public health and safeguard the environment.

Congratulations to GFDLEA's newly elected board members:

President: **Lucas Harris**
Vice-President: **Steve Garner**
Treasurer: **Seth Underwood**
Secretary: **Vicky Hayes**
Membership Coordinator: **Steve Mayle**
At-large board members: **Shannon Rees** (new), **Robbie Toggweiler** (returning), **Erker Baysal** (returning), and **Dan Schwarzkopf** (returning).

[The Impact of MPOWIR: A Decade of Investing in Mentoring Women in Physical Oceanography](#)

CICS Associate Director **Sonya Legg**, an AOS faculty member, is coauthor of a new article featured in a special issue of *Oceanography* "Women in Oceanography: A Decade Later." The article "[The Impact of MPOWIR: A Decade of Investing in Mentoring Women in Physical Oceanography](#)" describes the MPOWIR (Mentoring Physical Oceanography Women to Increase Retention) Program, a US community-initiated and community-led mentoring program aimed at improving the retention of women physical oceanographers in academic and/or research positions. It also describes MPOWIR's impact to date and outlines its future directions.

[New Study Uses GFDL Global Climate Models to Investigate Behavior of Brewer-Dobson Circulation](#)

In a new study led by AOS Postdoctoral Research Associate **Pu Lin**, GFDL global climate models were used to investigate how the Brewer-Dobson circulation would vary in response to different natural and anthropogenic climate forcings. The authors calculate the strengths of the Brewer-Dobson circulation simulated by GFDL global climate models CM3 and CM2.1, and find that the strengths correlate with the tropical mean surface temperature. This correlation is also supported by observational-based analysis. **Yi Ming**, a lecturer in Department of Geosciences and the AOS Program, and GFDL Director **V. Ramaswamy** are coauthors of the [study](#) published in *Geophysical Research Letters*.

[Representations of the Nordic Seas Overflows and their Large Scale Climate Impact in Coupled Models](#)

He Wang, a graduate student in the AOS program, is the lead author of a new [study](#) published in *Ocean Modelling* that describes the sensitivity of the North Atlantic climate in GFDL models to the model representation of the Nordic Sea overflows (flows of dense water through gaps in the ridge between Greenland and Scotland). These flows are usually poorly captured in coarse resolution climate models. Wang and coauthors CICS

Associate Director **Sonya Legg** and **Robert Hallberg**, an AOS faculty member, find that the Meridional overturning circulation, the direction of the warm North Atlantic Current and the temperature and salinity of the northernmost part of the Atlantic can all be affected. This is the first study to carefully compare old and new methods of capturing the overflows in climate models, and to show the importance of representing these flows accurately in order to correctly simulate the climate in the North Atlantic.

[Upwelling in the Southern Ocean Topic of Physics Today Article](#)

AOS Postdoctoral Research Associate **Adele Morrison** is the lead author of a recent article outlining the mechanisms and impacts of upwelling in the Southern Ocean and the role of the [SOCCOM](#) Program in investigating it. AOS Director **Jorge Sarmiento** and **Thomas Frölicher** (ETH Zurich) are coauthors of the [article](#) published in *Physics Today*.

Arrivals

Liwei Jia transferred from UCAR to CICS and is now working with Andrew Wittenberg and Gabe Vecchi as a postdoc.

Alison Gray arrived in mid-November from the University of Washington. She is working with Jorge Sarmiento and his group as a postdoctoral research fellow.

Fernando Gonzalez Taboada, a postdoctoral research associate who is working with John Dunne and Charlie Stock, arrived in mid-November. Fernando comes to us from the University of Oviedo, Spain.

Weiye Yao arrived in early January and comes to us from the University of Michigan. She is working with S.J. Lin as a postdoctoral research associate.

Dawei Li arrived in early January from University of Chicago. He is working with Rong Zhang and Tom Knutson as a postdoctoral research associate.

Andrew Barton arrived in early January and is working as an associate research scholar with Charlie Stock and John Dunne. Andrew has a NSF International Research Fellowship at Duke University and is jointly hosted by Duke and the University of Liverpool.

Jonas Nycander, a professor from Stockholm University, arrived in early January. Jonas will be working with Steve Griffies and Sonya Legg for the next six months.

Alon Stern arrived in mid-January from the Courant Institute of Mathematical Sciences (NYU) to work with Olga Sergienko and Bob Hallberg as a postdoc.

Sulagna Ray (formerly from LOCEAN-IPSL) began working with Andrew Wittenberg as an associate research scholar in mid-January.

Philip Pika returned from ETH Zurich in mid-January to work with Jorge Sarmiento's group for a few months.

Dan Ward arrived in early February from Cornell University. He is working with John Dunne and Elena Shevliakova as an associate research scholar

Charlotte Laufkotter arrived in mid-February from ETH Zurich. She is working with John Dunne and Charlie Stock as a postdoctoral research associate.

Barbara Muhling arrived in early March to work with Vince Saba as an associate research scholar. She comes to us from CIMAS, a research institute of the University of Miami.

Departures

Visiting Postdoctoral Research Associate **Malte Jansen** accepted an assistant professor position at the University of Chicago in late December. While at Princeton, Malte's research focused on improving our understanding of the large-scale dynamics of the atmosphere, the ocean, and the coupled climate system.

Greg de Souza, an associate research scholar in Jorge Sarmiento's group, accepted a postdoctoral scientist position at the Institute of Geochemistry and Petrology, ETH Zurich in early January. His research combined observational isotopic data with ocean general circulation

model studies to gain a process-based understanding of the controls on oceanic stable isotope distributions, specifically the stable isotopes of silicon, an element that is vital to the growth of siliceous phytoplankton such as diatoms.

Yuxing Yun accepted a postdoctorate research associate position at Pacific Northwest National Laboratory (PNNL) in late February. As a member of GFDL's Atmospheric Physics and Climate Group, she used numerical models, observations and theories to advance understanding of atmospheric physical processes in governing climate variability and change.

Katsuya Toyama accepted a researcher position at the Meteorological Research Institute in Japan. His last day in the AOS Program will be March 6th. Katsuya is interested in the formation and decay processes of various water masses in the global oceans (especially in the North Pacific), and their role in the carbon cycle.

Birth Announcements

Congratulations to AOS Faculty Member **David Medvigy** and his wife, Christy, on the birth of their daughter, Lydia Marguerite, on October 20, 2014.

Congratulations to **James Watson**, a former postdoc in the Sarmiento group, and his wife, Jodi, on the birth of their son, Leif William Macrae, on September 29, 2014.

Congratulations to **Martin Jucker**, a former associate research scholar, and his wife, Emmanuelle, on the birth of their son, Simon Evan, on February 13, 2015.

*AOS Program
Princeton University
300 Forrestal Road, Sayre Hall
Princeton, NJ 08540*

*Phone:
(609) 258-6047*

*Fax:
(609) 258-2850*

*We're on the Web!
<<http://www.princeton.edu/aos/>>*

*Editor: Joanne Curcio
Email: jcurcio@princeton.edu*