



# AOS & CICS Newsletter

Fall 2013

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## Legg Appointed CICS Associate Director

AOS Faculty Member Sonya Legg has been appointed as the new Associate Director of the Cooperative Institute for Climate Science (CICS) effective September 2, 2013. The Associate Director works closely with CICS Director Jorge Sarmiento to set organizational priorities and implement annual and long-range research objectives related to the CICS mission.



CICS Associate Director Sonya Legg

In an announcement to the AOS and CICS communities, Sarmiento said "Sonya brings tremendous talent and a deep commitment to the mission of CICS and I look forward to working with her in this capacity." Legg's appointment follows the departure of Geoff Vallis, AOS faculty member and senior research geoscientist, who accepted a faculty position at the University of Exeter in the United Kingdom.

"I am pleased to be contributing to the CICS mission in bringing together University and GFDL scientists to further our understanding of the climate system," Legg said.

Legg received her Ph.D. in physical oceanography from Imperial College, London in 1993, and carried out postdoctoral research at the University of Colorado, Boulder, and at UCLA, the latter as a NOAA Climate and Global Change postdoctoral fellow. Prior to arrival in Princeton in 2004, she was a member of the scientific staff at the Woods Hole Oceanographic Institution. Legg is a member of the Princeton Atmospheric and Oceanic Sciences program faculty and served as the Director of Graduate Studies from 2009-2012. Legg has served as an associate member of the IAPSO/SCOR working group 121 on Ocean Mixing, as a member of the US CLIVAR Process Studies and Model Improvement Panel for 5 years including 3 years as panel chair, and is currently a member of the steering committee of MPOWIR (Mentoring Physical Oceanography Women to Increase Retention), a nation-wide mentoring effort funded by NSF, NOAA and NASA. 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. Legg has participated in two multi-institutional efforts funded by NSF and NOAA to improve the representation of small-scale ocean processes in climate models: the Climate Process Teams for Internal Wave Driven Mixing (2010-present), and Gravity Current Entrainment (2003-2008), the latter as lead PI.

CICS was established in 2003 to foster research collaboration between Princeton and GFDL. Its principal mission is to focus the core scientific competencies of the University into answering key questions related to the sciences of climate change and Earth system modeling, and in doing so provide an effective bridge between the two institutions. ■

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

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TigerTransit/Shuttle Services  
Operating on Fall Schedule  
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## Vallis Moving On After 15 Years

After 15 years in Princeton, AOS Faculty Member and Senior Research Geoscientist Geoff Vallis has accepted a tenured faculty position in the College of Engineering, Mathematics and Physical Sciences at the University of Exeter in the United Kingdom. He began his appointment on October 1, 2013.



*Former AOS Faculty Member Geoff Vallis*

Vallis served as the Associate Director of the Cooperative Institute for Climate Science (CICS) since 2005 and was the AOS Program's Director of Graduate Studies (DGS) from 2006 - 2009. He was also an associate faculty member at the Program in Applied and Computational Mathematics. Vallis was the recipient of the 2013 Stanislaw M. Ulam Distinguished Scholar Award, an annual award which enables a noted scientist to spend a year carrying out research at the Center for Nonlinear Studies at Los Alamos. Over the years, he served as editor of the *Journal of Atmospheric Sciences*, associate editor of *Reviews of Geophysics*, and editor of *Fluid Dynamics Research*. He also served as a member of the steering committee of MPOWIR (Mentoring Physical Oceanography Women to Increase Retention), a nation-wide mentoring effort supported by the physical oceanography programs at ONR, NSF, DOE, NOAA and NASA.

His research interests include oceanic and atmospheric circulation and dynamics. He is primarily interested in fundamental problems in large-scale dynamics and their effect on the climate system. Vallis taught a wide range of topics at Princeton including: physical oceanography and

geophysical fluid dynamics, and published extensively in both the oceanographic and meteorological literature.

"Geoff's research on fundamental problems in atmospheric and oceanic fluid dynamics has been inspirational for a generation of students and post-docs in the AOS Program, and we especially value his contribution to maintaining the reputation of our Program as a center of excellence in this vitally important area," AOS Faculty Member Isaac Held said.

He published two books, *Atmospheric and Oceanic Fluid Dynamics*, in 2006, and *Climate and the Oceans*, in 2011. In addition to his scholarly work, he has been a frequent public lecturer on climate and related matters.

"Geoff's contributions to the AOS Program both as a faculty member and as an active participant in our Graduate Work Committee and as Director of Graduate Studies have been invaluable," AOS Director Jorge Sarmiento said. "His contributions to research at Princeton, and the two books he has written while here, have given him and our program high visibility. Last, but not least, he has been invaluable in helping to run the Cooperative Institute for Climate Science as Associate Director. He is going to be sorely missed. We certainly wish him the very best as he begins the next phase of his career at the University of Exeter."



*Vallis at 2013 AOS Student/Postdoc Retreat*

Faculty, postdocs, and students attended a farewell luncheon in his honor on Tuesday, September 17<sup>th</sup> at Prospect House.

"Princeton and GFDL remain remarkable places to do research; I will always treasure my time here," Vallis said. "I expect to return frequently to collaborate with colleagues, postdocs and students."

Vallis earned his undergraduate degree in Physics from Oxford University and his Ph.D. in Physics from Imperial College, London. ■

## AOS Program Workshop Held on Forrestal Campus

An inaugural workshop on "Using Diverse Observations in Climate Modeling Research" was held September 9-11, 2013 at GFDL and Sayre Hall. Spearheaded by AOS students, the aim of the workshop was to explore how observations and modeling can be used to better our understanding of the Earth sciences. Moreover, the workshop afforded the entire AOS/GFDL community, but most specifically AOS graduate students, the opportunity to learn from experts outside of the University while providing a framework for thought and discussion.

Given the diversity of research conducted at AOS/GFDL, speakers were invited with the hope of addressing issues and challenges that resonate with the entire AOS/GFDL community. AOS graduate students of all years and disciplines worked closely with three innovative invited scientists to explore the opportunities and challenges integrating models and observations, according to AOS Graduate Student Jane Baldwin, one of three Workshop organizers. The invited speakers each presented tutorials on measurement techniques used in his research and a public lecture on his current research.

The first lecture, entitled "What does nature tell us about anthropogenic aerosol indirect effects?" was given by Tianle Yuan (GSFC/UMBC) and highlighted observational tests that might help constrain aerosol indirect effects, a significant uncertainty in climate models. Yuan introduced his work on cloud formation around sulfate particles originating from a volcano in the Northern Mariana Islands, and proposed that lightning may be a partially anthropogenic phenomenon given its enhancement by aerosols.

Scott Saleska (University of Arizona) presented a seminar entitled "Modeling carbon-cycle feedbacks to climate from the

Amazon to the Arctic: Does ecology matter?" on the 2<sup>nd</sup> day of the workshop which introduced novel methods for observing parts of the land biosphere that have a great impact on carbon-cycling. He introduced a LIDAR-based method to explore tree canopy variations in the Amazon, and discussed his group's latest research on how the types of microbes present in the arctic permafrost can predict methane fractionation and, in turn, the ratio of methane to carbon dioxide released from the permafrost.

"The use of stable isotopes to refine models of the interconnected history of water in the atmosphere, clouds, and land" was the title of David Noone's (University of Colorado) talk on the final day of the workshop. It focused on various applications of water isotope observations that are relevant to climate models. In particular, he introduced empirical estimations from water isotopes of precipitation efficiency, a parameter essential to climate model microphysical schemes that is typically quite poorly constrained. The speakers also led small group discussions with graduate students which allowed for more direct interaction between the speakers and the students.

"Tutorials, seminars, and discussions provided students with both practical information on available observational datasets, and thought-provoking examination of creative ways the speakers made and employed observations in their own research," Baldwin said.

"The workshop was excellent in both vision and execution," said AOS Graduate Student Spencer Hill. "The three speakers' clever use of available observational data to tackle tough problems in their respective fields was a refreshing change of pace from our typically model-centric perspective. The variety of settings in which to learn from and interact with them -- tutorials, discussions, seminars, and meals -- made for a really stimulating and enjoyable three days."

"The workshop concluded with an energetic panel discussion with speakers and students on pursuing scientific careers, and the larger themes that had emerged from the workshop," Baldwin noted.

Beyond these formal events, the workshop included ample opportunities for casual interaction between the speakers and the

participants over meals and breaks, including a barbecue for students and faculty at GFDL and dinner at Triumph Brewing Company in Princeton.

The fall workshop was well attended, with 30 people attending the tutorials and seminars. According to Workshop Planning Committee Members Baldwin, Todd Mooring and Anna Trugman, the workshop will likely continue annually with the generous support of Isaac Held, an AOS faculty member and GFDL senior research scientist, who was awarded the BBVA Foundation Frontiers of Knowledge Award in Climate Change in 2012.

"The workshop was a great start to what will hopefully become an annual tradition for the AOS program!" Baldwin said. ■

## PWiGS Initiative Underway in AOS & GEO

A Princeton Women in Geosciences (PWiGS) initiative is presently under development between the AOS Program and Geosciences Department (GEO). Postdoctoral Research Associate Sarah Kapnick and Geeta Persad, a third-year graduate student, are actively involved from AOS and are joined by Sarah Fawcett, Johanna Goldman and Meytal Higgins from GEO.

The primary mission of the PWiGS initiative is to increase the retention and boost the morale of women in the Earth Sciences through the development of an active peer network and the fostering of mentorship. The initiative has been funded by the Dean of the Graduate School, GEO, and AOS. It will provide for a meeting of all women across AOS and GEO and will allow for dinners with female seminar speakers to discuss work-life balance and gender-specific issues. Additionally, informal round table meetings will be held with both male and female early career scientists and female seminar speakers to discuss topics of career and research development.

By engaging both women and men in these conversations, the initiative aims to encourage and promote a more diverse and compassionate generation of

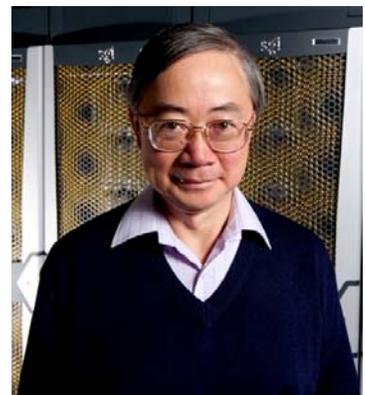
researchers. The first informal discussion on career and research development was held with Nadine Unger, Assistant Professor of Atmospheric Chemistry, Yale School of Forestry and Environmental Studies. According to Kapnick, the response of participants has been tremendously positive. "I have been encouraged by the overwhelmingly positive support this initiative has received in my discussions with various AOS community members," she said.

Echoing Kapnick's sentiments, Persad said, "I've heard excellent feedback from fellow AOS students on the initiative's potential to fill an important need for greater access to mentorship and career advice. It's been very empowering to work toward giving my peers a forum for improving their perspective on careers in our field. Thank you to AOS, GEO, and the Graduate School for providing support!"

The PWiGS initiative is still evolving and, according to the organizers, feedback is welcome. ■

## Gabriel Lau Returns to his Roots after 35 Years

After 35 years at GFDL and in the AOS Program, Gabriel Lau has returned to his roots and has joined the faculty of his alma mater, the Chinese University of Hong Kong. A graduate of St. Francis Xavier's High School in Hong Kong (1970), the Chinese University of Hong Kong (B.Sc. in Physics, 1974) and the University of Washington (Ph.D. in Atmospheric Sciences, 1978), Lau came to Princeton in 1978 to join what was then called the "Geophysical Fluid Dynamics Program."



Former AOS Lecturer & GFDL Scientist  
Gabriel Lau

A lecturer with rank of professor in the AOS Program and lead scientist of the Climate Diagnostics Group at GFDL, Lau's research interests include observational and modeling studies of the atmospheric general circulation, the impact of large-scale air sea-interaction on atmospheric variability, and properties of tropical circulation systems. A primary focus of his work is to perform data analysis with the goal of understanding the climate system's behavior and evaluating model projections of future climate variations.

Lau taught as a guest professor at Peking University in 2008 and was elected as an American Meteorological Society fellow in 1991. In 1990, he was awarded the Clarence Leroy Meisinger Award by the AMS for "outstanding studies of low-frequency variability in the atmosphere by a synthesis of modeling and diagnostics."

Over his 35 year tenure, Lau has made numerous contributions to the Program, most notably as a mentor to his students. In recent years, Lau taught Weather and Climate Dynamics and co-taught Responsible Conduct of Research (RCR) in Geosciences as well as an AOS Great Papers course.

"As long as I have known Gabriel, he has maintained an incredible commitment to his own scholarship and because of that, he has been the consummate teacher, mentor, and colleague," AOS Director Jorge Sarmiento said. "He will be sorely missed."

On July 30, Lau was honored and thanked for his contributions at an informal farewell luncheon at Prospect House. Faculty members and students were among the attendees there to commemorate his years at Princeton.

"Thank you from all of the AOS students for your dedication to teaching and care and concern for your students," AOS Graduate Student Geeta Persad said. "Almost all of us have gained unparalleled benefit from your course, and I'm immensely grateful to have had that opportunity. You will be greatly missed, but we wish you all the best on your next step and hope to see you back here frequently."

For Lau, having the opportunity to collaborate with members of the AOS

Program has been an unforgettable experience.

"I shall retain warm memories of my cordial interactions with several generations of graduate students and visiting scientists in the AOS Program, many of whom have gone on and accomplished much in our profession," Lau said. "I also hold the highest admiration and respect for my faculty colleagues, from whom I have learned a great deal through the years."

Although his retirement formally took effect on July 31<sup>st</sup>, Gabriel remains beloved by his students and colleagues and his presence will be felt in the AOS Program and GFDL for many years to come. ■

## AOS Holds Student/Postdoc Retreat

AOS graduate students, postdocs, and faculty gathered for the Program's second annual retreat at Mountain Lakes House in Princeton on Friday, September 13, 2013, with approximately 35 people in attendance. Organized by AOS students and faculty to promote scientific and social interactions among students, research staff, and faculty and to welcome the incoming students, the retreat was a follow-up to 2012's inaugural event which was a tremendous success among students and faculty.



*AOS students, postdocs, and faculty enjoy a lighthearted moment underneath the Mountain Lake House canopy*

The organizational committee oversaw the planning and organization of the scientific and social activities at the retreat.

Committee members included AOS Graduate Students Nicholas Lutsko and Anna Trugman, and Faculty Members Stephan Fueglistaler and Steve Garner, who served on last year's committee. At

the suggestion of Geosciences Assistant Professor Stephan Fueglistaler, invitations to the 2013 event were extended to AOS postdocs as well as students to further the sense of community within the Program.

Following a morning ice-breaker session, scientific sessions included an interactive poster session which highlighted faculty research with a trivia twist and a lively faculty debate surrounding the evaluation of climate models. A third session presented attendees with a challenge of preparing a short abstract and presentation of an "original" research idea, with the aim of seeking hypothetical research funding based on four criteria: originality, creativity, logic, and believability.

The gathering also provided ample opportunity for students and postdocs to interact through team-building activities designed to foster a sense of community and to enhance student/postdoc/faculty communication.



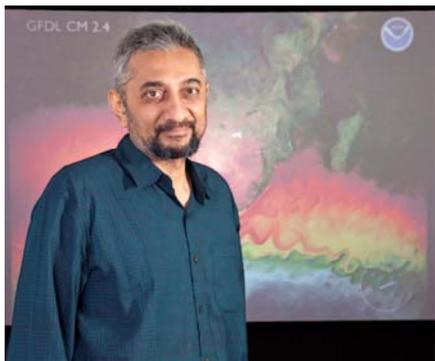
*As her team members look on, AOS Faculty Member Sonya Legg demonstrates her egg-balancing skills*

"The second annual AOS department retreat was a resounding success," Trugman said. "It provided students and faculty the opportunity to interact through a mixture of academic and recreational mediums as well as a chance for the AOS community to welcome our new students, Anna FitzMaurice, Youmi Oh, and Zhaoyi Shen. We look forward to feedback on the agenda and to the retreat next year." ■

## Balaji Joins GFDL's Science Board

GFDL Director V. Ramaswamy recently announced the appointment of V. Balaji, an AOS senior professional technical specialist, as a member of the Lab's Science Board. Balaji joins AOS Faculty Members Ramaswamy, Isaac Held and

Tom Delworth, as well as GFDL Research Scientist Ron Stouffer and GFDL's Deputy Director Brian Gross on the Board. The Science Board provides long-term strategic thinking for GFDL's leadership (the Director's office and the Research Council) and a forum to grapple with scientific, technical, and policy trends that cut across the Lab's scientific research themes and areas.



*AOS Senior Professional Technical Specialist  
V. Balaji,  
(Photo by Elle Starkman)*

In an announcement to the GFDL/AOS community, Ramaswamy recognized Balaji's years of expertise and experience as Leader of the Modeling Services Group, which, according to Ramaswamy "includes many important interactions with the Lab's scientific groups over the years," as well as his leading role in the Lab's high-performance supercomputing strategies which contributed widely to the Lab's model development and simulation activities. Ramaswamy noted that Balaji will continue as a member of the Research Council for the foreseeable future, lending his counsel as the Modeling Services Group Leader.

"I am very deeply honored to have been asked to join the Science Board and to be in such distinguished company," said Balaji. "GFDL's history stretches back to the days of Smagorinsky, Manabe and Bryan who discovered how to harness computers to solve the riddles of climate, and maybe even further back to the very dawn of computing, when Smagorinsky and John von Neumann were colleagues at the Institute for Advanced Study. It is amazing and humbling to be called upon to play a part in guiding this Lab's future."

Balaji takes the place of Gabriel Lau, who retired at the end of July and "rendered invaluable contributions as a Science

Board member," according to Ramaswamy.

For those interested, Balaji's brief account of the history of computing in climate science can be found at:

<http://xrds.acm.org/article.cfm?aid=2425684>>. ■

## Pattullo Conference Centerpiece of MPOWIR

In early October, CICS Associate Director and AOS Faculty Member Sonya Legg participated in the Pattullo Conference. Named for June Pattullo, the first woman to receive a Ph.D. in physical oceanography, the Conference is the centerpiece of the Mentoring Physical Oceanography Women to Increase Retention (MPOWIR) program which provides mentoring to junior women physical oceanographers as they make the transition from graduate students to independent researchers.

The goal of the Pattullo Conference is to build networks and foster a collaborative atmosphere through an intensive retreat format. The aim of the sessions is to give ideas and advice to the junior researchers on how to convert a research project into a research program, as they transition from Ph.D. students and postdocs to principal investigators (PIs). In addition to research talks, professional development sessions and round-table discussions that addressed issues such as: strategies for funding, proposal writing, giving presentations, and negotiations, the agenda also included time for one-on-one interaction between junior and senior scientists as well as unstructured time for informal networking.

The program is unique in that it not only brings junior women and senior scientists together to share experiences, advice and concerns, but also raises awareness of issues confronting junior women among the senior scientist community.

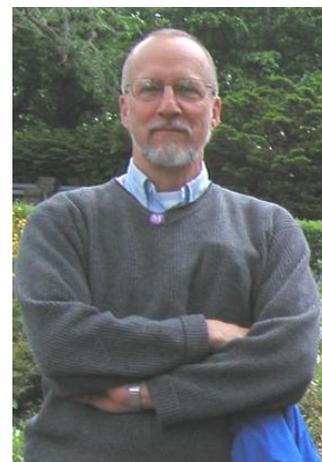
"The Pattullo conference is a very positive experience for all involved," said Legg, one of the Conference's co-organizers. "Rather than dwelling on the difficulties faced by junior women in science, the focus is instead on imparting the skills and

connections which will help them to succeed. I enjoy meeting the cohort of researchers who will be my future colleagues, and we all come away with a better sense of belonging to a wider community of physical oceanographers."

The Conference was held October 6-9, 2013 in Warrenton, Virginia. In addition to the Conference, the MPOWIR effort includes a website, mentor groups, a blog, forums at major meetings, the NOAA MPOWIR internships (in which GFDL participates) and the NASA MPOWIR Speaker Series. Additionally, MPOWIR is engaged in collecting statistics and interviews from past and present U.S. Ph.D. graduates to assess retention rates in the field, as well as to document the success of this effort. To learn more, visit the MPOWIR website. ■

## Symposium Celebrates Hiram "Chip" Levy II

On August 16, 2013, colleagues, former students, and friends of Hiram "Chip" Levy II came together for a day-long symposium and reception held to celebrate his nearly four decades of service to GFDL and two decades of service to Princeton University.



*Hiram "Chip" Levy II*

Recognized as a pioneer in the field of tropospheric chemistry and for his 1971 seminal paper in *Science* that laid the foundation upon which all subsequent studies of tropospheric chemistry have been built, Levy has discovered and witnessed tremendous advances in atmospheric chemistry during his

illustrious career. From the recognition that photochemistry occurs in the troposphere, to the application of advanced modeling tools to understand atmospheric chemistry and transport, to the growing understanding of chemistry-climate interactions, Levy has played a pivotal role every step of the way. The new photochemical mechanisms discovered by Levy have had profound implications for the understanding of the factors controlling ozone, a major air pollutant and greenhouse gas, within the troposphere. His recent work has focused on the interactions between short-lived chemical species, public health, the biosphere, and climate. Using successive generations of the GFDL coupled climate model and through leading a multi-model study with other modeling centers, Levy has demonstrated that projected changes in ozone and aerosols, could have significant impacts, locally and far afield, on surface temperatures and precipitation over the 21st century.

Maintaining a strong commitment to education throughout his career, Levy initiated and taught Atmospheric Chemistry in the AOS Program for nearly two decades. He mentored students and postdoctoral fellows during his years at GFDL and Princeton, many of whom returned to Princeton for the celebratory event.

The symposium, attended by over 50 Levy admirers, featured 14 talks by colleagues from GFDL, Princeton, and other universities that characterized Levy's career – from early breakthroughs in chemical modeling to recent advances in short-lived climate forcing. Larry Horowitz, a physical scientist at GFDL and symposium co-organizer, kicked off the day with an overview of Levy's career: "From Chemistry to Climate: Chip's Contributions through the Decades." Other topics ranged from "Sensitivity Analysis of Aerosol Feedbacks on Chemistry and Weather at Urban and Regional Scales" to "Influence of Climate Variability on Tropospheric Ozone Depletion Events in Arctic Spring." In closing the event, fellow co-organizer and former Levy student Tracey Holloway (University of Wisconsin) gave a talk on "Mentoring Early-Career Scientists" – a testament to Levy's enduring mentorship and collegiality.

"It was such a joy to celebrate Chip's career, and to highlight his excellent mentoring approach," Holloway said. "Chip took a 'whole person' perspective on advising - recognizing that success in research is tied to career goals, personal interests, and life outside of work. In pulling together the talk for his retirement symposium, I contacted Chip's former students and post-docs. It was so inspiring to read their responses, with each person offering positive reflections on his style of support, encouragement, and advice. We each benefited so much from Chip's investment of time and energy. And, he serves as a role model for those of us who are advisors and mentors now."

"I don't think it's a coincidence that three of Chip's mentees - Meredith Hastings, Arlene Fiore and myself-- all served as founding members of a group dedicated to supporting early-career scientists, the Earth Science Women's Network (ESWN)," Holloway added. "Since 2002, ESWN has grown from a small group of students and post-docs to an international organization of over 1500 women, plus a 3000+ co-ed network to share jobs (the Earth Science Jobs Network). ESWN offers a platform for women in science to connect with and support each other, both personally and professionally. Chip recognized that career success depended on personal relationships as well as good science."

The evening festivities included a reception at Sayre Hall.

"I would like to thank all involved for the chance to catch up with many old friends, colleagues and students and at the same time learn about new developments in the evolving field of atmospheric chemistry and climate," Levy said. "In particular I want to thank Ram for not taking "No" for an answer; Larry Horowitz and Tracey Holloway for all of their efforts organizing the packed program, speakers and extracurricular events; Meredith Hastings for organizing the pre-symposium gathering; many others at GFDL for logistical support; the folks at AOS, especially Anna Valerio, for snacks and the reception; and all of the speakers who found time in their busy summer schedules to really make the day. As I write this, the sun is shining on another beautiful fall day in Nova Scotia (New Hope, PA is still my permanent residence), and I am starting to plan the use of my Home Depot gift card."

A graduate of Iowa State University, Levy earned his Ph.D. in Chemistry from Harvard University. He was awarded the prestigious 2009 Department of Commerce Silver Medal, along with five colleagues, "for showing that projected changes in human emissions of short-lived gases and particles, which are controlled locally and regionally throughout the world to improve air quality, may significantly influence climate in the 21<sup>st</sup> century." In 2013, Levy was the recipient of a NOAA Distinguished Career Award in Scientific Achievement "for pioneering the understanding of tropospheric chemistry through discovery of fundamental mechanisms and global atmospheric chemistry modeling." He has published over 100 scientific papers, many highly cited in the field. ■

## AOS Graduate Students Welcomed at New Student Orientation

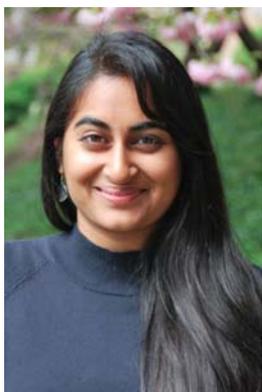
The Department of Geosciences and the AOS Program held their graduate student orientation programs on Tuesday, September 10, 2013. The programs are designed to help incoming students transition to graduate studies in Princeton's Geosciences Department and AOS Program. The joint morning welcome session began with a breakfast in the Great Hall of Guyot Hall, followed by introductions by Allan Rubin, Chair, Department of Geosciences, Knox Taylor Professor of Geosciences George Philander, and AOS Director of Graduate Studies Isaac Held.

Following the combined welcome, three new AOS students returned to the Forrester Campus for AOS administrative staff introductions and a brief overview of available Program-specific resources found at Sayre Hall. A presentation by the AOS Graduate Work Committee, led by DGS Held, and a student-guided tour of GFDL took place prior to a luncheon with current students. Subsequent to the luncheon, students met with faculty advisors to discuss areas of possible mutual research interest. After meeting with advisors, the new students attended a GFDL seminar, as part of the "Using Diverse Observations in Climate Modeling Research" Workshop which was being held concurrently on the

Forrestal Campus. The seminar, “Modeling carbon-cycle feedbacks to climate from the Amazon to the Arctic: Does ecology matter?” was given by Scott Saleska (University of Arizona).

The day ended with a return trip to Main Campus for dinner at Triumph Brewing Company on Nassau Street. The Program extends a warm and generous AOS welcome to its newest students: Anna FitzMaurice, Youmi Oh, and Zhaoyi Shen. ■

## Persad Selected Chair of Gordon Research Seminar in Radiation and Climate



*AOS Graduate Student  
Geeta Persad*

AOS Graduate Student Geeta Persad has been selected as the chair of the next Gordon Research Seminar (GRS) in Radiation and Climate in 2015. The seminar, a two-day early career scientist symposium preceding the Gordon Research Conference (GRC), is an opportunity for graduate students, postdocs, and other scientists with comparable levels of experience and education to come together in a highly-stimulating and non-intimidating environment to discuss their current research and build informal peer networks that may lead to a lifetime of collaboration and scientific achievement.

As chair of the 2015 Seminar, Persad will have the privilege of determining the overarching focus of the seminar, inviting a keynote speaker, as well as working with the GRC chairs to encourage graduates student/postdoc participation in the overall

conference. Persad’s level of discussion participation in the 2013 and 2011 Gordon conferences and the merit of her scientific contributions to the conferences led to her selection as chair of the 2015 event. AOS Graduate Students Spencer Hill and Claire Radley joined Persad at the GRS in Radiation and Climate this past July.

“The position will hopefully provide some great visibility for the AOS Program and an opportunity to guide the themes of the conference toward those relevant to our department,” Persad said. “I am looking forward to this new and challenging experience, and am hoping to learn a great deal.” ■

## AOS & CICS Research in Action

*[This column is intended to focus on AOS & CICS research accomplishments and milestones, past, present, and future. In this issue, we highlight the accomplishments of AOS Associate Research Scholar Massimo Bollasina who spent three years in the AOS Program.]*

Associate Research Scholar Massimo Bollasina left the AOS program in August to join the School of GeoSciences at the University of Edinburgh as a lecturer in atmospheric science. Massimo’s research focuses on shedding light on mechanisms and physical processes controlling changes in hydroclimate over key geographical regions at seasonal to interdecadal time scales. In order to achieve this goal, Massimo makes use of a variety of tools, from observations to a range of modeling experiments.



*AOS Associate Research Scholar Massimo  
Bollasina*

Massimo has spent three exciting and enriching years, both personally and professionally, in Princeton working at GFDL with Yi Ming and V. Ramaswamy.

By integrating observational analysis and model simulations, his research aimed at improving the understanding of the multifaceted hydrological cycle of the South Asian summer monsoon. The monsoon is a major component of the global atmospheric circulation and affects the livelihood of more than 20% of the world’s population.

While at GFDL, Massimo found that the observed widespread summer-mean monsoon precipitation reduction over South Asia during the second half of the 20<sup>th</sup> century is very likely attributable to increased anthropogenic aerosols. The drying is associated with a slowdown of the tropical meridional overturning circulation to counteract the aerosol-induced inter-hemispheric energy imbalance and subsequent reduction of the meridional land-sea surface temperature gradient. Targeted experiments revealed that while the predominant changes over India are associated with locally-emitted aerosols, aerosols from remote sources contribute as well, especially in early summer and in enhancing summertime precipitation over the northwestern regions. Indeed, in stark contrast with their seasonal-mean effect, aerosols are likely responsible for an earlier shift of the monsoon onset over most parts of India. This shift is found to be initiated by strong direct aerosol forcing over the Bay of Bengal and Indochina in May, and is subsequently driven by thermodynamical changes in the spatial distribution of monsoon heating sources mediated by changes in the large-scale circulation.

Massimo also found that regional land-atmosphere processes, mediated by surface hydrology, play a major role in driving the transition to the monsoon regime and in modulating the inland northward progression of rainfall over the Indian subcontinent. These findings highlighted the unsteady nature of the onset phase of the monsoon and underscored the importance of the northwestern semi-arid areas for monsoon variability.

During his time in Princeton, Massimo investigated the serious precipitation bias over the western Indian Ocean in current models. The regional meridional sea surface temperature gradient was found to exert an excessive control on the simulated monsoon precipitation and circulation by enhancing the near-surface meridional wind convergence and inducing a cross-

equatorial meridional circulation, with implications for the monsoon evolution over India. The proposed mechanism highlighted the key role of this part of the ocean in simulations and future projections of the monsoon.

"Massimo spent three memorable years at GFDL, during which he published five important papers, including one in Science, and received two major awards from WMO and AGU," Ming said. "More important, with BIG hugs that only a true Italian can give, he was just such a nice person to be around. As Massimo takes on new endeavors on the other side of the pond, I wish him all the best and look forward to continued collaboration for many years to come."

Massimo said he is extremely honored and grateful for the time spent in Princeton. "I have greatly enjoyed these years, especially the interaction with many colleagues and friends, and I am very thankful for the opportunity to work in a truly inspiring and top-quality environment with the most advanced tools and expertise," he said. "I look forward to continuing and further extending my collaboration with GFDL scientists on a number of topics in the future." ■

## AOS & CICS News

AOS Postdoctoral Research Fellow **Greg de Souza** has been awarded an Advanced Postdoc Mobility postdoctoral fellowship, for one year beginning October 1, 2013, by the Swiss National Science Foundation (SNSF).

AOS Postdoc **Carolina Dufour** is the lead author of a recent study that investigates the role of mesoscale eddies in the response of the Southern Ocean carbon sink to wind intensification. This work, carried out during her Ph.D. in France, aims at elucidating more generally the role of mesoscale eddies in setting the Southern Ocean circulation, research that she can now pursue further at AOS using GFDL's high-resolution climate models. The article has been accepted for publication by Global Biogeochemical Cycles and is available at:

<http://onlinelibrary.wiley.com/doi/10.1002/gbc.20090/abstract>.

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Analysis of observations and sensitivity experiments with a new three-dimensional global model of stable carbon isotope cycling elucidate processes that control the distribution of  $\delta^{13}\text{C}$  of dissolved inorganic carbon (DIC) in the contemporary and preindustrial ocean, according to a recent paper co-authored by AOS Research Oceanographer **Bob Key** and published in Biogeosciences. Analysis of a new synthesis of  $\delta^{13}\text{C}_{\text{DIC}}$  measurements from years 1990 to 2005 is used to quantify preformed and remineralized contributions as well as the effects of biology and air-sea gas exchange.

Access the paper here:  
<http://www.biogeosciences.net/10/5793/2013/bg-10-5793-2013.html>.

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The American Geophysical Union's (AGU) first Science for Solutions Award <http://sites.agu.org/honors/medals-awards/science-for-solutions-award/> has been awarded to **Sol Hsiang**, a postdoc in AOS Associated Faculty Member **Michael Oppenheimer's** group and the STEP program <http://www.princeton.edu/step/>. This new award recognizes a student or postdoctoral scientist "who uses his/her skills and knowledge in the Earth and space sciences to create solutions to societal problems." Sol's work uses large statistical data bases to analyze how humans respond to the effects of climate variability and change, including agricultural impacts and tropical cyclones, with a central emphasis being the potential for civil conflict. Sol has accepted an assistant professorship at Berkeley.

## Alumni News

As part of the AeroCom project, former AOS Graduate student **Cynthia Randles** is the lead author and co-author of two international inter-comparisons of radiative transfer models used in global aerosol modeling. The studies are published in Atmospheric Chemistry and Physics:

"Intercomparison of shortwave radiative transfer schemes in global aerosol modeling: results from the AeroCom Radiative Transfer Experiment"  
<http://www.atmos-chem-phys.net/13/2347/2013/acp-13-2347-2013.html>.

"Host model uncertainties in aerosol radiative forcing estimates: results from the AeroCom Prescribed intercomparison study"

<http://www.atmos-chem-phys.net/13/3245/2013/acp-13-3245-2013.html>.



## AOS Iron Chef

**Tuesday, October 22<sup>nd</sup> at 2:30 pm** in the Sayre Hall Conference Room  
**Secret Ingredient: "Nut"**

## Arrivals

The AOS Program extends a warm AOS welcome to our new graduate students: **Anna FitzMaurice**, **Youmi Oh**, and **Zhaoyi Shen**.

**Kara Jo Sulia** arrived from Penn State on September 1st to work with Chris Golaz as a postdoctoral research associate.

We welcome back **Xianglei Huang** (Associate Professor Department of Atmospheric, Oceanic, and Space Sciences (AOSS) University of Michigan) who began working with Yi Ming and V. Ramaswamy on September 1<sup>st</sup> as a visiting research scholar.

**Rebecca Asch**, a postdoctoral research associate and Senior Nereus Fellow, arrived from Scripps Institution of Oceanography on September 16<sup>th</sup> to work in Jorge Sarmiento's group.

Postdoctoral Research Associate **Adele Morrison** arrived on September 30<sup>th</sup> to work in Jorge Sarmiento's group. Adele comes to us from Australian National University in Canberra.

**Terrence O'Kane**, a senior research scientist at CSIRO, will be working with Steve Griffies for a couple of months as a visiting fellow. Terrence arrived on October 17th.

**Nir BenMoshe** is arriving on October 24<sup>th</sup> from the Hebrew University of Jerusalem. He will be working with S.J Lin as a postdoctoral research associate.

## Departures

In late July, AOS Postdoctoral Research Associate **Hyeong-Seog Kim**, who worked with Tom Knutson and Gabe Vecchi, accepted a faculty position at Korea Maritime University. His research interests include diagnosis and prediction of tropical cyclone activity, climate change and variability using the observation and dynamical model, and understanding in long-term variation/change of tropical cyclone activity in past and future.

In August, after three years in the AOS Program, **Massimo Bollasina**, an associate research scholar, accepted a faculty position at the University of Edinburgh. His research focuses on shedding light on mechanisms and physical processes controlling changes in hydroclimate over key geographical regions at seasonal to interdecadal time scales.

In late October, Associate Research Scholar **Yu (Sophie) Zhang** accepted a faculty position at Ocean University of China. Her research interests include the role of ocean in climate change, the role of ocean circulation in ocean biogeochemical response to climate change, the dynamics of Southern Ocean meridional overturning circulation and its response to climate change, and the dynamics of Atlantic meridional overturning circulation.

## Birth Announcements

Congratulations to **Charlie Stock** (GFDL), and his wife, Nancy, on the birth of their daughter, Emma Shi-Ai, on August 1, 2013.

Congratulations to **Raffaele Bernardello** (UPenn), who collaborates with Jorge Sarmiento's group, and his wife, Stephanie, on the birth of their daughter, Ella Sophia, on August 3, 2013.

Congratulations to AOS Associate Research Scholar **Jingqiu Mao** and his wife, Yan Xiong, on the birth of their daughter, Chelsea, on September 24, 2013.

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