



# AOS & CICS Newsletter

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## Orlanski Awarded RAICES Prize

After more than 20 years of collaboration with the University of Buenos Aires and the National Council of Scientific and Technical Research (CONICET), AOS Faculty Member Isidoro Orlanski was awarded the RAICES Prize by the Ministry of Science and Technology of Argentina on October 6, 2011. The Prize is awarded to Argentinean scientists working in foreign institutions for their exceptional scientific contributions and their efforts in promoting science development in Argentina.



Faculty Member Isidoro Orlanski

In 1987, following a request by CONICET (the funding agency of the present-day Ministry of Science and Technology) to start a research group devoted to the development of numerical models for atmospheric and oceanic sciences, Orlanski, on his sabbatical from GFDL, arrived in his native Buenos Aires with two computer models, ZETAC, a regional atmospheric model developed at GFDL, and an early ocean model (M. Cox). With a small group of enthusiastic graduate students and computer time allowed him by Argentina's National Atomic Energy Commission, Orlanski and his group were successful in running limited area models for weather and climatic studies.

At the time, he could not have possibly envisioned that the "little" group he was creating would today become one of the most recognized centers in South America dedicated to the study of and applications in meteorology, climatology and oceanography. Today CIMA (Research Center of the Sea and the Atmosphere) is widely recognized both nationally and internationally as a center of excellence, due, in large part, to the dedication of the young scientists, some of them originally Orlanski's students and many others who attended courses given by him over the last 24 years.

"I am pleased to receive the RAICES Prize. As we say here, it is the "icing on the cake" because, for me, every time that I visit CIMA I feel rewarded for its achievements and the scientific role that it plays in South America. It feels good to know that I played a role in its development and growth," Orlanski said. "I've collaborated with fine researchers through CIMA over the years and I am extremely grateful to have had those opportunities."

CIMA has been a pioneer in national-level implementation of atmospheric and oceanic models and is the only institute devoted mainly to computer simulations of Earth system models in Argentina. ■

TigerTransit/Shuttle Services Operating on Fall Schedule  
<<http://www.princeton.edu/transportation/ForrestalFall11.pdf>>

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

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## New Students Welcomed at Orientation

On Tuesday, September 13<sup>th</sup>, the AOS Program's largest incoming class in over three decades began their graduate educations at new student orientation.

Following breakfast in the Great Hall of Guyot Hall, AOS and Geosciences faculty

welcomed seven new AOS students to the University. AOS Director of Graduate Studies Sonya Legg introduced the students to the AOS Program. The students returned to Forrester Campus after a discussion on IT resources in Guyot to meet with the AOS administrative staff and for a tour of Sayre Hall.

"It's great that we have such a large incoming class this year, and we were treated to perfect New Jersey fall weather for our welcoming lunch outside," Legg said.

Following the outdoor lunch with faculty and current students, the students listened to a presentation by Legg and the Graduate Work Committee. A tour of GFDL followed as did meetings with faculty advisors to discuss areas of mutual research interest and possible research problems the student might decide to work on.

The day culminated with a picnic behind Guyot and Eno Halls. The Program extends a warm AOS welcome to: Junyi Chai, Spencer Hill, Jaya Khanna, Todd Mooring, Geeta Persad, Jeffrey Strong, and Hannah Zanowski. ■

## Preparations Underway for CICS Review

The Cooperative Institute for Climate Science (CICS) will undergo a comprehensive NOAA Science Advisory Board Review from November 2<sup>nd</sup> to November 4<sup>th</sup>, 2011. All NOAA Cooperative Institutes (CI's) are required to undergo periodic reviews of their administrative and scientific programs, once every five years. CICS' last review was in 2006.

The review will evaluate both scientific and administrative performance using a panel of experts in areas of science, science management, education and outreach, and administrative management that are relevant to the CI.

The administrative review will take place on November 2<sup>nd</sup> in Sayre Hall and will examine the administrative procedures associated with the grant management of CICS and Princeton University. AOS Program Manager and CICS Administrator

Laura Rossi will lend her expertise to this effort along with representatives from the Office of the Dean of the Faculty, the Office of Research and Project Administration (ORPA), the Office of Sponsored Research Accounting (SRA), the Office of Audit and Compliance, the Office of Technology Licensing and Intellectual Property, and GFDL's Administrative Offices.

The science review will take place on November 3<sup>rd</sup> at the Friend Center on Main Campus. Following a welcome by Dean for Research A.J. Stewart Smith, CICS Director Jorge Sarmiento will give an introduction and overview of CICS, including a brief history of the CI and the collaboration between GFDL and the University. GFDL Director V. Ramaswamy and CICS Associate Director Geoff Vallis will further describe the role of CICS in relation to GFDL and the AOS Program. A series of science presentations highlighting recent scientific accomplishments will be followed by discussions with senior researchers, postdocs and graduate students. Confirmed presenters include: Alistair Adcroft, Sonya Legg, David Medvigy, Stephen Pacala, Olga Sergienko, Jim Smith, and Charlie Stock. A poster and executive session will follow.

The review will conclude on November 4<sup>th</sup> with a tour of GFDL and AOS and a series of executive sessions. The review panel will present its preliminary findings and recommendations to the CI Director during an exit briefing. The final findings and recommendations of the review panel will be submitted to NOAA several weeks following the review. ■

## Majkut Awarded PEI-STEP Fellowship

AOS Graduate Student Joe Majkut has been awarded a PEI-STEP Fellowship by the Princeton Environmental Institute (PEI). Selected from a competitive pool of applicants, Majkut will join fellow 2011 awardees Dan Li and Matthew Reid, both within the Department of Civil and Environmental Engineering, in addressing the environmental policy implications of their thesis research through supplementary

course-work and policy-oriented research over the course of two years.

Entitled "Implications of Learning about the Carbon-Climate Feedback," Majkut's PEI-STEP project aims to understand how our current uncertainty surrounding the response of the carbon system to climate change should impact our decisions involving emissions policy. Describing his project, Majkut said, "I will use the DIMES climate-carbon-economy model to evaluate how we might anticipate the impacts of this currently unknown climate feedback and chart an optimal path now. I am excited to learn about the economic and social considerations that go into making climate policy and discover how scientific research can be carried out with climate decisions in mind. Our global response to climate change is a grand engineering challenge and I am happy to have this program to find my place in it."



*AOS Graduate Student Joe Majkut*

"This support will be invaluable to Joe as he explores the policy dimensions of his doctoral research," AOS Director Jorge Sarmiento said. "We are pleased that he was selected."

In addition to producing a paper or incorporating a policy component of publishable quality into their thesis, PEI-STEP fellows usually take three STEP approved courses, on aspects of policy related to science, technology or the environment. Majkut's STEP Advisor is Michael Oppenheimer.

Students who complete the requirements of the PEI-STEP fellowship program are awarded a Graduate Certificate in Science, Technology, and Environmental Policy from the Woodrow Wilson School of Public and International Affairs in addition to receiving a degree from the department

in which the student is enrolled. Since 2000, the program has supported over 30 PEI-STEP Fellows many of whom have gone on to pursue positions of environmental leadership in academic, government, non-profit, and industry sectors following their time at Princeton. Majkut joins an impressive group of PEI-STEP Fellows, including former AOS Graduate Students Curtis Deutsch and Ian Lloyd who were awarded the Fellowship in 2000 and 2009 respectively, and former Geosciences Graduate Student Bryan Mignone who was awarded the Fellowship in 2001. ■

## Study Addresses Uncertainty Analysis

In a recent study published in the *Journal of Climate*, an interdisciplinary team of Princeton scientists including Mechanical and Aerospace Engineering (MAE) Graduate Student Lauren Padilla, CICS Associate Director Geoff Vallis, and MAE Associate Professor Clarence W. Rowley, addresses the impact of forcing uncertainty and internal variability on estimates of transient climate sensitivity (TCS) (the double CO<sub>2</sub> response of globally averaged surface temperature on short time scales). A range of probabilistic estimates of the TCS that combine these two sources of uncertainty for various underlying assumptions about the nature of the uncertainty is provided in the study. Additionally, the authors provide estimates of how quickly the uncertainty in the TCS may be expected to diminish in the future as additional observations become available.

For the study, the scientists constrained a simple energy balance model by observations of the 20th century surface temperature record and forcing estimates, using a particular nonlinear form of the Kalman filter as a way of estimating parameters. This approach allowed them to explicitly examine the way in which probability distributions depend on the underlying assumptions and length of the observed record.

According to the authors, given their most plausible uncertainty assumptions, if the medium term (decadal to century timescale) future temperature increase is to

be kept below 2K with 95% certainty, the data and calculations suggest that equivalent CO<sub>2</sub> levels should be kept below about 475 ppmv. The study suggests that the uncertainty in TCS may be reduced by approximately 45% by the year 2030, and that if the temperature before then does not increase more than currently expected, the target emissions level may rise to 540 ppmv CO<sub>2</sub> equivalent. The authors emphasize, however, that their results provide upper bounds on emissions targets that constrain temperature increases only on the short and medium term. Due to great thermal inertia in the deep ocean, the equilibrium temperature response to sustained emissions at those levels is likely to be much larger than the transient response.

An early online release can be found here:

<http://journals.ametsoc.org/doi/pdf/10.1175/2011JCLI3989.1>. ■

## Majkut and Persad Selected for PECS Group

AOS Graduate Students Joe Majkut and Geeta Persad were recently selected for the Princeton Energy & Climate Scholars (PECS) group. They are among the six graduate students selected this fall. Created in the spring of 2008, PECS aims to provide a platform for Ph.D. students working on any aspect of energy and climate research to interact, collaborate, gain first hand understanding of research areas outside of their own discipline, and ultimately broaden their horizons both as scholars and as citizens.



AOS Graduate Student Joe Majkut

The students meet once a month, over lunch or dinner, to share research results and to introduce their work to each other

through informal discussions. On at least two occasions during each semester, PECS will also convene dinner conversations with faculty. This will bring together PECS students, members of the PECS Faculty Board, as well as invited guests from within or outside of the university community. Included among the Faculty Board are AOS Senior Scientist Syukuro (Suki) Manabe and Assistant Professor David Medvigy. On other occasions during the semester, social events at local venues will bring together students, faculty, and PECS alumni, for informal conversations. PECS alumni include Former AOS Graduate Student Ian Lloyd and Ilissa Ocko, a fourth-year graduate student in the AOS Program.



AOS Graduate Student Geeta Persad

“I’m honored to have been selected for PECS and am looking forward to being inspired by my exceptional colleagues in the program. It promises to be a great opportunity to get to know faculty and fellow students with common interests in energy and climate policy and solutions, and to put our minds together to come up with innovative research directions,” Persad said.

PECS consists of a student body of between 10 and 15 Ph.D. students and a Faculty Board comprising 6 to 8 faculty members. PECS is supported by the Siebel Energy Grand Challenge. ■

## Climate Modeling and Research Symposium Held at GFDL

On Monday, October 17<sup>th</sup>, GFDL held a day-long Climate Modeling and Research Symposium. The event featured talks by GFDL scientists focused on important scientific findings from the latest climate modeling and applications research, among

them AOS Faculty Tom Delworth, Larry Horowitz, Isaac Held, and Bob Hallberg and CICS Scientists Meiyun Lin Elena Shevliakova, and Olga Sergienko.

The talks explored cutting-edge results arising out of the lab's work over the last couple of years, including experiments using models developed for the IPCC's AR5. New research and findings in the areas of Atmospheric physics and chemistry, and climate; Atmospheric dynamics and climate; Earth System Modeling, and Seasonal to decadal to centennial climate variability, predictability and change were featured.

According to GFDL Director V. Ramaswamy, the symposium received high acclaim from all in attendance. He attributes its success to the "unique and distinct contributions" of GFDL personnel "which enable us to sustain excellent standards in research and to continually advance the scientific frontiers."

The symposium was held in GFDL's Smagorinsky Room, with approximately 115 people in attendance. The event comes two years after the OAR External Lab Review of GFDL conducted in July of 2009. ■

## Remembering Dick Wetherald

Returning from the Columbus Day weekend, GFDL received news that Richard "Dick" Wetherald passed October 9.



Former GFDL Scientist Dick Wetherald

After earning a Master's degree from the University of Michigan, Dick became a research scientist at GFDL when the lab was still located in DC. He moved with the lab to Princeton, NJ in 1964, and continued to research and publish, even after he had officially retired in 2008. He will be

remembered for his passion for climate research, unflinching kindness and grace toward colleagues, devotion to his family, generosity in giving back to others through volunteer work, and his unabashed appreciation for life, even as he was undergoing treatment for cancer.

For more than 30 years, Dick worked closely with Suki Manabe. Together, they published several seminal global warming papers, starting with their 1967 paper offered the first quantitative estimate of the change in surface air temperature due to increasing CO<sub>2</sub> in the atmosphere. It continues to be one of the most-cited papers in climate science. Dick helped build and run many different climate models at GFDL, and carried out numerous studies that shed light on hydrological changes associated with increasing greenhouse gases. Nearly 50 papers in the peer-reviewed literature bear Dick's name, as author or coauthor.

Dick was a well-known local public speaker on global warming. He shared his enthusiasm for weather and climate with countless teachers and school children through teacher workshops, by founding and coaching science clubs, and mentoring students of all ages. Outside of GFDL, Dick was a very dedicated father and proud grandfather, and he was very active in his church. ■

## 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 Associate Research Scholar Vince Saba who spent nearly two years in Princeton.]*

In September, Vincent Saba left the AOS program to begin a new position as a Research Fisheries Biologist with NOAA's National Marine Fisheries Service Northeast Fisheries Science Center. Vince is a marine ecologist who has worked as an Associate Research Scholar in the AOS Program and GFDL for almost two years. His previous research has involved the ecology of sea turtles, fish, and sharks as well as marine primary productivity model assessments.



Associate Research Scholar Vince Saba and his son Dean

In the Climate and Ecosystems group at GFDL, Vince has worked under Charlie Stock and scientists from Drexel and Purdue Universities to design a climate-forced population dynamics model for the critically endangered eastern Pacific leatherback turtle population that nests on the Pacific coast of Costa Rica.

Relying on the longest-running empirical dataset of climate and sea turtle ecology in both the ocean and nesting beach, Saba et al. used an ensemble of IPCC-class climate



Eastern Pacific Leatherback

models along with GFDL's Earth System Model to project the population's response to climate change over the 21<sup>st</sup> century. Currently in review with two journals, their results showed that the eastern Pacific population faces extirpation due to rapidly rising air temperature that drastically reduces the success of leatherback eggs on the nesting beach at Playa Grande, Costa Rica. On a positive note, Saba et al. suggests that anthropogenic climate mitigation of nests in Costa Rica (shading and irrigation) may be able to sustain the population by maintaining present-day nest success.

"Vince showed great initiative and ingenuity in pursuing multi-disciplinary collaborations and developing approaches to assess the potential impacts of climate change on an endangered population of leatherback sea turtles. We look forward to

continuing to work with him to assess climate impacts on a range of Living Marine Resources as he begins his tenure as a research scientist at NOAA's Northeast Fisheries Science Center," Stock said.

Vince is also in the final stages of completing a book chapter with Charlie Stock and John Dunne regarding the relationship between size class-based marine primary productivity and leatherback phenology and fecundity. ■

## AOS & CICS News

Congratulations to AOS Faculty Member **Isaac Held**, who was awarded the 2012 Editor's Award for the Journal of the Atmospheric Sciences, "For high-level and insightful reviews for a number of editors."

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Congratulations to AOS Postdoctoral Research Associate **Takeshi Doi**, who recently received an AMS Editor's Award for the Journal of Climate, "For providing a thoughtful and decisive review of a difficult paper on short notice."

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Congratulations to the winner of the GFDL Golf Open AOS Research Oceanographer **Bob Key**. The Open was held at Bunker Hill Golf Course on July 22<sup>nd</sup>.

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Beginning this fall, The GFDLEA will hold "Afternoon Tea Gatherings." The first was held on September 29<sup>th</sup> at 3:00 pm in the GFDL Lobby. The gatherings will be held monthly. All are invited!

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### Save the date!

The first student-run **Research Symposium in the Geosciences** will be held on Friday, **November 11<sup>th</sup>, 2011** in Lewis Library from 9am – 7 pm. The event will include oral and poster presentations by student participants.

The goal of this symposium is to advance student appreciation and understanding beyond their specific area of research by encouraging a more holistic view of the

Geosciences through presentations from graduate students in any branch of Earth



Science: *atmospheric science, Earth history, geochemistry, geology, geophysics, oceanography, orography, paleoclimate, paleontology, and seismology.*

For details, please visit:  
<<http://www.princeton.edu/geosciences/graduate/gradsymposium/>>

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### Fall 2011 Wellness Programs for Faculty, Staff and Graduate Students are available at:

<<http://www.princeton.edu/healthier/news-events/calendar/>>.

### Arrivals

Visiting Faculty Member **Marcelo Barreiro** arrived in August from the Universidad de la Republica in Uruguay. He will be working with George Philander.

Postdoctoral Research Associate **James Watson** arrived on September 1st. He will be working with Jorge Sarmiento and Charlie Stock on the future of fisheries.

**Gualtiero Badin** also arrived on September 1st. He will be working with Geoff Vallis as an Associate Research Scholar.

### Graduate Students:

**Junyi Chai**  
**Spencer Hill**  
**Jaya Khanna**  
**Todd Mooring**  
**Geeta Persad**  
**Jeffrey Strong**  
**Hannah Zanowski**

## Departures

**Daniel Goldberg** – July 2011  
Department of Earth & Planetary Sciences,  
MIT

**Vince Saba** – September 2011  
NOAA National Marine Fisheries Service,  
Northeast Fisheries Science Center

## Birth Announcements

Congratulations to **Fanghua Xu** on the birth of her son, Nathan Xu Lin, on May 16<sup>th</sup>.

Congratulations to **Sophie Zhang** on the birth of her daughter, Serana Joy Yuan, on August 11<sup>th</sup>.

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