Princeton University
Department of Geosciences & Program in Atmospheric & Oceanic Sciences

Program in Graduate Studies
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Throughout this brochure you will find reminiscences by a number of our former graduate students. Many thanks to Richard Allen *00, Chris Andronicos *99, Karen Casciotti *02, Meredith Galanter-Hastings *04, Tracey Holloway *01, Klaus Keller *00, Gregory O’Mullan *05, Tapio Schneider *01, Sang-Heon Shim *01, Sergio Speziale *03, Hsin-Yi Tseng *97, and Suzan van der Lee *96.
Graduate Studies at Princeton Geosciences and the Program in Atmospheric & Oceanic Sciences

Introduction

The Department of Geosciences (GEO) offers Ph.D. programs in a range of disciplines including seismology, earth history, mineralogy, geomicrobiology, tectonics, and environmental geochemistry. The Program in Atmospheric and Oceanic Sciences (AOS), which is concerned mainly with the physical aspects of weather and climate, is a part of the Department of Geosciences. Students with interdisciplinary interests, in the Earth's carbon cycle or in atmospheric chemistry, for example, can create their own research program within GEO. The administration of the graduate program in AOS differs from that in GEO; the AOS program is described on their website http://www.princeton.edu/aos/.

We offer an education that is both wide in scope, in response to the extreme complexity of the problems faced by geoscientists, and well grounded in the major sciences to provide full flexibility for continuing growth after the Ph.D. Our graduates find leading positions in academia, industry, consulting, and government.

The choice of a research advisor is at least as important as the choice of an institution. You may wish to explore research possibilities by contacting one or more of the faculty members listed below, and/or their students.

From the beginning of the first year, the emphasis in Geosciences is on research. Following consultation with an advisory committee (generally 3 members of the faculty), students start on a research project. Students give oral reports on the progress of their research near the end of their first year, and, as one component of the General Examination, they describe and defend their research project(s). All students take a General Examination within two years after arriving. Passing this exam qualifies them to continue toward a Ph.D.

Chris Andronicos ’99
Associate Professor
Cornell University

I applied to the University of New Mexico, MIT, and Princeton for graduate school. I was from Albuquerque, so MIT and Princeton were the better choices for me, and Princeton seemed like a much friendlier place than Cambridge after visiting both places. I also had a 2-year-old child at the time and Princeton was a much better place to have children. Finally, my future advisor did a good job of recruiting me with a great field-based research project.

Princeton was a great learning experience for me. I had done research before coming to Princeton, but working on my Ph.D. I think I really learned how to formulate good questions and follow them through to the end. The research community in Princeton really pushes you to be the best without being unfriendly. I found the things I was best at and learned how to push others to achieve their best. This was possible because of the intellectual freedom you are given at Princeton.

The thing I remember most about Princeton was the diverse group of people I had the opportunity to work with and meet. I grew up in the West and had never really traveled except in the USA. At Princeton I met people from all corners of the world. Additionally, people did very diverse research, everything from global change to seismic wave propagation. It was a great place to meet people who were very different from myself. Also, Princeton was one of the nicest places I have ever lived. The seasons were great and the easy access to New York and Philadelphia was a big plus.

My graduate experiences at Princeton changed my life for the better. The faculty at Princeton are outstanding, the research opportunities are excellent, and the Princeton area is a very nice place to live. I made friends at Princeton that I expect I will be in contact with for the rest of my life. It was a great experience.
Course requirements are flexible, though every student takes the two-semester course “Fundamentals of the Geosciences” (GEO505/506) in the first year and normally completes six more one-semester courses by the end of the second year. Other requirements are decided on an individual basis and may depend on the discipline.

The Department of Geosciences currently has over 50 graduate students, about 15 postdocs, 18 faculty members, and several associated faculty at the Geophysical Fluid Dynamics Laboratory (http://www.gfdl.noaa.gov). In addition, half a dozen graduate students from other departments (biology, chemistry, engineering) work in Guyot Hall with a Geosciences advisor.

Admission
A strong background in the sciences is a prerequisite for admission for the Geosciences and AOS Ph.D., but the program of study is designed for every student individually. We admit students who have majored in such diverse fields as chemistry, physics, mathematics, geology, biology, computer science, and engineering.

Because of the variety of backgrounds, we do not require a subject GRE test. The required General GRE scores form only one of the criteria that guide us in the admissions process.

Foreign students must show proficiency in the English language. The GRE and TOEFL examinations are a first indication of English proficiency. We often conduct a telephone interview with foreign applicants before deciding on admission.

Application forms in PDF format can be obtained from:
http://gradschool.princeton.edu/about/docs/admission/application.pdf

Financial Aid
In general, graduate students are supported (tuition plus stipend) for at least four years by First Year Fellowships provided by the University, project grants awarded to individual faculty members from outside agencies, and through an Assistantship in Instruction. Support beyond four years is generally through project grants. A few Departmental or University Fellowships are also available. Students who are U.S. citizens are urged to apply for National Science Foundation, Department of Defense, NASA, or Hertz fellowships. Various funds are also available to support summer studies, fieldwork, and other research away from campus. The average time to obtain a Ph.D. in the Geosciences is about 5 years, and in AOS about 4 years.

Housing
The University provides a wide variety of housing within walking or biking distance from campus for both married and unmarried graduate students, and there is a shuttle service from graduate student housing to both the main and Forrestal campuses.

The booklet Housing and Cost of Living for Graduate Students is sent to all newly admitted students and provides detailed information. See also:
http://www.princeton.edu/pr/admissions/g/hcl

About Princeton
Princeton is a residential community about 80 kilo-
meters from both New York City and Philadelphia. It is located in countryside that makes it possible to jog along the river towpath, take bicycle rides in the hilly landscape, and sail or canoe on Lake Carnegie. A train station on campus connects to all important trains serving the Northeast corridor. Manhattan is only an hour away by trains that continue to run until about 2 am, providing easy access to all the amenities of this vibrant cultural center.

Princeton Borough has preserved its historical character by maintaining many original colonial buildings and homes. The University has athletic facilities for many sports, including golf, tennis, basketball, sailing, soccer, swimming, and squash. The campus and nearby countryside have numerous parks and trails for hikers and cyclists. The renowned McCarter Theater presents concerts, dance programs, and professional theater. There are many opportunities on campus and in town to view first-run as well as classic and foreign films.

There are abundant employment opportunities for spouses at Princeton University as well as at neighboring colleges, research institutions, and commercial enterprises such as Rutgers University, Rider University, Education Testing Service, Gallup Poll, Johnson & Johnson, Merrill Lynch, David Sarnoff Research Center, McGraw-Hill Publishing, Siemens, and Bristol Myers-Squibb.

For more information, consult:
http://geoweb.princeton.edu
http://www.princeton.edu/aos/
http://www.princeton.edu

Hsin-Yi Tseng *97
ExxonMobil Exploration, Houston, TX

When the opportunity arose for me to study geosciences at Princeton University, I eagerly accepted. I knew that it was the chance of a lifetime, the opportunity to receive advanced education at the best institution with the best people, to gain an insight into American life, and to exploit my independence in a wider world. My intuition was correct — Princeton inspired me to think outside the box and I have become more.

After undergraduate study in Taiwan, I came to the geochemistry program at Princeton. I received a tremendous amount of support from my primary advisor, Professor T.C. Onstott, who was always keen to see that I achieved the best results possible. He encouraged me to try new things and persevere when nothing appeared to be working and shared my excitement when I got some positive results. He even managed to answer my questions and make things clear when I wasn’t even sure what I was asking. Due to the small size of the department, I received a high level of individual attention and lots of hands-on experience of the lab equipment. Through working with many brilliant professors and scientists in the department and at other institutions, I developed a better understanding of and more respect for a range of approaches to trace and model the fluid history of basins and to assess the geochemical impact of subsurface microbial activity. I learned how to integrate a variety of technologies to put the puzzles together and was provided with numerous opportunities to communicate research results in professional meetings and workshops. This experience has been critical to the rest of my career with ExxonMobil, including research in petroleum systems and development of exploration strategy as a planning advisor.

My favorite memories of Princeton are countless. The sky in springtime was an amazing deep blue color and with blossoms sprouting on the trees. Friendly smiles and help received from local residents and the beauty of the town and campus were unforgettable. Meal times at the Graduate College to meet a wide variety of people and catch up on the news of the day were enjoyable. The opportunities to learn as a teaching assistant were priceless. Trips to New York, arranged by Princeton’s International Center, to watch shows on Broadway and listen to opera in Lincoln Center were joyful. It was the best years of my life, and I learned an incredible amount about geosciences, American culture, people, and myself — that I will always carry with me.
Michael L. Bender  
Professor  
Ph.D., 1970, Columbia University  
e-mail: bender@princeton.edu  
Current Research Interests: Studies of biogeochemistry and paleoclimatology involving measuring the changing concentration and isotopic composition of O$_2$ in air on various timescales, and using the results to characterize the fertility of ecosystems and to study Earth’s climate history.  
Current Students:  
Kuan Huang (huangk@princeton.edu)  
Recent Graduates:  
Gabrielle Dreyfus (“Dating an 800,000 Year Antarctic Ice Core Record Using the Isotopic Composition of Trapped Air,” 2008)  
Makoto Suwa (“Chronologies for Ice Cores Constrained by their Gas Records and their Implications for Climate History for the Past 400,000 Years,” 2007), now at Japan International Cooperation Agency.

Thomas S. Duffy  
Professor  
Ph.D., 1992, California Institute of Technology  
e-mail: duffy@princeton.edu  
Current Research Interests: Understanding the large-scale behavior of planetary interiors through experimental study of the properties of minerals under extreme conditions of pressure and temperature.  
Current Students:  
Susannah Dorfman (dorfman@princeton.edu)  
Zhu Mao (zhumao@princeton.edu)  
Jue Wang (juewang@princeton.edu)  
Lisha Xie (lxie@princeton.edu)  
Recent Graduates:  
Ph.D.  
Sergio Speziale (“Elastic Properties of Earth Materials,” 2003), now at GeoForschungsZentrum, Potsdam, Germany.  
Sang-Heon Shim (“Stability, Crystal Structure, and Equation of State of Silicate Perovskites in the Earth’s Lower Mantle,” 2001), now Assistant Professor, Massachusetts Institute of Technology.  
M.A.  
Claire Runge, 2006  
Sutacha Hongsresawat, 2003

Lincoln S. Hollister  
Professor  
Ph.D., 1966, California Institute of Technology  
e-mail: linc@princeton.edu  
Current Research Interests: Origin and evolution of the continental crust  
Current Students:  
Sean Long (slong@princeton.edu) Co-Advisor: N. McQuarrie  
Tobgay Tobgay (ttobgay@princeton.edu) Co-Advisor: N. McQuarrie  
Recent Graduates:  

Klaus Keller ’00  
Associate Professor  
Penn State University  
I chose Princeton because of the excellent faculty and the opportunity to work on cutting-edge science. Working with smart people taught me how to think critically and how to identify interesting and feasible projects. People who went to similar schools share a sense of exciting (but also very busy) times. The PEI-RISE fellowship gave me the opportunity to explore the field of environmental economics. This program has been very successful in exposing scientists and engineers to a neighboring field.  
After my graduation in July 2000, I was a postdoctoral research associate in the Woodrow Wilson School of Public and International Affairs working on economic aspects of climatic change. From July 2001 to December 2001, I continued this work as professional research staff. Since January 2002, I am assistant professor of geosciences at the Pennsylvania State University.
Working at the best institution with the best people is the most important consideration when applying to grad school. There is no question, people are always impressed to discover your Ph.D. is from Princeton. This is particularly true nationally but also internationally. Princeton’s prestige carries a long way. When faced with a pile of applications, an education at a top institution gets you to the second round along with candidates who have a strong recommendation from a known colleague.

Three things attracted me to Princeton initially: the reputation of the Geoscience department and international recognition of the university, the strong recommendations for my two advisors, and the Iceland project which had just been funded and included all the research elements I was interested in. The community amongst the geophysics students, postdocs, and faculty provides for an enjoyable work environment and also a highly educational one. The group provided an invaluable resource to help tackle research problems, and to unwind over a beer. The department nurtures this environment by supporting activities such as the graduate student retreat.

After completing my thesis on the structure of the crust and mantle beneath Iceland, I spent a year as a postdoc at Caltech developing a prototype earthquake alarm system (ElarmS) in addition to continuing my work on tomographic imaging—investigating finite frequency effects on our “image” of the Icelandic mantle. After completing my postdoc I moved to the University of Wisconsin-Madison to take up a position as Assistant Professor of Geology and Geophysics. I am now an Assistant Professor in the Department of Earth and Planetary Science’s Seismological Laboratory at the University of California, Berkeley.
François M. M. Morel
Albert G. Blanke, Jr., Professor of Geosciences
Director, Center in Environmental Bioinorganic Chemistry
Ph.D., 1971, California Institute of Technology
email: morel@princeton.edu

Current Research Interests: The study of trace elements and their interaction with the microbiota in the environment.

Current Students:
Jenna Losh (jlosh@princeton.edu)
Dalin Shi (dshi@princeton.edu)
Brandon Stackhouse (bstackho@princeton.edu)

Recent Graduates:
Haewon Park ("Cadmium Carbonic Anhydrase of Marine Diatoms: Diveristy and Expression," 2008)
Yan Xu ("Novel Metalloenzymes in Marine Phytoplankton: A Link Between Trace Elements and Macronutrients in the Oceans," 2008), now at Princeton University, Princeton, NJ.
Madeli Castruita ("Iron Storage Proteins in the Marine Environment," 2006), now at University of California, Los Angeles, CA.
Eileen Ekstrom ("Investigations into the Mechanisms of Biotic and Abiotic Mercury Methylation," 2006), now at Harvard University, Cambridge, MA.

Philippe Tortell ("Evolutionary and Ecological Perspectives of Inorganic Carbon Acquisition in Phytoplankton," 2001), now at the Department of Earth and Ocean Sciences, University of British Columbia, Canada.
Klaus Keller ("Trace-Metal-Carbon Interactions in the Marine Phytoplankton: Implications on the Cellular, Regional, and Global Scale," 2000), now at Penn State University.
Anne Kraepiel ("Biogeochemistry of Trace Metals: Mechanisms of Metal Partitioning in Aquatic Systems," 1999), now at Princeton University, Princeton, NJ.

Satish B. Myneni
Associate Professor
Ph.D., 1995, Ohio State University
email: smyneni@princeton.edu

Current Research Interests: Environmental geochemistry of natural interfaces, chemistry of water, metal solvation and complexation, and the chemistry of natural organic molecules.

Current Students:
Gregory J. Finkelstein (gjfinkel@princeton.edu)

Recent Graduates:

Sergio Speziale *03
Research Fellow
Geo-Research Center (GFZ), Potsdam, Germany

Working towards a Ph.D. in Princeton is an incredible experience for many reasons. Being a Princeton alumnus opens great opportunities to find prestigious positions, but above all, being there as a graduate student is an extraordinary life experience. Princeton University offers… practically everything! Princeton is a prestigious University with a tradition of excellence in many disciplines. The campus hosts a diverse community made of students and professors from everywhere in the world, and it is a lovely green place to enjoy outdoor life.

The Ph.D. program offered by the Department of Geosciences is strongly research oriented, so that since the very first moment students can be engaged in cutting-edge research. The community in the Department is so diverse covering many areas of Earth Sciences and the interaction with people involved in completely different projects is very stimulating. In addition, the large network of collaborations of all the research groups grants almost continuously the presence of visiting scientists whose seminars complement an already rich program of weekly talks.

The enormous advantage of being in a high-profile research university as Princeton is that you can always satisfy your curiosity in a variety of fields just looking in the many departments on-campus. Attending advanced seminars in other research areas is sometimes the way to give new direction to a Ph.D. project, and a perspective to a whole scientific career!

Now I am a research fellow at the Geo-Research Center (GFZ) in Potsdam, Germany, where I study the physical properties of minerals of the deep interior of the Earth and I have built a new laboratory for the determination of the elastic properties of materials under very high pressures. In supervising my students’ work, I constantly take advantage of the great lessons that I learned in my years at Guyot Hall. The person and the scientist I am are the result of the combination of all the experiences of my life. In many senses I owe a great deal to my experience in Princeton. The years I spent there are among the best of my life.
Alessandra Leri ("Halogen Dynamics in Environmental Systems: An X-Ray Spectroscopic Study," 2007), now an Assistant Professor at Marymount Manhattan College, New York, NY

David Edwards ("Molecular Studies of Hydroxamate Siderophore Interactions with Aqueous and Solid Phase Iron," 2005), now an Assistant Professor at Wesleyan College, Macon, GA.

Tullis C. Onstott
Professor
Ph.D., 1980, Princeton University
email: tullis@princeton.edu

Current Research Interests: Application of molecular, geochemical, and isotopic techniques to deep subsurface microbiology, the search for life on Mars, bacterial transport and bioremediation of radionuclides and toxic metals.

Current Students:
Shannon Tronick (stronick@princeton.edu)

Recent Graduates:

Bianca Silver ("The Nutritional and Energetic Constraints on Life in the Deep Biosphere of South Africa," 2008), now at Exxon-Mobil, Houston, TX.

Li-Hung Lin ("Radiolytic H2 and Microbial Communities in the Witwatersrand Basin," 2003), now at National Taiwan University.

Brian Mailloux ("The Role of Aquifer and Microbial Heterogeneity on the Transport and Activity of Bacteria in the Columbia Aquifer, Oyster, Virginia," 2002), now at Barnard College, NY.

Michael Oppenheimer
Albert G. Millbank Professor of Geosciences and International Affairs
Ph.D., 1970, University of Chicago
email: omichael@princeton.edu

Current Research Interests: Climate change science and climate change policy: ice sheets, sea level rise, vulnerable ecosystems, climate-induced migration. Defining “dangerous anthropogenic interference” in the climate system.

Current Students:
Christopher Little (cmlittle@princeton.edu)

S. George H. Philander
Knox Taylor Professor of Geosciences
Ph.D., 1970, Harvard University
email: gphlder@princeton.edu

Current Research Interests: Oceanic Circulation, Ocean-Atmospheric Interactions; Climate Fluctuations, Paleoclimates

Recent Graduates:

Scott Harper ("The Influence of Subtropical Forcing on the Density Structure of the Tropical Ocean," 2001), now at ONR.

Andrew Wittenberg ("ENSO Response to Altered Climates," 2002) now at GFDL, Princeton, NJ.

Allan M. Rubin
Professor
Ph.D., 1988, Stanford University
email: arubin@princeton.edu

Current Research Interests: Earthquake and fault mechanics, seismology, magma transport, rock fracture in crustal deformation.

Current Students:
Enning Wang (enningw@princeton.edu)

Suzan van der Lee *96
Assistant Professor
Northwestern University

Princeton provided me with the opportunity to complete a vast amount of research on a topic that was of great interest to the geosciences community. This experience has been of crucial importance in the rest of my career. After graduating, I spent 2.5 years as a postdoc at the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, where I installed seismic stations in southern Africa (see photo) and did research on seismograms from southern Africa and South America. After that I joined the staff at the Earth Sciences Department of the Federal Institute of Technology (ETH) in Zurich, Switzerland. In 2003 I moved to Northwestern, where I teach, advise graduate and undergraduate students, and continue my research in seismology.

I chose Princeton because of the excellence of the professors in geosciences and Princeton’s being very well known and in an attractive location. I also very much liked the campus. The Princeton environment is very green and peaceful. Once that starts to be boring, NYC is an hour away by train. Additionally, the graduate students are a diverse and active group. Of course one needs an Ivy League undergraduate degree in order to be able to read the Princeton graduate degree diploma!
Jorge L. Sarmiento
Professor
Director, Program in Atmospheric and Oceanic Sciences
Ph.D., 1978, Columbia University
e-mail: jls@princeton.edu

Current Research Interests: Global Carbon Cycle, Ocean Biogeochemical Dynamics, Ocean Circulation, Paleoceanography.

Current Students:
Daniele Bianchi (dbianchi@princeton.edu)
Kelly Kearney (kkearney@princeton.edu)
Yves Plancherel (yplanch@princeton.edu)

Recent Graduates:
Patrick Schultz (“Observing Phytoplankton Physiology and Ocean Ecosystem Structure from Space,” 2008), McKinsey & Co., Germany
Irina Marinov (“Controls on the Air-Sea Balance of Carbon Dioxide,” 2005) now at WHOI, Woods Hole, MA.
Curtis Deutsch (“Biogeochemical Constraints on the Modern and Glacial Oceanic Nitrogen Cycle,” 2003), now at UCLA
David Baker (“Sources and Sinks of Atmospheric CO2 Estimated from Batch Least-Squares Inversions of CO2 Concentration Measurements,” 2001), now at NCAR.

Karen Casciotti ’02
Associate Scientist
Woods Hole Oceanographic Institution

It’s true that New Jersey has a popular coastline and that Princeton has some of the best oceanographers in the country. What drew me to Princeton were the top-notch faculty and research opportunities in the Department of Geosciences. I wanted to understand how the billions of bacteria living in the ocean affect ocean chemistry and climate. In very few other programs are the connections between microbial processes, geochemistry, and climate so easily made. I was impressed by how well the faculty working in diverse areas of geosciences, and their students and postdocs, collaborated with each other and how many possibilities there were for doing interdisciplinary research. The community of ocean-focused researchers at Princeton was growing and I wanted to be a part of it!

The town of Princeton is quaint, but offers a variety of outdoor activities as well as cultural enrichment. While at Princeton, I took up rock climbing, learned Taekwondo, and put many miles on my road bike. I also enjoyed the open lectures from world leaders on campus and made good use of the trains to Manhattan. I also shared many dinner parties and learned a great deal from the community of Princeton graduate students and postdocs.

After graduating from Princeton in 2002, I continued to pursue research on stable isotope geochemistry and microbial ecology as an NRC postdoctoral fellow at the US Geological Survey in Reston, VA. In 2004 I was hired as an Assistant Scientist in the Department of Marine Chemistry and Geochemistry at the Woods Hole Oceanographic Institution, and was recently promoted to Associate Scientist. I learned many important things from my graduate advisor, Bess Ward, about being a successful scientist. Being a Princeton student doesn’t just give you a good name to put on your CV, but it shapes the way you think about and conduct your science. There’s no doubt that time I spent at Princeton was a great investment for my future.

Daniel M. Sigman
Professor
e-mail: sigman@princeton.edu

Current Research Interests: The use of stable isotopes to study the nitrogen cycle, today and in the past; the interaction of biogeochemical cycles with ocean circulation and climate, focusing on recent glacial cycles; construction of geochemical models for Earth history studies; chemical oceanography; sediment geochemistry.

Current Students:
Brigitte Brunelle (brunelle@princeton.edu)
Peter DiFiore (pdfiore@princeton.edu)
Kristen Karsh (kkarsh@princeton.edu)
Mathis P. Hain (mhain@princeton.edu)
Abby Ren (hren@princeton.edu)

Recent Graduates:
Angela Knapp (“The Stable Isotopic Composition of Dissolved Organic Nitrogen and Nitrate in the Subtropical Ocean,” 2006), now at University of Southern California, Los Angeles, CA.

Recent Graduates:
Alon Ziv (“Application of Fracture Mechanics to Geophysical Problems,” 2001), now at Ben-Gurion University of the Negev, Beer-sheva, Israel.
Yuri Fialko (“Fluid-Driven Fractal and Melt Transport Through Lithosphere on Earth and Terrestrial Planets,” 1998), now at Scripps Institution of Oceanography, UCSD, La Jolla, CA.
Frederik J. Simons
Assistant Professor
Ph.D., 2002, MIT
e-mail: fjsimons@princeton.edu

Current Research Interests: Geophysics; structure and evolution of continents; seismic waveform analysis and tomography; topography and gravity anomalies; development of oceanic instrumentation; earthquake early-warning studies; theoretical spectral analysis; satellite measurements and inverse problems.

Current Students:
Jessica Hawthorne (jchawtho@princeton.edu)
Dong Wang (dongwang@princeton.edu)

Jeroen Tromp
Blair Professor of Geology; Professor of Applied & Computational Mathematics
Ph.D., 1992, Princeton University
e-mail: jtromp@princeton.edu

Current Research Interests: Theoretical and computational seismology. Development and implementation of numerical methods for forward and “adjoint” simulations of wave propagation in acoustic, elastic, and poroelastic media over a broad range of spatial and temporal scales.

Bess B. Ward
Department Chair; William J. Sinclair Professor of Geosciences
Ph.D., 1982 University of Washington
e-mail: bbw@princeton.edu

Current Research Interests: The nitrogen cycle and molecular ecology of microorganisms involved in the transformations of inorganic and organic nitrogen in the ocean and in sediment environments. Current projects involve field work in the Arabian Sea and the west coast of the US, using approaches ranging from stable isotope experiments to metagenomics.

Current Students:
Anita Adhitya (aadhitya@princeton.edu)
Sarah Fawcett (sfawcett@princeton.edu)
Silvia Newell-Bulow (snewell@princeton.edu)

Recent Graduates:
Karen Casciotti (“Genetic and Stable Isotopic Characterization of Enzymes Involved in Nitrification and Nitrifier-Denitrification,” 2002), now at WHOI, Woods Hole, MA.
Gregory D. O’Mullan (“Diversity and Composition of Ammonia Oxidizing Bacterial Assemblages in Aquatic Environments,” 2005), now at Lamont Doherty Earth Observatory, Palisades, NY.

Meredith Galanter-Hastings ’04
Assistant Professor
Brown University

A number of factors influenced my decision of [on] where to go to graduate school: Is the university located in a place where I think I would enjoy living? How well does the existing program fit my research interests? How happy are the other graduate students? How long does it typically take to graduate? What are recent graduates of the program doing now? Princeton scored positively in terms of all of these questions, at the time and in retrospect.

Princeton is a beautiful place to live. I really enjoyed living in a small town with the benefit of an easy train ride to major metropolitan cities like New York and Philadelphia. On a daily basis, I loved the walk-ability between my apartment, town and the school; being in a small town afforded more opportunities for time with friends, cooking, jogging, seminars, and of course working late in the lab!

In deciding to join the Geosciences program at Princeton I was certainly influenced by the prestige of the University and the faculty. I could trust that whatever direction my career took (e.g., academia, government, or private industry) I would benefit from the education I received at Princeton. I continue to benefit from the rigor and depth of my education in the Department of Geosciences and the ability to participate in world-class research in the Department and with scientists in the Atmospheric and Oceanic Sciences Program at the Geophysical Fluid Dynamics Laboratory. I also took advantage of fantastic opportunities in the Princeton Environmental Institute (PEI) and the PEI Science Technology and Environmental Policy program, and enjoyed exposure to prestigious visitors from all over the world. It is significant, too, that throughout my time at Princeton I felt inspired to pursue unique research directions and was supported in doing so.

After graduating, I was awarded a postdoctoral fellowship from the Joint Institute for Study of the Atmosphere and Ocean that supported my research in the Department of Atmospheric Sciences at the University of Washington. From there I joined the faculty at Brown University in Providence, RI.
Leo Donner

*Lecturer with the rank of Associate Professor*

Ph.D., 1983, University of Chicago
email: leo.j.donner@noaa.gov

**Current Research Interests:** Interactions among clouds, convection, and radiation in the Earth’s climate system.

**Recent Graduates:**
Seoung-Soo Lee (“Aerosol Effects on Clouds and their Sensitivity to Numerical Representation of Microphysics,” 2007), now at the University of Michigan

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Stephen Garner

*Lecturer*

Ph.D., 1986, MIT
email: steve.garner@noaa.gov

**Current Research Interests:** Regional climate modeling, scale interactions, and physical closure schemes for numerical models.

**Current Students:**
Agnieszka Smith-Mrowiec (agnieszka.smith@noaa.gov)

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Anand Gnanadesikan

*Lecturer*

Ph.D., 1994, MIT/Woods Hole Oceanographic Institution
email: anand.gnanadesikan@noaa.gov

**Current Research Interests:** Earth system dynamics, with a focus on the physics driving the ocean overturning circulation and on interactions between physical circulation and biogeochemical cycles.

**Current Students:**
Arno Hammann (ahammann@princeton.edu)

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Robert Hallberg

*Lecturer*

Ph.D., 1995, University of Washington
email: robert.hallberg@noaa.gov

**Current Research Interests:** Developing and using comprehensive numerical models of the global ocean circulation to study critical aspects of the ocean’s role in climate, with a particular emphasis recently on Southern Ocean dynamics and dense water overflows.

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Isaac Held

*Lecturer with the rank of Professor*

Ph.D., 1976, Princeton University
email: isaac.held@noaa.gov

**Current Research Interests:** Large-scale structure of the atmosphere with a recent focus on those aspects of special importance to the response of the atmosphere to global warming.

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Tapio Schneider ’01

*Associate Professor*

California Inst. of Technology

GFDL and Princeton’s associated AOS Program have a reputation of excellence in theoretical research on and modeling of global-scale climate dynamics. I chose Princeton’s AOS Program because its faculty offers a blend of expertise in theoretical, computational, and observational studies of the global climate that is unique worldwide. The AOS Program is one of the few graduate programs in which the atmosphere and ocean are studied not as separate entities, but as coupled components of the climate system, with similar fluid dynamical phenomena and with connections between them, for example, through heat exchange and along biogeochemical pathways. Interaction with my adviser, Isaac Held, and with other faculty members was what I benefited from most during my graduate studies at Princeton. Scientists at GFDL and in the AOS Program are unusually available and ready to engage in discussions with graduate students. The superb computational resources to which students in the AOS Program have access are unmatched.

I also enjoyed the intellectually stimulating atmosphere at Princeton at large. Princeton’s graduate school is small but very diverse, so that it is easy to meet fellow graduate students not only in the science departments, but also in departments such as architecture, music, and literature.

To find an academic position and to get to know others working in my field, it was very helpful that scientists from other leading institutions visit Princeton regularly. After graduation, I worked for two years at New York University’s Courant Institute of Mathematical Sciences, in the new Center for Atmosphere-Ocean Science. Currently I am an Associate Professor at the California Institute of Technology, in an environmental science and engineering program with a focus on the science of the global climate.
Current Students:
Sarah Kang (skang@princeton.edu)

Recent Graduates:
Gang Chen (“Mechanisms that Control the Latitude of Jet Streams Surface Westerlies,” 2007), now at MIT.

Larry Horowitz
Lecturer
Ph.D., 1997, Harvard University
email: larry.horowitz@noaa.gov

Current Research Interests: Focus on tropospheric trace gases and aerosols, using global chemical transport models to simulate the chemical and dynamical processes affecting these species.

Ngar-Cheung (Gabriel) Lau
Lecturer with the rank of Professor
Ph.D., 1978, University of Washington
email: gabriel.lau@noaa.gov

Current Research Interests: The nature of atmospheric variability on time scales ranging from several days to a few decades, with a particular interest in the roles of various internal processes and external influences in maintaining the mean and time-varying states of the atmospheric general circulation.

Gregory O’Mullan *05
Assistant Professor, School of Earth and Environmental Sciences, Queens College, City University of New York
Adjunct Associate Research Scientist, Lamont-Doherty Earth Observatory of Columbia University

Princeton’s reputation continues to open doors to new and exciting opportunities. My graduate training at Princeton provided me with the skills and confidence needed to succeed as a teacher and researcher. During my years at Princeton I was challenged intellectually and encouraged to excel in both the laboratory and classroom. My most valuable training occurred during lab meetings. These weekly meetings brought together a truly impressive group of microbiologists, oceanographers and geochemists to discuss papers and evaluate research plans. It is hard not to succeed when surrounded by such talented faculty, staff and fellow graduate students.

I chose to attend Princeton due to the combination of world-class faculty and the opportunity to conduct interdisciplinary research. There were no barriers to collaboration and I was fully integrated into both the Department of Geosciences and the Department of Ecology and Evolutionary Biology. These diverse interactions were essential to my training as an environmental microbiologist. The departments are not especially large, making it easy to get to know everyone and to become involved in departmental activities. I really enjoyed my years in graduate school and I feel fortunate to have had the opportunities offered by Princeton.

After leaving Princeton, I joined the Lamont-Doherty Earth Observatory of Columbia University to help develop a new Earth Microbiology Initiative. My interdisciplinary training was immediately put into action. I am now an Assistant Professor in the School of Earth and Environmental Sciences at Queens College, City University of New York.

Sonya Legg
Lecturer
Ph.D., 1992, Imperial College, London
email: sonya.legg@noaa.gov

Current Research Interests: Small-scale mixing processes in the ocean, including mixing by tides, internal wave breaking, gravity currents and oceanic convection, and their parameterization in ocean climate models.

Isidoro Orlanski
Lecturer with the rank of Professor
Ph.D., 1967, MIT
email: isidoro.orlanski@noaa.gov

Current Research Interests: The mechanisms that control the daily weather, in particular severe events (fronts, blizzards, flash floods, etc.). What controls their variability year to year and what to expect for a climate change scenario.
Venkatachalam Ramaswamy
Lecturer with the rank of Professor
Ph.D., 1982, SUNY, Albany
email: v.ramaswamy@noaa.gov

Current Research Interests: Climate forcing and response due to natural and anthropogenic agents

Current Students: Fuyu Li (fuyuli@princeton.edu)


Geoffrey K. Vallis
Lecturer with the rank of Professor
Ph.D., 1981, Imperial College, London
email: gvk@princeton.edu

Current Research Interests: Large-scale circulation of the ocean and atmosphere, climate dynamics and geophysical fluid dynamics.

Current Students: Neven Fuckar (nevensf@princeton.edu) Lauren Padilla (lpadilla@princeton.edu) Erica Staehling (estahli@princeton.edu) Peng Xie (pxie@princeton.edu)


Tracey Holloway *01
Assistant Professor
Director, Center for Sustainability and the Global Environment (SAGE)
University of Wisconsin

At Tiger Noodles, my favorite Chinese restaurant in Princeton, I received one night the following fortune cookie: “Great things await, if you work a little harder.” I taped the red-printed fortune to the top of my computer, and it became my mantra during the final months of dissertation-writing. By that time, however, I did not need a fortune cookie to remind me to work hard—years at Princeton had taught me that if I work harder than I’ve worked before, I can accomplish more than ever expected. I remember the late nights studying for general exams and the weekends debugging Fortran code. But, my more potent memories are those of the accepted papers, the passed exams, the lasting friendships, and the delicious Chinese food.

I started at Princeton in 1995 and completed my Ph.D. in August 2001, in the Atmospheric and Oceanic Sciences (AOS) Program. I was interested in public policy as well as science, and participated in the Princeton Environmental Institute-Science, Technology, and Environmental Policy Program (PEI-STEP). Through my PEI-STEP participation, I earned a Graduate Certificate in Science, Technology, and Environmental Policy at the Woodrow Wilson School, and incorporated policy issues into my dissertation. After a postdoc at Columbia University’s Earth Institute where my work focused on the role of air pollution models in public health and policy assessments, I joined the faculty at the University of Wisconsin - Madison, where I am now an Assistant Professor of Environmental Studies.

When deciding where to apply for graduate school, Princeton appealed to me as a prestigious university well-suited to my academic interests in numerical modeling of the atmosphere. After having been accepted by a number of strong programs, however, I could base my decision on personal as well as academic considerations. In the end, I chose Princeton because I thought I would be happy there. The professors were nice, the students were friendly, and the flowers were blooming on the trees during my April visit.

My initial impressions were correct—I was very happy. For three years, I lived in the Graduate College, since I liked the community of students there, as well as the old rooms overlooking the golf course. From the GC, I moved to an aging duplex on Wiggins Street, shared with an ever-changing collection of housemates. We would eat breakfast on our porch in the summertime, and throw big parties late into the night.

The AOS Program offered close interactions with faculty and other members of the NOAA Geophysical Fluid Dynamics Laboratory (GFDL). The computing resources were extraordinary, and my advisor was the best ever. The flexibility of the AOS Program allowed me to tailor a research program well-suited to my interests, and I was able to benefit from the expertise of faculty in a number of different departments. Overall, I had an extremely positive experience at Princeton, and my time there helped get my career off to a good start.
Professors Emeriti

Geosciences

William E. Bonini  
Ph.D., 1957, University of Wisconsin

Kenneth S. Deffeyes  
Ph.D., 1959, Princeton University

W. Jason Morgan  
Ph.D., 1964, Princeton University

Guust Nolet  
Ph.D., 1976, University of Utrecht

Robert A. Phinney  
Ph.D., 1961, California Institute of Technology

John Suppe  
Ph.D., 1969, Yale University

Franklyn B. Van Houten  
Ph.D., 1941, Princeton University

Atmospheric & Oceanic Sciences

Emeritus

George Mellor  
Sc.D., 1957, MIT

Senior Scientists

Kirk Bryan  
Ph.D., 1957, MIT

Sykuro Manabe  
Ph.D., 1958, Tokyo University

Kikuro Miyakoda  
Ph.D., 1961, Tokyo University
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Central image: Jeroen Tromp - Snapshot of a simulation for the M=9.2 2004 Sumatra earthquake, with a seismogram from station PAL; Front cover images: (top) AOS - Sandstorm leaving North Africa toward the Atlantic - Canary Islands, courtesy NASA; (middle) Lincoln Hollister and Nadine McQuarrie - Bhutan; (bottom) AOS - NASA satellite of Hurricane Fran (1996); Back cover images: (top) Satish Myneni - New Jersey Pine Barrens; (center) Adam Maloof - Triple Goose Creek, Andros Island, Bahamas; (bottom) Daniel Sigman - photomicrograph of diatom microfossils from Southern Ocean sediments.

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