
Justin Strauss

Here's what you'll find in this issue:

Earth Sciences Department Welcomes New Faculty

By Gayathri Janakiraman Paramasivan

Dr. Justin Strauss is the newest faculty member joining us this January. He is a sedimentary geologist passionate about finding clues to understand Earth history. Justin currently holds a post-doctoral position in Stanford. He grew up in California, pursued his undergraduate study in Colorado College and graduate school at Harvard. We caught up with Dr. Strauss to explore his research interests, his journey to becoming an Earth sciences scholar and of course what attracted him to Dartmouth.

ROX NEWSLETTER TEAM

All writers are current graduate students

Mila Pinigin – ***Editor/Admin. Assistant***

Karina Graeter

Lauren Farnsworth

Maggie Jackson

Gayathri Janakiraman Paramasivan

http://earthsciences.dartmouth.edu
www.facebook.com/DartmouthEarthSciences

Did you always know you wanted to be an Earth scientist?

Absolutely not. I started my undergraduate education at Colorado College with an intent to double major in biology and environmental studies. It was only after taking a physical geology course at the end of my first year that I became interested in sedimentary geology and Earth history. This initial interest, which was largely inspired by my undergraduate advisor Paul Myrow, was later converted into a dedicated passion and future career trajectory after doing some field work in the western U.S. for my undergraduate thesis project.

What is it about working at Dartmouth that attracted you?

Dartmouth is known for its dedication to undergraduate education and high-level academic research. It is also known as an institution that attracts some of the most motivated and intelligent students in the world. The combination of fantastic students and an incredibly supportive faculty and research community certainly sets Dartmouth apart from other colleges and universities. My initial feeling that this would be a great place to work has already been confirmed – the faculty and staff in the Department of Earth Sciences have been super supportive and I had a great summer working with a current EARS student (Peter Mamrol, Class of 2016) on his senior thesis research project!

Where have you worked/taught before?

After finishing my undergraduate studies, I worked for a year as a paraprofessional, or full-time Teachers' Assistant, in the Department of Geology at Colorado College. This post was followed by a number of relatively short stints in field assistant and lab technician roles in both the Department of Geosciences at Princeton University and the Department of Earth and Planetary Sciences at Harvard University. After taking some time away from academia, I decided to return to graduate school in the Department of Earth and Planetary Sciences at Harvard University where I helped develop and/or teach a series of courses in Earth History, Historical Geobiology, Field Geology, and Sedimentology and Stratigraphy. Right now, I'm finishing up a short post-doctoral position at Stanford University before starting at Dartmouth in January.

UPCOMING EVENTS!

January 7-February 5: Faculty Recruitment

February 11-25: Obering Fellow Recruitment

FEBRUARY 21ST:
THE ANNUAL DEPT. SKATING PARTY ON OCCOM POND!

What are you looking forward to most here? And how about the New England winters?

I am really looking forward to meeting all of the current students (both undergraduate and graduate), developing some new courses in sedimentary geology, and initiating some future collaborations with faculty members at Dartmouth. I'm also excited to get my lab up-and-running and find some adventurous undergraduates to join me on future field expeditions. My wife and I are avid skiers and ice climbers, so the New England winters are actually pretty enticing!

What do you do when you're not unlocking the secrets of the Earth?

I like to go rock/ice climbing, trail running, skiing/snowboarding, traveling, cooking, woodlot management, reading and drinking good coffee.

The Earth Sciences Department extends a warm welcome to Dr. Strauss! We look forward to seeing him in our department with his Australian cattle dog, Shubie, who'll feel right at home in our canine-friendly work spaces.


Katherine Yu ’16

Undergraduate Spotlight: Katherine Yu

By Maggie Jackson

A senior EARS major, Katherine took part in the STRETCH last fall, and since then has interned for the NYC Department of Environmental Protection and independent research into the stream quality in northern New Hampshire. She shared her thoughts on the STRETCH and her time in the department, as well as her plans for life after Dartmouth.

What were you up to this summer?

This summer I had an internship at the New York City Department of Environmental Protection Water Supply Bureau Natural Resources Division. New York City gets its water from the Catskills, and so the DEP is responsible for transporting water to the city. Given Pleistocene glaciation in the Hudson valley, fine sediment deposition and resultant turbidity are huge concerns (they affect the effectiveness of the UV rays). Additionally, invasive species control, community interests, and infrastructure maintenance all must be taken into consideration.

What sparked your interest in water quality?

After taking hydrology my sophomore spring and discovering a passion for water engineering projects, I knew I wanted to pursue a career in a water-related field. My supervisor was the division chief, so I got a very multi-faceted approach to a complex system. There is a lot going on - biology/ecology, law, geology, GIS, stream restoration, social/community interactions, etc.

Did the STRETCH impact your plans?

Before going on the STRETCH, I didn’t think I wanted to go to grad school, let alone do a thesis. It was certainly my most meaningful academic experience and helped me realize that I really want to be outside doing water-related things in my future.

You’re in the midst of an independent research project - can you tell us what you’re working on?

I’m trying to see if there are any tangible impacts (namely in terms of fine sediment deposition) in the Dead and Swift Diamond Rivers up in the Second College Grant. I’m collecting fine sediment samples, macroinvertebrate samples, Wolman pebble counts, embeddedness, stream cross sections, and pH to detect these differences.

What’s been your favorite aspect of life in the EARS department?

My favorite part of the EARS major has definitely been the STRETCH. Probably the best consecutive ten weeks of my life thus far - being from California, I really identify with the West. I love the rivers, mountains, and vistas out there and couldn’t have imagined a better group of people to travel with and professors and TAs to learn from.

Do you know what you want to do after graduation?

I’m taking a year off before (hopefully) heading off to grad school. I haven’t quite nailed down what I hope to do next year, I’d just like to be out West with plenty of time to be outside and hopefully doing something personally fulfilling. I definitely want to do something related to rivers, but I don’t know in what capacity yet.

Mount Hunter in Denali National Park, AK, as seen from climber's base camp. We collected two ice cores from the summit plateau (13,000') of Mount Hunter in 2013. Credit: Erich Osterberg

New Climate Dynamics Class Builds on Students' Own Research

By Karina Graeter

"I wanted to teach this class to help ground students' understanding in the fundamental processes that drive climate…" -Erich Osterberg

Erich Osterberg

Graduate and undergraduate students alike are learning how to interpret modern climate data in a new class this fall. Climate Dynamics is taught by Professor Erich Osterberg, whose research uses ice cores to study climate change, glacier response, and atmospheric pollution. The course exposes students to the dominant patterns of climate variability, including El Nino, the North Atlantic Oscillation, and the Pacific Decadal Oscillation, and explores how these climate patterns are manifested in the modern era. Class time is spent discussing the underlying processes responsible for these patterns and interpreting the climate system using reanalysis data sets and critical literature.

"Many of our students are researching climate change using paleoclimate proxies," says Dr. Osterberg. "I wanted to teach this class to help ground students' understanding in the fundamental processes that drive climate and in our knowledge of climate during the instrumental period. Additionally, it's important for the students to have a discussion about future climate change, the current state of our understanding of climate science, and the debates going on in the literature today."

This fall, there are six graduate students and three undergraduates enrolled in the course. Many of the students are excited to take a course that is so relevant to their research. "I like the opportunity to become more familiar with reanalysis data and look forward to using it in my own research," says third year PhD candidate Maggie Jackson.

The course will culminate in a final research project that integrates climate literature, reanalysis data, model outputs, and/or instrumental climate data to examine a chosen climate phenomenon. Many of the graduate students will be incorporating their thesis work into this project. For example, PhD student Dom Winski is "going to use [his] ice core from Alaska to see how the melt layers and accumulation record relate to regional climate patterns." By the end of the course, Dr. Osterberg hopes that students will have a better understanding of the current state of knowledge of climate phenomena by learning how to read critically and to question the literature. His goal is that students will incorporate the reanalysis data sets used in class and the key concepts learned into their own research. More generally, he hopes that the course will help students develop the skills to speak confidently and clearly about future climate issues, a skill that is growing increasingly necessary for the young earth scientist.

Alumnus Interview with Hal Macartney '75

By Lauren Farnsworth

Hal Macartney '75 Photo credit Nathan Hamm PhD

This September I had the opportunity to be a teaching assistant on the first segment of the STRETCH. The segment starts in Banff National Park in Canada, where the students are introduced to glaciology on the Athabasca glacier (led by Prof. Bob Hawley). Then the students move to the warmer climate of the Bighorn Basin in northern Wyoming (led by Prof. Meredith Kelly). In the Bighorn Basin, students focus on mapping Triassic, Jurassic, and Cretaceous sedimentary rocks. We also had the pleasure of meeting with alumnus Hal Macartney '75 and visiting Spence Dome, an oil field where he has worked. I reached out to Hal when I returned from the STRETCH to hear more about what he has done since his time at Dartmouth.

Q: What year did you graduate from Dartmouth College and with what degree?

A: 1975, BA (Geology)

Q: What was the (career/life) path you took directly following graduation and for what reason?

A: I took some time off for adventures before settling into a career. Mike Peters '75 (now a radiologist in Seattle) and I drove west and worked on the oil rigs in Wyoming and then up in Alaska as the Trans Alaska Pipeline was being completed. I ended up in Fairbanks helping Dick Ellsworth '74 run the world's northernmost and biggest-selling Burger King. Then we returned for careers; Mike to medical school and me to a career in geoscience in the oil industry.

Q: Did you have any memorable/special experiences while you were a student in the EARS department that led you to pursue specific goals and the career that you have today?

A: The professors were a big part, a course on Physical Geography, and then the STRETCH. I was originally an Anthropology major but the professors and a class in geography steered me to Earth Sciences where the professors were unusual in that they had all worked and had great backgrounds before their teaching. The STRETCH and the field excursions (mapping especially) were what made me want to stay in geosciences for the long haul.

Q: What was one of your favorite classes you took at Dartmouth and/or in the EARS department? Who taught it?

A: Oceanography with Chuck Drake was great. He was a giant in the subject. Geologic History of North America was the most stimulating as it was just when Plate Tectonics was coming into general acceptance and there were no real textbooks yet; Gary Johnson handed out mimeographed copies of seminal papers. All new concepts and terminology, impressing on me that this is an ever-changing science.

Q: What was the STRETCH like when you were an undergraduate? Where did you all go?

A: More intensive for field mapping before leaving Hanover, and a few more prerequisites, I think (like Structural Geology). There was less time in the US and in vans than today. It was a spectacular trip that included Lake Powell, paleomagnetism in Arizona, modern carbonates in Belize, volcanology in El Salvador, Nicaragua, and Guatemala with side trips for underground mines and tree ring studies in Central America.

Q: What do you currently do and how is it different/similar to what you did after graduating?

A: I am currently involved in studies related to seismology, 'basement' faulting and morphology, and their relation to oil and gas operations. Really different from when I started, and has constantly changed through my career. Every year seems to be the best year yet, all the way along. My career spanned many roles, from exploration to development of resources, staff, and strategic planning work at the top of a huge corporation, to starting my own small company. We have also lived and worked in some great places around the world and known many great people. Always learning. It's been a really rewarding career.

Q: Do you have any career/academic/life advice for EARS students, especially seniors graduating this spring?

A: Put aside your preconceptions about resource exploration and exploitation. Try things out. Go to grad school for something you can be passionate about.

Ben Kopec EARS PhD Candidate

EARS Graduate Student Research gets published in EOS, New York Times, Huffington Post (Science), and more…

Excerpt from EOS:

Vanishing Sea Ice Could Trigger More Arctic Precipitation

Photo Caption: Decreasing sea ice could cause more precipitation to fall in the Arctic as more Arctic waters are exposed and evaporate into the atmosphere. Credit: Kathryn Hansen, NASA , CC BY-NC 2.0 By Cody Sullivan (EOS) 4 January 2016

A promising method for evaluating Arctic precipitation predicts retreating sea ice will increase snow and rainfall in the Arctic and counteract some of global climate change's effects regionally.

Sea ice faces a grim future as global temperatures rise. The warming temperatures melt the ice and force it to retreat further poleward. Images of skinny polar bears often accompany news of sea ice disappearing, but a new study predicts a less bleak impact of the retreating ice on Arctic weather and precipitation.

A recent study examined the origins of moisture in the Arctic atmosphere, which falls as rain or snow. The team of researchers, led by Ben Kopec, a graduate student in Dartmouth University's Earth Sciences Department, found that as sea ice retreats, more moisture evaporates from Arctic waters. This moisture then contributes more heavily as a source for precipitation. The researchers predict more atmospheric moisture will lead to an increase in the overall amount of precipitation falling in the Arctic. Their study was published in the *Proceedings of the National Academy of Sciences of the United States of America*.

To continue reading the EOS article: https://eos.org/articles/vanishing-sea-ice-could-trigger-more-arctic-precipitation
PNAS: http://www.pnas.org/content/113/1/46.full

Thank you to all of our writers and contributors of the latest ROX Newsletter.

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We would also like to send a special *Thank You* to our alumni for your continued support of the Earth Sciences Department at Dartmouth College.

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Wishing you a happy, healthy and wonderful New Year!

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