

Newsletter

College of Physical and Mathematical Sciences

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Chemistry professor named Distinguished Faculty Lecturer

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Juliana Boerio-Goates

Juliana Boerio-Goates, professor of chemistry and biochemistry, was named this year's Karl G. Maeser Distinguished Faculty Lecturer, Brigham Young University's most prestigious faculty honor, at the annual University Conference on Tuesday, Aug. 23.

Boerio-Goates will deliver her lecture during a forum assembly on Feb. 14, 2006, in the Marriott Center.

She has been recognized internationally for her work in the measurement of thermodynamic properties, and has also served as associate dean of General and Honors Education and director of the Center for Chemical Thermodynamics.

Others who were honored during the University Conference included Lori L. Seely, assistant dean in the College of Family, Home and Social Sciences, who received the Ben E. Lewis Management Award, and Earl E. Albee, animal care facilities manager at the university's agricultural station, was given the Fred A. Schwendiman Performance Award, top honors for administrative and staff members.

Other faculty and staff members honored included:

Karl G. Maeser Excellence in Teaching Awards: David J. Comer, electrical and computer engineering; Kristine Hansen, English; and Kelly D. Patterson, political science.

Karl G. Maeser Excellence in Research and Creative Arts Awards: John E. Clark, anthropology; Larry L. Howell, mechanical engineering; and Michael A. Jensen, electrical and computer engineering.

Karl G. Maeser Professional Faculty Excellence Award: Diane Chamberlain, exercise science.

Karl G. Maeser General Education Professorships: Daniel J. Fairbanks, plant and animal sciences, and Harold L. Miller, psychology.

Abraham O. Smoot Citizenship Award: Gary M. Burlingame, psychology.

Wesley P. Lloyd Award for Distinction in Graduate Education: Morris J. Robins, chemistry and biochemistry.

Alumni Professorship Award: Richard H. Jackson, geography.

Phi Kappa Phi Award: Michael F. Whiting, integrative biology.

Part-Time Faculty Excellence Award: Norah T. Hunter, plant and animal sciences.

David O. McKay Fellowships: Susan C. Hill, health sciences, and Richard R. Sudweeks, instructional psychology and technology.

Eliza R. Snow Fellowship: William A. Barrett, computer science.

John A. Widtsoe Fellowships: Stephen J. Bahr, sociology, and Barry M. Willardson, chemistry and biochemistry.

Alcuin Fellows: Ralph B. Brown, sociology; Paul F. Eastman, mechanical engineering; Valerie Hegstrom, Spanish and Portuguese; Richard N. Holzapfel, Church history and doctrine; Steven E. Jones, physics and astronomy; C. Riley Nelson, integrative biology; David E. Spencer, economics; Larry V. Shumway, humanities, classics and comparative literature; and Brian F. Woodfield, chemistry and biochemistry.

Young Scholar Awards: James C. Brau, business management; William F. Christensen, economics; Wade A. Jacoby, political science; and Paul E. Kerry, history.

Creative Works Awards: Howard B. Christensen and Patti B. Collings, statistics.

The Sponsored Research Recognition Award was presented to Joel Janetski, anthropology.

The Technology Transfer Award was given to Paul Savage, chemistry and biochemistry.

In addition, the President's Appreciation Awards were given to the following: Administrative -- Lynn Astle, technology transfer; Rulon J. Barlow, student health services; Brenda Butterfield, fine arts and communications; Scott R. Greenhalgh, counseling and career development; R. Dwight Laws, independent study; Mark A. Philbrick, university communications; Staff awards -- Dianne T. King, continuing education; Nancy J. Bailey, technology transfer; Ruth Ann Hay, Lee Library; Phyllis A. Daniel, linguistics; Alan R. Ewell, physical plant; and Kathleen Pierce, audiology and speech pathology.

Expedition to Florida Keys, Bahamas preps BYU geology students for jobs in the oil and gas industry

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By Grant Madsen

August 5, 2005

High prices at the pump this summer have Utahns thinking more about gasoline than they might otherwise like. But for a group of Brigham Young University geology students, the chance to ponder the particulars of petroleum was one they couldn't pass up.

And even though their "mega" field trip to the Florida Keys and Andros Island in the Bahamas may sound like easy living, it was really an exhausting and exhilarating extension of the classroom designed to teach them all they could learn about carbonate rocks in one of the few places they are known to currently form.

These highly permeable and porous rocks, ideal for the underground migration and pooling of oil and gas, are of eminent interest to companies like Chevron-Texaco and ExxonMobil, almost 50 percent of the world's oil and gas reserves come from underground reservoirs in carbonate rocks.

Also of interest to the oil and gas world are up-and-coming BYU geology students, who, thanks to real-world experience like this W. K. Hamblin Global Geology field trip, are attractive hires in an industry eager to find the best and brightest capable of hitting the ground running—destination: oil reservoir.



BYU geology student Elizabeth Zobell swims across a reef to gain perspective on how carbonate rocks form. Photo by Mark A. Philbrick

So important are students who have been exposed to environments like the ones in Florida and the Bahamas, that Anadarko Petroleum Company, one of the world's largest independent oil and gas exploration and production companies, helped subsidize the mentored-learning excursion.

"Wages are so good in the oil and gas industry right now that most people in the program are landing there," said senior Riley

Brinkerhoff from Vernal, Utah, adding that graduates of the program have earned as much as \$70,000 as a starting wage. "The money is tempting."

And so for one week, Brinkerhoff and his fellow students—14 undergraduates and 12 graduate students in all—got dirty, sweaty, sunburned, seasick and extremely excited looking at countless samples of mud, sand and rock, and not just for the promise of a petroleum payday.

Spend any time with these students and you'll quickly learn that their true motivation lies in the excitement of identifying a fossil in the bathroom tile of their motel room or seeing ripples form in the sand of the ocean's floor during one of the trip's many excursions.

"The ripples were amazing! And seeing them in real life makes a huge difference," said Ashley Dalrymple, a senior from Glendale, Calif. "Before, I thought, 'Great. Tides move sand.' But I didn't really know they could actually move things that fast. It never really occurred to me there would be that much movement of sediment because of tides—they are such a force!"

Two stops among many illustrate how students gained perspective on the trip—the first at Windley Key Fossil Reef Geological State Park in Florida and the other at an extensive, submerged sandbank off Andros Island in the Bahamas.

The park is home to a limestone quarry that supplied massive blocks for the overseas Florida East Coast Railway in the early 1900s. The clean cuts of the quarry machinery used to extract the blocks exposed the fossilized remains of a 125,000-year-old coral reef. Nearly every inch of the quarry's flat, sun-bleached

“When you’re snorkeling, you’re by yourself,” Ritter told the students. “You’re isolated with your thoughts. I want you to be thinking ‘geology.’”

Scott Ritter

Geology Professor at BYU

panels contains recognizable plant and animal ocean life—mollusks, sea urchins and corals of all shapes and sizes.

Upon arrival, the students grouped into pairs to map meter-wide cross sections of the rock wall at the rear of the quarry. As part of the exercise, they explained to one another what they think happened geologically—why that portion of the wall looks the way it does.

Peering over the shoulder at an undergraduate’s map, graduate student Carl Standley, a participant in the Graduate Mentoring in Applied Science Setting program funded by the College of Graduate Studies, encouraged him to “take a mental snapshot” for the upcoming portion of the trip—a snorkeling excursion over living ocean reefs.

“The ancient rocks here will help you understand the modern setting,” said Standley. “Then, you’ll take that information and figure out what the petroleum is doing.”

Sure enough, the very next morning the group—some members clad in wetsuits, others wishing they were clad in wetsuits—jumped from boats into the chilly ocean. For the first half of the day, professor Scott Ritter, lead faculty adviser on the trip, stopped in multiple locations around the Florida Keys to observe the composition of sand and mud on the ocean’s floor. At each point, students took measurements of the water’s salinity, acidity and temperature and gathered sediment samples for later classroom discussion.

Hours later, the group swam across a reef, comparing what they saw in the quarry to real life.

“When you’re snorkeling,

students. “You’re isolated with your thoughts. I want you to be thinking ‘geology.’”

After one more day of observations, students had a good idea of the sedimentology of present-day reefs, as well as the plant and animal life that inhabits them. Next, they traveled to Andros Island in the Bahamas to fill in the last puzzle piece in their understanding of how carbonate rocks form.

Andros Island’s shoal, a sandbank roughly 15 miles by 10 miles across, is compromised of “ooids”—not the granite-based sand familiar to most North Americans.

As its name suggests, ooid sand is round, having formed around a nucleus of bone, fecal matter or shell particles. Organic material coats the nucleus over time, in a process similar to that of a pearl’s formation. Each granule is no larger than 2 millimeters, but in clumps and as a whole is porous and permeable, allowing fluid to quickly and easily migrate through it.

“Air bubbles in lava rock are nonporous and lack permeability. They are individually sealed chambers, unconnected to one another,” explained geology professor Tom Morris, another faculty

adviser on the trip. “That type of rock isn’t a good place to look for oil. Carbonate rock, on the other hand, allows liquid to pass through it very easily.”

The site of the shoal is what Miami looked like 130,000 years ago. For that matter, it’s also what parts of Utah looked like anciently—sand as far as the eye can see. It is this ooid sand that settles and hardens between the plant and animal remains on reefs, forming carbonate rock.

The Andros Island shoal is one of three places where ooids are known to form, and Ritter guesses the most pristine. The crystal blue water, ankle-deep when the group first arrived, barely covered the smooth, white granules beneath. With the incoming tide, students were soon up to their knees.

They repeatedly scooped the flowing sand into their hands, looking at it through magnifying lenses to better appreciate its unique properties.

“I think these trips are priceless,” said Rachel Henderson, a first-year grad student from Grosse Pointe, Michigan. “Until I saw the ‘carbonate factory’ in real life, I didn’t really understand the expanse of it all.”

Ooid sand is the best friend of geologists working in the oil and gas industry. Using 3-D visualization tools, they are able to take “pictures” of geologic formations underground, like reefs buried in ooid sand—a feature that vastly increases the chance that oil and gas is

present.

Near the end of the trip, Morris told students: “It’s really incredible what we’ve seen in the last few days. If you internalize it, you will have a great feel for carbonate sedimentation. You can talk the talk and walk the walk.”

Eager to do just that, Anne Dangerfield, a senior from Green Bay, Wisc., hopes a future employer finds the experience as invaluable as she did.

“I kept saying to myself, ‘So this is what *that* looked like when it was alive.’ The trip has really given me a better understanding of size and scope, and I think the experience will help me land a job after graduation.”

Student News

The ASQ Statistics Division Ellis R. Ott Scholarship Governing Board has selected Jeff Lingwall to receive a \$5,000 scholarship!

BYU Statistics Professor Receives Top Honor from Texas A&M

BYU News
James McCoy



A professor in the Department of Statistics at Brigham Young University will be honored with the H.O. Hartley Award at the Joint Statistical Meeting in Minneapolis Monday, Aug. 8.

Scott Grimshaw is the 2005 recipient of the Hartley Award given by the Texas A&M University Department of Statistics for distinguished service to the profession. Grimshaw is an alumnus of Texas A&M, where he received his doctorate in statistics under the direction of Emanuel Parzen.

According to the citation, Grimshaw’s career has included distinguished service as well as excellence in teaching, research and consulting.

His research has been focused on developing new statistical methodology to provide solutions to real-world problems.

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