

August 2018 News Notes

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Alumni Change Lives

Fengyang Xiong is a graduate student working with Dr. Joachim Moortgat. Here he describes how the Friends of Orton Hall fund furthered his graduate studies. If you are interested in giving to support the Friends of Orton Hall or other funds, please visit our giving page ([link](#)).

Shale gas has become increasingly significant in the global energy market. However, many issues related to these types of tight formations with ultra-low porosity and permeability still remain poorly understood. One of the hottest topics are the key geological controls on the shale gas sorption capacity. My current research focuses on the effect of pore structure and composition on gas sorption capacity. We found that pore structure and composition directly determine the sorption capacity of transitional gas shales (deposited in environments such as lagoons, deltas, beaches and tidal flats), as well as environmental conditions, pressure, temperature and moisture. Thanks to the generosity of the Friends of Orton Hall (FOH), I was able to travel to Seattle to give an oral presentation, “Effect of pore structure and composition on gas sorption capacity of transitional shales” in the “Unconventional Energy Resources” session, national Geological Society of America (GSA). FOH financially supported the registration fee, transportation and meals for this conference that took place in October 22-25,

2017. Besides listening to talks and learning about advances in research on shales, the most important thing for me is to seek collaborators for our Computational Geosciences Group led by Dr. Moortgat on my next research topic, “Comparison with canister sorption and pressure decay measurements to investigate the flow within shales”. I developed new collaborations with colleagues working in industry. I also talked to several PhD students from The Indiana University and University of Texas at Arlington, whose research field are similar to mine. One is to focus on organic petrology, and the others are to investigate the geochemical, petrologic and mechanical properties of shales. We all look forward to seek further cooperation in our future research. GSA enabled me to advance towards my career goals.



Bevis installs one of the world's highest GPS stations

Prof Mike Bevis is currently in Bolivia, installing two new gps stations in the Cordillera Real near La Paz, Bolivia. The higher of the two stations is at the top of Chacaltaya, and will be one of the highest GPS stations in the world- about 5,300 m ASL. The photo above is the view from the higher of this pair, the station at the top of Chacaltaya. It has a wonderful view of nearby Huayna Potosi.



The photo below shows the antenna monument for the new GPS station at Chacaltaya. The bedrock here is so frost-shattered; four anchor bolts had to be installed two feet into the ground so as to get good coupling.

We are installing a sister station on the other side of Huayna Potosi, just below the terminus of Zongo glacier.

The two stations will be used for studying the ionosphere, measuring the total quantity of water vapor above and between the two stations, and providing base stations for measurements of a gps station to be installed within Zongo glacier.



Jennie Harkness paper receives award

Dr. Jennie Harkness, graduate students Colin Whyte and Myles Moore, and Professor Tom Darrah from the School of Earth Sciences have received the prestigious Dalway J. Swaine Award from the Society for Organic Petrology. The award is presented to the authors of the paper judged to be the best for the year in coal and hydrocarbon source rock geochemistry. The paper, entitled “The geochemistry of naturally occurring methane and saline groundwater in an area of unconventional shale gas development,” was published last year in *Geochimica et Cosmochimica Acta* and highlighted in articles by NPR’s State Impact, Energy & Environment News, and Fox News. The study investigated the chemistry of private drinking water wells in West Virginia over a three-year period during which hydraulic fracturing of the Marcellus Shale was initiated. This study was the first to report a broadly integrated use of geochemical techniques, including isotope and noble gas tracers, in studying groundwater contamination before and after the installation and fracking of shale gas wells. The results reveal that saline, methane-rich water has naturally migrated over time into the shallow aquifers. While the study did not find any evidence for groundwater contamination from fracking during the first three years, it did present evidence that accidental spills of wastewater pose a threat to surface water quality in the region. In addition to establishing baseline groundwater quality in an area of unconventional natural gas production, the noble gas geochemistry provides exciting new insights into the subsurface gas geochemistry of the Northern Appalachian Basin.



Allison Chartrand Attends Summer Glaciology School

Contributed by Allison Chartrand, graduate student working with Prof Ian Howat.

This June, I attended the fifth biennial International Summer School in Glaciology in McCarthy, Alaska. The school is hosted by the University of Alaska Fairbanks glaciology faculty, and sponsored by NASA, the International Glaciological Society, the International Association of Cryospheric Sciences, the International Arctic Science Committee, and the *Frontiers in Earth Sciences* journal. I convened with 27 other students from around the world and our 8 instructors in Fairbanks early on the morning of June 5, and together we drove in vans to McCarthy, an early 1900s boom-town near the mining town of Kennecott, where we spent 10 days diving deep into the study of glaciology.



The Summer School was truly defined and enhanced by its unique and remote setting. McCarthy can be accessed only by plane or by a 60-mile dirt road, and has no centralized utilities. Water is carted in from the nearby Kennicott glacier, and electricity is provided by solar panels and generators. My fellow students and I camped in a clearing about a 7-minute walk from the Wrangell Mountains Center, the organization that generously provided our meals and learning spaces. Our days consisted of 4 hours of lectures on glaciology topics including, but not limited to continuum mechanics, glacier hydrology, remote sensing, modeling, and geomorphology in the morning, followed by lunch, 2 hours of problem set work with guidance from the instructors, and 2 or more hours of group project time. I had the opportunity to work with Dr. Kelly Brunt of NASA and the University of Maryland for my group project on laser altimetry, in which my partner and I gathered, corrected, and compared laser altimetry datasets for Kennicott glacier, Summit, Greenland, and the Larsen C ice shelf in Antarctica. I gained a wealth of laser altimetry processing and comparison techniques, which I have readily applied to my own research on the Getz ice shelf in Antarctica. The summer school also offered a handful of evening public lectures, which were well-attended by the community. The discussions that ensued between us (the glaciology students and instructors), and McCarthy locals and tourists helped us hone our science communication skills and connect with people from a variety of backgrounds.

The highlights of the school were the two excursions, the first of which was an all-day, round-trip hike across the Root glacier, to the point where it meets up with Kennicott glacier at the end of Blackburn Mountain. This was my first experience traversing an ungroomed glacier, and it was incredible to see features like clear blue surface ponds, moulins, medial moraines, and (small) crevasses firsthand. Our second excursion was a half-day hike along the terminus of Kennicott glacier, led by National Parks Service geologist Dr. Mike Loso, on which we clearly saw the effects of climate change. Most notably, a sizeable lake has formed over the last several years between the end of the glacier and a past end moraine, indicating both glacier retreat and melt. The locals of McCarthy have started to capitalize on the opportunities this new lake offers, such as a new location for kayaking, but they have yet to name it!

It was wonderful to learn a wide range of glaciology topics at a deep level from experts on those topics, and to make personal connections with the instructors and fellow glaciology graduate students. I arrived back in Columbus armed with a fresh perspective on how my research fits in to the broad field of glaciology, a renewed appreciation for what I had learned at OSU in my first year that helped me thrive in Alaska, a new bite from the travel bug, and a touch of the head cold that had inevitably passed through the entire school.

SES Alumnus Brad Cramer granted tenure

SES alumnus Bradley Cramer was granted tenure and promoted to Associate Professor at the University of Iowa starting this Fall. Brad received his PhD in 2009 with Prof Saltzman, and was awarded an NSF Postdoctoral Fellowship (at Univ of Kansas) before moving to the University of Iowa. Brad is an NSF CAREER award winner and his research is focused broadly on Paleozoic stratigraphy and Earth history. He was also project leader for a successful International Geoscience Programme (IGCP) Project 591 - The Early to Middle Paleozoic Revolution. Congratulations on your promotion Brad!



Prof Howat named the new director of Byrd Polar

The Byrd Polar and Climate Research Center is excited to welcome Ian Howat as new director ([link to story](#)).

This announcement was made by Randy Moses, at The Ohio State University Office of Research:

“I am pleased to announce that Ian Howat, professor in the School of Earth Sciences, has been named director of the Byrd Polar and Climate Research Center (BPCRC), effective July 1, 2018. BPCRC is internationally recognized as a leader in polar, alpine and climate research.



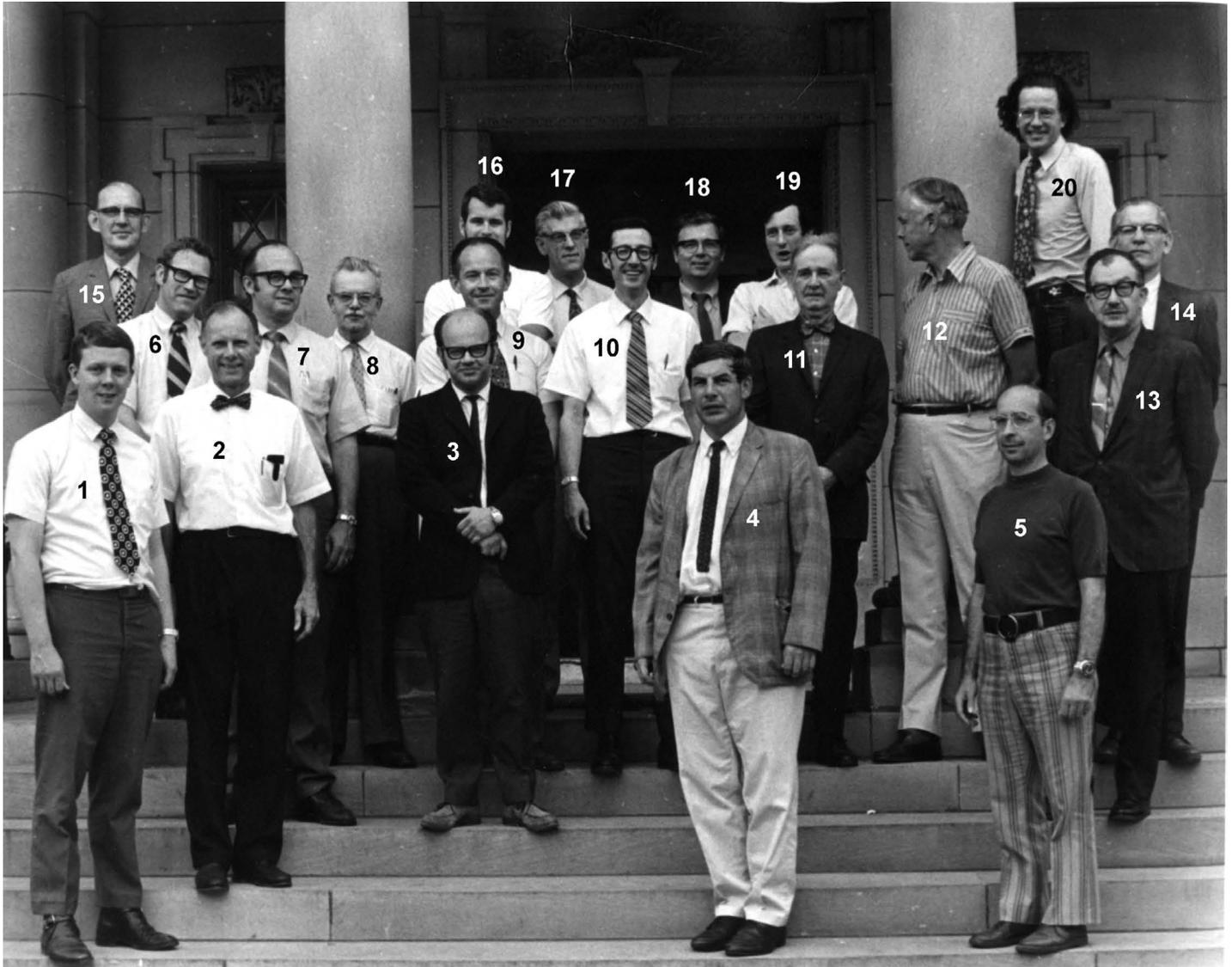
As director, Ian will further the center’s mission to achieve research excellence, producing national and international contributions in understanding climate variability, detecting and interpreting changes in modern physical and biological systems, and predicting future environmental changes and their consequences for society. He will provide the strategic vision and leadership to strengthen and expand the scope of BPCRC’s existing research programs, and work to facilitate interdisciplinary, collaborative activities within the center and across the university. He will also foster relationships with current funding agencies and explore additional opportunities for financial support of the center’s programs.

Ian has gained a national and international reputation as a leader in the field of glaciology. He served as chair of the Water, Climate and Environment Division within the School of Earth Sciences and leads the Glacier Dynamics Research Group at BPCRC. His research focuses on the dynamics of glaciers and ice sheets, using a wide range of observations from remote sensing, in situ data networks and field campaigns to constrain quantitative models of ice flow. He has led and participated in numerous science expeditions to Antarctica, Iceland and Greenland. His honors and awards include the 2017 Hyperion Research Innovation Excellence Award and a 2011 National Science Foundation Presidential Early Career Award for Scientists and Engineers. Ian received his BA from Hamilton College in New York and his PhD from the University of California, Santa Cruz. Ian joined Ohio State in 2008.”

Brevia

Associate Professor Thomas Darrah has been elected to head the Division of Water, Climate and Environment in the School of Earth Sciences. He replaces Professor Ian Howat who became the director of the Byrd Polar and Climate Research Center in July. Besides guiding the division through the upcoming external review process, Dr. Darrah will work to promote the division as the locus of water-, climate-, energy and environment-focused research and education at OSU. Darrah also serves as the Associate Director of the OSU Center for Energy Research, Training, and Innovation (CERTAIN).

Recently, Prof Emeritus Jim Collinson unearthed the photograph below, which shows the Geology faculty as of 1971. How many can you recognize without looking at the legend (beneath the photograph)?



1. Jim Collinson, 2. Sid White, 3. Stig Bergström, 4. Colin Bull, 5. Dave Nickey (Mansfield), 6. Russ Utgard, 7. Wayne Pettyjohn, 8. Auréle La Rocque, 9. Walt Sweet, 10. Charlie Corbató, 11. Ed Spieker (emeritus), 12. Valter Schytt (Sweden), 13. Jim Schopf (USGS), 14. George Moore, 15. Bob Bates, 16. Bob Fleck, 17. Charles Summer-son, 18. Gunter Faure, 19. David Elliot, 20. Chris Kendall.