Greetings from the Head of Department

So many good things have been happening in the department!

We have welcomed and are about to welcome a host of new faculty members! Dr. Anna Harrison, an Environmental Geochemist, joined us in July 2018 and Dr. Elisabeth Steel, a Sedimentologist, will join us in January. We have FOUR searches currently underway. At a department meeting last year we set our goal at “22 in 22”; that is, 22 faculty members in 2022. Who knew we'd make it to 19 in 2019!

Dr. Linda Tsuji, the new curator of the Miller Museum of Geology, comes to us from the Royal Ontario Museum. Dr. Anne Sherman (Ph.D 2001), joined us as the new Lab and TA coordinator. Anne’s signature sense of humour is a great gift, particularly during the September rush. In October, we welcomed Mr. Paul Bass as the new department manager; he has made his mark already with his enthusiasm, energy and welcoming nature.

We also said goodbye and happy retirement to fantastic staff and faculty, including Mr. Mark Badham (B.Sc. 1986, M.Sc. 1997), the Curator of the Miller Museum of Geology, Dr. Ione Taylor (who designed the Masters of Earth and Energy Resources Leadership program (MEERL)), and long time faculty Dr. Ron Peterson, Dr. Doug Archibald, Dr. John Hanes. Ms. Lindsay Waffle, the first Lab and Teaching Assistant Coordinator, left us for an exciting field position. Ms. Megan Rhymers, Department Manager during the crucial and difficult months of 2017 and early 2018 was enticed back by her former employer to a very exciting new position. We wish them well in their new opportunities.

In May 2018 the last group of Geo students, faculty and TAs pulled out of Sutton Quebec. In August 2019, our newly designed, week long, 300 level field school focused on mapping will be held near Kaladar Ontario. Colin Joudrie (BSc ’91) pointed out to me that a week is too short a time to fall in love, as he and his wife Dawn Russell (BSc ’90) did in field school, so perhaps we will need to stretch it to 9 days! We will be introducing a new 400 level field course, the focus of which will change with the interests and foci of the instructors. Field learning continues to be the centre piece of our curricula. We thank everyone who has donated so generously to our field funds – your donations help defray the costs to students during this foundational part of their learning.

Our approximately 250 undergrads, are frequently found in the Reading Room, adjacent to the Earth Systems Information Laboratory and just of the main lobby of the Bruce Wing is the heart of the department during the term. We have aspirations to refresh these spaces, upgrading computer equipment, furniture, and, I hope, new flooring and paint. Our teaching and research spaces, and our digital strategy. Faculty renewal has come more quickly than we had anticipated, but we will continue to request base budget faculty positions in strategic areas, aiming for 22 in 2022. We wish to upgrade research laboratories, many of which are in desperate need of attention. We would like to refresh and renovate the main lobbies of Miller and Bruce, as they are the spaces that welcome new students and visitors. Paul Bass, our new Department Manager, is spearheading a review of all facilities and spaces, with a view to providing a long-term plan to upgrading.

Geologists and geological engineers are very used to big data, but we now design state-of-art data collection tools, to capture, use, and model large data sets. From drones, to satellites, to “Dirk” the use of GIS and LiDar, our digital strategy starts with the considerable strength we already have. One of our capstone design projects is sponsored by IBM and their Watson Super Computer! While we will continue our focus on field research and learning, we wish to augment our work with AI and digital technologies and we hope, an online, “virtual museum” of our mineral, rock, and fossil holdings, laser-scanned in 3D to provide exquisite detail. We have been eyeing up the main lobbies of Miller and Bruce, as they are the spaces that welcome new students and visitors. Paul Bass, our new Department Manager, is spearheading a review of all facilities and spaces, with a view to providing a long-term plan to upgrading.

As this newsletter is going to press I am returning from Vancouver after two incredible alumni events, one to honour Gordon Keep (BSc ’79) and Katherine Keep (BA ’81) and one in the home of Margie and Wayne Savigny (Sci ’71), attended by Principal Wolfe and a host of young alumni. Former heads have told me that meeting with alumni is one of the most rewarding parts of the job, and 17 months into my Headship, I would have to agree.

Vicki Remenda
Welcome Dr. Anna Harrison

The department welcomes one of its newest faculty members, Dr. Anna Harrison. Dr. Harrison is a Queen's National Scholar and is jointly appointed to Geological Sciences and Geological Engineering and the School of Environmental Studies. Her research interests are in aqueous and environmental geochemistry, and include experimental, analytical, and reactive transport modelling approaches, complemented by field data. This research not only helps to address the fundamental geochemical questions of what controls mineral dissolution-precipitation reactions, but has important implications for understanding natural mineral weathering and element cycling processes over geologic time, and for issues of immediate environmental significance such as groundwater contamination, nutrient availability, and engineered CO2 sequestration under a changing environment. Welcome Dr. Harrison!

Welcome Dr. Elisabeth Steel

We also welcome Dr. Elisabeth Steel. Dr. Steel studies clastic sedimentary systems via a combination of field work and physical modeling. She will be building an experimental facility in the Coastal Engineering Lab designed for modeling deltas and turbidity currents in order to examine the various ways that the dynamics of these systems are recorded by the morphology and architecture of their deposits. She will also develop field projects with the goal of comparing experimental results to ancient and modern systems. Ongoing work includes: quantifying the kinematics of channel networks on delta surfaces; developing methods for predicting deltaic stratigraphy based on surface kinematics; characterizing lateral spreading rates of turbidity currents; and predicting lift-off distances of lofting turbidity currents. Welcome Dr. Steel!

Professor Rob Harrap Awarded Golden Apple Award

Congratulations to Professor Rob Harrap, who has been awarded a Golden Apple Award. The Golden Apple Award is a faculty award given by the Engineering Society which rewards professors who consistently demonstrate superior teaching abilities and concern for students on an individual level. This was the only Golden Apple Award presented for this academic year.

Dr. Diederichs Wins First Year Instructor Teaching Award

Congratulations to Dr. Mark Diederichs, who was chosen by the Engineering Class of 2021 as the recipient of the Engineering and Applied Science First Year Instructor Teaching Award (Fall Term) for APSC151, The Earth's Physical Environment. The award is given each year to the instructors of first year Engineering and Applied Science courses who, in the opinion of the students, contributed most to creating a good teaching and learning environment in the classroom.

Dr. Helmstaedt Awarded 2018 CFES Mentorship Medal

Congratulations to Dr. Herb Helmstaedt, Professor Emeritus, who has been awarded the 2018 CFES Mentorship Medal from the Canadian Federation of Earth Sciences. This award recognizes the sustained and inspirational mentorship of colleagues and employees including peers, graduate students, undergraduate students and technicians. The sole criterion for the award is excellence in mentoring over a sustained period of time.

Dr. Hutchinson Named 2019 Glossop Medal Lecturer

Congratulations to Dr. Jean Hutchinson who has been named the 2019 Glossop Medal Lecturer, sponsored by the Engineering Group of the Geological Society (UK). Jean will be presenting the 20th Glossop Lecture in mid-November 2019 in London, England. Dr. Hutchinson also received the Geoffrey Flynn Advancement Champion Award from Queen's University, Office of Advancement, in recognition of work with alumni and on advancement during the time of her Headship.

Steve Rose, In Memoriam

Shortly before 4:00pm on Friday, June 29th, 2018, Steven Vincent Rose passed away peacefully at home surrounded by his wife and children. Steve was a loving husband, father, son, brother, mentor, and friend to many throughout his life.

Steve attended Queen's University for his Bachelors of Applied Science in Geological Engineering, starting in the infamous “Fourth McNeil” residence and falling in love with the city of Kingston, Ontario, Canada. After graduation he explored the United States and eventually started his career as an engineer in the greater Los Angeles region. He also remained active in academia, serving as an Adjunct Professor in the Department of Geological Sciences and Geological Engineering. His contributions to the 4th year capstone design projects were legendary.

A celebration of life was held on Saturday, July 28th, 2018. Donations can be made in his name to the Kingston Cancer Centre or the Al Gorman fund at Queen's University. Any questions can be forwarded to harose22@gmail.com, 8beckyrose@gmail.com, or nicolasvrose@hotmail.com. The obituary can be found at: http://yourlifemoments.ca/sitepages/obituary.asp?id=1083228

Ian Nichol, Professor Emeritus, In Memoriam

Dr. Ian Nichol, Emeritus Professor, died on April 16, 2018, in the Kingston Health Sciences Center. Dr. Nichol received his BSc from Durham University in the U.K. and his MSc from Queen’s in 1958, studying the trace element geochemistry of sulphide minerals under the supervision of Professor Ed Hawley. He then returned to Durham for research on his PhD thesis, a study on the geochemistry of manganese minerals, which he completed in 1962. In 1969, Dr. Nichol was appointed as Professor of Geochemistry at Queen’s and soon established an internationally recognized research programme in exploration geochemistry. He created modern laboratory facilities and, between 1969 and 1997, supervised more than 30 graduate students conducting research on a broad range of exploration geochemistry projects, mostly in Canada but also in Chile, China, Thailand and the U.S. Dr. Nichol retired in 1997 to become Professor Emeritus. After retiring, he made a major financial contribution to the departmental field studies program. Details about Dr. Nichol’s wide-ranging contributions and achievements may be read in a more extensive memorial to come in the EXPLORER Newsletter of the Association of Applied Geochemists. For anyone wishing to help honour Dr. Nichol’s memory, there is a Named Field Studies Fund that helps support field education in the Department of Geological Sciences and Geological Engineering. www.givetoqueens.ca/geological

3rd Virtual Geoscience Conference

On August 22 - 24 2018, Queen’s University Department of Geological Sciences and Geological Engineering hosted the third annual Virtual Geoscience Conference (VGCon). 72 participants travelled from across Canada, US, UK, Norway, Denmark, Germany, Switzerland, Austria, Italy, Spain, China, Morocco. There were keynote lectures from Norway, Switzerland, the US and Canada.
The first cohort of this, MEERL19, will be graduating in May 2019. They have already received job promotions through the program, from chief mine geologist to vice president business development, and stakeholder relations specialist to senior director of policy. We can’t wait to see where they go next.

Here’s what some of the students have had to say about the program:

“MEERL is more than just a Master, it’s a project we as students have the honor to take part of. I’m so impressed how motivated (everyone is)”

“Overall, I am incredibly impressed with the residential week, the faculty, and the overall program. This week has given me an impression that Queen’s University is full of highly competent and engaged faculty; and that it is willing to demonstrate leadership and innovation in having created this program.”

“I feel that this program is absolutely the right fit for me, and that I have both a lot to learn from the diversity of students as well as things to offer.”

Students will be looking for projects to work on in summer 2019. Projects may span a year and are a great opportunity to learn what our faculty, and that it is willing to demonstrate leadership and innovation in having created this program.”

Superconducting Gravimeter “Dirk” arrived at Queen’s

In August 2018, a new iGrav superconducting gravimeter by GWR Instruments was installed at Queen’s University, specifically, in the basement of Miller Hall, on a bedrock mounted slab. The iGrav with the serial number 41 has been named ‘Dirk’ after Dirk Nowitzki, one of the greatest basketball players of all time and a true expert in handling spherical objects with the jersey number #41.

This instrument is one of about 30 such instruments worldwide and measures the subtle changes in the Earth’s gravity field. Gravity is expressed in units of mGy or Gal (after Galileo Galilei, 1564-1642) and the Earth’s gravity field is on average 981 Gal. The iGrav is sensitive to 0.05 microGal or detects 1 part in 20 billion.

Mass transfer processes continuously change the Earth gravity field. Processes such as; flooding, erosion, snowfall, glacial melting, atmospheric pressure, sea level change, or extraction of material out of the ground all cause gravity changes. Dirk measures gravity changes from the basement of Miller, from signals originated from anywhere on the globe. In fact, Dirk is a very good seismometer and sits side by side and complements the Canadian Seismic Network KNGO. Dirk further measures Earth tides, similar to ocean tides, which are driven by the gravitational attraction of the Moon and the Sun. The figure to the right shows an example of Dirk’s capabilities in capturing Earthquakes. These data are from August 21, 2018. Dirk’s future lies in the exploitation of its sensitivity to monitor subsurface reservoirs. Extracting heavy oil from a reservoir in Alberta or pumping groundwater to serve a pulp mill are two processes which result in the distribution of mass changes in time. In both scenarios, operators need to know how much oil or water has been extracted and from where, e.g. from the heel or toe of well X or the groundwater or surface water. Moving Dirk across the reservoir will allow for the determination of oil depletion and changes in the piezometric surface groundwater table has been lowered. The ultimate scenario for Dirk is to work in concert with another iGrav (the only other instrument in Canada, currently stored in Alberta). This will allow for gravity gradiometry, which amplifies the signals even further and allows for improved interpretations of
Alumni Updates & Congratulations

Gord Keep BSc’79, and his wife Katherine Keep BA’81 received the Kathleen Beaumont Hill Award from the Vancouver branch of the Queen’s University Alumni Association.

Dr. Andrew Feustel PhD’95, returned from his six month space expedition, where he was Commander of the International Space Station.

Victoria Sterrit is leading Teck’s participation in a new multidisciplinary initiative called Canada’s Digital Technology Supercluster.

Amy Follwell, BSc’06 was featured in the Globe and Mail for her company “Bijoux by Amy”.

Andrew Leriche, BSc’15, MASc’17, received the best thesis award from the American Rock Mechanics Association (ARMA).

Clare Miller, BSc’13 and current PhD student, received the Finnigan Award for Northern Research from the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG).

Share your good news stories with us! Send to geolalum@queensu.ca, or share on the “Queen’s GEO Alumni” Facebook group!

GEOLOGY COUNCIL UPDATE

After 13 years, Roger Smith has stepped down as President of the Queens’ Geology Council. We are appreciative of all his hard work including spearheading and raising money for the Field Studies Fund which currently stands at $2M. This fund ensures that field work remains an important component of the program and that students can afford to participate. Andy Williamson (GeoEng ’84) has agreed to take on the role of President. He can be reached at email address. We look forward to working with him and the Geology Council to help Dr Vicki Remenda in achieving her priorities.

The Geology Council meets by telephone once a month to discuss matters of the department including advancement topics, curriculum, alumni reunions, and more. Anyone who would be interested in being a part of the council is invited to reach out to us at geolalum@queensu.ca. We welcome all interested parties and appreciate the support.

2018 ALUMNI REUNIONS
Visit www.queensu.ca/geol for upcoming events