THE G(e)OSSIP

The official newsletter of the Geology Department

29 July 2021 | Issue 5

WELCOME

July was the month of never-ending beach days, barbecues and pure sunshine. Ireland also experienced two tropical nights (air temperature at night > 20°C) in a row for the first time ever. #climatechange

Nearly all of our young career researchers have been offered their first vaccine dose. Fifty-three percent of the Irish population is fully vaccinated and 66% have received their first dose. Pubs have reopened for indoor seating for fully vaccinated or Covid-19 recovered people.

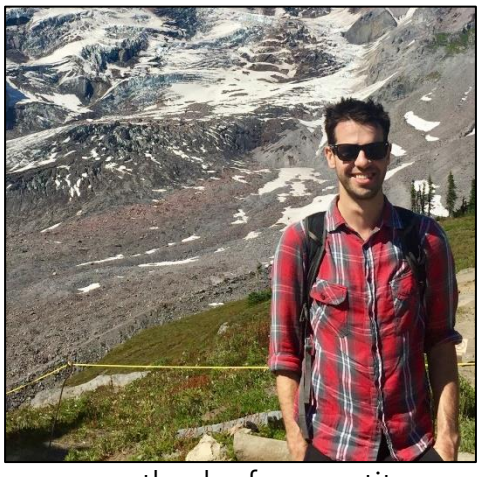
The Geology Department is still looking for a new logo. Get your creative juices flowing and send your design submissions to geossip.tcd@gmail.com.

Our newsletters are archived and uploaded on the Geology website. You can access them here.

The G(e)ossip will be released on the last Thursday of each month. If you have feedback or anything to be added to upcoming newsletter issues, please send us an email at geossip.tcd@gmail.com.

-The G(e)ossip Team

STAFF MEMBER IN THE SPOTLIGHT



Mike Stock was born in Bristol but grew up in Sussex, Southeast England. He completed his undergraduate degree at the UK National Oceanography Centre (University of Southampton) and graduated in 2011 with an MSci in Geology. After a productive year working in a cocktail bar, he went on to do a PhD on magmatic apatite at the University of Oxford, developing new methods for apatite analysis by EPMA and SIMS, and interpreting apatite volatile records to understand eruption triggers at Campi Flegrei caldera. From 2016 to 2019, he held the Charles Darwin Junior Research Fellowship at the University of Cambridge, where he worked on interpreting petrological and geophysical records of magmatic processes in the Galápagos Archipelago, and once shared a stage with David Attenborough to promote Galápagos research! Mike joined Trinity in 2019 as an Assistant Professor in Geochemistry and Director of the Earth Surface Research Laboratory (ESRL). He currently teaches geochemistry and will be starting a new module on advanced volcanic/magmatic processes in the near future. His core research is focused on using novel petrological and geochemical techniques to understand sub-volcanic systems, incorporating aspects of petrography, thermodynamics and fluid mechanics. However, his work has recently expanded into layered intrusions, ore-forming processes, and anthropogenic heavy metal pollution in soils. He currently has a research group including one postdoc, one research MSc student, and two technicians in the ESRL, with an additional PhD student arriving in September 2021. He also works closely with Geological Survey Ireland on the Tellus geochemical survey and has been assisting with the on-going urban sampling campaign in the Dublin area. Outside of work, Mike enjoys exploring Ireland, hiking, watching most kinds of sport and baking sourdough. He is getting married later this year and acquired a mischievous golden retriever puppy during lockdown.

MEET MIKE STOCK'S TEAM

Elliot Carter (he/him)

Hi I'm Elliot and I'm a research fellow working with Mike Stock in the Earth Surface Research Lab. My research spans igneous and fluid geochemistry with a strong interest in volatiles, but my current focus is on re-examining the igneous geochemistry of the Antrim Lava Group, N Ireland (part of the North Atlantic Igneous Province). This project is funded by an Irish Research Council GOI Fellowship and seeks to examine the records of mantle conditions (temperature, depth, composition) and lithospheric interactions preserved by the basalts. I also have strong interests in hydration and carbonation of mafic and ultramafic igneous rocks which my PhD work focused on. I was part of the Oman Drilling Project Science Team 2017-2018, working to characterise new cores from the Oman Ophiolite, and in 2022 I am due to sail as a member of the Science Party during IODP Expedition 390 to drill a 60 Myr transect of oceanic crust across the South Atlantic. Alongside my research I'm a committee member for the Volcanic and Magmatic Studies Group and an early career co-representative for the GMPV division of EGU. During my PhD I helped set up a podcast, The Cosmic Cast, and continue to appear as a co-host, discussing the latest Earth and planetary science research in an accessible format. When I'm not smashing up rocks, I'm happiest cycling around and searching for the perfect sour beer.

Lydia Whittaker (she/her)

Hi I'm Lydia and I'm an MSc research student in Geology working with Mike Stock. My research involves looking at crystal zoning patterns to interpret sub volcanic processes within the Campi Flegrei system in Italy. Within the scope of this project, I aim to use diffusion chronometry to assign timescales to these processes; this will (hopefully) help to mitigate future eruptions at the caldera. When I'm not thinking about volcanoes, I like to read fantasy novels, and I'm looking forward to rekindling my love for horse riding and cheerleading when the pandemic restrictions finally ease.

VIVAS

Congratulations to those that successfully passed their PhD vivas!

Remi Rateau, Quantifying Cenozoic exhumation on the Irish midland and offshore using low-temperature thermochronology and seismic studies.

Hilde Koch, The chemostratigraphy of early carboniferous ash layers (tuffs) in the Irish midlands and their relation to Irish Zn-Pb deposits based on geochemical and geochronological fingerprinting.

Alexandra Stavropoulo, Analytical mineralogy – Efficient characterisation of minerals and fabrics with the scanning electron microscope.

MENTAL HEALTH MATTERS

It might be summertime, but TCD's Student Counselling Services is open and available to all students. Check out their website here to read about services they provide, follow them on Instagram at @tcd_headspace for mindfulness and mental health information, or email them at student-counselling@tcd.ie to request an appointment.

COVID-19

Please don't forget to sign in on the Geology Google Doc and check in on the SafeZone app if you're on campus. This is very important for contact tracing in the event of a positive COVID-19 case on campus. As always, wash your hands, practice social distancing and wear a mask. You can stay up-to-date on all TCD statements here.

GEOLOGY IN THE NEWS

Research hints at potential signs of life on Saturn's moon Enceladus

Photo credit: NASA/JPL-Caltech

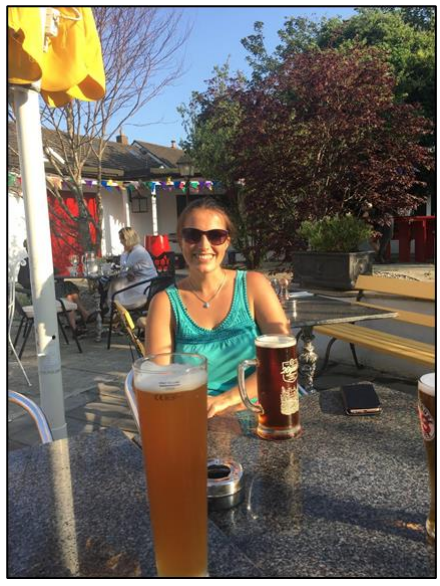
A study by Affholder et al. (2021) published in *Nature Astronomy* has suggested possible links to signs of life on Enceladus, Saturn's moon. Their research focused on the giant plumes of water vapour emitted from the moon's surface. These plumes have long fascinated scientists of NASA's Cassini mission and have indicated the potential presence of a large ocean between the solid core and icy outer shell of Enceladus. The Cassini spacecraft had previously detected high concentrations of dihydrogen, methane, and carbon dioxide within these plumes. Through probability-based modelling of this plume data, the team concluded that the most plausible sources of these gases are biogeochemical processes similar to those seen at hydrothermal vents on Earth or due to an entirely new and unknown process specific to Enceladus. Albeit, this is by no means conclusive proof, it is a step closer to revealing the potential for life to exist on this planetary body. You can access more information here or read the full publication here.

Recent study reveals juvenile pterosaurs were strong enough for flight

Photo Credit: Chuang Zhao

New research from a team lead by Darren Naish from the University of Southhampton suggests that young pterosaur bones were stronger than previously thought and therefore would have been suitable for flight. Previous science behind pterosaur development had led researchers to believe that young hatchlings may not have been capable of flight at all due to their small wing size. However, the team here took a biomechanical approach and modelled the flying abilities of juveniles through analysis of all anatomical features considered critical for flying. Their results revealed that the humerus bones of hatchlings were even stronger than some adult pterosaurs, making them certainly able to sustain flight. You can read the full publication here.

AUF WIEDERSEHEN



After spending five incredible years in Trinity, Hilde Koch is moving on to work with Murray Hitzman as a postdoctoral researcher. Although she will officially be part of UCD, she will keep her desk in the TTEC museum office (as long as she doesn't get chased away). Hilde will be part of the iCRAG geochemistry platform, mainly overviewing the analytical facilities, which are available across four iCRAG member institutions (NUIG, Trinity, UCC, UCD) with the major aim that they are used targeted and efficiently. Thus, if you are already part of the geochemistry platform, she will most likely contact you within the next couple of weeks. If you are wondering which of the facilities is suitable to answering your research questions, please feel free to get in touch with her at hkoch@tcd.ie. Hilde has been an integral part of the Geology department - from organising Friday Beers and department holiday parties, to serving as the postgrad rep for two years, she has always stepped up to help and we wish her all the success on her new position!

EARTH SURFACE RESEARCH LABORATORY

ESRL launches as a new national geochemistry facility on the island of Ireland

The Earth Surface Research Laboratory (ESRL) launched this month as a new national research facility for geoscientists based on the island of Ireland. Located in TTEC Unit 6 and funded by GSI, the lab hosts state-of-the-art sample preparation and analytical equipment for chemical characterisation of geological, biological and other materials. Instruments include a high-precision Zetium WD-XRF, a high-throughput Nex CG ED-XRF, an Hg analyser and an elemental analyser (for TC, TOC and TIC). The lab is currently in the process of acquiring an ISO 17025 accreditation for testing and calibration laboratories, after which it will act as a main data supplier for the Tellus geochemical survey. Researchers can either access the laboratory facilities using grant funding, submitting a short/pilot project application (<24 hours) or through an ESRL open call (>24 hours). Open calls will be run every six months, with analyses funded by GSI and proposals assessed by the ESRL Scientific Advisory Committee; the first call closes at 17:00 on Monday 19 July. The laboratory launch was covered in the national media, including the Mooney Goes Wild show on RTÉ Radio 1.

For further information about the ESRL equipment (including a promotional video) and facility access, see the ESRL section of the Geology website here or contact Mike Stock at Michael.Stock@tcd.ie.