THE GEOLOGICAL SOCIETY OF GLASGOW

Newsletter - April 2025

Lecture Programme

The April lecture will be on Thursday 3rd April and will be by zoom only. No need to come into the Boyd Orr.

There will be two short (half-hour) talks by two students who received grants from the Society: **Kiara Brooksby,** Camborne School of Mines, Exeter University on tin mineralisation in Cornwall and **Ella Davis,** Department of Geosciences, Virginia Tech on metamorphism in the NW Highlands of Scotland.

https://us02web.zoom.us/j/83164648993?pwd=qpjEAzAERnDDZ0DUHVbEcSIMttjK3V.1

Meeting ID: 831 6464 8993

Passcode: 530340

Kiara Brooksby, *Camborne School of Mines, Exeter University.*

"Paragenetic evolution of tin-dominated lode systems in the Pool Mining District, Cornwall"

SW England hosts a world-class, W-Sn-Cu-As-Zn-Pb-Li ore field associated with the Early Permian granites of the Cornubian Batholith. In the Pool Mining District, which includes South Crofty Mine, magmatic-hydrothermal mineralisation is largely associated with steeply dipping ENE-WSW striking extensional fault systems (lodes). Recent drilling by Cornish Metals has included boreholes that intercept the principal South Crofty lodes and the Great Flat Lode. This study provides a paragenetic sequence and characterisation of mineralising fluids through detailed core logging, optical microscopy, QEMSCAN (quantitative evaluation of minerals by scanning electron microscopy) imagery, hot cathodoluminescence (an optical and electromagnetic phenomenon in which electrons impacting on a luminescent material such as a phosphor, cause the emission of photons which may have wavelengths in the visible spectrum), microthermometry and LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectrometry) analysis of fluid inclusions. It is the first such study of the South Crofty lode systems for 30 years. These new data, combined with historic descriptions, contribute to a revised model of tin mineralisation within the district.

Kiara obtained her Geology/Earth Science BSc at the University of Glasgow in 2019 before moving onto the University of Exeter, where as a Richard Osman scholar, she obtained an MSc in Mining Geology. In 2021 she began her current PhD research at the Camborne School of Mines, Exeter University.

Ella Davis, *Department of Geosciences, Virginia Tech.*

"Tectonic transport directions and timing of metamorphism in the southern part of the Northern Highlands Terrane, Scotland"

Determining the tectonic histories of ancient mountain belts presents an interesting challenge as we cannot measure the motion and characteristics of collision during mountain building and instead must decipher affected rocks to deduce tectonic evolution. Analyses of the deformed and metamorphosed units in the Northern Highlands Terrane in NW Scotland has played an integral role in understanding the large-scale tectonic evolution of the Scottish Caledonides. However, most of these studies on the deformation, metamorphism, and timing of mountain building events have been focused on the northern half of the terrane. We have extended these kinematic (movement) and isotopic studies to the south to better understand the tectonic transport directions and timing of metamorphism.

We have collected samples from four E-W transects crossing the Sgurr Beag thrust near Loch Monar, Glen Sheil, Kinloch Hourn, and Lochailort as well as from the "Flat Belt", the structurally simpler eastern extent of southern NHT. Mineral fabrics in samples collected from the western transects show a top-down to the SE shear sense while those collected from the east show a top-up to the NE shear. Shear senses from these western fabrics contradict the shear

directions that are well recorded in the north where there is a top to the NW shear sense. It remains to be determined what deformational event caused these different fabrics.

Analyses of U-Pb isotopic ages collected from titanite, monazite, and xenotime show multiple recorded periods of metamorphism in the southern NHT. Radiometric dating on samples from the northern NHT show that the region experienced multiple tectonic events, including the Knoydartian (870-720 Ma) and Caledonian orogenies, the latter divided into Grampian (~475- 460 Ma) and Scandian (~435-420 Ma) events. Our preliminary data shows a Caledonian period of metamorphism ranging from ~450-415 Ma and earlier Knoydartian-related metamorphic events ranging from 750-690 Ma

Ella is a second year Master's Student at the Department of Geosciences, Virginia Tech where her undergraduate research focussed on quartz microstructures from samples collected in north-western Scotland under the direction of Dr Richard Law. This led to further research to determine tectonic transport directions and deformation environments using small-scale shear structures and quartz fabrics.

Recordings of past lectures

St Andrews students' Greenland Expedition https://youtu.be/giy1WE9L-Cw

Stuart Haszeldine: Carbon Capture & Storage https://youtu.be/oXiIQD7eHdk

Heather Stewart: The Abyss Gazes Also Into You https://youtu.be/-6b9bi-AehM

Paige dePolo: Pantodonts from New Mexico https://youtu.be/RWamAw6uo10

Luisa Hendry: Promoting geology through social media https://youtu.be/ksMcrrTyCg8

Alex Dunhill: Ecology and Mass Extinctions https://youtu.be/uR3zB0XpyQM

David Webster: The Geology of Colonsay https://youtu.be/CMCq0nMHG8s

GSG YouTube channel https://www.youtube.com/channel/UCfNSIvgEbUfLWMsCeNiRm1w/

Members' Night

May 8th - Members Night. Venue: Lecture Theatre 213 at the St Andrews Building.

Provisional Programme so far:

- Campbell Forrest & Ian Veitch; Climbing and Geology of Ardverikie Wall, Binnean Shuas
- Gary Hoare: Crinoids from Trearne Quarry
- Katy Strang: Rocks, Fossils and Minerals from the Hunterian Collections

---

Day Trips Excursion Programme

Full details of day trips and booking are now published on the website, and you can book and pay through webcollect.

Contact excursions@gsocg.org if you have difficulties and to join the field trips whatsapp group.

9 April – Kelvin Valley from Dawsholm to Kelvinbridge. ***Leaders: Iain Alison and Katie Strang***

This guided walk will use the Strathclyde Geoconservation Group's leaflet but in the reverse direction. This half-day trip will take an entirely off-road route along the Kelvin Walkway taking in the geology along the way. Many exposures can be seen only across the river but there are some we can get close to. The rocks are mainly in the Limestone Coal Formation but getting up into the Upper Limestone Formation at Dawsholm – all middle Carboniferous. With a bit of scrambling through vegetation, some plant fossils may be seen at the Dawsholm end. We will see fluvial sandstones, some channels and some finer grained beds.
https://geologyglasgow.org.uk/event/kelvin-valley-from-dawsholm-to-kelvinbridge/

2 May – Portencross. ***Leaders: David Webster and Austen Brown***

The rocks exposed around Portencross are mainly sandstones (known across the UK as the 'Old Red Sandstone' or ORS) dating back to the Devonian Period (420 to 360 million years ago). The 'Lower Old Red Sandstone' was deposited in desert environments in the aftermath of the Caledonian Orogeny when Scotland (on part of the North American continent called Laurentia) collided with England and Wales (on part of the European continent

called Avalonia), closing the intervening Iapetus Ocean. The collision was marked by major strike-slip faulting and considerable local volcanism. Later in the Devonian there was a further period of mountain building (the Acadian Orogeny) when Iberia collided into Avalonia further south. This resulted in more uplift and renewed sandstone deposition (the 'Upper Old Red Sandstone'). On the walk we will examine, compare and contrast the Lower and Upper Old Red Sandstones and also look at some igneous rocks.
https://geologyglasgow.org.uk/event/portencross/

22 May – A Geological Look at Holmwood House. ***Leaders: Keith Farrell and Neil Clark***

Holmwood House is a Victorian villa designed by Alexander 'Greek' Thomson, with a kitchen garden and courtyard tearoom. If the weather allows we will walk down into Linn Park to look at some fossil trackways before heading back to the house for a short tour and a look at how the design of the house links with geology; including the use of earth pigments. We will have a display of minerals used to make pigments and a discussion about how these have been used in the past
https://geologyglasgow.org.uk/event/holmwood-house-and-linn-park/

11 June – Glasgow Necropolis. ***Leader: Margaret Greene***

Necropolis Hill is one of the highest points of Glasgow. It stands proud simply because it is the outcrop of an intrusion of more resistant dolerite rock into the surrounding weaker sandstone. This can be seen in the quarry at the southern side of the Necropolis. The present landscape has been extensively remodelled during the ice ages over the last 2 million years. Broad ice sheets have repeatedly moved out from the mountains to the Firth of Clyde, moving across the Glasgow area scouring the landscape and depositing sand and gravel from west to east. This gives Necropolis Hill its characteristic shape of a steep side due to the harder rock on the side facing the Cathedral, then tapering out to the east. This afternoon trip will explore the geology of some of the remarkable monuments in this cemetery. The architecture, sculpture, views and stories continue to amaze.
https://geologyglasgow.org.uk/event/necropolis-tour/

19 July – Burnmouth. ***Leader: Katie Strang***

The rocks exposed along the foreshore at Burnmouth in the Scottish Borders are early Carboniferous in age and belong to the Ballagan Formation. They were deposited in a low-lying vegetated coastal wetland around 350 million years ago, when Scotland as we know it was a very different place! During this time we were situated at low latitudes close to the equator and experienced a hot and humid climate. The area was subject to vast droughts and flooding, sea levels fluctuated and sandy river channels meandered across the land. It was in this setting that we also saw the first tetrapods (four-limbed animals with backbones) making their way on to the land. Originally these rocks were laid down on a relatively flat surface and they stayed this way until a period of significant tectonic activity and continental collision known as the Varsican orogeny, which happened around 200 million years ago. These intense tectonic forces caused the rocks at Burnmouth to be uplifted, tilted and faulted, eventually resulting in the striking near vertical orientation we will see on the shore today!
https://geologyglasgow.org.uk/event/burnmouth/

2 August – Girvan. ***Leaders: Neil Clark, Katie Strang and Gary Hoare***

A jaunt over to Girvan with our friends from the Edinburgh Geological Society to explore Mid-Ordovian to Early Siluran fore-arc sequences. We will examine stratigraphical sequences ranging from shallow to deep marine, viewing the cyclical and fault-controlled deposition investigated to guide the understanding of the palaeo-environment. We will also have a chance to look at interesting rocks and fossils on the foreshore.
https://geologyglasgow.org.uk/event/girvan-joint-egs-trip/

September

Details to be confirmed. Events to be part of Scottish Geology Festival. Likely to include Hunterian tour, Pavement Geology, Rock Doctors, Building Stones of George Square.

Residential Excursion Programme

4th-8th September 2025 – Glenelg, and Kintail: ***Leader: Simon Cuthbert.***

This four-day excursion visits part of the northwest Highlands opposite the Isle of Skye that is well known for its dramatic scenery and human stories, encompassing the dramatic fjord of Loch Duich and Lochalsh, Eilean Donan Castle, the hidden gem of Glenelg and Sandaig Bay. Exposed in these hills and shores, emerging from under the Wester Ross Supergroup (the "Moines"), is an enigmatic complex of ancient gneisses - the Glenelg-Attadale Inlier (GAI), the largest of the so-called "Lewisianoid" basement Inliers of the Northern Highlands Terrane. The rocks resemble the Lewisian Complex further north, but enclose a beautiful garnet-pyroxene rock-type - eclogite - that formed at extreme pressure when this continental crust was subducted during continental collisions. This is the only example in the British Isles of well-preserved eclogite and is unusually old for such rocks - early to mid-Proterozoic - and were formed long before they were caught up in the Caledonian orogeny and thrust westwards along the Moine Thrust system. This area is where some of the great figures of Scottish geology have worked and we can admire their insights and originality.

For further information please contact excursions@gsocg.org

Geonatter

Next dates: 2 April, 7th May

Recent Papers on Scottish Geology

A new paper by one of our Members! Come to Members' Night to hear more!

Hoare, G. and Donovan, S.K., 2025. The Ureocrinus bockschii bed of Trearne Quarry SSSI (Mississippian, Lower Carboniferous), north Ayrshire, Scotland. *Scottish Journal of Geology,* pp.sjg2024-008. https://doi.org/10.1144/sjg2024-008

Also:

Leather, D. and Brown, J.F., 2025. Gypsum Pseudomorphs, subaqueous cracks, lake bed morphology and palaeoclimate in the Middle Devonian lacustrine flagstones of Orkney Scotland. *Scottish Journal of Geology*, pp.sjg2024-001. https://doi.org/10.1144/sjg2024-001

C.L. Kirkland, R.A. Strachan, D.B. Archibald, J.B. Murphy; The Neoproterozoic glacial broom. *Geology* 2025. https://doi.org/10.1130/G52887.1

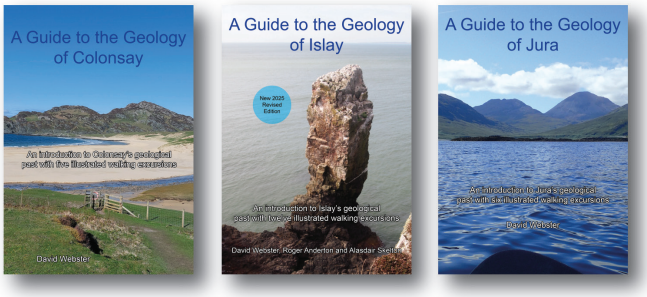
Panciroli E, Funston G.F., Maidment, S.C.R *et al.* 2025. The first and most complete dinosaur skeleton from the Middle Jurassic of Scotland. *Earth and Environmental Science Transactions of the Royal Society of Edinburgh*. https://doi.org/10.1017/S1755691024000148

Dinosaurs from Skye

A team of researchers led by Dr Elsa Panciroli, announced Scotland's latest dinosaur discovery from the Isle of Skye. The 'Elgol Dinosaur' was first spotted by a research group back in 1973, making it the first dinosaur body fossil ever found in Scotland - but it was not reported at the time. It was rediscovered and collected in 2018, and studied by researchers, led by National Museums Scotland. Through comparative anatomy and histology (study of bone miscrostructures), the team identified it as the fossil of an ornithopod, the group of dinosaurs that includes Iguanodon. It comes from the limestone beds of the Kilmaluag Formation in the Great Estaurine Group, making it Middle Jurassic (around 166 million years old). This makes it one of the oldest fossils belonging to this group of dinosaurs in the world.

See link to paper above, also Inside Science on BBC iplayer at https://www.bbc.co.uk/programmes/m0028jvw

Publications and Books



The Society has reduced its holding of books for sale.

However, we have stocks of the Gigha, Moine and Madeira Guides and also can ship the new suite of Islay, Jura and Colonsay Guides.

See the Books Page on the Website here

A selection of these books will usually be available at Lecture nights.

Scottish Geology Trust

The fifth Annual General Meeting of the Scottish Geology Trust will be held on Thursday 10th April 2025 between 12:30 and 16:00 (AGM business 13:30 – 14:00).

The meeting will be hybrid, with the option of attending in person at National Museums Scotland, or on Zoom.

More details from the Secretary, Emily Brown, secretary@scottishgeologytrust.org

---

Geological Society of London - Free Lectures

The Geological Society hosts public lectures throughout the year to share knowledge with the geoscience community. These monthly lectures are open to everyone and free to attend. The lectures are ordinarily held at Burlington House in London and virtually via Zoom.

Details on their website here

20 May: Re-storifying Planet Earth: narratives and storylines for publics and policymakers

17 June: Forged by fire - How can volcanoes shape out landscapes, lore and lives

---

Geology Bites

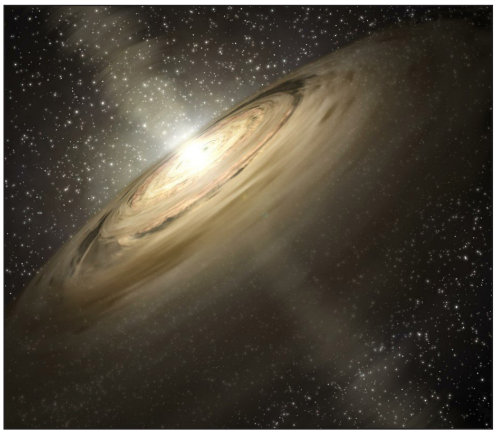
Lindy Elkins-Tanton on the Origin of Earth's Water

The planets formed out of a cloud of gas and dust around the nascent Sun. Within the so-called snow line, it was too hot for liquid water to exist. Since the Earth lies well within this line, why does it have water? Did it somehow manage to retain water from the outset or did it acquire its water later? In the podcast, Lindy Elkins-Tanton explains how these two scenarios might have played out but she says the evidence strongly favours one of these theories.

Elkins-Tanton has concentrated much of her research career on the formation and evolution of planets, and especially the role of water. She is a Professor in the School of Earth and Space Exploration at Arizona State University and Principal Investigator of the NASA Psyche mission

Fascinating stuff!

Go to https://www.geologybites.com/lindy-elkins-tanton



Artist's impression of a region of a giant molecular cloud that is collapsing to form a protoplanetary disk of gas and dust. A star forms at the center of the disk, and planets form out of the disk. NASA/JPL CalTech

---

Down to Earth

Latest episode of Extra here

Geological Society of Glasgow

https://geologyglasgow.org.uk/

President: Margaret Greene pres@gsocg.org

Secretary: David Webster sec@gsocg.org