



Hybrid Lecture on Wednesday 25th March 2026

Progress towards a basal Cryogenian GSSP: defining time on the Garvellach islands, SW Scotland

Presented by

Dr Elias Rugen PhD

Date: Wednesday 25th March 2026

**Venue: RSK Group offices, 2nd Floor, Chancery Exchange, 10 Furnival Street,
London EC4A 1AB**

This hybrid lecture is also being presented on Zoom

Venue opens and refreshments from 6.30pm. Lecture starts at 7pm

Lecturer: Dr Elias Rugen



Elias completed his undergraduate degree in Geology at Imperial College London before pursuing a Master's in Geochemistry at the University of Copenhagen. It was during his time in Copenhagen that he developed an interest in Precambrian geology.

In 2021, Elias began a PhD at University College London, supervised by Professor Graham Shields. It was Professor Shields who introduced him to the concept of Snowball Earth and, more significantly, sent him off to the Garvellach Islands in Scotland, where Elias has been conducting fieldwork for the past four years.

After receiving international media attention for his research in the summer of 2024, and being named the Geological Society's Early Career Geologist of the Year for 2025, Elias has been invited to present some of his latest work at the HCNRG Public Lecture Series.

Abstract

At the beginning of the Cryogenian Period, around 717 million years ago, ice caps advanced abruptly to cover the entire planet. Global ice cover is thought to have been attained relatively quickly, over thousands of years, because of the albedo effect – that is, the more ice there is, the more sunlight is reflected back into space, and vice versa. After reaching the equator, ice sheets persisted there for up to 58 million years. Understanding how our planet could have plunged into such extreme cold is still the subject of intense debate, but there is a problem.



Sedimentary records of the moment when ice first reached low latitudes are absent everywhere on Earth, or so we once thought.

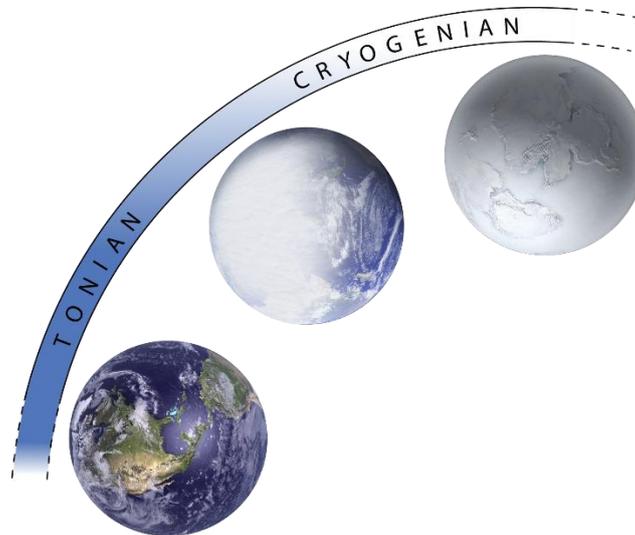


Figure 1. ‘Snowball Earth’ Transition.

Off the west coast of Scotland lies a chain of tiny islands called the Garvellachs that may hold some of the clues to a time in Earth’s history known evocatively as ‘Snowball Earth’, illustrated in Figure 1. The islands host the only known demonstrably transitional record from underlying carbonate rocks of the Tonian period into glacial rocks of the Cryogenian. Sedimentary observations of these late Tonian carbonates can be interpreted as deposition in warm tropical seas, full of bacterial life, before an observable transition into an increasingly frigid climate and the definitive movement of ice caps over the land; akin to seeing Greenland-scale ice caps descending on the Caribbean today.



Figure 2. The Garvellach Islands on a sunny day.

Elsewhere on Earth this pivotal transition into the Cryogenian period appears to have been removed by the erosive power of glaciation, resulting in a missing time gap in the sedimentary



record. However, on the Garvellachs no such gap is found, making it a truly unique location globally for Snowball Earth science.

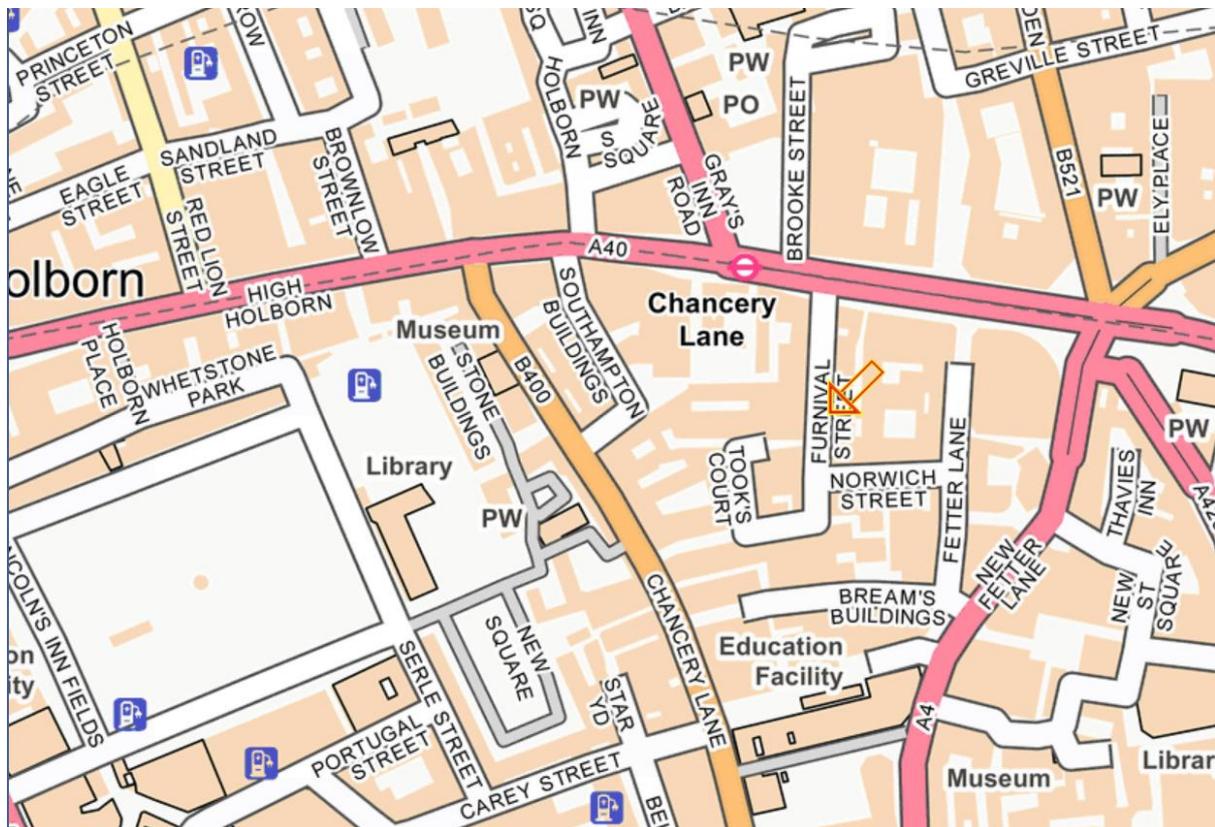
New geochronological age constraints from the rocks on the Garvellachs show that they were deposited between 717 and 660 million years ago, marking the first of two Snowball Earth glaciations in the Cryogenian. Armed with these new age constraints, and the unique preservation of the transition into this global glaciation, these Scottish islands may prove integral for understanding how and why Earth descended into a Snowball Earth climate state, whilst having ramifications for defining the yet ratified GSSP (Global Boundary Stratotype Section and Point) for the basal Cryogenian period.

Accessing the venue

The lecture is being held in a meeting room at RSK Group's offices on the 2nd Floor, Chancery Exchange, 10 Furnival Street, EC4A 1AB, London.

Furnival Street is located off the south side of High Holborn (A40) almost opposite Chancery Lane Underground Station (Central Line).

There are no car parking spaces available at this office.



This event is free of charge to all members of the Geological Society. Priority will be given to Fellows and Student Fellows of the Geological Society who are members of the Home Counties North Regional Group.

Please book your places on a first-come-first-served basis by e-mail to homecountiesnorthregionalgroup@gmail.com

Please provide your membership number when booking your place.

Accessing the virtual lecture

Please book your place for online ZOOM attendance, providing your membership number, by e-mail to homecountiesnorthregionalgroup@gmail.com and you will receive a link to the Zoom platform by email before the event.

For more information on the Home Counties North Regional Group visit the website <http://www.geolsoc.org.uk/hcnrg>

CPD (Continuing Professional Development) hours – This Home Counties North Regional Group event qualifies for your CPD hours spent travelling to/from and attending the event. The content is intended to be suitable for early career through to experienced geologists and related professionals.

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