East Midlands Geological Society

Spring Lectures 2026

Saturday 10th January 2026, 6.00 - 7.00pm

Late Ordovician subduction, super-eruptions and closure of the Tornquist Sea

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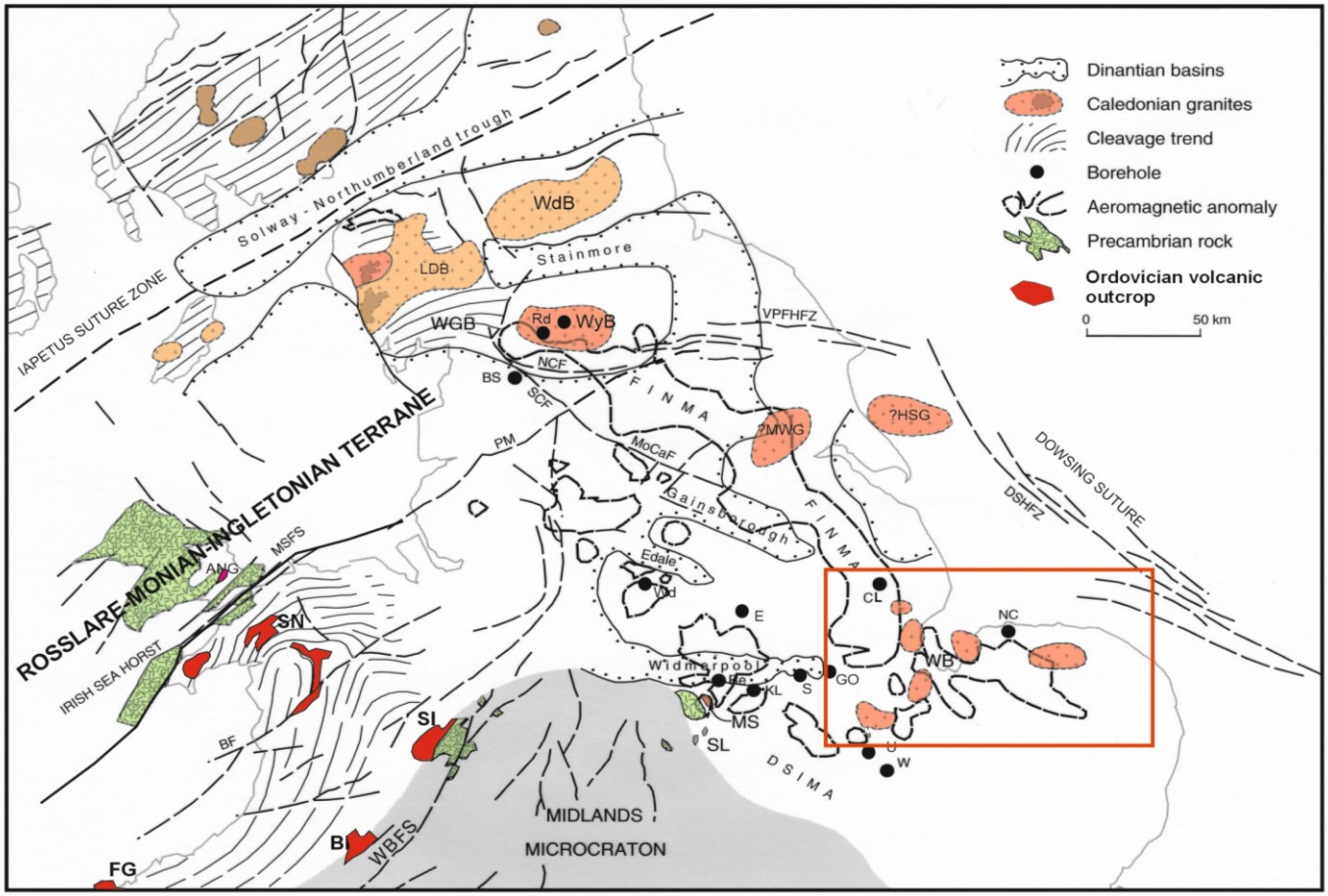

Venue: School of Geography, Sir Clive Granger Building, University of Nottingham, University Park, Nottingham, NG7 2RD *Google Maps*

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Abstract: In the Midlands and eastern England, Ordovician rocks are rarely exposed, Ordovician igneous rocks even more so, due to a Mesozoic sedimentary cover that thickens towards the North Sea. Quarries at Nuneaton, Mountsorrel and in south Leicestershire sample intrusive igneous rocks. Boreholes to the Caledonian basement in eastern England encounter further examples of intrusive and volcanic rocks and define a calc-alkaline geochemical trend, typical of subduction-related arc magmatism. Of particular interest are the volcanic rocks proved by two boreholes in the vicinity of The Wash, which have recently been very precisely dated at 454.4 ± 0.5 million years, placing them in the Sandbian stage of the late Ordovician. Further information from geophysical surveys in the region enables the plate tectonic context of this magmatic episode to be better understood. The new precise ages and forensic geochemical studies permit correlation of volcanic sources in The Wash Igneous Complex with thick deposits of tephra (ash) in the Ordovician stratigraphy of Scandinavia, which record some of the largest super-eruptions in Earth history. These may have resulted in global cooling and contributed to the first major global extinction event in the history of life at the end of Ordovician time, although this is presently a controversial topic.

Cover Image: Map of Mid to Late Ordovician basement structure and magmatic centres in southern Britain modified after Pharoah et al 1997. The red rectangle shows the location of the Wash Igneous Complex (WIC). Borehole locations: CL, Claxby 1; GO, Great Osgrove Wood; NC, N Creake 1; E, Eakring 146; K, Kirby Lane; Rd, Raydale; Rs, Rempstone; S, Sproxton; U, Upwood; W, Warboys. Other localities: AN. Anglesey; BW, Builth; LD, Lake District; MS, Mountsorrel; PE, Pembrokeshire; SL, S Leicestershire intrusions; SN, Snowdonia. Major negative Bouguer gravity anomalies: HS, Inferred Hornsea Granite; LD, Lake District; MW, Market Weighton; WB, Inferred Wash Batholith; WD, Weardale; WY, Wensleydale. Major positive magnetic anomalies: DSIMA, Derby-St Ives MA; FINMA, Furness-Ingleborough-Norfolk Magnetic Anomaly. Tectonic lineaments: DSHFZ, Dowsing-S Hewett Fault Zone; FHFZ, Flamborough Head Fault Zone; ISZ, Iapetus Suture Zone; MSFS, Menai Strait Fault System; WBFS; Welsh Borderland Fault System.