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Brief Summary

Continental crust is a fundamental geochemical reservoir that shaped the evolution of the Earth's atmosphere, ocean, and biosphere through the cycling of oxygen and nutrients. However, the timing and formation mechanism of continental crust is contested. Established models for continental crust formation rely on zircon crystals and the U-Pb, Lu-Hf, δO data they contain. However, zircons predominantly record the evolution of evolved (felsic) rocks and do not effectively record the formation of silica poor continental crust. To address this bias, detrital and magmatic apatite crystals will be used to track crustal growth by developing age constrained Sm-Nd and U-Pb databases. Effective models of continental crust formation should factor for the mafic component of continental crust. Accordingly, this new apatite database will be integrated with existing zircon databases, thus gaining a holistic understanding into the evolution of continental crust. This project will establish apatite as a novel tool to study the evolution of the continental crust. Reconstructing continental crust formation will have far-reaching implications for ore-deposit exploration, biochemistry paleo-tectonic modelling.

Education: University of St. Andrews & University of Exeter (The Camborne School of Mines)

Research interests: Geochronology, Economic Geology, Ore Deposits, Tectonics & Archean Earth

Thesis title: A window into Earth Evolution: Apatite as a new tool to track continental crust evolution

Supervisors: Professor Chris Kirkland & Dr Stijn Glorie

Publications: "Why it is time Wales protected its gold" (Nation. Cymru, 2021)

Conferences: Rooks, C.J.W., Finch, A.A., Clarke A.J.I., Scheerer, D.A., Wright, A.H., "Aillikite Diatremes and the Early Stages of the Gardar Rift System" (VMSG 2020, Plymouth)