Kolloquium:

Reading the History of the Deep Earth in Diamonds and Their Inclusions

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Speaker: Prof. Simon Kohn
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Diamonds and their inclusions provide unique opportunities to learn about processes in the deep Earth over a wide range of timescales. Most diamonds are sourced from 150-200 km depth in the lithosphere, but others originate from at least 800 km in the lower mantle. Furthermore, while many diamonds are ancient, as old 3.5 Ga, others crystallised shortly before their exhumation to the surface. The diamonds themselves contain trace elements such as N and H and more complex defects that evolve through time at a rate determined by the residence temperature in the mantle. Silicate and sulphide inclusions contain a wealth of geochemical information and can sometimes be dated with different geochronological systems.

In this talk I will focus on two complementary case studies. In the first I will show how infrared spectroscopic observations of zoning in diamonds can constrain the thermal history of the lithosphere and provide insights into the formation of cratonic lithospheric mantle. In the second, I will show how detailed mineralogical and geochemical studies of sulphide inclusions cast doubts on some previously published diamond ages, and the chronology of continental evolution that is built upon such data.