

A synchrotron journey to the Earth's core

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The Earth's formation is one of the most profound events in our history. Evidence from meteorites provides constraints on the refractory material from which the Earth formed, but the origin of volatile elements, including those that gave us oceans of water and the building blocks needed for life, are not well known. Surface reservoirs are generally well documented, but the Earth's interior may contain large hidden inventories. The core in particular, which probably formed during the accretion phase of the Earth itself, may harbour some of these volatile elements. Synchrotron experiments allow us to investigate this otherwise inaccessible part of the Earth in the laboratory. The presentation will illustrate how nuclear resonance experiments on iron and iron alloys provide constraints that can be directly compared to geophysical data, allowing us to look back in time to the beginning of Earth's history.