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Inductively Coupled Plasma Mass Spectrometry at the Boulby Underground Laboratory.

Tuesday 8 April 2025 13:30 (15 minutes)

Achieving unprecedented material radiopurity is paramount for ultralow background (ULB) physics experiments searching for rare events. In the BoulB laboratory, we have established a dedicated Inductively Coupled Plasma Mass Spectrometry (ICP-MS) facility to address this challenge. This presentation will first provide a concise overview of ICP-MS fundamentals. Subsequently, we will detail our specific ICP-MS system and the analytical methods we have developed for ultrasensitive quantitative analysis of elemental impurities, particularly long-lived radioisotopes like U-238, and Th-232, K-40, in detector materials. We will explore the capabilities and practical challenges encountered in our system when meeting the stringent radiopurity demands of current and future generations of ULB detectors, showcasing examples relevant to groundbreaking discoveries in astroparticle and high-energy physics.

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