

# Electroforming at Boulby deep underground laboratory

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Rare event searches, such as those for dark matter and neutrinoless double beta decay, require increasingly sensitive detectors. A critical aspect of this is the reduction of backgrounds in the detector material. High-grade copper is an attractive choice for detector materials, due to its commercial availability and lack of long-lived radioisotopes, the longest being  $^{67}\text{Cu}$  with a half-life of 61.8 hours. Despite this, copper still represents a dominant background, caused by impurities implanted during manufacturing or cosmogenic activation. To combat this, some experiments have turned to electroforming, a manufacturing method in which copper from solution is deposited onto a model by applying a current. Because of its favorable electrochemical properties, copper is preferentially plated compared to contaminants making the final product much purer and less active, often below the sensitivity of available assay detectors. In this contribution, the progress towards constructing a copper electroforming facility at Boulby, the UK's deep underground laboratory, will be outlined, which is key for several proposed future experiments such as DarkSPHERE. The near-term future plans to fully electroform a spherical proportional counter in the facility will also be presented.

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