

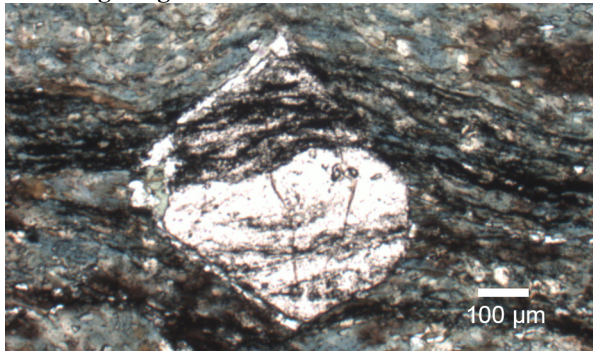
## Elements of Eoarchean life trapped in mineral inclusions

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Metasedimentary rocks from Isua, West Greenland (> 3.7 billion year old) contain <sup>13</sup>C depleted carbonaceous compounds, with isotopic ratios consistent with a biogenic origin. Metamorphic garnet crystals in these rocks contain bands of carbonaceous material contiguous with carbon-rich sedimentary beds in the host rock, where carbon is fully graphitized. Here we studied carbonaceous inclusions armoured within garnet porphyroblasts by *in-situ* Infrared absorption on  $\sim 10^{-21}$  m<sup>3</sup> domains within these inclusions. The absorption spectra are consistent with carbon bonding to N and O and likely to phosphate. C-H or O-H bonds could not be detected. These results are consistent with biogenic organic material isolated for billions of years and thermally matured at temperatures around 500 °C. They therefore provide spatial characterization for potentially the oldest biogenic carbon relics in Earth's geologic record.



**Figure:** Thin section showing a garnet crystal (bright particle) with dark bands of carbonaceous material.

Reference:

Hassenkam, T., Andersson, M. P., Dalby, K. N., Mackenzie, D. M. A. & Rosing, M. T. Elements of Eoarchean life trapped in mineral inclusions. *Nature* **548**, 78-81, doi:10.1038/nature23261

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