

Time-Resolved Two Million Year Old Supernova Activity Discovered in the Earth's Microfossil Record

Shawn Bishop¹, Peter Ludwig¹, Ramon Egli², Valentina Chernenko¹, Boyana Deveva¹, Thomas Faestermann¹, Nicolai Famulok¹, Leticia Fimiani¹, Jose Gomez¹, Karin Hain¹, Gunther Korschinek¹, Marianne Hanzlik³, Silke Merchel⁴, and Georg Rugel⁴

1. Physik Department, Technische Universität München, 85748 Garching, Germany
2. Geomagnetism and Gravimetry, Central Institute for Metrology and Geodynamics, 1190 Vienna, Austria
3. Chemie Department, FG Elektronmikroskopie, Technische Universität München, 85748 Garching, Germany
4. Helmholtz Zentrum Dresden-Rossendorf, Helmholtz Institute Freiburg for Resource Technology, 01328 Dresden, Germany

Using accelerator mass spectrometry, we have conducted a search for live, supernova-produced, ⁶⁰Fe atoms within biogenically produced magnetite (Fe₃O₄) crystals contained in two Pacific Ocean sediment cores. We have found a time-resolved ⁶⁰Fe signal in both sediment cores, above background, centered at approximately 2.1 Myr ago and spanning approximately 800 kyr duration (full width half maximum). The onset of this signal coincides with a known marine extinction event at the Pleiocene/Pleistocene boundary, and its shape will require eventual astrophysical interpretation to understand.