Contribution ID: **148** Type: **Contributed talk**

Search for neutron stars from the supernovae that delivered 60-Fe to Earth to constrain supernova nucleosynthesis

Tuesday 17 September 2024 15:20 (15 minutes)

60-Fe found in the Earth crust points to one or several core-collapse supernovae within 100-150 pc of Earth 1.5-2.5 Myr ago, probably from the young OB-associations in Scorpius, Centaurus, and Lupus.

We search for neutron stars formed in those supernovae: (i) We trace back the motion of all young neutron stars and runaway stars (whose former common multiple star system was disrupted by the supernova) to find cases where both were at the same place at the same time, as evidence for a supernova in a multiple star. This constrains time and distance towards the supernova and the mass of the progenitor star. We found one credible case: the pulsar PSR1706 and the runaway star zeta Oph (Neuhaeuser et al. 2020 MNRAS).

(ii) We also search for young nearby high-mass X-ray binaries consisting of at least one massive (OB) star and one compact object (usually a neutron star) in a close orbit to produce accretion and X-ray emission (PhD thesis K.-U. Michel).

We will present new results (i) and first results from (ii). Once distances and times of supernovae (and the supernova progenitor masses) that delivered 60-Fe to Earth are
determined, supernova nucleosynthesis models can be constrained.

Primary author: NEUHAEUSER, Ralph (Astrophysical Institute, University Jena, Germany)

Co-authors: Mr MICHEL, Kai-Uwe (AIU Jena); Dr HAMBARYAN, Valeri (AIU Jena)

Presenter: Mr MICHEL, Kai-Uwe (AIU Jena)

Session Classification: Plenary Session