

Presolar Stardust – the Oldest Solid Samples in the Lab

Presolar dust grains are solid samples of stars available for study in the laboratory. They are extracted from old, primitive meteorites and are identified by their exotic isotopic compositions that match the compositions of circumstellar dust grains. Their study provides information regarding nucleosynthesis, mixing, and stellar outflows that can be complementary to what is obtained by observational and theoretical astrophysical studies. Before the grains were incorporated into Solar System materials 4.568 billion years ago, they were exposed to galactic cosmic rays on their trajectories from their stellar sources. The analysis of cosmogenic nuclides in presolar grains provides a way of estimating their ages, the oldest ages of any solid samples determined in the laboratory. In my talk I will give examples of knowledge generated by the study of presolar grains. I will particularly focus on presolar exposure ages and will discuss implications for the understanding of the lifecycle of interstellar dust.

Best wishes,
Philipp