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Nuclear burning recorded in meteorites as a tracer of the birth of the Sun and its planets

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In the past half century, thanks to ever-growing precision, laboratory analysis of meteorites has revealed clear fingerprints of the nuclear reactions that happen in stars. First major nuclear-burning signatures were found as pure stellar material, in the form of radioactive nuclei and micrometer-sized stardust. More recently, the variable imprint of nuclear processes in stars has also been found in whole meteorite rocks, albeit much diluted. While comparison of these data to nuclear-burning predictions is not trivial, it carries the unique power to investigate the birth of Sun, even if it happened 4.6 billion year ago. I will show how nuclear burning recorded in stardust provides insight of the ancient solar neighborhood, radioactive nuclei on the Sun's birth environment, and bulk meteorite isotopic variability on the evolution of the proto-planetary disk and planet formation.

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