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Stellar cluster production of SLRs and their impact on planetary formation

The short-lived radionuclides (SLRs), such as ^{26}Al and ^{60}Fe , were the major heat sources responsible for the melting and differentiation of planetesimals in the early Solar system. The Earth and other terrestrial planets formed by accretion of such differentiated planetesimals. An interesting question is, how is heating provided by these SLRs related to the planetary conditions for life? The melting and differentiation of planetesimals is crucial to creating planets with iron-rich cores. The Earth's liquid iron core generates our planet's magnetic field, which acts as a shield from irradiation by powerful solar winds, and thus provides radiation-free conditions for complex life to thrive. Our project focuses on understanding the accumulative effect of abundance of SLRs from stellar clusters which then trigger a new generation of stars and planets to form, and how that contributes to the habitability conditions of those newly formed planets.

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