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**Understanding planetary evolution in the early Solar System via non-traditional isotopes**

Originated from similar building materials in the Solar System, Earth, other terrestrial planets, and large asteroids are widely different from each other as a result of distinct formation, differentiation, and evolution processes they experienced. Understanding these processes is vital to deciphering how planets achieved their current internal structure and chemical composition, the fate of volatiles throughout the geological history of a planet, and ultimately the favorable conditions leading to the development of habitable worlds. Recent advancement in mass spectrometry techniques enabled rapid exploitation in non-traditional isotope systems such as Fe and Cu, which brought us new ways to study planetary differentiation and evolution. In this talk, I will show how Fe isotopes can be used to understand planetary core crystallization.