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Tracing the Origins of Elements: Insights from AGB and Post-AGB Stars

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Low- and intermediate-mass (LIM) stars are fundamental to the Universe's chemical evolution, yet their element production remains poorly understood. Recent observations of post-AGB stars reveal striking chemical diversity—some exhibit strong carbon and s-process enrichment, while others show no trace of these elements. Binary interactions further complicate this picture, with most post-AGB binaries displaying photospheric chemical depletion, though recent discoveries challenge this trend. This diversity has profound implications for Galactic Chemical Enrichment models, which rely on theoretical stellar yields to trace the origins of elements. In this talk, I will present insights from multi-wavelength observations of post-AGB stars and advanced modelling to unravel this chemical diversity, highlighting recent advances and critical gaps in our understanding of LIM stars' contributions to the cosmic chemical budget.

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