

Oxygen in the local universe: Error and uncertainty in abundances

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The metal content of a galaxy is one of the most important properties used to distinguish between viable evolutionary scenarios and strongly influences many of the physical processes in the ISM. An absolute and robust calibration of extragalactic metallicities is essential in constraining models of chemical enrichment, chemical evolution, and the cycle of baryons in the cosmos. Despite this strong dependence on abundance, the calibration of nebular abundances from nebular emission lines remains uncertain. Different calibrations of the abundance scale require different assumptions, which may or may not be valid, and measurements, not all of which are easily obtained. MODS on LBT and the late Herschel Space Observatory are allowing us to clarify this long standing calibration uncertainty. The sensitivity of MODS is enabling the detection of numerous temperature sensitive lines in nearby galaxies and Herschel observations of the [O III] 88 micron fine structure line in nearby galaxies are enabling the determination of nebular abundances that are nearly independent of temperature. I will discuss current efforts at constraining the abundance scale using these modern facilities.