Volatiles in Protoplanetary Disks and the C/N Budgets of Terrestrial Worlds

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Compared to the Sun, the C/Si and N/Si ratios of the bulk silicate Earth are depleted by four to five orders of magnitude. What sets this depletion, and how might it vary in exoplanetary systems? In the core accretion model of terrestrial planet formation, the fate of volatile species depends on both their initial speciation in the protoplanetary disk and chemical/physical processing in planetesimals and planetary-scale bodies. This talk will examine the distribution of C-, N- and O-containing volatiles in the disks around young stars, using a combination of infrared, far-infrared and especially new (sub)mm-wave observations enabled by the Atacama Large Millimeter/submillimeter Array (ALMA), and discuss the delivery to and fate of such volatiles on nascent planetary surfaces.