

Circular Polarization And The Origin Of Biomolecular Homochirality

Jeremy Bailey; Anglo-Australian Observatory

The origin of the homochirality of biological molecules (the fact that living systems use almost exclusively left-handed amino acids and right-handed sugars) has been a puzzle since the last century. The discovery of an excess of left-handed amino acids in the Murchison and Murray meteorites suggests that homochirality reflects a bias that existed in primordial solar-system material before the origin of life. The action of circularly polarized light is the most likely source of such an asymmetry. I will report observations of circular polarization in star formation regions which show that polarization due to dust scattering in reflection nebulae may be able account for the chiral asymmetry. Since homochirality may be a prerequisite for life, it may be that the suitability of a planet for life depends on the polarization environment in the region in which the star formed.