

Astrophysical Masers

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Abstract

Masers, and lasers, represent one of the great technological breakthroughs of the past century. Despite the challenges that stood in the way of building terrestrial masers, nature has been successful in producing masers of its own. Monochromatic emission, at levels greatly exceeding emission in thermal equilibrium, have been observed in molecular species both within the Milky Way and in extragalactic sources, and are attributed to maser activity. That the conditions for a maser exist in interstellar space is, perhaps, surprising, and gives insight in to the conditions in which the masers occur. As the observed masers are generally associated with either a young, star forming, region, often still encased in gas and dust, or a red giant undergoing significant mass loss, finding and observing astrophysical masers provides a tool for learning about interesting astrophysical environments.

Keywords: masers, star formation, red giants, molecular clouds

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