

Molecular Hydrogen in Space

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The physics and chemistry of molecular gas are key to three fundamental questions in astrophysics: the formation of galaxies, stars and planets. Progress in these areas depends critically on our ability to observe the molecular gas in galaxies, especially H₂. H₂ initiates complex interstellar chemistry by bonding with heavier elements. H₂ is a tracer of the low-metallicity molecular material in the outskirts of galaxies, but also a tracer of the energetic processes that shape the structure of the interstellar matter, from galactic scales to the scales of turbulent dissipation. In that sense, H₂ is very complementary to CO. I will review what we learned from extragalactic H₂ observations, the perspectives with JWST, and some critical points that remain to be achieved on modelling and lab experiments.