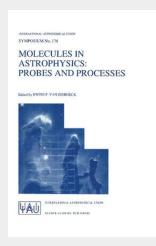
## Molecules in Astrophysics: Probes and Processes

Molecules are found in a large variety of astronomical environments, ranging from comets in the solar system to galaxies at high redshift. This book brings together astronomers, physicists and chemists to discuss the use of molecules as probes of astrophysical parameters, explore their role in the evolution of astronomical objects, and study the basic chemical processes that occur in space. The enormous progress in observational techniques is illustrated by studies of the physics and chemistry on scales comparable to the protosolar nebulae around high- and low-mass forming stars and planetary systems. Elegant new experimental techniques for the measurement of gasphase reactions at low temperatures, the analysis of spectra, and the investigation of surface adsorbates on interplanetary dust particles and meteorites are presented; the importance of accurate quantum chemical calculations is emphasized. Present knowledge of the composition of dust grains and polycyclic aromatic hydrocarbons is summarized. Other topics include models and observations of jets and outflows, photon- and X-raydominated regions, masers in and outside our galaxy, the comet D/Shoemaker-Levy collision with Jupiter, the envelopes and photospheres of late-type stars including brown dwarfs, diffuse and translucent clouds, and external galaxies ranging from the nearby Magellanic Clouds to distant quasar absorption line systems and starburst galaxies at the edge of the Universe.

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