PHOTODISSOCIATION REGION MODELS (PDR MODELS)

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Photodissociation regions (PDRs) are regions of neutral ISM whose physics and chemistry are driven by the impact of stellar FUV photons. Located in particular at the surface of molecular clouds in star forming regions, they reprocess a significant fraction of the light of the newborn stars into infrared emission (dust and line emission), contributing a major fraction to the total infrared spectrum of galaxies, and providing us with a wealth of tracers to study the physical conditions and feedback processes in star forming regions. In this lecture, I will introduce the numerous physical and chemical processes that govern PDRs and their emission. I will start from the most fundamental (H_2 formation and photodissociation) and progressively add details towards a more complete picture of PDRs. For each physical and chemical process, I will discuss existing modeling approaches. An overview of the observable tracers in different wavelength domains and of their link to the physical conditions will also be presented.