Photoionization modeling of astronomical plasmas

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Photoionized plasmas comprise a large variety of scenarios where gases are ionized and heated by electromagnetic radiation from a bright source. Spectra of these gases contain information about the composition, motion, excitation and ionization of gas. Deriving the physical conditions from observations depends on models that describe the micro-physics of the atoms, ions and free particles that conform the gas with photons.

In this presentation, I describe the different ingredients of the models and the current computational tools. I will also discuss the validity of some of the standard assumptions and the needs associated with future observations of complex astronomical phenomena.