Progress in modeling astrophysical plasmas*

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The Universe contains a broad range of plasmas with quite different properties depending on distinct physical processes. In this contribution I will give an overview of the recent developments in modeling such plasmas using the SPEX package developed at SRON. The origin of this package dates back to the early seventies of the last century. I will present recent work on the update of atomic parameters in the code that describes the emission from collisional plasmas, where older approximations are being replaced now by more accurate data. Further I discuss the development of models for photo-ionized plasmas in the context of outflows around supermassive black holes and models for charge transfer that are needed for analyzing the data from the upcoming ASTRO-H satellite.