

## RYDBERG ATOMS IN ASTROPHYSICAL PLASMAS: MODELING AND DATA RESOURCES

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This research examines the influence of Rydberg atoms (RA) across various astrophysical environments. It covers a wide range of physical conditions, enabling the simulation of different types of astrophysical plasmas. The study highlights the importance of Rydberg states in identifying weakly ionized regions within Active Galactic Nuclei (AGN)-including both broad-line regions (BLR) and narrow-line regions (NLR)-as well as in determining the populations of excited hydrogen atom states in the solar photosphere and in diagnostic modeling. The work also investigates weakly ionized geocosmic plasmas and white dwarf atmospheres. The findings are relevant to laboratory plasma experiments, offering valuable insights into plasma behavior under controlled conditions. The paper also outlines key data sources, such as SerVO, and discusses their integration with the VAMDC.

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