



## Clouds in the Galactic Sky – The Gaseous Halos of Galaxies from the Synergy of Observation and Theory

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Undoubtedly, the Earth's atmosphere is an integral part of its ecosystem. Everyday weather and long-term climate of the atmosphere are directly linked to activities on the surface of the Earth and vice versa. Gaseous halos, known as the circumgalactic medium (CGM), are the equivalent atmosphere of galaxies. The galactic climate arises from infalling gas from intergalactic space and enriched materials launched from the interstellar medium. The CGM is, therefore, one of the largest gas reservoirs with complex baryonic cycles. We need to improve our understanding of the CGM to achieve a complete picture of galaxy formation and evolution.

In this talk, I will first focus on the observational efforts to place empirical constraints on the spatial extent and the metallicity of the CGM. I will then present some theoretical work on the baryonic cycles in cosmological zoom-in simulations and show that the CGM provides orthogonal constraints to star formation and feedback processes. Finally, I will present a new high-resolution ( $< 1\text{pc}$ ) simulation study to model the CGM systematically with radiative cooling, thermal conduction, and magnetic fields.