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Zoom-in Numerical Simulations for Star Formation

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Star formation plays a crucial role in shaping its environment and is central to the evolution of planets, the interstellar medium, galaxies, and the universe as a whole. To bridge the gap between galactic-scale processes —where the initial conditions for star formation are set—and the formation of individual stars, we conducted state-of-the-art numerical simulations of a portion of a galaxy. These simulations include a wide set of physical processes, including gravity, turbulence, magnetic fields, radiative heating and cooling, and stellar feedback. From this simulated volume, we selected multiple active star-forming regions and used adaptive mesh refinement (AMR) techniques to zoom in and resolve star formation at high resolution. We analyze the statistical properties of the resulting stellar populations and explore how they vary across different regions, providing insights into the diversity of star formation environments within galaxies.

Astrophysics Field

Star Formation - Numerical Simulations

Author: ABBOUDEH, Georges (AIM - CEA Saclay)

Orateur: ABBOUDEH, Georges (AIM - CEA Saclay)

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