Simulating the Birth of Stars : The Second Gravitational Collapse

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Understanding the birth of protostars and their circumstellar disks, their interaction and evolution, as well as the role of the magnetic field in this process, is an observational challenge and is mainly studied numerically, but the integration time after protostar formation is still limited to a few years (Ahmad et al. 2025).

To integrate further back in time, we are running a simulation of the core collapse with the GPU accelerated code IDEFIX (Lesur et al. 2023) on a spherical grid, including non-ideal magnetohydrodynamic effects (ambipolar and ohmic scattering). This poster will present the numerical configuration and the current results.