

Computer Simulations of the Early Universe

Monday, 7 September 2020 09:00 (30 minutes)

We are now able to simulate much of the early universe from the time of the Electro-Weak Phase Transition through the end of primordial nucleosynthesis. This simulation is performed using a General Relativistic Magnetohydrodynamic code based on the Cactus framework. It solves both the relativistic magnetohydrodynamic equations and Einstein's equations of General Relativity. As a result, it can simulate: magnetogenesis, primordial gravitational waves, turbulence, primordial perturbations and the role of dark matter in the early universe. Future work will involve extrapolating this work to the present epoch.

Primary author: GARRISON, David (University of Houston Clear Lake)

Co-author: Mr BARRERA, Joshua (University of Houston Clear Lake)

Presenter: GARRISON, David (University of Houston Clear Lake)

Session Classification: COSMOLOGY, DE, DM, COMPACT STARS, GRAVITY, BHs, GWs