

# Inhomogeneous cosmological simulations with numerical relativity

*Monday, 17 September 2018 09:00 (30 minutes)*

High-precision cosmological surveys are due to deliver measurements accurate to the percent level. In order to ensure we correctly interpret these data, we need to be sure that our cosmological model is accurate. The current standard model assumes that the Universe is homogeneous and isotropic. These assumptions are valid at early times and on very large scales. On smaller scales, these assumptions are called into question. Smaller-scale nonlinear structures will affect light propagation, and hence our observations. The extent our observations will be affected can only be fully addressed with numerical relativity. We use the Einstein Toolkit to perform cosmological evolutions with full numerical relativity. I will present our results of averaging a truly inhomogeneous, anisotropic matter distribution and how this compares to the equivalent FLRW model.

**Presenter:** MACPHERSON, Hayley (Monash University)

**Session Classification:** Monday Session 1