Contribution ID: **17**                                                      Type: **Presentation**

# The local dark matter distribution from hydrodynamic simulations

*Monday 20 June 2016 11:50 (25 minutes)*

Our lack of knowledge of the details of the dark matter distribution in the Solar neighborhood introduces significant uncertainty in the interpretation of dark matter direct detection data. Dark matter only simulations of galaxy formation predict local velocity distributions which deviate substantially from a Maxwellian. I will discuss the local dark matter density and velocity distribution of simulated Milky Way analogues obtained from the high resolution EAGLE and APOSTLE hydrodynamic simulations which include baryons. To make reliable predictions for direct detection searches, we identify simulated haloes which satisfy the Milky Way observational constraints. Using the dark matter distribution obtained for the selected Milky Way analogues, I will present an analysis of direct detection data, and show how the allowed regions and exclusion limits set by direct detection experiments in the dark matter mass and spin-independent cross section plane shift with respect to the Standard Halo Model.

**Primary author:**   BOZORGNIA, Nassim (GRAPPA, University of Amsterdam)

**Co-authors:**   FRENK, Carlos (Institute for Computational Cosmology, Durham University);  CALORE, Francesca (GRAPPA, University of Amsterdam);   BERTONE, Gianfranco (GRAPPA, University of Amsterdam);   SCHAYE, Joop (Leiden University);   NAVARRO, Julio (University of Victoria);   LOVELL, Mark (GRAPPA, University of Amsterdam);   SCHALLER, Matthieu (Institute for Computational Cosmology, Durham University);   CRAIN, Robert (Liverpool John Moores University);   THEUNS, Tom (Institute for Computational Cosmology, Durham University)

**Presenter:**   BOZORGNIA, Nassim (GRAPPA, University of Amsterdam)