Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Simulating Cosmic Reionization and its Observable Consequences with Fully-Coupled Radiation-Hydrodynamics PAUL SHAPIRO, Department of Astronomy, The University of Texas at Austin — I will summarize recent progress in modelling the EOR by large- scale simulations of cosmic structure formation, radiative transfer and their interplay. I will describe the first fully-coupled radiation-hydro simulations of reionization and galaxy formation in the Local Universe, in a volume large enough to model global reionization and with enough resolving power to follow the formation and evolution of all the atomic-cooling galactic halos in that volume. A box 91 cMpc on a side was simulated from a constrained realization of primordial fluctuations, chosen to reproduce present-day features of the Local Group, including the Milky Way and M31, and the local universe beyond, including the Fornax and Virgo clusters. These simulations are called CoDa, for "Cosmic Dawn". CoDa I and II, by hybrid CPU-GPU code RAMSES-CUDATON, used 4096-cubed N-body particles for dark matter and 4096-cubed cells for gas and ionizing radiation. CoDa I-AMR, by hybrid CPU-GPU code EMMA, used 2048-cubed particles and 2048-cubed initial cells which refined. All simulations were on the Titan supercomputer at Oak Ridge.

Paul Shapiro
Univ of Texas, Austin

Date submitted: 12 Jan 2018 Electronic form version 1.4