## R02a Simulating NGC4303 and NGC3627: Barred Spiral Galaxies – Interacting and Isolated

E. J. Iles, T. Okamoto, A. Pettitt –Hokkaido University

Understanding the formation and evolution of observable attributes in galaxies is important for deepening our knowledge of the properties and processes which govern physics in the universe. As such, there is a long history of research in this area, both through observations and numerical simulations. Here, results for a selection of Smoothed-Particle Hydrodynamic (SPH) simulations are presented to consider star formation properties in barred spiral galaxies through both interacting systems and in isolation. These have been performed using n-body SPH to evolve a stellar population and associated gas disk comparable to observational results for the specific, well-observed, systems: NGC4303 (isolated) and NGC3627 (interacting). Observational data constraints, in the form of galactic rotation curves and surface densities, were used to specify the simulation parameters. The simulation was evolved with sophisticated heating, cooling and stellar feedback acting on the gas. Morphology and star formation properties for each target system type were analysed and compared, both with respect to each-other and the corresponding observational literature. Through considering star formation features across each component of the disk – bar, arm, inter-arm regions – as well as the overall trends in each case, conclusions are drawn as to the impact of a central bar and effects arising from whether a galaxy is involved in an interaction or effectively isolated.