



PHYSICS AND ASTRONOMY SEMINAR

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“Footprints of the Magellanic Clouds and Sagittarius dwarf galaxy on the Milky Way dynamics.”

Abstract

In this talk, I will review recent observational and theoretical results on the Milky Way from its outermost parts in the stellar halo all the way to the solar neighbourhood. I will show that the Milky Way is far from being a quiescently evolving galaxy as often suggested and that signs of violent satellite galaxy encounters linger on, both in the stellar halo and stellar disc. In particular, I will focus on the effects of the Milky Way's two most luminous satellites on its dynamical evolution - the Magellanic Clouds and the Sagittarius (Sgr) dwarf galaxy. I will show how the Large Magellanic Cloud is currently affecting both the kinematics of stellar halo tracers from the smooth halo to individual streams as well as that of the Galactic disc. Equally important for the disc's evolution, I will discuss the origins of outer disc structures with respect to the orbital mass-loss history of Sgr, the dark matter halo wake response as well as Sgr's tides. By presenting results from live N-body simulations of the interaction of Sgr with the Milky Way, I will show that these pre-Gaia models in light of Gaia DR2 are qualitatively, and to a large degree quantitatively able to reproduce many of the recently uncovered features in the 6D Gaia samples. I will examine the origins of these various structures in the context of Sgr impact model which provides a unifying model over a decade in scale radius. I will conclude with some falsifiable predictions of this model which should motivate future studies