



PHYSICS AND ASTRONOMY SEMINAR

Professor Annalisa Pillepich,

**“The many diverse manifestations of supermassive
black-hole feedback”**

Abstract

“Feedback from super massive black holes (SMBHs) is commonly invoked in state-of-the-art large-scale cosmological galaxy simulations to halt star formation in massive galaxies. In fact, no other mechanism so far has been shown to be capable of returning entire populations of simulated massive quenched galaxies that are consistent with the observed red sequence and quenched fractions. In this talk, I will leverage the IllustrisTNG cosmological galaxy simulations to gain insights and testable predictions on the manifestations of these energetic phenomena. With IllustrisTNG, with one unique set of physical ingredients, we simultaneously resolve and model the inner structural details of thousands of galaxies across five orders of magnitude in stellar mass, across environments, and together with the evolution and dynamics of the inter-stellar, circum-galactic and inter-galactic media. We are putting together ever more quantitative and plausible evidences as to the role that feedback from SMBH can have, not only in shaping galaxy structural properties and galaxy populations across 90 per cent of the Universe’s history, but also in regulating the thermodynamical, ionization, and metal enrichment properties of the cosmic gas across halo scales and beyond. In particular, I will show how the IllustrisTNG model predicts that the gaseous atmospheres within and around galaxies are X-ray **brighter** for star-forming than for quiescent galaxies at the transitional mass scale of 10^{10-11} solar masses. And I will discuss how novel results on the observed quenched fractions from SDSS support the ejective character of SMBH feedback from the central galaxies in groups and clusters at low redshift. Image teaser: https://www.tng-project.org/static/tng/media/boxImage_TNG100-1_gas-velmag_thinSlice_3840.png”

Thursday, December 10, 2020

11:00 a.m.

Zoom link:

<https://uvic.zoom.us/j/84990026520?pwd=WTdoeGZlUVl6Y0JlSCt5bENNU0Vndz09>