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Galaxy assembly, outflows and the evolution of disks with the IllustrisTNG simulations (Annalisa Pillepich)(I)

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TNG50 is the last installment of the IllustrisTNG project (www.tng-project.org), a series of three cosmological gravity+magnetohydrodynamics simulations for galaxy physics. It returns an unprecedented combination of statistics and numerical resolution, so that we can quantify the evolution of massive star-forming galaxies at high redshift while simultaneously following, for example, the interactions of dwarf galaxies within a Virgo-like galaxy cluster all the way to the present epoch. In this talk, I will give an overview of the insights that these simulations are allowing us to uncover on the evolution of galaxy demographics and of galaxies' structures and morphological components. I will focus on the quantitative details of gas outflows and their relation to galaxy properties, the emergence of stellar and gaseous disks across cosmic times from both a structural and kinematical perspective, and the theoretically-expected mass fractions of dark matter within the innermost regions of galaxies.

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