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Maria Vittoria Zanchettin - AGN driven winds and gaseous discs in local Seyfert galaxies: high resolution study of the multiphase ISM with ALMA, MUSE and JVLA

Monday, 12 June 2023 17:10 (20 minutes)

In this talk I will discuss the physics of the multiphase gas in local active galaxies and the impact of the Active Galactic Nucleus (AGN) on the host galaxy evolution. AGNs can generate winds and jets that interact with the host galaxy interstellar medium (ISM), potentially altering both the star formation and the nuclear gas accretion. I will focus on the cold molecular and warm ionized phases of the ISM, using ALMA and MUSE/VLT data to probe the kinematics and interaction of the different gas phases, over a broad range of physical scales. I will present a detailed dynamical modeling of the gas component through which we can reconstruct the distribution and kinematics of the multiphase discs, winds and their interaction, from nuclear out to several kpc-scale. By exploiting spatially resolved sub-mm and optical emission lines, we are able to derive the best estimate of the velocity field, the spatial distribution, and electron density and therefore properly quantify both the ionized and molecular mass across the disc, narrow line region (NLR) and outflow, and their relative weight. I will present the application of our approach to the IBISCO sample, a sample of local hard-X-ray selected Seyfert galaxies. In the peculiar object NGC2992, part of the IBISCO survey, ALMA data allows to resolve a dust reservoir co-spatial with the molecular disc, therefore quantifying the gas-to-dust ratio. JVLA data shows the presence of two components, one due to expanding radio bubbles and the other due to star formation in the disc. By exploiting radio and sub-mm emission we are able to derive the spatially resolved star formation law on scales of ~ 200 pc.

Session Classification: Local Universe