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Going deep with MHONGOOSE: uncovering low column density HI with MeerKAT

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How galaxies replenish their gas supply in order to sustain star formation, is a research topic of many of the new and upcoming neutral atomic hydrogen (HI) surveys on the SKA precursor instruments. This replenishment, or accretion, of gas can potentially be detected in HI at column densities one or two orders of magnitude below previous observational limits. The Meerkat HI Observations of Nearby Galaxy Objects - Observing Southern Emitters (MHONGOOSE), a large survey programme with the SKA-precursor telescope, MeerKAT, is currently underway and is providing the deepest and most sensitive HI data of nearby galaxies until the advent of the SKA. Using the combination of MeerKAT's impressive column density sensitivity and high spatial resolution, we are now routinely detecting and imaging HI at column densities of $\sim 10^{18} \text{ cm}^{-2}$, two orders of magnitude below the column densities typically found within the main galaxy disks. We are therefore beginning to uncover, in exquisite detail, the low-column density HI gas in the outskirts of galaxies, and at the same time, the complex morphology of the HI in the galaxy disk. In this talk, I will present some results to come out of the first full-depth MHONGOOSE observations which provide a tantalising picture of what is still to come, both from MHONGOOSE but also from the SKA.

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