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Definitive characterization of the ISM in the Local Universe: SKA and other facilities - 15'

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Understanding the interplay between the various components of the interstellar medium (ISM: dust, atomic and molecular gas) in galaxies of the Local Universe is of fundamental importance for studies of galactic formation and evolution. In the last decade, thanks in particular to *Herschel*, we made a considerable effort in the study of one of these components, the dust. In this framework, the DustPedia project has been devised aimed at performing a complete characterization of dust in the Local Universe. However, we need information on all the phases of the ISM, including the gas, to draw definitive conclusions on it.

Exploring the cosmic evolution of the gas content of galaxies is a key science driver for **SKA**, and DustPedia is supporting this providing a first important step in understanding how the cold ISM related to the dust content, and to galaxy ability to form stars. We present the main scaling relations between uniformly homogenized data of molecular and atomic gas, and dust for a sample of ~450 nearby ($z < 0.01$), late-type galaxies extracted from the DustPedia sample. Only such a large and coherent dataset of all phases of the ISM can provide a definitive view of the ISM in the Local Universe and permit to link it with that at high redshift, tracing its evolution.

ALMA is revealing the molecular gas component through several tracers, as e.g. CO, detectable at millimeter wavelengths, while telescopes as JVLA and, in future, **SKA** detect the atomic gas component (21cm-HI). Our approach therefore represents a clear example of **synergy** between **SKA** pathfinder/precursors, ALMA, and *Herschel*, in addition to put us in a favored position for the forthcoming use of **SKA**.

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