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New frontiers in galaxy clusters with SKA-LOW

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Galaxy clusters host radio emission in different flavours and on very different angular scales: from the compact emission of starburst galaxies and “radio quiet” AGN, to the extended lobes of the more powerful radio galaxies, to the impressive megaparsec scale diffuse emission associated with the ICM in the form of halos and relics. The latter, as well as the lobes of radio galaxies, are best studied at low frequency (i.e. below 1 GHz), due to their steep synchrotron spectrum. SKA-LOW is thus the instrument which will inherit and improve on the role that ASKAP, LOFAR, MWA, GMRT and the VLA are presently playing in this field. In this presentation I will first provide an overview of the SKA-LOW, with particular emphasis on the collaboration between Italy and Australia. I will then summarize the current status of our understanding of the radio emission in galaxy clusters, and show some very recent results obtained with the SKA-LOW precursors and pathfinders which represent the state-of-the-art knowledge. I will finally comment on the expected impact of SKA-LOW. In the very last part of my presentation I plan to bring the attention to the need for stable and long-lasting institutional programmes of bilateral cooperation and funding schemes between Italy and Australia.

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Session Classification: The Square Kilometre Array (SKA) project : chair G. Umata