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LOFAR and LOFAR 2.0 : una nuova finestra per osservare l'Universo

Wednesday 4 June 2025 17:45 (25 minutes)

“LOFAR, the Low-Frequency Array, is the largest radio telescope operating at low frequencies and the most important pathfinder of the SKA-low. Its geographical extent enables high-resolution imaging comparable to the Hubble and James Webb space telescopes, while also providing a large field-of-view and the ability to see how the sky changes on timescales of milliseconds or less.

Thanks to its unprecedented sensitivity and angular resolution, which are orders of magnitude better than those of previous radio telescopes operating at low frequencies, LOFAR is opening a new window for the observation of the Universe and in these years has led to ground-breaking discoveries in several areas of astrophysics and cosmology.

Nonetheless, the full scientific potential of the LOFAR array remains unharnessed due to data transport and computational bottlenecks. Some of these limitations will be overcome by the soon-to-be deployed LOFAR2.0 upgrade which will allow increasing the computational capacity at the LOFAR antenna fields by a factor of 10 and will push the sensitivity of the radio telescope at the lowest frequencies by a factor of 5.

In this talk I will review the most relevant results obtained with LOFAR data and the scientific contribution of the Italian community

with particular focus on the area of the non-thermal emission from galaxy clusters and large scale structure of the Universe, and will discuss the prospects with LOFAR 2.0.”

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Session Classification: Astronomia radio: verso SKAO e ngVLA (chair: F. Govoni)