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The sub-uJy radio sky at sub-arcsecond resolution: lessons learned from VLA extragalactic radio surveys

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Radio continuum imaging has been a key approach to trace the production of stars and the activity of supermassive black holes at redshifts $0 < z < 5$ –a cosmic epoch marked by the dominant fraction of star formation that is obscured by dust. In recent years, our team has pushed the resolution and sensitivity limits of the Very Large Array (VLA) to obtain some of the deepest and sharpest radio continuum images ever obtained, providing unique constraints on the radio morphologies of massive star-forming galaxies at high redshifts. In this talk, I will present updates on the multi-frequency VLA radio surveys in the GOODS-N, Frontier, and CEERS fields that reach sub-uJy sensitivity and sub-arcsecond resolution at 3-10GHz. After summarizing the available data products and initial science results, the talk will focus on the imaging challenges faced to produce and characterize the aforementioned radio surveys. In particular, I will present an empirical analysis that explores different imaging algorithms to minimize the total fraction of spurious sources in deep, high-resolution radio continuum maps, which will be key to explore future SKA and ngVLA blind radio surveys.

keywords

survey overview, imaging, star-forming galaxies

In-person or online?

in-person

Career level

ECR

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