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The promise of next-generation RC surveys: Revealing the physics and evolution of galaxies and AGN in the SKA era

A wealth of new data from upgraded and new radio interferometers are rapidly improving and transforming our understanding of the faint extra-galactic radio sky. Indeed the mounting statistics at sub-mJy and μJy flux levels is finally allowing us to get stringent observational constraints on the faint radio population, and on the modeling of its various components. In this talk I will provide a brief overview of the latest results, focusing on star-forming galaxies and (low power) Active Galactic Nuclei (AGN), the two populations dominating the faint extra-galactic radio sky. In particular I will highlight a) the benefit of wide-area deep samples to provide statistically robust constraints on radio source demography and evolution, and b) the added value of sub-arcsec resolution to get an unbiased census of SF, and to address the role of AGN feedback in galaxy evolution.

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