

# The Third National Workshop on the SKA Project - The Italian Route to the SKAO Revolution



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## Clues on the evolving infrared-radio correlation towards the SKA era

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Understanding what drives the observed correlation between total infrared and GHz-radio emission in galaxies ("infrared-radio correlation", IRRC) is a major quest in extra-galactic astronomy, in order to calibrate radio emission as a star formation rate (SFR) indicator. We have recently calibrated the IRRC in the COSMOS field by exploiting deep VLA and MeerKAT continuum surveys, combined with exquisite multi-wavelength ancillary data. Starting from a sample of  $>400,000$  star-forming galaxies selected in stellar mass ( $M_*$ ), we investigate how the IRRC varies as a function of both  $M_*$  and redshift, out to  $z \sim 4$ . We stack deep radio and infrared images in different ( $M_*$ ,  $z$ ) bins, carefully removing radio-excess AGN candidates via a recursive approach. We find that more massive galaxies are radio brighter at fixed infrared luminosity than less massive counterparts, at all redshifts. I will discuss possible physical interpretations of these findings. Our study provides a leap forward in understanding the radio-SFR relation at different  $M_*$  and cosmic epochs, which will prove crucial in future ultra-deep SKA surveys to convert radio detections into accurate SFR measurements.

### Research area

Extragalactic Continuum (galaxies/AGN, galaxy clusters)

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