

Automated identification of diffuse radio emission in all-sky surveys with Radio U-Net

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The next generation of radio telescope arrays promises unparalleled sensitivity and resolution, unveiling a wealth of faint and diffuse radio sources in galaxy clusters and beyond. Conventional cataloging approaches struggle with the complexity of such data. To address this, we introduce Radio U-Net, a convolutional neural network based on the U-Net architecture, tailored for identifying diffuse radio sources, such as haloes and relics. Trained on synthetic observations derived from cosmological simulations, Radio U-Net demonstrates robust segmentation capabilities, achieving high accuracy in both detection and morphological recovery of radio sources. In this talk, I will present our network and its application to the LOFAR Two Metre Sky Survey data.

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