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Cosmic depth and detail: advancing LOFAR imaging workflows to unveil the deep high-resolution universe

Jong, J.M.G.H.J. de

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Propositions
accompanying the thesis
Cosmic Depth & Detail

Advancing LOFAR imaging workflows to unveil the deep high-resolution universe

1. The deeper our LOFAR observations and the more refined our direction-dependent calibration, the better we can unravel the origin of diffuse Mpc-scale radio bridges between pre-merging galaxy clusters. (*Chapter 2*)
2. Deep sub-arcsecond angular resolution imaging is vital to better understand the cosmic evolution of Fanaroff-Riley type I and II radio morphologies beyond redshift $z=0.8$. (*Chapter 3*)
3. Constructing an accurate sky model for the primary in-field calibrator, when calibrating the international LOFAR stations, can eliminate the need for astrometric and flux-scale corrections in the final image products. (*Chapter 4*)
4. Sometimes you need to revisit the old “forgotten” techniques to push the boundaries with modern pipelines. (*Chapter 5*)
5. LOFAR does not have one optimal angular resolution.
6. Neural networks can replace our human eyes for performing quality inspection during the calibration process of radio astronomical data.
7. Developing the best strategy for sub-arcsecond resolution wide-field imaging with LOFAR is a balancing act between image quality and computational costs.
8. To ensure the highest quality science, prevent wasted time, and potential harm to academic careers, scientific journals should implement more effective filters for selecting referees.
9. Pursuing a PhD in astronomy becomes far more enjoyable if you have worked in industry before.
10. It is possible to complete a PhD in radio astronomy without knowing anything about radio astronomy beforehand.
11. Being unable to consistently produce fluent speech is not the same as being disabled to speak.
12. The scientific and other international communities should play an active role in demonstrating the power of global collaboration, especially at the current time, when the urgent crises require global solutions.

Jurjen Michiel Gerrit Hendrik Jan de Jong
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