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Prying eyes on radio skies: pushing the high-resolution low-frequency frontier with LOFAR

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Propositions

accompanying the dissertation

Prying Eyes on Radio Skies

Pushing the high-resolution low-frequency frontier with LOFAR

by

Frits Sweijen

1. Ultra-steep spectra of high-redshift radio sources above $z \approx 2.5$ are likely to result primarily from inverse Compton losses from scattered cosmic microwave background photons (Chapter 3).
 2. The International LOFAR Telescope is a powerful instrument for wide-field sub-arcsecond imaging, but the associated computational cost still needs to be reduced (Chapter 4).
 3. There is a population of active galactic nuclei among hyperluminous infrared galaxies that is easily missed without high-resolution radio observations (Chapter 5).
 4. There is no single correct definition of “size” to attribute to sources. What matters most for a meaningful comparison between (empirical) simulations and observations, is using a mutually consistent definition (Chapter 6).
 5. Quintessential all-sky surveys of survey instruments do not belong in community proposals. Their legacy value makes it the responsibility of the hosting observatory to facilitate such endeavours.
 6. A radio astronomer’s confidence is reflected in how much of the background they are willing to show in their images.
 7. Local compute resources are essential for development of software and pipelines, but when scaling up, investing in national or international resources should be the preferred choice.
 8. Pruning “raw” data from astronomical archives should be a last resort. One irrevocably cuts off a branch of history from future generations and data may have been taken under conditions that may not be available for a long time.
 9. Science drives software and software drives science. A standardised data reduction pipeline should therefore not have more than three mandatory inputs.
 10. Offering resources on how to deal with stress, or similar, is beneficial to any institution, but without an honest reflection on the cause of these symptoms, they only emphasize that you are the problem.
 11. One will never “have time”. You have to make it. It is at that moment when your true interests are revealed.
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