
Precision cosmology with fast radio bursts

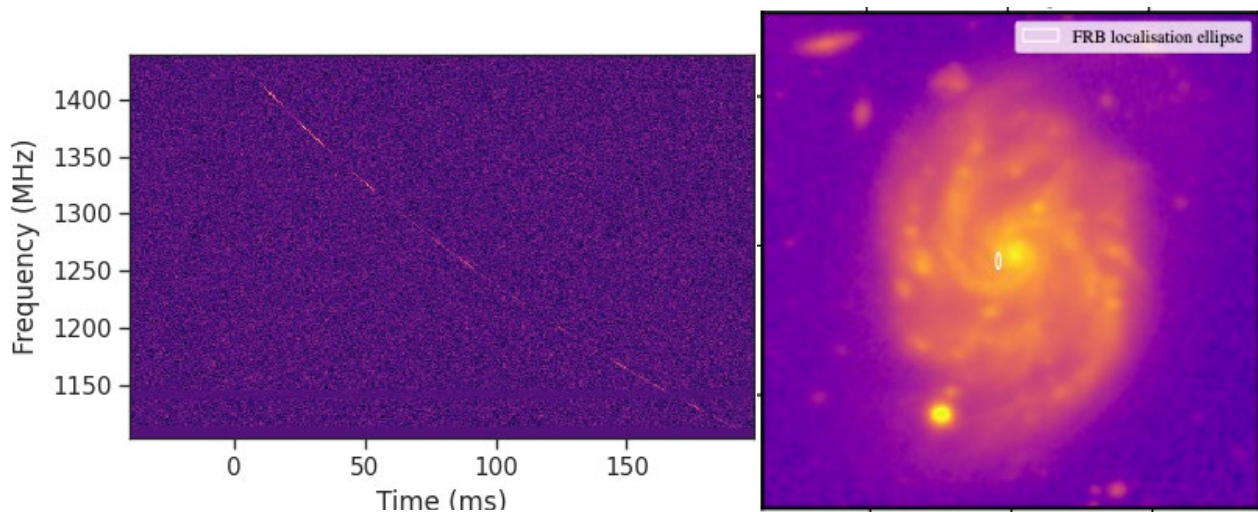
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Description:

Fast radio bursts (FRBs) are millisecond radio transients that are powerful enough to reach us despite being emitted from distant galaxies when the Universe was half its current age. Two major questions haunt the dreams of FRB astronomers: what causes these extreme events, and what can they tell us about the structure of the Universe? This PhD aims to answer both questions at once.



FRBs last milliseconds (left), and come from distant galaxies (right).

The Curtin Institute for Radio Astronomy (CIRA) is a member of the Commensal Real-time ASKAP Fast Transients Survey (CRAFT) with the Australia Square Kilometre Array Pathfinder (ASKAP). The CRAFT project has been detecting FRBs, determining their arrival directions to within a ten thousandth of a degree, and identifying the host galaxies from which they came. See [here](#) for an example of the impact of this work. This project will:

- Fit FRB data to cosmological and FRB population models
- Analyse nanosecond FRB data for signs of interaction with dark matter or astrophysical plasma encountered during propagation
- Study the response of the ASKAP FRB detection system to determine how this might bias our estimates

The field of FRB science is dynamic and rapidly evolving, and a successful candidate should be prepared to adapt their research as new discoveries come to light, and be prepared to work with national and international collaborators.
