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Fast radio bursts: ASKAP and beyond

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Fast radio bursts (FRBs) are intense pulses of radio emission now known to originate in distant galaxies. They are showing their promise as tools to understand extreme physical processes and environments, and as powerful probes of the diffuse cosmic web of baryons, nearly impossible to study otherwise. One of the key instruments for detecting and studying FRBs has been the Australian SKA Pathfinder, owing to its wide field of view and bespoke FRB detection systems. In this presentation, I will highlight recent discoveries made using ASKAP's latest fast transient detection system, an image based system capable of searching 24 trillion pixels per second. This includes the first repeating FRB source detected with ASKAP, and one of the rare class of FRB originating from an elliptical galaxy. I will discuss how these discoveries are enabling us to use FRBs as cosmological probes and unlock the cause and source of FRB emission. I will conclude by motivating future image plane FRB detection systems, both with the SKA and an all-sky Southern hemisphere aperture array.

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