research highlights

TRANSIENT SKY

Fast radio bursts down under

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Fast radio bursts (FRBs), energetic transient events that last no more than a few milliseconds, were first observed in 2007 by the Australian Parkes telescope. Building on this heritage, Keith Bannister and collaborators present the first FRB detection with the newly minted Australian Square Kilometre Array Pathfinder (ASKAP). The detected FRB is extremely bright, with an integrated flux over its duration of almost 60 Jy ms.

This detection was made possible by the unique capabilities of ASKAP, whose 12-metre radio antennas are equipped with phased array feeds (PAFs). Through their multiple beams on the sky, PAFs provide an effective field of view of 160 square degrees for the combined 8-antenna array. For comparison, Parkes only covers 0.6 square degrees for any given pointing. This orders-of-magnitude improvement in sky coverage, together with the increased sensitivity, makes ASKAP a uniquely powerful survey instrument for these very rare transient events.

With the wide bandwidth of their detectors, Bannister *et al.* also constrained the spectrum of the FRB, which shows a drop-off above 1,400 MHz. Furthermore, since the FRB was detected in multiple beams, localization was achieved to a precision of a few tens of square arcminutes, showcasing the potential of the full ASKAP array to not only detect FRBs but to actually characterize them as a population.

Marios Karouzos