A brilliant flash of radio waves from the distant universe has given a unique glimpse of the gas that lies between galaxies. The flash was captured and analysed by a mostly Australian team, using CSIRO’s Parkes telescope and the results were published in the journal *Science* today.

‘This flash lasted just a third of a millisecond, making it one of the briefest we have seen,’ said research team co-leader Dr Ryan Shannon of CSIRO*, the International Research Centre for Radio Astronomy Research (ICRAR) and Curtin University.

Called fast radio bursts, or FRBs, such cosmic flashes were discovered with the Parkes ‘scope in 2007. Just 18 have been spotted to date, most with the Parkes. Astronomers think that between 2,000 and 10,000 go off all over the sky every day but their cause is unknown. Coming from a small patch of sky containing only distant galaxies, the flash in question, FRB 150807, is believed to have originated more than a billion light-years away, according to CSIRO in a statement of 18 November.

Dr Vikram Ravi of Caltech who co-led the team with Dr Shannon said it was also exceptionally bright: ‘By far the brightest measured since the first one in 2007.’

Combined brightness and distance meant FRB 150807 offered an unprecedented view of the thin gas in space between galaxies. Intergalactic gas, also called the cosmic web, feeds galaxies, making them grow. It can alter radio waves passing through it, like a stained-glass window colouring light.

The imprint on FRB 150807 shows that the intergalactic gas is calm and has very weak magnetic fields, qualities scientists had predicted but were unable to measure until now. FRB 150807 was found with a real-time detection system developed by Swinburne University of Technology that is used on the Parkes telescope to study pulsars and fast radio bursts.

The researchers involved are affiliated with CSIRO, the International Centre for Radio Astronomy Research/Curtin University, Swinburne University, the ARC Centre of Excellence for All-sky Astrophysics (CAASTRO), the Australian National University and Manly Astrophysics; California Institute of Technology (Caltech) and the National Radio Astronomy Observatory in the USA; the SKA
Organisation in the UK; and the Max Planck Institute for Radioastronomy in Germany.

*Commonwealth Scientific and Industrial Research Organisation. Celebrating a centenary of innovation for 2016 marks 100 years since the establishment of the Advisory Council of Science and Industry, a precursor to CSIRO. This year CSIRO is celebrating a century of Australian innovations that have had a profound impact on the country’s industries, society and environment.

Picture caption

CSIRO’s Parkes telescope was first to detect the fast radio burst or FRB.

Photographer: David McClenaghan©