MURCHISON WIDEFIELD ARRAY DIPOLE

Background
In the outback of Western Australia, roughly 500 miles (800km) north of Perth, 3,000 of these dipole antennas are arranged in 200 square tiles, each a 4x4 array of 16 dipoles to form a massive and expandable radio telescope called the Murchison Widefield Array (MWA). Its goal is to probe our universe on a large scale without a large cost. Astronomers use the MWA to study everything from our own Sun and ionosphere to pulsars and the early universe.

The MWA observes at frequencies of 80-300 MHz, a band that is dominated by cellular phones, TV, and radio communications on earth. Therefore we use the Murchison Radioastronomy Observatory Radio Quiet Area in the shire of Murchison: an area the size of Massachusetts with only 100 people living in it.

Construction took place in 2011-2012, and the array was expanded in 2016 with the assistance of 4 UWM undergraduate physics students.

Why a dipole?
A *dipole* is the simplest antenna, receiving radio waves almost equally from any direction. The MWA tiles combine 2 crossed dipoles to detect radio waves from two different *polarizations*. Each dipole only costs about $50.

Scan for more information!

http://www.cgca.uwm.edu/outreach/maker.html

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