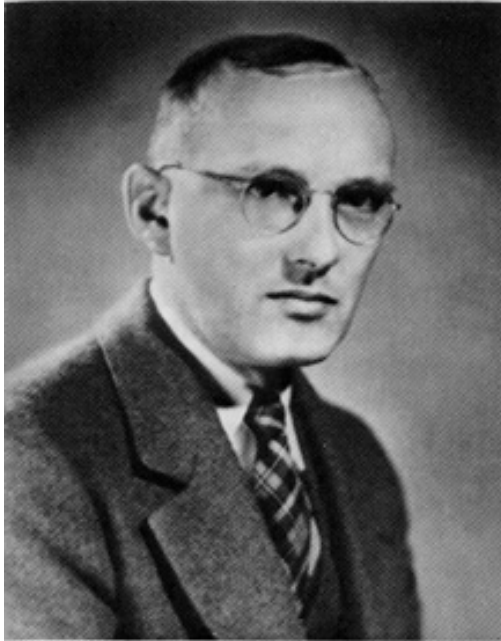


## Karl Jansky (1905-1950)

American radio engineer who was employed at the Holmdel Field Station of Bell Labs to maximise the signal to noise ratio for the short-wave transatlantic radiotelephone. Using a rotating short-wave receiver array



(Bruce array) operating at 20.5 MHz and 45 kHz, he discovered extraterrestrial 'noise' in 1932-1933. Jansky noted a continuous interference which changed direction over the course of the day. At first, he believed it was caused by the Sun, but then noticed that the time of peak was shifting in solar time over the course of the year. His suspicion was also aroused when the partial solar eclipse of Aug. 31, 1932 did not affect the signal. In December, he realised that his data were consistent with a source moving across the sky with a

period of the sidereal day. He published this conclusion in *Nature* and *Proc. Inst. Radio Engineers*. His discovery was also emblazoned across the first page of the *New York Times* on May 5, 1933. In 1933, Jansky concluded that the emission came from the entire Milky Way Galaxy, although it was strongest at  $18\text{ h} \pm 30\text{ min}$  in the direction of Sagittarius. Unfortunately for radio astronomy, other tasks left him little time to pursue his discoveries from 1934 onwards. His life was cut short by liver ailment (Bright's disease), which led to high blood pressure. He died of a stroke at the age of 45. His discoveries, however, were pursued by Grote Reber and led to the enormously successful field of astronomy.

## Grote Reber (1911-1999)

American radio engineer who was born in Chicago, Illinois and graduated from the present Illinois Institute of Technology in 1933. He worked as an engineer for several radio manufacturers in Chicago over the period 1933-47 during which he conducted his initial researches in radio astronomy.



His interest in radio astronomy began after he read Jansky's 1932 and 1933 articles. He built the world's first radio telescope (a 31 foot tiltable paraboloid) in his backyard in Wheaton, Illinois in the four months from June to September, 1937. His antenna is currently located at NRAO in Greenbank, West Virginia.

Reber attempted detection at 9 and 33 cm, but without result. Then, he tried 187 cm. At this wavelength, however, he was forced to observe at times of day in which no car ignitions were sparking. He detected emission from the Milky Way, which encouraged him to build an improved receiver in 1941. With this, he detected the Sun and a strong source in Cassiopeia. He published contour maps. He also achieved successful detection with a 62.5 cm receiver.

From 1947 to 1951, Reber was employed at the National Bureau of Standards, but from 1951, he became self-employed with his research in Hawaii and Tasmania, Australia being supported by the Research Corporation. His interests included mapping of the background radiation at 1-2 MHz, Cosmic Ray studies, dating of Aboriginal sites, and botanical studies.

## Sir Martin Ryle (1918-1984)

British radio astronomer. After a degree in physics at the University of Oxford in 1939, Ryle worked with the Telecommunications Research Establishment on the design of radar equipment during World War II. Afterwards, he led the radio astronomy group at Cambridge. He completed the 2C and 3C surveys with an interferometer containing four parabolic cylinder antennas in a rectangle which he had designed. The original 2C survey suffered from source confusion, so the 3C survey was made at roughly half the frequency Ryle devised aperture synthesis (Synthesis Imaging) and, in 1960-61, was the second person to use Earth rotation synthesis (after Högbom's modest test). Ryle also invented the technique of phase-switching and built a 5 km telescope (now the 'Ryle Telescope') with four fixed and four movable 42 foot antennas. He shared 1974 Nobel Prize in physics with Antony Hewish.



## Bernard Lovell (1913-)

British physicist and astronomer. Before World War II, he did Cosmic Ray studies with Blackett. During the war, he did radar research. After World War II, with the assistance of Hey he was able to procure an ex-Army mobile radar unit operating at a wavelength of 4.2 m. After finding that the electric trams at Manchester produced interference, he transported the radar van to the Manchester University Botany Department site at Jodrell Bank, where he used it to study transient radar echoes. His goal was to study cosmic ray showers using radar, but instead he found that the echoes came from the ionized trails of meteors. With Clegg, he built a 218 foot transit telescope (the 'wire bowl'). This instrument was used by Hanbury Brown and Hazard, who showed that M31 was a radio source. Pursuing his dream of a large steerable telescope, Lovell was the driving force behind the construction of the Mark 1 Jodrell Bank telescope (now the 'Lovell Telescope'), which was the world's first large radio telescope.

