

Bernard Lovell (1913-)

Bernard Lovell is an outstanding experimental physicist, who played a key part in the wartime development of radar in Britain and pioneered the study of radio astronomy. He constructed the world's largest steerable radio telescope at Jodrell Bank in Cheshire. The Museum holds Lovell's Freedom of the City of Manchester document and the silver salver on which it was presented.

Bernard Lovell was born in Oldland Common, Gloucestershire. His father ran the Oldland Cycle & Radio Company. A visit to Bristol University to hear a lecture given by A. M. Tyndall on 'The Electric Spark' inspired the young Lovell to study physics at Bristol University, where he completed his Ph.D.

In 1936, Lovell was appointed to the staff of the Physics Department at the University of Manchester, where he was to spend his career. After early university work on the detection of cosmic ray showers with Professor Patrick Blackett, Lovell was conscripted to the Air Ministry in 1939. There, he conducted valuable research on the use of radar for detection and navigation purposes. He was awarded the Order of the British Empire (OBE) in 1946 for this work.



After the Second World War, he obtained an ex-army mobile radar unit in order to study transient radar echoes – a phenomenon he had observed on radar screens during the war. As electric trams in Manchester caused interference, he moved the equipment to Jodrell Bank, an open field outside Manchester owned by the University and used by the Botany Department. Lovell was expecting the radar echoes to be a result of cosmic ray showers; however, he found that they came from the ionised trails of meteors. He also determined that many meteor showers occur during daylight hours and are not of interstellar origin, as had been suggested, but originated from the solar system.

Soon afterwards, the University of Manchester agreed to provide him with a permanent establishment at the site. It also sponsored the construction of his first radio telescope, a fixed parabolic aerial with a 218-ft (67-m) aperture, constructed in 1947. This aerial was used to detect the radio emission from the Andromeda galaxy in 1951. The work stimulated Lovell's plans for what is undoubtedly his greatest and most lasting contribution to science, the building of a 250-ft (76-m) diameter, steerable parabolic radio telescope.

The actual building of the telescope greatly exceeded the original cost and time estimates. Although Lovell was criticised for this, the Jodrell Bank telescope (known as the Mark I) broke new ground as the first 'big science' project. It has been used by numerous teams of scientists for studying a wide range of phenomena for many years. Today, such projects are often funded on an international basis and are administered by sizable committees.

Construction of the Mark I bowl began in 1952. The telescope was rushed to completion in October 1957 to track the carrier rocket of *Sputnik*, the Soviet Union's (and the world's) first artificial satellite. This was an achievement that captured the public imagination and put Jodrell Bank on the map. It also saved Lovell from personal bankruptcy: 'By a strange irony, Sputnik saved me and Jodrell Bank from extinction.'

Subsequently, Jodrell Bank has been involved in many astronomical and space research projects. In 1959, the telescope recorded the first photographs of the hidden side of the Moon, transmitted by Lunik 3. In 1966, it recorded the first photographs from the Moon's surface transmitted by the Luna 9 probe. Although the telescope was used in the radar mode for studies of the Moon and measurement of the distance of Venus, the emphasis has been on detecting radio signals emitted by astronomical objects. It played an instrumental role in the discovery of quasars in 1963. Much of the early work on pulsars followed and the gravitational lens effect of quasars was discovered in 1979.



Bernard Lovell has received many honorary memberships and degrees. He was knighted in 1961 for his pioneering work in radio astronomy. While Lovell's personal scientific achievements are noteworthy, his lasting impact on science has been through his administrative and political efforts. These led to the building of the great scientific instrument that today bears his name.

For further information:

Read Lovell, Bernard. *Astronomer By Chance*. London: Macmillan, 1991.

Saward, Dudley. *Bernard Lovell – A Biography*. London: Dudley Hale, 1984.

Visit Jodrell Bank Visitor Centre, Macclesfield, Cheshire