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The Würzburg antennas

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Radioastronomy took shape in France with the installation of military radars recycled after the war. A new kind of astronomy was born.

Although the radio waves emitted by celestial bodies had been discovered at the beginning of the XXth century, their importance would only be recognized with the advent of radar during the Second World War. In fact, the first steps in radioastronomy were taken by the physicists and engineers specializing in radio waves.

From the war in the air, to the study of the cosmos

A certain number of large radars used by the German army were recycled by the first European radioastronomers. Three Würzburg-type antennas were the first large instruments of this discipline to be installed in France. One of them was installed at Meudon Observatory and used essentially for the study of the Sun, while two others were installed in a vast area specially bought for this purpose in the Cher, in the commune of Nançay.



German Würzburg radars, Nançay, around 1958

These two 7m50 diameter antennas were adapted between 1957 and 1959, for equatorial mountings ; each was on a platform which could move along two several hundred meters long rails arranged in the form of the letter T. Specially designed electronics enabled the two antennas to work together as an interferometer (a so-called adjustable interferometer because the two antennas could move) at a wavelength of 21 cm : the best angular resolution obtainable was 17,4 seconds of arc, limited by the distance separating the two antennas.

The birth of interferometry

The Würzburg antennas

The first computer installed at Meudon, an IBM 650, was used to solve numerous numerical problems.

From 1959 to 1962, the Nançay team worked under the aegis of the Paris Observatory ; its director André Danjon having recognized quite rightly the importance of this new discipline. The team established the radio characteristics of certain discrete galactic radio sources (among them Sagittarius A) and also extragalactic ones (among them Cygnus A and Virgo A).

In a climate of intense international competition, the Würzburg antennas, pioneering instruments, showed the way to new interferometers and other types of huge radiotelescopes.

The three Würzburg antennas can still be seen. One has remained at the Nançay site, but is no longer used. Its twin has been restored to its original state and is now a key element of the radar museum of Douvres-la-Délivrande. The Meudon antenna was moved to Bordeaux Observatory : it still works and is used for teaching.