

OART

Open Access Radio Telescope

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Project duration: 2 years

Pillar 2: Heritage science



Figure 1: The OART telescope before and after its renovation

Context

The Humain radio astronomy station was founded by the Royal Observatory of Belgium in 1953 to host the very first radio telescopes operational in Belgium for the observation of the Sun. During the past 70 years, many instrumental projects were set up including a solar interferometer and individual radio telescopes for the monitoring of the Sun. The OART project deals with the renovation of one of these historical radio telescopes, which had been standing still for decades. As such, the project can be seen as a Belgian contribution to a European-wide effort to preserve historical scientific assets that were once world class instruments but slowly lost their ranks and usage in the scientific community.

Objectives

The Open Access Radio Telescope project is not only a heritage preservation enterprise but also an attempt to teach the basis of radio astronomy to a large audience: the general public, enthusiast amateurs, pupils or university students by restoring the telescope mobility and making it easily accessible.

With a small telescope like this (6-m dish), basic but fundamental radio astronomy experiments can be performed: the observation of the hydrogen distribution in our galaxy (and the derivation of its rotation rate), the timing of “bright” pulsars, study of star forming regions, or the concept of noise and temperature.

Methodology

OART includes a fully mechanical restoration of the telescope itself, the design of a receiving chain fitted to the scientific objectives, a new control system, and an interface allowing the public to remotely interact with the instrument and access the observations.

Main results

The full mechanical renovation of the telescope was performed in house at ROB, with new additions like a support for the feed antenna. A new receiving chain has been elaborated with a special feed antenna, a focal plane RF box using SMD components, the use of RF over fibres technologies to minimize attenuation. A new control system adapted to these non solar observations has been set up, and several test web interfaces for the public have been investigated.

Keywords : Radio astronomy; scientific heritage; renovation; education; telescope