OART

Open Access Radio Telescope

DURATION
15/12/2020-15/03/2023

BUDGET
349.197 €

PROJECT DESCRIPTION

Public attention towards astronomy is driven by the availability of pictures taken by ground based and space borne telescopes. It explains the success of practical astronomy either at home or in amateur societies and the success of astronomy classes in universities with access to small or medium scale optical telescopes. Yet, the visible domain is only a small part of the electromagnetic spectrum through which the Universe can be accessed. Radio astronomy for example remains, for non-professionals, restricted to high skilled amateur communities or very few facilities in Europe. On the other hand, institutional observatories often possess patrimonial facilities that are not in used anymore as technical progress made these obsolete. The Royal Observatory of Belgium has, in the Humain radio astronomy station, a 6-m radio telescope built in the 1960s for the observation of the Sun. It has been standing still for years and the OART project ("Open Access Radio Telescope") is precisely an attempt to revive this facility and make it operational for education purposes. During the course of the 2-year project, it will be completely renovated mechanically and electrically, fit with a modern control system and a receiving chain allowing basic but yet essential radio astronomy observations.

The telescope will be remotely operated via an online system that will be tailored to different audiences: general public and schools, amateur astronomy societies and university students. Data collected will be made available to the users and will be processed according to different online tutorials and classes addressing each category of end users. By doing so, we will provide an introduction to the field of radio astronomy, a domain which is rarely accessible to the public or to students. The telescope, although of small size (6-m) for radio astronomical standards, will provide practical illustrations of the concepts of radio noise, interstellar emission lines (H and OH), continuum emission from our galaxy, pulsars etc.

Bringing knowledge of radioastronomy to a large public will raise awareness on the use of the radio spectrum in our modern society and the necessity to protect some radio bands for scientific applications. It will help support and protect professional radio astronomy observations in Belgium and make stronger the case of the radio astronomy station of Humain with respect to local and national authorities when potentially harmful local industrial developments are in discussion. The renovation of a piece of the scientific patrimony of the Observatory for education will not only preserve it from further decay, but also serve as a test for the potential use of other historical instruments of this institution for public or educational activities. Finally, OART will extend the links between the Observatory, amateur astronomical societies and universities proposing classes in astronomy and astrophysics. The expected synergy will reinforce on the Observatory side, one of its mission, which is to make astronomy accessible to the public. OART will rely on different competences from the technical and scientific services of the Observatory and the Planetarium.

Once renovated, OART will be accessible and usable through an online platform allowing the programming of the observations and access to the data. A large section of the platform will be dedicated to basic tutorials and typical observations reachable with the telescope. We will provide online tutorials based on Python and Jupyter notebooks to process the data and operate the telescope the optimum way. We will choose a data format compatible with existing software libraries used in the community (professional or amateur) for the processing of pulsars or emission lines observations. Simple and interactive observations setups will be available for the Planetarium and its activities for schools and the public.

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The platform will also host reports of observations made by students and amateur groups and provides links and interactions with the active European radio astronomy amateur community (we will for example apply to host one of the European Conference of Amateur Radio Astronomy). We will finally advertise the existence of OART through digital channels, amateur publications, and by contacting different universities in Belgium and Europe to include OART observations in their astronomy classes.

CONTACT INFORMATION

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