

THE INTERNATIONAL LOFAR TELESCOPE (ILT)

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LOFAR, the Low Frequency Array, is a next generation radio telescope designed by ASTRON, with antenna stations located in the north of the Netherlands and across Europe. A total of 40 LOFAR stations are nearing completion in the Netherlands; the closest ones in the core area are nearly adjacent, and they then range up to distances of 80 km. A further 8 international stations are being deployed in Germany, France, Sweden, and the UK, on distances up to 1000 km. Plans for more LOFAR stations exist in several other countries in Europe.

Utilizing a novel, phased-array design, LOFAR is optimized for the largely unexplored low frequency range between 30 and 240 MHz. Digital beam-forming techniques make the LOFAR system agile and allow for rapid repointing of the telescopes as well as the potential for multiple simultaneous observations. Processing (e.g. cross-correlation) of the station data takes place in the LOFAR BlueGene/P supercomputer, and associated post-processing facilities. With its dense core array and long interferometric baselines, LOFAR is gearing up to reach unparalleled sensitivity and spatial resolution in the low frequency radio regime.

LOFAR was designed to excel in a number of widely different Key Science areas that together provide a facility able to tackle important research projects in modern astrophysics that range from Earth's upper atmosphere and interplanetary space to the earliest cosmological times. Dedicated teams are focused on the Epoch of Reionisation, Transients and Pulsars, Extragalactic Surveys, Cosmic Rays, Cosmic Magnetism, and Solar Physics and Space Weather. These teams are currently working with the development team at ASTRON in a concerted commissioning and early science phase, to implement a series of dedicated astronomical software pipelines. The pipelines are designed to deliver standard data products to the LOFAR archive, where, after a proprietary time, they will be publicly available.

Here, we will summarize both some of the most recent data calibration achievements, and some of the exciting astronomical results that are being produced at an accelerating pace in recent weeks and months, as the observatory is gearing up for survey-style operations in the upcoming winter season.

LOFAR is being operated as a fully international facility, to which end the International LOFAR Telescope has been formed. It is a Foundation under Dutch law, and aims to have board members from LOFAR consortia in each of the countries where LOFAR stations are located. Station owners contribute to support the central operations of the ILT, in which the Radio Observatory of ASTRON acts as the coordinating operational entity. Here, we will explain the governance, and the operational modus operandi; diagrams will be shown with the up-to-date membership and configuration of the ILT.

All proposals will be uniformly peer reviewed by independent experts. Subsequent time allocation in the initial years will be in part based on Open Skies and in part on reserved fractions to be assigned to projects by the national consortia, in return for the contributions from their country. It is planned to begin this allocation scheme in 2012, offering a gradually expanding complement of observing modes and capabilities once these have been operationally verified.