



## Sky surveys with the International LOFAR Telescope

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### 1 Extended Abstract

The LOw Frequency ARray (LOFAR) has in recent years established itself as an excellent wide-field observatory, in part thanks to the LOFAR Two-Metre Sky Survey (LoTSS) [1, 2] and the LOFAR LBA Sky Survey [3, 4]. Using the Dutch part of LOFAR, it is possible to instantaneously map over a dozen square degrees of sky area with an angular resolution of 6 arcseconds at 144 MHz. Additionally, with its baselines of up to 2000 km in length, spanning across the European continent, the International LOFAR Telescope (ILT) has the potential to increase the resolution from 6 arcseconds to only 0.3 arcseconds. The use of these long baselines was previously hindered by the significant technical and logistical challenges associated with these, including the ionosphere, lacking software tools, its phased-array design, and the lack of known good calibrator sources. However, the recent development of the LOFAR-VLBI pipeline by the LOFAR Long Baseline Working Group [5] has enabled the ILT to reach its maximum angular resolution of  $\sim 0.3$  arcseconds. Notably, LOFAR's ability to perform such wide-field high-resolution imaging was demonstrated by [6]. Currently, many projects are underway to make use of LOFAR's high-resolution capabilities. For example, the current LoTSS-coverage is currently being processed using the LOFAR-VLBI pipeline to calibrate and image these areas including LOFAR's international stations (LoTSS-HR). Additionally, following the commission of the LOFAR2.0 upgrade, new large programmes will aim to observe major parts of the extragalactic sky to perform deep and high-resolution imaging, such as the LOFAR Ultra-Deep Observations (LUDO) and the ILoTSS programme.

In this talk I will present the current status of current large sky surveys performed with LOFAR, including their observing and calibration strategies, and recent scientific results. Additionally, I will present a future outlook for what to expect from LOFAR in the near future, including the LoTSS-HR, the LUDO and the ILoTSS surveys.

### References

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