



LOFAR NEWSLETTERS MAY- JUNE 2021

Previous LOFAR newsletters are collected [here](#).

Announcements:

- **Cycle allocations:** At the PC meeting on 11-12 May, allocations for Cycle 16, 17, 18, and 19 were given. In total, more than 6000 observing hours were distributed across the four cycles. Cycle 16 was fully allocated and defined. In total, 2674 observing hours, 2682 processing hours, and 1742 TB of LTA storage were distributed. Allocations can be found [here](#). The observing schedule has been finalised (available [here](#)). Observations started on June 1 and will continue till November 30.
- **Cycle 17 proposal call:** the call for Cycle 17 proposals will be advertised early July. The proposal submission deadline will be early September. The call will be for single cycle projects only for the observing period between 1 December 2021 - 31 May 2022.
- **Poznan and Juelich LTA sites issues:** intermittent issues with data downloads from the Poznan and Juelich LTA sites have been reported in the past few days. These are due to grid certificate (Poznan) and network (Juelich) related challenges. The problems are being addressed and will be resolved as soon as possible.

Array & observing system status:

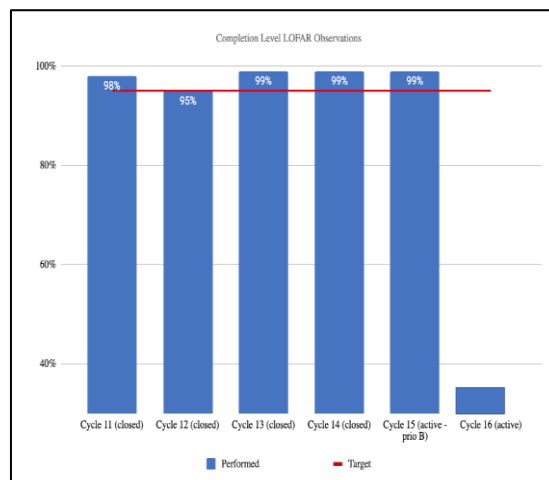
- 38 stations operational in the Netherlands: 24 core and 14 remote stations. 14 international stations in operations: DE601, DE602, DE603, DE604, DE605, FR606, SE607, UK608, DE609, PL610, PL611, PL612, IE613, LV614.
- A new international station will be built in Italy. Station deployment will start in 2022. The station is expected to be fully functional in 2023.



- All stations are performing nominally. The overview of non-operational antenna elements for LBA and HBA is available [here](#).
- The high temperatures recorded in most parts of Europe between 14-20 June caused many stations to drop out of observations resulting in considerable loss of observing hours. In addition, the air-conditioner units at three German stations (DE601, DE604 and DE609) have been replaced this month.
- No major failures occurred on CEP hardware/software over the past couple of months. The minor challenges experienced after the CEP4 nodes upgrades have all been resolved.

Observing Programs

- Cycle 15 ended on 31 May. 99% of the observing program has been completed. Only 68 failed observing hours were recorded during the Cycle. The average observing efficiency during the Cycle was 68%, mainly due to commissioning activities related to TMSS (see below).
- Cycle 16 started on 1 June 2021 and will run till 30 November 2021. So far, 16% of the observing program has been completed, with an average observing efficiency of 69%. The observing schedule can be found [here](#).



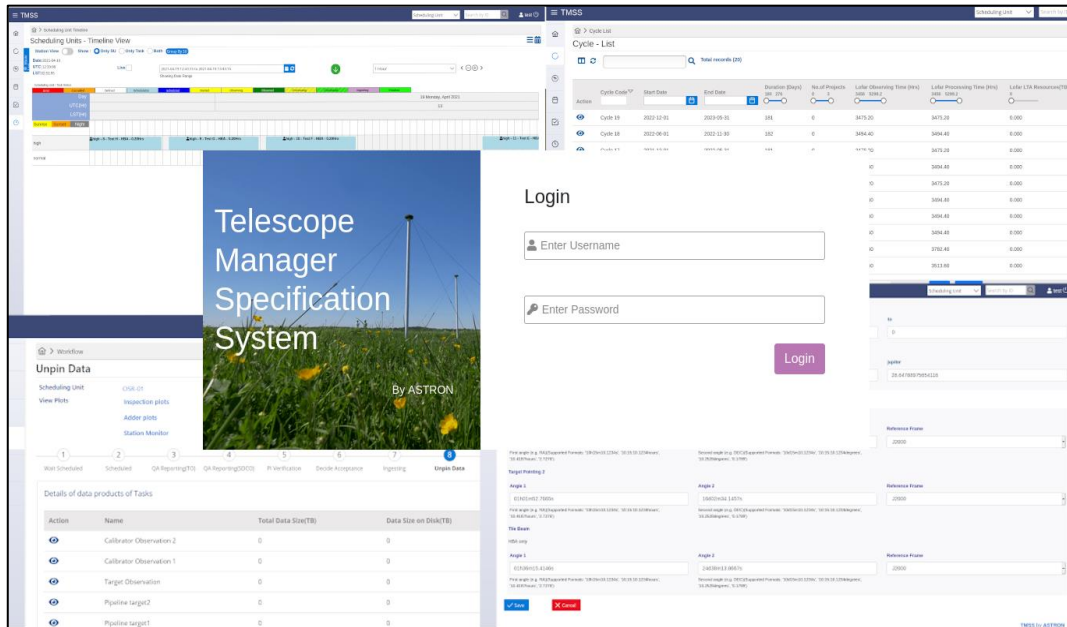
PROJECTS

Telescope Manager Specification System (TMSS; S. ter Veen, M. Iacobelli, R. Pizzo)

- TMSS (Telescope Manager Specification System) is a brand-new software application for the specification, administration, and scheduling of LOFAR observations. It enables the support for LOFAR2.0 use cases, while also streamlining LOFAR operations and improving the adaptability and maintainability of software for future extensions.
- In the past months, support was added for beamformed observations and pipelines, priorities for dynamic scheduling, LBA observations and user administration, as well as reporting about projects and cycles. Eventually, an inbox was implemented where support personnel and science users are informed about which observations require their attention.
- Commissioning of TMSS is progressing at a fast pace to make sure that the system will be stable for its release in production by 1st of September. Meanwhile, TMSS phase 2 started in June. This will deliver support for additional science and operational use cases,

as well as further streamlining of operational processes through a better link to the NorthStar proposal submission tool. The progress of TMSS can now be followed through these [infographics](#).

- TMSS will be presented to the LOFAR community at the Lofar Status Meeting on July 14th. A training session will be organised for users and contact authors participating in shared-support projects.

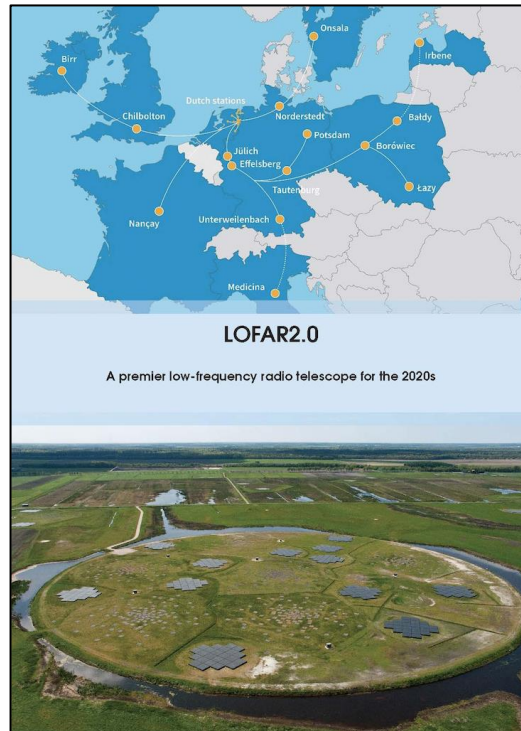


LOFAR2.0 Program (W. van Cappellen)

- LOFAR2.0 progress highlights are presented every two months in the LOFAR2.0 Newsletter (<https://www.astron.nl/lofar2-0-newsletter/>).
- A LOFAR2.0 White Paper (see figure) is being prepared to help advertise the project, its science goals, and to assist ILT partners with science text that they can use in their local funding drives. The document is being written collaboratively with inputs from dozens of LOFAR community scientists. A call for expressions of interest in LOFAR2.0 science will be released around September this year, followed by a workshop on the capabilities of

LOFAR2.0. We welcome your contributions and comments to the white paper. Jason Hessels will ask for your input and feedback shortly.

- The realisation of the Dwingeloo Test Station (DTS, see figure) is proceeding slower than planned. The cabinet has been installed in the field. The first 2 Uniboards have arrived and are being tested in the lab. The new LBA receivers will follow in a couple of weeks. In the meantime, thermal tests of the DTS cabinets have commenced. Although the new LOFAR2.0 hardware processes 3x as many inputs as the old system, its heat production will be (only) 30-40% higher. Nevertheless, the thermal design of the Dutch cabinets will be updated to keep a cool head. The thermal design has been prototyped and is currently being verified in the Dwingeloo Test Station.



- The Timing Distributor subsystem, that uses White Rabbit technology to distribute a central clock to all LOFAR stations in the Netherlands, is preparing for its Critical Design Review (CDR). The project has completed a number of verification observations in LOFAR stations to validate the design. After the CDR, the system will be procured and gradually rolled-out.
- The COBALT2.0 project delivered the software for the Lofar Megamode (LMM). The LMM is currently available in expert-mode only. There are some software related obstacles before the new LMM can go in full production. We are currently planning how to best resolve these issues and aim to have the LMM in production before the end of the year.



SDC Program (J. Swinbank)

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- The SDC Program (SDCP) has adopted a form of the [SAFe development methodology](<https://www.scaledagileframework.com>), as successfully used by — among others — the Square Kilometre Array. Over the last few months, we have been putting all the pieces in place, and are now ready to start our first Program Increment (PI) at the beginning of July. This marks a major milestone in the establishment of the SDP, and will provide a solid basis for both continuing to improve and professionalize

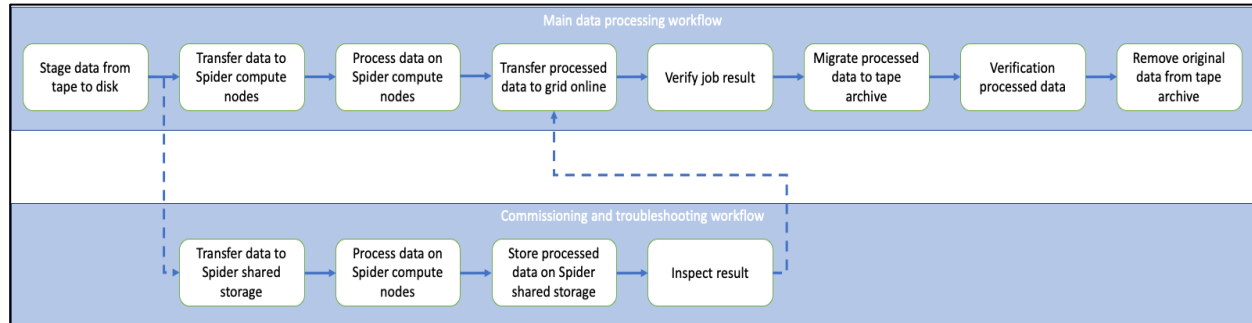
our software development process, and the development of a long term roadmap for SDCP software releases.

- The next major SDCP deliverable will be an upgraded version of the Prefactor pipeline, which provides direction-independent calibration and imaging for LOFAR. This new version of Prefactor is primarily being developed in support of the LDV project — described below in this newsletter — and represents an important milestone, as the first software release by the SDCP and delivery to the SDC Operation team. The new version of Prefactor should be available by the end of September.
- Bram Veenboer has been funded by the SDC Program to continue his work on GPU-accelerated W-tiling. He has now implemented forward W-tiling, providing an increase in speed by a factor of between two and five times, depending on the size of the grid. Work to complete backwards W-tiling is still in progress, with further substantial performance gains expected. Ultimately, this work will be written up for publication, and integrated into LOFAR processing pipelines.
- The SDC Program has deepened its involvement with the SKA Regional Centres development effort. All of the SRC development working groups now have representation from SDCO (Science Data Centre Operations) and/or SDCP involved, and work is rapidly picking up pace. We expect the first set of high-level requirements on the SRC network to be released later this year.

LOFAR Data Valorization (R. Pizzo, C. Baldovin)

- The LOFAR Data Valorisation (LDV) project will bring the data currently hosted in the LTA archive from level L0-L1 (uncalibrated) to L2+ (advanced data products, including direction-dependent calibrated images). LDV will significantly increase the scientific output of LOFAR since more users will be able to more easily access the advanced data products and use them for cross-domain science. It will also streamline data processing operations at the LTA through a gradual adoption in production of the LTA processing interface. By doing so, LDV will prepare SDCO (SDC Operations) for routine LTA operations towards the LOFAR2 surveys.
- During the first half of 2021, LDV has made significant progress towards the goal of reprocessing the LOFAR data in the LTA-SURF site. The content at SURF has been completely profiled, redundant data have been identified and are ready for deletion. A proposal to delete ~2 PB of data has been accepted by the ILT director in May and the deletion will start in the coming weeks. This deletion is the first one foreseen during the project, that has as ultimate goal to reduce by 22 PB the data volume across the 3 LTA sites, 11 PB in SURF only.
- The preparation of the workflow to reprocess the data has made an important step; it has been tested with science validated results. Our team is now working on the final steps to its completion.
- The Apertif Task Database (ATDB) has been successfully adapted to the workflows being developed in LDV (a schematic view of the workflow is shown in the picture) and it is now ready for operations. It will be used as a pipeline execution framework for the

project. ATDB-LDV works as a unified system to monitor resources and to monitor and control the workflows.



Calendar next LOFAR activities:

The dates of LOFAR Status Meetings, roll-outs and stop days are listed in an online calendar that is available [here](#). In particular, we emphasize:

- Next LOFAR bulletin: August 2021
- Cycle 17 proposals submission deadline: early September