



## LOFAR NEWSLETTERS AUGUST-SEPTEMBER 2021

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

### Announcements:

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- **COBALT bug in multi-beam LOFAR observations:** most multi-beam HBA & LBA observations performed between 8 February and 4 August 2021 were affected by a bug discovered in the correlator (i.e., COBALT2.0) during the first week of August. The bug might have been introduced during software rollout at the correlator level on the 8 February. It was understood on 3 August and fixed immediately on 4 August. The PIs of the affected projects have already been informed. The re-run plan of such observations is being rolled out in consultations with the PIs. This was really an unfortunate development: measures have been put in place to avoid such in future.
- **Cycle 17 proposal call:** at the end of the 8 September proposal submission deadline, 14 proposals have been received; requesting for totals of 590.46 observing hours, 1394.94 processing hours and 434.86 TB of storage space. These represent oversubscription factors of 1.0 telescope hours, 2.38 processing hours and 0.23 LTA storage space. Technical assessments of the proposals are currently underway, with a PC meeting planned to take place on 3 November 2021. The Cycle 17 observations will run from 1 December 2021 to May 31 2022. The projects to be observed during the cycle will include those that will be accepted from the cycle proposals, the already running long term projects from the previous cycles and perhaps some of the projects affected by the correlator bug.
- **SURFsara and Juelich LTA sites issues:** intermittent issues with data staging and downloads from the Poznan and Juelich LTA sites were reported in the past few weeks. These were due to grid certificate (SURFsara) and network (Juelich) related challenges. The problems have been resolved.
- **LOFAR password self-service downtime:** there is an unexpected issue with the LOFAR password self service and LTA staging server, and as a result, the password self-service and LTA staging had been offline for a while. The LTA staging service is up and running now. Investigations are ongoing to address the password self service challenge, which is still pending, as soon as possible.
- **Progress report deadline:** 12 UT on 18 October 2021 is the deadline for submission of progress reports of ongoing long-term (LT14 and LT16) observing projects.

## 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 is planned to start in 2022. The station is expected to be fully operational in 2023.

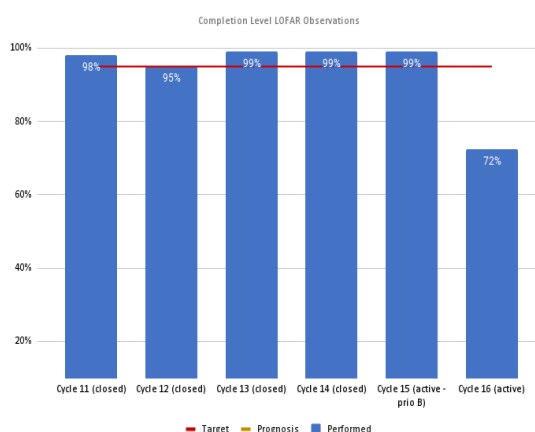


- Antenna elements of all stations are performing nominally, except DE601 LBA that was hit by flooding a few weeks ago, and has remained offline since. The overview of non-operational antenna elements for LBA and HBA is available [here](#).
- DE605 had a broken power supply in SubRack 2. The unit was sent to the station immediately, but it took a little longer to get it fixed due to the summer holidays. DE601 has a predominant power supply issue, which is being investigated. DE604 has also been experiencing network connection issues over a couple of weeks now. CS001, CS002 and CS302 suffered connection problems after network connection maintenance in the past two weeks; the connection is now restored.

No major failures occurred on CEP hardware/software over the past couple of months. The discovered COBALT bug was resolved immediately.

## Observing Programs

- Cycle 16 observations started on 1 June, and will run till 30 November 2021. The observing schedule can be found [here](#).
- At the end of observing week 17, 72% of the observing program had been completed, with an average observing efficiency of 71%. About 108 observing hours (representing 4% of production hours) have been lost mainly due to high temperatures, critical stations unavailability and other system issues. The failure numbers reported here exclude those that had been caused by the correlator bug.



## PROJECTS

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

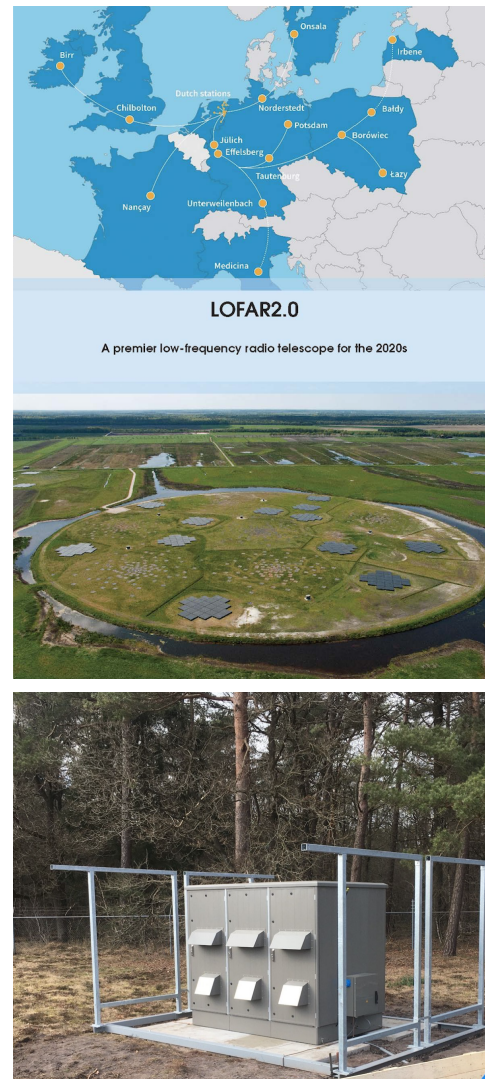
- TMSS (Telescope Manager Specification System) is a brand-new software application for the specification, administration, and scheduling of LOFAR observations. It enables the support for LOFAR2.0 use cases, while also streamlining LOFAR operations and improving the adaptability and maintainability of 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 1<sup>st</sup> 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 was 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.

The screenshot displays the TMSS web application interface. Key components include:

- Scheduling Unit:** A panel on the left showing a timeline view of observation cycles.
- Telescope Manager Specification System:** A central banner with the ASTRON logo.
- Login:** A section on the right with input fields for 'Enter Username' and 'Enter Password', and a 'Login' button.
- Cycle List:** A table on the right showing a list of observation cycles with columns for Cycle ID, Start Date, End Date, and various status indicators.
- Details of data products of Tasks:** A table at the bottom left listing tasks such as 'Calibrator Observation 2', 'Calibrator Observation 1', 'Target Observation', 'Pipeline target2', and 'Pipeline target1', along with their 'Total Data Size(TB)' and 'Data Size on Disk(TB)'.
- Task Editor:** A section at the bottom right for editing task parameters, including 'Task Name', 'Priority', and 'Task ID'.

## 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, which 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 first SDC “program increment” started in late June, and will conclude in late September. This is a three month period where teams are focusing on a defined set of priorities. Major goals for this PI are to deliver production-quality version of the “Prefactor” pipeline which the LOFAR Data Valorization (LDV) project will start using from early 2022, to continue work in support of LDV pre-processing and compression, and to start detailed planning for ADEX, the ASTRON Data Explorer — our next-generation interface to the ASTRON archives. Work is currently underway to define our goals for the PI#2, which will take us to the end of this year.
- ADEX will likely be based on ESAP, the Science Analysis Platform that ASTRON is leading the development of in the context of the ESCAPE project. August saw a workshop focused on ESAP development, as well as a series of project reporting deadlines. The preliminary outcome of these was very positive: ESAP development is going very well, it already offers a range of useful capabilities — including archive queries, VO interfaces, and systems for managing interactive data analysis — and it forms a solid basis for us to build on to create ADEX. Detailed reports on the workshop and the current status and plans for ESAP will be posted to the project website at [www.projectescape.eu](http://www.projectescape.eu) when they are available. See the attached screenshots for a preview of work in progress!
- The SDC team is heavily involved in planning for the SKA Regional Centres network, which has really been heating up over the last few months. Members of the SDC development program, the SDC operations team, and our colleagues at ASTRON and from SURF have representation on all of the various working groups — covering everything from the overall system architecture to operational considerations, networking, computing, and science user engagement — and are working hard to produce a first set of SRC requirements by the early autumn.

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

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During the last months, progress has been achieved in several aspects of the LDV-phase 1. In particular, with the first deletion of redundant data in the LTA, amounting to 1.7 PB.

The initial implementation of the archive and ingest service for ATDB-LDV has been completed.

On the data processing aspect, we have achieved the characterization of the LBA datasets collection for validating the operational as well as the “compression” workflows for visibilities was finalized. Work is still in progress for:

- finalizing the definition of a robust set of operational procedures to be adopted in the production phase;
- documenting the operational procedures
- defining quality metrics that will allow to set a quality flag per dataset and expose it in the LTA archive

As next steps we will focus on completing the end-to-end commissioning of the production environment and after will start with the production phase.

## Calendar next LOFAR activities:

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*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: October 2021

## Upcoming Conferences:

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### Science at Low Frequencies (SALF) VIII

The abstract deadline for the eighth incarnation of Science at Low Frequencies (SALF) VIII is coming up (Friday October 8 2021). SALFVIII will be held online from the 6th to the 9th of December, 2021.

More details about the conference can be found here: <https://salfconference.org/salfviii/>

Registration and abstract submission can be found directly at the following website: <https://forms.gle/x1qsQy4nfsxsdACD6>

### IMPORTANT DATES

Abstract submission deadline: Friday October 8th, 2021

Preliminary Schedule Announced: First week of November 2021

Registration deadline: Friday December 3rd, 2021

Conference period: Monday 6th to Thursday 9th of December, 2021

Scientific Organising Committee:

Rick Perley (NRAO)  
Natasha Hurley-Walker (Curtin)  
Jason Hessels (ASTRON/UvA)  
Joe Callingham (Leiden/ASTRON), Chair  
Monica Orienti (INAF)  
Poonam Chandra (NCRA)  
Tao An (SHAO)  
Nichole Barry (UMel)  
Ryan Lynch (NRAO)  
Paul Scholz (UoFT)

Local Organising Committee:

Jason Hessels (ASTRON/UvA)  
Joe Callingham (Leiden/ASTRON)  
Ralph Wijers (UvA)