

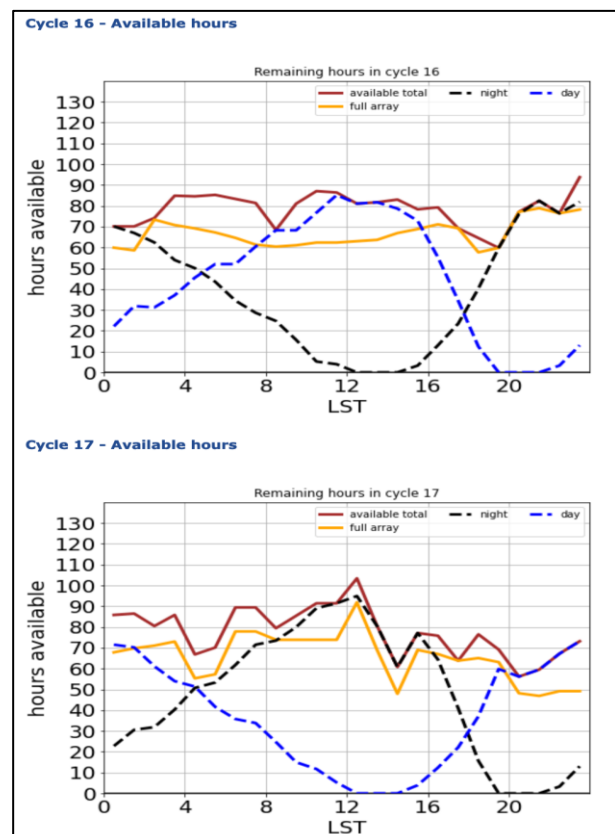


## LOFAR NEWSLETTERS JANUARY- FEBRUARY 2021

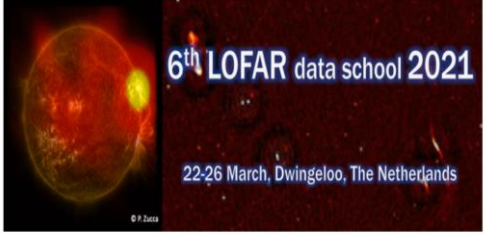
Previous LOFAR newsletters are collected [here](#).

### Announcements:

- **Cycle 16 -19 proposal call:** the deadline for the submission of Cycle 16 proposals is fast approaching: 3 March, 12 UT (noon). The call (available [here](#)) is for both long-term and single-cycle projects. The long-term period runs from Cycle 16 till Cycle 19 (observing period 1 June 2021 - 31 May 2023). Single-cycle projects for Cycle 16 will run between 1 June – 30 November 2021. Proposals should be submitted via the [NorthStar](#) online submission tool. *Note: the system capabilities will evolve during the long-term period as described [here](#).* The availability of observing time as a function of LST after taking into account the already active long-term projects is presented in the figures as well as [online](#). Note: (i) this call represents the *last long-term opportunity* for users to propose observations with the LOFAR1 system before its upgrade to LOFAR2.0; (ii) follow-up proposals concerning Long-Term science already reviewed at this round cannot be submitted for future Cycles during the same long-term period.



- **SDC helpdesk:** Starting from 1 February 2021 the JIRA space 'Radio Observatory Helpdesk' (ROHD) has been migrated to the '[Science Data Center Helpdesk](#)' (SDCH).
- **Lofar School:** the 6th LOFAR Data School will take place between 22 - 26 March 2021. Because of the current Covid-19 pandemic, the event will be virtual. The school will offer lectures and demos. Resources will also be provided for offline hands-on data processing sessions. Interaction and networking between participants and lecturers will be promoted via Q&A sessions as well as team building activities. The School website can be found [here](#).



**6th LOFAR data school 2021**  
22-26 March, Dwingeloo, The Netherlands

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Organizing institutes  
**ASTRON**  
**LOFAR**  
**STELLAR**

**General information**

The 6th LOFAR Data School will take place between 22-26 March 2021. Due to the Covid-19 pandemic, the event will be virtual. Registration is now open.

**Aim of school**  
The aim of the School is to introduce the LOFAR system to new members of the LOFAR community who will analyse both interferometric and high time resolution beamformed LOFAR data. Students, postdocs, and staff are all encouraged to attend. The School will cover the many aspects of the LOFAR system from the capabilities of the basic station hardware to the software pipelines and their science products. Lectures and demos will be presented by members of the LOFAR project team as well as staff from the many institutes involved in the collaboration. Participants will have the choice of following demos on beamformed or interferometric data reduction. Online material will also be provided for offline hands-on data processing sessions. Interaction and networking between participants and lecturers will be promoted via Q&A sessions as well as team building activities.

**Minimum requirements for participants**  
Presentations will be given at a level appropriate for someone new to LOFAR. Familiarity with standard data processing software such as CASA will be useful, but not required. Minimum requirements should include some familiarity with the concepts of radio interferometry and with scripting languages, in particular Python. Parallel sessions covering more advanced topics are also planned.

If you do not see the Poster embedded below, click [here](#)

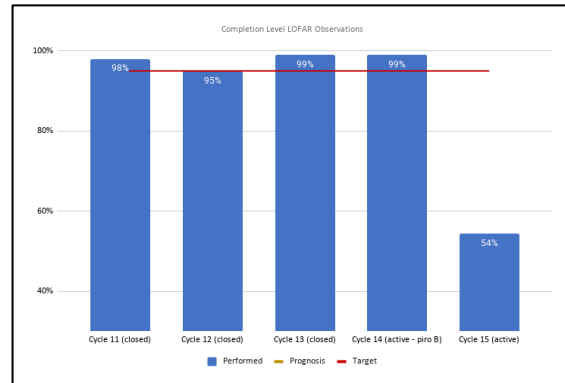
### Array & observing system status:

- 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.
- The overview of non-operational antenna elements for LBA and HBA is available [here](#). At the moment, all antenna components are operating nominally.
- No major failures were experienced on CEP hardware/software over the past couple of months. A major CEP4 upgrade took place in January 2021 with minor system downtime.
- Station calibration: significant progress has been made with the development of the holography method. Both the observations preparations and the data analysis have been streamlined – a diagnostic holography run is now ready for inspection in ~3 hours. A full analysis takes less than a day to process. The current plan is to deliver the holography method for HBA by the end of March.



## Observing Programs

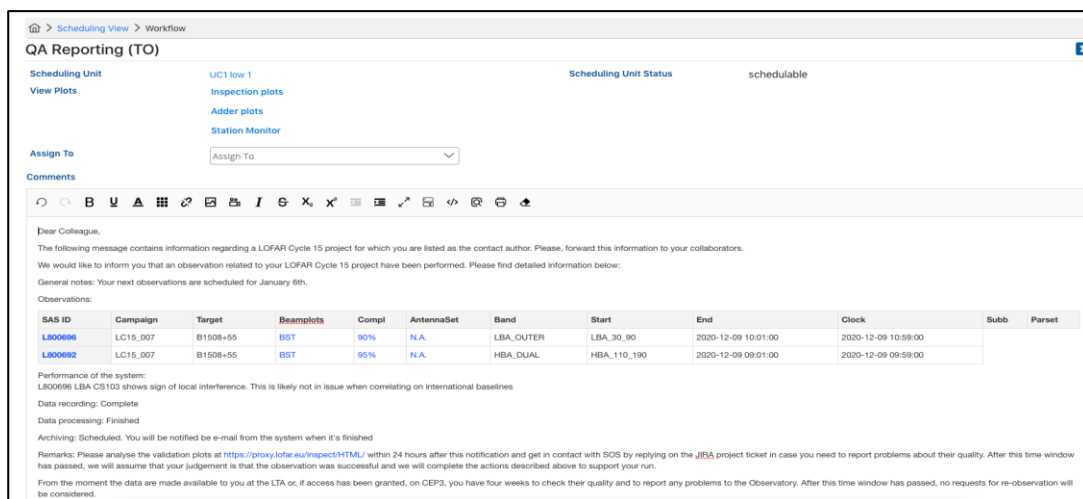
- Cycle 15 started on 1 December 2020 and will run till 30 May 2021.
- The figure shows the completion levels of the last five cycles. The completion target is indicated by the red line: this is set at 95%. At the end of observing week 12, the completion level of Cycle 15 is 54%. The average observing efficiency so far was 74%. The observing schedule can be found [here](#).



## PROJECTS

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

- TMSS (Telescope Manager Specification System) will be a brand-new software application for the specification, administration, and scheduling of LOFAR observations. it will enable the required support for LOFAR2.0 use cases, while also streamlining LOFAR operations and improving the adaptability and maintainability of software for future extensions.
- During the past two months, work has progressed on the quality assessment workflow in TMSS, which will streamline the reporting of observations to the project investigators (an example of the QA reporting interface is shown in the figure), the ingest, dynamic scheduling and adjusting the GUI with all new features added. The first dynamically scheduled observations have run and commissioning is in progress.



QA Reporting (TO)

Scheduling Unit: UC1 low 1 | Scheduling Unit Status: schedulable

Assign To: [Assign To]

SAS ID	Campaign	Target	Beamplots	Compl	AntennaSet	Band	Start	End	Clock	Subb	Parsset
LB00696	LC15_007	B1508+55	BST	90%	N.A.	LBA_OUTER	LBA_30_90	2020-12-09 10:01:00	2020-12-09 10:59:00		
LB00692	LC15_007	B1508+55	BST	95%	N.A.	HBA_DUAL	HBA_110_190	2020-12-09 09:01:00	2020-12-09 09:59:00		

Performance of the system:  
LB00696 LBA CS103 shows sign of local interference. This is likely not in issue when correlating on international baselines

Data recording: Complete  
Data processing: Finished

Archiving: Scheduled. You will be notified by e-mail from the system when it's finished

Remarks: Please analyse the validation plots at <https://proxy.lofar.eu/inspectHTML/> within 24 hours after this notification and get in contact with SOS by replying on the JIRA project ticket in case you need to report problems about their quality. After this time window has passed, we will assume that your judgement is that the observation was successful and we will complete the actions described above to support your run.

From the moment the data are made available to you at the LTA or, if access has been granted, on CEP3, you have four weeks to check their quality and to report any problems to the Observatory. After this time window has passed, no requests for re-observation will be considered.

- Two current focus areas for the further development are adding support for beamformed observations and pipelines and adding constraints and priorities to the dynamic scheduler.

- The development plan of TMSS is on track: TMSS will be put in production in June 2021, at the start of cycle 16. A second phase of TMSS development will start after that to support more science use cases and realize further streamlining of the operational processes.

### **LOFAR2.0 Program (W. van Cappellen)**

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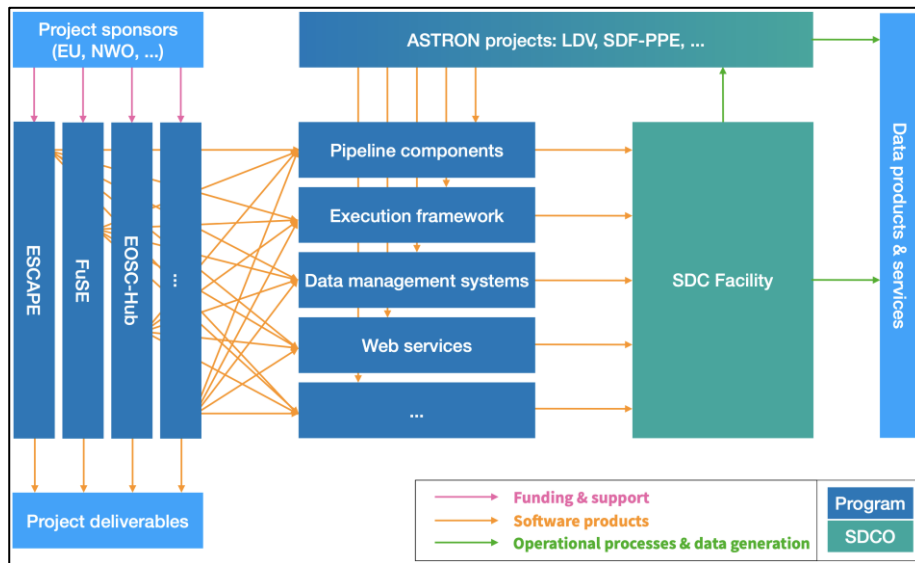
- The realisation of the LOFAR2.0 Dwingeloo Test Station (DTS) has kicked-off! First, the DTS will be used to verify the new Station design. Do all the interfaces between the components work as planned, is the overall thermal behavior within spec, can we control the station with the freshly introduced Tango framework? Next, the Dwingeloo Test Station will be integrated with other sub-systems like Timing Distributor, Central Processor, Network, Telescope Manager and Operational Processes. This will allow early verification of key functionality. For example, as part of setting up the full chain, it will be verified that the central processor is able to read the LOFAR2.0 station data. It will also allow early validation by users: an example is that the operator can validate the graphical user interface to operate the limited system.
- As reported in the previous edition of this newsletter, the costs of developing all planned LOFAR2.0 functionality will exceed the budget approved by the ILT Board. Options have been identified to downscope LOFAR2.0 functionality to reduce development costs. Final decisions will be made in March by the ILT Board.
- DAB transmitters between 170 and 190 MHz are causing spurious signals, limiting the useful integration time of core stations in the 110 – 170 MHz band. It is decided to install a new switchable filter to optionally include or exclude the 170 – 190 MHz band in HBA LOW observations.

You can find more highlights of the LOFAR2.0 program in the [LOFAR2.0 Newsletters](#).

### **SDC Program (J. Swinbank)**

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- The Science Data Centre (SDC) Program has been established to develop the software and technologies which will form the basis of the operational SDC. This represents a major new effort within ASTRON to develop a uniform approach to user-facing software and service development, which we are confident will soon start bearing fruit for the LOFAR community.
- The SDC Program will coordinate work across various sponsored projects currently underway or getting started at ASTRON, with the goal of transforming the various disparate project deliverables into a coherent system which will be delivered to the SDC Operations team. This is shown schematically in the figure.



- The SDC Program will also represent ASTRON in preparing for the upcoming network of SKA Regional Centres, ultimately being responsible for delivering the systems which will operate the Dutch SRC.
- The new SDC Program Manager joined ASTRON late in 2020, and work is now ongoing to establish the basic program structure and core documentation. One of the first results will be a document laying out the detailed vision for the SDC, which we expect to be published imminently.

### Science Delivery Framework – Production Pipeline Enhancement (J. Swinbank, T. Shimwell)

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- Over the last several years, the Science Delivery Framework: Production Pipeline Enhancement (SDF-PPE) project has focused on developing integrated scientific processing pipelines. This functionality is now the core business of the SDC Program. It has therefore been decided to wind up the SDF-PPE effort by the middle of 2021.
  - The final major delivery from SDF-PPE will be a version of the Prefactor pipeline which provides direction-independent calibration implemented using CWL, the Common Workflow Language.
  - Future algorithmic work will be coordinated by the SDC Pipelines team, while the SDC as a whole will take ownership of the execution environment and system architecture.

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

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- 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) and will streamline data processing operations at the LTA through a gradual adoption in production of the LTA processing interface under development within the SDF-PPE project. By doing so, LDV will prepare SDCO (SDC Operations) for routine LTA operations towards the DUPLLO surveys.
- LDV started in September 2020 and will last until June 2024. Data processing will be performed in phases and will be applied to both imaging and BF data.
- LDV is supported by a grant from NWO that provides access to computing time, storage capacity, and technical support from SURF over the period 2021-2022. During its first phase, LDV will operate at SURF only with the plan to move to the other sites (Juelich and Poznan) after 2022.
- Work is currently on going to finalise the Workflow Execution Framework, which will manage the processing tasks at the archive site. We expect that LDV production operations will start in March 2021.
- The data products will be made available to the community in subsequent data releases.

**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: April 2021