SDC Operations: Status and Plans

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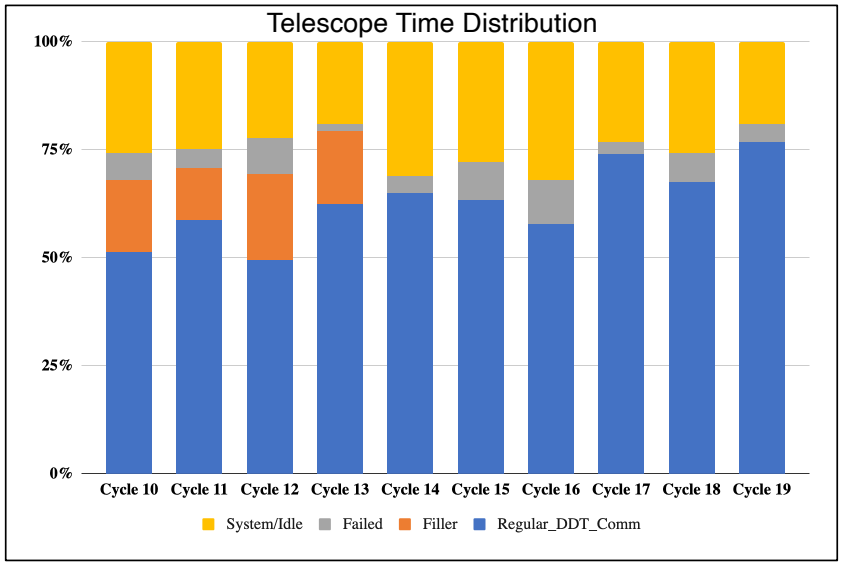
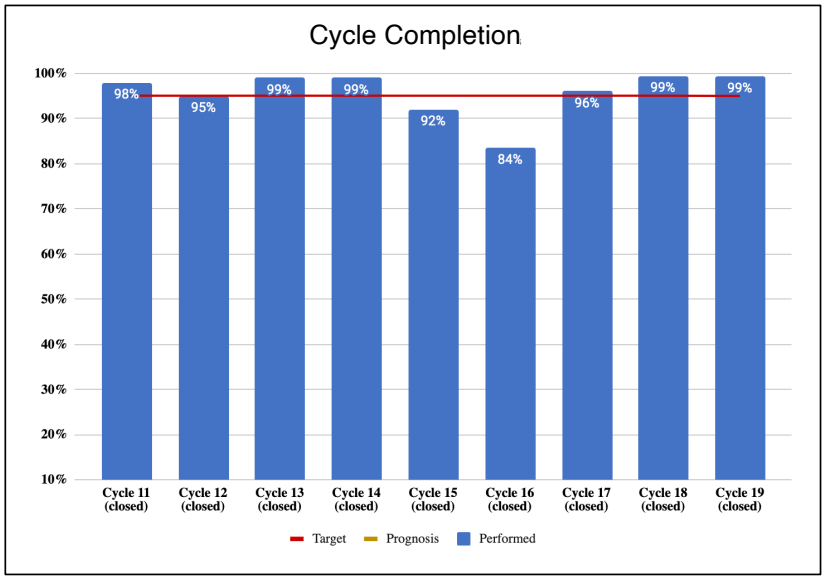
LOFAR

THE INTERNATIONAL LOFAR TELESCOPE

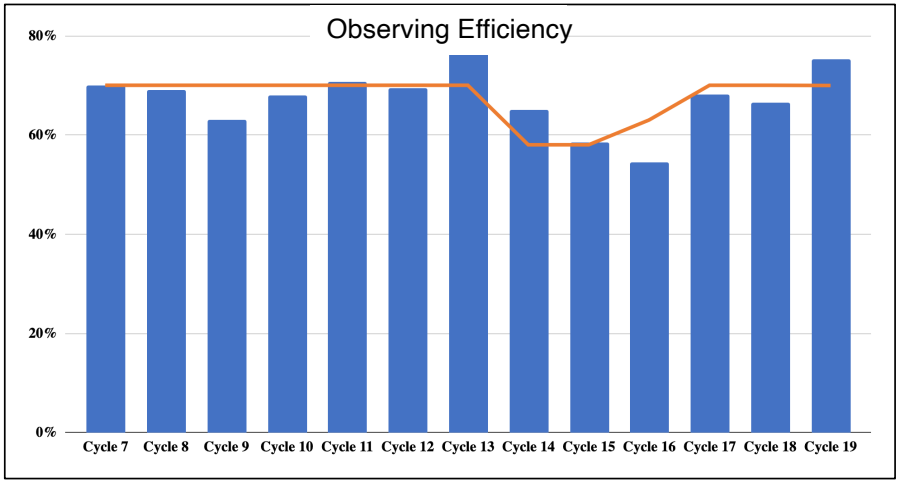
- 38 Dutch stations
- 14 International Stations
- 2 more stations coming in 2025:
  - Italy
  - Bulgaria

LOFAR CYCLES AND OBSERVING EFFICIENCY

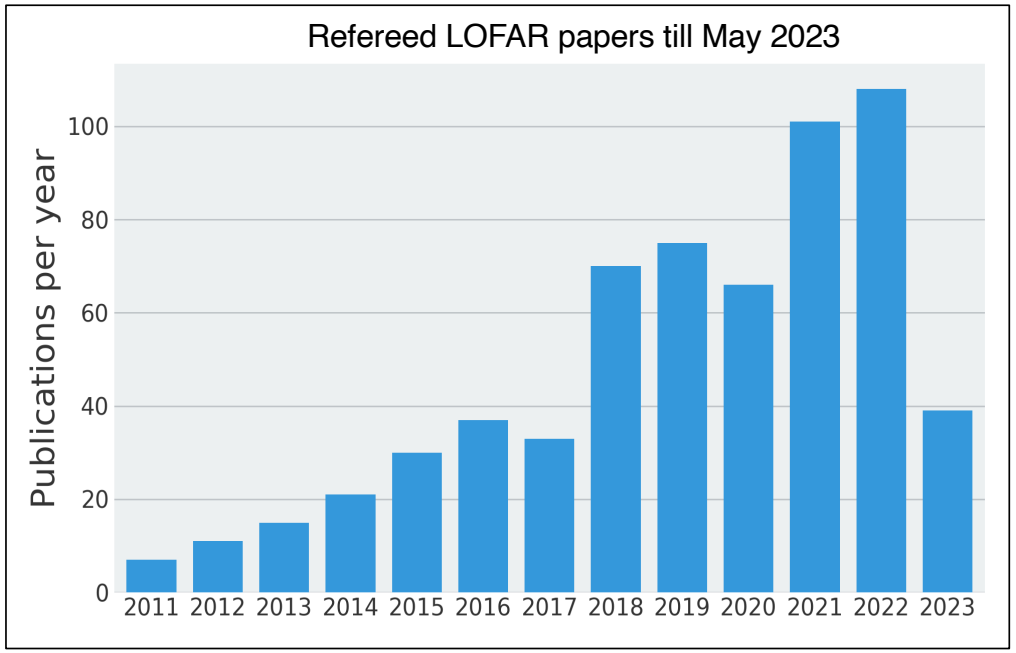


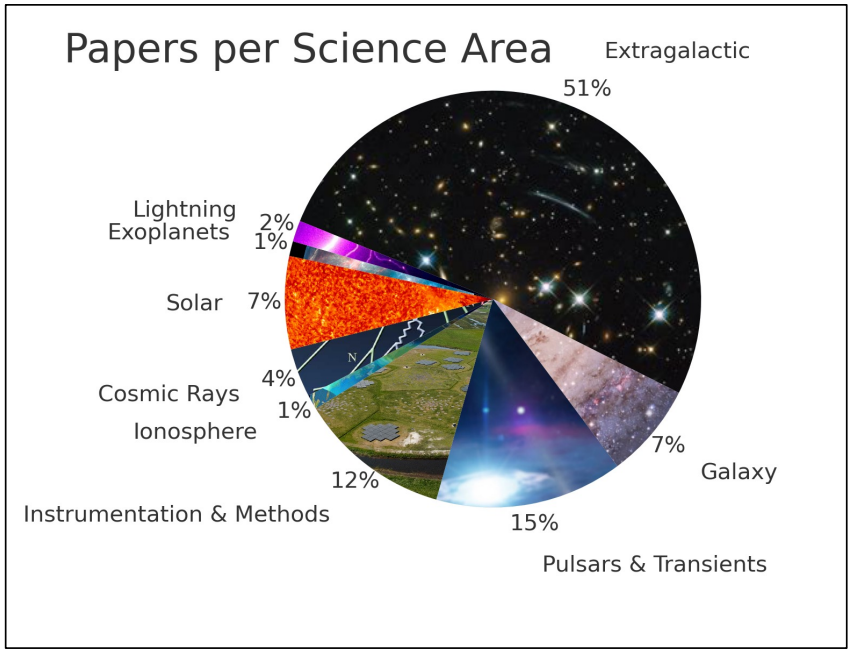


- Target efficiency: 70%
- Target completion: 95%
- Cycle 19: 99% completed - 75% efficiency



LOFAR SCIENCE OUTPUT

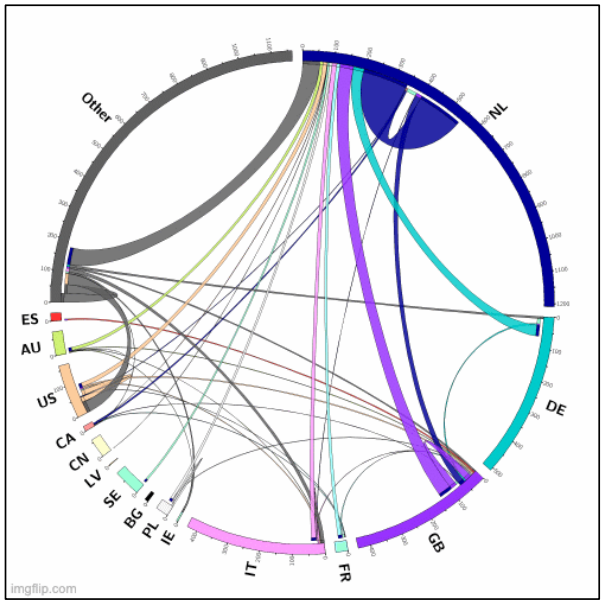


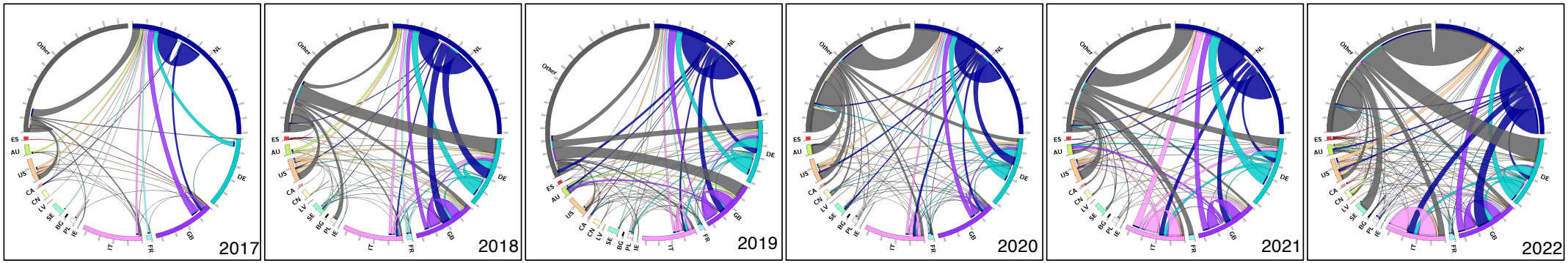


- 613 refereed publications
- Publication rate: 2 papers per week – top 10% of all astronomical facilities

COMMUNITY EVOLUTION

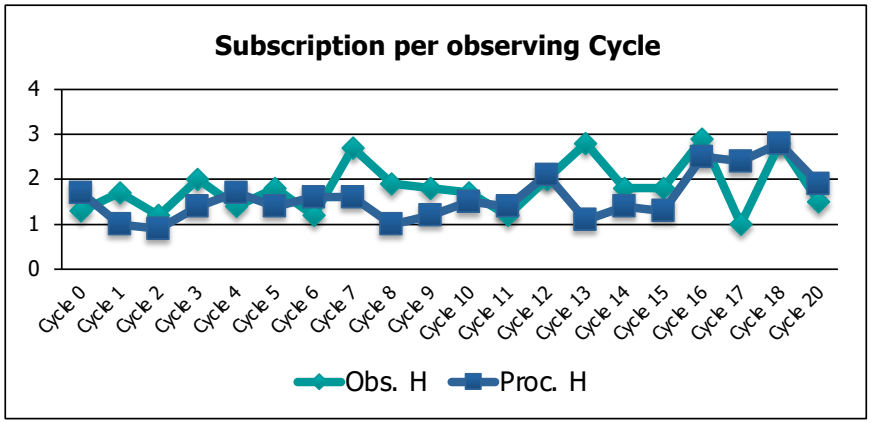
- Measuring the success of LOFAR: shape of the LOFAR community and evolution of international collaborations.
- LOFAR's community spans the entire World and expanded by over a factor of 3 in the period 2017-2022.
- Evolution of collaborations: chord plots obtained by analysing the LOFAR publications over the period 2017-2022.
- Between 2017 and 2022 there was a factor of 7 increase in collaborations.



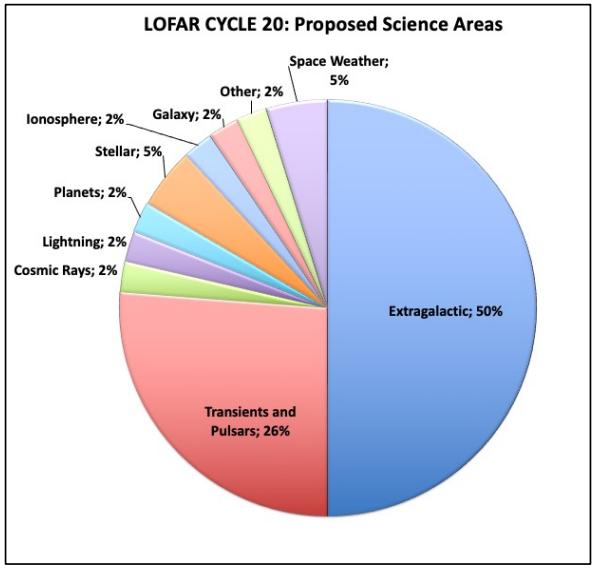


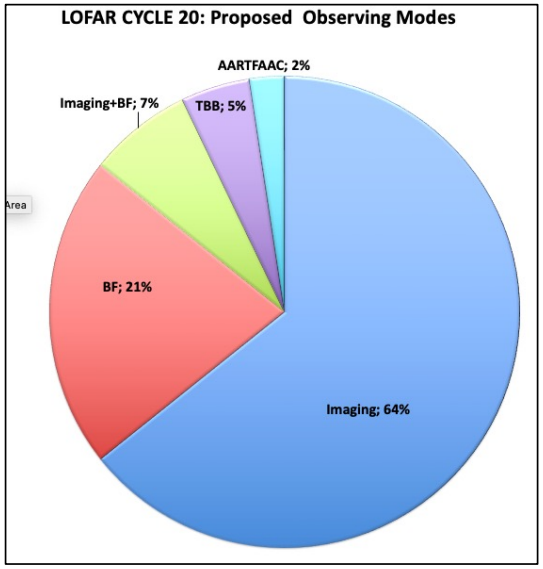
Courtesy of J. Dempsey

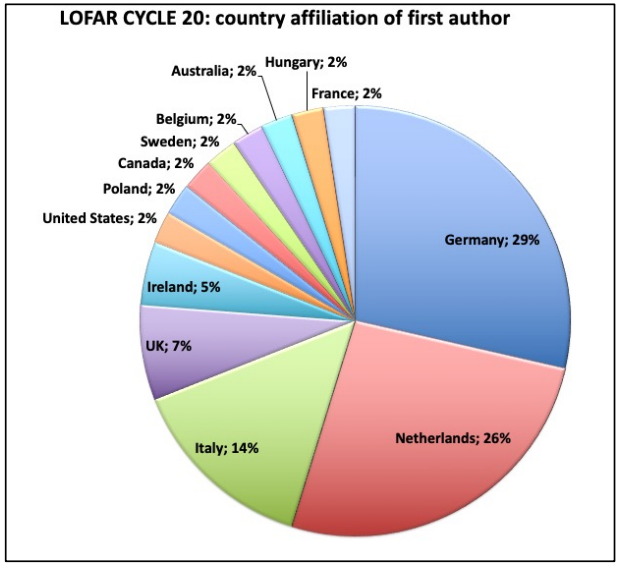
THE LAST LOFAR1 CYCLE



- LOFAR1 functionality still in high demand!
- Cycle 20 – last LOFAR1 Cycle
- 6000+ observing hours allocated
- Downtime expected after 1 June 2024 till 2025 for the upgrade to LOFAR2





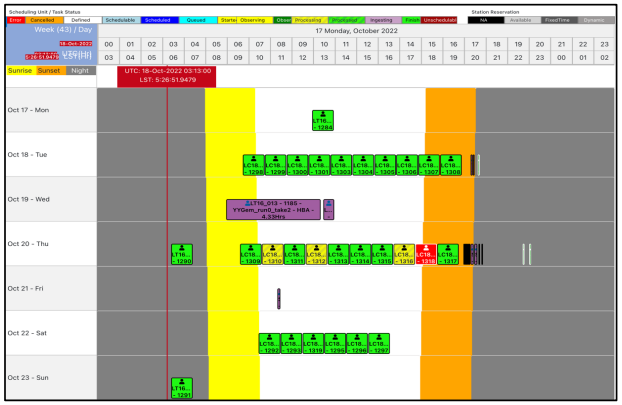


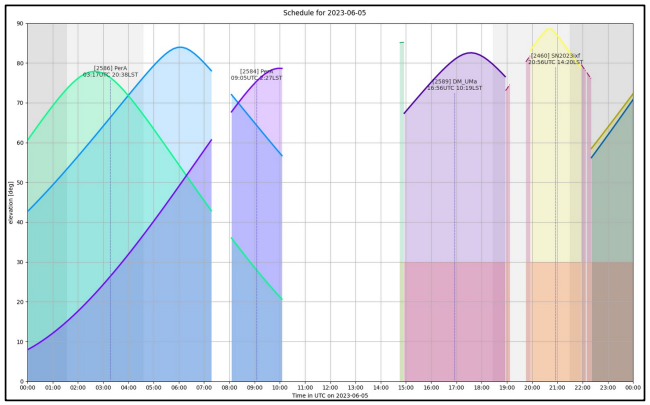
EVOLUTION: TMSS RUNS THE SHOW

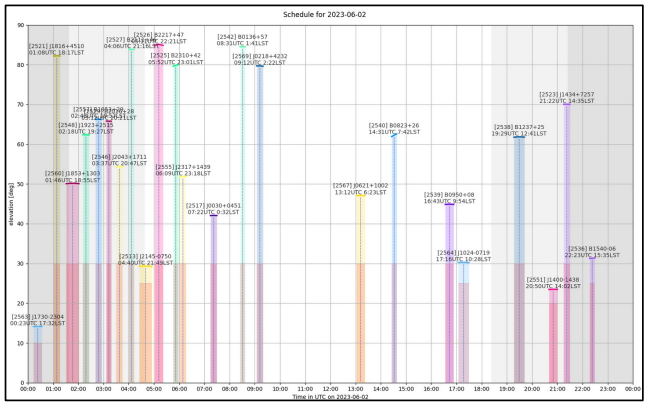
Benefits

- More efficient LOFAR operations
- Dynamic scheduling
- Improved adaptability and maintainability of software

- TMSS running the full Cycle 20 observing program
- Dynamic scheduler is live – see today's ASTRON daily image!
  - Schedule observations automatically based on constraints
  - Allows for responsive telescope interruptions







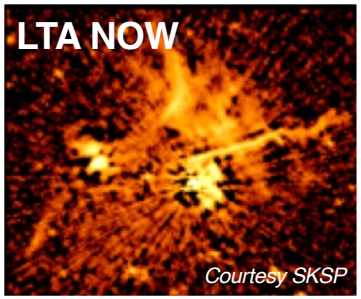
Images courtesy of the TMSS team

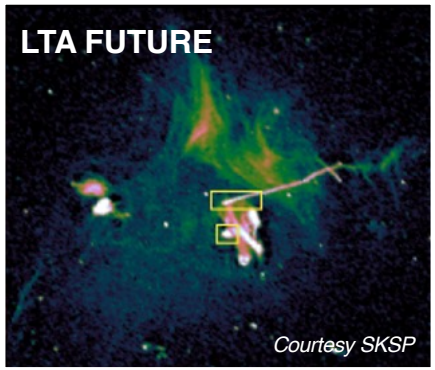
EVOLUTION: NEW PROPOSAL MANAGEMENT TOOL

- NorthStar successor needed for LOFAR2
  - Timeline: ready in ~ 1 year
- Analyzed tools adopted at other major astronomical facilities
- Conclusion: adopt & adapt Edwig (East Asian Observatory)
- It will:
  - Support proposal creation and experiment specification
  - Support review process
  - Transfer technical specs of allocated projects automatically to facility management systems (LOFAR & SDC)
  - Integrate with FAAI

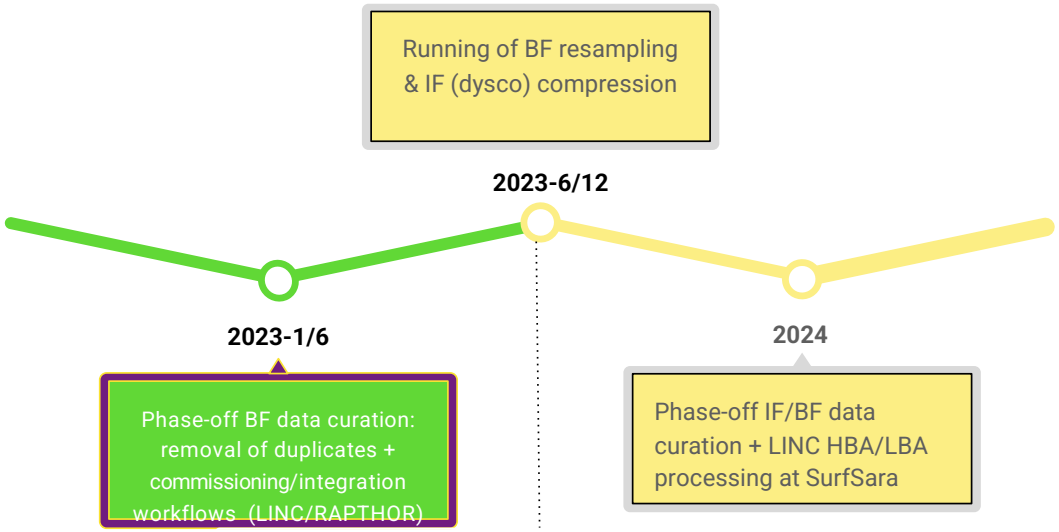
EVOLUTION of LTA and LTA OPS THROUGH LDV

LOFAR Data Valorization: make LTA data science-ready



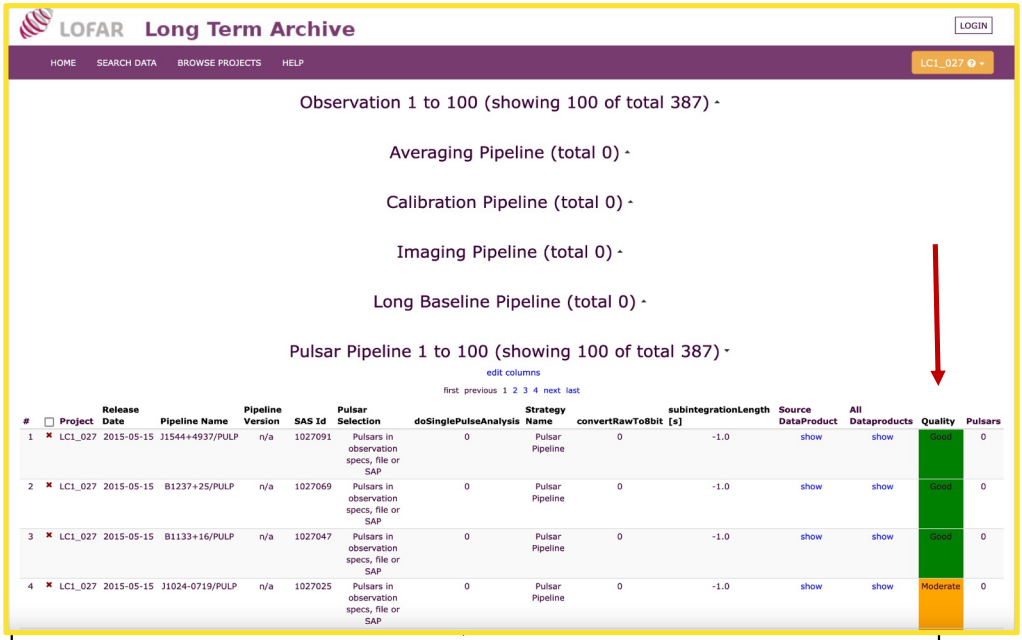


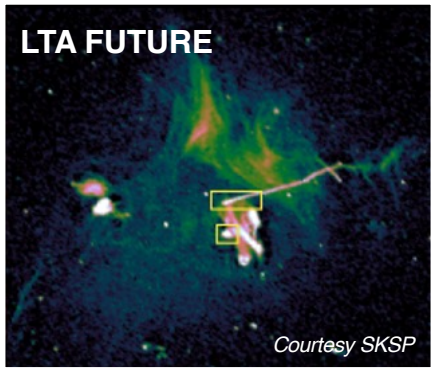
- Plus:
  - Reduce data volume at the LTA to reduce operational costs
  - Streamline data processing operations at the LTA
  - Prepare ASTRON for LOFAR2 surveys
- LDV Operations started early 2023 after development of necessary execution systems
- Current focus: BF data processing (re-quantization) – IF data compression following this year



goal: reduce storage occupancy @ Surf

EVOLUTION of LTA and LTA OPS THROUGH LDV





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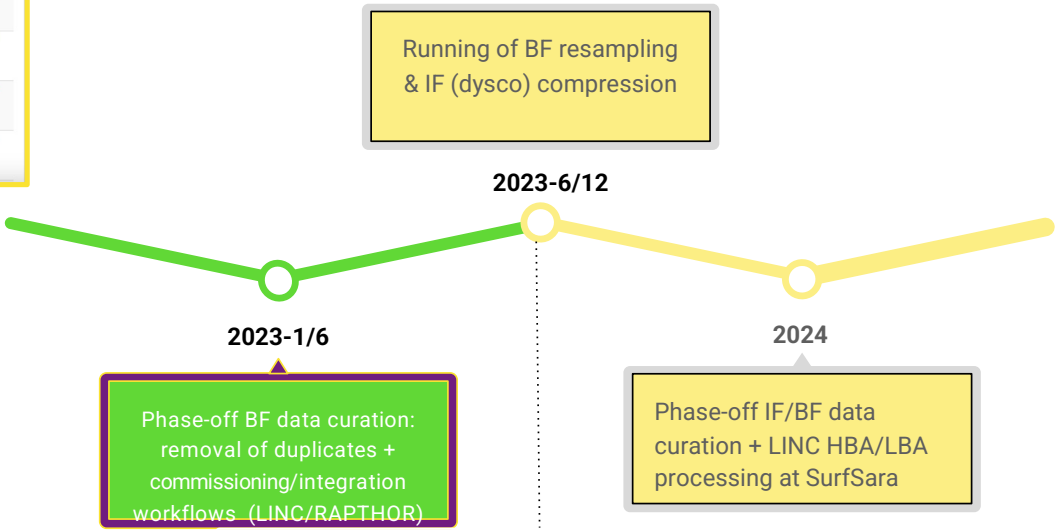
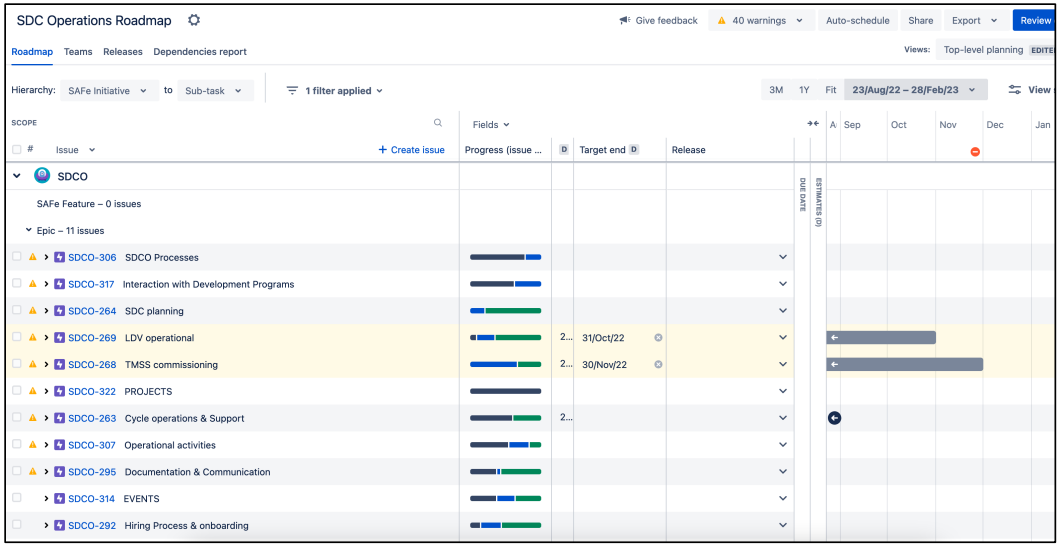


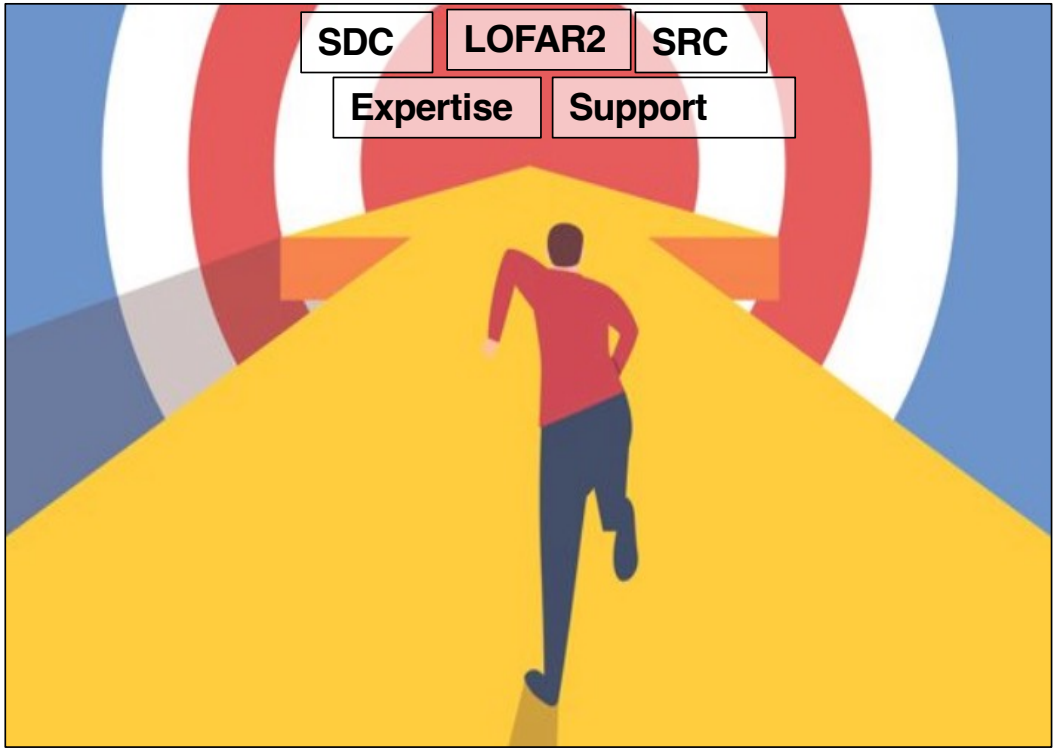
goal: reduce storage occupancy @ Surf

NEXT STEPS

- Continued support to SDC & LOFAR2 Programs to define & operationalize services:
  - NorthStar successor
  - SDC Focus Project
  - LOFAR2 system
- Commissioning:
  - Pipelines (LINC, Rapthor)
  - TMSS
  - Dynamic scheduler
- Operations:
  - Cycle 20
  - LOFAR2 Large Program proposals
  - LDV
- Community Engagement & Training:
  - Coordination of the Large Programs exploitation
  - LOFAR Data School – April 2024



SDCO GROUP EVOLUTION



- Securing necessary resources and expertise
- Strengthen the Instrument Scientist component in 2023/2024 to handle the future LOFAR2 and SDC challenges
- Seeking for Scientific Data Analysts ('SDCO operators')

Thanks – questions?