



This Project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 951815

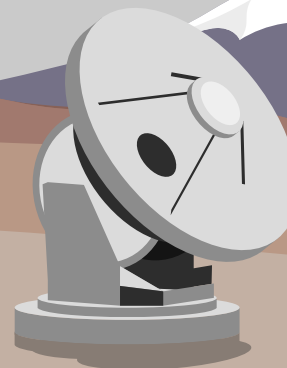
AtLAST's Operations plan: a multifaceted perspective

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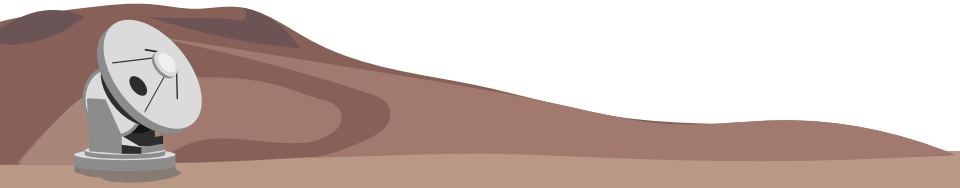
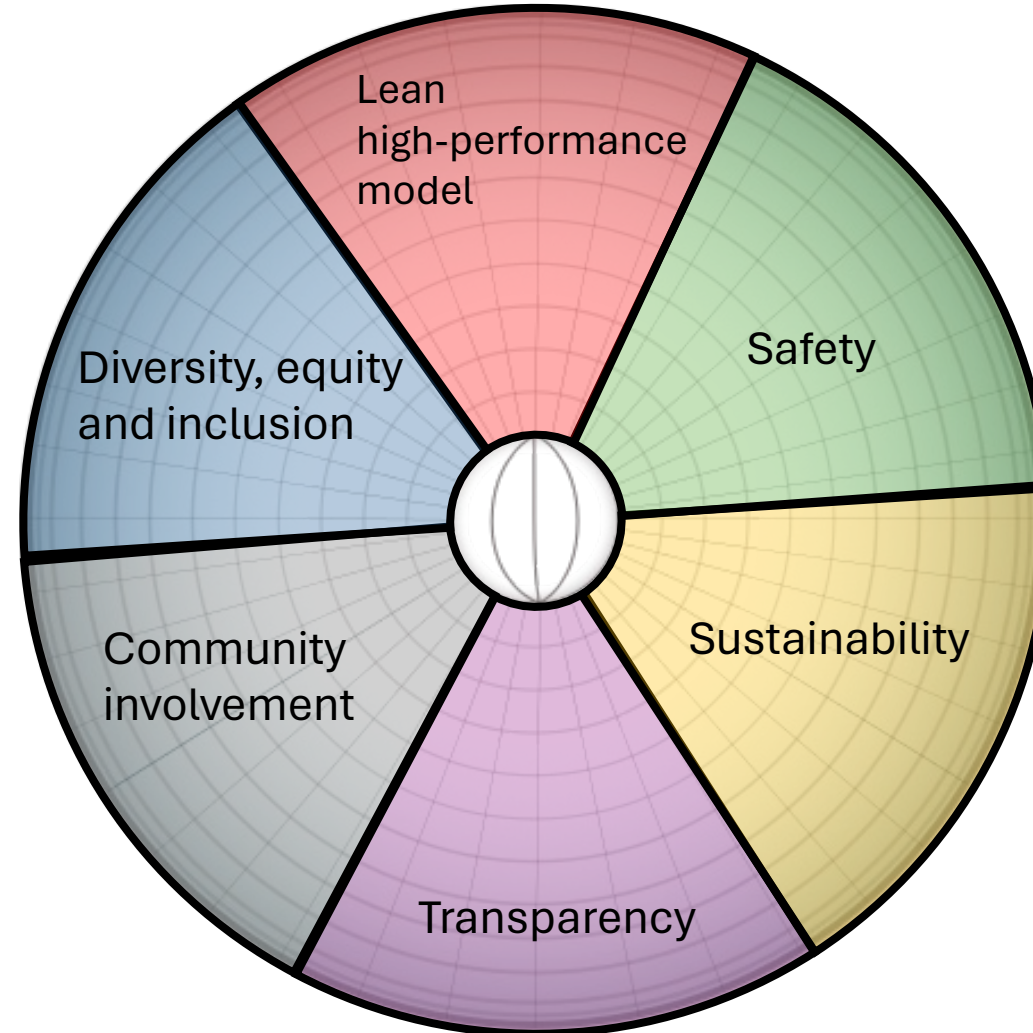


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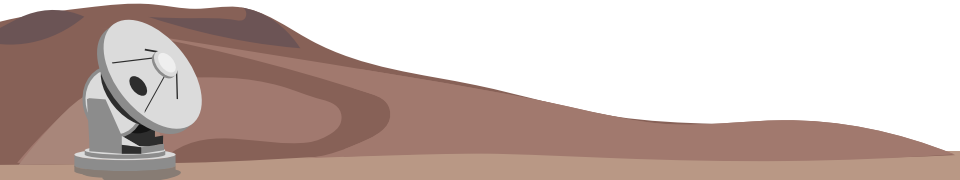
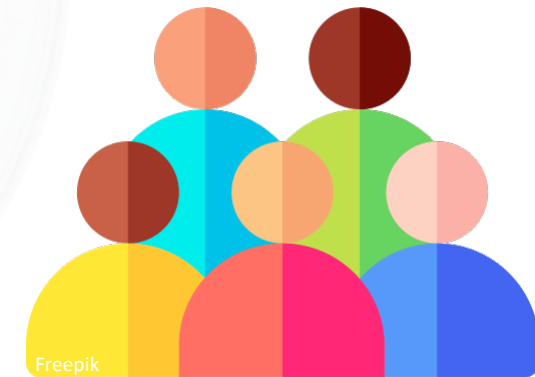
Operations driving principles





Diversity, equity and inclusion (DEI)

- AtLAST is an international project. It is diverse.
- **Diversity** enriches international projects: variety of ideas, innovative problem solving, facilitates adaptability to diverse cultural contexts
- **Equity and inclusion** are crucial
 - Collaboration and teamwork
 - Psychological safety
 - Promote work-life balance
 - Avoid the super-hero model
- We foresee a DEI committee to promote a culture of DEI, define and maintain policies, monitor progress toward goals.





Community involvement



Image by freemagesive.co.uk - Prawny

Community involvement

- Science-driven operations
 - Requirements from scientific drivers
 - Facilitate multi-wavelength, multi-messenger research
 - Legacy value: open archive
- Instrumentation and technology developments
 - Push technology from sub-mm instrumentation labs
 - Collaborate in calibration & data reduction software
- Outreach and dissemination: People engagement
 - Bringing operations closer to young researchers and public
 - Launch citizen science projects



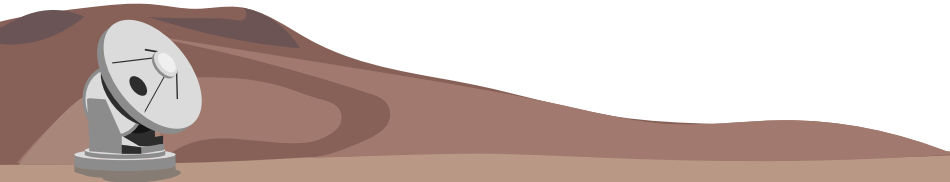


Transparency = Trust

- Transparent proposal review processes
 - Based on scientific merit and technical feasibility
 - Abstracts of approved projects promptly available
- Observatory: real-time broadcast
 - Status of telescope (observing, maintenance, shutdown)
 - Weather conditions and model predictions
 - Target being observed
- Open access:
 - Scientific data (with some proprietary period)
 - Calibration and processing software



Transparency





Sustainability and safety



- Quality infrastructure to ensure economic efficiency
- Aim at long-term operations (30+ years)
 - Plan for technical updates
 - Remain attractive to users
- Management of social, environmental and financial implications of own's actions
 - Minimise negative impact in the environment
 - Cooperation and synergies with related communities (e.g. local community in San Pedro; research institutions from partners, etc).
- Development of a safety management plan

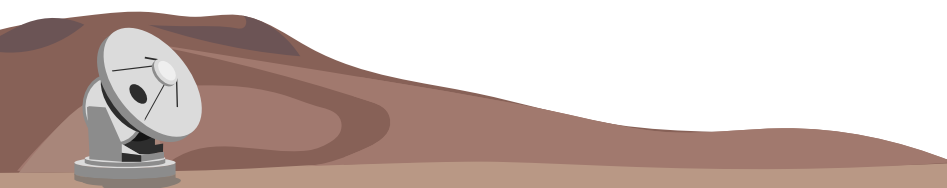




High-performance operation

- High-value data products (solid QA)
- Automatisation as a means for optimization and reproducibility
- Service mode with trained teams of specialists
- Clearly defined technical and performance specifications
- Ensure operations within the technical design specifications (or beyond, if possible).

Lean
performance
model





AtLAST Operations plan: key points

- Time allocation share according to partners' contributions
- 24 h operation + maintenance/technical blocks
- Service mode
- Enhanced remote operations (incremental approach)



- Optimised use of telescope. Automated (AI-assisted) scheduling. Consider requirements from science drivers
- High standards in data products (Robust QA and DRPs)
- **Interaction channels** between PIs and observatory
- Legacy value: Public Archive supported by budget. Data VO-compliant.



SOAR Remote Observer's G

- Proposing for SOAR
- SOAR Issue Status
- Targets of Opportunity
 - Multi-Messenger As SOAR
- AEON: Time Domain at
 - SOAR AEON Feature
 - SOAR AEON Night C
 - Goodman Live Data
 - AEON pages for SOA
- SOAR FILTERS
- **SOAR Remote Observe**
- Overheads & Efficiency
- Creating Target Lists
- Instrument Setup Form



Published June 13, 2019 | Ver

Remote Observing Years After

Baade, Dietrich¹; Zijlstra, All
Labraña, Francisco⁶; Dobbe

In the 1990s, ESO was a worl
under full remote control as o
3.5-m New Technology Telesc
from ESO's Headquarters in C
was to save costs incurred by
area of control systems, com
ESO's observatory in Chile ar
challenges, solutions, and les
proposal for this talk about re
collaboration with Anders Wallander, Gianni Raffi, and Andrea Balestra on technical matters.)

Sciops-R(emote) operations

The next big step arrived with the possibility to con
in San Pedro de Atacama. This was possible with m
design and implementation of a failsafe remote-con
called Sun Avoidance System, SAS).



APEX control centre for remote opera

Sciops-R(emote) operations started successfully in 2
The control room in Sequitor became the operation

To know more...

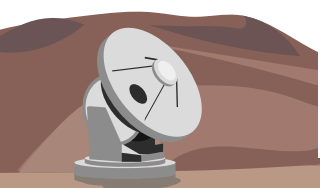
➤ See T. Klein et al, "APEX beyond 2016: the evolu
millimetre wavelength observatory" Proc. SPIE
Systems VII, 107041V (10 July 2018) doi: 10.1117/12.2312687

JCMT shifts to Remote Operations

November 2, 2019 News

JCMT has began a new era. Starting November 1st all data obtained at the JCMT will be observed remotely from Hilo. The first night of Remote Observing was staffed by JCMT Telescope Operator Mimi Fuchs.

JCMT astronomers who obtain data on a given night will now receive an automated email to inform them of observation being taken. At that time users are welcome to "eavesdrop" on operations by joining a remote connection directly to the JCMT Remote Observing Control room (JROC) in Hilo via the link provided in the automated email.





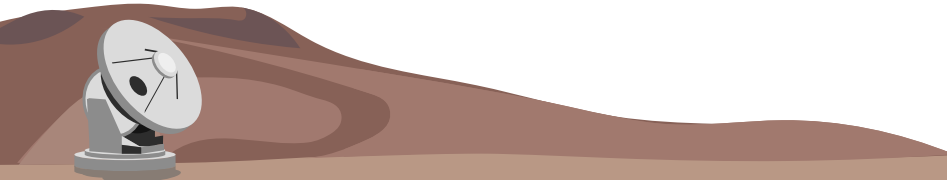
Planning for “enhanced” remote operations

Rewards

- Sustainability
- Safer
- Reduced CO₂ footprint
- Better involvement and training of the community
- More cost-effective
- Promotes DEI
- Better working conditions and work-life balance
- Model that can be exported to other scientific operations?

Challenges

- Technical setup (connectivity, latency, cyber-security...)
 - Ensure redundancy
 - Safety of people at the site & equipment
- Performance of a distributed team
 - Coordination
 - Communication
 - Team building





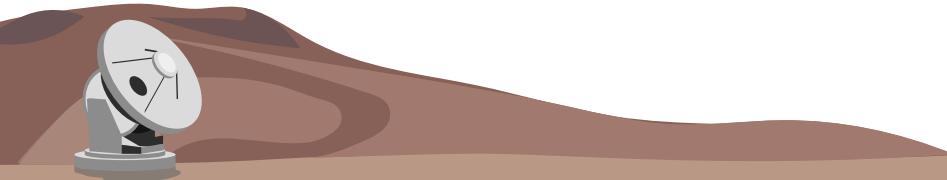
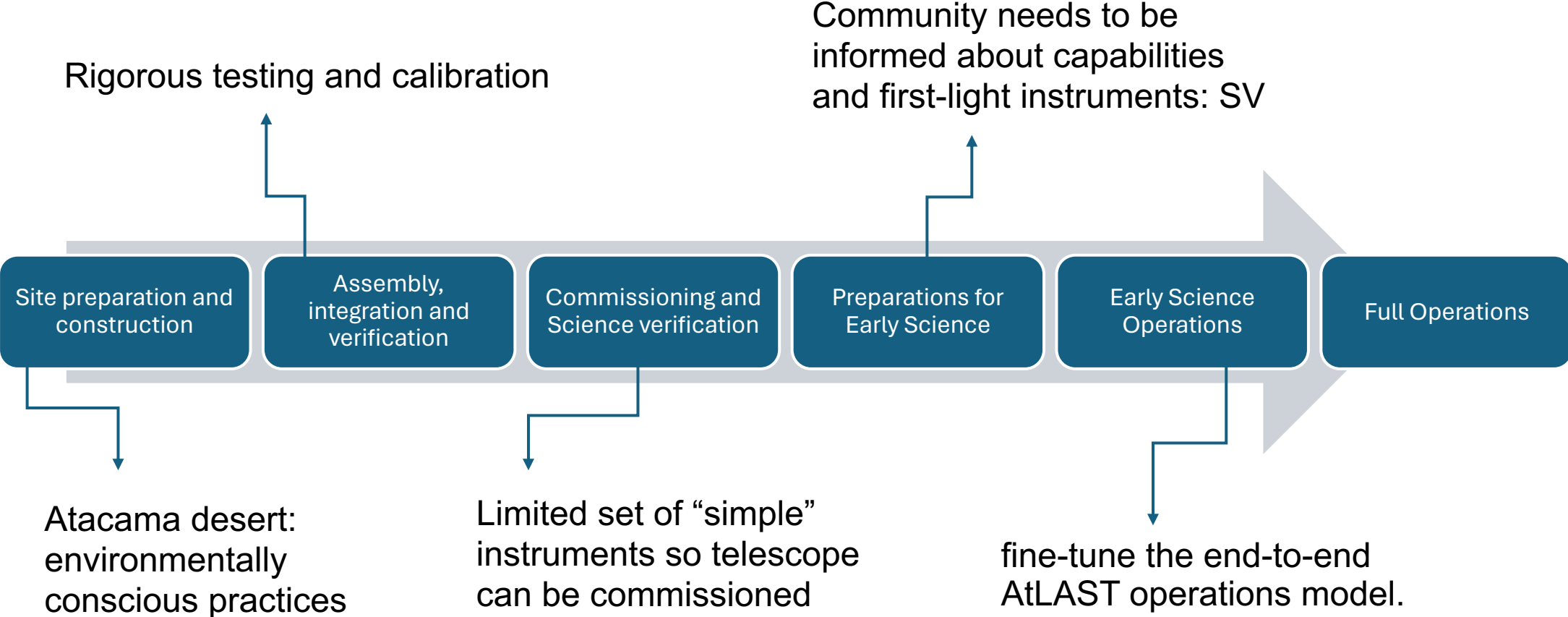
Operations requirements from science

- Large FoV & sensitivity: make the most of every image / datacube
 - Main target and commensal observations
 - Going “deep” considering cadences for variable targets or transients
 - Efficient pipeline to report promptly on newly discovered sources
 - Calibration observations preferably on fields with scientific value
- High calibration accuracy
- Coordinated observations with other observatories
- Efficient handling of Targets of Opportunity
- Fast switching between instruments or multi-frequency observations
- Integration into the EHT network





AtLAST operations lifecycle



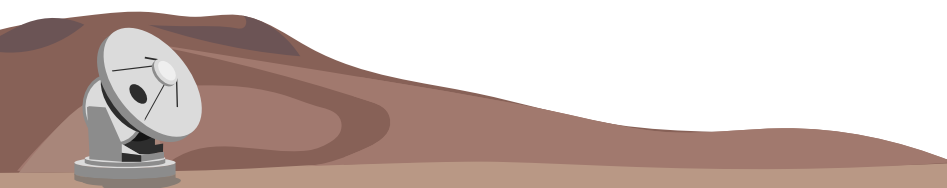


Condition-based maintenance

- Monitoring the condition of an asset to decide on what maintenance to be done
 - Monitoring systems for critical parameters
 - Data analysis and interpretation
 - Predictive modelling
 - Decision support systems
 - Address obsolescence



Klein et al. 2018, Proc. of SPIE Vol. 10704, 107041V, doi: 10.1117/12.2312687





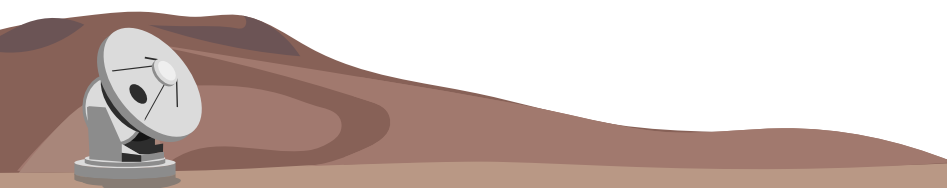
Data management plan

Data produced by AtLAST

- Raw, calibrated, science-ready (+ special data products)
- Simulated data
- Engineering and monitoring data
- Weather monitoring data / forecasts
- Calibration and reduction software (open & version controlled)
- Products for outreach, education

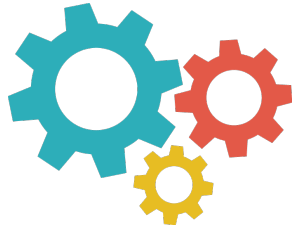
- FAIR principles

- Public open archive supported by budget
- Metadata according to radio data model. Findable by humans and by machines
- Interoperable. VO standard protocols, specific tools.
- Compatible/integrated with open science platforms (EOSC)

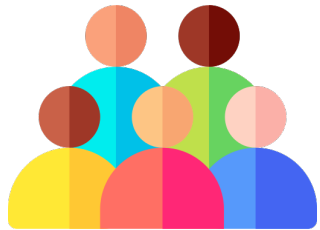
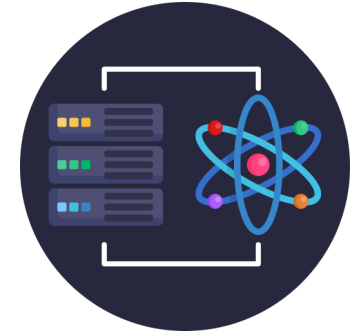




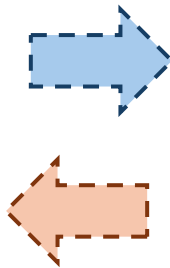
AtLAST Interface for Remote Exploration (AIRE)



- Technical and scientific documentation
- Proposal preparation tools
- Proposal review tools
- Phase 2 preparation



- Scientists
- Proposal reviewers
- Archive users
- General public



- Observations follow up
- Interaction channel during observing run
- Access to Archive
- Simulation, reduction and analysis tools, notebooks
- Support centre





Next steps

- Collect feedback from the AtLAST (and larger) community
- Deepen on remote distributed operation models
- Explore technical solutions
- Conceptual design of the AIRE platform
- Synergies with existing infrastructures





Thank you!

Get in touch with us, we want to get your feedback

