



ESO Telescopes Scheduling

Marina Rejkuba

Nando Patat, Lowell Tacconi-Garman

ESO

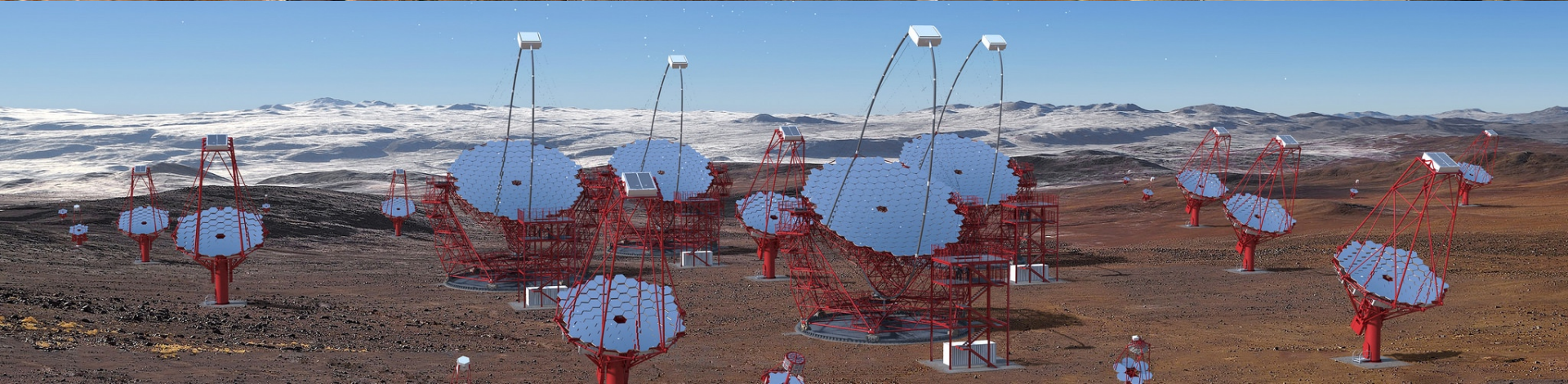


Outline

- ESO Observatory Scheduling: context
 - Multi-site
 - Multi-instrument, different types of instruments
 - Large variety of science programmes
- Long Term Schedule vs Short Term Schedule
- Telescope Time Allocation Input & process
- New Time Allocation Tool



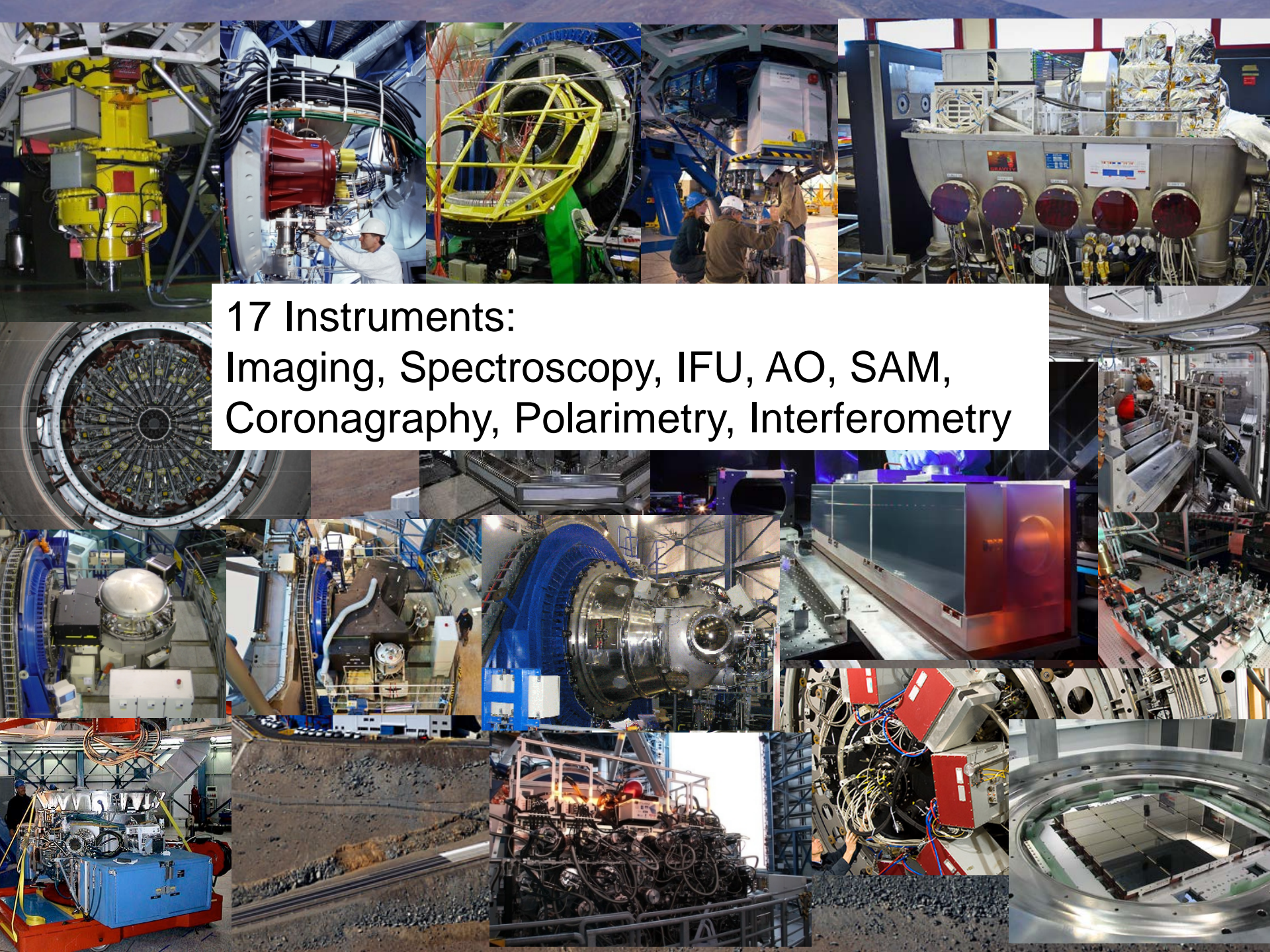
ESO Sites





La Silla Paranal Observatory





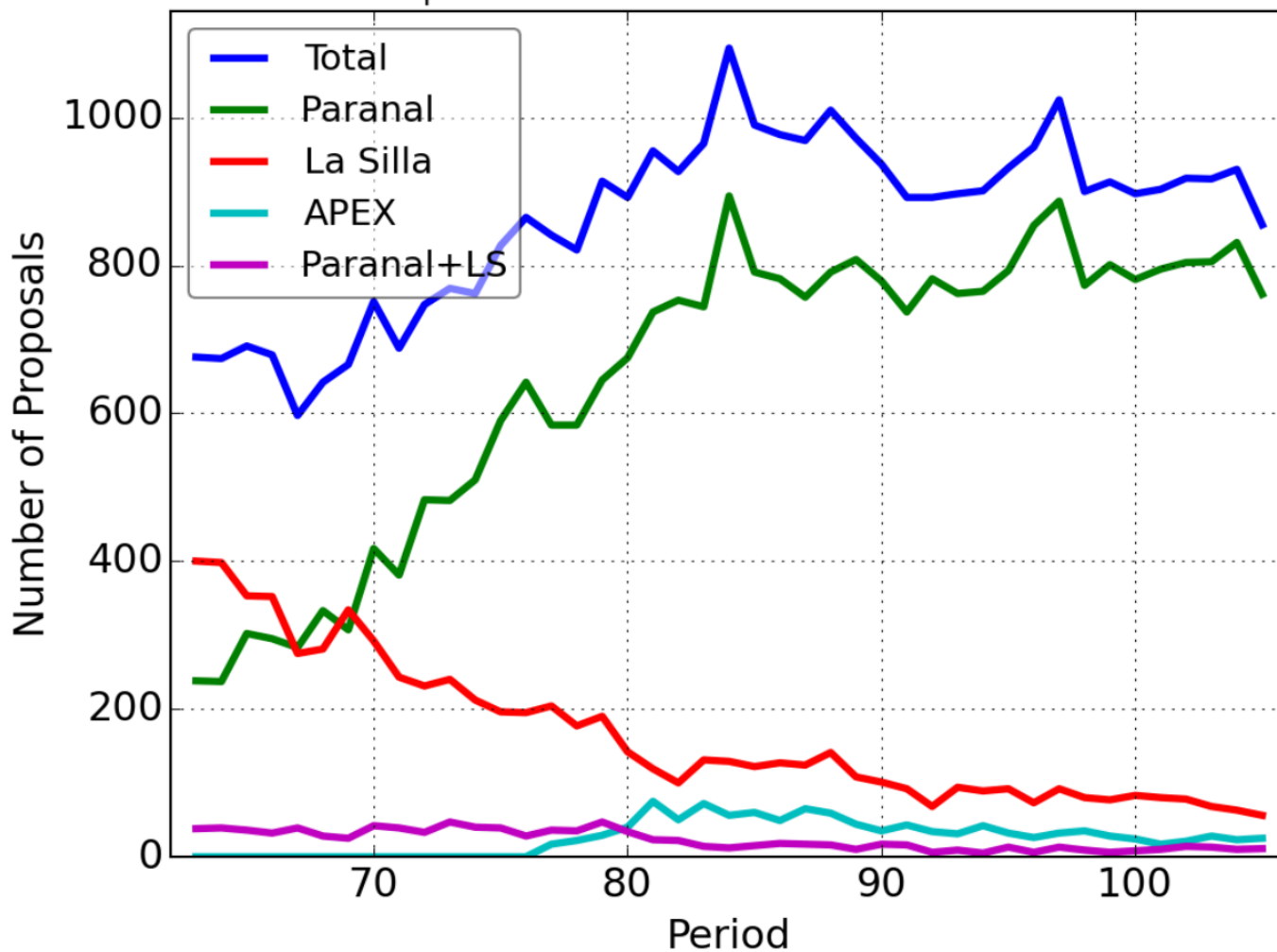
17 Instruments:
Imaging, Spectroscopy, IFU, AO, SAM,
Coronagraphy, Polarimetry, Interferometry



Number of proposals per site

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~900 proposals
Every 6 months

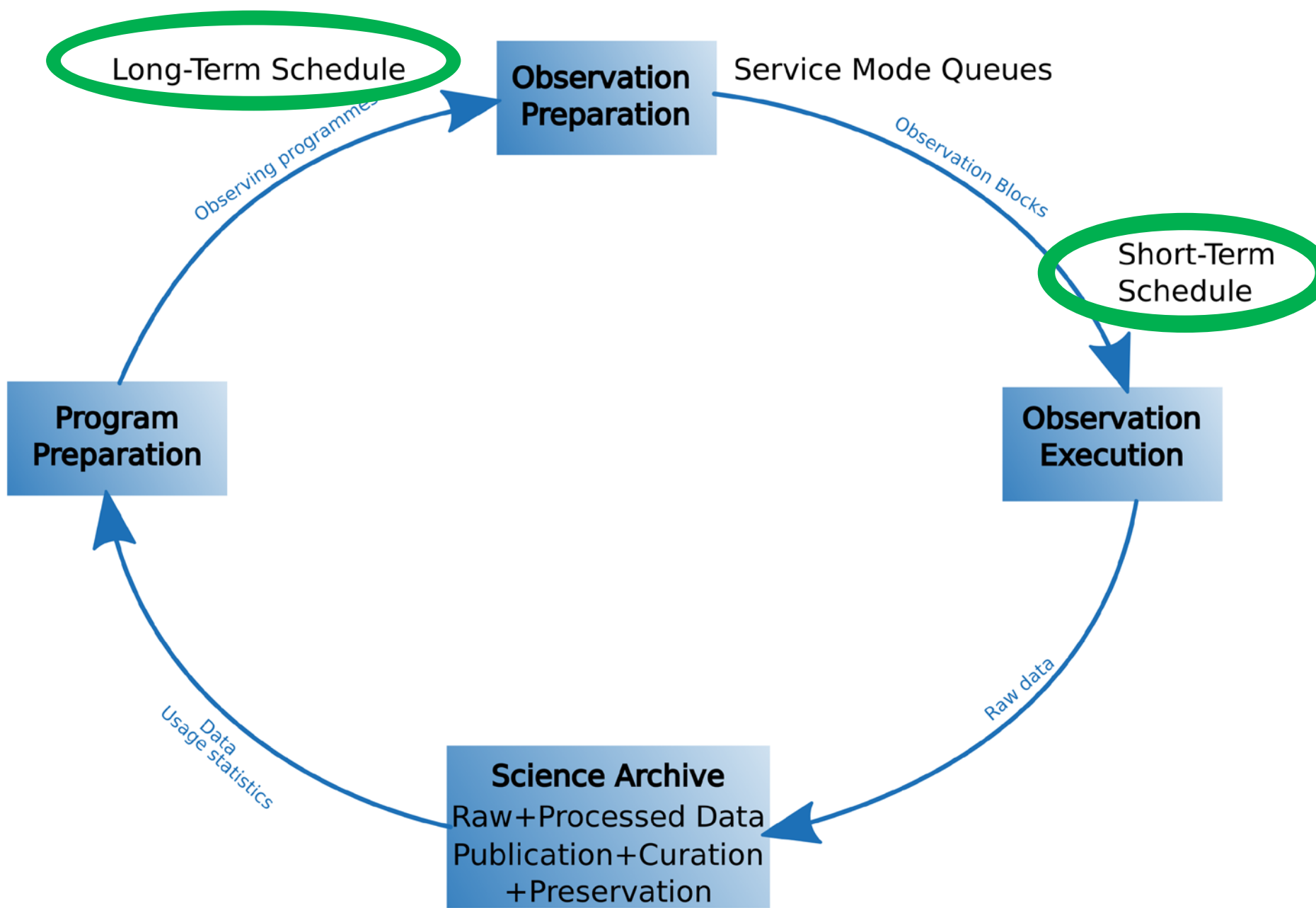
Diversity and Flexibility

■ Observing Modes

- Visitor (Classical) Mode
- Service (Queue) Mode

■ Observing Programme Types

- Normal – high priority, medium, filler type
- Monitoring Programme – relatively small but long time
- Target of Opportunity, Rapid Response Mode
- Large Programme – 10 nights or longer
- Public Surveys – imaging, spectroscopic surveys
- Calibration Programme
- Guaranteed Time Observations
- Coordinated proposals with XMM





Telescope Time Allocation Input

- Science Operations Policy (SM/VM/GTO/ToO/RRM/...)
- Ranked list of proposals from the OPC
- Observatory constraints (fixed)
 - Commissioning and Maintenance
 - Calibration plan – fraction of SM allocation
- Ongoing commitments
 - Large Programmes, Surveys, Carryovers
- Technical feasibility for science proposals
- Constraints: sky transparency, moon, atm turbulence
- VLTi baselines, ESPRESSO 4UT mode, FORS2 blue CCD
- Laser collisions

Short Term Scheduling

■ Step 1: Observations Filtering

- airmass, sky transparency, moon, PWV, GL fraction, τ_0
- image quality as a function of airmass & filter (λ)
- wind, AO friendly atmosphere, availability of laser, inst. configuration
- sidereal time, absolute time (include long-term schedule)
- **Result: Observable vs. Non-observable queue**

■ Step 2: Observations Ranking

- scientific ranking of the programme
- combined probability of the realization of observing constraints
- time critical score + setting target score
- user priority, group score, group contribution
- **Result: ranked list + rank justification**



“Cross Facilities Collaboration in the Multi Messenger Era”

- Currently – regular Call for Proposals (March/Sept)
 - Target of Opportunity
 - Rapid Response Mode
- Director General Discretionary Time
- Joint ESO VLT-XMM Proposals
 - Up to 80 hours; offered in yearly calls (odd periods)
- Time Allocation Working Group Recommendations
 - Larger time allocations and yearly call
 - Faster turnover – fast track channel

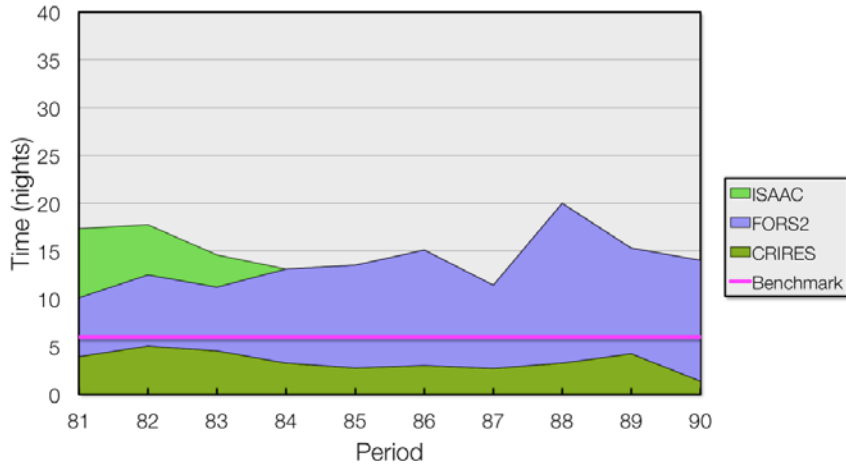
New Time Allocation Tool (TAtwo)

- Close the loop: Long – Short Term Schedule
- Dynamical scheduling/changes
- Getting ready for ELT
- Time Allocation Working Group Recommendations
 - Yearly call for Proposals (OPC evaluation)
 - Fast track channel (Distributed Peer Review?)
- Realistic constraints including time constraints & linking between observations

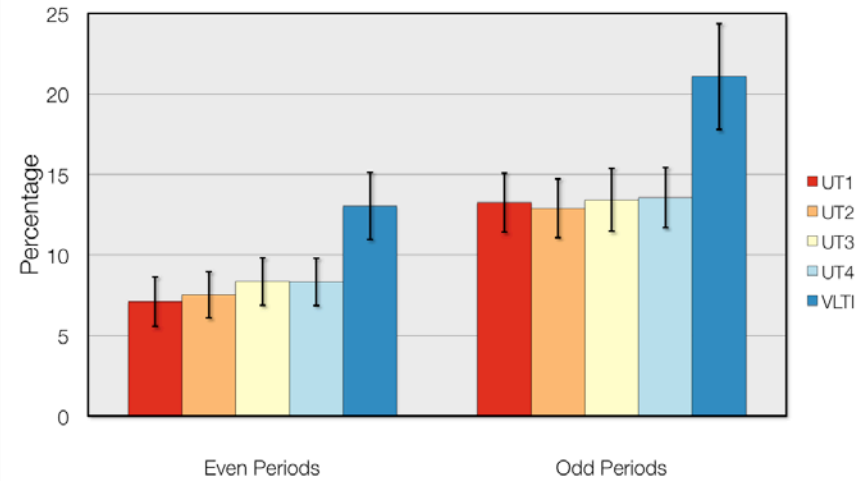


Metrics: input for scheduling

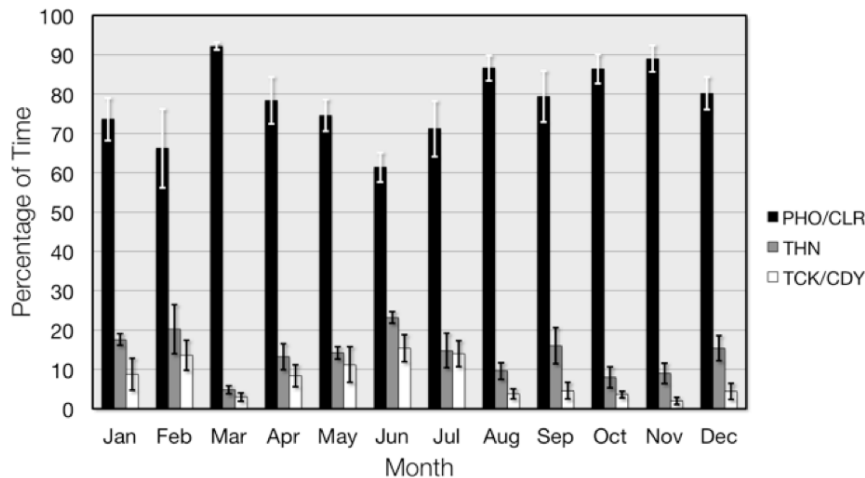
UT1 SM Total Calibration Time



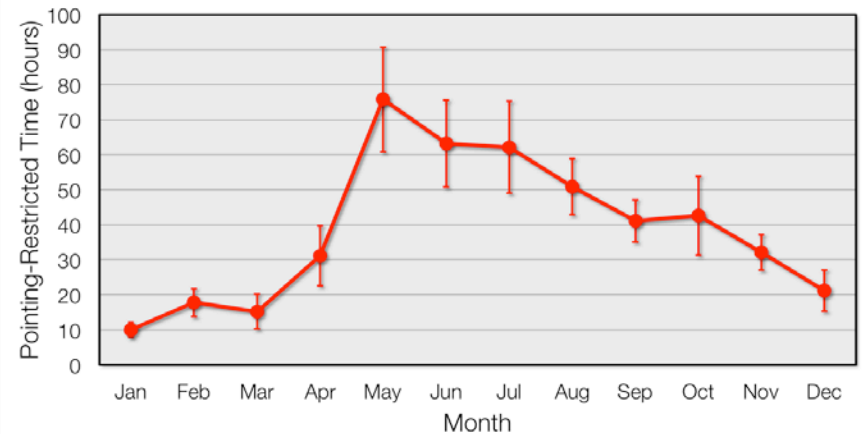
Weather Loss as a Percent of Science Time



Transparency Statistics by Month (2008-2012)



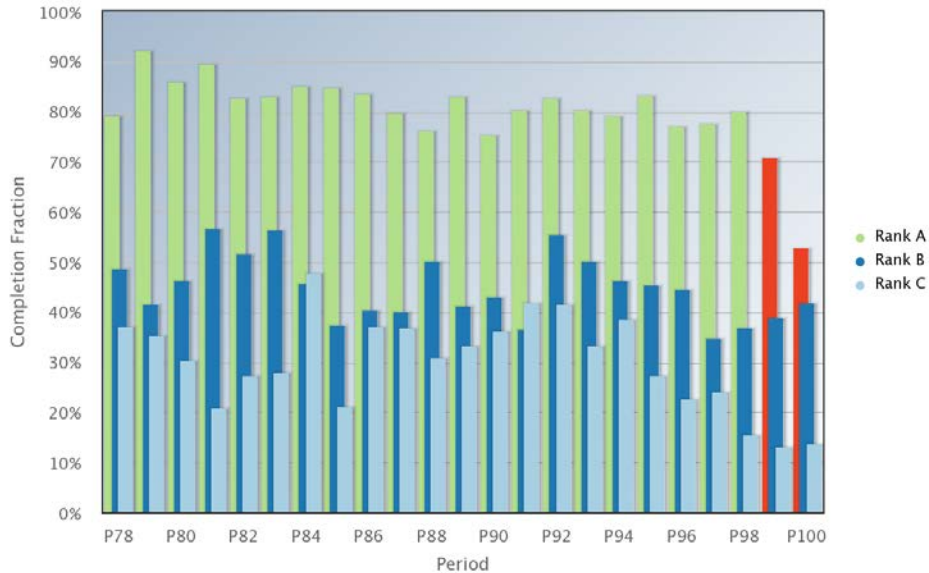
Mean Wind Pointing-Restriction Times by Month (2006-2012)



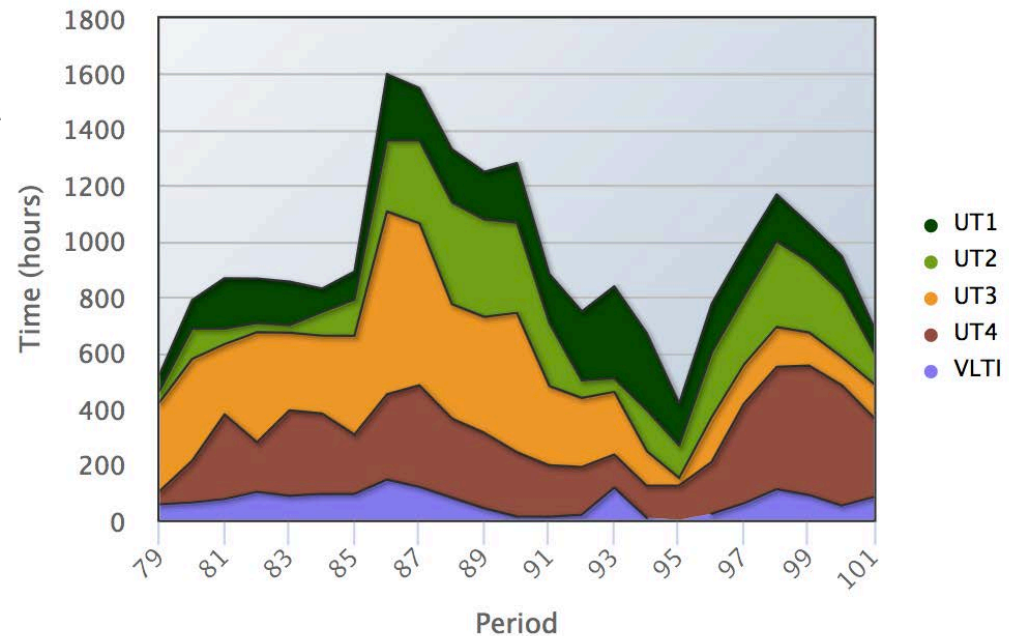


Metrics

Overall Completion Fractions of A-, B-, and C-class Runs
[in terms of runs completed]

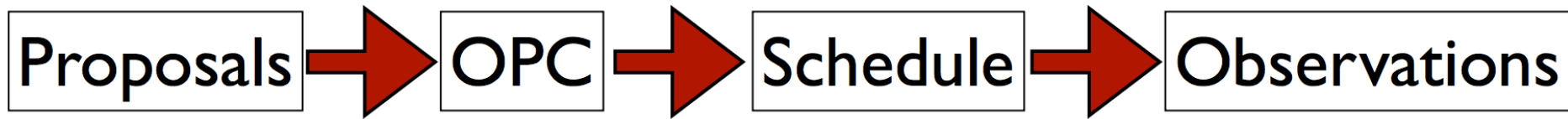


Time Carried Over Into Period



Top Level Requirement

- Maximise the scientific return within the operational specifications



- TLR: Follow the ranking provided by the OPC as close as possible
- TLR: Include the ongoing commitments
- TLR: Include prioritised technical/programme needs within limit posed by the science policy



New Time Allocation Tool (TAtwo)

Top Level Requirement

maximize scientific return & minimize the differences between the OPC recommendations and the final outcome of an observing period within operational constraints