Getting the most out of your observing time

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(ESO - User Support Department)
Congratulations
ESO observing time was allocated to your programme !!

Your goal

- Obtain data as soon as possible
- Obtain all the data
- Obtain highest quality data
Your next step (PHASE2)

Select the right STRATEGY and carefully PREPARE / PLAN your observations

Checklist:

- Do I need special calibrations? → check the standard calibration plan
- Select best instrument set-up (→ User Manual/Template manual) and exposure times for your science (Phase1 is binding)
- Re-Calculate exposure times with ETCs, check the S/N
- ESO service mode rules → Check if you need to submit a waiver (e.g. >1hr OB)
- Check Phase2 instrument specific webpages
  http://www.eso.org/sci/observing/phase2/SMGuidelines.html
Your next step (PHASE2)

- Select the right STRATEGY and carefully PREPARE / PLAN your observations

ESO observation preparation tools
What is your programme’s ranking?

- Rank class (i.e. priority) of your programme (in SM)
  - **Rank A - High Priority**: These programmes are considered to have the highest scientific value and are executed first as observing conditions allow. ESO makes every possible effort to complete programmes in this Group.
  - **Rank B - Medium Priority**: Programmes in this group have lower scientific priority than Group A and are executed only when no Group A programme can be executed. ESO tries to complete all programmes in this Group, but incomplete programmes are terminated at the end of the allocated semester.
  - **Rank C - Low Priority**: These programmes have lower scientific priority than those in Groups A and B – any weather programmes...
Rank class <-> Observation block (OB) constraints
   - OB constraints: Airmass, Sky transparency, Lunar illumination, Moon Angular distance, Image quality
   - Probability of realization → OB constraints

OB preparation tool
p2
Chances of seeing realization

Primas, F. et al., Messenger Article (Dec 2014)
General Strategies: Bright or Dark Sky

Patat 2004, Messenger

B-filter, FLI=0.5, moon elevation 20

Do not overconstrain your OBs (observation blocks)!
Make use of the twilight constraint
## General Strategies

### Typical OB constraints (but Phase1 is binding!)

<table>
<thead>
<tr>
<th>Rank A</th>
<th>Rank B</th>
<th>Rank C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td><strong>Name</strong></td>
<td><strong>Name</strong></td>
</tr>
<tr>
<td>Sky Transparency</td>
<td>Sky Transparency</td>
<td>Sky Transparency</td>
</tr>
<tr>
<td>Image Quality (arcsec)</td>
<td>Image Quality (arcsec)</td>
<td>Image Quality (arcsec)</td>
</tr>
<tr>
<td>Airmass</td>
<td>Airmass</td>
<td>Airmass</td>
</tr>
<tr>
<td>Lunar Illumination</td>
<td>Lunar Illumination</td>
<td>Lunar Illumination</td>
</tr>
<tr>
<td>Moon Angular Distance</td>
<td>Moon Angular Distance</td>
<td>Moon Angular Distance</td>
</tr>
<tr>
<td>Twilight (min)</td>
<td>Twilight (min)</td>
<td>Twilight (min)</td>
</tr>
<tr>
<td>Baseline</td>
<td>Baseline</td>
<td>Baseline</td>
</tr>
<tr>
<td>Strehl (%)</td>
<td>Strehl (%)</td>
<td>Strehl (%)</td>
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<tr>
<td>PWV (mm)</td>
<td>PWV (mm)</td>
<td>PWV (mm)</td>
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<tr>
<td>Atmospheric Turbulence Model</td>
<td>Atmospheric Turbulence Model</td>
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</tr>
<tr>
<td>Contrast</td>
<td>Contrast</td>
<td>Contrast</td>
</tr>
</tbody>
</table>

### Highest rank class can have stringent constraints if needed

### Medium rank class ok, but remember termination at period end

### Filler rank class relax the constraints, re-calculate exp. times and expected S/N
General Strategies

- Your programme has limited time allocated – Use it wisely!

p2 web-tool
Phase2 observing preparation (OB preparation)

https://www.eso.org/sci/observing/phase2/p2intro.html
General Strategies

- Optimize your overheads!
  - Short OBs with targets close together on the sky can be concatenated (i.e. execution in immediate sequence)
  - Calibrators can be concatenated to the science OB

Depending on targets’ distances you save up to ~5min per OB
Plan your time sequences!

- Use time-links → ensure the quality of your science, e.g. for variability studies
- Check the telescope schedule first
- Don’t put stringent time-constraints for rank C programs, loose constraints ok
General Strategies

- Group certain OBs together (Group containers)
  - E.g. complete set of all filter observation for a target
  - E.g. complete set of all (identical) OBs for a deep field
  - Particularly useful for rank B and C programmes

- Priority of execution at the telescope will increase for remaining OBs of a group once one OB of the group was started
Don’t underestimate the usefulness of the Finding Charts

- Situation: your OB is started but then execution aborted, because the operator cannot recognize the field, or it is ambiguous

**EXAMPLE**

- ReadMe file instruction: put the bright target under the coronograph

Bad finding chart! Which one is the target?
How to ensure the best data are taken for multi-obj spectroscopy?

- KMOS/FORS/FLAMES have specific preparation tools – KARMA/FIMS/FPOSS

- Your target input catalog is crucial! Precise relative astrometric accuracy; reference stars must be in the same astrometric system as your target catalog; the optimization is crucial – take your time!
GuideCAM tool – MUSE/VISIR/HAWK-I

Slit spectroscopy of faint/invisible target. Acquisition via offset star.

Blind offset values in arcsec
GuideCAM tool – MUSE/VISIR/HAWK-I

Acquisition fine-tuning and Tip-tilt star selection
GuideCAM tool – MUSE/VISIR/HAWK-I

Define and check FOV dither pattern

Dither offset values

Current absolute offset:
RA: 0.0  Dec: 0.0

RA/Y: 600  Dec/Y: 0

RA 300.0 Dec 0.0
RA -600.0 Dec 0.0

Move Up
Move Down
Remove
Apply
Next
Show all
Check the progress and act(!) if necessary

**During the observations**

- Check the status of your observing run

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**ESO User Portal Services**

**Phase 1**
- Download the proposal form
- Submit an observing proposal
- Check the time allocation information

**Phase 2**
- Prepare observing materials
- Submit a target or set-up change request
- Check the status of your observing runs
- Delegate Phase 2 tasks

**Phase 3**
- Download the Science Data Products Standard
- Submit data
- Check your Phase 3 submission status
- Delegate Phase 3 tasks

**Archive Services**
- Query the Archive for
  - La Silla Paranal raw data
  - La Silla Paranal reduced data
  - APEX reduced data
  - Phase 3 Catalogs
- Delegate proprietary data access rights

**Help**
- Ask for help
- Find User Portal Information and FAQ
- Check the data reduction FAQ
During the observations

- Check the progress and act(!) if necessary

### Phase 1
- Download the proposal form
- Submit an observing proposal
- Check the time allocation information

### Archive Service
- Query the Archive for
  - La Silla Paranal raw data
  - La Silla Paranal reduced data
  - APEX reduced data
  - Phase 3 Catalogs
- Delegate proprietary data access rights
During the observations

- **Time link with “F”ailed OBs**

<table>
<thead>
<tr>
<th>OB</th>
<th>Epoch</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
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<td>OB 1811570</td>
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<tr>
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<td>✓</td>
<td></td>
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</tbody>
</table>

- **Monitor** your time-links, and **contact ESO** to add missed epochs to the end of a time-sequence!!

- **Missed epochs**
- **Completed epochs**
Summary

- Careful preparation and strategy selection ensure the best use of your observing time
- Make use of ESO tools, User Manuals & Tutorials

- For help contact the User Support Department
  usd-help@eso.org