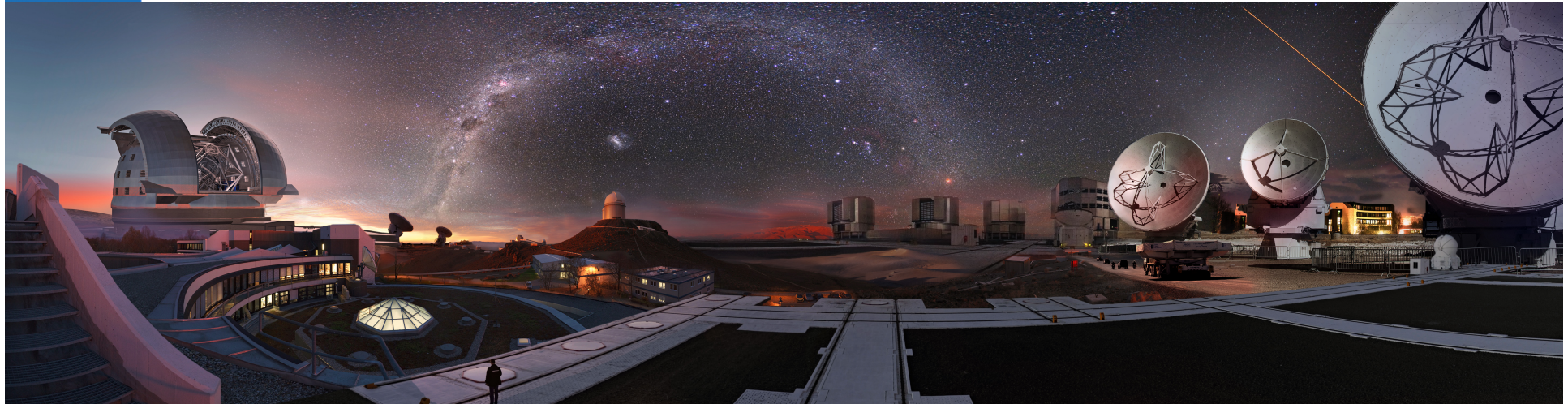




# The ESO Observing Process



**Paolo Padovani**  
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(with thanks to Nando Patat)

- The ESO call for proposals
- Proposal types and numbers
- The ESO Observing Programmes Committee
- Some tips



# Astronomy is based on observations!

- Three main options to get data:
  - Astronomical archives: raw data
    - + data already there
    - - no choice of targets
    - - data need to be reduced
  - Astronomical archives: reduced data (surveys)
    - + data already there and reduced
    - + large samples
    - - no choice of targets
  - Get your own data: apply for telescope time



# How to get telescope time

- Have a great idea!
- Think about the data needed to materialize it
- Select the most appropriate instrument (spectrograph, imager, IFU, etc.)
- Select the most appropriate mode (spectral/spatial resolution, wavelength range, field of view, etc.)
- Write the proposal:
  - Your science case
  - A justification of the request for telescope resources (time/instrument/observing conditions)
  - A demonstration that what you propose is feasible
- Submit your proposal!



# The ESO call for proposals (1)

- ESO calls for proposals **twice a year**
- Two periods:
  - April 1<sup>st</sup> to September 30<sup>th</sup>
  - October 1<sup>st</sup> to March 31<sup>st</sup>
- Next useful period for proposal submission is **P101** (April 1<sup>st</sup> 2018 to September 30<sup>th</sup> 2018; deadline should be around September 30<sup>th</sup> 2017)
- Proposal preparation and submission is indicated as **Phase 1**
- It is possible to apply for **Service Mode** (SM: queue) and/or **Visitor Mode** (VM: classical)



# The ESO call for proposals (2)

- The principal investigator (PI) submits the proposal, typically with a number of co-investigators (co-Is)
- A proposal is considered as a non-member country proposal if more than 2/3 of the co-Is are not affiliated to an ESO member country (MC)
- All expenses (travel and lodging) will be covered by ESO for successful MC applicants. No extra funds (data reduction, post-docs, etc.) are provided



# Call for Proposals (CfP)

## ■ Important document

- contains a lot of relevant information
- especially important for first-time users. Reading it is a must!
- contains many useful links to instrumentation and other useful information
- binding document, if proposal is approved



ESO Call for Proposals – P100  
Proposal Deadline: 30 March 2017, 12:00 noon CEST

<http://www.eso.org/sci/observing/phase1/p100/proposalsopen.html>



# The User Portal

<b>ESO User Portal</b>
General Information and FAQ
<b>Actions</b>
Report/Comment Cards
Visas Management
Referee DDT
Observatory View
Request a Special Run
<b>Administrative Options</b>
<b>Home Page</b>
Change Username
Change Password
Manage Profile

**Phase 1**

Download ESOFORM packages

Submit a proposal

Check the web letters

You need to create your own account





# Proposal Types

Director's Discretionary Time proposals (up to 5% of the available time):

- can be submitted any time
- of ToO nature requiring the immediate observation of a sudden and unexpected astronomical
- requesting observations on a hot and highly competitive scientific topic
- asking for follow-up observations of a programme recently conducted from ground-based and/or space facilities, where a quick implementation should provide breakthrough results
- of a somewhat risky nature requesting a small amount of observing time to test the feasibility of a programme.







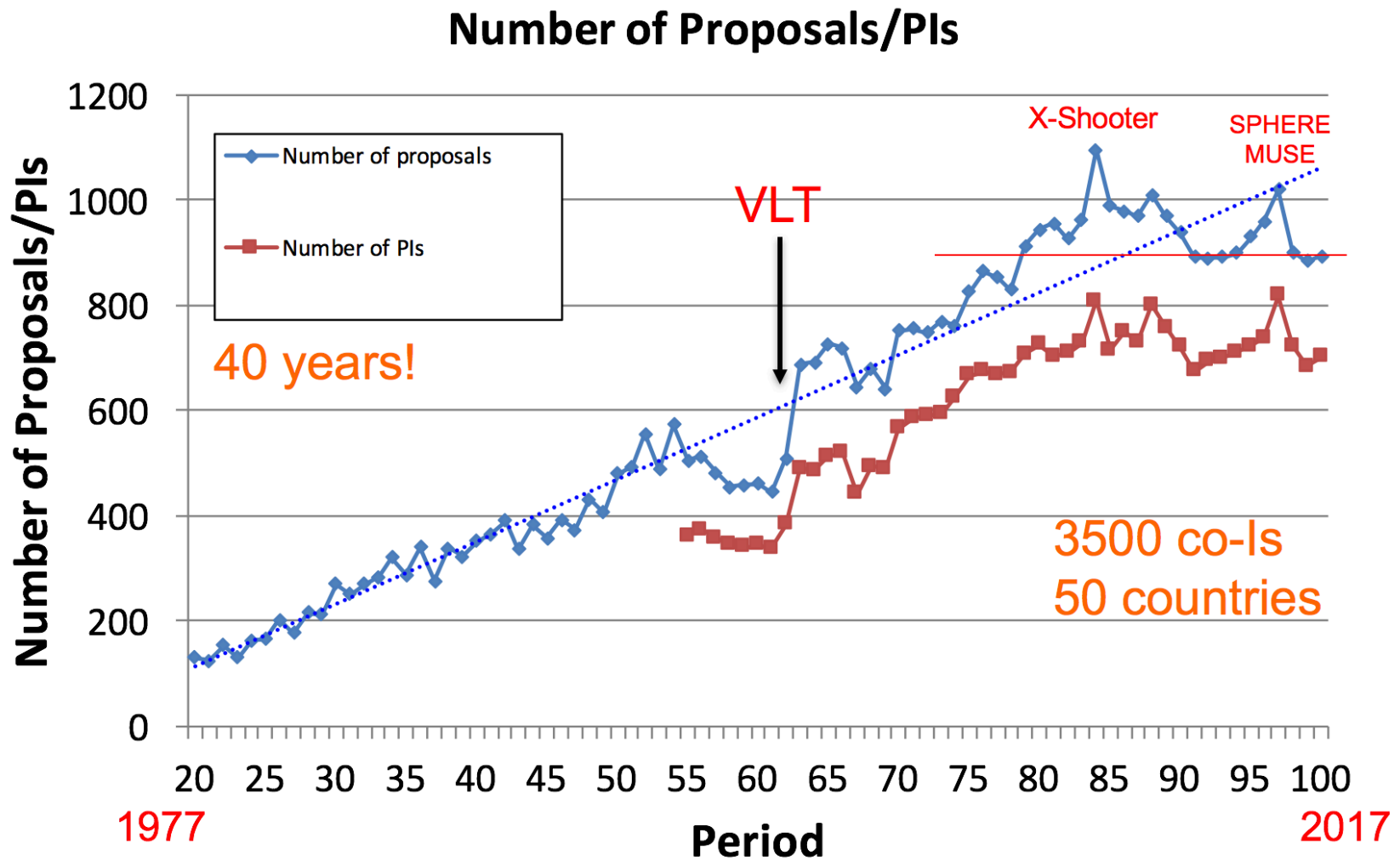
# Some numbers

- ESO receives ~900 proposals/period
- ~700 distinct PIs
- ~3,500 distinct co-Is from ~50 countries (IAU members ~10,000)
- ESO serves about 30% of the astronomical community world-wide
- A fraction (up to 10%) goes to Guaranteed Time Observations (GTO)
- The request is ~3,200 nights/semester
- The available science time is ~1,070 nights/semester





# Proposal submission stats

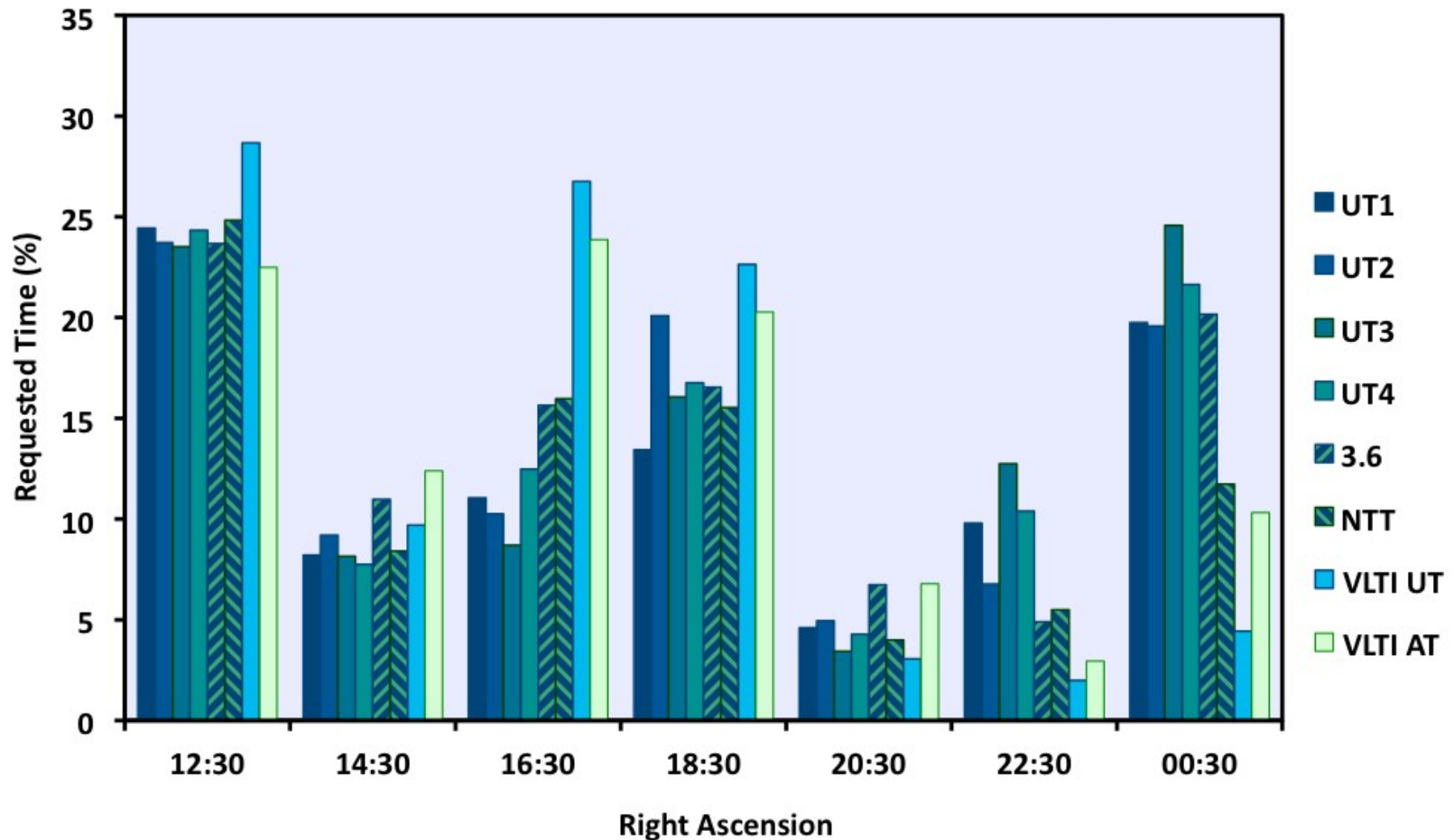


# Oversubscription

- Pressure factor typically high
  - typical oversubscription for ESO telescopes  $>3$ 
    - often reaching 5 and in certain periods/RA ranges 8 or higher
  - Large Programmes have an acceptance rate  $< 20\%$
  - Pressure on ToO proposals is extremely high
    - Gamma-ray bursts, supernovae, novae, stellar occultations by trans-Neptunian objects, microlensing, other transient phenomena

# RA demand (5 yr average)

- Some right ascensions are in high demand



[See Alves & Lombardi \(2004\), The ESO Messenger, 115, 15](#)



# Structure of the ESO Observing Programmes Committee (OPC): categories

## OPC Categories

### A - COSMOLOGY

- A1 Surveys of high-z galaxies
- A2 Identification studies of extragalactic surveys
- A3 Large scale structure and evolution
- A4 Distance scale
- A5 Groups and clusters of galaxies
- A6 Gravitational lensing
- A7 Intervening absorption line systems
- A8 High redshift galaxies (star formation and ISM)
- A9 Surveys of AGNs and AGN host galaxies

### B - GALAXIES AND GALACTIC NUCLEI

- B1 Morphology and galactic structure
- B2 Stellar populations: unresolved and resolved
- B3 Chemical evolution
- B4 Galaxy dynamics
- B5 Peculiar/interacting galaxies
- B6 Non-thermal processes in galactic nuclei (incl. QSRs, QSOs, blazars, Seyfert galaxies, BALs, radio galaxies, and LINERS)
- B7 Thermal processes in galactic nuclei and starburst galaxies (incl. ultraluminous IR galaxies, outflows, emission lines, and spectral energy distributions)
- B8 Central supermassive objects

### C - INTERSTELLAR MEDIUM, STAR FORMATION and PLANETARY SYSTEMS

- C1 Gas and dust, giant molecular clouds, cool and hot gas, diffuse and translucent clouds
- C2 Chemical processes in the interstellar medium
- C3 Star forming regions, globules, protostars, HII regions
- C4 Pre-main-sequence stars (massive PMS stars, Herbig Ae/Be stars and T Tauri stars)
- C5 Outflows, stellar jets, HH objects
- C6 Main-sequence stars with circumstellar matter, early evolution
- C7 Young binaries, brown dwarfs, exosolar planet searches
- C8 Solar system (planets, comets, small bodies)

### D - STELLAR EVOLUTION

- D1 Main-sequence stars
- D2 Post-main-sequence stars, giants, supergiants, AGB stars, post-AGB stars
- D3 Pulsating stars and stellar activity
- D4 Mass loss and winds
- D5 Supernovae, pulsars
- D6 Planetary nebulae, nova remnants and supernova remnants
- D7 Pre-white dwarfs and white dwarfs, neutron stars
- D8 Evolved binaries, black-hole candidates, novae, X-ray binaries, CVs
- D9 Gamma-ray and X-ray bursters
- D10 OB associations, open and globular clusters, extragalactic star clusters
- D11 Individual stars in external galaxies, resolved stellar populations
- D12 Distance Scale - stars



# Structure of the ESO OPC

- 13 panels in 4 science categories
  - A: Cosmology (3 panels)
  - B: Galaxies and galactic nuclei (2 panels)
  - C: ISM, star formation and planetary systems (4 panels)
  - D: Stellar evolution (4 panels)
  
- 6 members per panel
  - 1 panel chair
  - 1 panel co-chair
  
- OPC:
  - 13 panel chairs
  - 3 panel co-chairs (1 in A, 2 in B)
  - 1 OPC chair (not a panel member)
  
- Total:
  - 17 OPC members
  - 78 panel members



# OPC Composition

- OPC and panel members are selected on the basis of their scientific competence
  - Some allowance for gender balance and for distribution across member states (but not on a rigid basis)
    - Non-member state scientists of sufficient scientific stature can be OPC or panel members
    - ESO staff members cannot be OPC or panel members
- Candidates are proposed by the OPC Nominating Committee
- Term of service:
  - OPC members: 2 years (4 periods)
  - Panel members: 1 year (2 periods)
    - A fraction of the panel members are invited to serve an extended, 2-year term, to ensure sufficient continuity





# OPC terms of reference

It is the function of the OPC to review, evaluate on scientific merit, and rank all proposals submitted in response to a call for the use of ESO observing facilities, and thereby advise the Director General on the distribution of observing time taking account of ESO's scientific policy.







# ESO and the OPC

- The OPC is a body consisting of members of the astronomical community, who provide a service to this community
- ESO facilitates the OPC process but takes no active part in the scientific evaluation of the proposals
- Time allocation is the implementation by ESO of the outcome of the OPC proposal review process, taking into account technical and scheduling constraints



# The OPC Process/1

## ■ Before the OPC meeting

- All panel members read all proposals assigned to their panel (barring conflict of interest) and grade each run of these proposals (1 to 5)
- The grades of all referees are normalised so that the distribution of the grades of each of them has the same mean and the same standard deviation
- A single ranked list per telescope is built from these normalised grades (*excluding Large Programmes, GTO and Chilean proposals*)
- The cumulative requested time per telescope is computed down each list
- A “triage” line is drawn when this cumulative time exceeds 70% of the total requested time on the considered telescope



# The OPC Process/2

## ■ Triage:

- As a rule, proposals below the triage line are not further considered
- For each telescope, the cumulative amount of requested time above the triage line must exceed the amount of available science time by a factor  $\geq 1.5$  (to avoid under-subscription)
- Lists of triaged proposals per panel are compiled from the lists per telescope



# Panel meeting organisation

- Group proposals by topic
- For each proposal:
  - Primary referee gives a short presentation of the proposal and presents his evaluation
  - All other (non-conflicted) panel members present their assessment of the proposal
  - After a general discussion, vote takes place
- Voting procedure:
  - Each panel member fills a voting slip with his acronym, the proposal or run id, and a grade



# The OPC Process/3

- During the OPC meeting the OPC:
  - reviews the progress of the Large Programmes and provides recommendations on their continuation
  - reviews the final ranked list; lists are merged across panels after grades are normalized
  - recommends ToO programmes
  - discusses the new Large Programmes and provides recommendations on their implementation



# OPC Feedback

- The primary referee is responsible for writing feedback comments to be communicated to the PI
  - He/she must make sure that he/she gathers all the necessary information during the panel meetings
- Feedback comments are based on the discussion of the proposal at the meeting
  - For triaged proposals, they should be based on pre-OPC meeting report cards



# Writing a proposal

- Need to have a good idea
- Need to explain it very clearly. What is THE question? What will we learn by answering it?
- Need to convince your peers your idea is good, it will lead somewhere and it is worth being pursued
- Need to justify the request for telescope resources (time/instrument/conditions)
- Need to demonstrate what you propose is feasible
- Be aware that you are not the only applicant and that the referees will have *many* proposals to read (40 to 60 each!)





# Writing a successful proposal

- Make your science understandable
  - make it as simple as possible for the panel to understand your science and proposal
    - remember there are broad topical panels
  - get to the point immediately
  - be explicit, do not assume that the panel will work out what you meant
  - it is most likely that your proposal will be the 20<sup>th</sup> proposal to be read during that day ...
  - if the referee does not understand what you say you have lost
    - there is no possibility to check the literature





# Writing an exciting proposal

## ■ Make your science understandable

### ➤ avoid jargon

- expressions in your field may not be used in others

### ➤ avoid acronyms, which may not be clear to everybody

- what was  $\epsilon$  Eri Ba again?
- $H_0$  may be understood by most,  $w$  needs explanation
- if you need acronyms or special terms explain them

### ➤ avoid complicated language

- use simple English
- should be correct English – have (senior) colleagues or collaborators read your proposal



# Consistency

- Write a consistent proposal
  - have you selected the best suited instrument for your observations?
  - the exposure times and the target sample have to match your science case
  - there is a good chance one referee will pick up on any inconsistencies
  - exposure times have to make sense, use the Exposure Time Calculators (ETCs)
  - figures (tables) should help the text and be relevant



# Overheads are important

- Get them from the instrument web pages

## Overheads (valid for P93)

### La Silla

Telescope	Instrument	Action	Time (minutes)
3.6m		Preset	5
3.6m		Preset, within a few degrees from previous target	2
3.6m		Focussing	10
	HARPS	Fibre automatic redefinition, object centering on fibre, start guiding	1
	HARPS	Instrument configuration	0.5
	HARPS	Readout+writing image to disk (416 kpx/s speed)	0.38
	HARPS	Readout+writing image to disk (104 kpx/s speed)	1.45
	HARPS	Minimum time between exposures	0.53
	HARPS	Switching between ThAr and Iodine modes	5
	HARPS	HARPS/EGGS or HARPS/CES instrument change	1
	HARPS	Polarimeter insertion: circular	0.25
	HARPS	Polarimeter insertion: linear	0.5
	HARPS	Polarimeter insertion: switching linear/circular	0.25
	HARPS	Polarimeter rotation	0.2



# Overheads and Exposure Times

- They can also be verified using the Phase 2 Proposal Preparation Tool (P2PP), by preparing test Observing Blocks (OBs). This is the most accurate way of deriving the execution times that need to be entered in the proposal (and not the exposure times!!!)
- Exposure times can be derived from the Exposure Time Calculators (ETC), provided for each instrument.

<http://www.eso.org/observing/etc/>





# For further reference

## Selecting and Scheduling Observing Programmes at ESO

*F. Patat & G.A.J. Hussain, 2013, pp. 231-256*

*In Organizations, People and Strategies  
in Astronomy - Volume 2*

[http://venngeist.org/opsa2\\_toc.htm](http://venngeist.org/opsa2_toc.htm)

