Successful ESO proposals an overview

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(ESO)

This is the right time to start …

- Call for proposal is open since yesterday (26 February)

Structure of the ESO OPC

- Observing Programmes Committee
  - 4 scientific categories
    - Cosmology (A)
    - Galaxies and Active Galactic Nuclei (B)
    - Interstellar Medium, Star Formation and Planetary Systems (C)
    - Stellar Evolution (D)
  - 12 panels
    - 2 each for categories A and B
    - 4 each for categories C and D

Proposal types

- 5 proposal types all handled by OPC
  - normal programmes
  - short programmes
  - large programmes
  - Target of Opportunity
  - calibration programmes
    - all considered by the OPC
- Director Discretionary Time
    - submission any time
    - decided by ESO Director General

ESO proposals

- Pressure factor typically high
  - typical oversubscription for ESO telescopes is >3
    - often reaching 5 and in certain periods/RA ranges 8 or higher
  - Large Programmes have an acceptance rate of about 20% or less
  - Pressure on ToO proposals is extremely high
    - GRBs, supernovae, novae, stellar occultations by TNOs, microlensing,

High pressures

- Some right ascensions are already in high demand

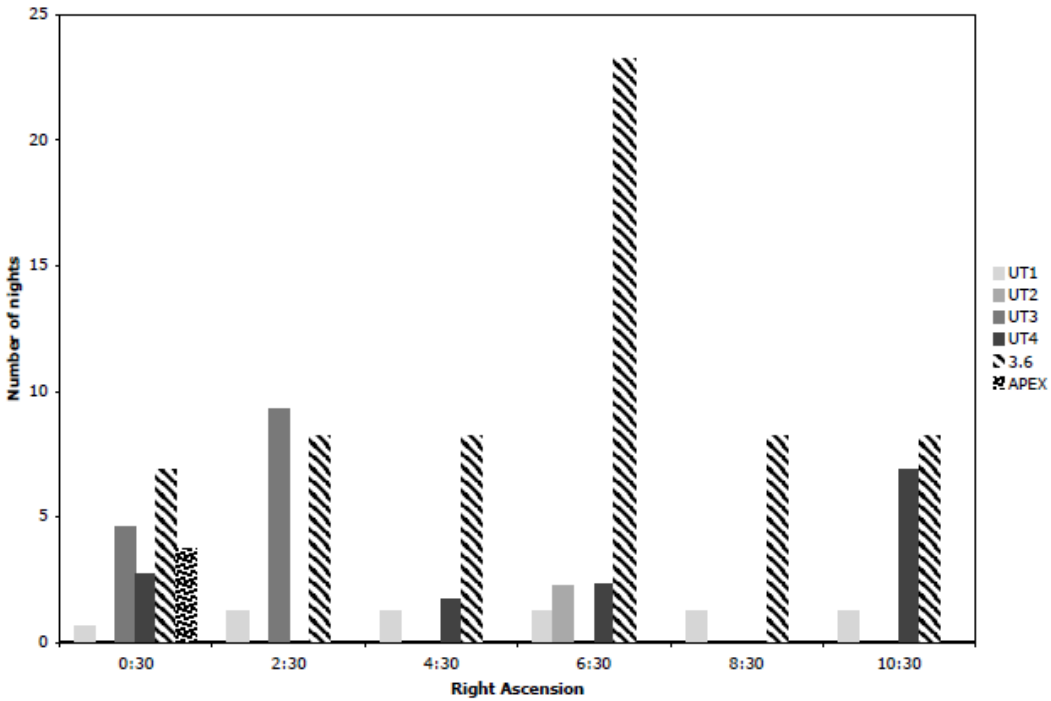


Figure 3: Expected time allocation (in nights) for ongoing Large Programmes in Period 84. The RA bins are defined as for Figs. 1 and 2.

Call for Proposals

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

Call for Proposals

- Everybody must read

Call for Proposals

- Find the appropriate instrument

La Silla: 5 Operational Instruments

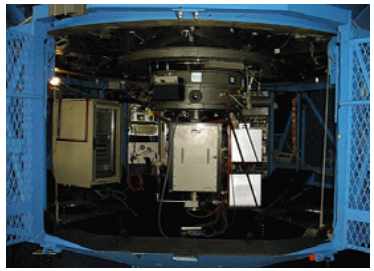
3.6m

HARPS

NTT

SOFI

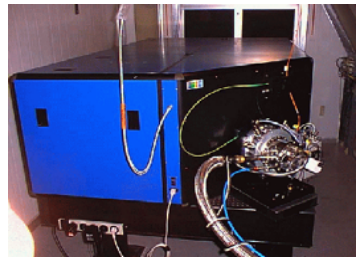
EFOSC2



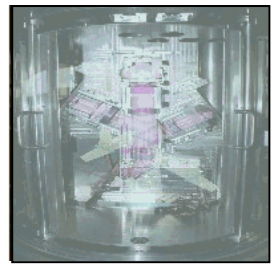
2.2m

WFI

FEROS



GROND



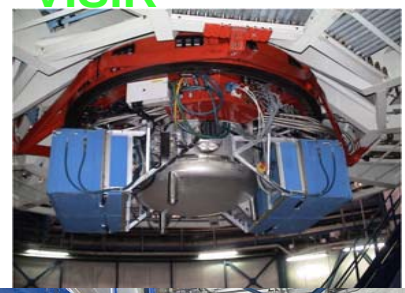
Paranal: 13 Operational VLT(I) Instruments




ISAAC

FLAMES

VISIR



SINFONI

FORS2

UVES

HAWK-I at Paranal

CRIRES

FORS1

Chajnantor

- Three operational instruments on APEX
- Watch out for ALMA
  - early science possibly in 2011
  - be prepared

Call for Proposals

- Important for you to correctly fill the proposal form

Call for Proposals

- Helpful to know and some legal stuff

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 20th 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 (cont.)
  - avoid jargon
    - expressions in your field may not be used in others
  - avoid acronyms, which may not be clear to everybody
    - what was ε 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

The Abstract is important

- Write your abstract first
  - this is the one paragraph that is guaranteed to be read by everybody
  - you have to be able to summarise the excitement in one paragraph
  - revisit your abstract several times during the writing and improve it

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2. Abstract / Total Time Requested

Total Amount of Time: 0 nights VM, 12.2 hours SM

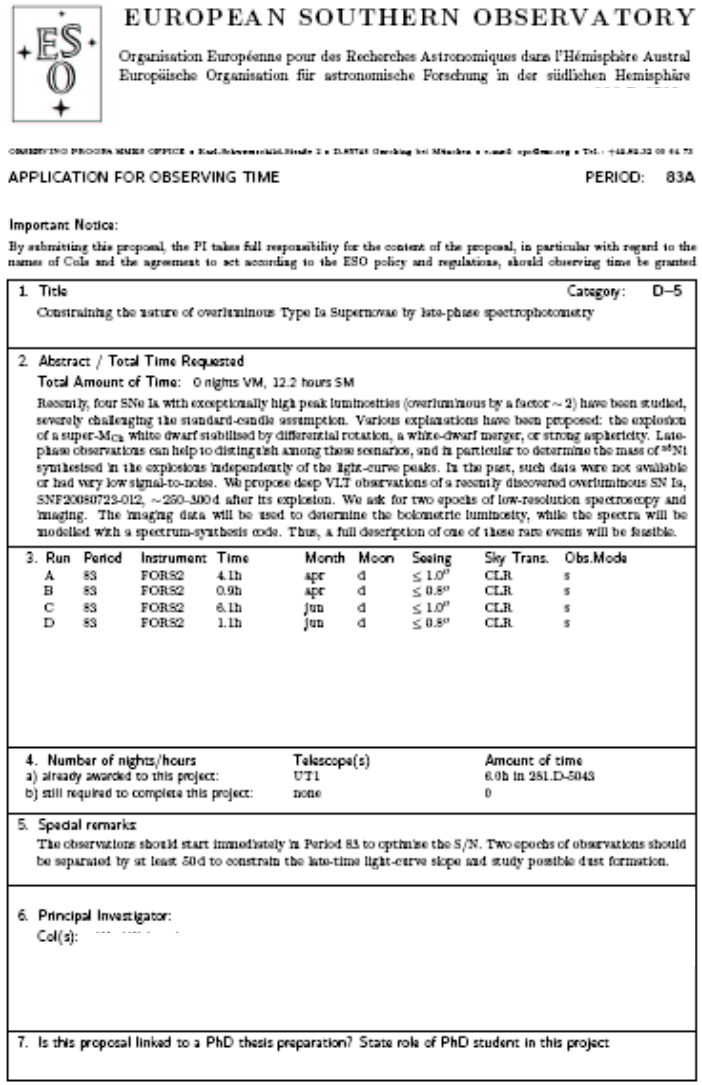
Recently, four SNe Ia with exceptionally high peak luminosities (overluminous by a factor ~ 2) have been studied, severely challenging the standard-candle assumption. Various explanations have been proposed: the explosion of a super-M_{Ch} white dwarf stabilised by differential rotation, a white-dwarf merger, or strong asphericity. Late-phase observations can help to distinguish among these scenarios, and in particular to determine the mass of ^{56}Ni synthesised in the explosions independently of the light-curve peaks. In the past, such data were not available or had very low signal-to-noise. We propose deep VLT observations of a recently discovered overluminous SN Ia, SNF20080723-012, ~ 250–300 d after its explosion. We ask for two epochs of low-resolution spectroscopy and imaging. The imaging data will be used to determine the bolometric luminosity, while the spectra will be modelled with a spectrum-synthesis code. Thus, a full description of one of these rare events will be feasible.

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 ETCs
  - figures (tables) should help the text and be relevant

Consistency

- ESO proposal form
  - particularly important boxes
    - Boxes 3 (run definitions and total times)
    - 4 (previous observations and future needs)
    - 5 (special remarks)
    - 8C (telescope justification)
    - 9 (justification for observing time)
    - 12 (target list)
    - 14 (instrument setup)



EUROPEAN SOUTHERN OBSERVATORY

Organisation Européenne pour des Recherches Astronomiques dans l'Hémisphère Austral
Europäische Organisation für astronomische Forschung in der südlichen Hemisphäre

APPLICATION FOR OBSERVING TIME PERIOD: 83A

Important Notice:

By submitting this proposal, the PI takes full responsibility for the content of the proposal, in particular with regard to the names of CoIs and the agreement to act according to the ESO policy and regulations, should observing time be granted

1. Title Category: D–5

Constraining the nature of overluminous Type Ia Supernovae by late-phase spectrophotometry

2. Abstract / Total Time Requested

Total Amount of Time: 0 nights VM, 12.2 hours SM

Recently, four SNe Ia with exceptionally high peak luminosities (overluminous by a factor ~ 2) have been studied, severely challenging the standard-candle assumption. Various explanations have been proposed: the explosion of a super-M_{Ch} white dwarf stabilised by differential rotation, a white-dwarf merger, or strong asphericity. Late-phase observations can help to distinguish among these scenarios, and in particular to determine the mass of ^{56}Ni synthesised in the explosions independently of the light-curve peaks. In the past, such data were not available or had very low signal-to-noise. We propose deep VLT observations of a recently discovered overluminous SN Ia, SNF20080723-012, ~250–300 d after its explosion. We ask for two epochs of low-resolution spectroscopy and imaging. The imaging data will be used to determine the bolometric luminosity, while the spectra will be modelled with a spectrum-synthesis code. Thus, a full description of one of these rare events will be feasible.

3.

Run	Period	Instrument	Time	Month	Moon	Seeing	Sky	Trans.	Obs.Mode
A	83	FORS2	4.1h	apr	d	≤ 1.0″	CLR		s
B	83	FORS2	0.9h	apr	d	≤ 0.8″	CLR		s
C	83	FORS2	6.1h	jun	d	≤ 1.0″	CLR		s
D	83	FORS2	1.1h	jun	d	≤ 0.8″	CLR		s

4. Number of nights/hours

	Telescope(s)	Amount of time
a) already awarded to this project:	UT1	6.0h in 281.D-5043
b) still required to complete this project:	none	0

5. Special remarks:

The observations should start immediately in Period 83 to optimise the S/N. Two epochs of observations should be separated by at least 50 d to constrain the late-time light-curve slope and study possible dust formation.

6. Principal Investigator:

CoI(s):

7. Is this proposal linked to a PhD thesis preparation? State role of PhD student in this project

Consistency

3. Run	Period	Instrument	Time	Month	Moon	Seeing	Sky Trans.	Obs.Mode
A	83	FORS2	4.1h	apr	d	$\leq 1.0''$	CLR	s
B	83	FORS2	0.9h	apr	d	$\leq 0.8''$	CLR	s
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4. Number of nights/hours	Telescope(s)	Amount of time
a) already awarded to this project:	UT1	6.0h in 281.D-5043
b) still required to complete this project:	none	0

5. Special remarks:

The observations should start immediately in Period 83 to optimise the S/N. Two epochs of observations should be separated by at least 50 d to constrain the late-time light-curve slope and study possible dust formation.

C) Telescope Justification: SNF20080723-012 exploded in a faint anonymous galaxy with a spectroscopically determined redshift of $z = 0.075$. At maximum brightness, which occurred in August 2008, the SN reached an unfiltered magnitude of ~ 17.3, which corresponds to an absolute magnitude ~ -20 at the given distance (310 Mpc). Ordinary SNe Ia fade by ~ 8 mag within one year from maximum. Applying this rate to SNF20080723-012, the SN would be at $V \sim 23.3$ at the time of the first proposed spectroscopic observation, and ~ 0.6. mag fainter two months later, when a second spectrum shall be taken. This makes the use of an 8 m- to 10 m-class telescope obligatory for low-resolution spectroscopy. VLT-UT1 equipped with FORS2 is the optimal solution in terms of efficiency and quality. Note that 50 to 60 h of observing time would have to be spent to obtain a similar S/N if NTT + EFOSC2 was used instead.

Consistency

3. Run	Period	Instrument	Time	Month	Moon	Seeing	Sky Trans.	Obs.Mode
A	83	FORS2	4.1h	apr	d	$\leq 1.0''$	CLR	s
B	83	FORS2	0.9h	apr	d	$\leq 0.8''$	CLR	s
C	83	FORS2	6.1h	jun	d	$\leq 1.0''$	CLR	s
D	83	FORS2	1.1h	jun	d	$\leq 0.8''$	CLR	s

9. Justification of requested observing time and lunar phase

Lunar Phase Justification:

The target is very faint ($V \sim 23.3$–23.9). Therefore, the observations have to be made during dark time.

Time Justification: (including seeing overhead)

Spectroscopy: We intend to cover a rest-frame wavelength range of $\sim$3700–8000 Å (corresponding to an observed range of $\sim$4000–8600 Å), where most of the expected emission lines of SNF20080723-012 should be located. We therefore ask for FORS2 with the MIT detector and grism 300V, since this combination provides a relatively homogeneous sensitivity over the desired wavelength range, little fringing, and adequate resolution ($\sim$15 Å). According to FORS ETC (v. 3.2.7; point source, blackbody spectrum, $V \sim 23.3$, 1" slit, 1" seeing, airmass 1.3, 3 d from new Moon) 3.2 h of exposure time are required to achieve an average S/N of 9–10 in run A. Since the SN is an emission-line object, a higher S/N of 15–25 can be expected in the line peaks, sufficient for the intended analysis. Including the overheads, this corresponds to the execution of 4 OBs with a total duration of 4.1 h. At the second epoch (run C), when we estimate the SN to be at $V \sim 23.9$, 4.8 h of exposure time yield an average S/N of 6–7 (and hence 10–15 in the lines), sufficient to detect significant changes in the line profiles. This can be accomplished with 6 OBs with a total duration of 6.1 h.

Imaging: Along with the spectroscopy, we need almost simultaneous (within 10 d) photometry with FORS2 in the *bvRI* filters to properly anchor the spectrophotometry. For an object of 23.3 mag, we need exposure times of 540–720 s in each filter (split into 3 individual exposures each) in order to achieve a S/N of $\sim$50–60 (20 in *I*) over the psf area in (MIT detector, point source, 0.8" seeing, airmass 1.3, 3 d from new Moon). Including overheads, this corresponds to a request of 0.9 h in run B. The realisation probability of the requested seeing (0.8") is 65%, yielding a realisation probability of almost 100% over the time span of this proposal. For the second epoch of observations (run D), when the SN has faded to $V \sim 23.9$, we would increase the exposure times a bit (600–900 s in each filter), and accept the slightly reduced S/N that results from the SN fading by $\sim$0.5 mag ($\sim$30–40 in *bvR* and $\sim$13 in *I*). Including overheads, this corresponds to one OB of 1.1 h.

Overheads are important

- From the Call for Proposals

Table 17: Telescope and Instrument Overheads

Hardware item	Action	Time (minutes)
La Silla telescopes	**Preset (point and acquire target)**	**4**
La Silla telescopes	**Preset (NTT with image analysis)**	**6**
HARPS	Read-out	1
SOFI	Imaging	~30% of total int. time
SOFI	Spectroscopy	~35% of total int. time
EFOSC-2	Read-out	2
FEROS	Read-out	2
WFI	Move to gap/pixel	7
WFI	Template change (with initial offset $\leq 120''$)	0.5
WFI	Template change (with initial offset $> 120''$)	1
WFI	Filter change	1
WFI	Offset + readout	1.17
Paranal telescopes	**Preset**	**6**
FORS2	Acquisition (1 cycle w/o exp. time)[1]	1.5 or 2
FORS2	Through Slit Image (2 cycles w/o exp. times)[2]	4
FORS2	Instrument Setup	1
FORS2	Retarder Plate Setup per PMOS/IPOL OB	1
FORS2	Read-out 100kHz binned (spectroscopy)	0.7
FORS2	Read-out 200kHz binned (imaging)	0.5
CRIRES	Acquisition without AO	3
CRIRES	Acquisition with AO	5
CRIRES	Read–out	10%–60% exposure time[3]
CRIRES	Nodding cycle	0.4
CRIRES	Change of wavelength setting	3.5
CRIRES	Change of derotator position angle	1
CRIRES	Attached wavelength calibration	2.5
CRIRES	Attached lamp flat	2

Consistency

3. Run	Period	Instrument	Time	Month	Moon	Seeing	Sky Trans.	Obs.Mode
A	83	FORS2	4.1h	apr	d	$\leq 1.0''$	CLR	s
B	83	FORS2	0.9h	apr	d	$\leq 0.8''$	CLR	s
C	83	FORS2	6.1h	jun	d	$\leq 1.0''$	CLR	s
D	83	FORS2	1.1h	jun	d	$\leq 0.8''$	CLR	s

12. List of targets proposed in this programme

Run	Target/Field	α(J2000)	δ(J2000)	ToT	Mag.	Diam.	Additional info	Reference star
A	SNF20080723-012	16 16 03.3	+03 03 17.4	4.1	23.3		acquisition by blind offset	
B	SNF20080723-012	16 16 03.3	+03 03 17.4	0.9	23.3			
C	SNF20080723-012	16 16 03.3	+03 03 17.4	6.1	23.9		acquisition by blind offset	
D	SNF20080723-012	16 16 03.3	+03 03 17.4	1.1	23.9			

14. Instrument configuration

Period	Instrument	Run ID	Parameter	Value or list
83	FORS2	A	LSS	GRIS300V+20
83	FORS2	B	IMG	b–HIGH+113, v–HIGH+114, R–SPECIAL+76, I–BESS+77
83	FORS2	C	LSS	GRIS300V+20
83	FORS2	D	IMG	b–HIGH+113, v–HIGH+114, R–SPECIAL+76, I–BESS+77

Helpful tips

- Take the instructions seriously
  - any proposal, which does not provide all requested information, damages itself
  - read the relevant parts of the Call for Proposals

Resubmissions

- We all have had proposals rejected
  - and yes, sometimes it really hurts
- Address comments from a previous submission
  - be clear what has changed and how the proposal has improved
- Why did the panel not understand your proposal?
  - this is not only their fault
  - be more explicit, more direct, crystal clear

Resubmissions

- Continuation of programmes
  - address the new goals
  - explain why you need a bigger sample
  - what has changed since the last proposal?

What makes a proposal successful?

- Exciting science
  - providing a clear progress in our understanding of some phenomenon
- A neat idea
  - unusual method, new idea, new approach, unique observation or experiment
- Clear language
  - presentation of an exciting story, which is interesting for many people
  - cover all questions somebody may have
  - information to the point

What makes a proposal successful?

- A consistent story
  - the proposal is complete and provides all information
  - quantitative arguments for the amount of time requested
- Good Luck!

ESO Archive

- The ESO data archive
  - is a rich source of excellent data
  - abstracts of previous proposals available
  - data public one year after they have been delivered to the PI
  - great way to compete with your competitor, if they got observing time
  - easy retrieval and selection of calibration data

Get involved

- Participate in OPC
- Participate in other ESO activities
  - get to know the organisation better
  - active interactions with ESO people
- Have a lively scientific exchange with the (European) astronomical community
  - conferences, workshops
  - regularly publish your results