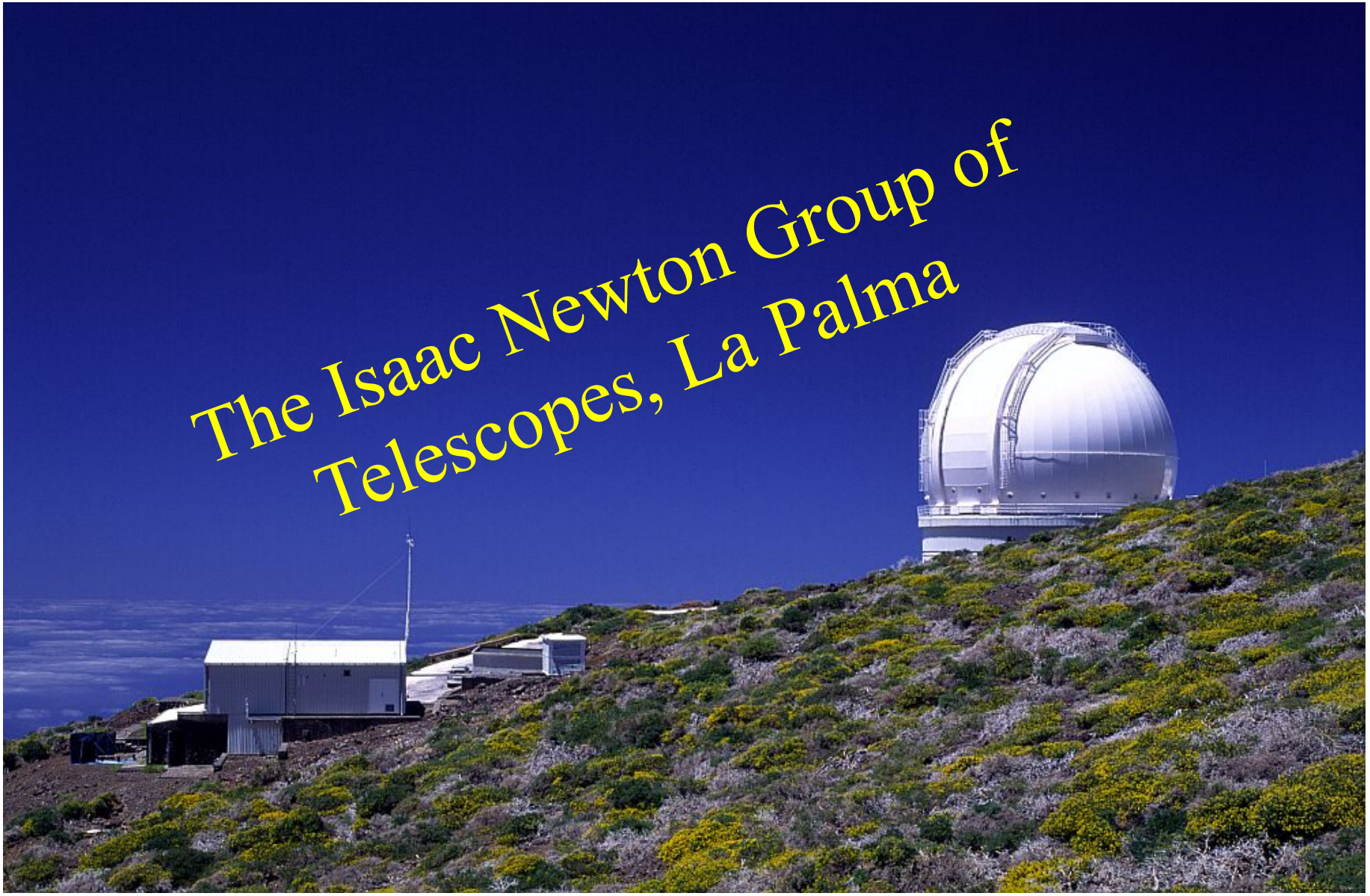


Chris Benn, ING, La Palma

La Palma

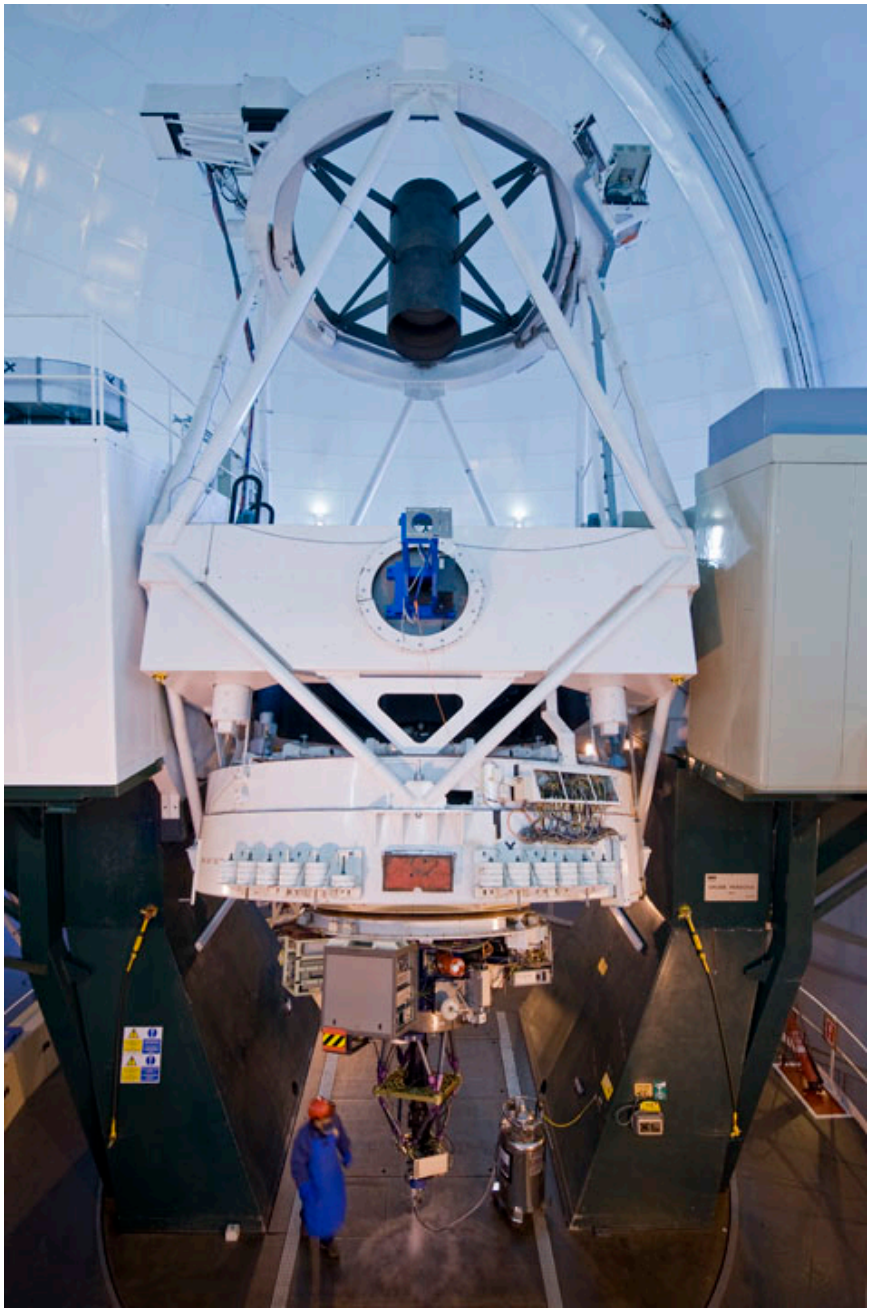
- 4.5 hours flight from UK, NL.
- Observatory at 2300 m, 1 hour drive from Santa Cruz. Residencia close to telescopes.
- Visitor-mode observing at most of the telescopes.

Isaac Newton Group

ING = 4.2-m WHT (left), 2.5-m INT (right), 1.0-m JKT (right).
Funding for ING is NL/ES/UK.
ING employs ~ 40 staff, all on La Palma.

Sea-level office

- Until the mid-1990s, most staff worked on the mountain.
- Currently, the sea-level office accommodates: 2/3 of staff; meeting rooms; library; remote-observing facility.
- No base in partner countries (UK, NL, ES).



4.2-m William Herschel Telescope

- Flexible operation:
- Broad range of common-user instruments: ISIS, LIRIS, ACAM, PF imager, AF2, AO.
- ACAM permanently at folded-Cass focus.
- ~ 6 visiting instruments per semester e.g. CANARY, EXPO, FASTCAM, GHaFaS, PNS, SAURON, Ultracam.
- Service programme, ~ 20 nights per year.

Daytime operations

- ~ 10 ING staff on the mountain, for:
- Instrument changes;
- Maintenance, e.g. aluminising;
- Fault fixing, aided by searchable fault database (> 20000 entries to date):

Quick View | Report Fault | Search

24 Hours | 72 Hours | 1 Week | **1 Month** | 1 Year | Outstanding Astronomy | Outstanding Computing | Outstanding Operations | Outstanding T&I

Refresh | Open All | Collapse All

ID	Type	Severity	Time Reported	Originator	Site	Instrument	Time Lost	Status	State	Time Spent
20867	T&I	Severe	07:41 30/08/2013	Unknown	INT	WFC	03:00	In-Hand	Open	03:00
▶ Horizontal Lines/bands In Images										
20866	T&I	Annoyance	06:45 30/08/2013	Unknown	INT	None	00:15	Resolved	Open	06:00
▶ INT HA Stopped Moving Again										
20865	T&I	Moderate	06:57 29/08/2013	Unknown	INT	None	00:05	Not reproducible	Open	00:00
▶ INT HA Stopped Moving										
20864	Operations	Critical	06:12 29/08/2013	Berto Gonzalez	WHT	ISIS	00:15	Resolved	Open	07:00
▶ Red CCD Camera Shutter										
20863	T&I	Moderate	23:41 28/08/2013	Unknown	INT	None	00:45	Not reproducible	Open	02:00
▶ INT Dome Stopped Moving										
20862	T&I	Critical	05:57 28/08/2013	Karl Kolle	WHT	OASIS	00:25	Resolved	Open	00:30
▶ MITLL3 Warming Up										

User support - why?

- The WHT has long been one of the most scientifically-productive 4-m telescopes, probably due to (1) a strong user community, (2) a good site, and (3) first-class telescopes and instrumentation.
- User support is key to efficient exploitation of the latter.
- Aim of user support is to facilitate every step of observing process, from proposal preparation to data acquisition.

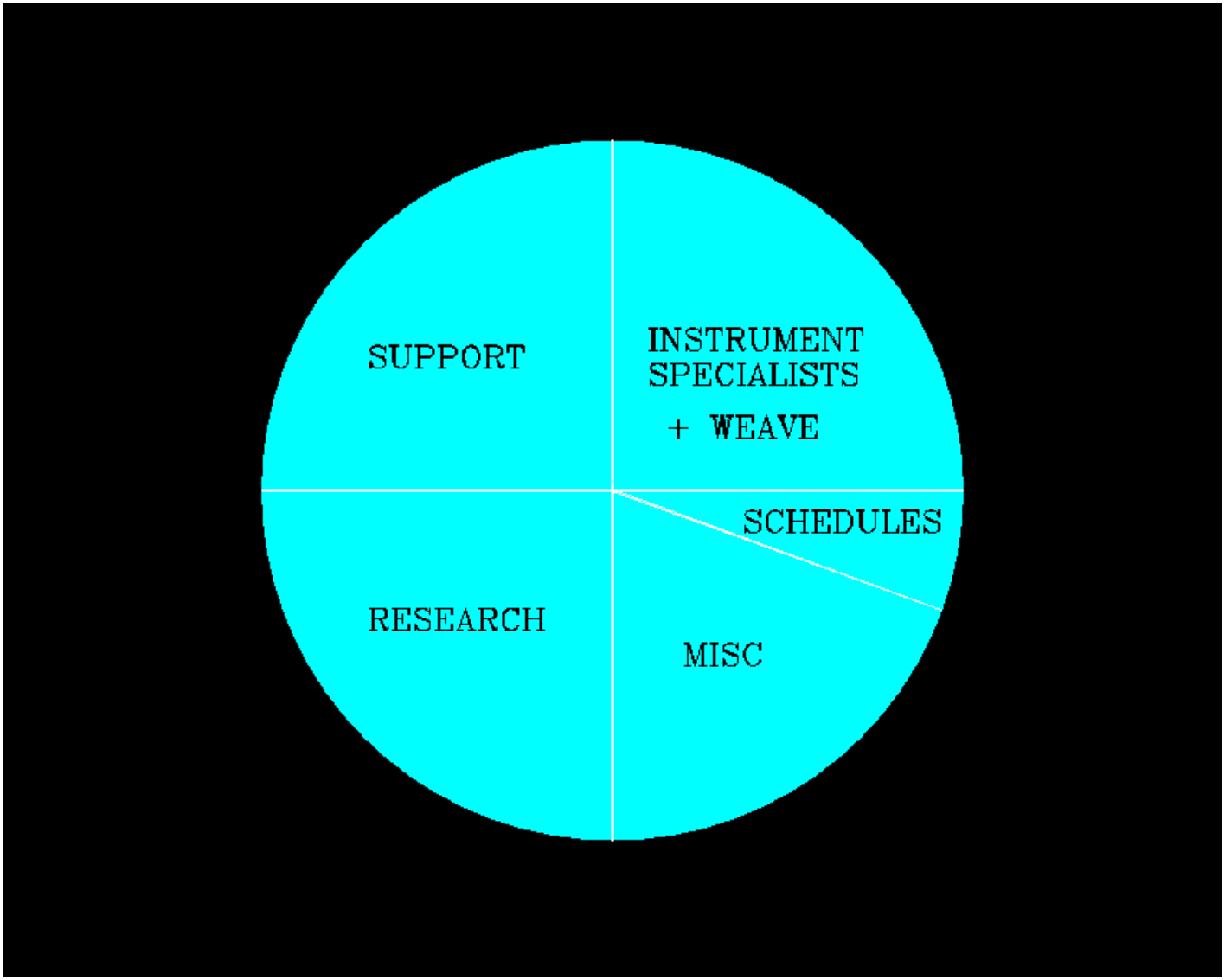
Support model at WHT

- Staff astronomers provide pre-observing and first-night (afternoon + evening) support of each run (~ 80 runs per year).
- Telescope operators provide all-night operator and engineering support, 365 nights per year.
- Total cost = 20% of each of 5 support astronomers + 100% of each of 4 operators = 5 staff.

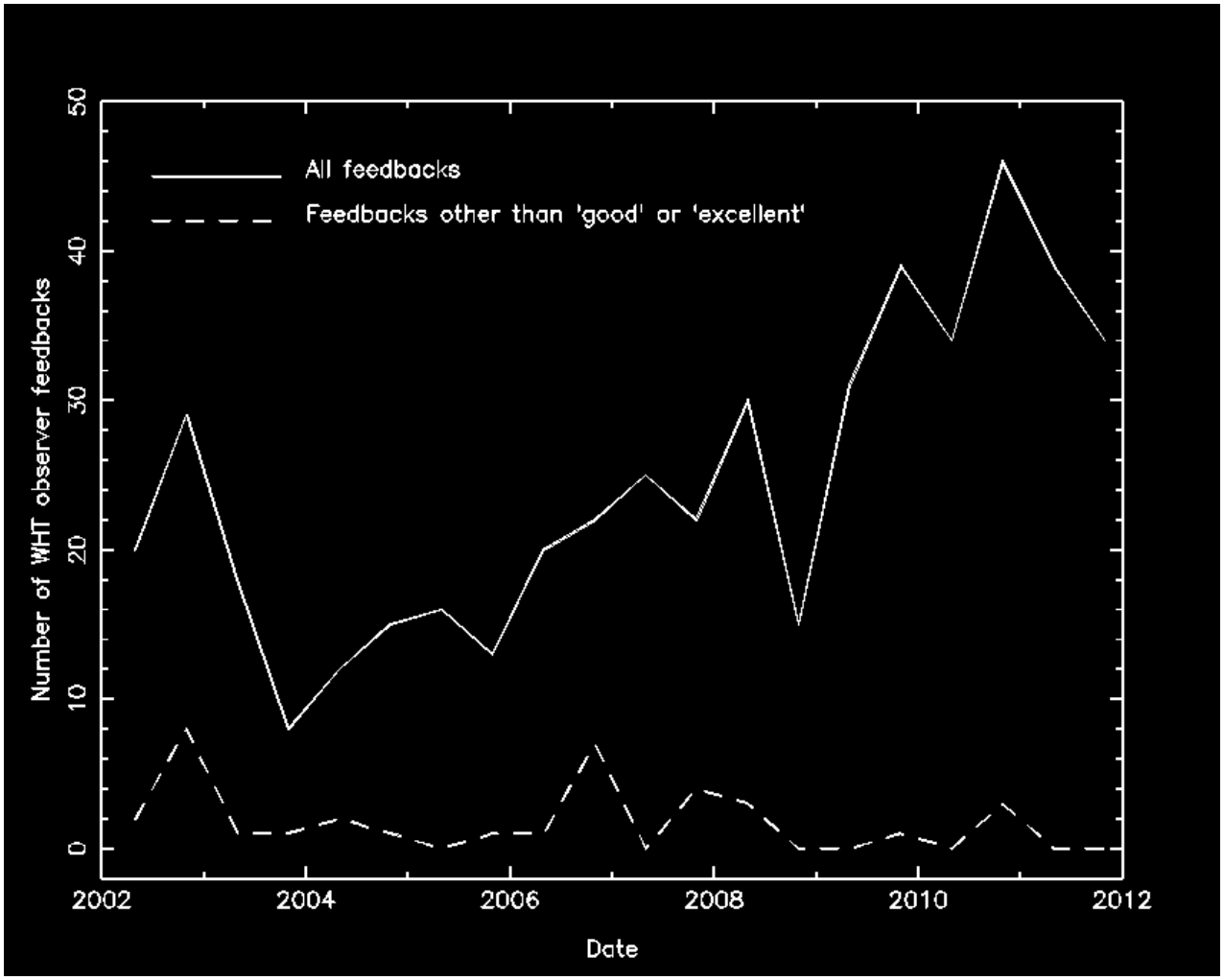
Astronomy support effort per proposal

- Help with proposal preparation; tech appraisal; scheduling of proposals (~ 1 hour).
- Pre-observing preparation (~ 6 h).
- Instrument setup; observing support (~ 12 h).
- Post-observing support (~ 1 h).

Support-astronomer duties

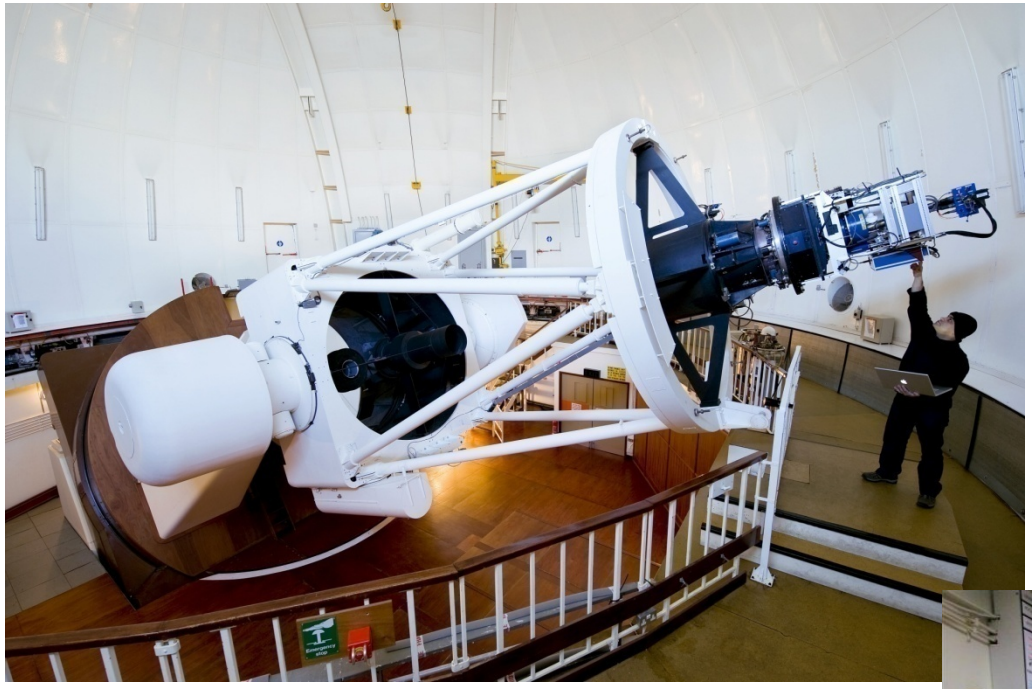


Observer satisfaction



- Feedbacks on ~ 35 WHT runs per semester.
- Over 2007-12, 97% rate their run ‘good’ or ‘excellent’.
- Frequent positive comments about user support e.g. “Very helpful… much appreciated” suggest a very positive perception by users.

2.5-m Isaac Newton Telescope



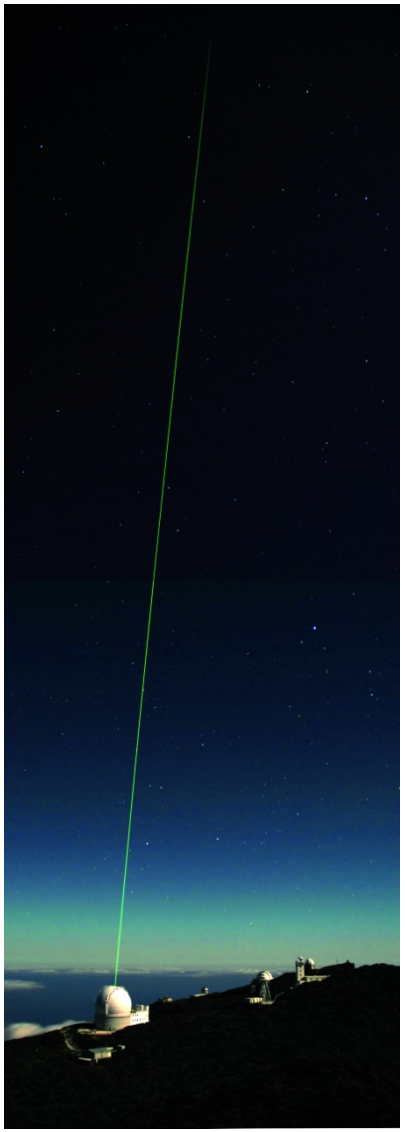
- Low-cost operation, < 5% of ING budget. Simpler instrumentation than WHT.
- Support provided by students. No operator.

Student support at the INT

- 4 undergraduate or PhD students per year.
- The students learn about observing, managing observers etc.
- ING pays travel, accommodation, living expenses.
- ~ 40 students have been through the scheme, mainly UK, Spanish.
- Iranian National Observatory also sends 1 – 2 students each year.
- Scheme considered a great success.

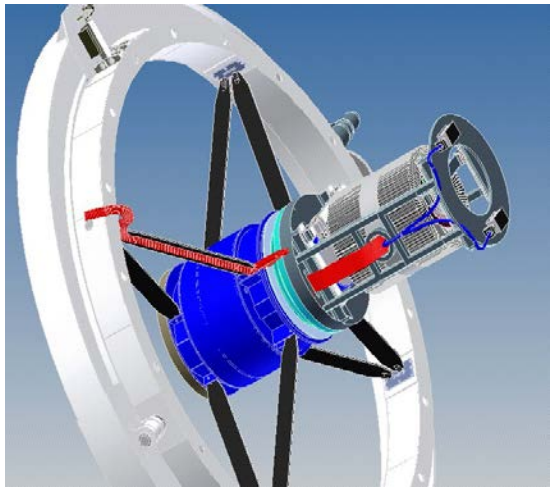
Adaptive optics

- NGS system (NAOMI) commissioned on the WHT in the late 1990s. The commissioning required many nights on-sky.
- Typically scheduled ~ 5 – 10 nights per semester, and observed in service mode.
- LGS commissioned 2008, but not currently used due to reduced power output.



Instrument development

- ACAM (2007-9, in-house). Highly versatile, popular with users.
- WEAVE (2012-17). International collaboration with strong ING participation. High science impact expected.



Scheduling

- Complex task, partly due to great flexibility offered to observers . New schedule every 6 months. Requires ~ 8 weeks of staff effort per year.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Feb	1 Feb (Fri) S/D ISIS ACAM	2 Feb (Sat) C95 ISIS	3 Feb (Sun) C95 ISIS	4 Feb (Mon) C62 GHAFAS	5 Feb (Tue) C62 GHAFAS	6 Feb (Wed) P18 OASIS/AO	7 Feb (Thu) P18 OASIS/AO	8 Feb (Fri) P18 OASIS/AO	9 Feb (Sat) P20 ISIS ACAM	10 Feb (Sun) P20 ISIS ACAM	11 Feb (Mon) [Ind] P24 ISIS	12 Feb (Tue) [Ind] P24 ISIS	13 Feb (Wed) P18 OASIS/AO	14 Feb (Thu) P18 OASIS/AO	15 Feb (Fri) S/D LIRIS ACAM	16 Feb (Sat) S/D P42 LIRIS ACAM
Mar	1 Mar (Fri) C118 LIRIS [MOS]	2 Mar (Sat) C118 LIRIS [MOS]	3 Mar (Sun) C60 GHAFAS	4 Mar (Mon) S/D P42 LIRIS	5 Mar (Tue) C60 GHAFAS	6 Mar (Wed) C60 GHAFAS	7 Mar (Thu) C60 GHAFAS	8 Mar (Fri) P12 PN.S	9 Mar (Sat) P12 PN.S	10 Mar (Sun) P12 PN.S	11 Mar (Mon) P12 PN.S	12 Mar (Tue) P12 PN.S	13 Mar (Wed) N7 PN.S	14 Mar (Thu) N7 PN.S	15 Mar (Fri) N7 PN.S	16 Mar (Sat) N7 PN.S
Apr	1 Apr (Mon) C72 ISIS	2 Apr (Tue) N6 SAURON	3 Apr (Wed) N6 SAURON	4 Apr (Thu) N6 SAURON	5 Apr (Fri) N6 SAURON	6 Apr (Sat) N6 SAURON	7 Apr (Sun) N6 SAURON	8 Apr (Mon) C68 OASIS/AO	9 Apr (Tue) N8 OASIS/non-AO	10 Apr (Wed) C123 SAURON	11 Apr (Thu) C123 SAURON	12 Apr (Fri) C123 SAURON	13 Apr (Sat) C123 SAURON	14 Apr (Sun) C14 INTEGRAL	15 Apr (Mon) C14 INTEGRAL	16 Apr (Tue) C14 INTEGRAL
May	1 May (Wed) N10 ISIS	2 May (Thu) N10 ISIS	3 May (Fri) N10 ISIS	4 May (Sat) N10 ISIS	5 May (Sun) N10 ISIS	6 May (Mon) N10 ISIS	7 May (Tue) N10 ISIS	8 May (Wed) S/D PFIP	9 May (Thu) N19 PFIP	10 May (Fri) N19 PFIP	11 May (Sat) N18 PFIP	12 May (Sun) N18 PFIP	13 May (Mon) N18 PFIP	14 May (Tue) P24 ISIS	15 May (Wed) P24 ISIS	16 May (Thu) S/D LIRIS
Jun	1 Jun (Sat) P33 OASIS/non-AO	2 Jun (Sun) N11 ISIS	3 Jun (Mon) N11 ISIS	4 Jun (Tue) N11 ISIS	5 Jun (Wed) N11 ISIS	6 Jun (Thu) P15 ISIS	7 Jun (Fri) P15 ISIS	8 Jun (Sat) P15 ISIS	9 Jun (Sun) P24 ISIS	10 Jun (Mon) P24 ISIS	11 Jun (Tue) C10 ISIS	12 Jun (Wed) C10 ISIS	13 Jun (Thu) C10 ISIS	14 Jun (Fri) N16 ISIS	15 Jun (Sat) N16 ISIS	16 Jun (Sun) N16 ISIS
Jul	1 Jul (Mon) S/D P42 LIRIS	2 Jul (Tue) C97 LIRIS	3 Jul (Wed) N12 ExPo	4 Jul (Thu) N12 ExPo	5 Jul (Fri) N12 ExPo	6 Jul (Sat) N12 ExPo	7 Jul (Sun) N12 ExPo	8 Jul (Mon) N12 ExPo	9 Jul (Tue) N12 ExPo	10 Jul (Wed) N14 Ultracam	11 Jul (Thu) N14 Ultracam	12 Jul (Fri) N14 Ultracam	13 Jul (Sat) P2 Ultracam	14 Jul (Sun) P2 Ultracam	15 Jul (Mon) P2 Ultracam	16 Jul (Tue) N14 Ultracam

Site-monitoring

- Weather stations for site and for each telescope.
- DIMM seeing monitor (right). Median 0.7 arcsec.
- Sky-brightness monitors for zenith and for WHT pointing. Sky ~ as dark as Chile.
- Independent systems for other observatories on La Palma provide backup and allow extensive cross-checking.

Safety

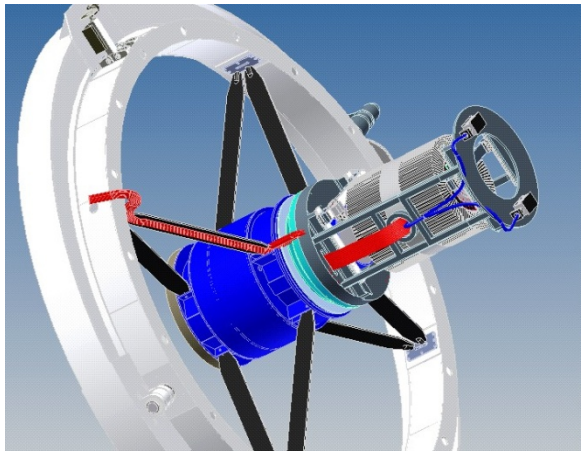
- Strong safety culture: policies based on those of UK research councils; generous training; near-miss reporting; 6-monthly safety review meetings.
- Biggest hazards: driving; slips and falls; moving chunks of metal around; stress.

Staffing, recruitment

- 1990s – mainly UK staff on expensive expatriate contracts, + a few local staff. Now all staff are on ‘local’ contracts.
- Pros and cons of working on La Palma.
- Steady turnover, ~ 10% per year.
- Staff are recruited from all over Europe, and beyond. The 6 support astronomers are currently Argentine, British, Czech, Finnish, Romanian and Spanish.

The future

- WEAVE: powerful wide-field 1000-fibre MOS for prime focus, begins 5-year survey in 2017. Key science is Milky Way archaeology, exploiting GAIA.
- Operational model for 2017 onwards will be more survey-oriented, but will build on lessons learnt over last 2 decades.



Summary

- ING's operational model is designed to optimise long-term scientific productivity, while keeping costs low. Key features:
- High degree of flexibility for observers to do what they want, when they want. Most observing is still in visitor mode, taking advantage of proximity to Europe.
- Pragmatic, coordinated approach to maintenance, quality control, fault fixing and enhancements.
- Autonomy of ING: all planning and most of work is done in-house.
- High level of operational involvement by students.