Chapter 4

Telescope Performance and Scientific Productivity

USE OF TELESCOPE TIME

The available observing time on the ING telescopes is allocated between British, Dutch and Spanish time allocation committees, the CCI International Time Programmes (ITP), service and discretionary nights, and scheduled stand-down and commissioning time.

The PPARC-NWO ING Board has delegated the task of time allocation to British astronomers to the PPARC Panel for the Allocation of Telescope Time (PATT), and to Dutch astronomers to the NFRA Programme Committee (PC). On the other hand it is the responsibility of the Astrophysics Institute of the Canaries (IAC) to allocate the Spanish time via the Comité para la Asignación de Tiempos (CAT). The ratio of UK PATT : NL NFRA PC : SP CAT : ITP is nominally 60 : 15 : 20 : 5. This ratio is monitored and small differences in these proportions in any one year are corrected over a number of observing seasons.

The PPARC makes 27 nights per year of its share on the JKT available to the National Board of Science and Technology of Ireland (NBST) and the Dublin Institute for Advanced Studies (DIAS). In a similar way, the University of Porto (Portugal) has 28 nights of observing time on the JKT.

The aim of the ING service programme is to provide astronomers with a way to obtain small sets of observations, which would not justify a whole night or more of telescope time. For each telescope and instrument several nights per month are set aside especially for this purpose. During those nights, ING support astronomers perform observations for several service requests.

Allocation of time for semesters 99A and 99B

	WHT		INT		JKT	
	Nights	%	Nights	%	Nights	%
UK PATT*	163.5	44.8	119.0	32.6	192.0	52.6
NL NFRA PC	41.5	11.4	38.0	10.4	44.0	12.0
SP CAT	55.5	15.2	65.0	17.8	60.0	16.4
UK/NL WFS	–	–	79.5	21.8	–	–
ITP	15.0	4.1	16.0	4.4	13.0	3.6
Service/Discretionary**	58.0	15.9	37.5	10.3	33.0	9.1
Commissioning	30.5	8.3	7.0	1.9	18.0	4.9
Stand-down	1.0	0.3	3.0	0.8	5.0	1.4
Total	365.0	100.0	365.0	100.0	365.0	100.0

*Includes Irish and Portuguese time on the JKT.

** Service nights include UK, NL and SP service time.

Stand-down and discretionary nights are used for major maintenance activities, commissioning, minor enhancements, calibration and quality control tests, etc., and partly for astronomy, for example, as compensation for breakdowns or for observations of targets of opportunity. They are scheduled together with service nights for greater flexibility, but a careful record of service observations per nationality is kept.

The way the available observing time on the ING telescopes has been shared in semesters 99A and 99B is summarised in the table above.

USE OF INSTRUMENTATION

The table on the right shows for each telescope the number of nights in semesters 99A and 99B for which the different instruments were scheduled. Stand-down periods are excluded and commissioning nights are shown between parenthesis. The abbreviations are explained in Appendix J. The list of common-user instruments for the same period of time can be found in Appendix B.

As in previous years, the ISIS spectrograph and polarimetre, and UES are the most popular WHT instruments. The improved large CCD detectors available in the WHT prime focus make imaging

Allocation of nights per instrument for semesters 99A and 99B

William Herschel Telescope		
	Nights	%
ISIS	137.0 (1.5)	38.1
UES	70.4	19.3
AUTOFIB-2	28.0	7.7
INTEGRAL	24.0 (2.0)	7.1
PF	24.0 (2.0)	7.1
SAURON	14.0 (2.5)	4.5
ELECTRA	(14.0)	3.8
LDSS	13.0	3.6
TAURUS	8.0	2.2
STJ	(6.0)	1.7
CIRSI	4.0	1.1
ISIS POL	4.0	1.1
TRIFFID	4.0	1.1
AUX	3.1	0.9
TEIFU	(2.5)	0.7
Total	**333.5 (30.5)**	**100.0**

Isaac Newton Telescope		
WFC	199.0 (3.0)	55.8
IDS	131.0 (4.0)	37.3
MUSICOS	19.0	5.2
FOS	6.0	1.7
Total	**355.0 (7.0)**	**100.0**

Jacobus Kapteyn Telescope		
CCD Imager	342 (18)	100.0

projects very attractive. Both the AUTOFIB-2 and INTEGRAL fibre units are used in combination with the WYFFOS spectrograph located on the Nasmyth platform. When the telescope is in Nasmyth or Cassegrain configuration, imaging at the Auxiliary Port of the Acquisition and Guidance Unit at the Cassegrain focus is also possible. On the INT, dark time periods are almost exclusively used for CCD imaging with the Wide Field Camera. JKT is a single instrument telescope for CCD imaging.

TELESCOPE RELIABILITY

Over semesters 99A and 99B the telescopes performed well, with downtime figures due to technical problems averaging 4.1, 4.5, and 3.5 % on the William Herschel Telescope (WHT), the Isaac Newton Telescope (INT), and the Jacobus Kapteyn Telescope (JKT), respectively. Although technical downtime on the WHT in particular has been somewhat higher than in previous years, these figures meet the target value of a maximum of 5 percent technical downtime.

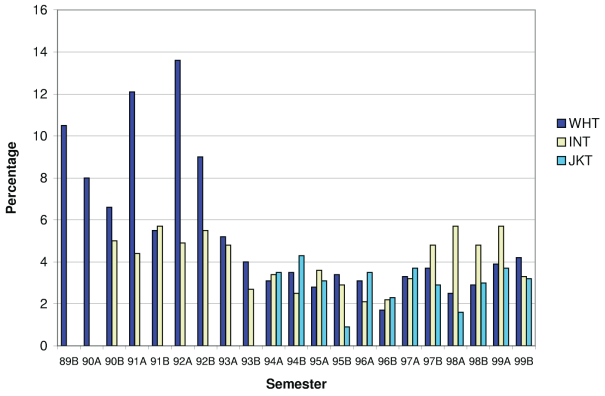
Weather downtime averaged 28.3, 24.0, and 26.6% on the WHT, INT and JKT respectively over the reporting period. These high figures are due to the exceptionally bad winter 1999–2000.

SCIENTIFIC PRODUCTIVITY

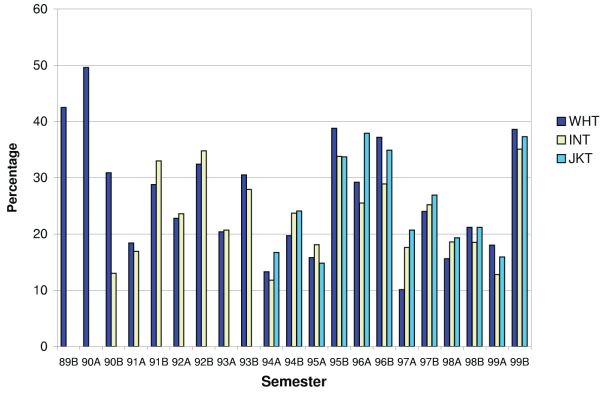
The scientific productivity over 1999 has again been very high with a total of 239 papers published in refereed astronomical journals: 115 for the WHT, 78 for the INT and the remaining 46 for the JKT. The scientific output of the WHT in particular places this telescope amongst the most productive ground-based facilities in the world. Also in terms of ground-breaking discoveries, as published in the journal *Nature*, the WHT is positioned as a top class facility. A full list of publications is presented in Appendix E.

A study was carried out to assess the scientific productivity of ground-based optical telescopes, comparing the ING telescopes to an international standard. As indicated by the figures above, the ING telescopes compare favourably in terms of number of papers, but do the papers represent important, high-impact discoveries? The index used in this study is the number of papers published in *Nature* between 1989 and 1998. The advantage of this measure is that it is

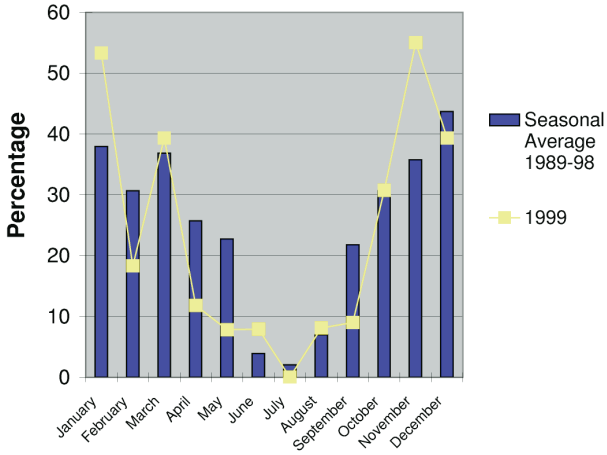
Technical down time per semester



Weather down time per semester

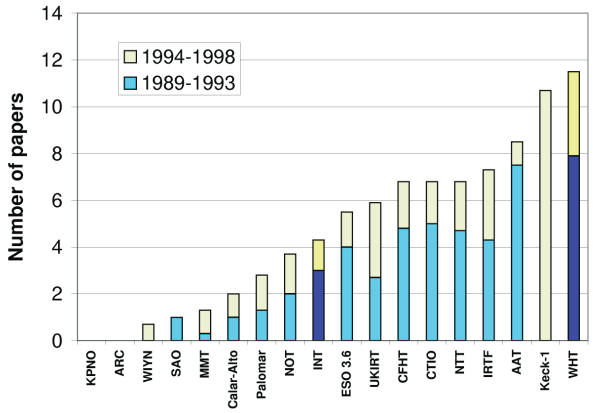


Monthly weather down time

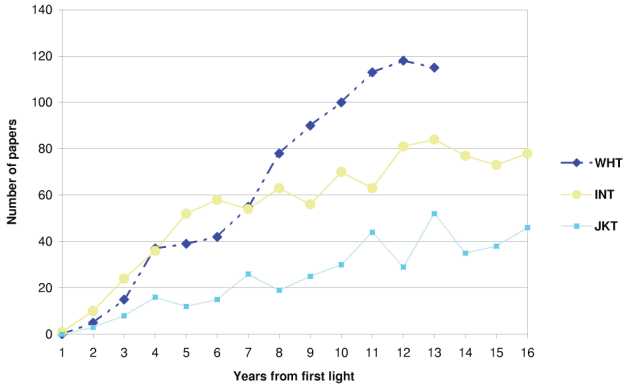


relatively free from regional bias, and the time delay between discovery and publication is short. The accompanying graph shows the result over the past 10 years for the ING telescopes compared with large telescopes elsewhere that have been in operation for a number of years. The sample includes all telescopes with an aperture larger than 3.5-m, plus the Nordic Optical Telescope, and the INT. (Papers with contributions from more than one telescope are divided equally between those facilities). Clearly the WHT compares very favourably with other telescopes.

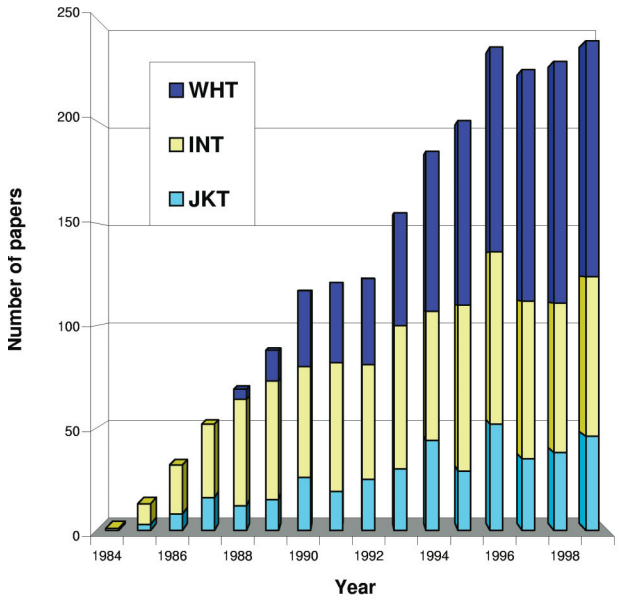
***Nature* papers from optical/IR ground based telescopes**



Number of publications per telescope since first light



Total number of ING publications per year

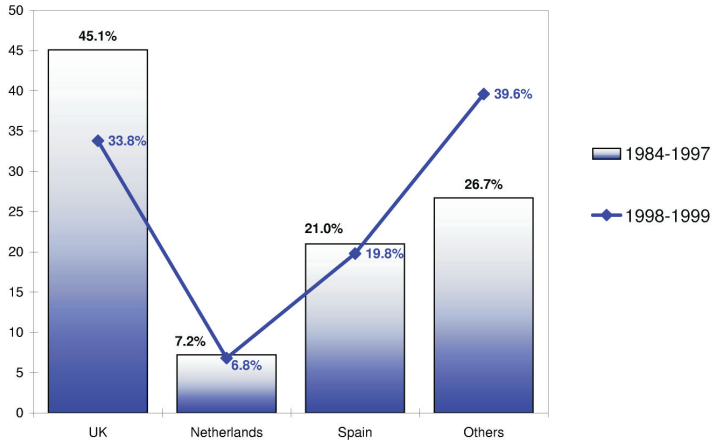


Number of publications per year and telescope

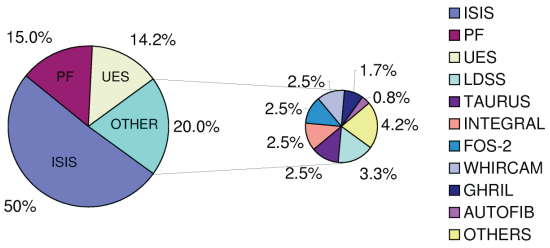
	WHT	INT	JKT	Total
1984	–	1	–	1
1985	–	10	3	13
1986	–	24	8	32
1987	–	36	16	52
1988	5	52	12	69
1989	15	58	15	88
1990	37	54	26	117
1991	39	63	19	121
1992	42	56	25	123
1993	55	70	30	155
1994	78	63	44	185
1995	90	81	29	200
1996	100	84	52	236
1997	113	77	35	225
1998	118	72	38	228
1999	115	78	46	239
Total	807	879	398	2,084

The charts below show the relative use of data in 1999 ING publications split by instrument used. The accompanying chart shows the authorship of all papers from 1984 to 1997 and for 1998-1999 only, split by nationality. The nationality of each author is attributed according to his or her address and equal weight is given to each author. It can be seen that the contribution from the rest of the world (others) has increased significantly as compared to the UK (only) contribution, which encourages us to believe that collaborative programmes are becoming increasingly important.

Paper authorship



Use of instrument data in WHT papers



Use of instrument data in INT papers