Chapter 3

USE OF OBSERVING TIME 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 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). It is the responsibility of the Instituto de Astrofísica de Canarias (IAC) to allocate the Spanish time via the Comité para la Asignación de Tiempos (CAT). For committee membership please see Appendix I.

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).

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.

Stand-down and discretionary nights are used for major maintenance activities, 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. A careful record of service observations per nationality is kept.

The way the available observing time on the ING telescopes has been shared in 2000 and 2001 is summarised in Table 1.

	WHT		INT		JKT	
	2000	2001	2000	2001	2000	2001
UK PATT	176	177	135	145	183	198
NL NFRA PC	42	43	34	35	48	51
SP CAT	62	66	71	70	68	72
UK/NL WFS	—	—	77	70	—	—
ITP	16	16	18	18	16	18
Service	26	24	21	18	16	16
Instrument Builders' Guaranteed Time	1	6	—	—	—	—
Commissioning	25	16	4	3	5	0
Discretionary	16	17	3	6	15	10
Stand-down	2	0	3	0	15	0
Total	366	365	366	365	366	365

Table 1. Allocation of nights from semester 2000A to semester 2001B. UK PATT allocation on the JKT includes Irish time, and Portuguese time to semester 2000B. Service nights include UK and NL service time, and SP CAT time includes also Spanish service time.

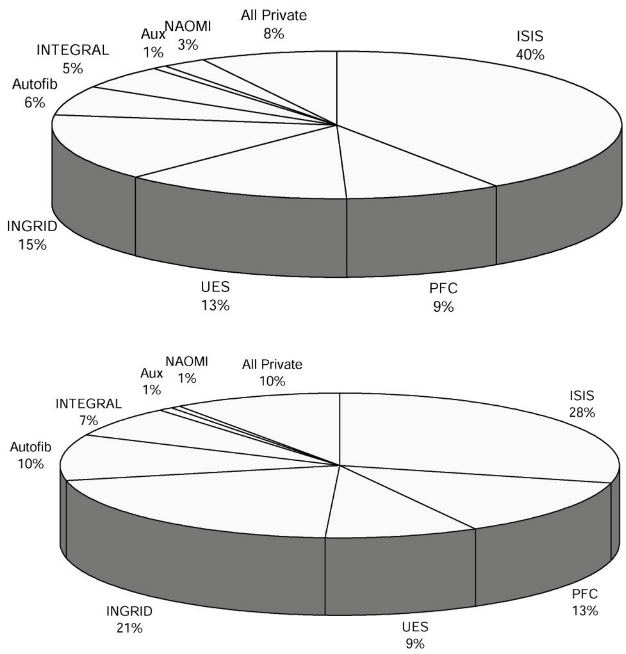


Figure 1. Above: Use of instrumentation in semesters 2000A and 2000B on the WHT. Below: The same for semesters 2001A and 2001B. Commissioning nights are excluded. The abbreviations are explained in Appendix K.

USE OF INSTRUMENTATION

Figure 1 shows the allocation of nights per instrument on the WHT in 2000 and 2001. As in previous years, the ISIS spectrograph and polarimeter was the most popular instrument but also remarkable is the increase in the use of the ING infrared imager INGRID, which became the second most popular instrument in 2001. Private instruments included LDSS, SAURON, and SCAM.

On the INT, dark time periods were almost exclusively used for CCD imaging with the Wide Field Camera (60.3% and 52.9% in 2000 and 2001 respectively). The rest of the time was for the use of the IDS spectrograph (33.4% and 39.9%) and ocassional private instruments like CIRSI, Musicos or the Texas Photometer (6.3% and 7.2% all private instruments). The JKT was a single instrument telescope for CCD imaging.

TELESCOPE RELIABILITY

During the year 2000 and 2001 the ING telescopes again performed very well, with downtime figures due to technical problems averaging at 2.1%, 3.0%, and 2.7% in 2000 and 3.3%, 1.1% and 1.2% in 2001 on the WHT, the INT, and the JKT respectively. These figures meet the target value of a maximum of 5 percent technical downtime. Down time due to poor weather averaged 22.8% in 2000 and 24.6% in 2001. The historical trends of technical down time and weather down time by semester are plotted in Figures 2 and 3. Figure 4 shows the seasonal average.

SCIENTIFIC PRODUCTIVITY

An important metric of the success of ING telescopes is the publication rate in refereed journals and for this reason the ING Bibliography (see Appendix I) is updated

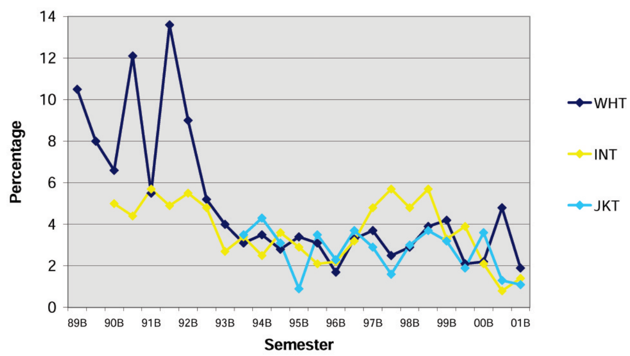


Figure 2. Technical downtime per semester.

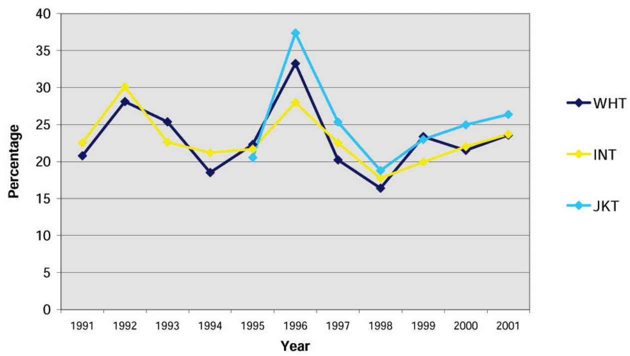


Figure 3. Weather down time per year.

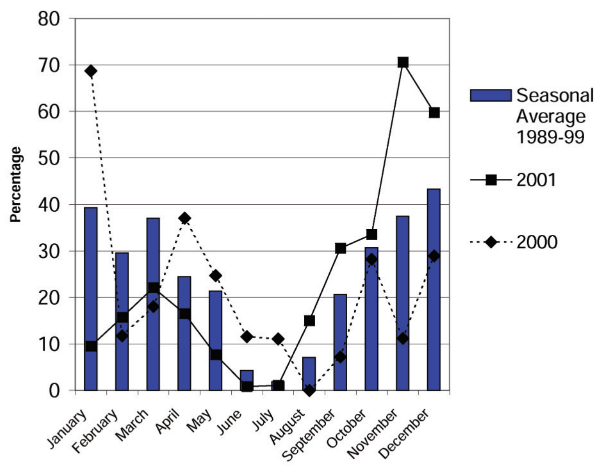


Figure 4. Monthly weather down time.

on a yearly basis. Traditionally this bibliography has been compiled by visually scanning all articles in many journals and identifying those which make use of data from our telescopes. However most journals are now published electronically and often have quite sophisticated search engines associated with them and it is therefore appropiate to conduct the search with the help of these facilities.

Our selection process identifies papers that make direct use of observations obtained with the ING telescopes. in order to qualify. Papers which refer to data presented in earlier papers (derivative papers) are not counted.

When we analyse ING publications for the five years between 1995 and 1999 inclusive it can be seen that more than 95% of articles are published in a small number of core journals. These core journals consist of the British journal MNRAS, the American journals ApJ, ApJL, ApJS, AJ and PASP, plus the European journal A&A (including the now defunct A&AS). We also include Nature and Science as core journals due to their perceived high impact. Journals making up the remainer of publications are widely spread among such journals as Icarus and the Irish Astronomical Journal to name a few. The bibliography for the years 2000 and 2001 was compiled from only the core journals listed above for reasons of efficiency. Search engines were used to select papers and the resulting list of papers visually inspected to ensure that they satisfied the selection criteria described above (the journal Astronomy & Astrophysics still had to be visually inspected).

Our initial results indicated a fall in the total number of journals compared with the previous few years, with 162 being found for 2000 and 162 for 2001 compared to the typical total of more than 220 found for the previous four years.

An analysis of these results indicated that this drop was due largely to a fall in the ApJ publication rate for 2000 by a factor of about 2. An immediate concern was that the electronic search process was missing articles. However, a check against previous years indicates that only few papers, if any are missed this way.

An analysis of these numbers follows (see Figures 5 – 9 and Table 2). Note that if a paper makes use of more than one telescope we count that paper for each telescope. Also, concerning perceived nationality we use the nationality of the first author's institution although

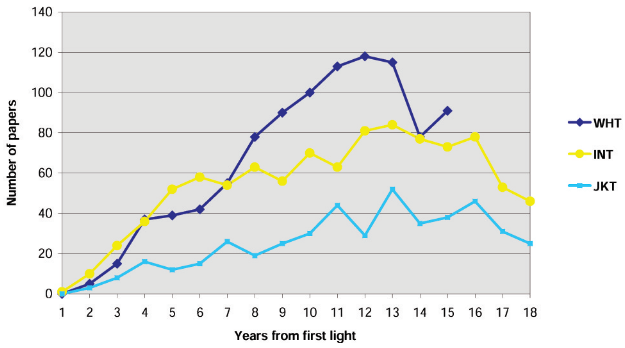


Figure 5. Number of refereed papers per telescope since first light.

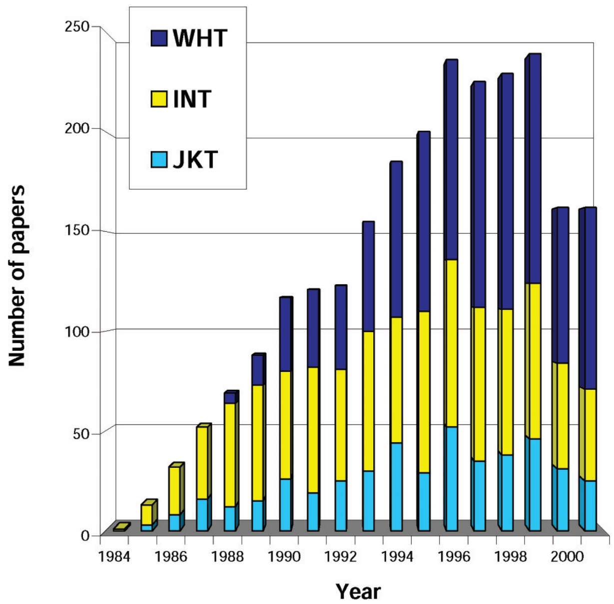
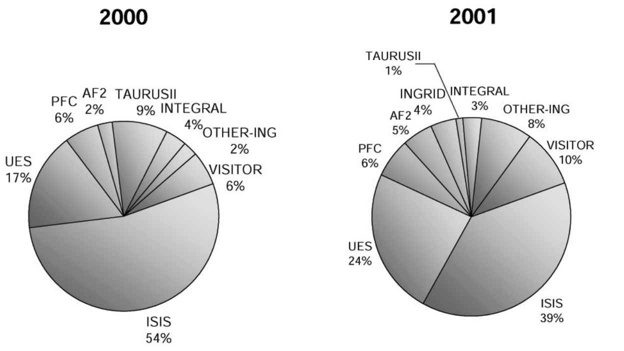
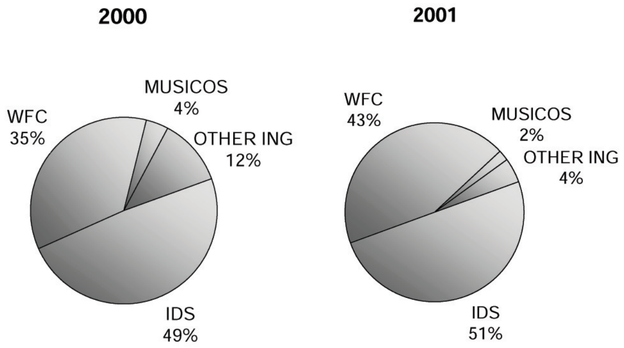


Figure 6. Total number of refereed papers per year and telescope.

	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
2000	78	53	31	162
2001	91	46	25	162
Total	976	978	454	2408

Table 2. Number of refereed papers per year and telescope.





Above: Figure 7. Use of instrument data in WHT papers. Below: Figure 8. Use of instrument data in INT papers.

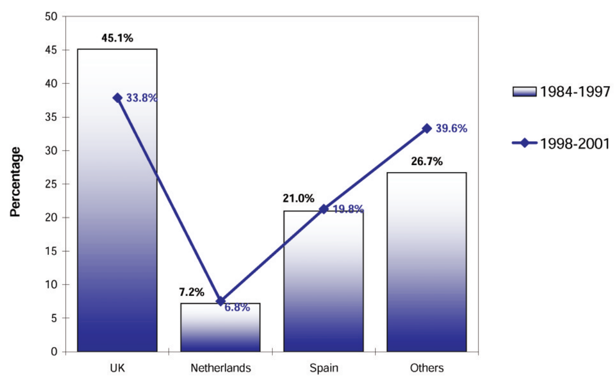


Figure 9. Paper authorship.

in a few cases two institutions are credited. Similarly, if a paper makes use of more than one instrument, that paper is counted against each instrument.

The fraction of papers attributed to the ISIS spectrograph from 1998 until 2001 (the years for which this information exists) varied from 39%, 50%, 54% to 39%. Clearly ISIS is still our most productive instrument by a long way. Over the same period the UES echelle spectrograph figures are 20%, 15%, 17% and 24% indicating the continuing demand for high resolution spectroscopy by our community. Papers from the newly

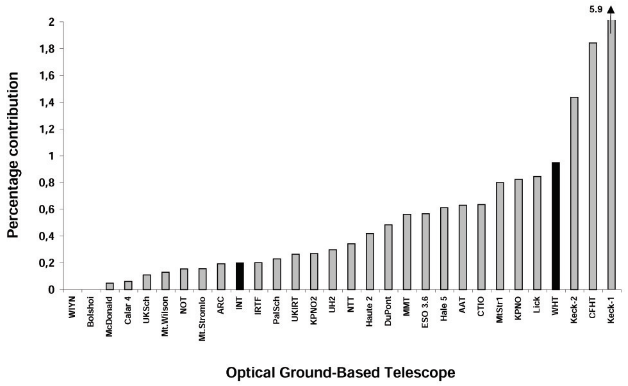


Figure 10. Result from a citation index study of the 1000 top-cited astronomy papers (125 top papers per year) from 1995 to 1998.

commissioned IR imager INGRID made a welcome appearance in 2001 with a total of 4 papers being attributed to this instrument. Interestingly the number of papers from visitor instruments on the WHT has increased from a few in previous years to 5 or 9 papers a year.

On the INT the papers are split very evenly between IDS spectrograph and the Wide Field Camera as might be expected from the split of observing time between these instruments, roughly 50–50.

It is heartening to note that the JKT still contributes to 25 to 30 scientific papers per year.

Concerning the nationality of the first author's institution, there is little change, at least considering the fluctuations from year to year. The UK share is steady around 40%, the Spanish share increased to 25% in 2000 but in 2001 was back at 20%. The NL share also showed little systematic change.

There is a clear decrease in the total number of papers published with a nearly 30% drop for the WHT. We believe our selection methods are sound but maybe more strictly applied than in previous years. Although some papers may have been missed by our more restrictive search, we expect that the main reason for the reduced publication rate is related to the advent of the 8-m class telescopes.

Encouragingly, ING telescopes continue to play an important role and in this respect we note the impact which the Wide Field Camera has had with an important paper in *Nature* concerning the merger of a satellite galaxy M31 (Ibata et al, 2001, *Nature*, **412**, 49).

In an attempt to measure the quality of the ING science, an analysis of the scientific productivity of large telescopes over the last decade (Benn and Sánchez, 2001, *PASP*, **113**, 385) puts the WHT in the lead over all other 4-m class and smaller telescopes, judging by counts of papers in *Nature*; and in close second place, after the Canada-France-Hawaii Telescope, judging by counts of citations to the 1000 most-cited astronomy papers world-wide (see Figure 10). This study also showed that during the 1990s, smaller telescopes accounted for half as much scientific output as did 4-m class telescopes, which bodes well for the continued productivity of the WHT in the era of 8-m telescopes.

THE ING ARCHIVE

All data taken with the ING telescopes is archived in the UK, at the Institute of Astronomy, Cambridge. The data archive is managed by the Cambridge Astronomy Survey Unit.

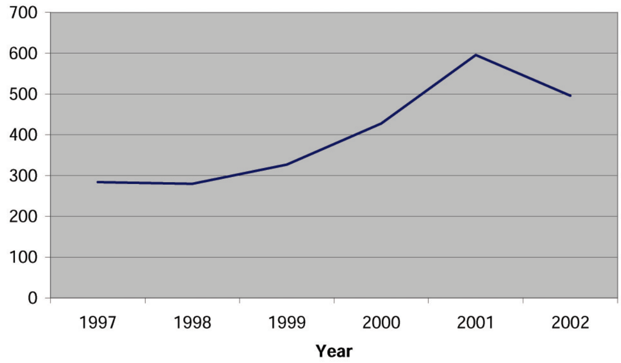


Figure 11. Number of archive requests.

Archival data from the ING telescopes is made available to anyone upon request, after a one-year proprietory period. The number of archive retrieval requests has remained high over the past two years, with around 500 requests per year. The historic trend of the archive requests can be seen in Figure 11. This level of archive use underlines the importance of the ING archive as a general tool for astronomy research.