

Chapter 8  
Some of the Telescopes of MSSSO



**The 74"**

Erection of the 74" telescope began in 1953. The design of the telescope featured three focus positions, Cassegrain ( $f/18$ ) and Coudé ( $f/32$ ) foci as well as a Newtonian ( $f/5$ ) focus that was removed in 1980 due to the increasing light pollution from Canberra. For the first few years, the telescope was plagued

by astigmatism problems. Though adjustments to the mirror-support system in 1956 provided some improvement, Arthur Hogg and Kurt Gottlieb finally obtained conclusive proof in 1957 that the astigmatism introduced by the mirror itself was in excess of the maximum permissible amount. The makers, Grubb and Parsons, produced a replacement mirror that was delivered to the Observatory



*The 74"*



in October 1959. Soon installed, the enhanced performance in 1960 enabled the measurement of the first high-resolution spectrogram with the Coude spectrograph that had been built by Ted Dunham. The instrument, by the modest assessment of the Observatory, remains as “one of the world’s classic scientific instruments” and is still heavily used by overseas astronomers as well as by MSSSO staff.

Current research programs concentrate on the structure and evolution of stars, and the chemical evolution of the galaxy.

### **The 50" - the Great Melbourne Telescope of 1868**

The old-timer was purchased as scrap by the Observatory in 1945. In the early fifties, it was rebuilt

to modern standards. The original speculum metal mirrors were replaced by pyrex ones, aluminised at Mt Stromlo, with the focal length shortened to  $f/18$ . Until close to 1980, the 50" was the main research telescope used by graduate students.

Again completely refurbished in the early nineties, it is now used as a dedicated instrument for the MACHO (Massive Astronomical Compact Halo Objects) program which has searched for and detected a dark matter component of the Galaxy.

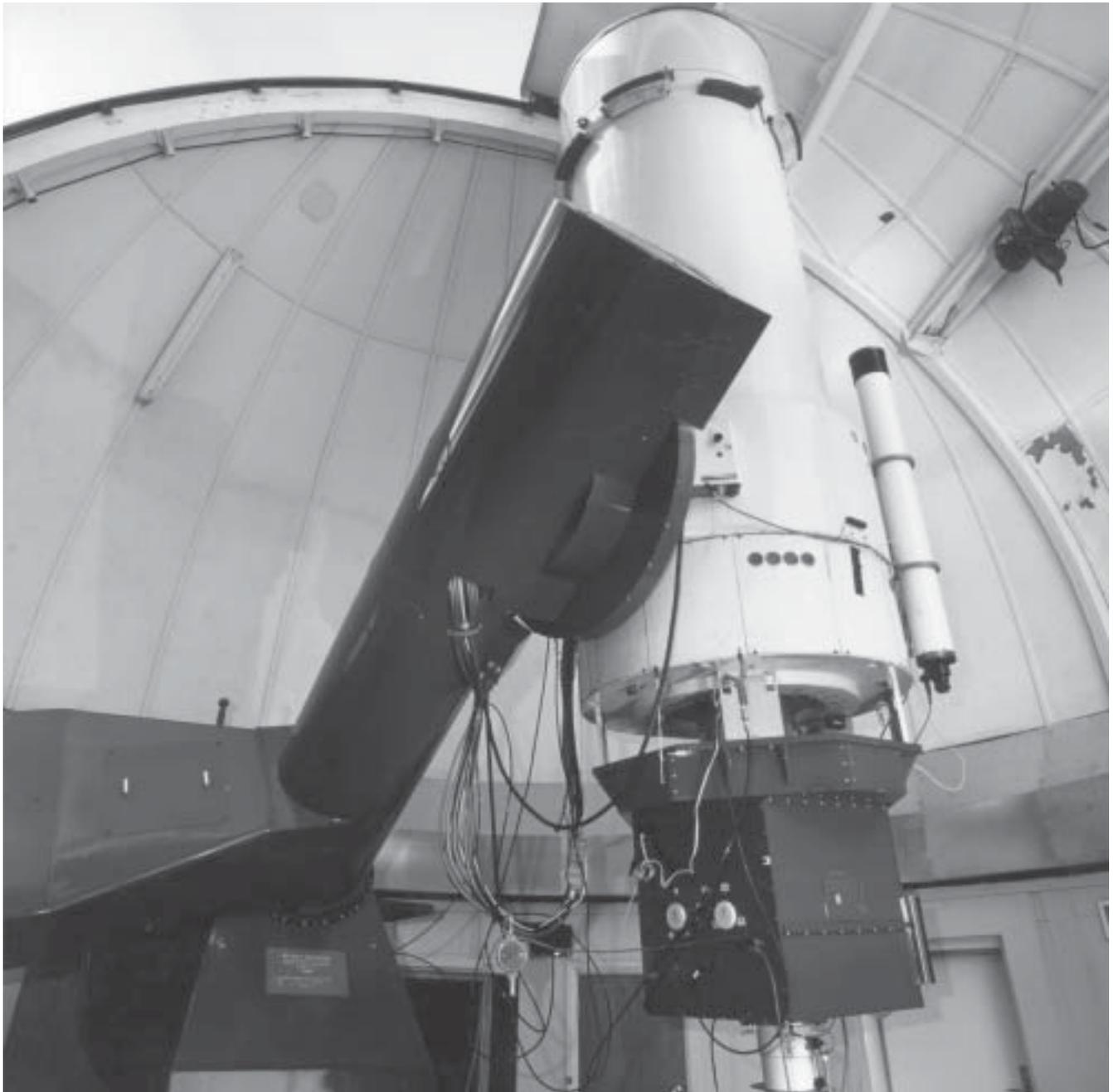
Nuclear physicists are justifiably proud of the longevity of the useful lifetimes of their accelerators, but none of them yet match that of the 9" Oddie at Mt Stromlo, let alone the Great Melbourne Telescope.

### **The 40"**

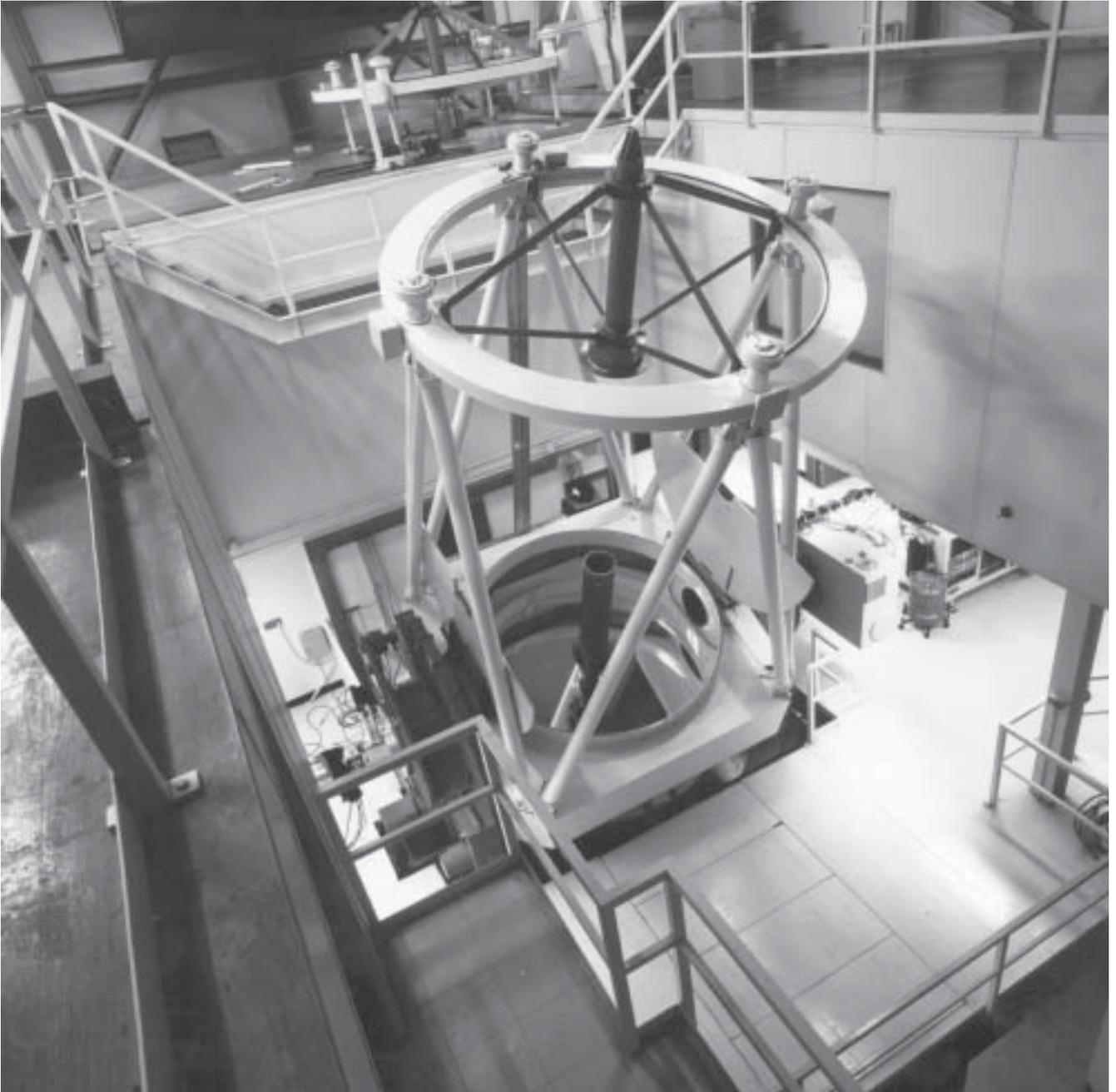
The 40" telescope was one of two that came into operation at Siding Spring in 1964 after the site had been selected for development as an observatory, two years before.

It was originally instrumented with photographic cameras and a photo-electric photometer. Nowadays, a range of CCD (charge-coupled device) imagers and spectrographs are used.

Research programs being undertaken include observational cosmology, the dynamics and evolution of galaxies and the structure and evolution of the Milky Way and of the Magellanic Clouds.



*The 40"*



### The 2.3 m Advanced Technology Telescope

This, the most versatile and powerful of the MSSSO telescopes was assembled at Siding Spring during 1983 and 1984. The inauguration, attended by Prime Minister Bob Hawke, was held on May 16 1984. The telescope was aimed to be “a versatile, precise and efficient telescope, equipped with advanced astronomical instrumentation, but costing a fraction of the price of a conventional telescope.” Components produced in the US, Switzerland and West Germany were supplemented with significant contributions from the State Dockyard at Newcastle, the School Workshop and the electronics section of MSSSO. Over runs increased the cost fraction beyond the early optimistic projections; otherwise expectations were realised with a superb instrument.

Designed for quick change between two Nasmyth foci ( $f/18$ ), two detection instruments can be mounted and selected for observations, depending on seeing conditions. There is also a Cassegrain focus ( $f/18$ ). CCD imagers, a double beam spectrograph and photometers are used at the Nasmyth foci, with infra-red photometers and spectrographs at the other focus.

Current research programs are similar to those of the 40" telescope, but with additional infra-red investigations of star-forming regions, the galactic centre and external galaxies.