

A second chance at **FIRST LIGHT**

The Isaac Newton Telescope at 50

Formerly part of the Royal Observatory, Britain's Isaac Newton Telescope has undoubtedly come of age. Yet it had a rough start, writes **Paul F Cockburn**

On La Palma, the observatory sits above an inversion layer, a meteorological phenomenon that traps cloud below



When The Queen inaugurated the Isaac Newton Telescope on 1 December 1967, its 98-inch mirror made it the fourth-largest reflector telescope in the world.

"It is often said that our most brilliant young men are tempted to leave the country and join the brain drain because of the lack of first-class equipment for them to work with here," Her Majesty said. "The Isaac Newton

YOUR BONUS CONTENT

We speak to Cecilia Fariña, manager of the Isaac Newton Telescope at the Roque de los Muchachos Observatory in La Palma

Telescope is a move to counter this in so far as astronomy is concerned."

Thanks to the likes of Sir Bernard Lovell, post-war Britain was certainly at the cutting edge of radio astronomy and theoretical astrophysics, but optical astronomy was another story. As then-Astronomer Royal Sir Richard van der Riet Woolley put it the day before the Queen arrived, the Isaac Newton Telescope (INT) would enable British astronomers to once again "get into the >

Construction of the Isaac Newton Telescope's dome at Herstmonceux in the 1960s...



..and the newly completed dome, as seen in 1967



▲ An astronomer rides in a cradle below the main mirror in this 70s shot



▲ A 30-minute exposure of M51 taken using the telescope in May 1970

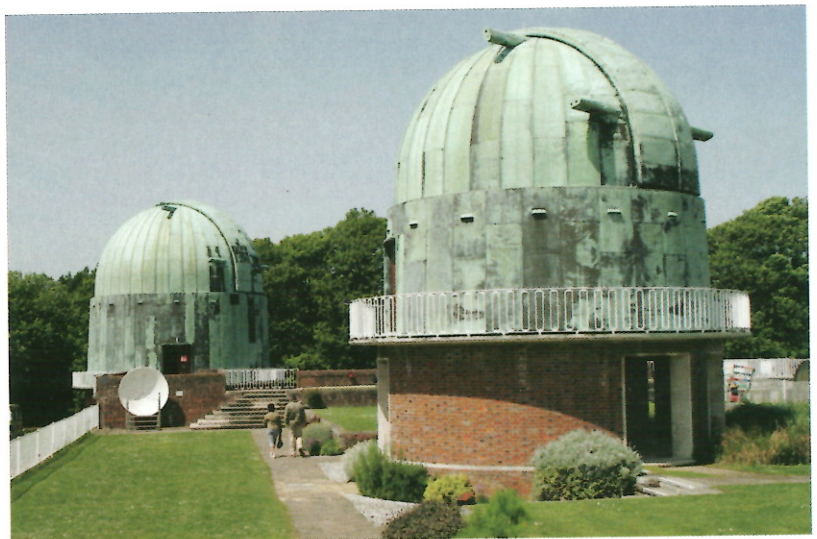
► business of studying very faint and interesting objects without begging time from the Americans". Except, it didn't quite work out like that.

Back in 1945, the Royal Society had established a small committee to assess the future of post-war astronomy. Led by Woolley's predecessor, Sir Harold Spencer Jones, the group's initial report suggested that "a reflector of 60-inch aperture at a selected site in the south of England could be effectively used for special observations which are not possible with the largest existing telescopes in this country".

By February 1946, when committee member (and president of the Royal Astronomical Society) Prof Harry Plaskett publicly aired the idea, the proposed primary mirror had already grown to "at least" 72 inches. Spencer Jones, however, disagreed; he believed an "appreciably larger" telescope would be needed to compensate for the vagaries of the British climate and the inevitable shorter exposure times. And so, the INT would eventually get a 98-inch mirror.

A decade of delays

Within a few months, the British Government agreed to foot the bill. It helped that the telescope was to be named after Sir Isaac Newton, meaning the news could be announced during 1946's delayed official celebrations to mark 300 years since Newton's birth. Yet almost immediately the project fell into limbo. "The delays of the next 10 years were mainly due to lack of decision," said Prof Patrick Blackett during his tenure as president of the Royal



▲ The Royal Greenwich Observatory's new base at Herstmonceux, East Sussex, which today is the Observatory Science Centre, was chosen as the first home of the INT

Society between 1965 and 1970. "The fault lay with the scientists who were concerned with the project. I was one of them, and we must take the blame."

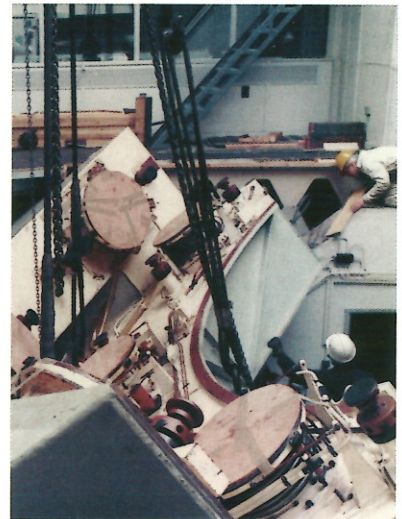
Additional delays included doubts about the quality of the mirror – a gift from the trustees of the McGregor Fund via the University of Michigan – the suitability of the Royal Greenwich Observatory's new home at Herstmonceux in Sussex, and unexpected knocks to government budgets, including the Suez Crisis. Ultimately,



▲ The Queen and Astronomer Royal Richard Woolley at the control console during the 1967 inauguration



▲ Left: Work on relocating the Isaac Newton Telescope to La Palma began in 1979; right: The process of carefully removing the telescope from its dome



it took 21 years and £1 million before the Isaac Newton Telescope completed its 'first light'. Even then it was underwhelming: light drizzle and poor visibility meant the Queen was unable to view Saturn or any notable objects through the telescope.

Though cutting-edge work would eventually be achieved from Herstmonceux – such as Paul Murdin and B Louise Webster's 1971 observations that confirmed the existence of the first stellar-mass black hole, Cygnus X-1– the often wet and cloudy Sussex weather ultimately led to the telescope's relocation to the new, international Roque de los Muchachos Observatory on the island of La Palma in the Canary Islands, a process begun in 1979.

The telescope may have been one of the largest in the world but, in the mind of Dr Marek Kukula, Public Astronomer at the Royal Observatory Greenwich, it did not fulfil its potential during its first few years. "They had their reasons at the ▶

▲ By 1981, work on the new facility that would house the telescope was well underway



▲ A new 100-inch mirror was commissioned to take full advantage of the clearer skies in La Palma



MILESTONES IN THE LIFE OF THE INT

- ▶ **December 1942** Tricentenary of Newton's birth; Royal Society postpones celebrations due to the Second World War
- ▶ **February 1946** Prof Harry Plaskett, president of the Royal Astronomical Society, calls for a large optical telescope sited in Britain
- ▶ **July 1946** The British Government commits to funding the Isaac Newton Telescope
- ▶ **1948** The Royal Greenwich Observatory begins its move to Herstmonceux, Sussex
- ▶ **August 1949** The 98-inch mirror arrives in London from New York
- ▶ **December 1967** The Isaac Newton Telescope is inaugurated by the Queen; first light in Herstmonceux
- ▶ **May 1979** Last observations at Herstmonceux before the Isaac Newton Telescope is moved to Roque de los Muchachos Observatory, La Palma
- ▶ **February 1984** The Isaac Newton Telescope experiences its second first light



► time, but now you just wouldn't put a telescope like that somewhere with such cloudy weather as we have here," he says. Kukula still has "a soft spot" for the INT, which he used during his early observational career in the 1990s.

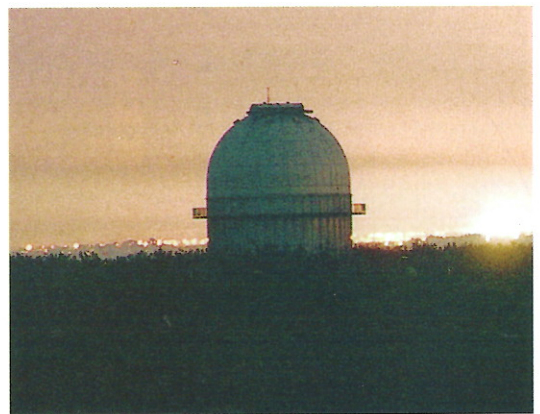
"It was and still is a really great instrument if you're a young researcher," he says. "I think there are quite a lot of people who have affection for it, because it was one of the first big professional telescopes that they got to use. And it has the wide-field camera, and the intermediate dispersal spectrograph – these are good workhorse instruments, and there's a lot of stuff you can do with them. It's still playing a useful role."

Back in 1967, however, it was just too early to catch the first wave of electronic detectors. "So really it's in the 1980s and 1990s that it does have this second life. It's testament to the great design of the telescope that it's still going strong with this whole new generation of amazing detectors attached to the back of it." **S**

▲ Above left: The clear skies of La Palma are perfect for the Isaac Newton Telescope

Above right: The Isaac Newton Telescope is a Cassegrain design with a focal length of 8.36m

Right: The original dome in Sussex now stands empty, the skyglow from light pollution having driven its telescope to pastures new



ABOUT THE WRITER

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THE MOMENT OF TRUTH

Five years after its last observations in England, the Isaac Newton Telescope was ready for its first light in La Palma

The night of 13/14 February 1984 proved to be an important one for the Isaac Newton Telescope: it was the first time it was turned towards the sky above its new home at Roque de los Muchachos Observatory, La Palma. As Sir Patrick Moore wrote afterwards in his then-regular column for the *Illustrated London News*: "That moment of 'first light' marked the real beginning of a new chapter in the story of astronomy in general and British astronomy in particular."

'First light' is an interesting rite of passage for any telescope, or instrument. Few of the resulting astronomical images

have much scientific value, as even the smallest telescope needs some on-site fine-tuning to get the best results. Yet there's often a 'wow' factor nonetheless.

The Isaac Newton Telescope, of course, has the rare honour of having had two first lights: its original 1967 opening at the Royal Greenwich Observatory at Herstmonceux, and then – with a new dome and a bigger, 100-inch mirror – in La Palma. Its second first light was recorded using a video camera,

delivering images of the Crab and Orion Nebulae, and galaxies M51 and NGC 4151.

Patrick, reporting from La Palma in April for the June 1984 edition of *The Sky at Night*, was particularly impressed by the telescope's first image of the Ring Nebula in Lyra. "All the intricate details in the Ring were enhanced," he later wrote. "It was difficult to believe that we were looking at an object well over 1,000 lightyears away."



The Isaac Newton Telescope (arrowed) is part of a wider network of telescopes in La Palma