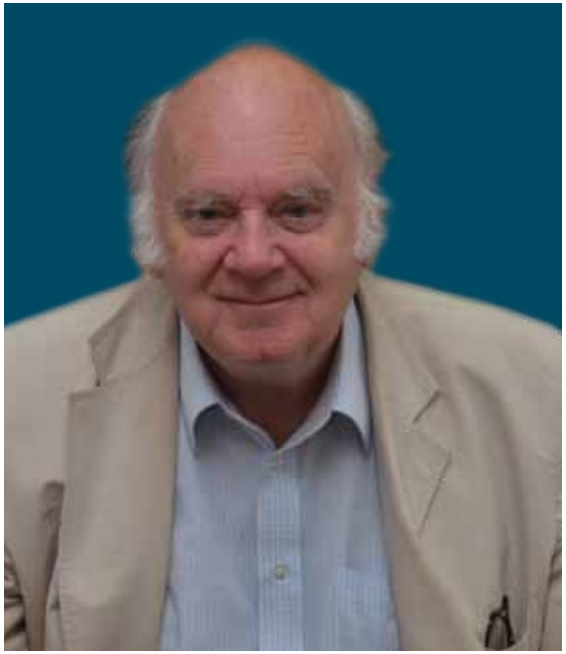
BRIAN WARNER



TOP THREE AWARDS

- John FW Herschel Medal, Royal Society of South Africa, 1988
- ASSAf Science-for-Society Gold Medal, 2004
- Fellowship of Balliol College, Oxford, 1965 – 67

DEFINING MOMENT

In physics class at my grammar school in England I realised one day that I didn't know in which century Isaac Newton was born. I looked him up in my dad's encyclopaedia. That got me permanently interested in the history of science.

WHAT PEOPLE DO NOT KNOW

I collect picture postcards that are 100 years old or more of the area I grew up in and of the Cape Peninsula.

ADDING THE SALT TO THE SKIES

Spending over half a century peering out into the cosmos has not made Brian Warner feel small. "I often get asked if I am overawed by the size of the universe. I am not," says the Cape Town-based astronomy Professor. After all, he is as big compared to an atomic nucleus as the universe is to him – a perspective that he finds comforting. "I'm right in the middle," he says, with a smile.

Warner has had a long and illustrious career in optical astronomy, first in the United Kingdom, then in the United States, before finally settling in South Africa. He was the first Head of the Astronomy Department at the University of Cape Town (UCT), and has watched it grow under his influence.

Today, South Africa's ambitions in astronomy are huge. It hosts the Southern African Large Telescope (SALT), which Warner named. It happened during one of his monthly lunches with the Director of the Cape Town observatory, Robert Stobie.

"Bob said to me that he'd gotten the money for the big telescope we had talked about, but that he needed a name for it. I thought for a second, and then reached out for the salt pot on the table. This will do, I said: the Southern African Large Telescope."

However, greater things are still to come with the country chosen as the central host of the enormous Square Kilometre Array (SKA) radio telescope. Projects such as SALT and the SKA would have been difficult to manage, had it not been for the people trained and the experience built up at what remains the country's only pure astronomy department at UCT.

EARLY LIFE AND EDUCATION

Brian Warner was born in Crawley Down in Sussex, England in 1939, a few months before the outbreak of World War II. His father was a gardener on a country estate, and his mother was a housewife and charwoman. They were not wealthy people, and had decided to only have one child in order to give him every opportunity they could offer.

When the male teachers in his local school went off to war, Warner was sent to a school in a neighbouring village with women teachers. They were good, he remembers. He also owes them his good fortune. When the time came for him to sit his '11+' exams to see if he would be selected to a good grammar school, Warner had a bad day. "I failed in mathematics," he remembers. Fortunately, there were vacancies at the grammar school in the end, and the school inspector asked Warner's headmistress whether she knew of a child whom she thought should have passed the exam, but hadn't. She told the inspector: Brian Warner.

Warner developed a fascination with science while at grammar school. He'd inherited a natural curiosity from his father. Warner senior had been taken out of school at 14 – but in general knowledge and plain ingenuity, his intellect surpassed that of his son, in the latter's estimation. Young Warner's passion was natural history. He might have become an archaeologist or a palaeontologist, but he could not abide cutting up animals in zoology class, and that meant that he was not allowed to do botany either.

However, as a teenager, Warner picked up an amateur interest in astronomy. The famous British astronomer Sir Patrick Moore lived just on the other side of the town from Warner. He and his friends became known as "Patrick's apprentices", due to the fact that they would go to Moore's house and use his telescope.

Warner went to study for his undergraduate degree at University College London (UCL). It was the only university in England at the time that would allow students to take astronomy as a first degree. Backed by a small scholarship (£5 per week), he was able to pay for food and lodging as well as the odd train ticket to visit his parents on weekends. Warner supplied his mother with money for the Sunday roast, a household treat.

Astronomy "was not an easy degree," Warner recalls. The first two years he had to do all the mathematics that the physicists did, plus all the physics that the chemistry students did. On top of that, he had to take courses on astronomy and carry out practical work at the observatory in Mill Hill, which amounted to 41 contact hours per week. Regardless, he found time

to work on his own ideas. His first scientific articles, on observations of Moon craters, were published in the *Journal of the British Astronomical Association* in the 1950s. In 1960, three weeks before his final undergraduate exams, he published his first paper in the *Monthly Notices* of the Royal Astronomical Society.

Exams were easy for Warner, who possessed an almost super-human short-term memory. In lectures, he would take notes, and later he would be able to write out in full what the lecturers had said. He quoted his lecturers *verbatim* in his exam answers, and thus had time to answer all six or seven of the exam questions in full (students were only required to answer five). As a result, he got ridiculous scores like 120%, and afterwards astronomy at UCL changed its examinations so that students were not allowed to answer more than five questions, even if they could.

Warner went on to do a PhD at UCL in astronomical spectroscopy under Roy Garstang. The method analyses the light emitted by astronomical bodies by studying their optical spectrum. This can reveal many things, including the chemical composition of the light-emitting body. Garstang had used spectroscopy to study the atmosphere of stars while working in the USA.

Warner travelled to Pretoria, where the British-owned Radcliffe Observatory allowed him to repeat the kind of measurements from the Southern Hemisphere that Garstang had taken in the North. He found Pretoria "deadly uninteresting" and too pious – the whole place closed down on weekends. However, he was able to make world-class observations with the 1.9-metre telescope. Presenting his results later at a conference in the Netherlands, he was approached by Willie Fowler (later a Nobel Laureate) who said: "Young Warner, you have the first direct evidence of nuclear reactions taking place inside stars".

OXFORD, TEXAS AND SOUTH AFRICA

After his PhD, Warner remained for a postdoc at UCL, during which time he returned to Pretoria. In 1965 he was awarded a Radcliffe Fellowship to Balliol College at the University of Oxford. He remained in the post for two years, and he loved the university town. The only problem was that it did not have an observatory.

In 1967, Warner was headhunted to work as a spectroscopist at a recently established astronomy department at the University of Texas at Austin in the USA. The university had a great telescope, and Warner was able to spend a lot of time getting data. He stayed in Austin for five years, and this is where he really forged his career in spectroscopy. He also worked on high-speed photometry, moving from the long exposures of spectroscopy to the quick-exposure used to study things like pulsars. In 1968, Warner's team received a phone call from colleagues in Arizona, who wanted him to confirm what they believed to be the first-ever optical observation of a pulsar. Warner's team did, and published a confirmatory paper in the same issue as the original discovery was published in *Nature*.

Warner could have happily stayed in Texas for decades, but fate had other plans in store. He befriended an electrical engineer who was working as a technician on the new telescope being built in Austin to study planets. The engineer was keen to do a PhD, but the University of Texas would not allow him to do one without prior academic qualifications in astronomy. Instead, he applied to UCT in South Africa, which would allow him to enrol for a PhD based on the on-the-job experience he had obtained in Texas.

Warner himself followed his engineer friend a year later to become the first Head of UCT's new Department of Astronomy. His friend from Texas ended up being his first PhD student there. Warner had been persuaded to take the post by Jack de Wet, a South African mathematician whom he had befriended at Oxford. De Wet wrote to Warner while the latter was still in Texas, telling Warner that he was due to retire at Oxford and that he was returning to UCT as Dean of Science. "That changed everything," says Warner. "I knew De Wet, I admired him. I wanted to go where he went."

Warner remained head of UCT's Astronomy Department until 1999. During that time, the department grew – albeit slowly at first. The observation facilities were improving as well. The government established Sutherland in the

Northern Cape as the country's new astronomy hub. New telescopes were built alongside others that were moved there, including the one Warner had used for his observations a decade and a half before in Pretoria.

During the 1980s the government tightened the funding for astronomy, and Warner nearly left South Africa as a result. But as the democratic era dawned, he was given fresh resources by UCT's first black Vice-Chancellor, Dr Mamphela Ramphele.

THE BOOK LOVER

In addition to being an astronomer, Warner is a bibliophile of note. He was on the board of the South African National Library for ten years. In his own collection, three books stand out. The first is a copy of *Ure's Dictionary of Chemistry* dated 1825. It cost him two shillings and six pence at a second-hand bookshop in the town where he went to school. "It's a little bit out of date, but the content is fascinating," he says.

The second, a book from John Herschel's own library, cost him a month's salary when he was a Professor. Herschel's entire library was sold to an American medical doctor, but books from the collection cropped up after 2000, presumably because the owner had died. The book has Herschel's library stamp on it, and is a treatise on the principles of natural philosophy. "I'm the custodian of it," Warner says, proudly.

The third book is the oldest: *A history of the house of Northumberland from 1550 to 1750*. Basically, it is the household accounts of an old English family. "It's a bit dull, but it's an important book for understanding the history of the aristocracy and it has a superb fore edge painting. Those are the three books that I turn to when I'm looking for something familiar and safe to read."

Warner has written several books and papers on the history of astronomy in South Africa. He considers the British polymath John Herschel, who lived and worked in the Cape from 1834 until 1838, "the greatest all-round scientist ever to live in South Africa". Warner suggested the Royal Society of South Africa name one of its medals after Herschel – a medal that Warner himself won in 1988. He is also one of the founders of the Academy of Science of South Africa (ASSAf).

However, Warner considers building up the astronomy department at UCT as his crowning achievement. When he took charge in the beginning, it consisted of only two people. Today there are so many staff and students that he can't remember the names of everyone. "It's a big department and I'm proud to have laid the foundation for it," he says. Without it and the people it has trained, South Africa would not have been in the position to build and run the ten-metre mirror SALT, which helped to win the bid to host the SKA.

Warner officially retired from UCT in 2004, but kept an emeritus post at the institution, and was later reinstated on the payroll as a senior scholar. He believes the future for astronomy is in good hands. "The future of astronomy in South Africa is enormous. I'm very impressed by what it has been possible to do," he says proudly.