Bill Allen, a retired electrical engineer, amateur astronomer and grape grower, with his robotic telescope.

DANIEL ROSE

The Truth is Out There

A high-powered telescope in a Marlborough vineyard is part of an international study of the explosive deaths of ancient stars dating back to the beginning of time.

About 8000 million years before the Earth was formed, the largest astronomical event known to humankind caused huge stars to collapse into hyper nova. Travelling across billions of light years and now making their way to earth, gamma-ray bursts (GRB) were first observed during the Cold War when the United States and the Soviet Union launched satellites to detect nuclear explosions. By the 1990s, scientists had determined the rays were of extragalactic origin.

Bill Allen, a retired electrical engineer, amateur astronomer and grape grower, is more than happy to play a small part in this epic story. A robotic telescope in his backyard called BOOTES 3 (Burst Optical Observer and Transient Exploring System) is part of an international network of telescopes studying the afterglow of the gamma-ray bursts.

The 10-year joint project is funded mainly by the Institute of Astrophysics in Andalucia, with Auckland University responsible for operating and maintaining the Marlborough telescope, which is due to return to Spain in 2019.

"By analysing the data collected from sites all around the world, they hope to work out how the early stars were formed," Allen says.

The GRB are initially detected by a satellite and may last only a few hours, hence the need for very fast telescopes and viewing places around the globe. Other telescopes in the BOOTES network are located in Spain and China, with another planned for Mexico.

"The bursts generally happen once a day somewhere around the world," says Allen. "Satellites tell the telescopes in the network to look at a particular point in the sky. Each telescope is given a 'shopping list' of objects, such as GRB and novae, and opens automatically at dusk if the viewing conditions are clear and dry. The Marlborough one collects data and images which I send to Spain each month on hard drives, where it is analysed."

Allen has had observatories in various locations around New Zealand for more than 40 years. For the BOOTES project, he designed a new observatory with roof flaps that open to allow the German-made telescope to pivot and scan the skies. His design has been used for the outpost in China and will be also implemented in Mexico.

With his engineering background and some Kiwi can-do, Allen ensures the telescope is maintained.

"It often needs tinkering with. My own telescope has automatic focusing so I changed the manual focuser to a temperature-compensating focuser that enables the telescope to be remotely focused from Spain. Auckland University students are also able to remotely use the telescope."

Allen built his first telescope when he was a Canterbury University engineering student in the 1960s and has been hooked on astronomy ever since. He was chosen to run New Zealand's BOOTES outpost because of his experience in running a large autonomous telescope and his collaboration with astronomy professor Phil Yock from Auckland University's physics department – as well as Marlborough's clear night skies.

He and Yock have worked together since the 1980s, observing phenomena such as super nova. Currently they're involved in gravitational microlensing (observing the chance alignment of two stars), a project set up by Auckland, Canterbury, Massey and Ohio State universities using Allen's own telescope.

Now in his 70s, the genial Allen still enjoys observing the unfolding mysteries of the universe – and the opportunity to contribute to our knowledge of the cosmos from his Marlborough vineyard. **JOY STEPHENS**