



## CTIO Supports Award-Winning Science

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The Shaw Prize Foundation announced its laureates for 2006 on June 21, awarding the Shaw Prize in Astronomy to Saul Perlmutter, Adam Riess, and Brian Schmidt “in recognition of their leadership roles on the two teams that made the remarkable discovery of an acceleration in the rate of the expansion of the Universe.”

The discovery of the accelerating universe was made contemporaneously in 1998 by the High-*z* Supernova Search (High-*z* SN) team led by Schmidt, and the Supernova Cosmology Project (SCP) led by Perlmutter. Both teams used the CTIO Blanco 4-meter telescope to discover the Type-Ia supernovae (SNe) that were used to measure cosmological distances and derive the evidence for acceleration and the mysterious “Dark Energy.” High-*z* SN team member Adam Riess was also recognized for his leadership in the study of even higher redshift SNe with the Hubble Space Telescope, which provided confirmatory measurements of the acceleration.

The pioneering work that forms the basis of using Type-Ia SNe as precise distance indicators was also done with CTIO telescopes. The Calan/Tololo survey (1990–1995), led by CTIO astronomers Mario Hamuy, Mark Phillips, and Nicholas Suntzeff, provided the first uniform, high-quality sample of low-redshift SNe light curves. This sample was used to discover a method of measuring distances to these supernovae to an accuracy of six percent, making them the most accurate “standard candles” in cosmology.

Based upon these findings, Suntzeff and Schmidt started the High-*z* SN team in 1994 to pursue the use of these candles in the study of cosmology. The SCP, using a similar distance calibration based on the Calan/Tololo data, began an independent campaign to measure cosmological parameters.

Both teams relied on the wide-field imaging capabilities of the Blanco telescope to identify the significant numbers of high-redshift SNe needed to trace the expansion history of the Universe. They both derived the surprising result that, instead of decelerating due to the mutual gravitation of all galaxies, the expansion is actually accelerating.

The Blanco 4-meter continues to be at the forefront of Dark Energy studies. The ongoing NOAO Survey project named ESSENCE (Principal Investigator Nicholas Suntzeff: see [www.ctio.noao.edu/essence](http://www.ctio.noao.edu/essence)) is attempting to constrain the equation-of-state parameter of Dark Energy through further studies of Type-Ia SNe. In addition, the recently initiated Blanco Cosmology Survey (PI Joe Mohr: see [www.cosmology.uiuc.edu/BCS/](http://www.cosmology.uiuc.edu/BCS/)) has begun observations aimed at probing Dark Energy through its effects on clusters of galaxies.

In the future, the Blanco will host one of the major next-generation probes of Dark Energy, known as the Dark Energy Survey (DES: [www.darkenergysurvey.org/](http://www.darkenergysurvey.org/)). The DES will bring a major new facility instrument, the 500-megapixel Dark Energy Camera, to the Blanco to support all NOAO community science in the southern hemisphere.

The Shaw Prize honors individuals, regardless of race, nationality and religious belief, who have achieved significant breakthrough in academic and scientific research or its application, and whose work has resulted in a positive and profound impact on humankind. It is an international award managed and administered by The Shaw Prize Foundation in Hong Kong. Previous winners of its astronomy prize have been Geoffrey Marcy and Michel Mayor (2005) and James Peebles (2004). For more information, visit [www.shawprize.org](http://www.shawprize.org).