SALT plays key role in the global hunt for Dark Energy

Twenty years after its discovery, dark energy is still one of the great mysteries of our time. The Southern African Large Telescope (SALT), the largest optical telescopes in the Southern Hemisphere, has played an important role as part of the international Dark Energy Survey’s (DES) quest to pin down dark energy, the mysterious force accelerating the expansion of the universe. As part of the hunt, SALT conducted follow-up spectroscopy of supernovae – stars that explode at the end of their lives – discovered by DES. Supernovae are so bright that they can be seen on the other side of the Universe and astronomers can accurately calculate the distances to a small subclass of them – the so-called Type Ia supernovae. Once their distances are known, Type Ia supernovae can accurately calculate the distances to a small subclass of them – the so-called Type Ia supernovae. Today, two decades later, dark energy is still one of the great mysteries of our time. These results, with the purest sample of supernovae to date, confirm yet again that dark energy is real, and will be a key target of investigation for the Square Kilometre Array (SKA), that will be built primarily in South Africa.”

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"Dark Energy is perceived to exist in the vast empty spaces between galaxies in the Universe known as voids and we believe that it is responsible for making galaxies move away from each other at ever-increasing speeds. In other words, it is responsible for the accelerated expansion of the Universe that we observe,” said Prof Roy Maartens, SKA Chair in Astrophysics and Cosmology at the University of the Western Cape and a member of the SALT DES supernova follow-up program. He went on saying “observing more and more supernovae in many galaxies gives us a handle to quantify the properties of dark energy and also provides us insight into the true nature of supernovae”.

SALT consistently played a pivotal role of classifying into various types the discovered supernova candidates and successfully determining how far they were from Earth, two important parameters that were key to the success of the DES experiment, which came to an end at the end of February 2018. Spectral observations of the discovered SN candidates by SALT and other spectroscopic capable telescopes in DES played a crucial role in helping algorithms that could classify the discovered supernova candidates and determine their redshift using only the images in which such candidates were discovered. This type of classification and redshift determination is less accurate in comparison to that performed with spectroscopic data from SALT and other spectroscopic capable telescopes.