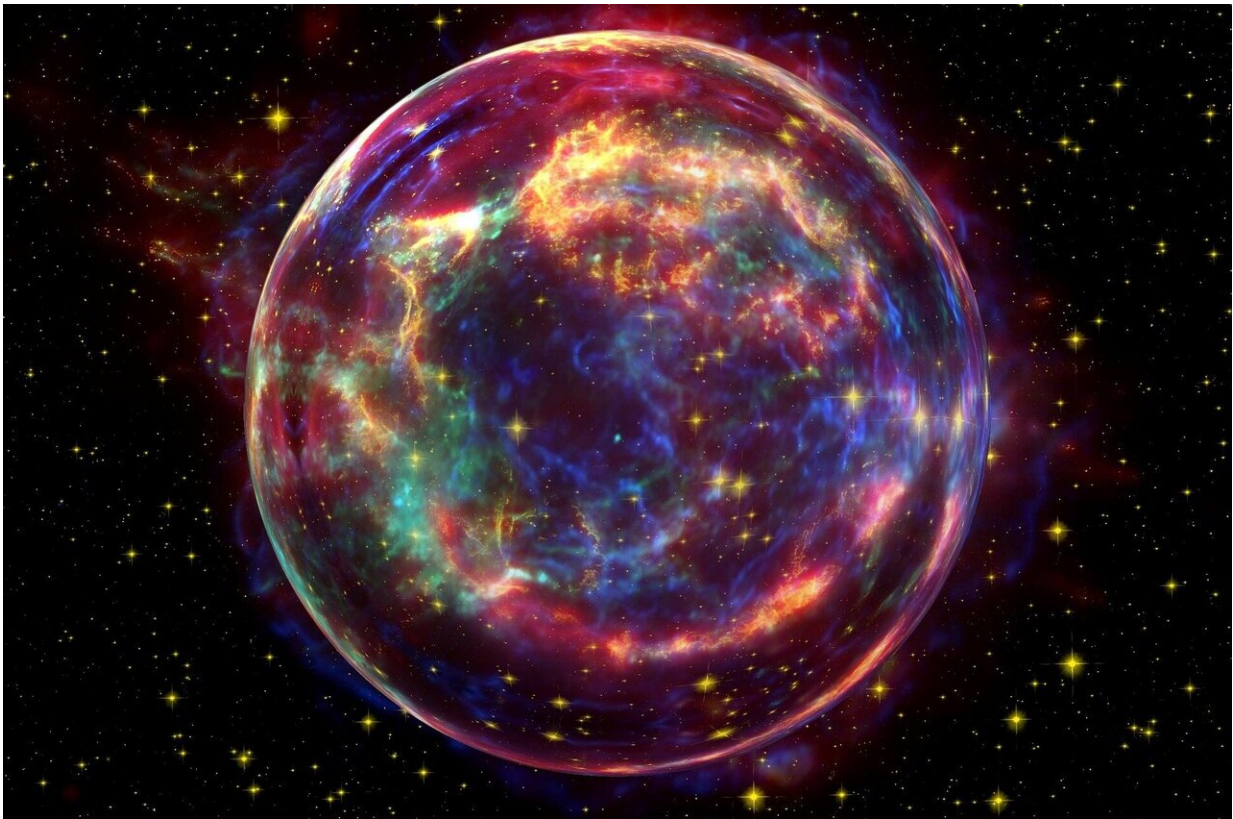


Chinese researchers obtain the most complete type Ia supernova template

January 8 2021, by Li Yuan



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Type Ia supernovae, as cosmological distance indicators, have led to the discovery of the accelerating expansion of the Universe. Nevertheless, the nature of their progenitors and explosion mechanisms remain

unsolved mysteries.

An international team led by Dr. Wang Lingzhi from Chinese Academy of Sciences South America Center for Astronomy (CAS-SACA)/China-Chile Joint Center for Astronomy (CCJCA) investigated a nearby Type Ia [supernova](#) SN 2017cbv and obtained the most complete light curve template and spectral template of a single supernova.

Their study was published in the *Astrophysical Journal* on Nov. 18.

"The data set is unique. It is one of the supernovae types with the most complete temporal coverage across the optical and near infrared filter bands and spectroscopy, which makes the target an ideal standard for comparative investigations of SNeIa," said Dr. Wang Lingzhi.

Prof. Nicholas B. Suntzeff, a coauthor of the study and pioneer in the field of supernova research, said, "These light curves in this study will be shown over and over again in talks around the world now, as the best example of Type Ia photometric behavior."

"Reliable estimates of the extinction and reddening caused by the dust in the host galaxies of Type Ia supernovae is the most important issue in the cosmological application of Type Ia supernova which laid the foundation for studies of dark energy of the Universe," said Prof. Wang Lifan, a coauthor of this study.

"With this unique data set, we are able to set constraints on the nickel mass synthesized during the explosion, construct the SN explosion model that best fit the data, as well as to derive an [upper limit](#) of 0.1 solar mass for the mass of hydrogen," said Dr. Wang Lingzhi.

More information: Lingzhi Wang et al. Optical and Near-infrared Observations of the Nearby SN Ia 2017cbv, *The Astrophysical Journal*

(2020). [DOI: 10.3847/1538-4357/abba82](https://doi.org/10.3847/1538-4357/abba82)

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