極めて大きな爆発エネルギーを持つ超新星の観測的研究

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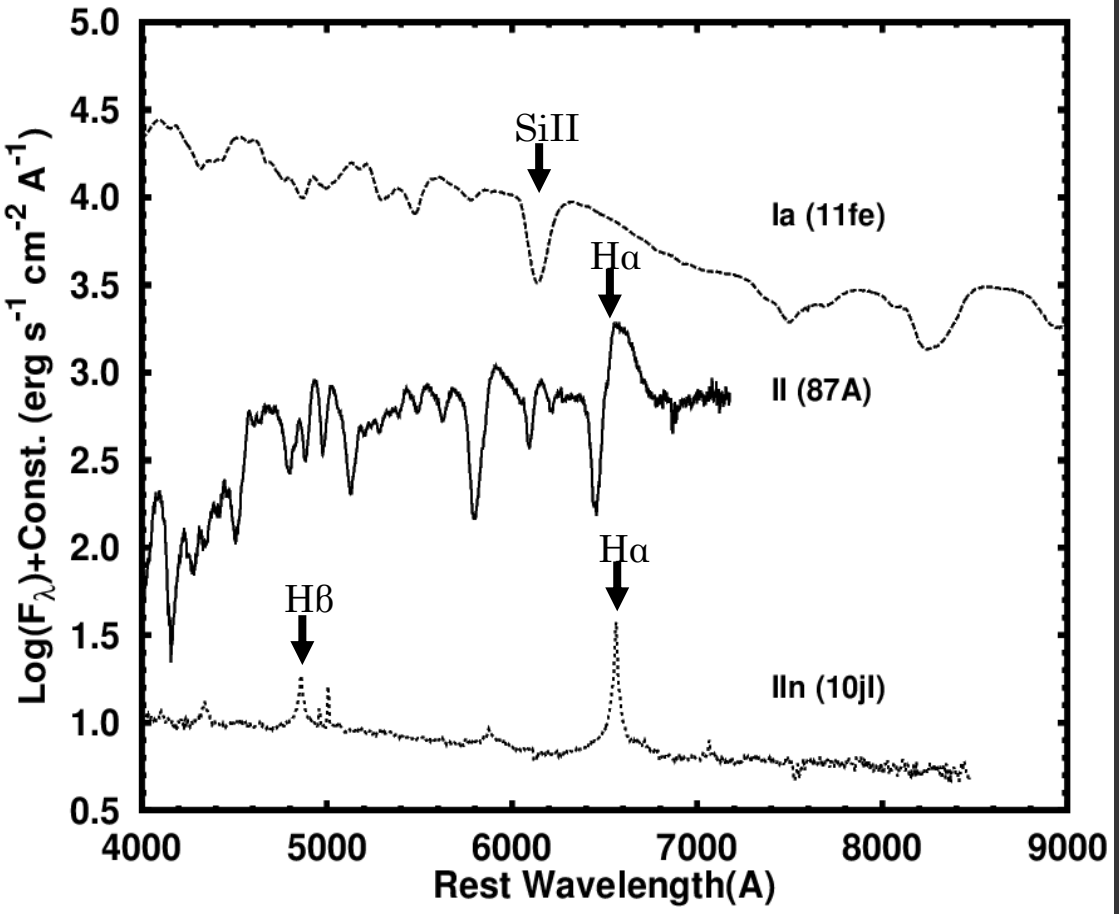
Type IIn SN

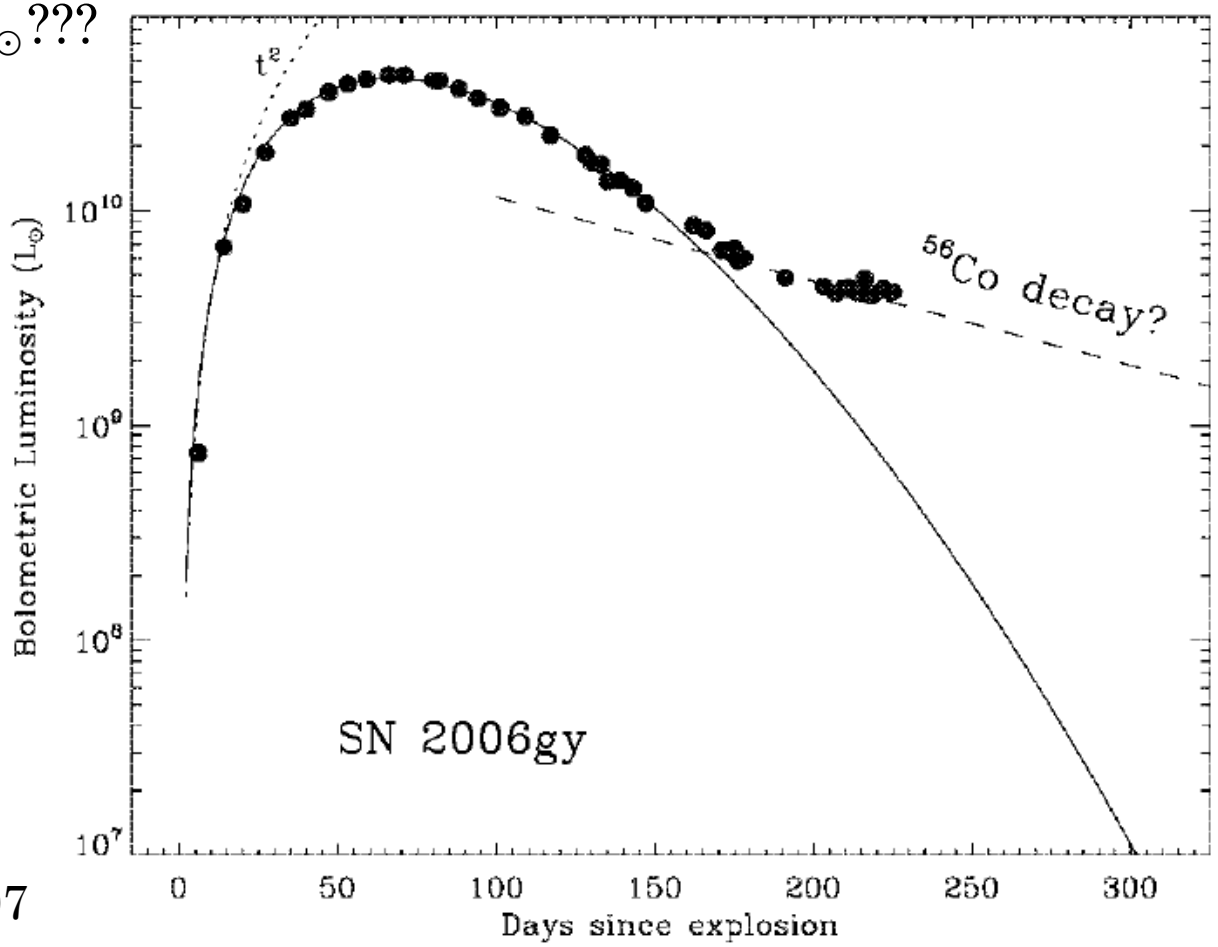


H emission line
"n"arrow
→IIn

emission line
→circumstellar material (CSM) & ejecta interaction
The origin of CSM is thought to be
luminous blue variable (LBV) outburst

SLSN-II

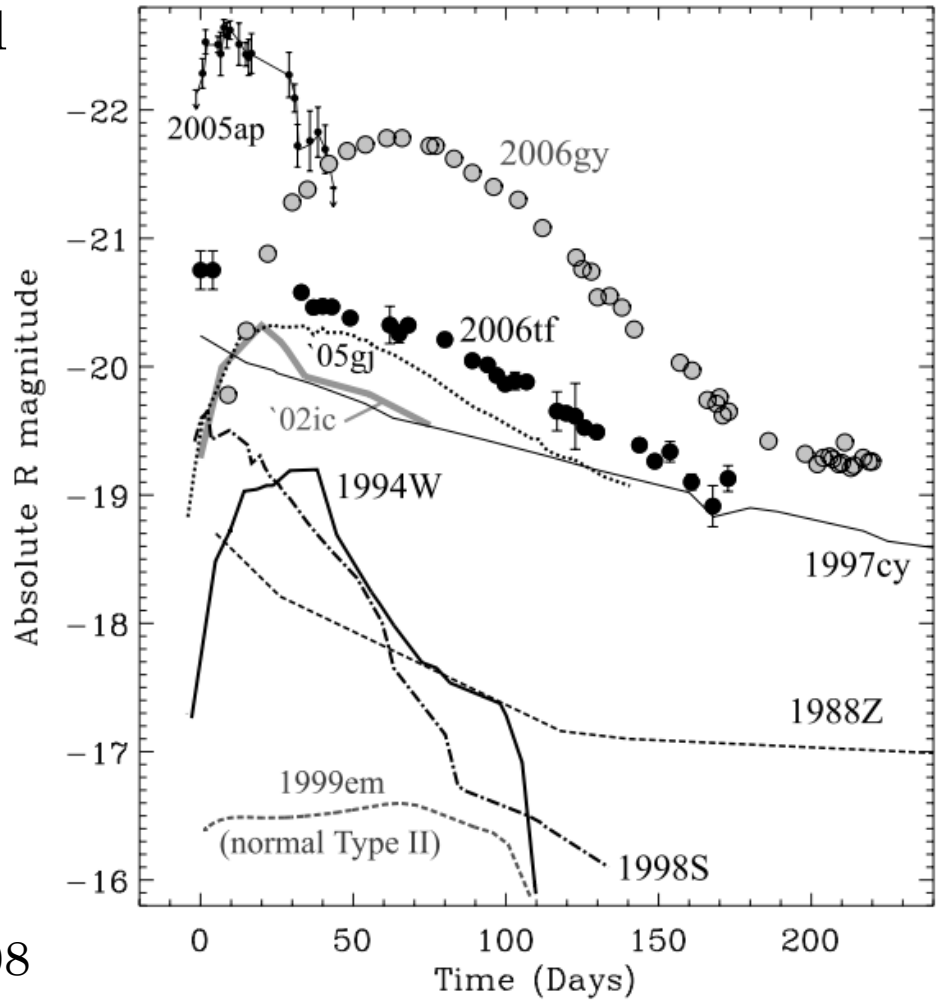
- Extremely luminous SN. (SN 2006gy ; -22mag)
- This can be explained by pair instability SN. (Smith et al. 2007 see also Yoshida-san's talk)
- progenitor : ~100$M_{\odot}$???



Smith et al. 2007

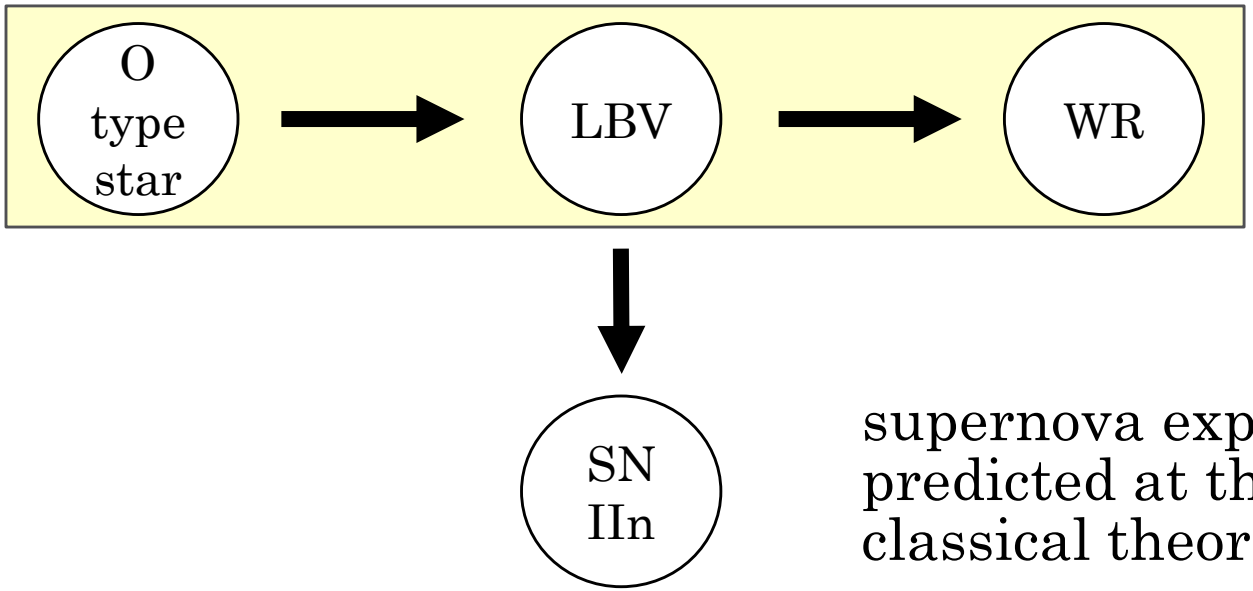
SN IIn Light curves

- Their peak luminosities show the large diversity in order of 10,000.
- The light curves show quite slow evolution comparing to normal SNe II.

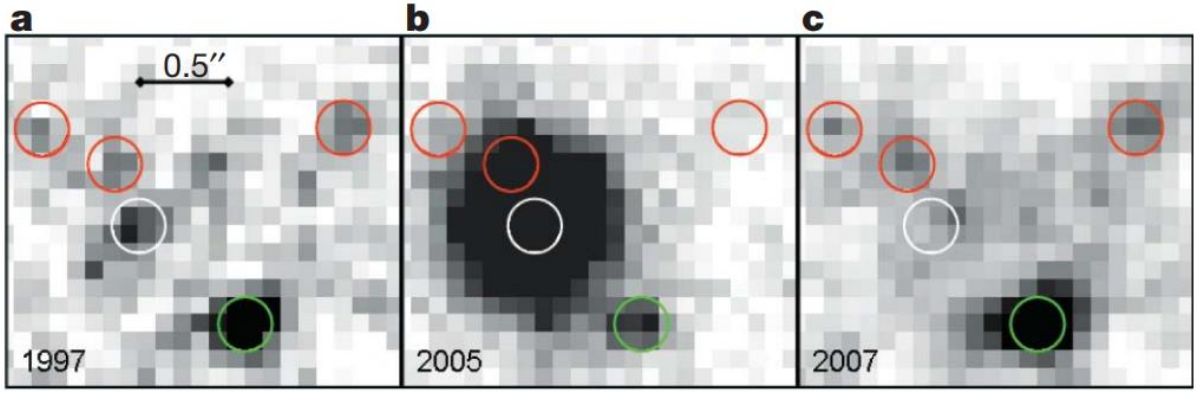


Smith et al. 2008

Overview of the stellar evolution of massive stars



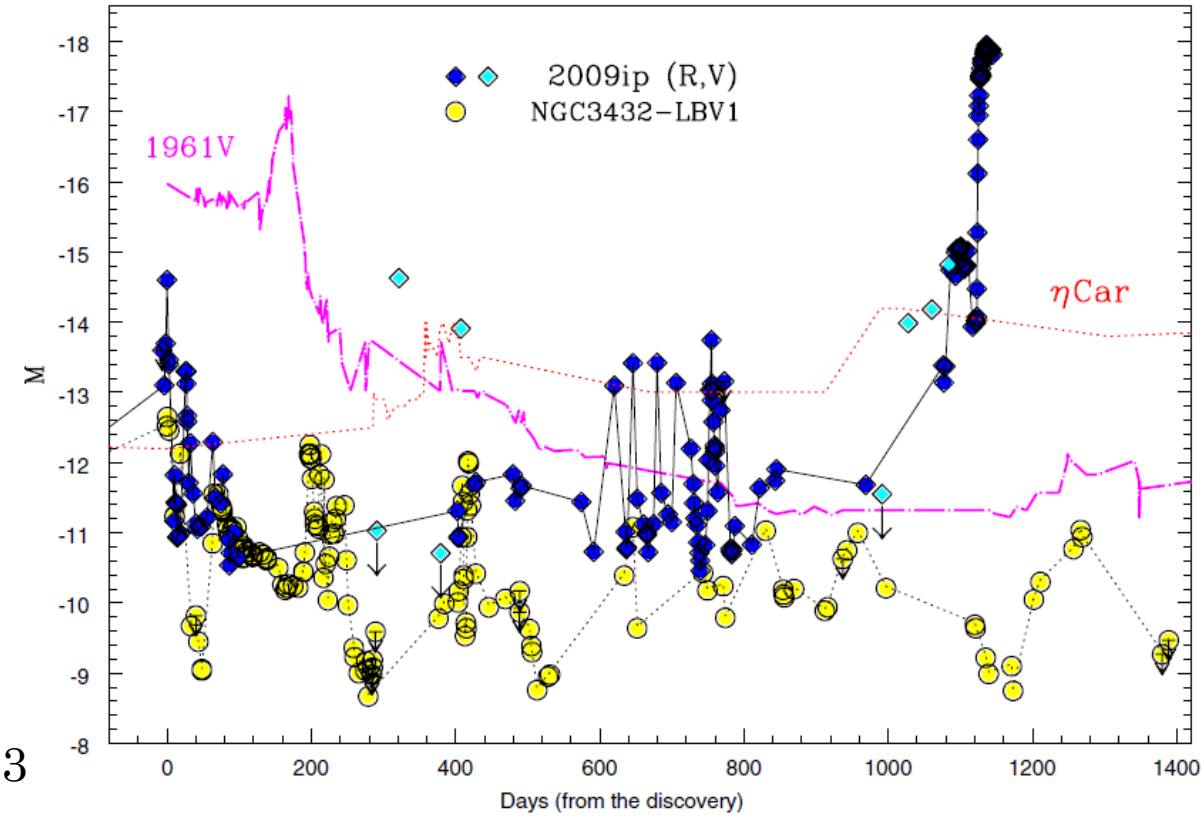
supernova explosion is not predicted at the LBV phase by classical theoretical studies.



progenitor of SN 2005gl
Gal-Yam et al. 2009

SN2009ip:rapid brightening after the LBV outburst

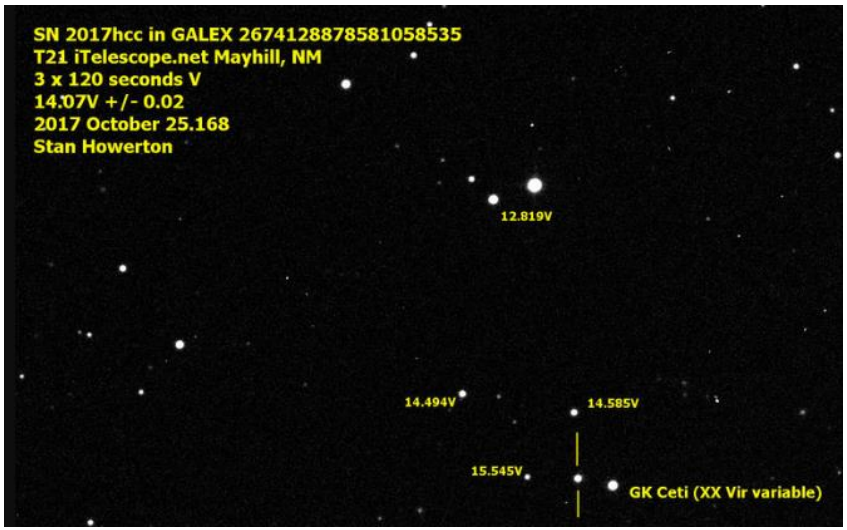
LBV outburst was discovered in 2009.
More luminous outburst was detected on October in 2012.
Thereafter the rapid brightening was found and its peak reached to -18 mag.
From it, this eruption could be a SN IIn.



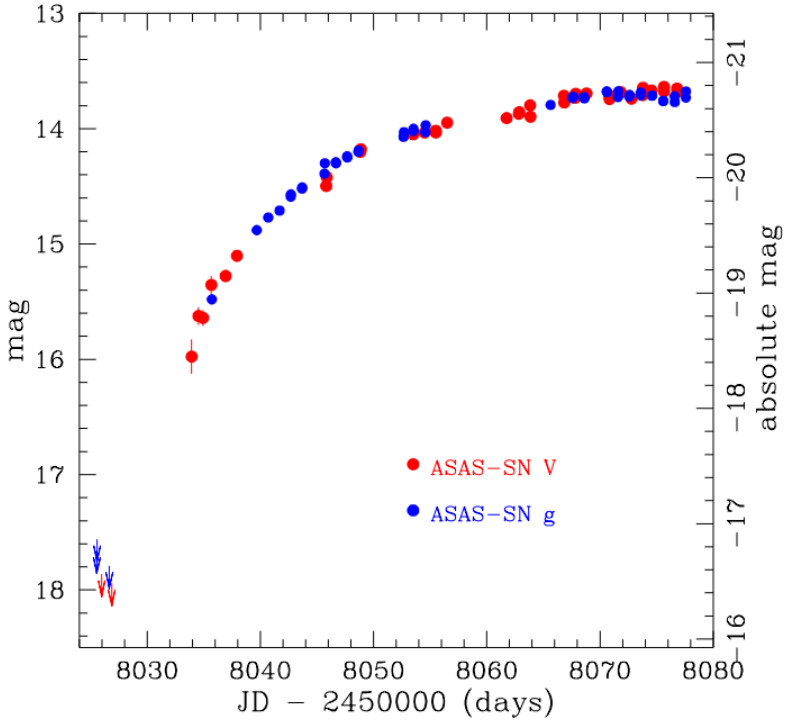
Pastorello et al. 2013

SN 2017hcc

- Discovery:Oct-02-2017
- This SN was identified as a SN IIn.
- Polarization degree was reported to be 4.84%, which is quite large among SNe IIn. (ATel #10911)



Host galaxy : very faint (https://c1.staticflickr.com/5/4472/37224388064_71d4839af0_b.jpg)



Prieto et al. 2017

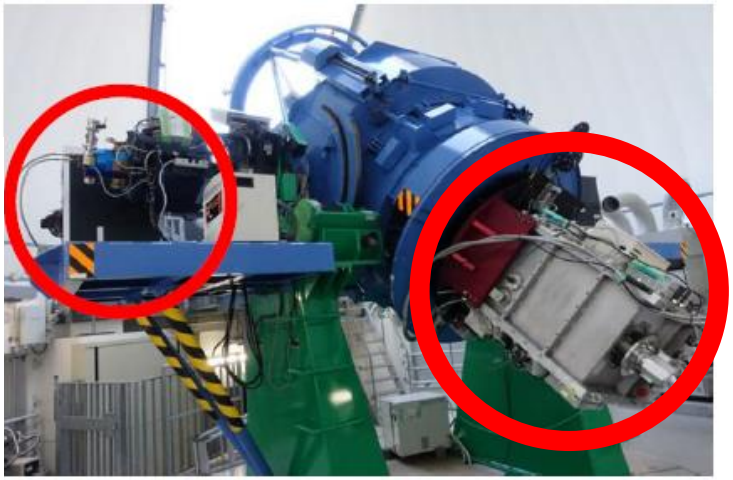
Scientific goal

We discuss the unknown origin of the extremely luminous Type IIn SN with the Kanata telescope.

Observation and data reduction

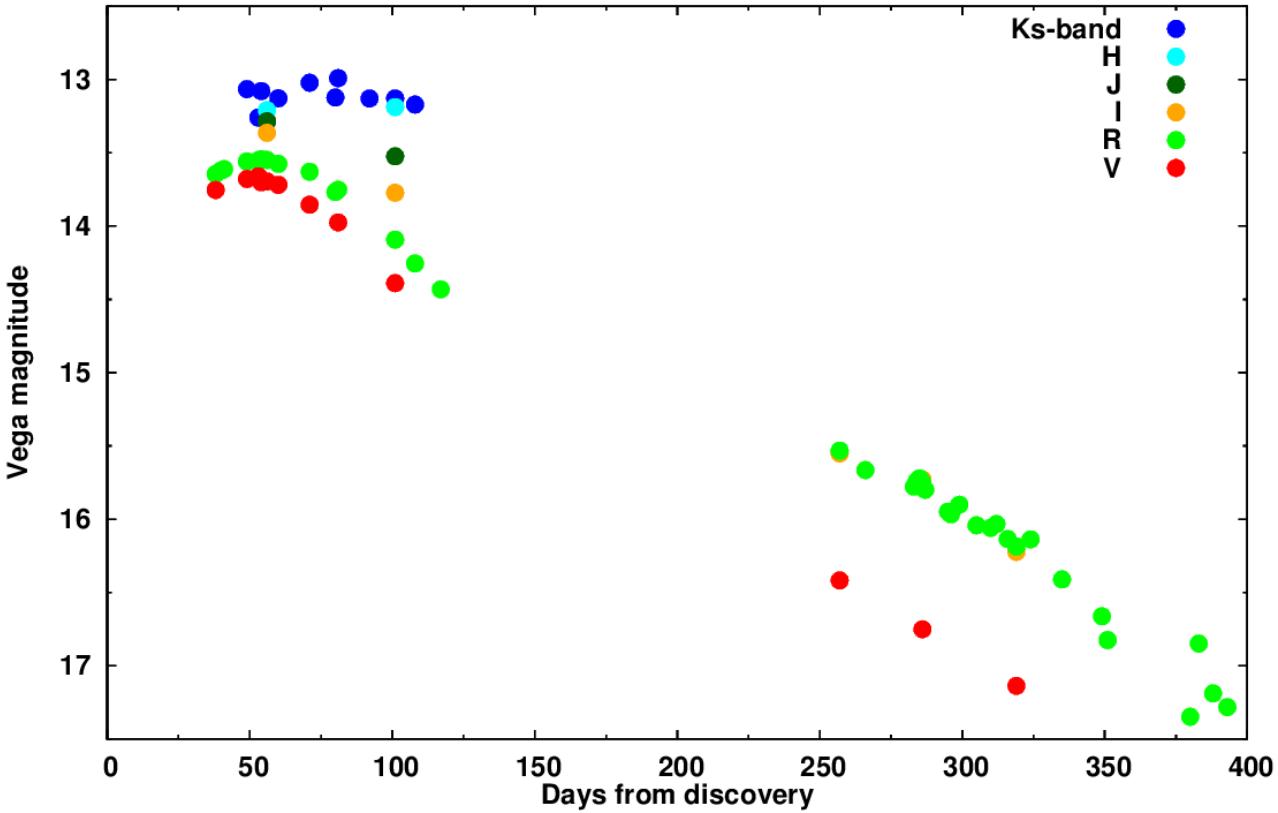
- We carried out photometry (BVRIJHKs-band) and spectroscopy observation from November 09, 2017 to the last night, using the Kanata telescope (1.5m).
- Photometry was done with aperture.

HOWPol
Spectral resolution
R=400



HONIR

multi-band light curves



Extinction of our Galaxy : $A_R(gal) = 0.072$
Extinction of host Galaxy : 0

R-band maximum is at 54 days after discovery. (13.5mag)
Around 4 magnitude faded in 350 days.