

Sang Chul KIM<sup>1,2</sup>, Dae-Sik Moon<sup>3</sup>, Jae-Joon Lee<sup>1</sup>, Mina Pak<sup>1,2</sup>, Hong Soo Park<sup>1,2</sup>, John Antoniadis<sup>3</sup>, Matthias He<sup>3</sup>, on behalf of the KMTNet Supernova Project

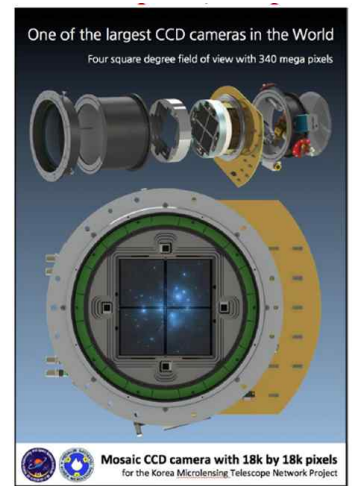
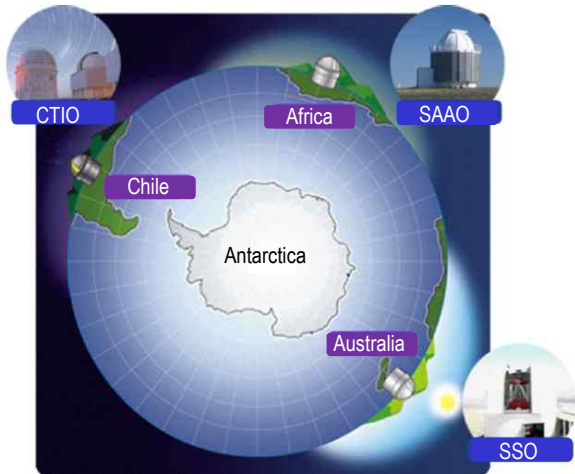


<sup>1</sup>Korea Astronomy and Space Science Institute (KASI), Daejeon, Republic of Korea [sckim@kasi.re.kr]

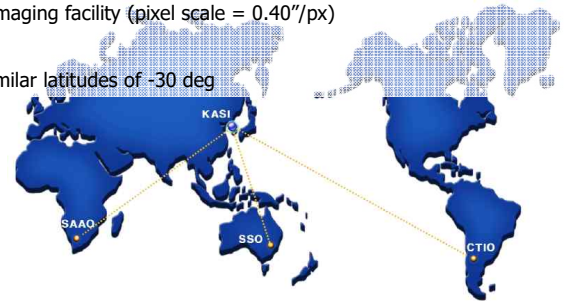
<sup>2</sup>Korea University of Science and Technology (UST), Daejeon, Republic of Korea

<sup>3</sup>PI, University of Toronto, Ontario, Canada [moon@astro.utoronto.ca]

## Facility, the "KMTNet"



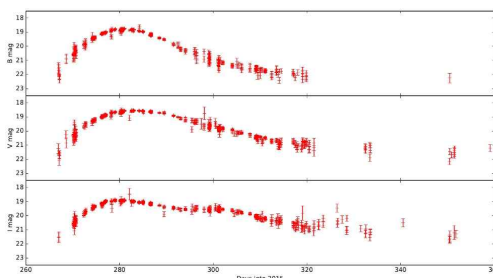
- KMTNet : Korea Microlensing Telescope Network
- 24-hour coverage, continuous monitoring facility equipped with wide-field (FOV =  $2^\circ \times 2^\circ$ ) imaging facility (pixel scale =  $0.40''/\text{px}$ )
- Three new big enough (1.6m diameter) telescopes for survey purpose
- Three southern hemisphere sites : CTIO (Chile), SAAO (South Africa), SSO (Australia) → similar latitudes of  $-30$  deg
- Mosaic e2v CCD camera of  $18K \times 18K$  pixels, Readout time  $\sim 71$  sec (32 channels)
- Filters : BVRI (3 sites), g'r'i'z' H $\alpha$  (CTIO only)
- Founded and operated by Korea Astronomy and Space Science Institute (KASI)
- Images are being transferred to the KMTNet data center in KASI in almost real time
- Officially started on October, 2015



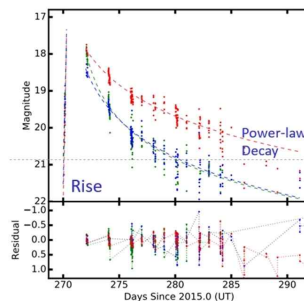
## KSP (KMTNet Supernova Project)

- 17% time of all three KMTNet telescopes are secured for 5 years (2015 – 2019)
- For discovering and monitoring early and/or peculiar SNe, optical transients, and related objects
- First year targets : nearby galaxy groups, small number of fields to achieve high cadence
- Mainly anti-bulge season (50% time for the KMTNet primary science observe bulge fields using gravitational microlensing technique)
- Typical exposure time : 60 sec for each B, V, I-band
- At  $1.2''$  seeing, S/N = 10 for B $\sim 20.6$  mag

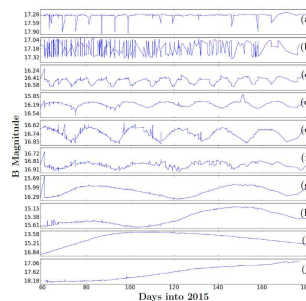
## KSP Initial Results - a few samples



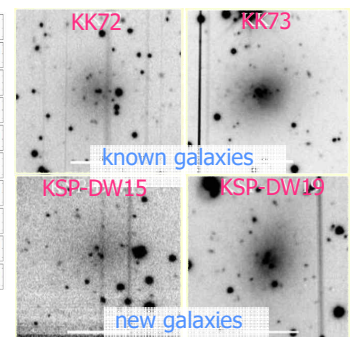
BVI light curves of an infant SN, which was discovered within 7 hours from the previous images in each of the BVI bands. No apparent host galaxy is identifiable immediately in the deep stack images (Moon et al. 2016).



Light curves of a rapidly evolving optical transient. Rapid rising with  $\geq 1$  mag/hr (Antoniadis et al. 2016)



B-band light curves of a sample of variable stars (periods increase from the top to the bottom) (He et al. 2016)



I-band images of newly found dwarf galaxies (Park et al. 2016)