

The ASAS-SN Survey

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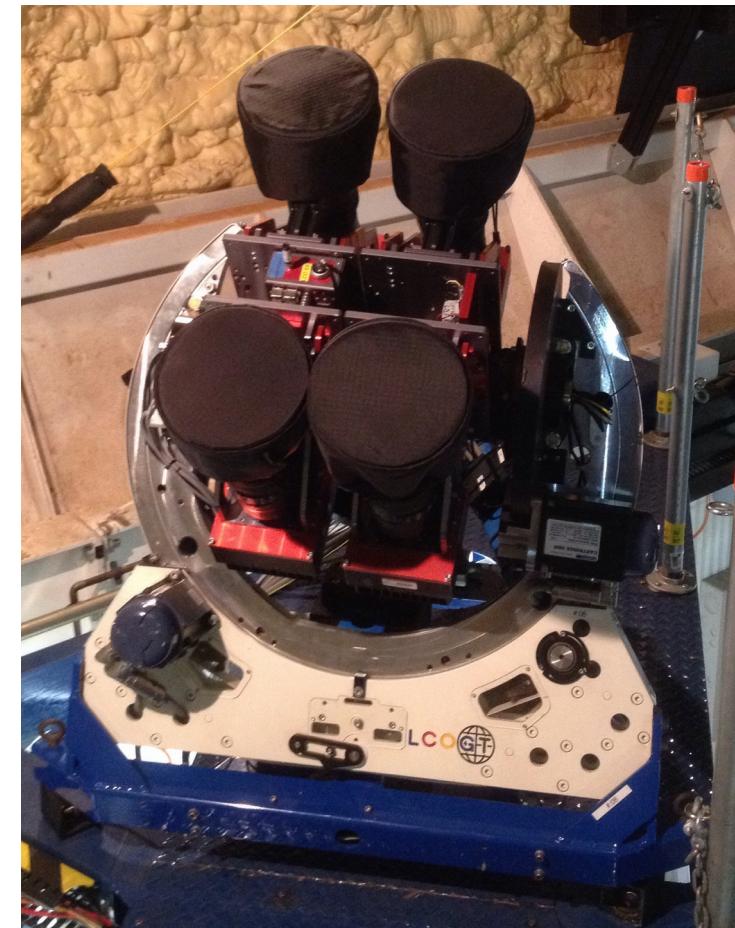
ASAS-SN

- At Ohio State University: Chris Kochanek, Kris Stanek, Tharindu Jayasinghe, Jon Brown, Josh Shields, Patrick Vallely, John Beacom, Todd Thompson, Johnny Greco, David Will, Christopher Britt (ASC Tech)
- Ben Shappee, Anna Payne, Michael Tucker, Kyle Hart (IfA, Hawaii)
- Tom Holoien (Carnegie Observatories)
- José Luis Prieto (Universidad Diego Portales; MAS)
- Grzegorz Pojmanski (Warsaw University Observatory)
- Joseph Brimacombe (Coral Towers Observatory)
- David Bersier (LJMU);
- Subo Dong, Ping Chen, Subhash Bose, Xiaowei Duan (KIAA-PKU)
- Emilio Falco (CfA)
- Przemek Wozniak (LANL)
- Maximilian Stritzinger, Simon Holmbo (Aarhus)
- Nidia Morrell (Carnegie Observatories, Las Campanas Observatory)
- Laura Chomiuk, Jay Strader (MSU)
- Anna Franckowiak (DESY)
- Ondřej Pejcha, Michał Pawlak (Charles University)
- Xinu Dai (University of Oklahoma)
- David Martinez-Delgado (Heidelberg)
- Katie Auchettl (OSU->DARK)



ASAS-SN

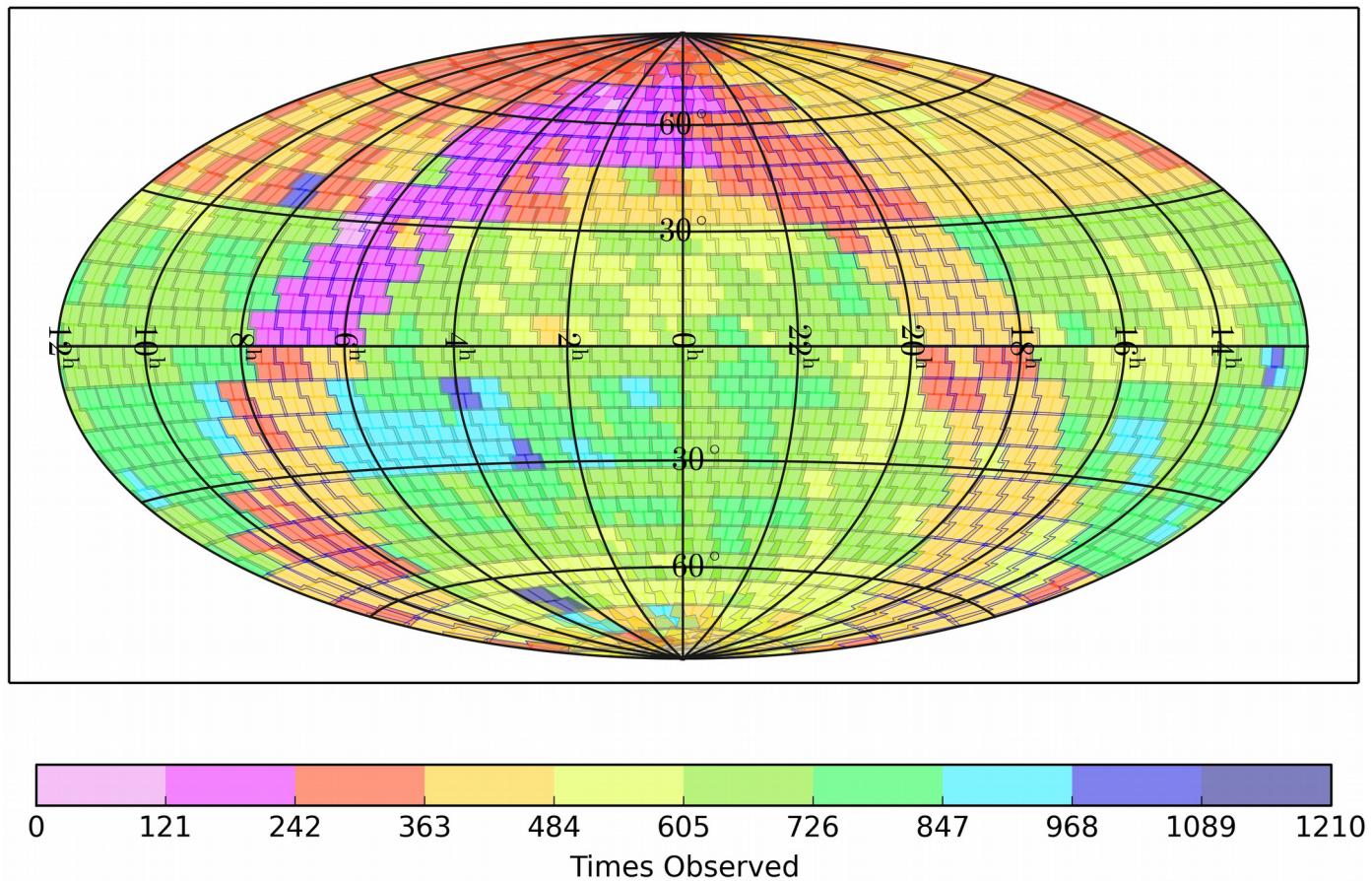
- all sky photometric survey
- 5 quadruple, 14-cm telescopes around the world
- magnitude range $\sim 9\text{-}17$ mag in V
- supernovae and other transients
- 400,000+ variable stars



ASAS-SN – sky coverage

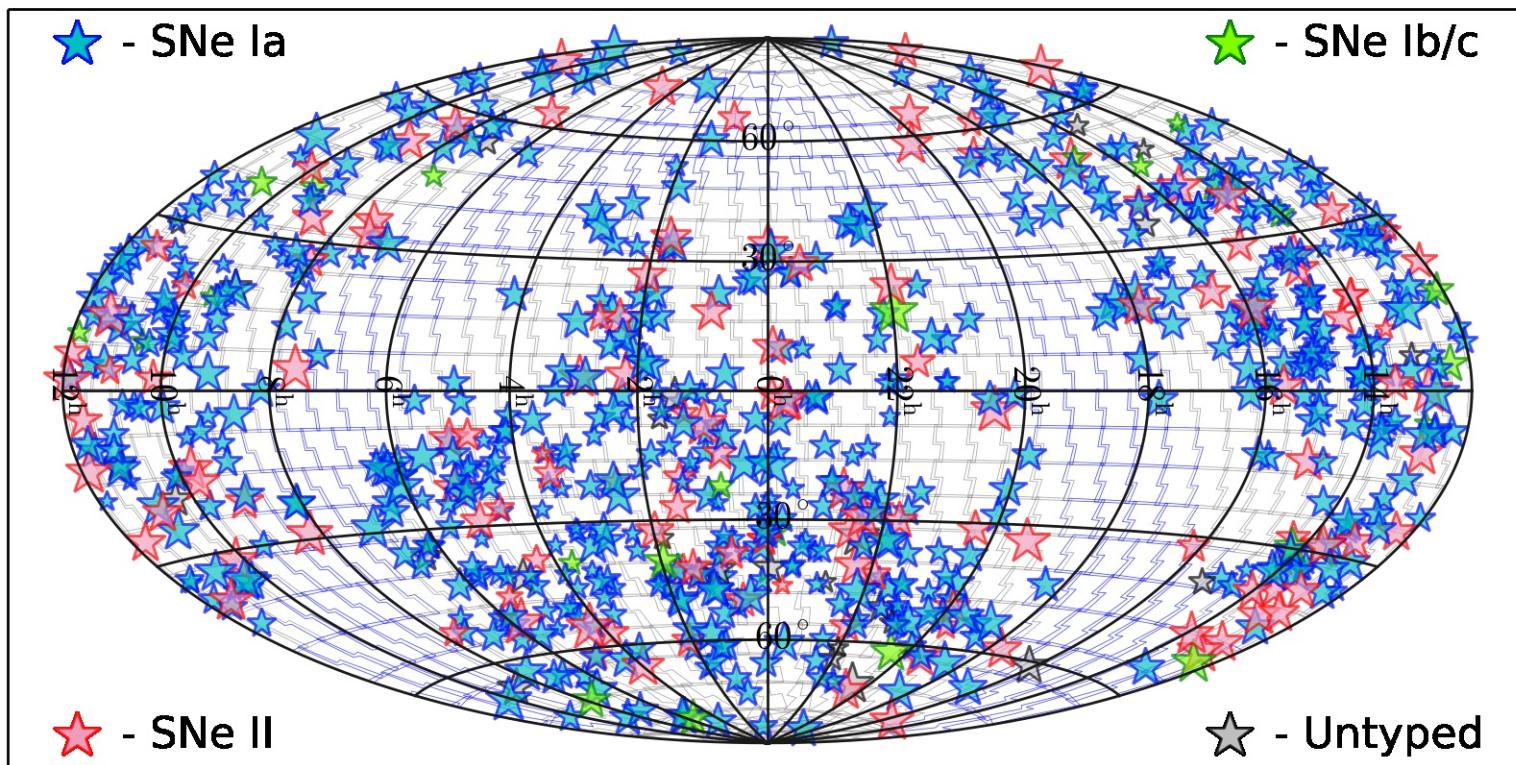
- entire sky
- almost every night
- up to 17 mag

Mon Sep 24 05:20:24 2018



ASAS-SN - supernovae

- 800+ supernovae discovered up to date
- 150 in the first half of 2018
- SN discovery rate doubled since 2016



ASAS-SN - supernovae

ASAS-SN Transients Fri Oct 5 15:58:46 EDT 2018

WARNING: All V-band/g-band magnitudes reported on this page are only approximate. Also, they represent not the total brightness of the source, but rather the excess flux compared to the reference image (only for a completely new source, like a freshly discovered SN, these two numbers are the same).

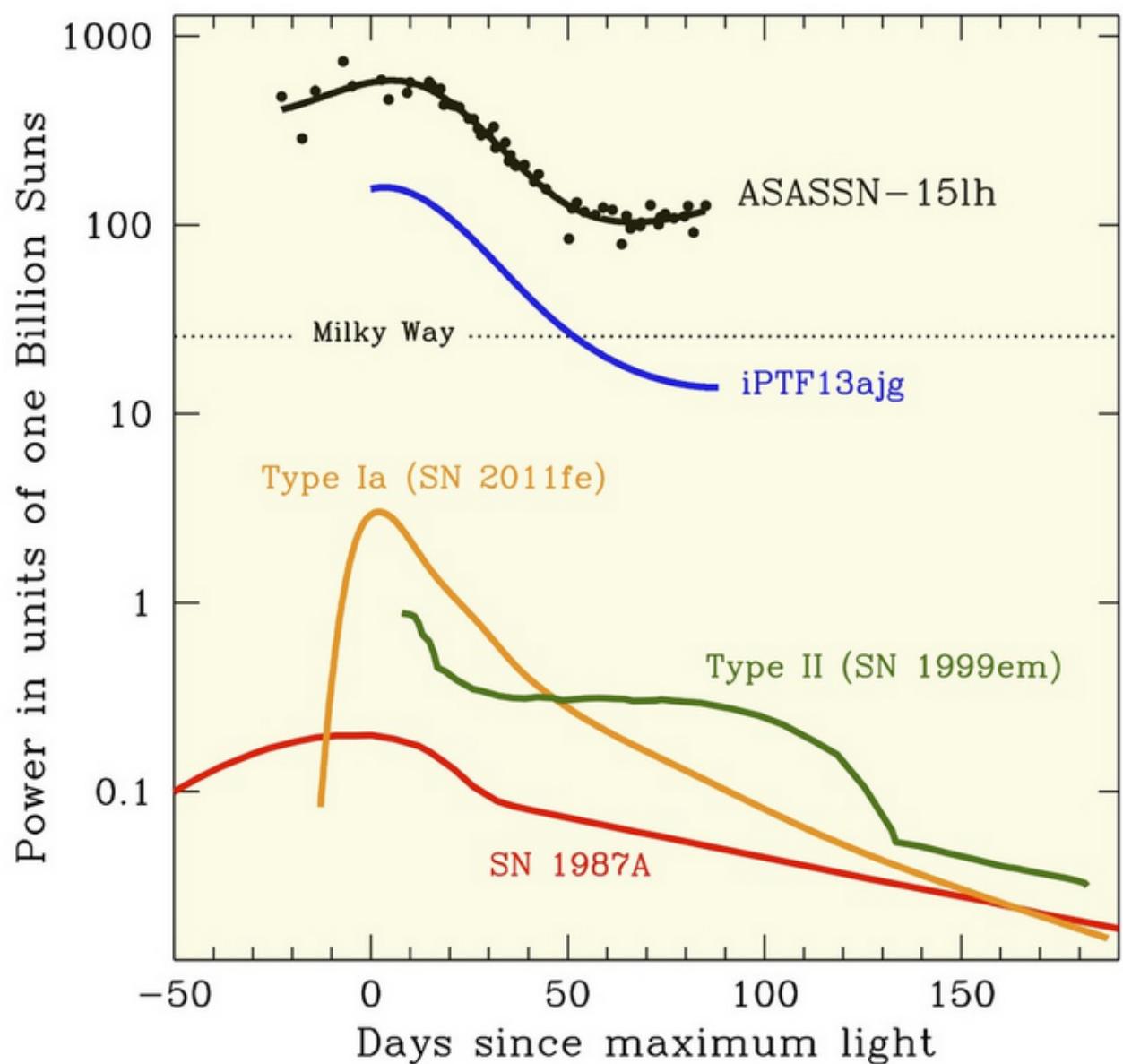
When using this list, cite [Shappee et al. \(2014\)](#).

ASAS-SN	Other	ATEL	RA	Dec	Discovery	V/g	SDSS	DSS	Vizier	Spectroscopic Class	Comments
ID	IDs	TNS		(UT)	(mag)	image	image	data			
---	AT2018gle (Gaia18cqs)	-----	4:25:3	-14:36:49.1	2018-10-5	17.33	SDSS	DSS	VIZIER	-----	known SN candidate, z=0.017500, discovered 2018/09/15.271, Type unknown
ASASSN-18wv	---	-----	18:31:47.24	-11:54:17	2018-10-4.14	16.14	SDSS	DSS	VIZIER	-----	CV candidate, no Vizier match, V>16.8 on 2018-09-24.23, V=15.9 on 2018-09-29.21, g=16.4 on 2018-10-03.14, g=16.4 on 2018-10-04.14.
ASASSN-18ww	---	-----	16:33:18.66	-66:38:38.5	2018-10-3.99	15.12	SDSS	DSS	VIZIER	-----	CV candidate, matches to GAIA DR2 G=19.3, g>18.1 on 2018-10-02.01, g=16.7 on 2018-10-03.00, g=15.5 on 2018-10-04.00.
---	AT2018gxq (ZTF18abzbkby)	-----	2:11:38.14	14:12:7.6	2018-10-4.42	16.66	SDSS	DSS	VIZIER	-----	known SN candidate, z unknown, discovered 2018/09/24.453, Type unknown
ASASSN-18ws	---	-----	16:43:11.23	-70:46:49.3	2018-10-3	17.05	SDSS	DSS	VIZIER	-----	CV candidate, no Vizier match, g>17.7 on 2018-09-29.02, g=16.6 on 2018-10-01.81, g=16.9 on 2018-10-02.01, g=17.4 on 2018-10-03.00.
ASASSN-18wr	AT 2018hbh	TNS	22:20:35.86	-30:11:54.7	2018-10-3.09	17.54	SDSS	DSS	VIZIER	-----	SN candidate, posted to TNS
ASASSN-18wq	SN 2018hay	TNS	9:23:17.75	42:22:47.4	2018-10-2.62	16.55	SDSS	DSS	VIZIER	-----	SN candidate, posted to TNS
ASASSN-18wt	---	-----	21:59:56.57	82:25:4.8	2018-10-2.25	16.5	SDSS	DSS	VIZIER	-----	CV candidate, matches to PS1 g=20.8, g>17.4 on 2018-09-29.31, g=17.0 on 2018-09-30.35, V=16.8 on 2018-10-01.34, g=16.8 on 2018-10-02.26.
ASASSN-18wu	---	-----	20:4:22.98	-38:1:15.2	2018-10-2.17	17.53	SDSS	DSS	VIZIER	-----	CV candidate, no Vizier match, g>16.1 on 2018-09-26.01, g=17.4 on 2018-09-26.73, g=17.4 on 2018-09-28.99, g=17.8 on 2018-10-02.18, g=17.9 on 2018-10-03.18.
ASASSN-18wh	---	-----	0:12:55.66	-52:8:17.1	2018-09-30.85	11.84	SDSS	DSS	VIZIER	-----	large flare, matches to g=13.7 GAIA DR2 source, g>17.7 on 2018-09-30.08, g=12.1 on 2018-09-30.86.
ASASSN-18wi	---	-----	18:34:36.13	31:32:0.8	2018-10-1.18	16.96	SDSS	DSS	VIZIER	-----	CV candidate, no Vizier match, g>17.2 on 2018-09-25.16, g=16.8 on 2018-09-30.18, g=17.2 on 2018-10-01.19.
ASASSN-18wj	---	-----	19:51:38.9	18:4:19.5	2018-10-1.24	16.61	SDSS	DSS	VIZIER	-----	CV candidate, matches to PS1 g=20.4, g>17.1 on 2018-09-25.23, V=17.0 on 2018-09-29.30, V=16.5 on 2018-09-30.25, V=16.5 on 2018-10-01.25.
ASASSN-18wk	---	-----	17:34:58.59	-75:36:49.5	2018-09-30.76	14.18	SDSS	DSS	VIZIER	-----	CV candidate, no Vizier match, V>18.7 on 2018-09-24.05, g=14.5 on 2018-09-30.77, g=14.6 on 2018-09-30.84.
---	2018giu (ATLAS18vgb)	-----	20:27:49.13	9:54:55.2	2018-09-30.74	16.9	SDSS	DSS	VIZIER	-----	known SN candidate, z=0.026, discovered 2018/09/15.369, Type Ic-BL
ASASSN-18wp	---	-----	18:8:22.15	-65:11:29.4	2018-09-30.75	15.41	SDSS	DSS	VIZIER	-----	CV candidate, no Vizier match, V>16.6 on 2018-09-24.06, g=15.8 on 2018-09-30.75, g=15.9 on 2018-10-01.81.
ASASSN-18wg	AT 2018gys	TNS	23:17:53.47	-42:12:46.7	2018-09-30.79	17.58	SDSS	DSS	VIZIER	-----	SN candidate, posted to TNS
ASASSN-18wf	AT 2018gyr	TNS	0:49:47.24	-61:39:12.8	2018-09-30.02	16.8	SDSS	DSS	VIZIER	-----	SN candidate, posted to TNS
ASASSN-18wl	---	-----	20:54:18.38	19:34:44.2	2018-09-30.28	16.12	SDSS	DSS	VIZIER	-----	CV candidate, no Vizier match, V>17.0 on 2018-09-18.05, V=15.7 on 2018-09-22.40, g=16.1 on 2018-09-27.90, g=16.5 on 2018-09-30.28, V=16.4 on 2018-10-01.37.

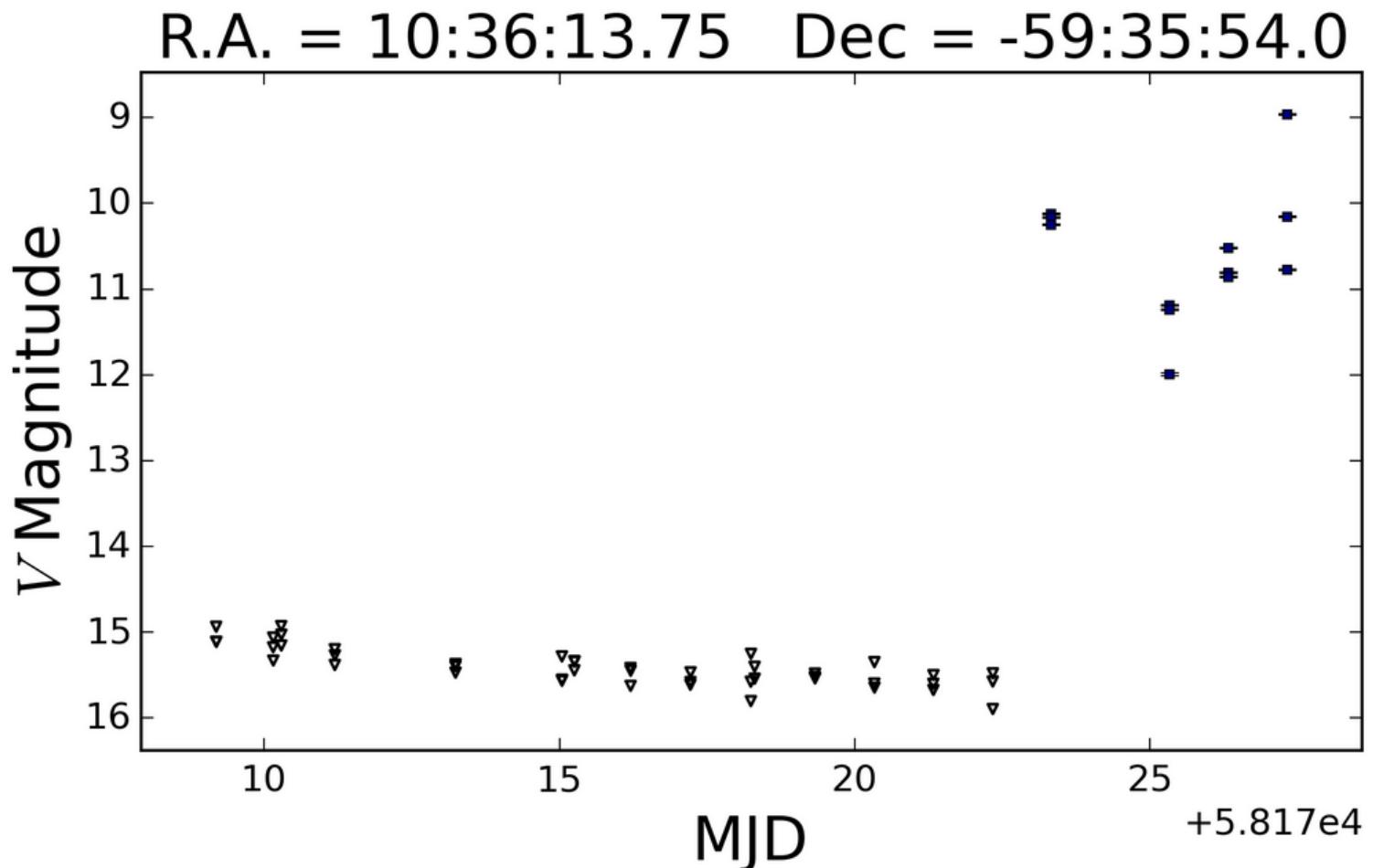
<http://www.astronomy.ohio-state.edu/~assassin/transients.html>

ASASSN-15lh

The most powerful SN

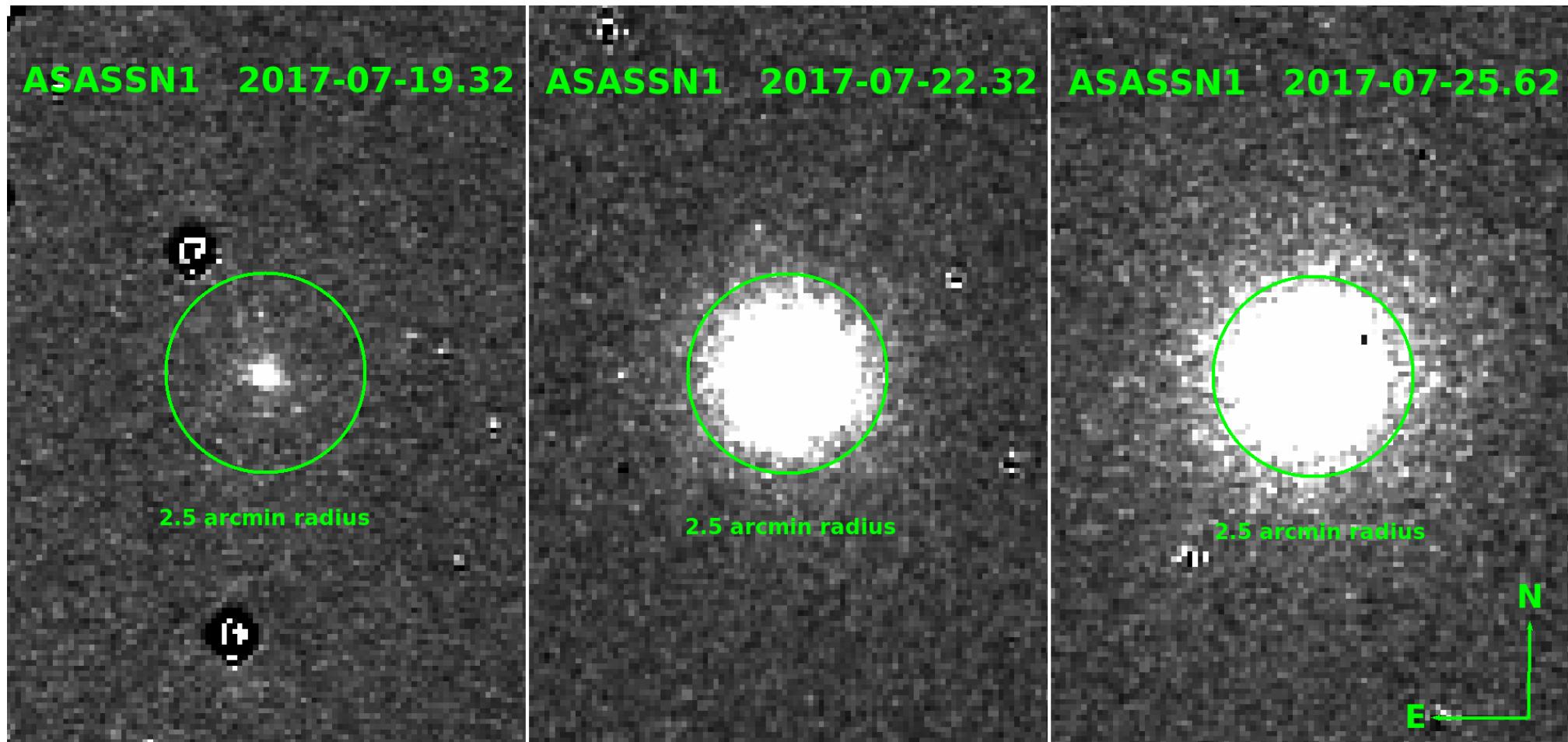


ASASSN-18fv

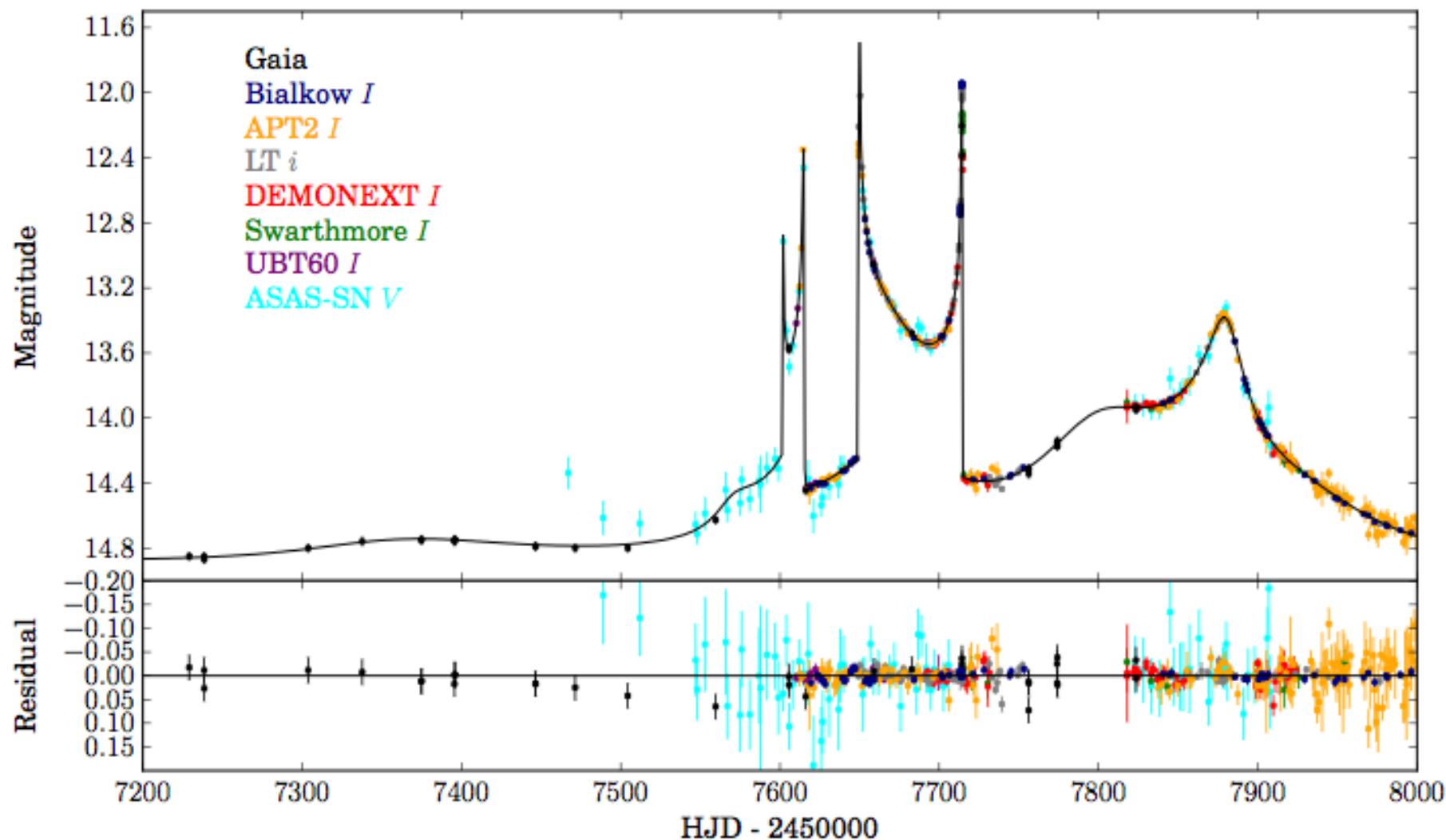


- very bright galactic nova?
- large outburst of a young stellar object?

ASASSN1 – the first ASAS-SN comet

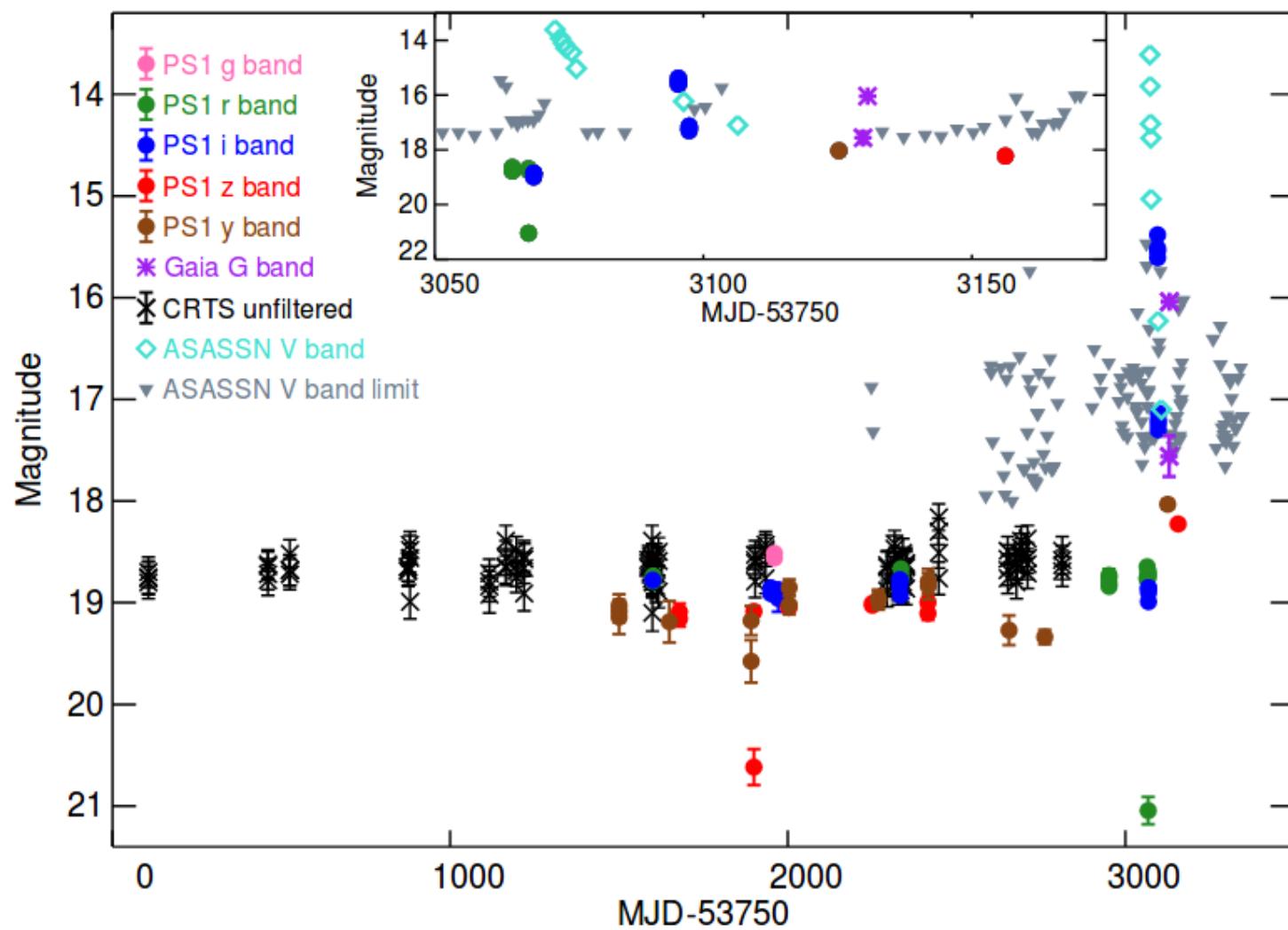


Gaia16aye



Wyrzykowski et al. (in prep.)

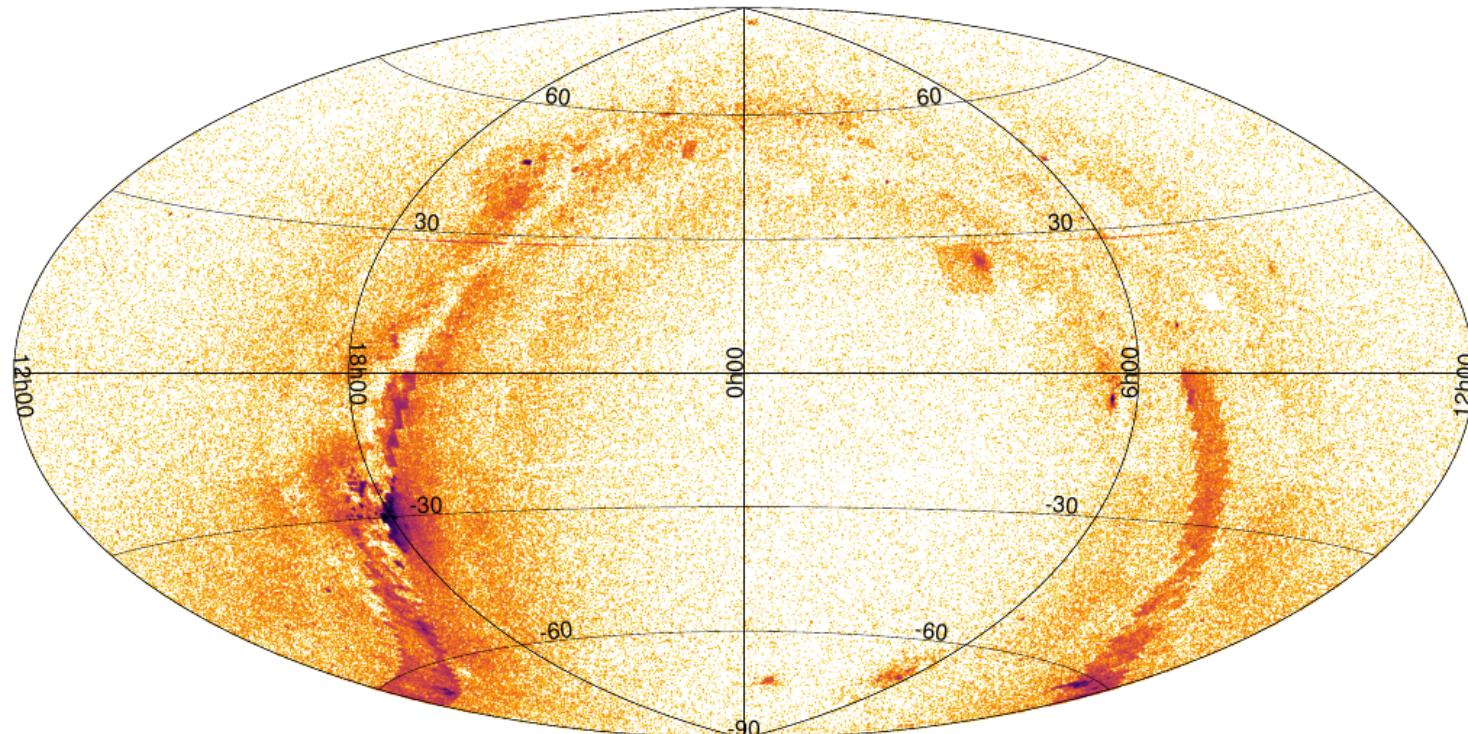
Gaia14aae / ASASSN-14cn



Campbell et al. (2015)

ASAS-SN – variable stars

- 57,000+ variable stars from serendipitous survey
- 400,000+ known variables uniformly classified with ASAS-SN photometry
- 1914 variables in the ASAS-SN/APOGEE sample



APOGEE

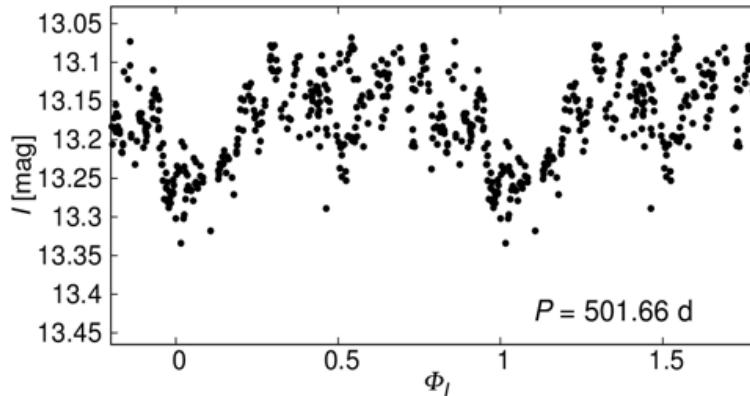
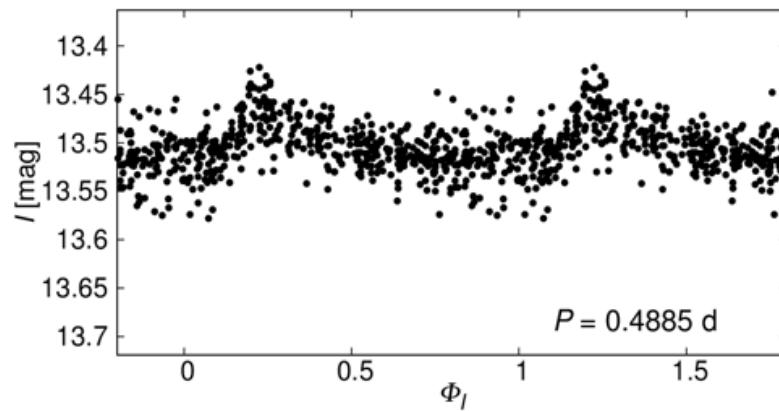
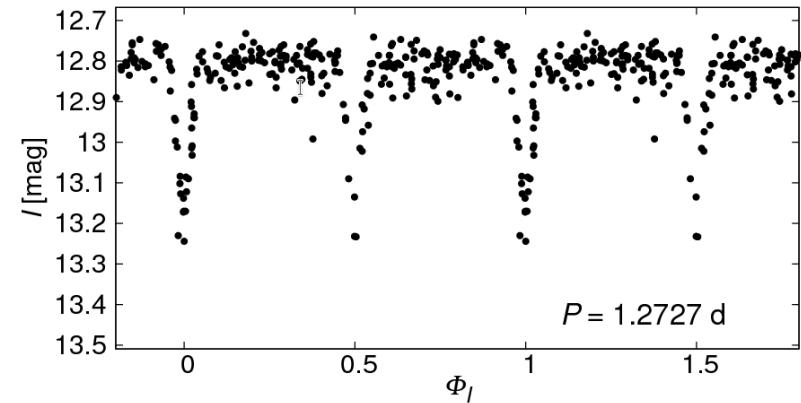
- Wavelength Range: 1.51-1.70 μm
- Spectral Resolution: $R \sim 22,500$
- Sample Size: $\sim 300,000$ stars
- Signal-to-Noise Goal: $S/N > 100$
- Radial Velocity Precision: ~ 200 m/s
- Provided parameters:
 $\log g$, $V\sin i$, T_{eff} , [Fe/H], [X/Fe]

Selection and classification

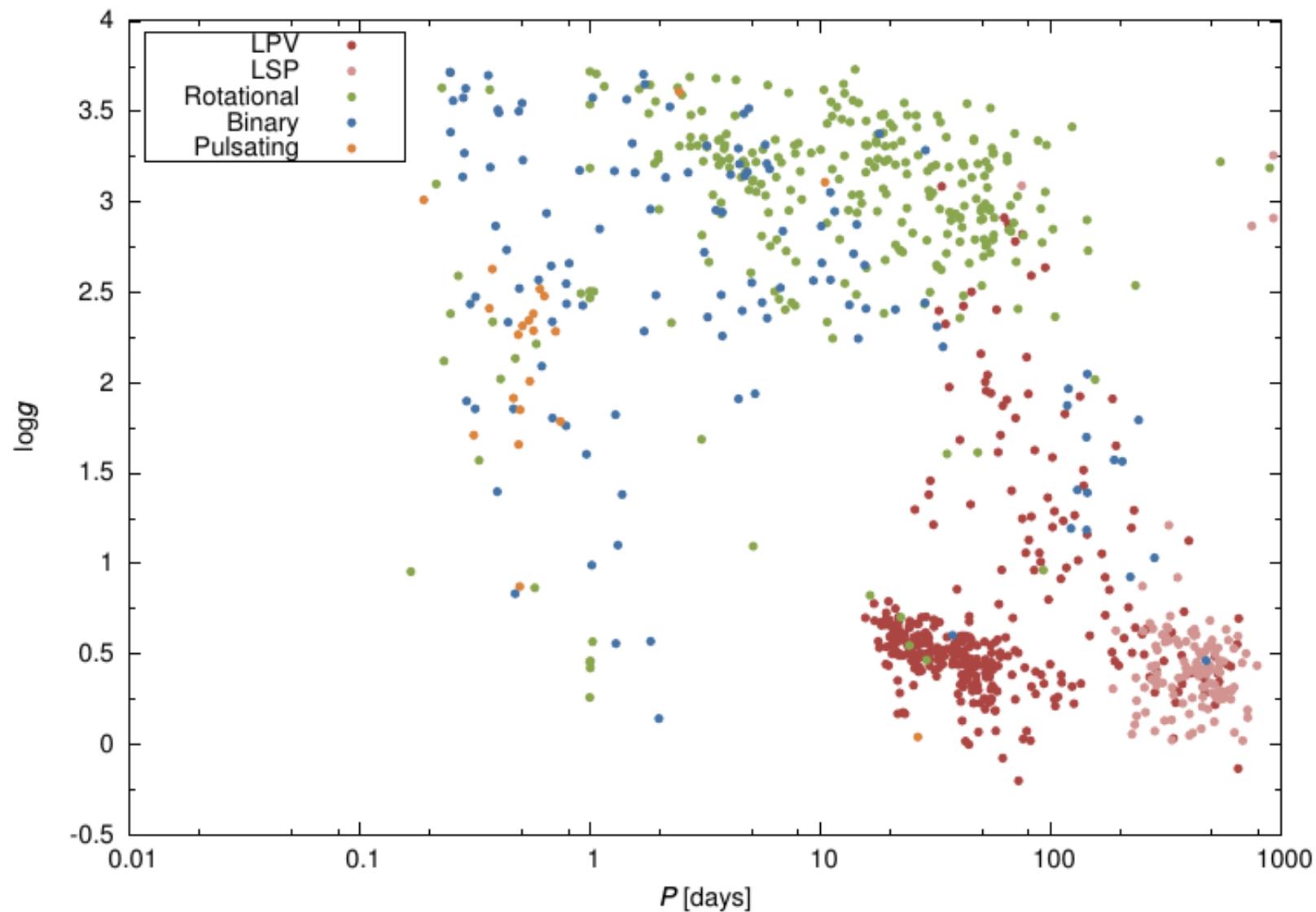
- ASAS-SN vs. APOGEE cross-match: ~300,000
- Period search: BLS and Lomb-Scargle
- ~10,000 candidates based on period S/N
- Visual inspection and machine learning
- Classification:
 - Classical Pulsators
 - Long Period Variables
 - Rotational Variables
 - Eclipsing and Ellipsoidal Binaries

The Catalog

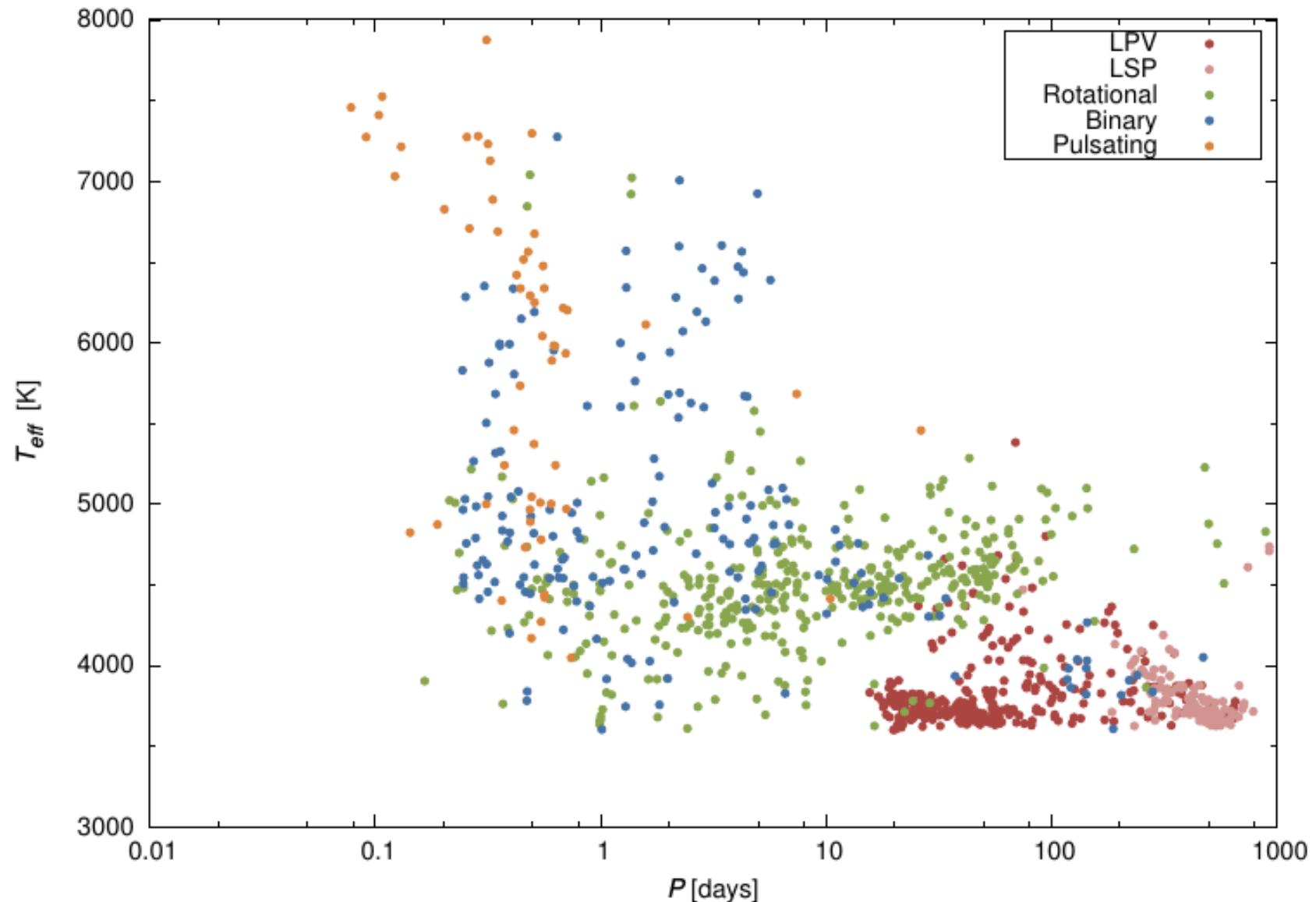
- The sample of variables:
 - 430 eclipsing binaries
 - 625 rotational variables
 - 140 pulsating stars
 - 720 long period variables
- For each object:
 - V-band light curve
 - $\log g$
 - $V\sin i$
 - T_{eff}
 - chemical abundances



ASAS-SN - APOGEE



ASAS-SN - APOGEE



ASAS-SN – Sky Patrol

Sky Patrol: <https://asas-sn.osu.edu>
- photometry for individual objects



All-Sky Automated Survey
for Supernovae
Sky Patrol



Making ASAS-SN light curves public is primarily funded by **MOORE FOUNDATION** grant GBMF5490.

Enter the Right Ascension and Declination:

* Enter J2000.0 Right Ascension:

e.g., 12:00:00.00, or 12 00 00.00, or 180.00000

* Enter J2000.0 Declination:

e.g., 03:00:00.0, or 03 00 00.0, or 45.00000

* Enter number of days to go back:

20

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Compute Lightcurve

Summary

- Transients from ASAS-SN
 - over 800 SN since 2014
- ASAS-SN catalog of variable stars
 - over 400,000 variables
 - 1915 variables from ASAS-SN/APOGEE
- ultimate goals
 - the whole sky monitored every day
 - complete all-sky variability catalog up to 17 mag
 - making ASAS-SN photometry publicly available