

All-Sky, All The Time



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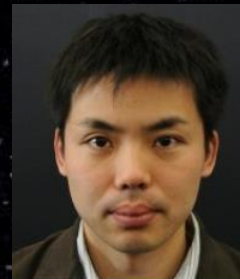


$$h = c = 2$$

Time-domain Astrophysics @CCAPP



Time-domain Astrophysics @CCAPP



The Sky is Big!

ASAS SN

A vibrant cosmic background featuring a mix of purple, pink, and blue nebulae with scattered stars.

You can observe a
lot just by watching.

Yogi Berra

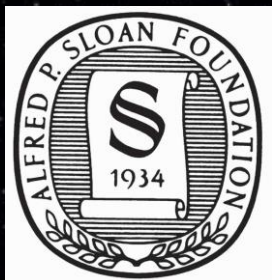
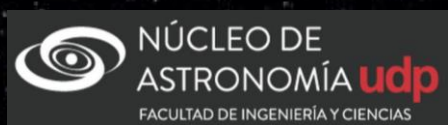
ASAS-SN Approach/Goal:

- Monitor the **entire sky every night in real-time**
- g-band limiting magnitude ~ 18 (~ 100 million objects)
- Use commercially available telephoto lenses and CCDs
- Find supernovae/other transients in a **minimally biased** search
- Announce discoveries **publicly** as soon as possible
- Release more and more data/data products to **everybody**

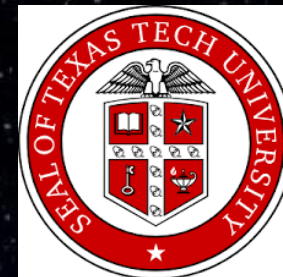


ASAS SN

We are a global project!



- C. Kochanek, K. Z. Stanek, T. Thompson, E. Jannerjahn, M. Tucker, J. Callahan, C. Lenhart, J. Beacom (OSU)
- B. Shappee, D. Desai, W. Hoogendam, K. Hart (Hawaii)
- J. Prieto (Diego Portales; MAS)
- L. Chomiuk, J. Strader (Michigan State)
- S. Dong (KIAA-PKU)
- X. Dai (University of Oklahoma)
- O. Pejcha (Charles University)
- K. Auchetti (Melbourne)
- A. Franckowiak (Bochum)
- E. Aydi (Texas Tech)
- D. Rowan (UC Berkeley)
- J. Hinkle (Illinois)
- M. Stritzinger (Aarhus)

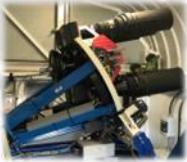


ASAS-SN Telescopes

- 5 mounts
- 4 telescopes per mount
- 14cm lens, 2k × 2k thinned CCDs
- 4.5 × 4.5 degrees field-of-view
- 7.8'' pixel scale
- g-band filters
- limiting magnitude $g \sim 18$ ($V \sim 17$)
- ~8,000 images per night
- ~55,000 square degrees per night
- ~15,000,000 science images



ASAS SN



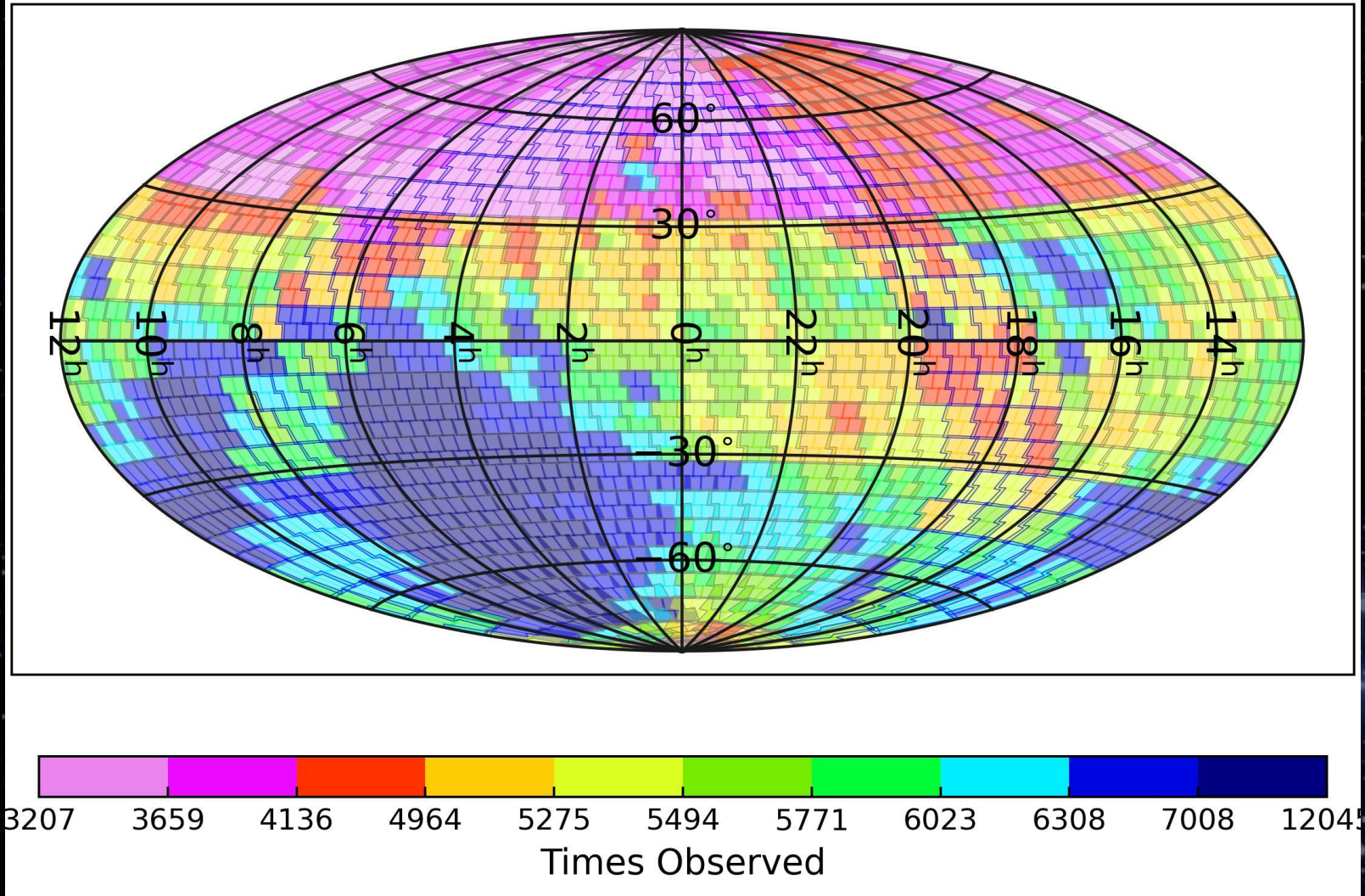
ASAS SN Data



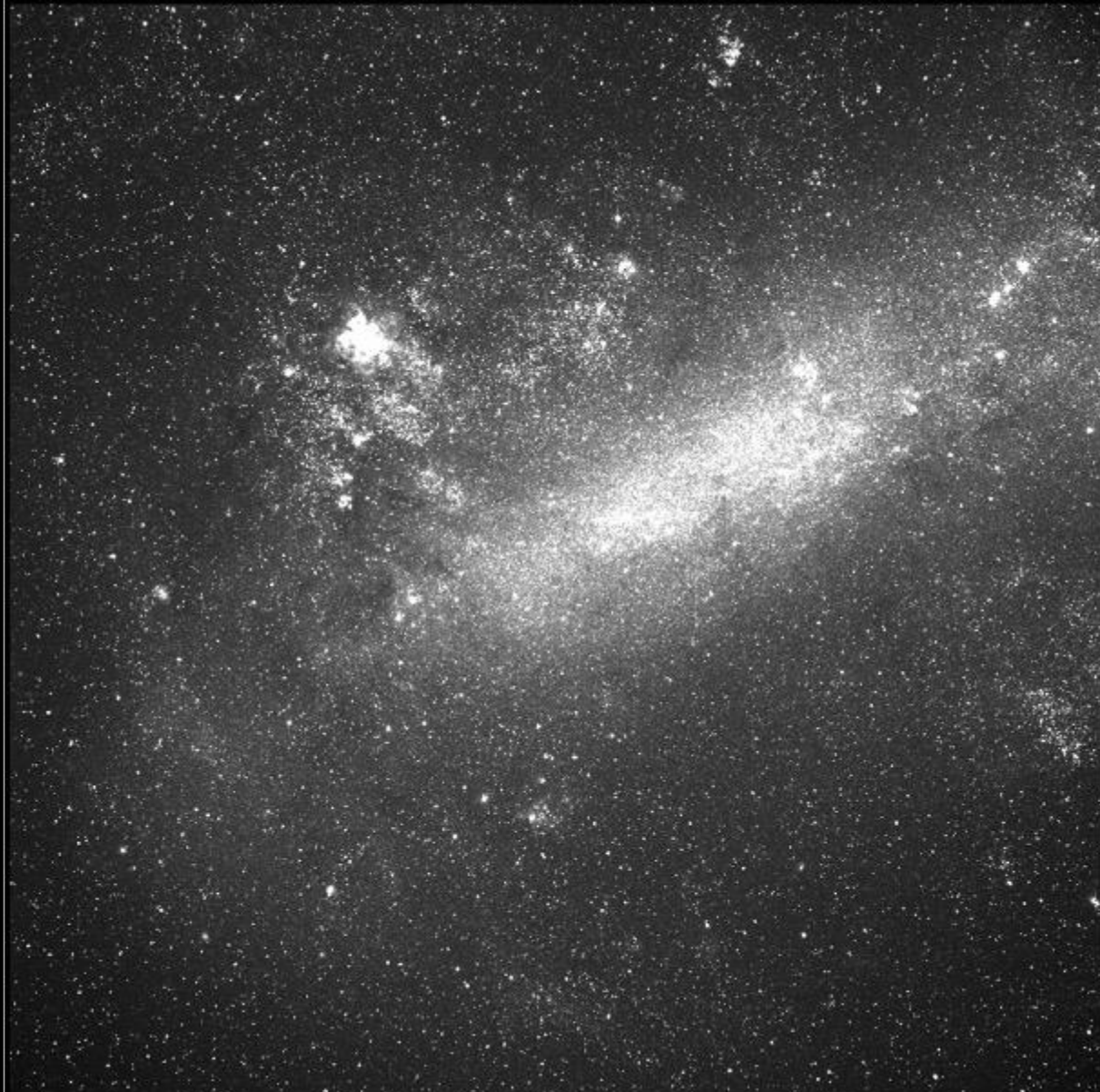
$\approx 4.5^\circ$

ASAS SN Cadence and Coverage

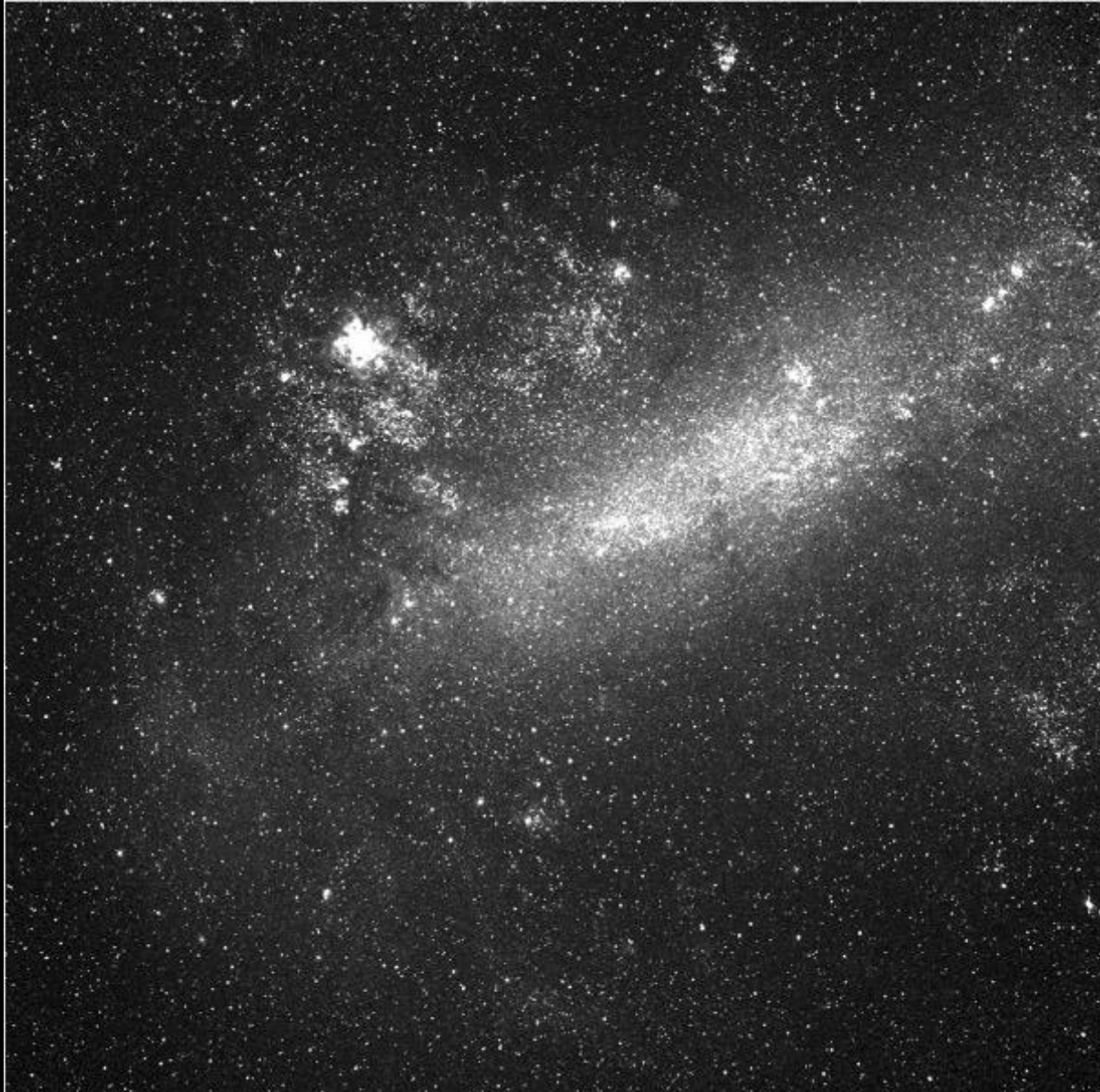
Mon Jun 8 02:21:59 2026



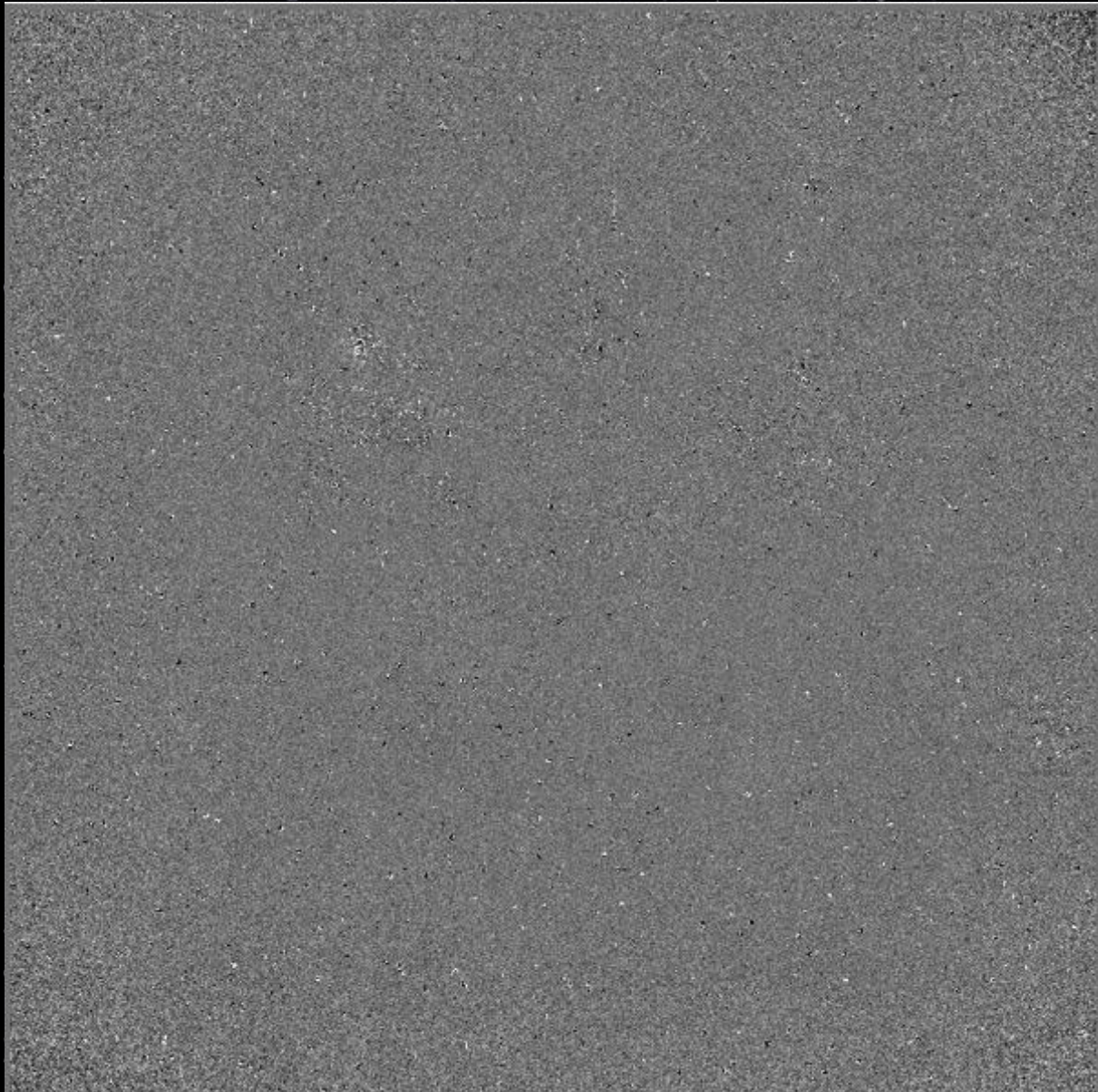
Reference Image



New Image



Subtracted Image



Transient Detection Pipeline

- Detections dominated by false positives (~few million per night)
- Many cuts made, including machine learning classifiers
- 100-200 candidates scanned by eye per night
- Follow up initiated, new transients announced typically in **hours**



Follow-up Facilities

- LBT 2 x 8.4 meter
- MDM 2.4 meter
- Swift and TESS satellites
- LCOGT 1 meters
- Magellan 2 x 6.5 meter
- Keck 2 x 10 meter
- Du Pont 2.5 meter
- LT 2 meter
- many others (SALT, UH 2.2m, FLWO 1.5m, NOT 2.5m, Faulkes, HST, Chandra, VLA ...)
- collaborations with AAVSO and others



ASAS-SN Discoveries

- ~150 scientific papers by ASAS-SN team, and counting
- ~1,400 SNe discovered, ~2,800 “recovered”
- 10+ TDEs discovered, ~15 recovered
- 350,000+ new variable stars
- >3,000 cataclysmic variable stars
- ~500 large amplitude M/L-dwarf flares
- 100s of AGN/blazar outbursts
- ~25 Classical Novae (Milky Way, LMC, SMC)
- ~10 changing-look AGN; Ambiguous Nuclear Transients?
- 2 comets
- 1 “killer asteroid” ☺

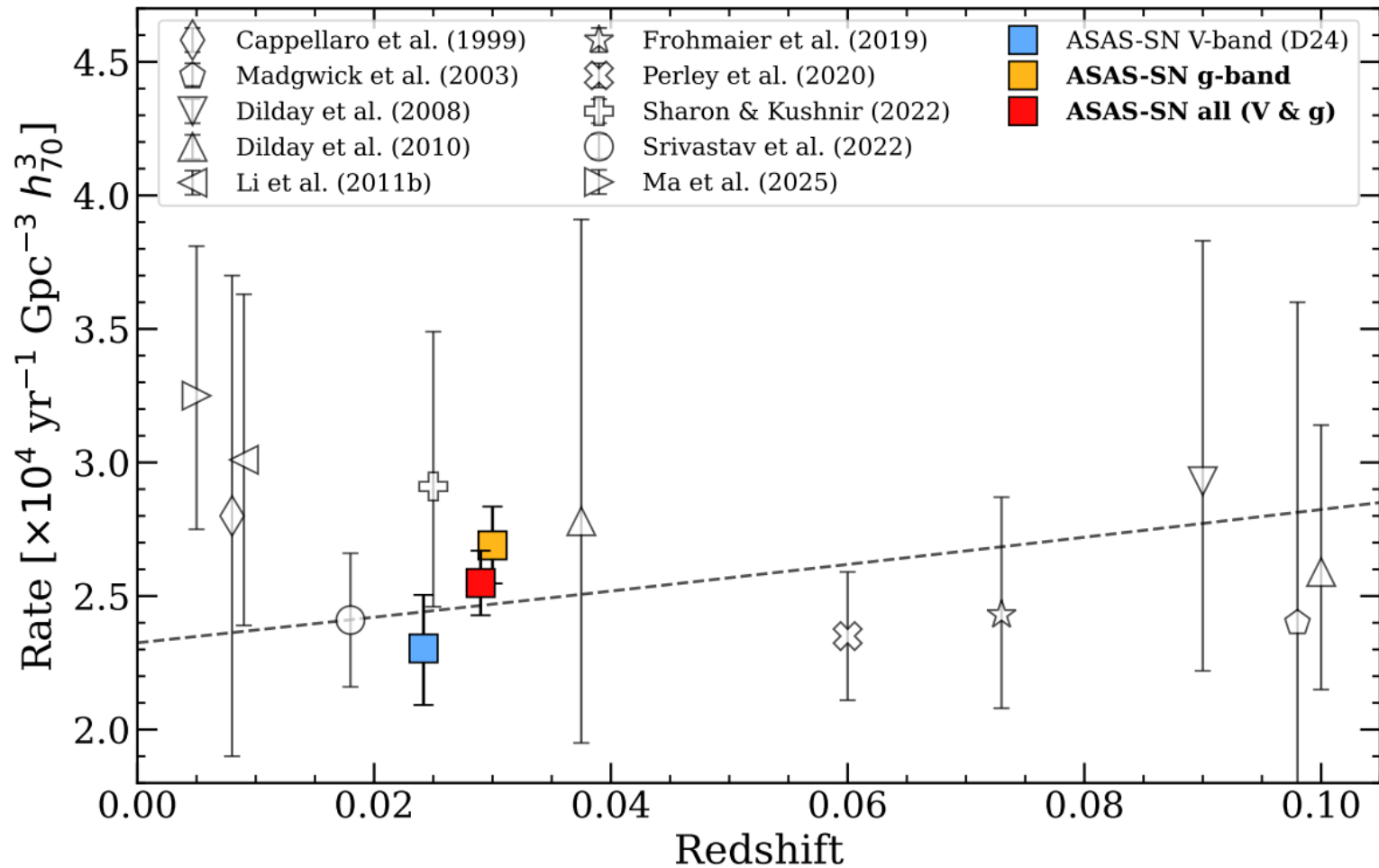
ASAS-SN Mentoring

- Out of the last **20** ASAS-SN papers, **18** led by graduate students or postdocs
- Out of the **Top 10** most cited ASAS-SN papers, **8** led by graduate students or postdocs
- Dom Rowan (OSU): Presidential Fellow (2024), Hubble (2025)
- Jason Hinkle (Hawaii): NASA FINESST (2023), Hubble (2025)
- Tharindu Jayasinghe (OSU): Presidential Fellow (2020), Hubble (2022)
- Elias Aydi (MSU): Hubble Fellowship (2022)
- Michael Tucker (Hawaii): DOE Fellowship (2018), CCAPP (2022)
- Tom Holoien (OSU, Carnegie): Hubble Fellowship (2020)
- Anna Payne (Hawaii): NASA Fellowship (2019)
- Patrick Vallely (OSU): NSF Fellowship (2018)



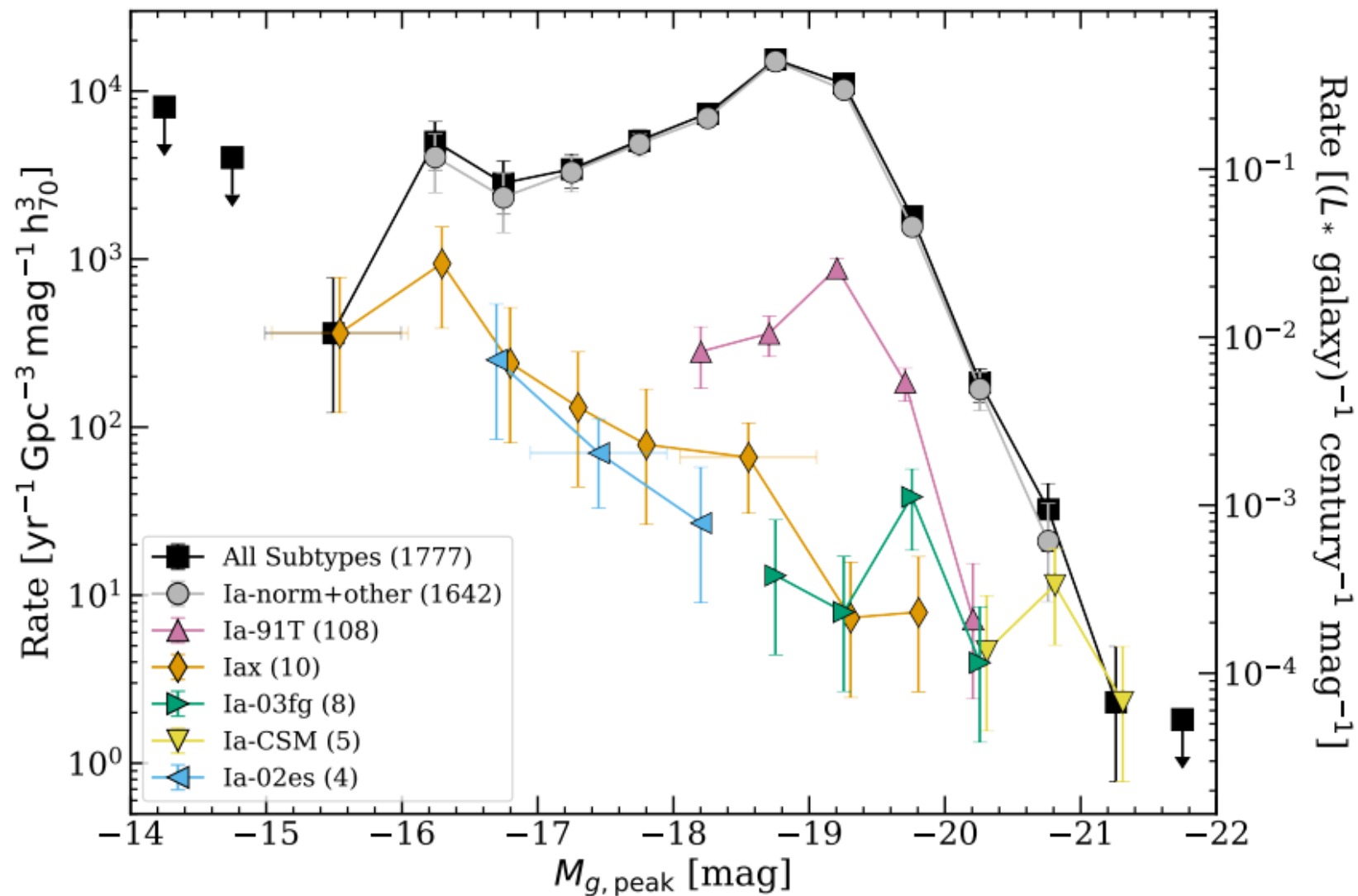
SN Rates

7



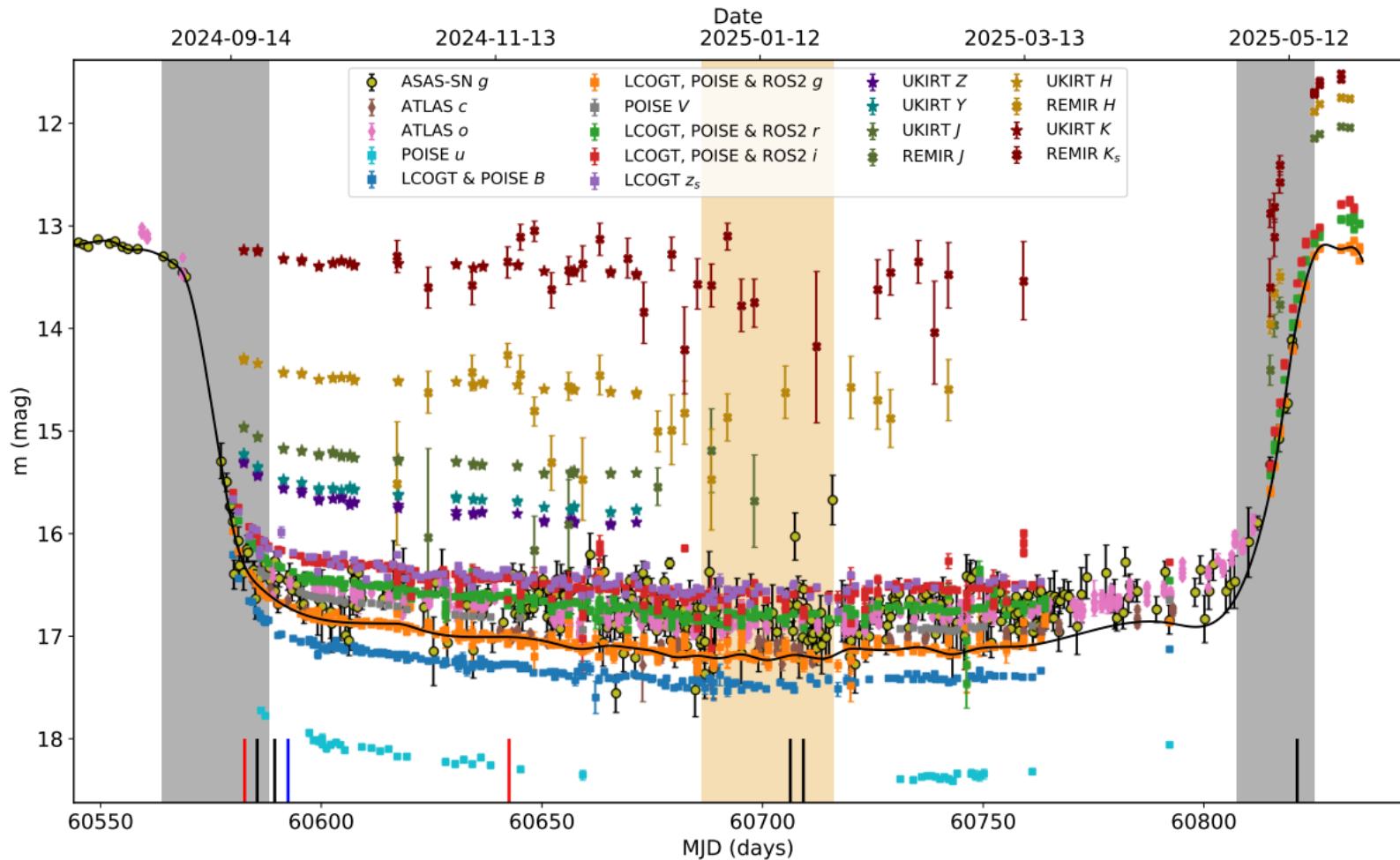
Desai et al. (2026)

SN Rates



Desai et al. (2026)

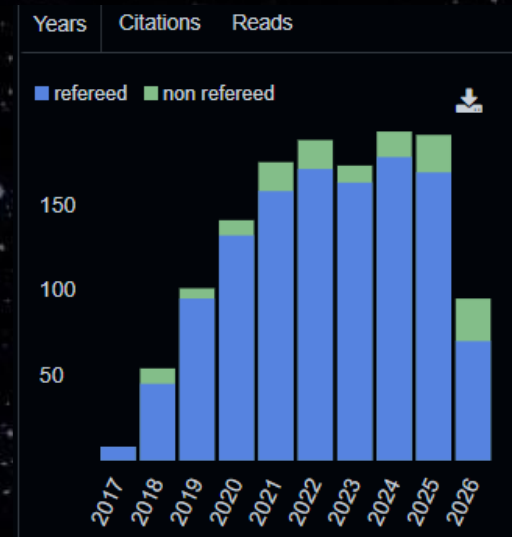
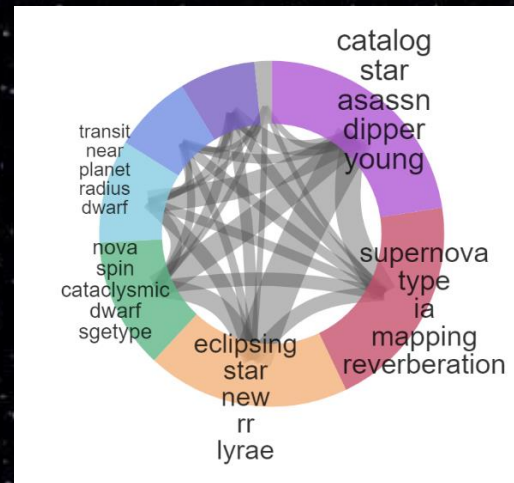
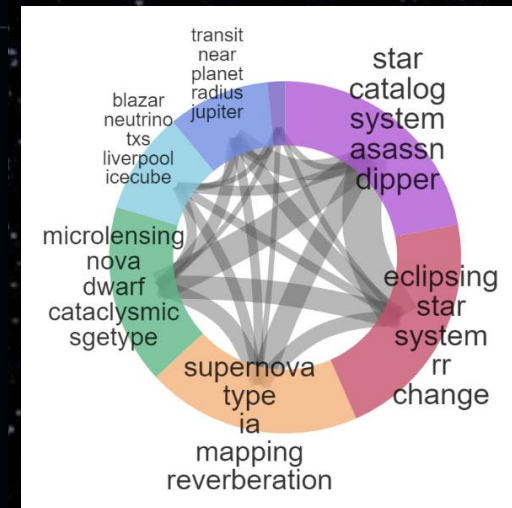
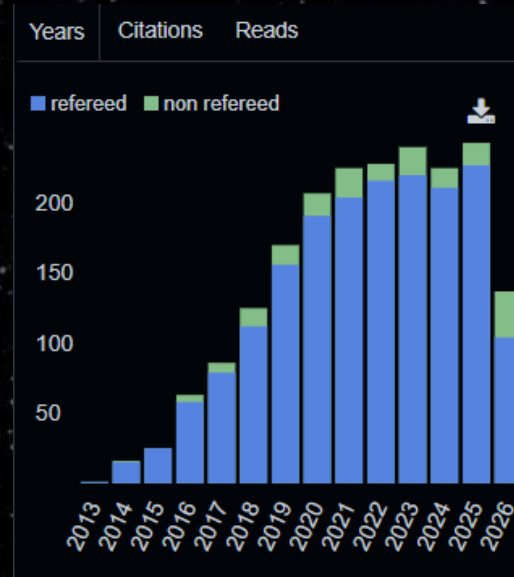
“Weird” Objects



Fores-Toribio et al. (2025)

ASAS SN Impact

- Shappee et al. (2014):
~1,990 citations (Top ~0.02%)
- Kochanek et al. (2017):
~1,320 citations (Top ~0.03%)



Planning the Future



ASAS-SN Needs You!

