The All-Sky Automated Survey for SuperNovae (ASASSN or “Assassin”) 

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ASAS-SN Approach:

• Monitor the entire sky every few nights in real-time
• V-band limiting magnitude $\approx 17$
• Use commercially available Telephoto lenses and CCDs
• Find supernovae in a minimally biased search
• Announce discoveries **publicly**
Is a Global Partnership

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ASAS-SN “Brutus” and “Cassius”

- 2 mounts
- 4 telescopes per mount
- 14cm lens, 2k × 2k thinned CCDs
- 4.47 × 4.47 degree field-of-view
- 7.8" pixel scale
- V-band filters
- limiting magnitude ≈ 17
- 2500 images per night
- 16,000 square degrees per night

Brutus Picture Courtesy of Mark Elphick
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Cassius Picture Courtesy of Jon De Vera
Subtracted Image
Follow-up Facilities

- LCOGT 1 meters
- Magellan 2 x 6.5 meter
- LBT 2 x 8.4 meter
- Du Pont 2.5 meter
- MDM 2.4 meter
- Liverpool Telescope 2 meter
- Swift satellite
- many others (SALT, UH 2.2m, FLWO 1.5m, NOT 2.5m, Faulkes, HST, Chandra, VLA ...
Nearby SNe

Bright (<17 mag) Confirmed SNe Discoveries
Jan. 1 - Dec. 31, 2016: 232 Total

- ASAS-SN: 135
- Amateurs: 37
- MASTER: 14
- Gaia: 14
- ATLAS: 13
- CRTS: 6
- LOSS: 4
- Pan-STARRS: 3
- PTSS: 3
- PTF: 2
- OGLE: 1
The first unbiased supernova sample

Holoiien et al. (incl. Shappee) 2017b
The first unbiased supernova sample

Host Galaxy $\log L/L_*$

Offset (arcsec)

ASAS-SN
Other Prof.
Amateurs

Holoiien et al. (incl. Shappee) 2017b
Tidal Disruption Events in ASASSN

- 3 of the brightest and (arguably) best-studied
- ASAS-SN is more complete than previous surveys
- Rates closer to theoretical rates

Holoien et al. 2014a, b, 2016
Holoien et al. (incl. Shappee) 2014b
ASAS SN -14li

Holoien et al. (incl. Shappee) 2016
ASAS SN-15oi

Holoien et al. (incl. Shappee) 2016b
iPTF 16fnl

Brown et al. (incl. Shappee) 2017
Tidal Disruption Events in ASASSN

Brown et al. (incl. Shappee) 2017
Tidal Disruption Events in ASASSN

Brown et al. (incl. Shappee) 2016b

Holoien et al. (incl. Shappee) 2016b
ASAS-SN-14li with MUSE

Prieto et al. (incl. Shappee) 2016
ASAS-SN-14li with MUSE

[O III] 5007
[N II] 6583
i-band continuum

Prieto et al. (incl. Shappee) 2016
The future.
Want all sky all the time, fastest cadence possible, deeper slow transient (TDE) search, & weather redundancy.
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Want all sky all the time, fastest cadence possible, **deeper slow transient (TDE) search**, & weather redundancy.
ASAS-SN Cadence and Coverage

Tue Feb 14 14:25:24 2017

Days since observed
$2.7M – 2 new sites, public database, 5 years. Cadence, cadence, cadence, weather, weather, weather, weather.
ASAS-SN

“Bohdan Paczyński”

Paczyński Picture Courtesy of Mark Elphick
The most luminous supernova(?)

- Nuclear transient, massive host
- The most luminous SN ever discovered?  
  Dong, Shappee, Prieto et al. 2016
- Magnetar powered supernova? (most energy possible?)  
  Metzger et al. 2015
- TDE like no other?  
  Leloudas et al. 2016
- Extreme events challenge all models, unbiased survey  
  Dong, Shappee et al. 2016
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Godoy-Rivera et al. (incl. Shappee) 2017