



Mariusz Gromadzki

Warsaw University Astronomical Observatory

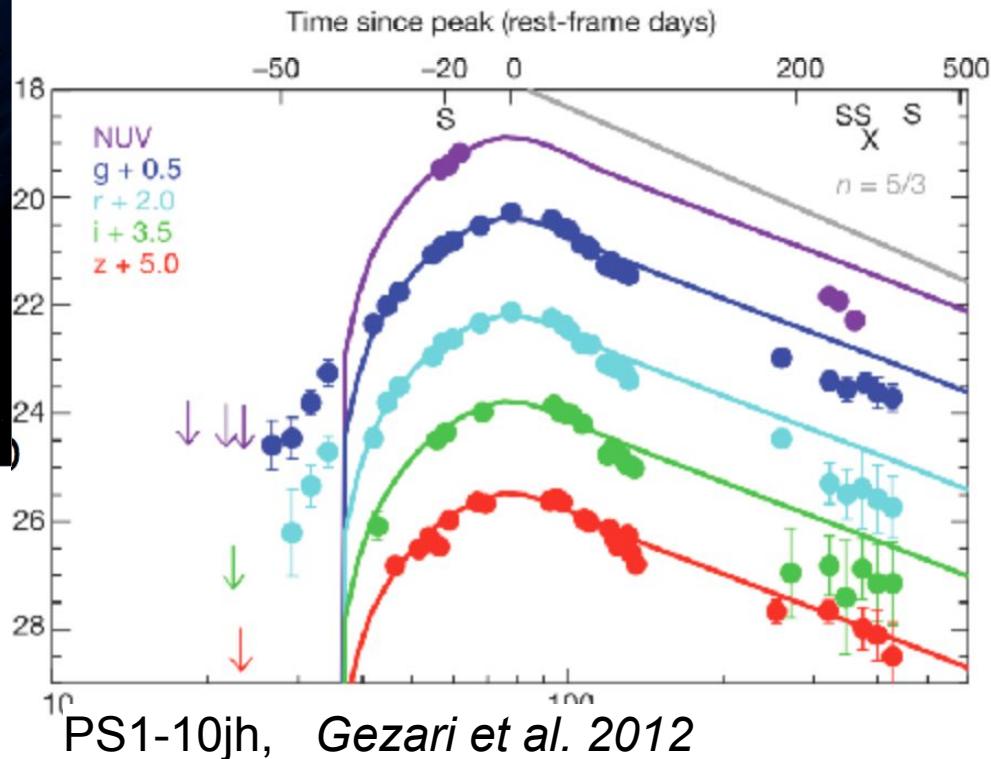
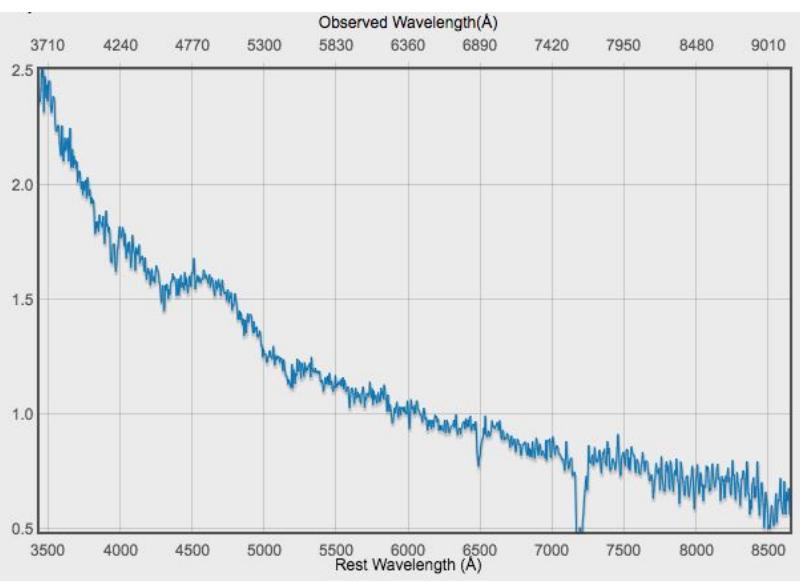


Ł. Wyrzykowski, N. Ihane, A. Hamanowicz, M. Fraser, P. Jonker, I. Arcavi, B. Trakhtenbrot,
S Mattila, A. Pastorelle, K. Sokolosky, G. Leloudas, OGLE and Gaia Alerts teams

Highlights from Warsaw hunt for TDEs



Tidal Disruption Event (TDE)

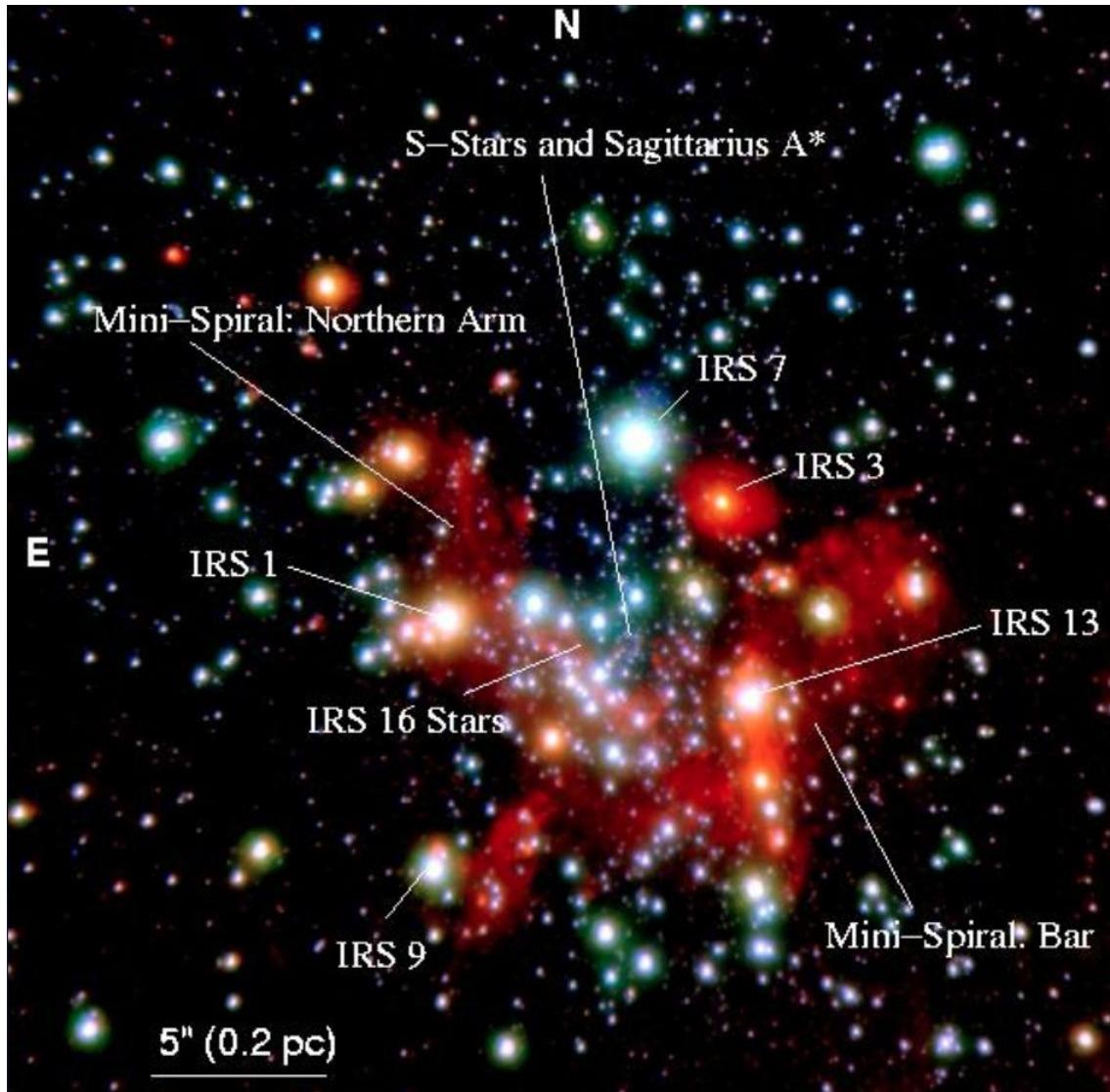


AT 2018fyk, ePESSTO

Nuclear transients

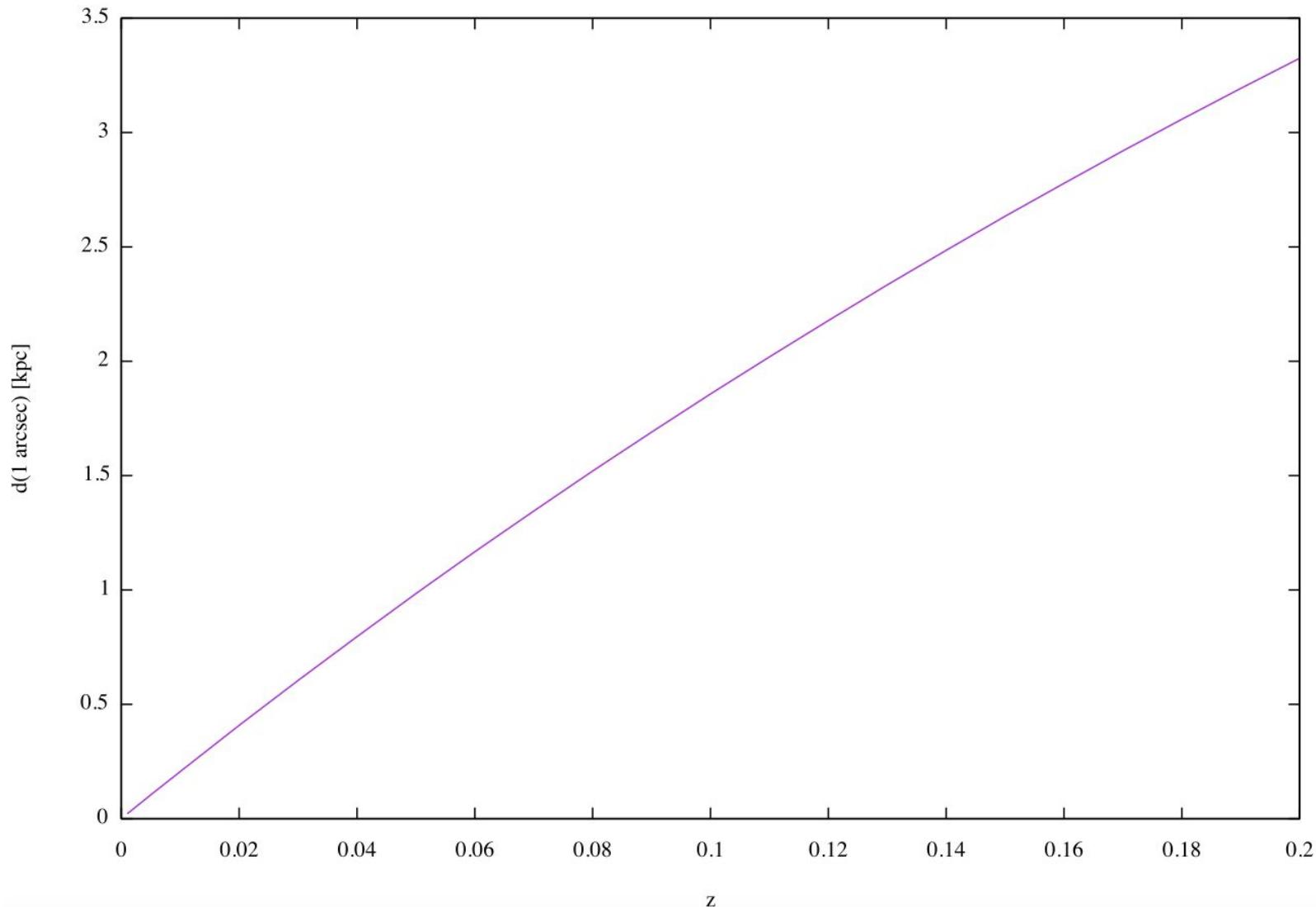


Nuclear transients vs Milky Way

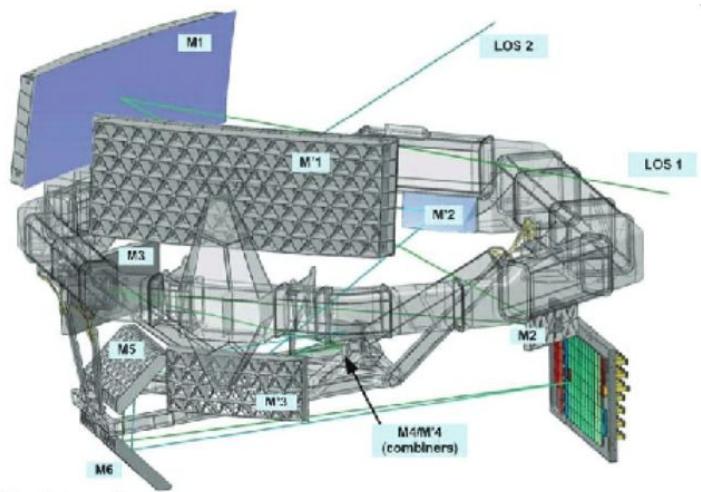
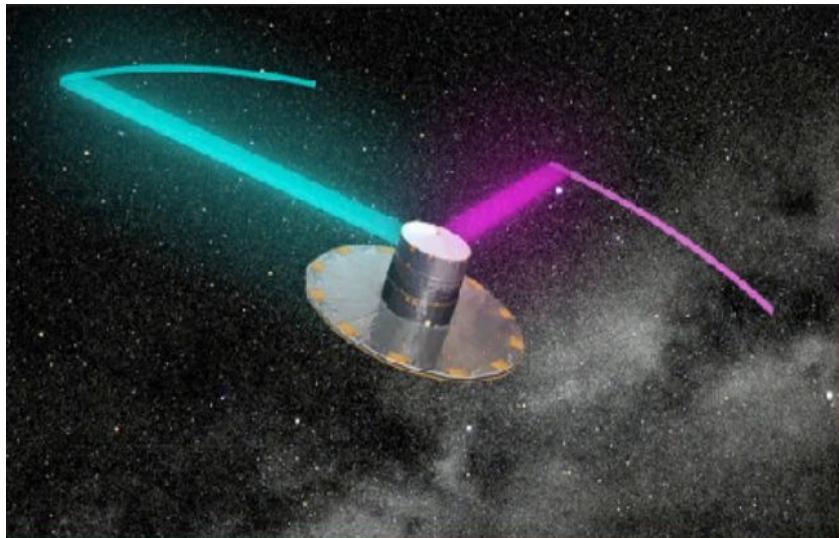


e.g. Gillessen et al. 2009, 2017

How "nuclear" are nuclear transients?



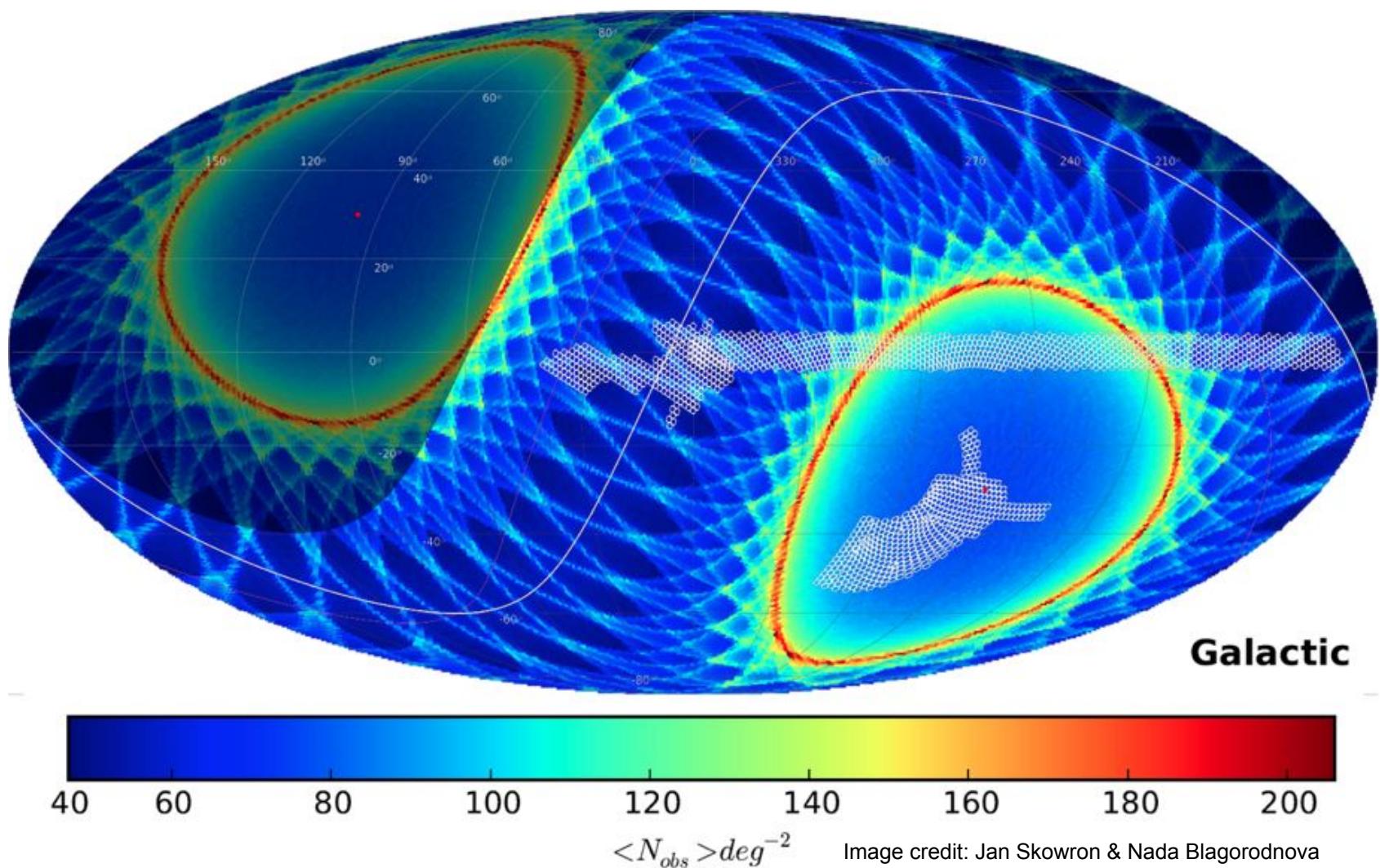
Gaia and OGLE



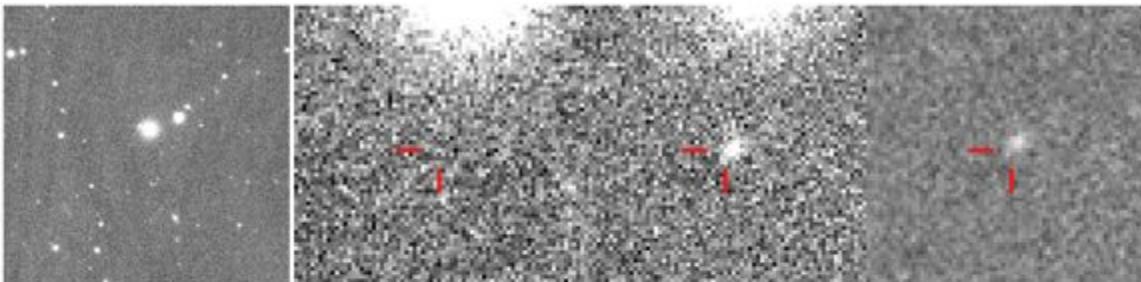
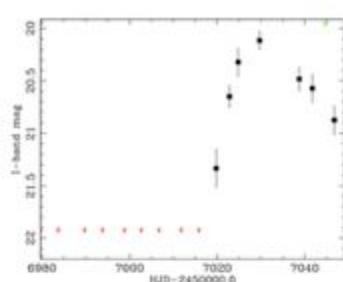
The Gaia payload



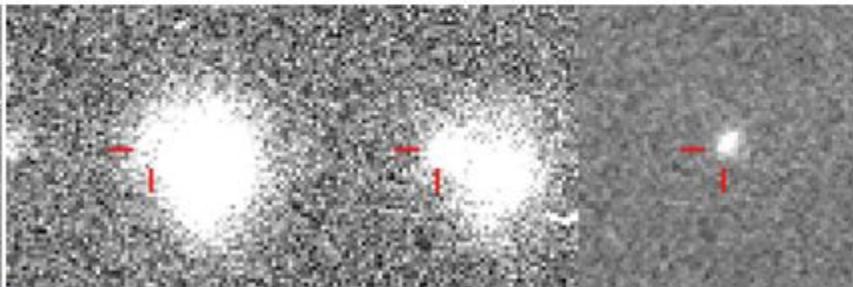
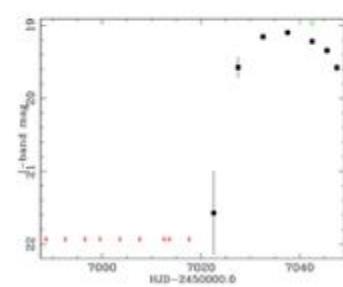
OGLE-Gaia sky



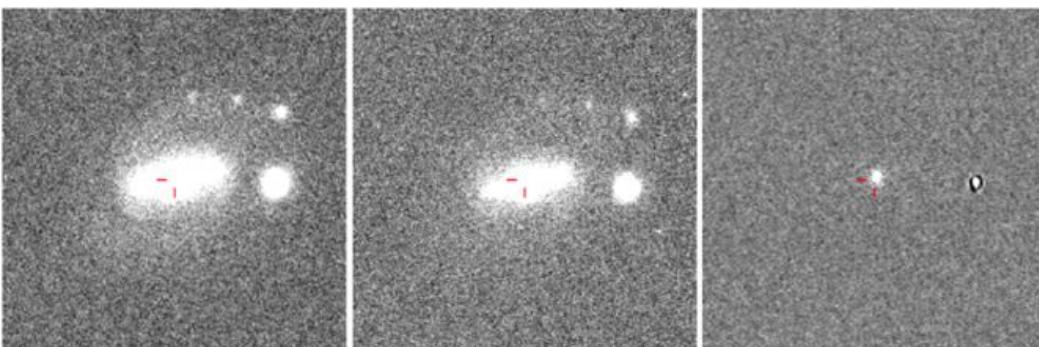
OGLE transients



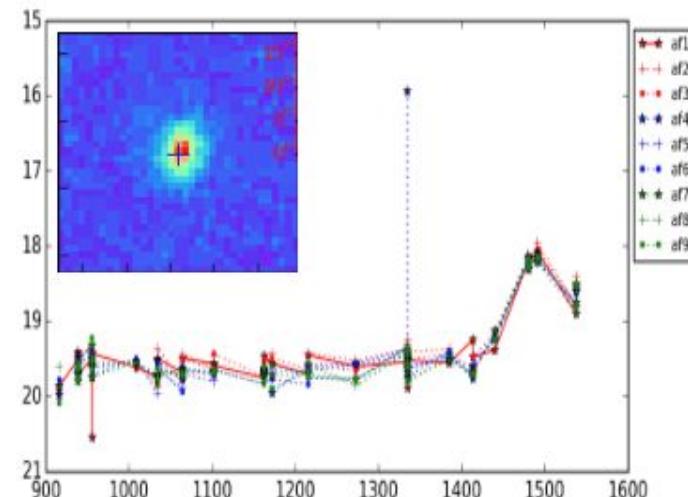
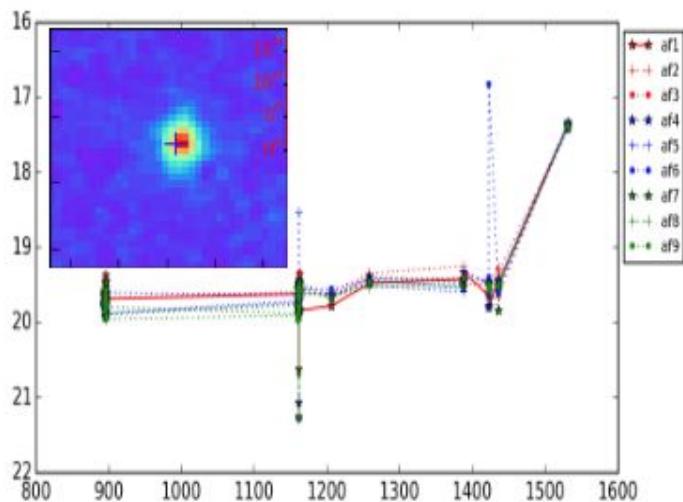
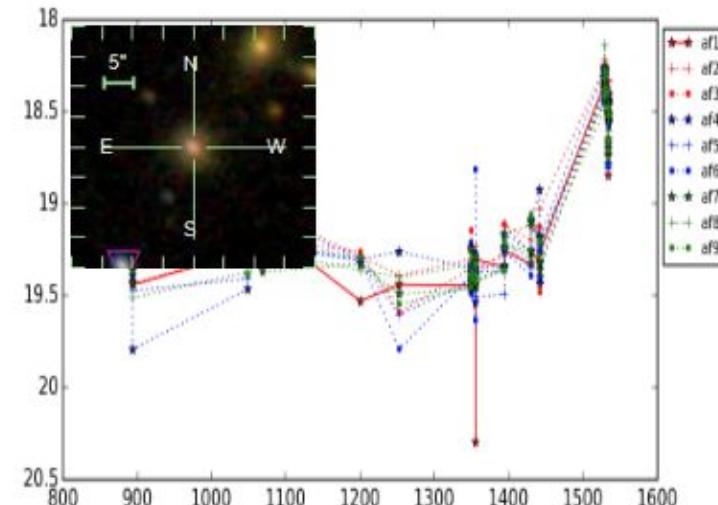
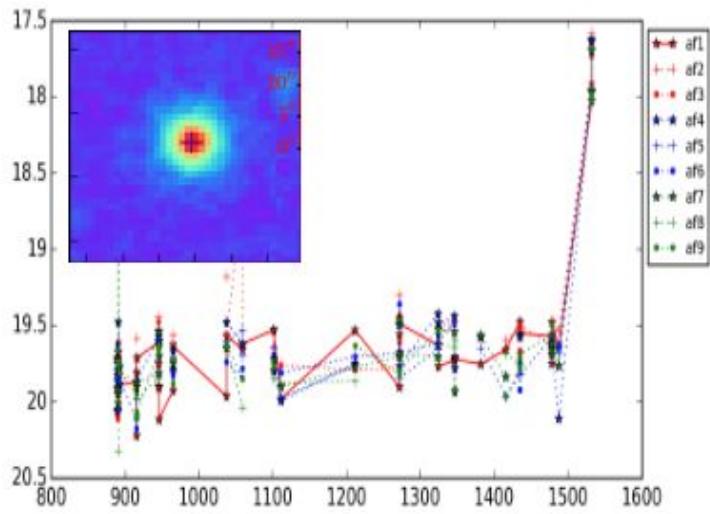
OGLE-2015-SN-022 Ra,Dec= [5:16:57.38 -58:21:57.9](#) HJD_max= 7029.70629 2015-01-07.206 LMC696.14.167N Disc_HJD= 2457038.74481 Disc_Img= 20.484 Offset= 41.36pix (10.75as) Phot.class= -



OGLE-2015-SN-021 Ra,Dec= [1:38:59.59 -69:03:46.1](#) HJD_max= 7037.54431 2015-01-15.044 SMC812.28.150N Disc_HJD= 2457037.54431 Disc_Img= 19.099 Offset= 13.56pix (3.53as) Phot.class= -

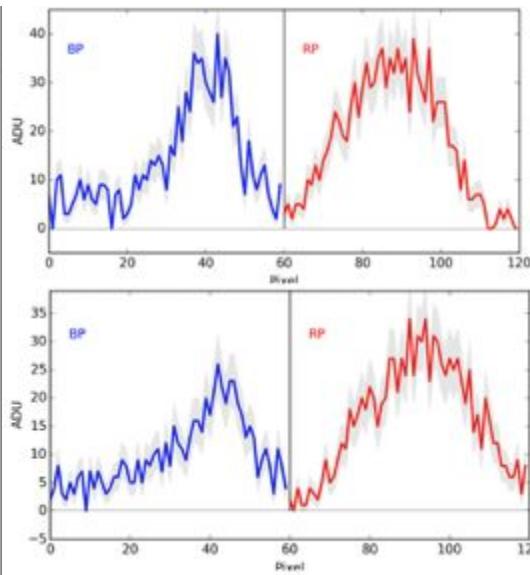
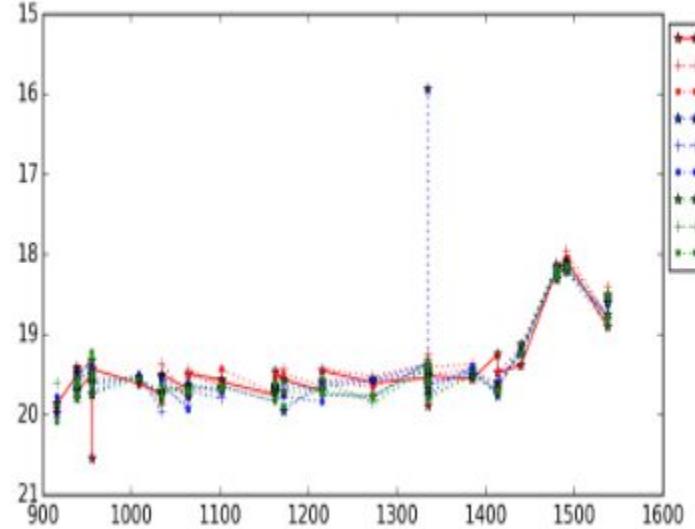


Nuclear transients in Gaia

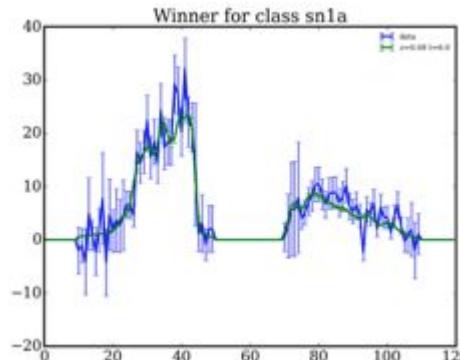
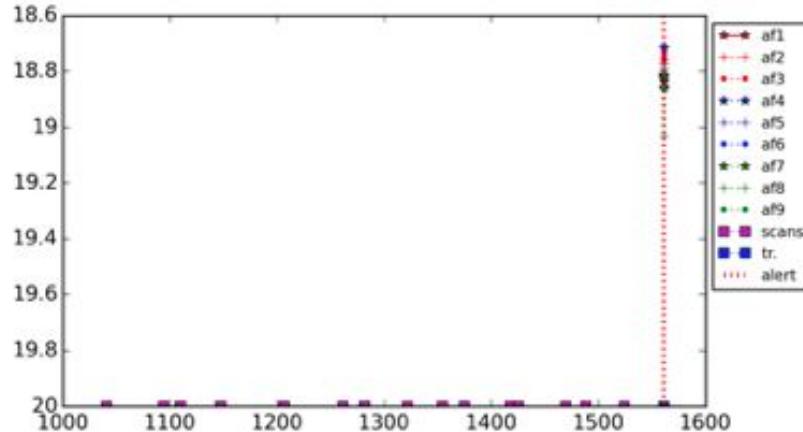


Gaia's advantage: superb astrometry

Nuclear transients in Gaia



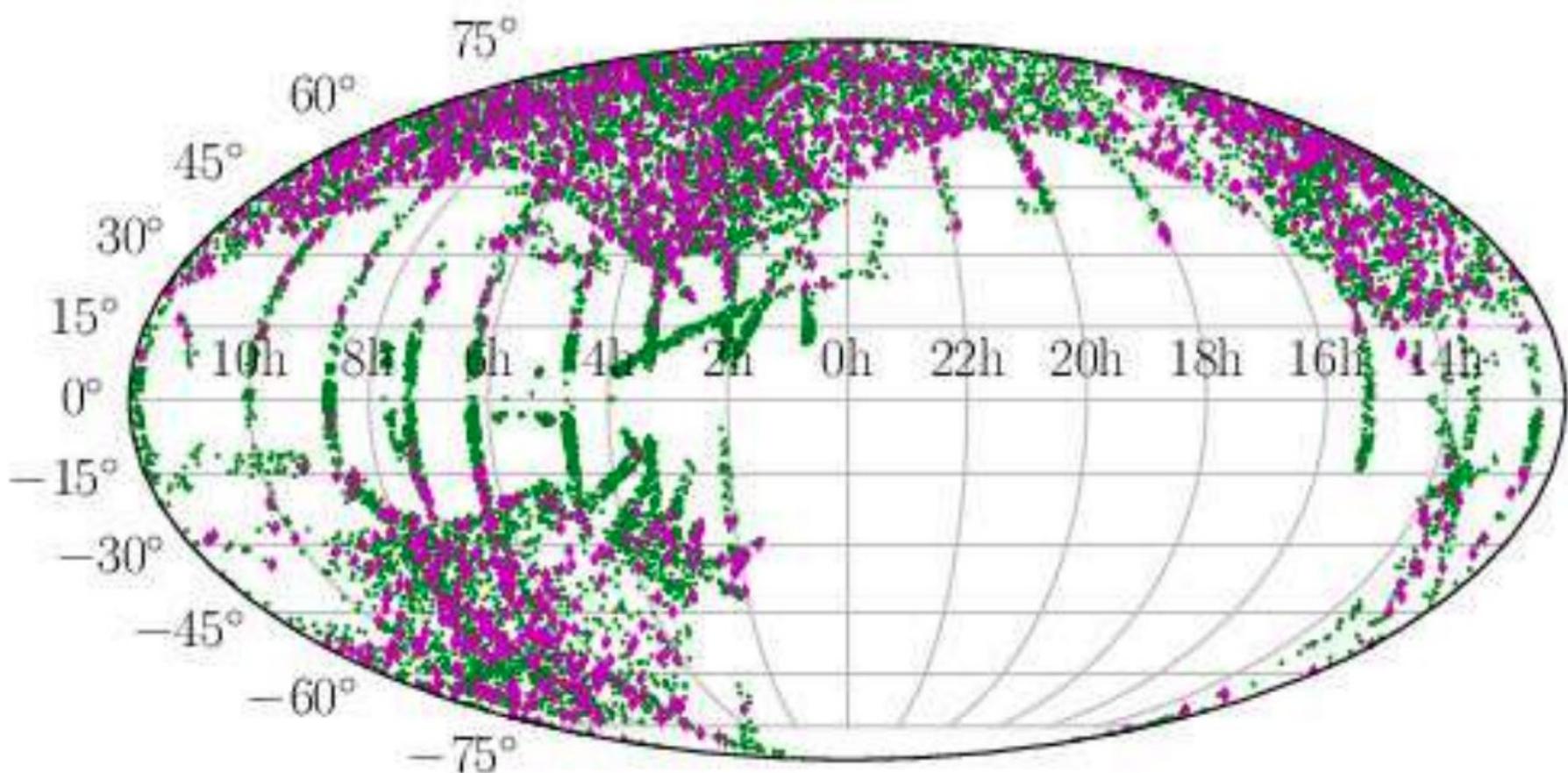
even raw BPRP spectra indicate the detected flare is blue



single BPRP spectra at <19mag can recognise SN Ia from other types

Blagorodnova et al. 2015, 2016

More about Gaia and OGLE Nuclear Transients in Simon and Nada's talks



Spectroscopic follow-up



NOT/ALFOSC
NUTS PI: S. Mattila



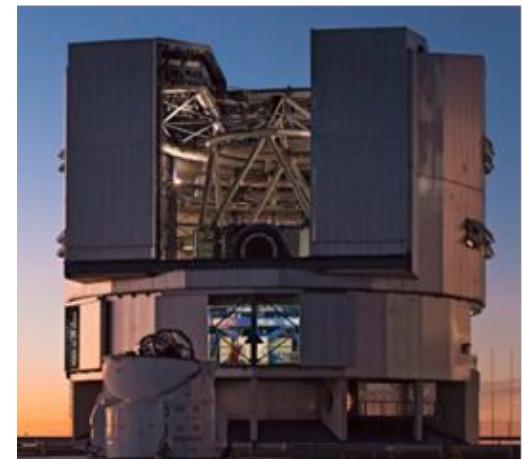
SALT/RSS
Transient Universe
PI: D. Buckley



NTT/EFOSC2
ePESSTO PI: S. Smartt

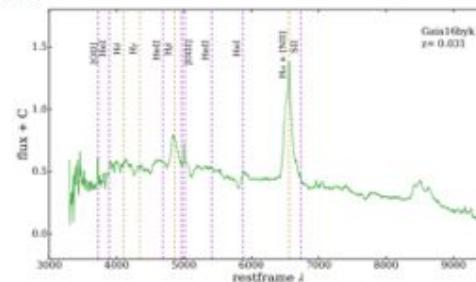
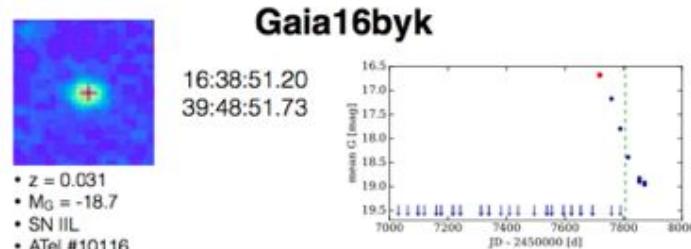
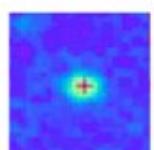
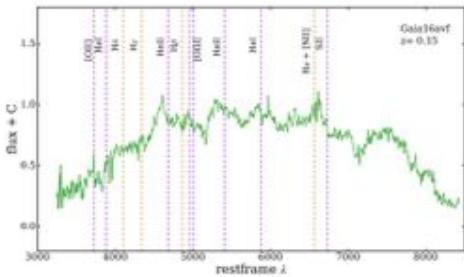
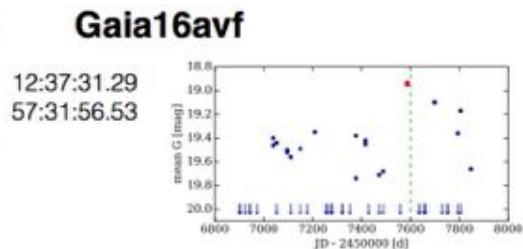
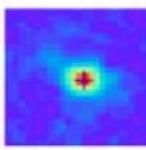
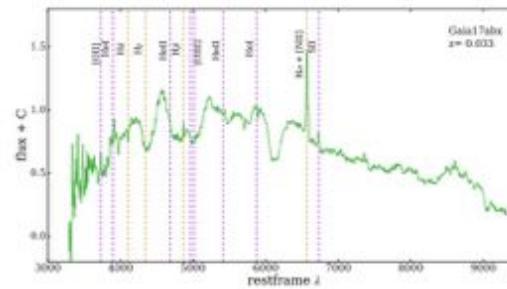
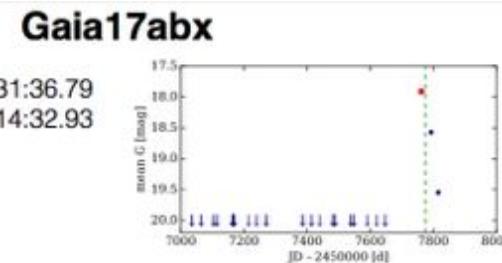
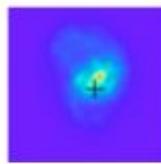
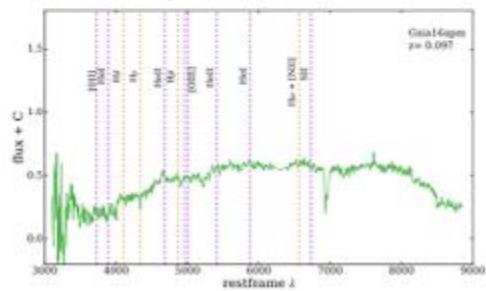
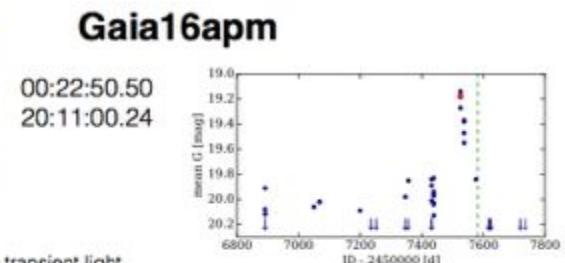
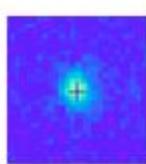


VLT/FORS2
PI: L. Wyrzykowski
PI: M. Gromadzki



and X-ray/UV with SWIFT

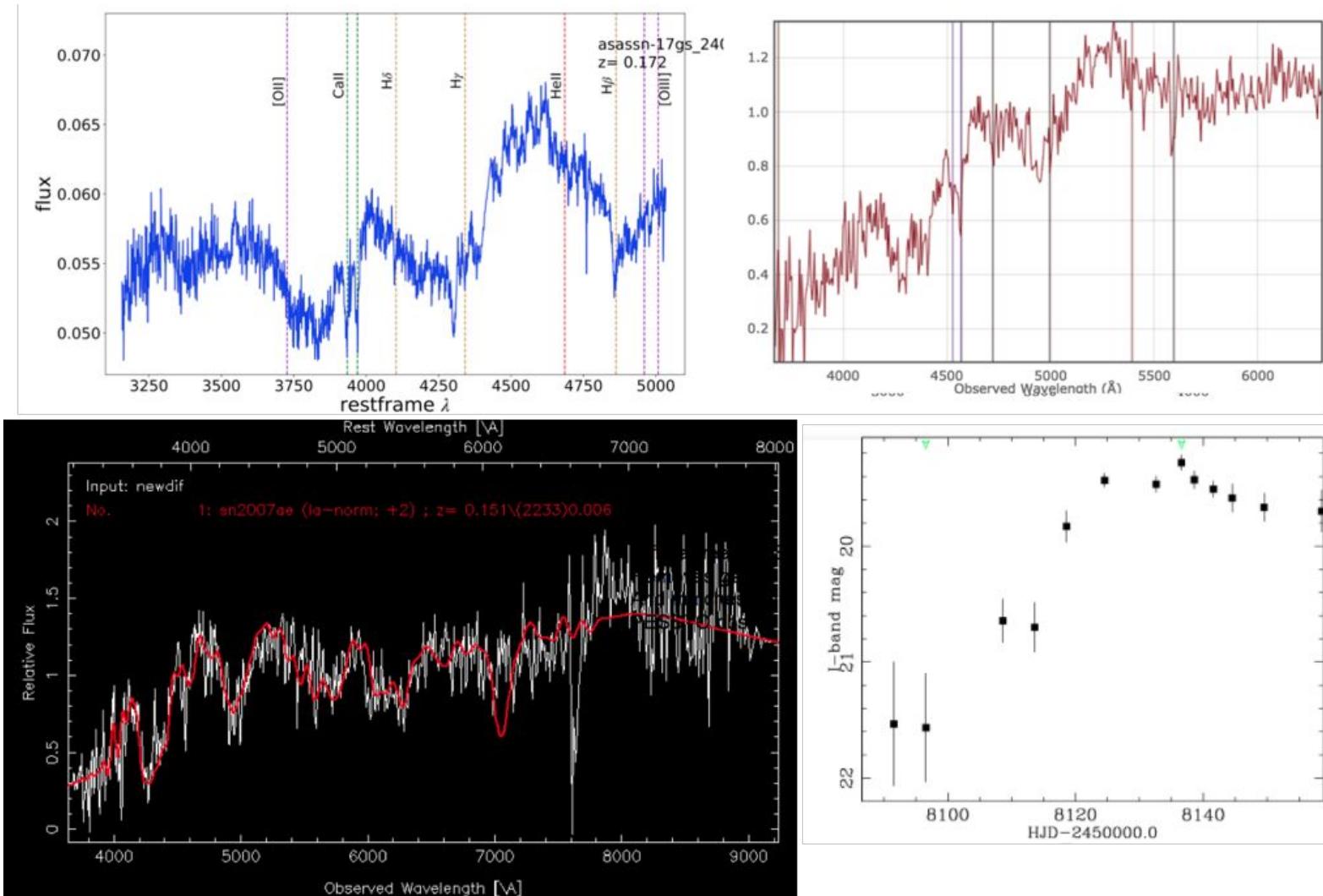
Typical effects of follow-up



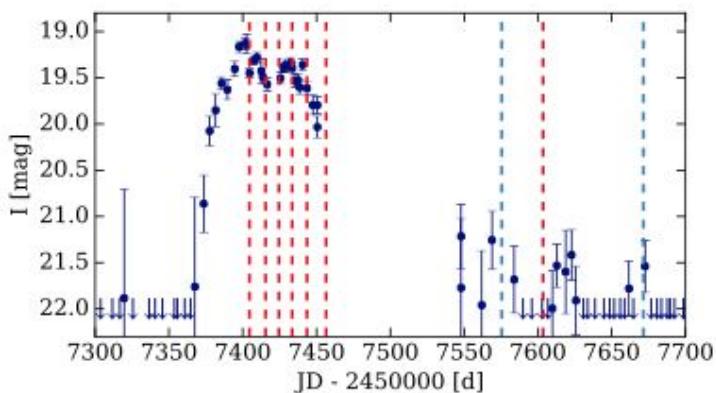
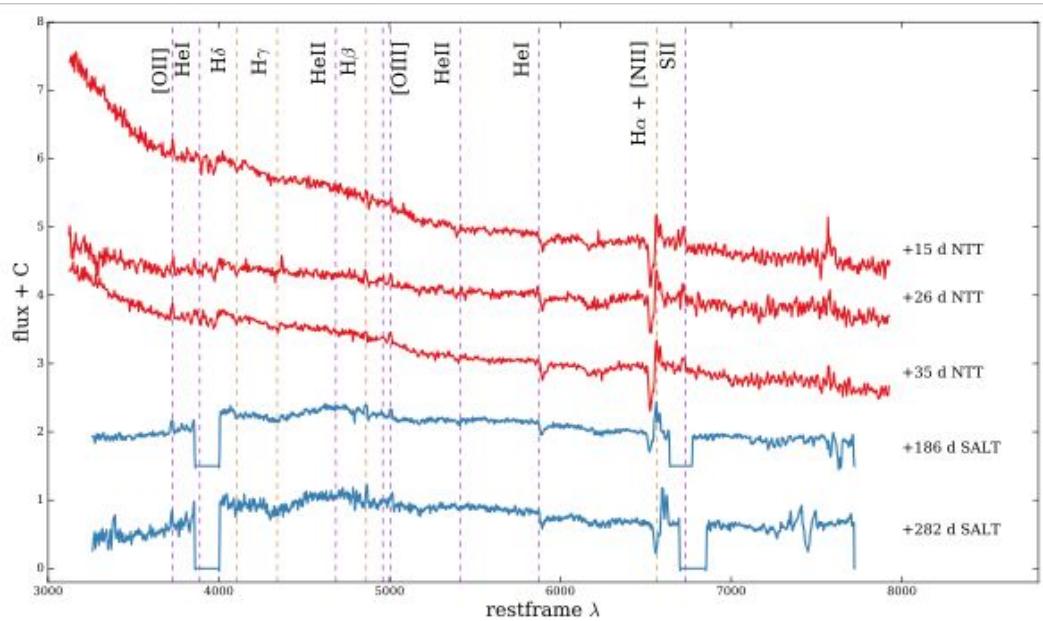
Hamanowicz et al. in prep & Wyrzykowski et al. in prep



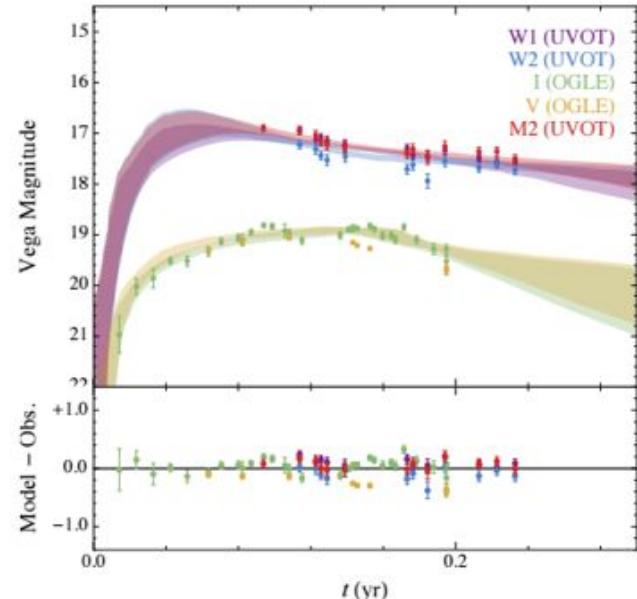
OGLE18be (it is not so easy !)



OGLE16aaa

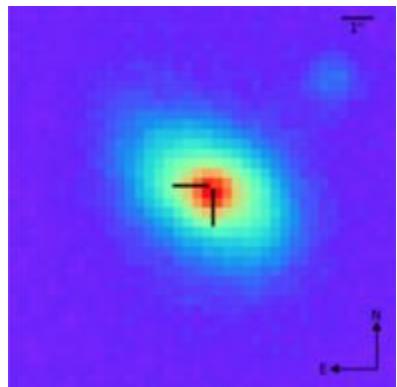


Wyrzykowski et al. 2017



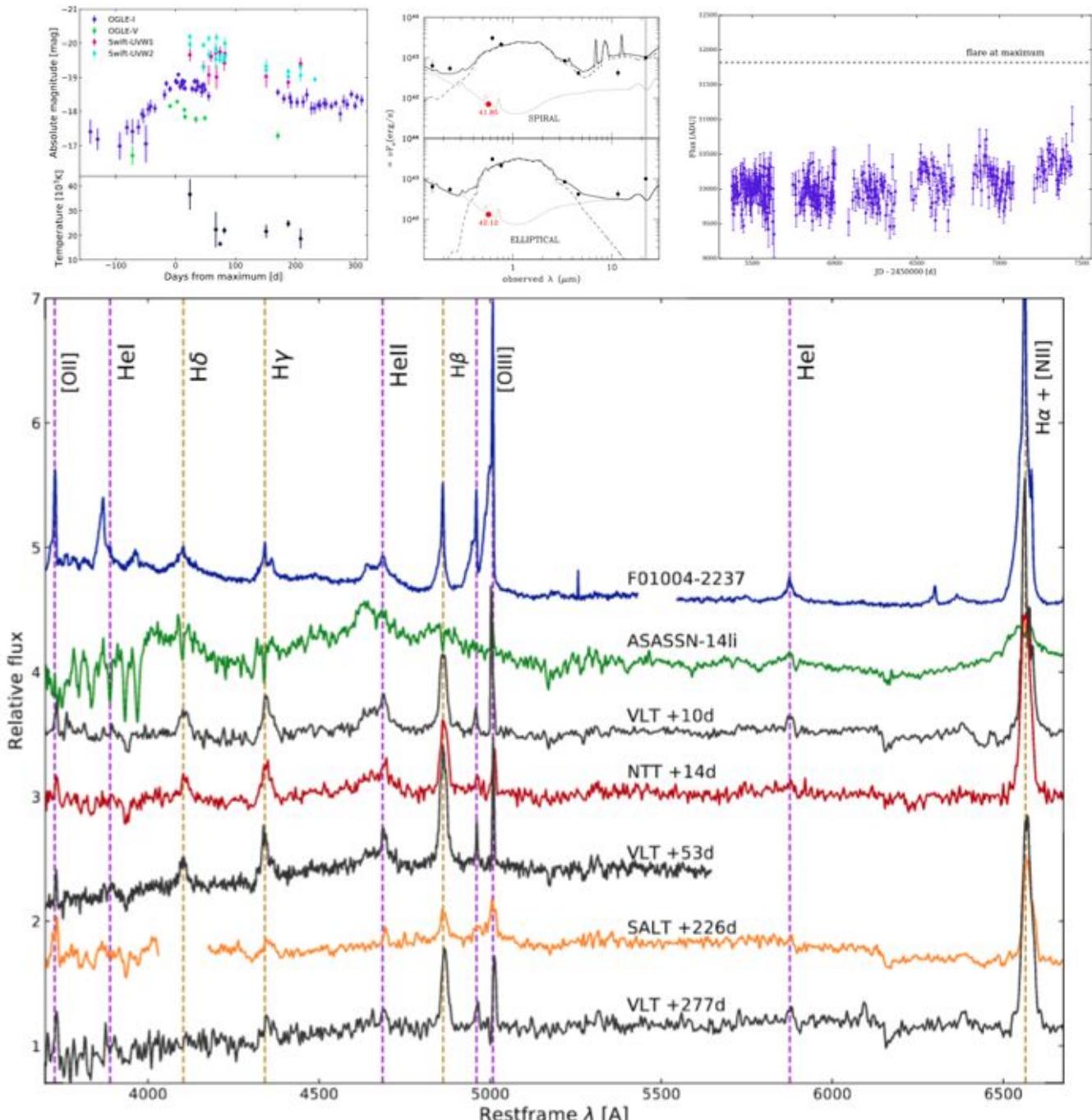
- $z=0.167$, peak absolute mag $M=-20.5$ mag
- slowly rising I-band light curve (~ 30 d) - unlike in most SNe, UV-bright (Swift)
- very broad HeII and H α emission
- hot black-body flare spectrum: 22,000K
- weak narrow AGN lines
- SMBH: $10^{6.5}$ MSun, star: 0.3 MSun

OGLE17aaj



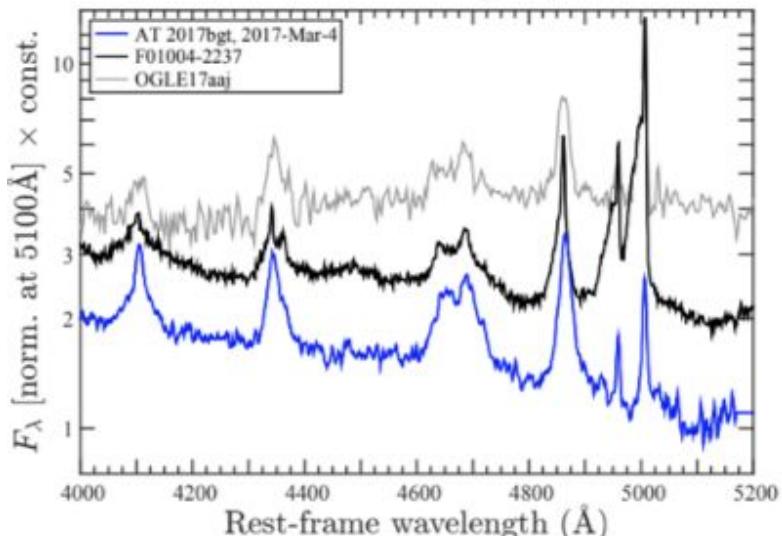
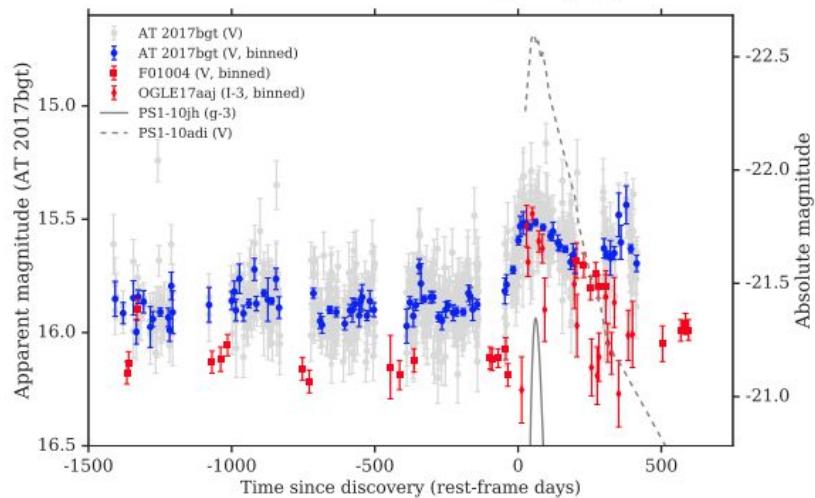
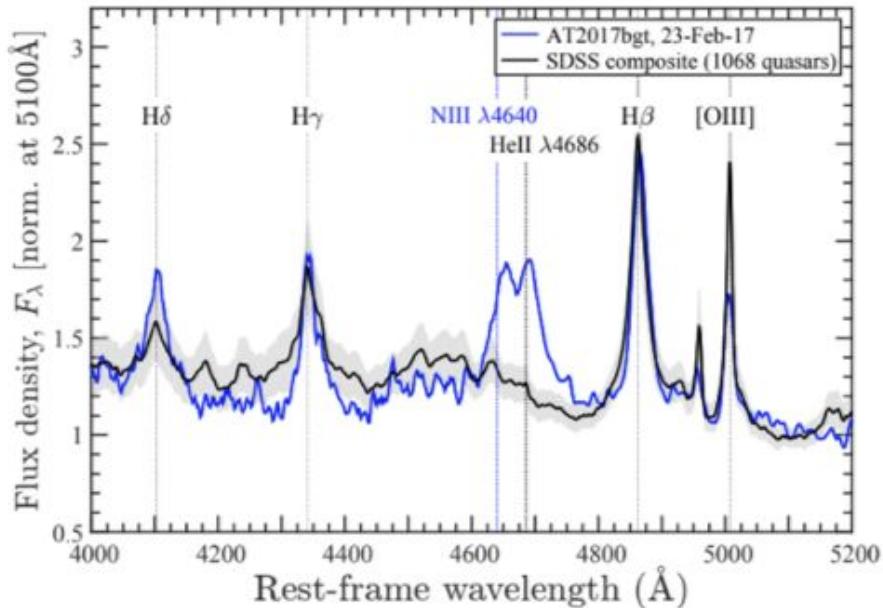
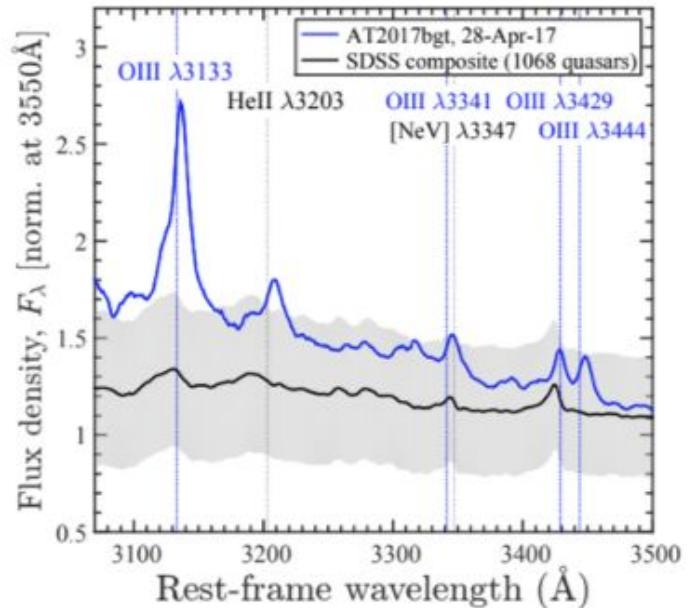
RA= 01:56:24.92
DEC=-71:04:15.9
 $z=0.116$
 $M(I)=-18.8$
Slow rise ~60d
TDE?
Similar to F01004-2237 URLIG
TDE
(Tadhunter et al. 2017)

$M(BH)=\sim 10^7 \text{ Msun}$



Gromadzki et al. submitted

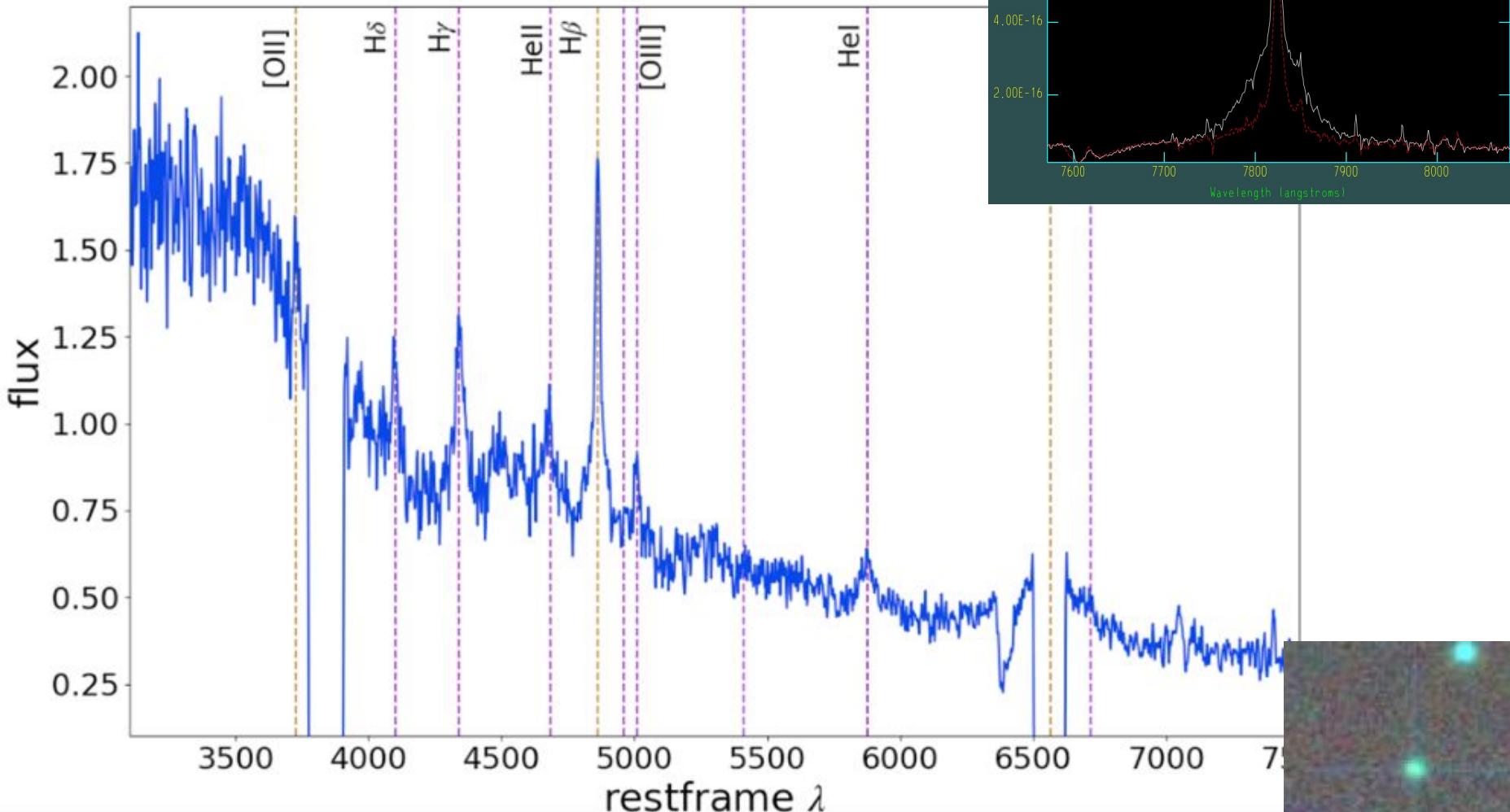
AT 2017bgt/ASASSN-17cv



Trakhtenbrot et al. submitted

Gaia17dbg/AT 2017gul

Nada's talk



AGN flare or a TDE? $M(G)=-21.5$ $Teff=22\text{kK}$ $z=0.192$

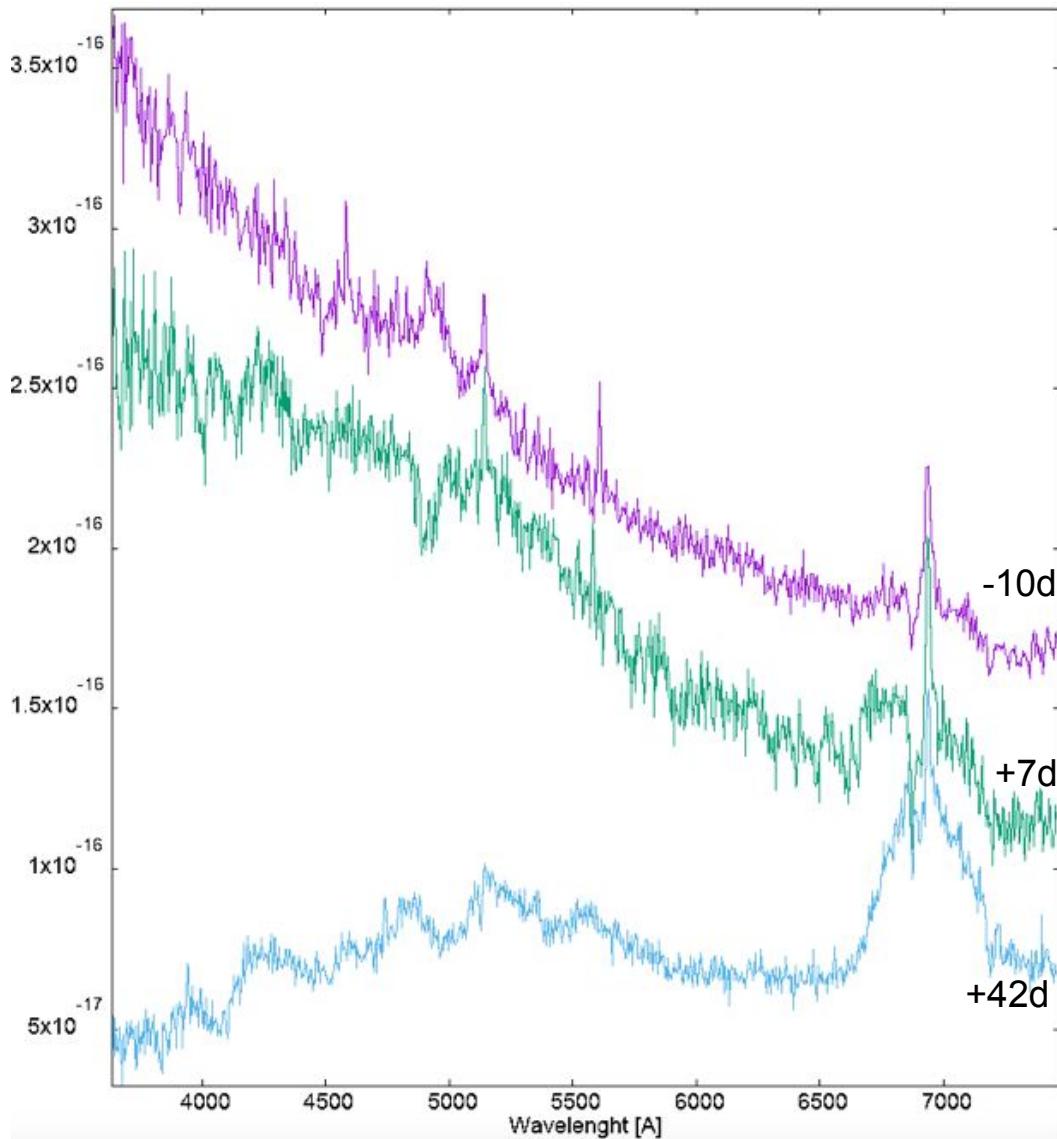
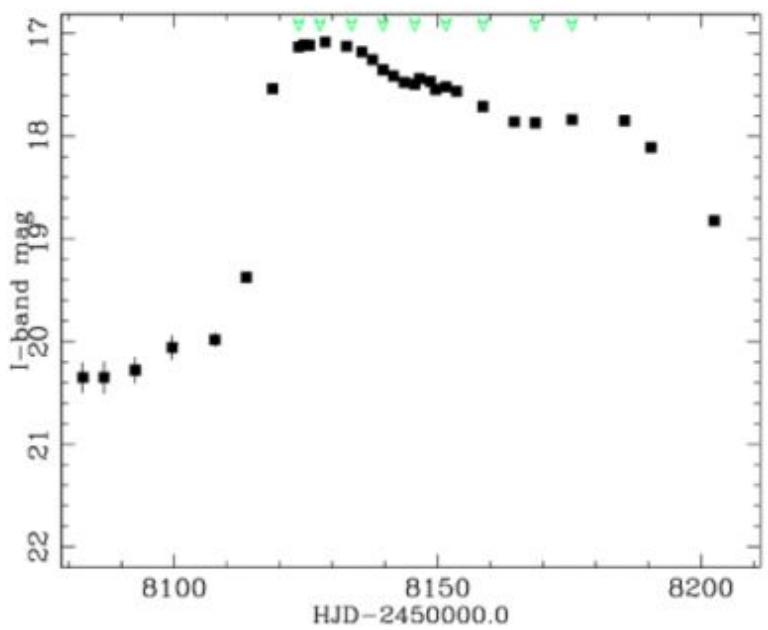
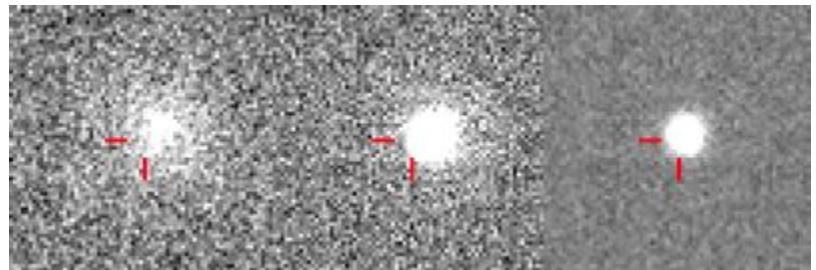


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Highlights from Warsaw hunt for TDEs

OGLE17jei

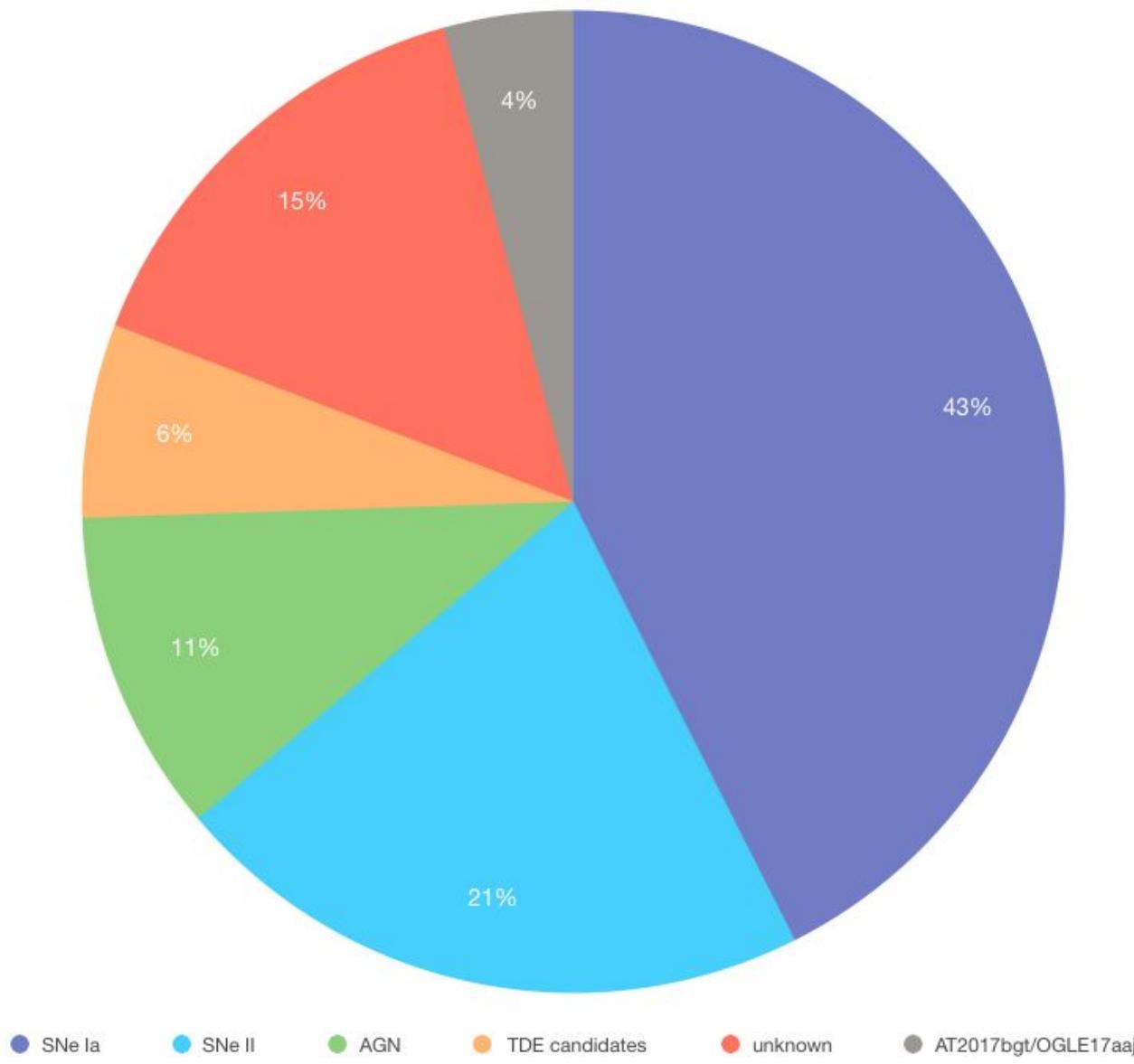


$z=0.058$

$M(I)=-20$

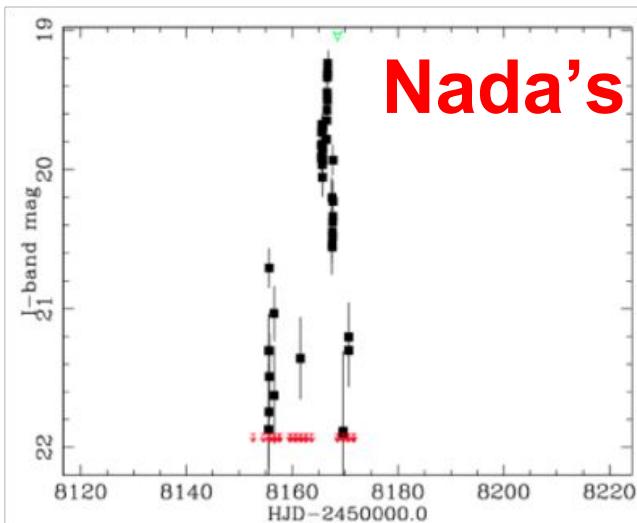
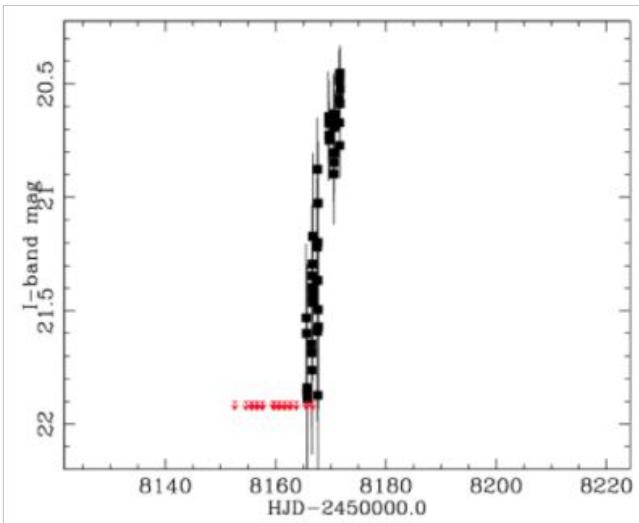
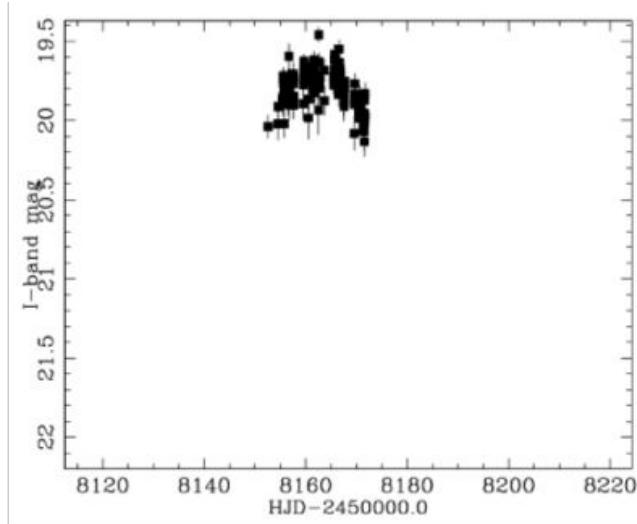
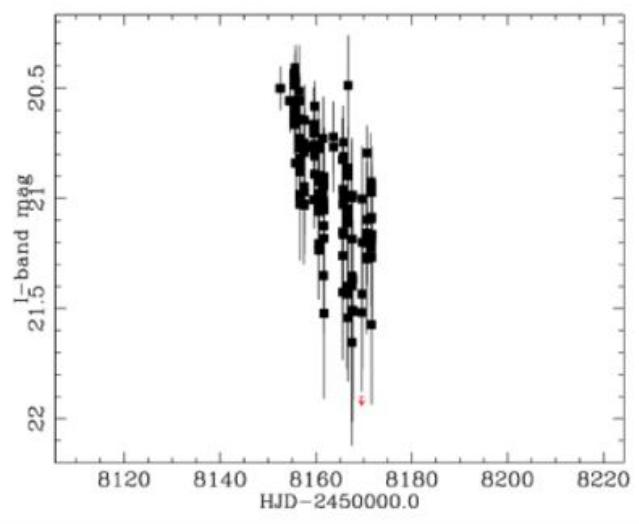
Teff=18 500 K

Take off statistics



OFF Topic - fast transients from OGLE - CORTe

Chile-OGLE Rapid Transients experiment



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Highlights from Warsaw hunt for TDEs