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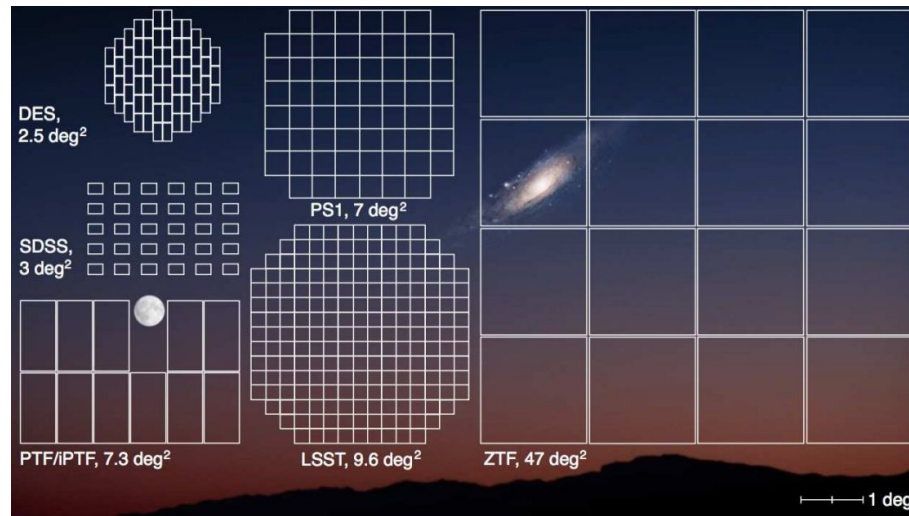
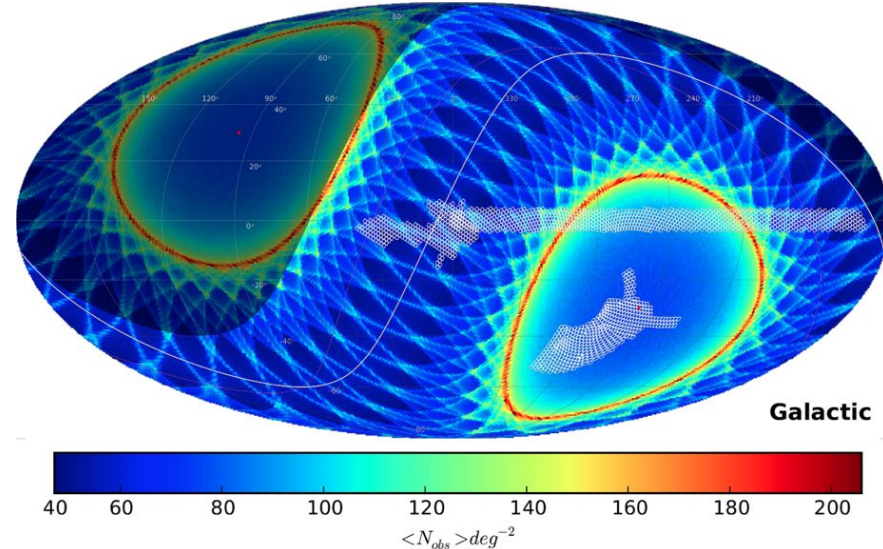


New type of transients in the era of all-sky surveys

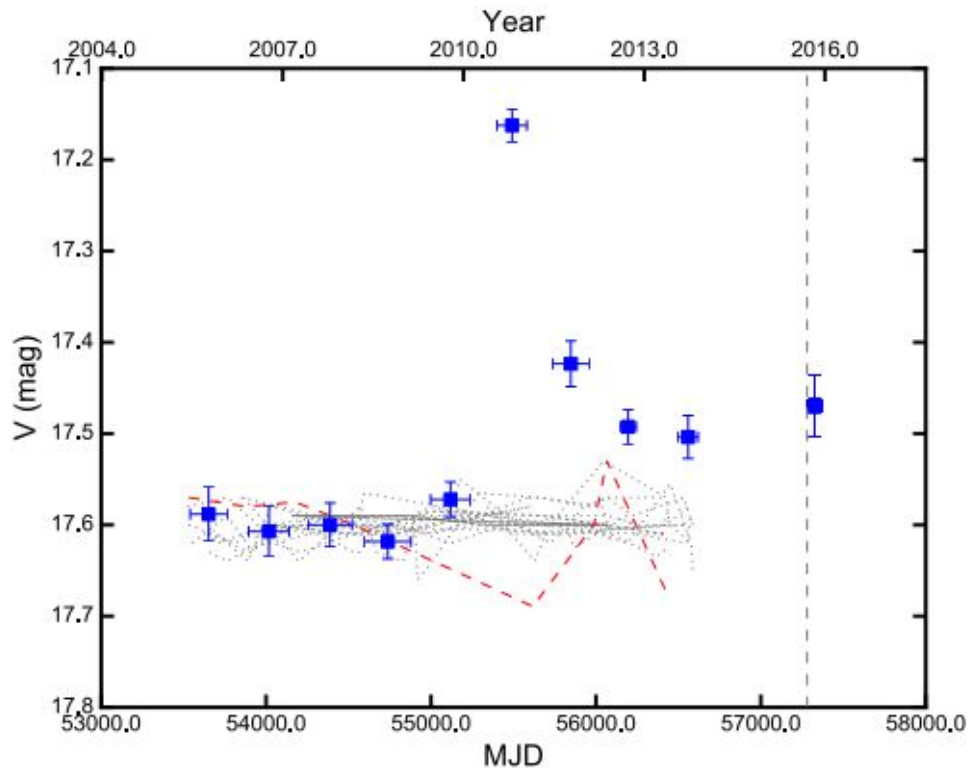


Era of all-sky surveys

- Current online: surveys
ASAS-SN, ATLAS, Gaia, GOTO,
Pan-STARRS, OGLE and ZTF
- Current 'delay'-online: VMC, VVV
and WISE
- Very soon: Rubin/LSST and
Roman/WFIRST



ULIRG F01004-2237



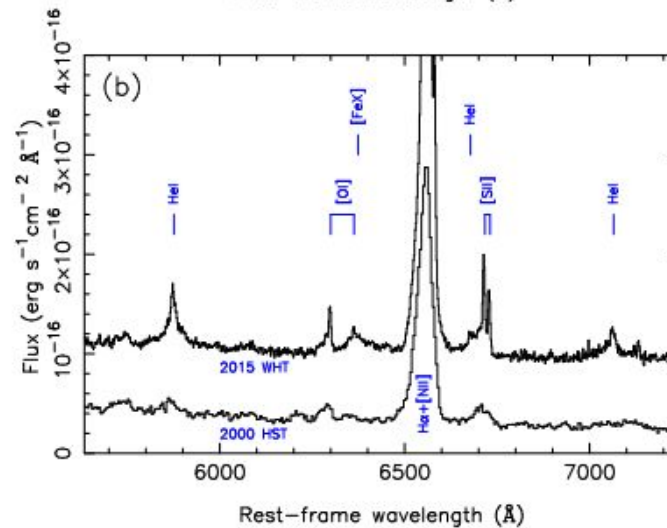
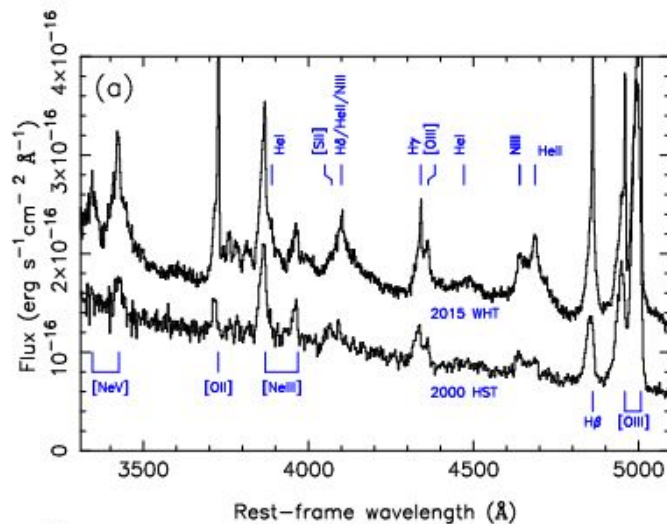
CSS light curve $\rightarrow M_V < 20.1$

$M_{\text{BH}} \sim 2.5 \times 10^7 M_{\text{Sun}}$

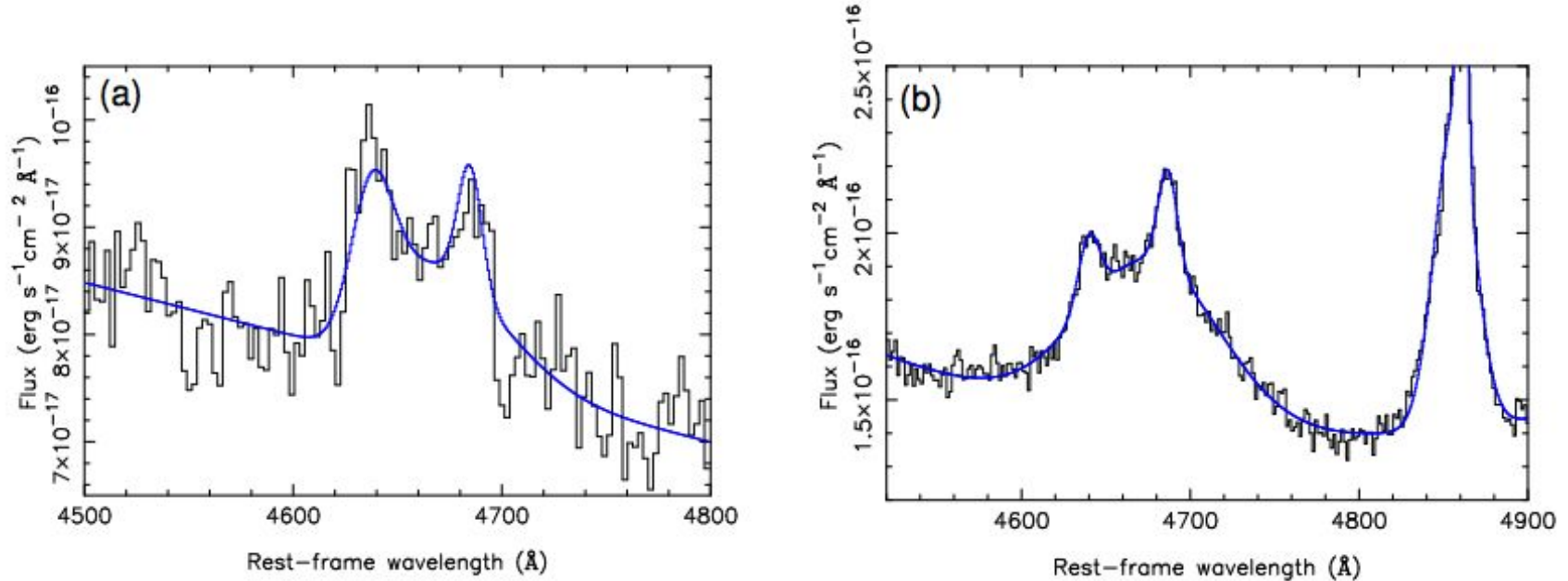
$z = 0.118$

$M_* \sim 1.9 \times 10^{10} M_{\text{Sun}}$

$N_{\text{W-R}} \sim 3 \times 10^4$ (3-6 Myr)



F01004-2237



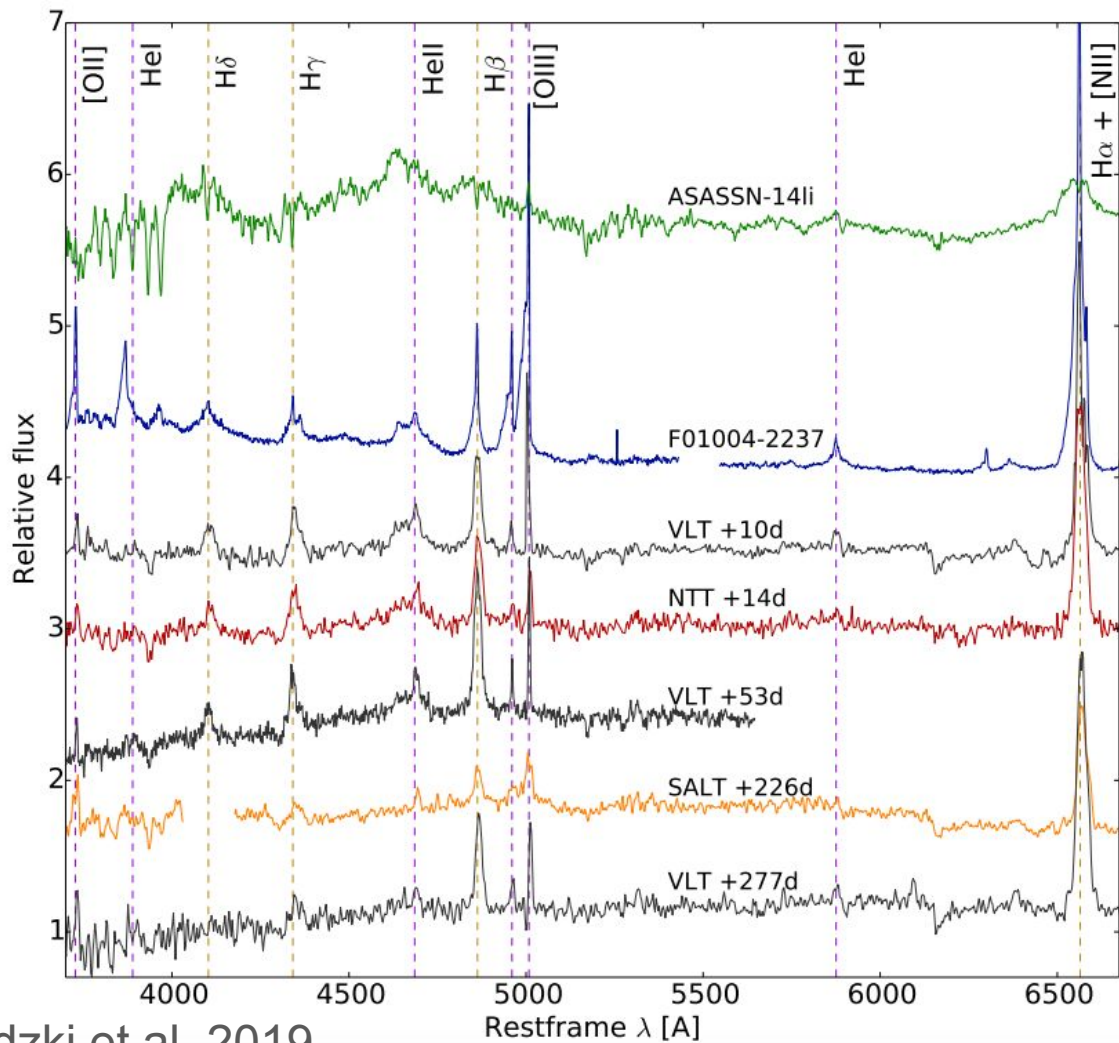
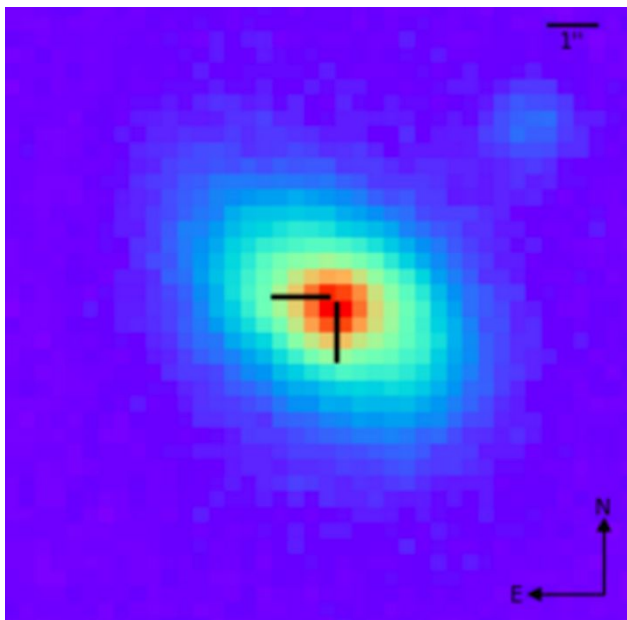
- HST/STIS spectrum (2000) fitted with WN7-9 + WC7-8 + blueshifted HeII $\lambda 4686$ (NLR)
- WHT/ISIS spectrum (2015) required additional HeII $\lambda 4686$ component with FWHM ~ 6200 km/s.
- CL-AGN was rule out because of presence of HeII/NIII component

OGLE17aaj

$z=0.116$

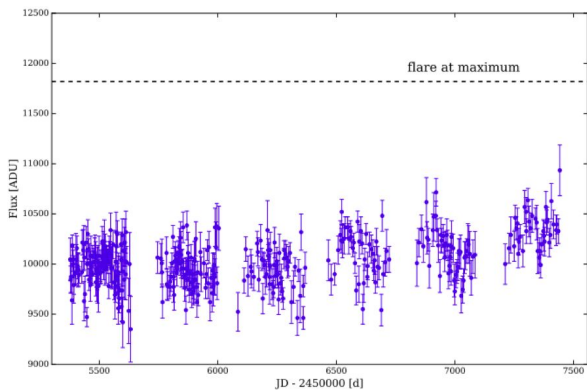
$M_V = -18.3$

$M_{\text{BH}} \sim 2.5 \times 10^7 M_{\text{Sun}}$

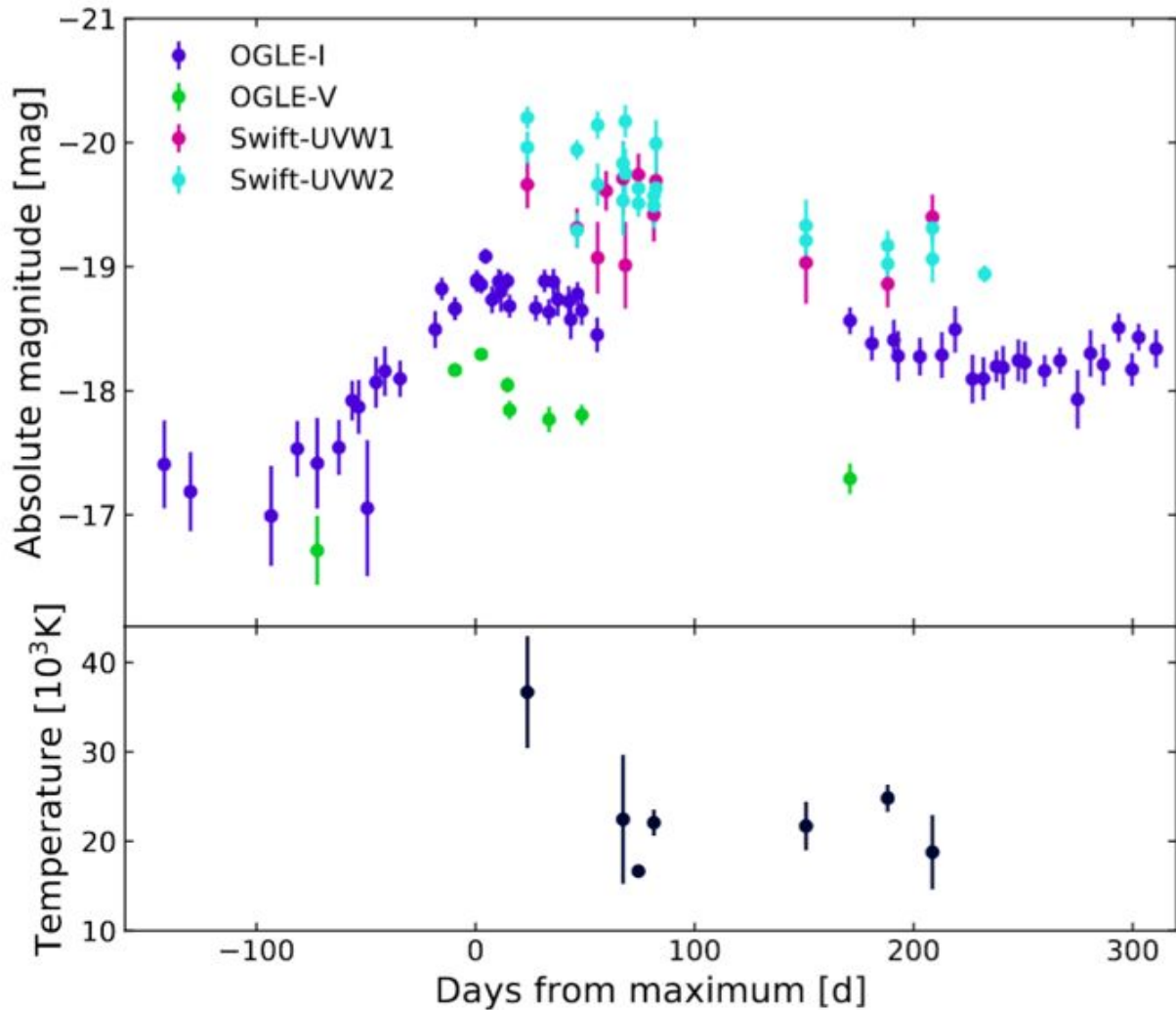


Gromadzki et al. 2019

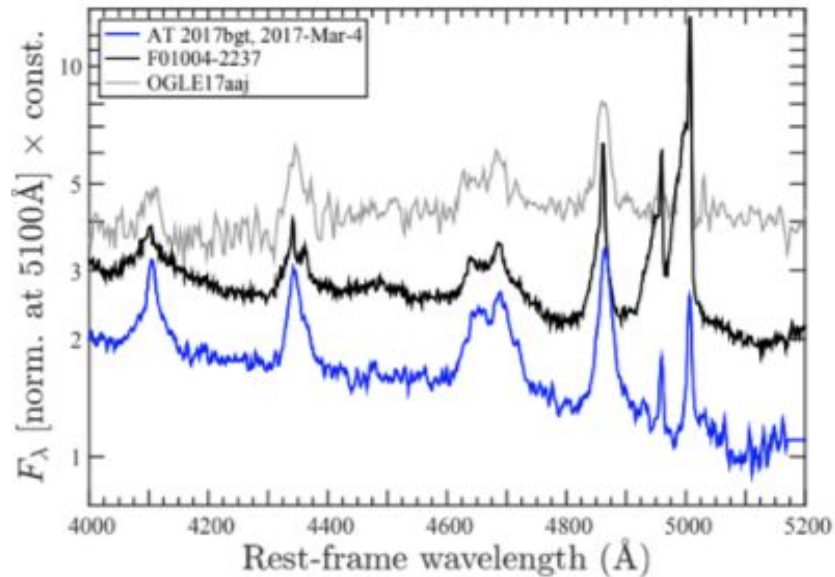
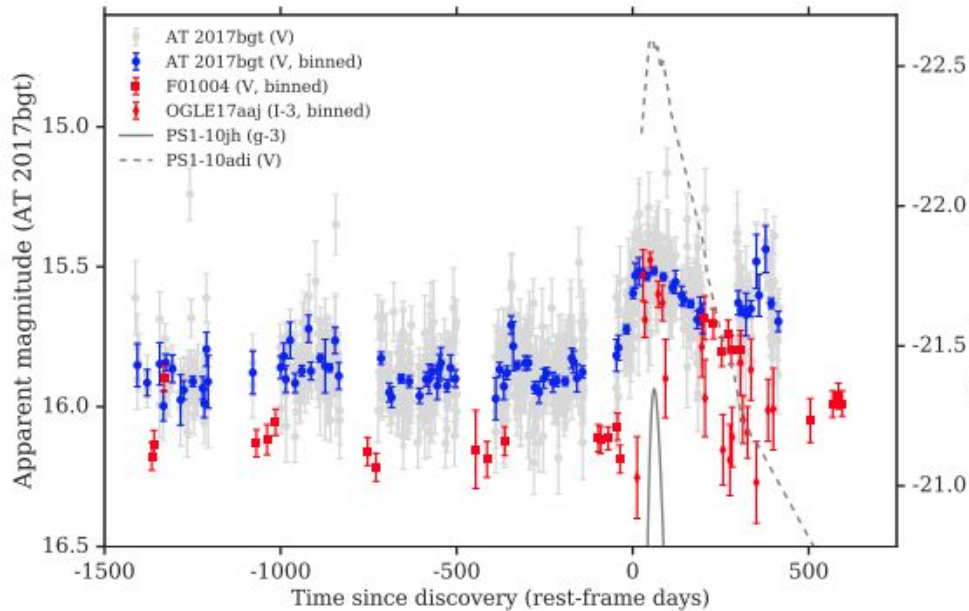
OGLE17aaj



Gromadzki et al. 2019



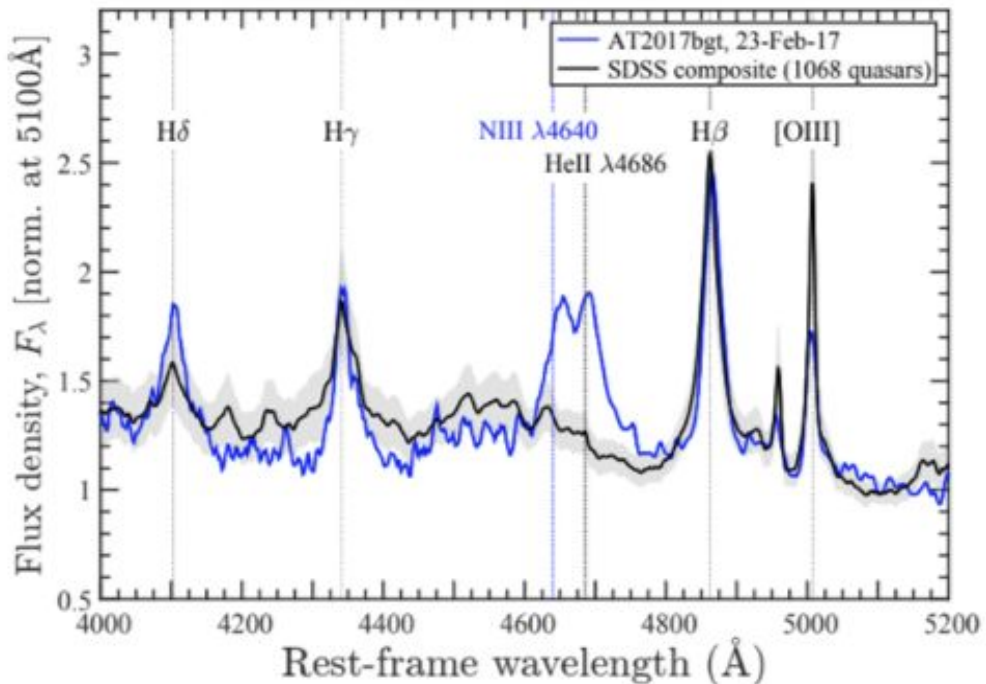
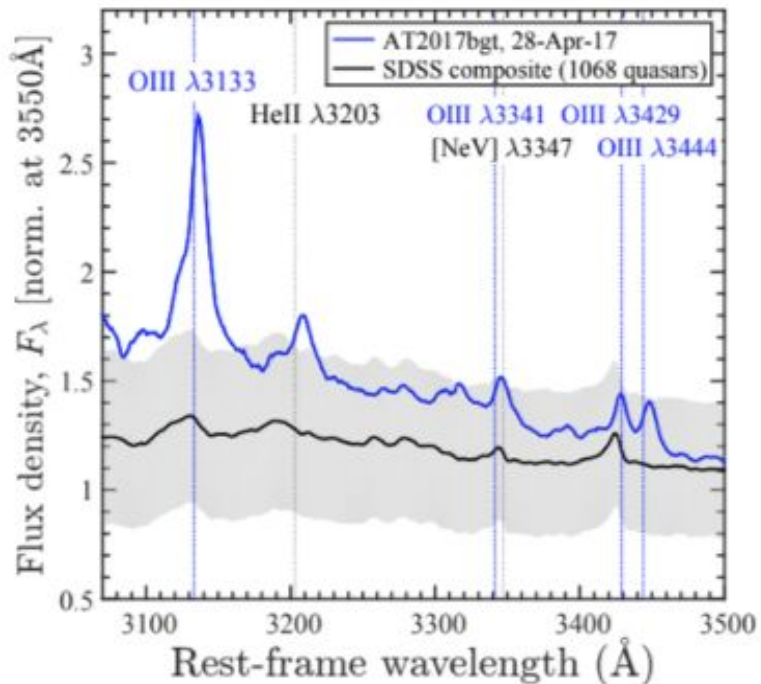
AT 2017bgt (ASASSN-17cv)



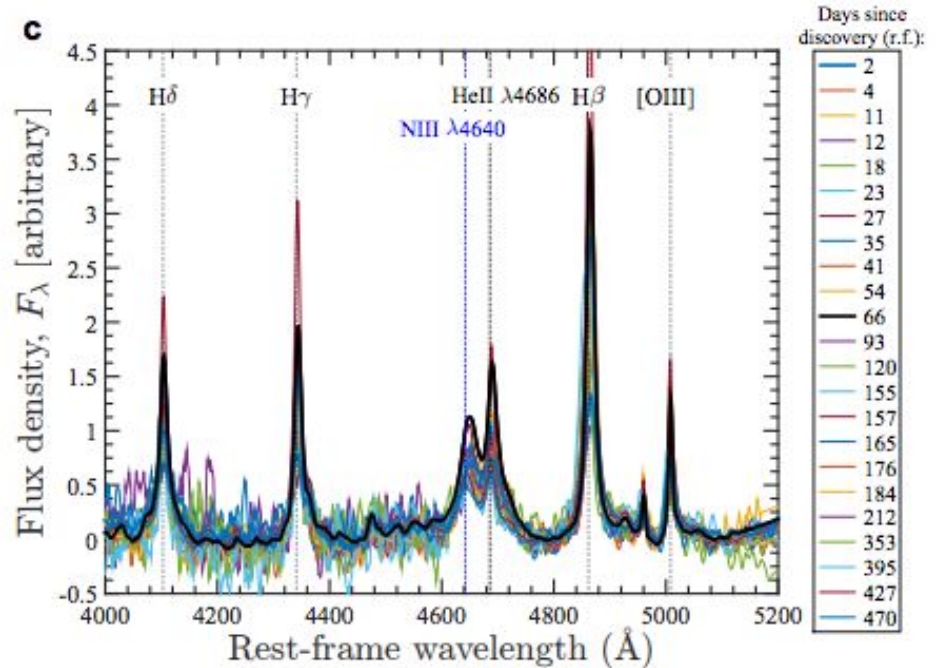
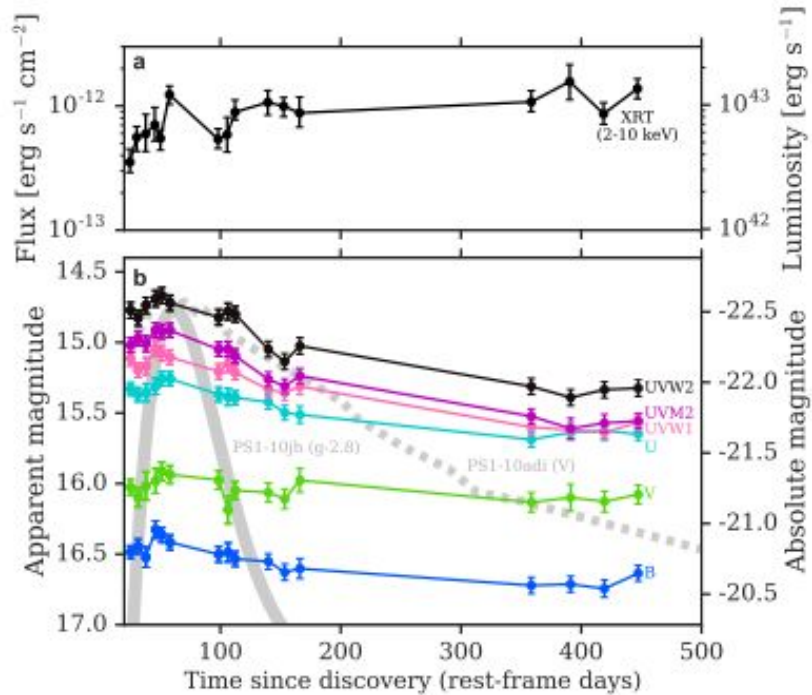
Trakhtenbrot et al. 2019

$z = 0.064$
 $M_V \sim -21.3$

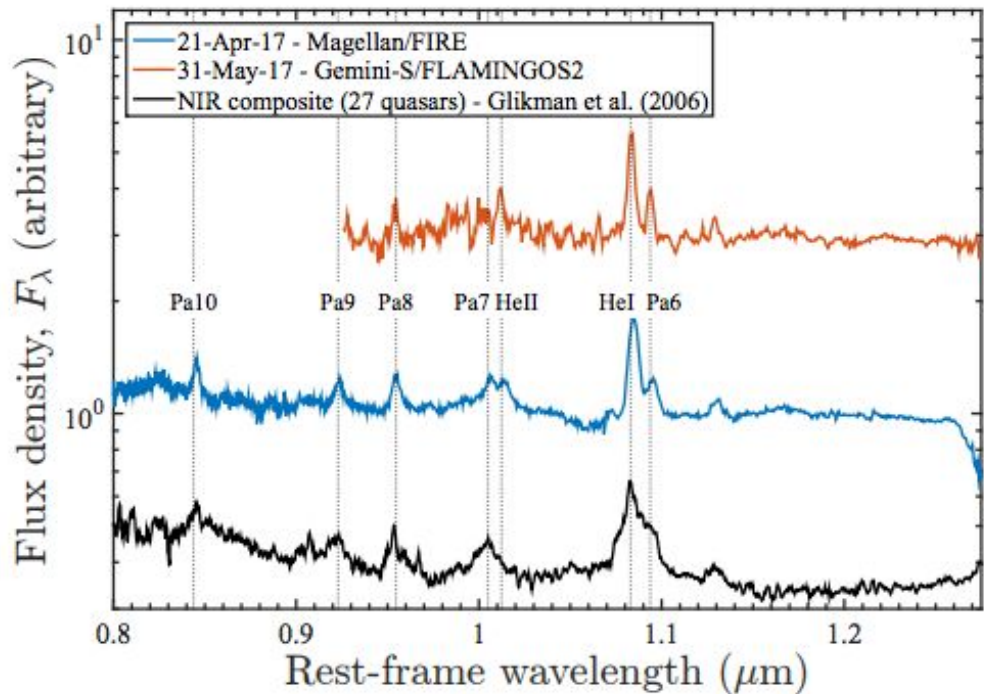
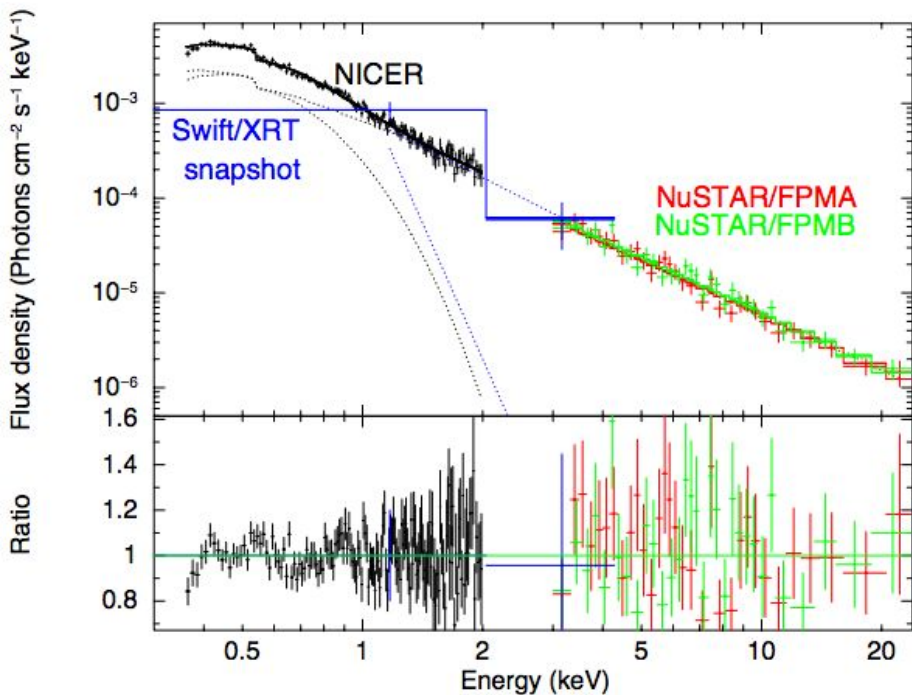
AT 2017bgt



AT 2017bgt: evolution

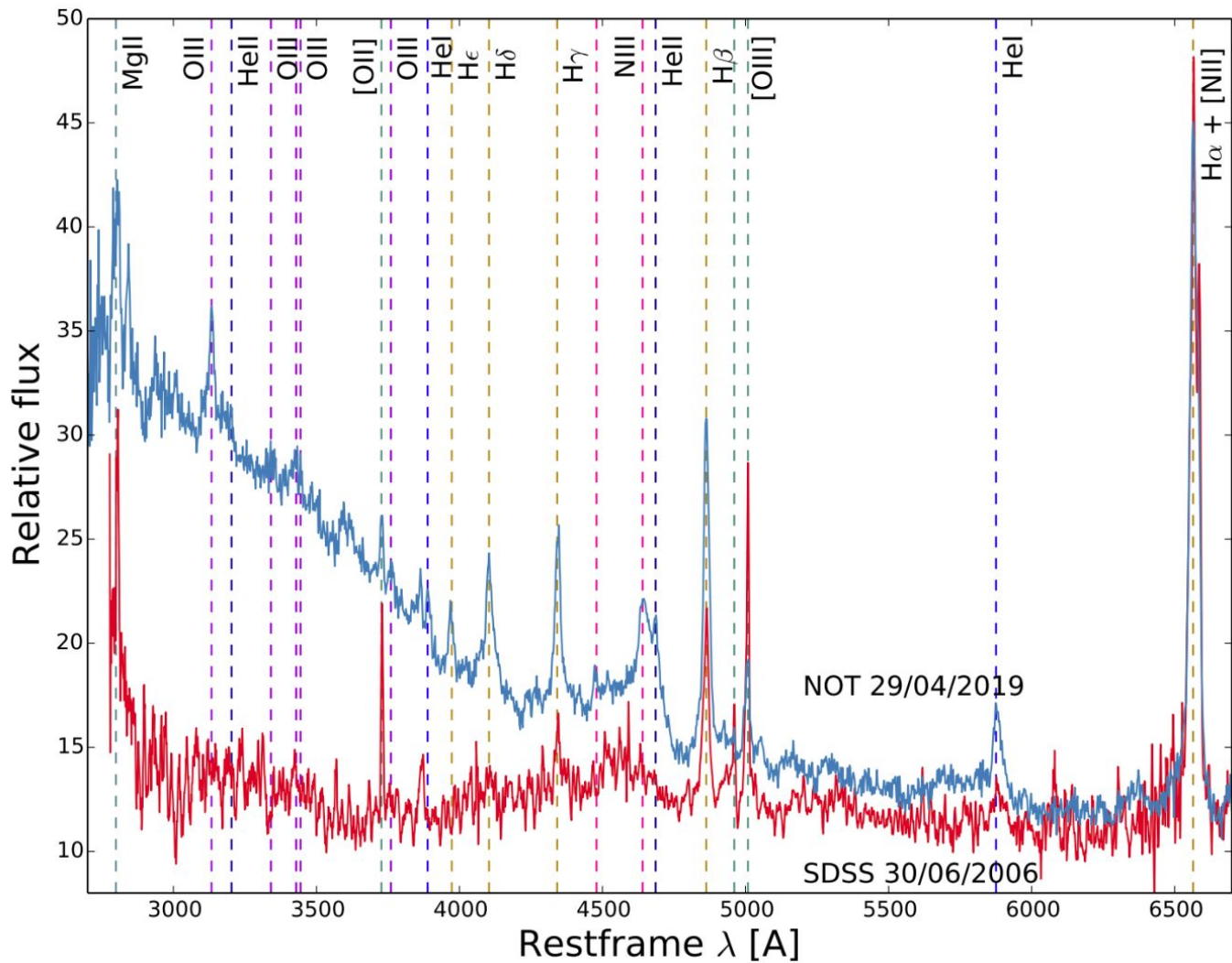


AT 2017bgt: from X-ray to NIR

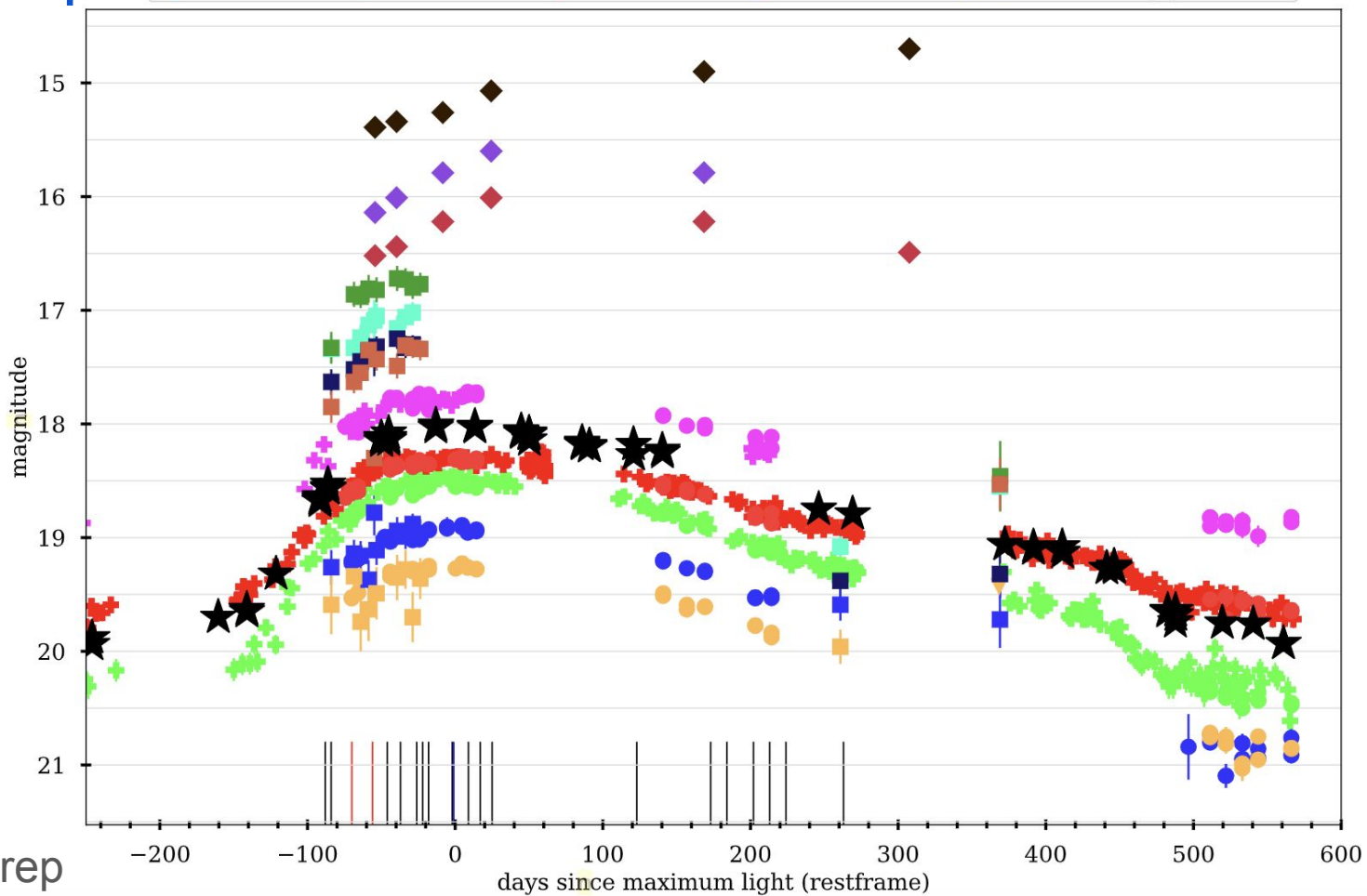
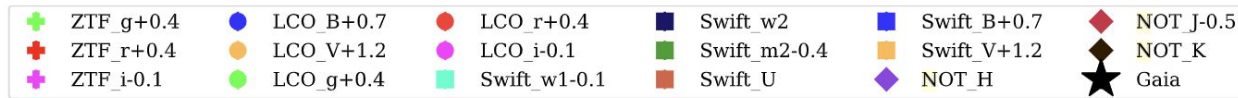


Gaia2019axp (AT 2019brs)

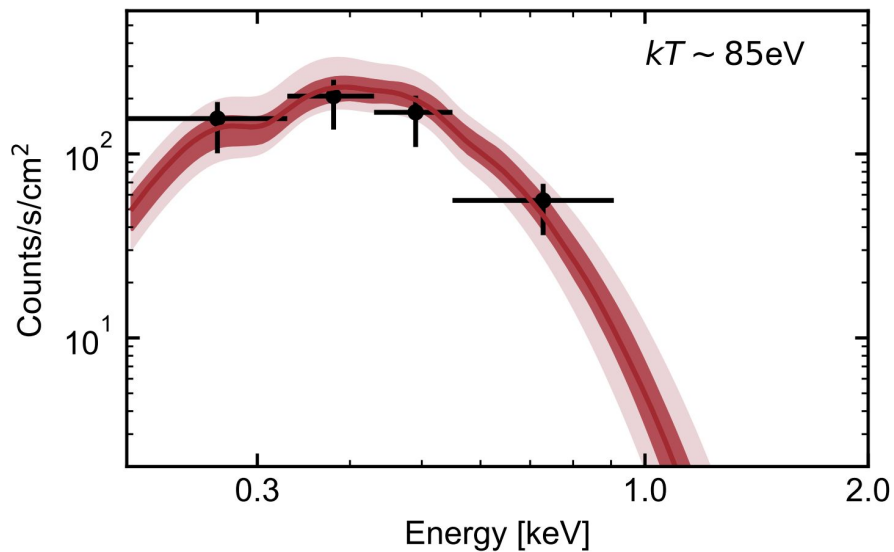
$z = 0.374$
 $M_G \sim -22.3$



Gaia2019axp

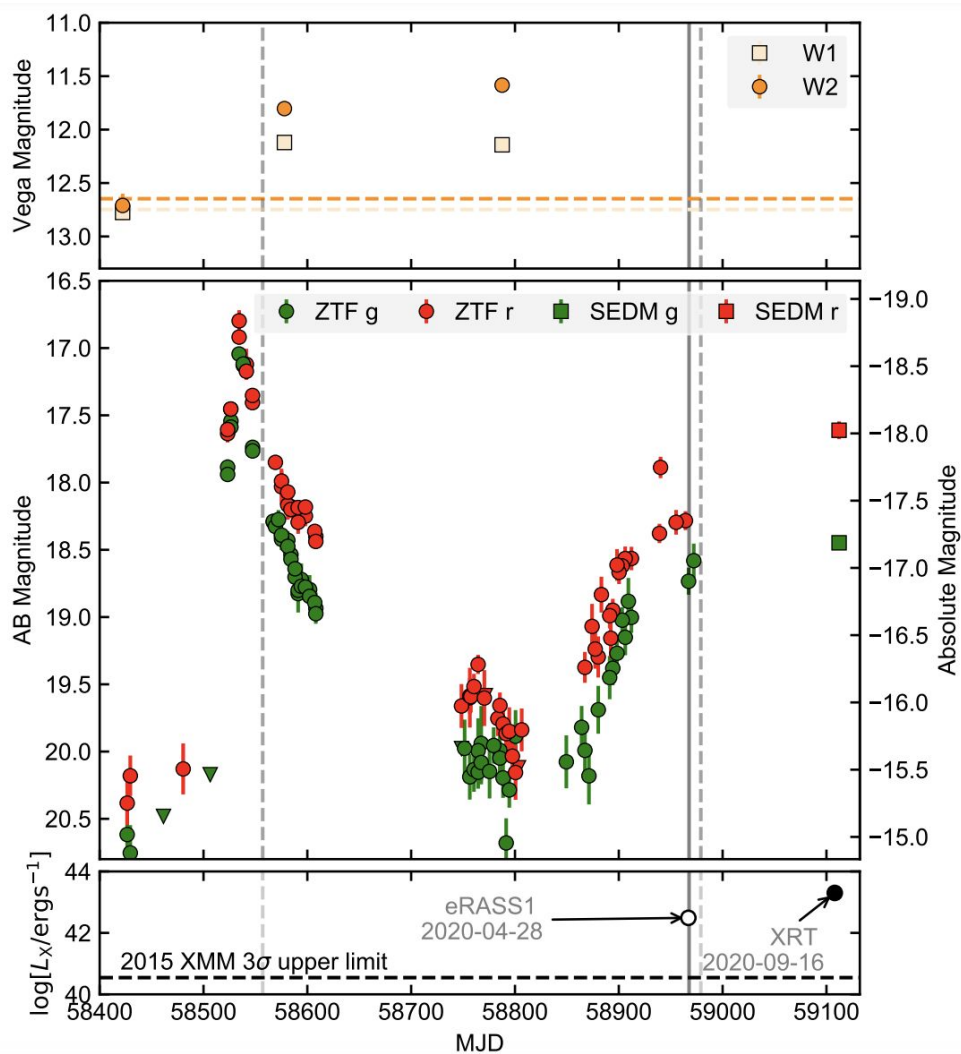


AT 2019avd



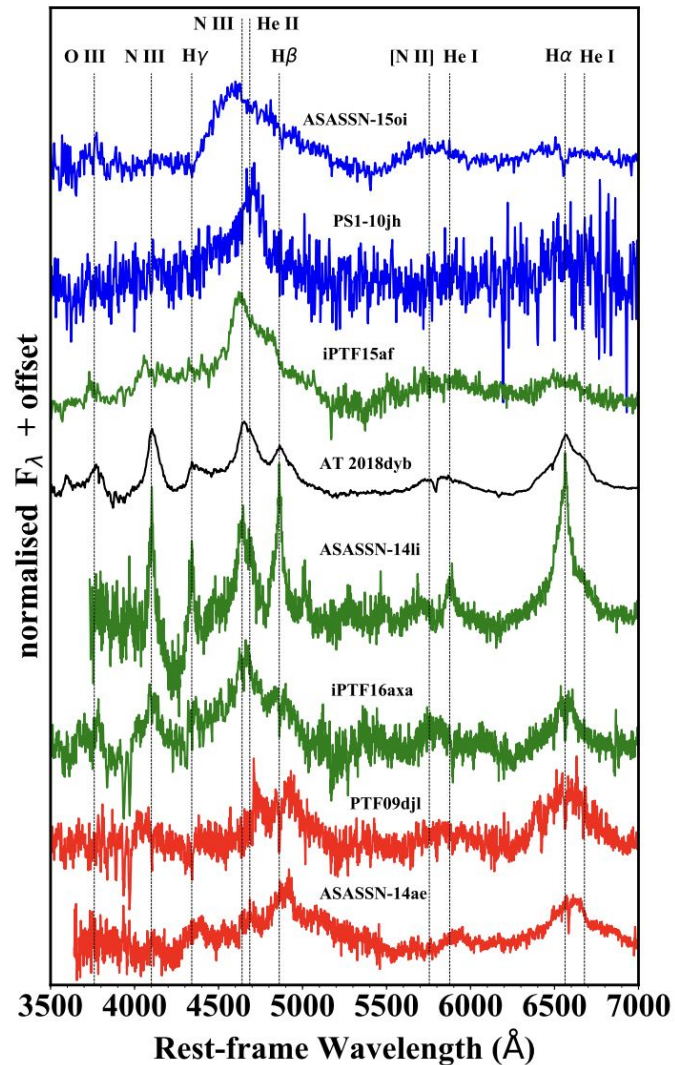
$z = 0.029$
 $M_V \sim -21.3$

Malyali et al. in 2021



Impact on TDEs Science

- Leloudas et al. 2019 found Bowen features in spectra of AT 2019dyb and also proved that previous TDEs also showed them
- Blagorodnova et al. 2019 found Bowen features in spectra of iPTFaf
- Van Velzen et al. 2021 proposed three classes of TDEs: (i) TDE-H, (ii) TDE-Bowen and (iii) TDE-He



Few take-home remarks

- Still no satisfactory scenario proposed
- Masses of BHs look similar ($10^6 - 10^7 M_{\text{Sun}}$);
- Wide range of released energy ($L_{\text{peak}} \sim 10^{42} - 10^{44} \text{ erg s}^{-1}$);
- Different spectroscopic and photometric evolution
- Few new similar transient were published and also discovered in the meantime, eg. ASAS-SN18jd, AT 2019avd
- Two of them show second re-brightening: F01004-2236 and AT 2019avd

... and more

