

TDE ("leave no TDE behind")

Nadia Blagorodnova & Arne Rau

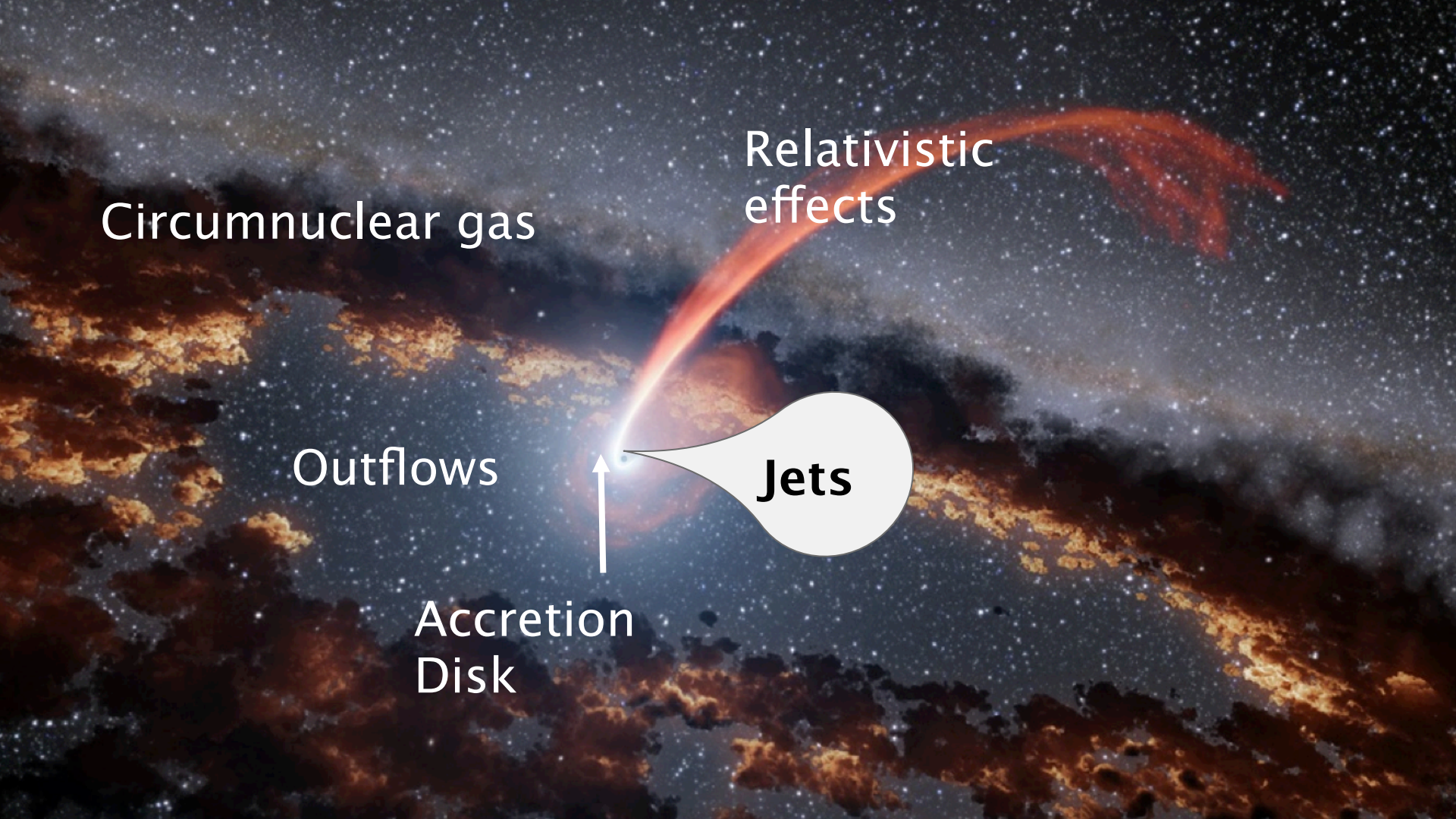
Circumnuclear gas

Relativistic
effects

Outflows

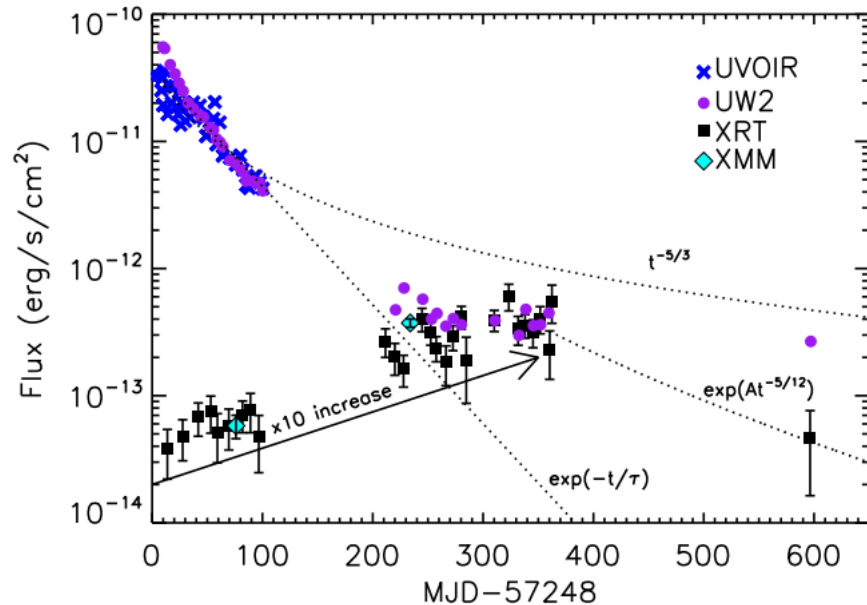
Jets

Accretion
Disk

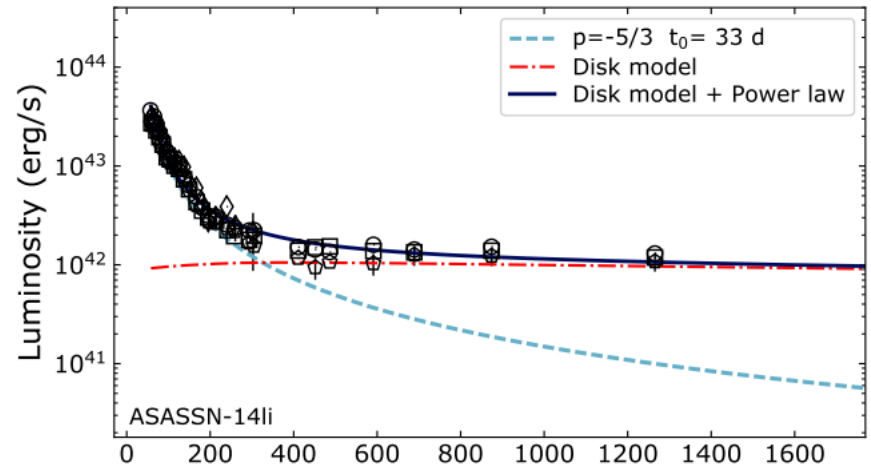


Accretion disk and relativistic effects

- Early time: UV and X-ray obscured by the stellar debris OR optical signature coming from stream-stream collision (not obscured).
- Late time: observations consistent with a disk model.

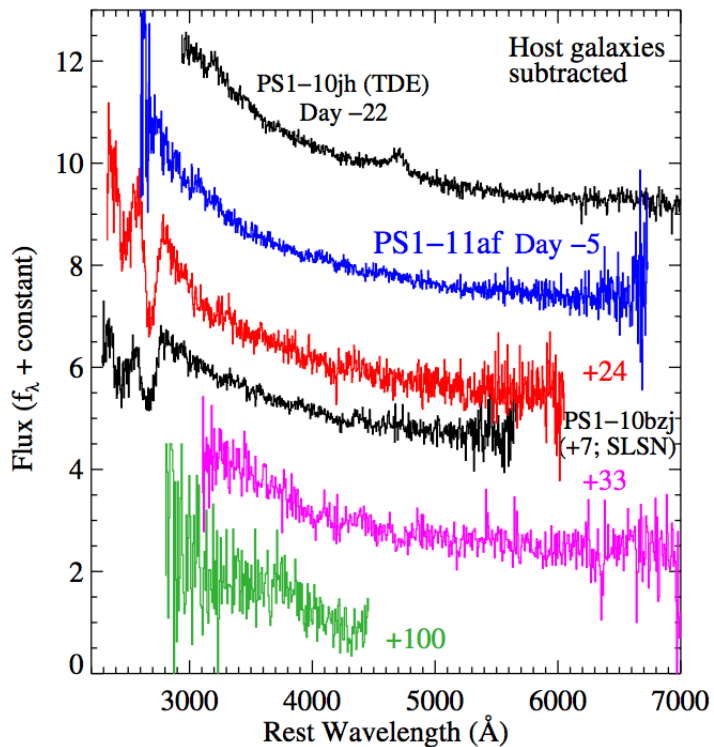


Gezari et. al. 2017

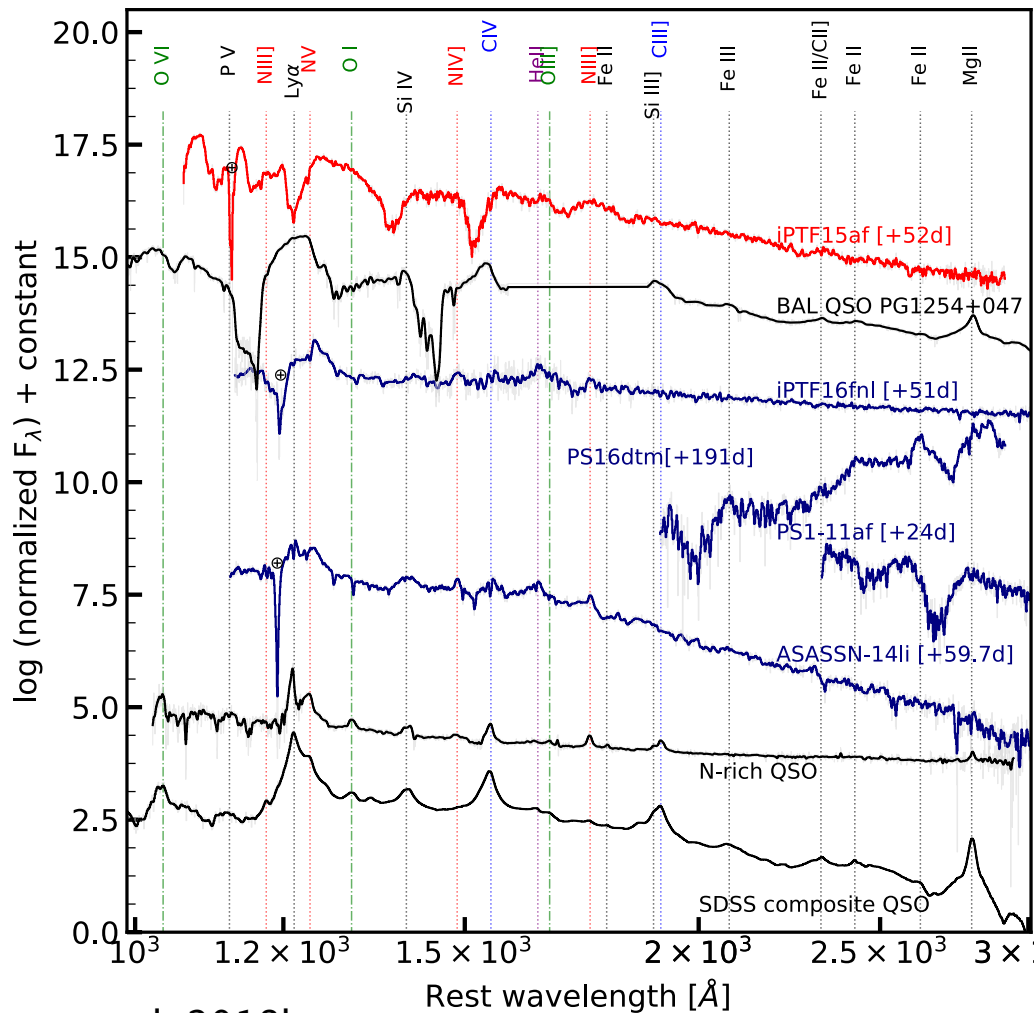


VanVelzen et. al. 2018b

Outflows from TDEs

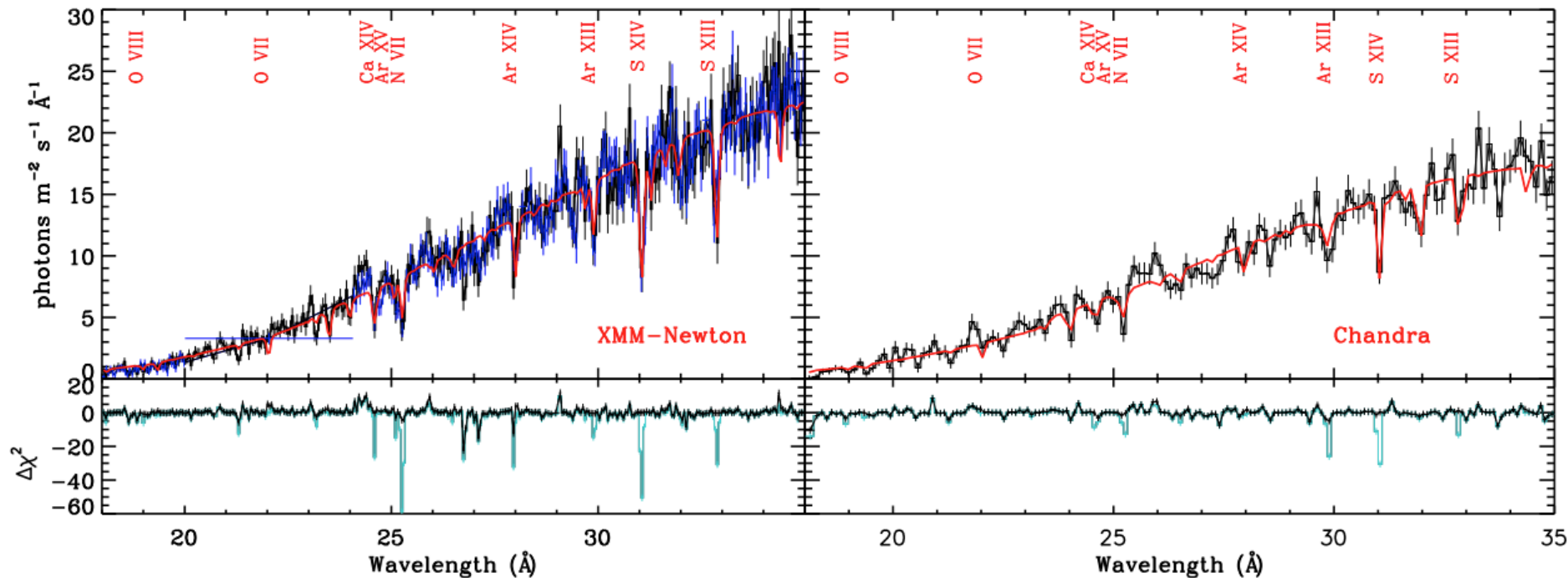


Chornock et. al. 2014

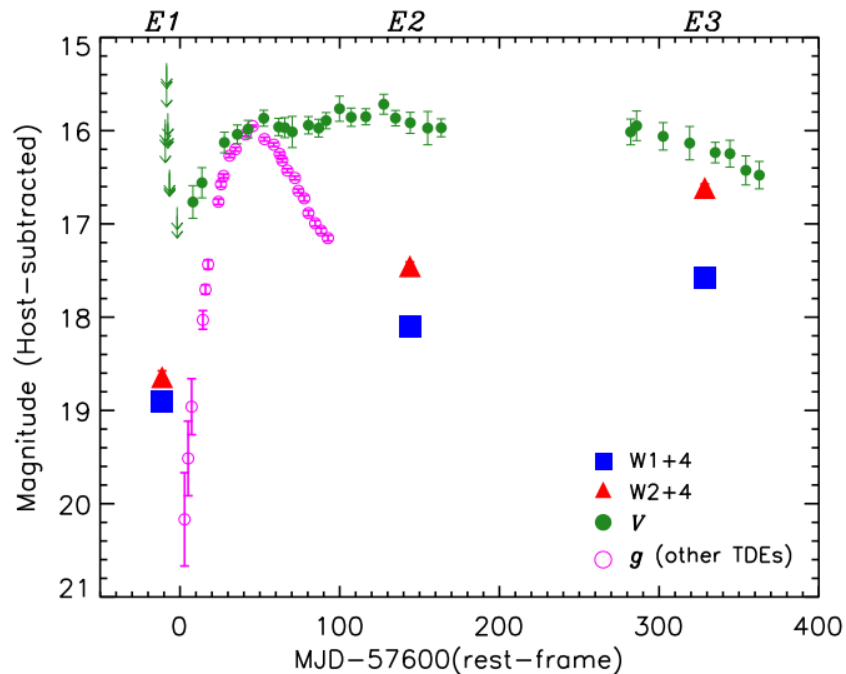
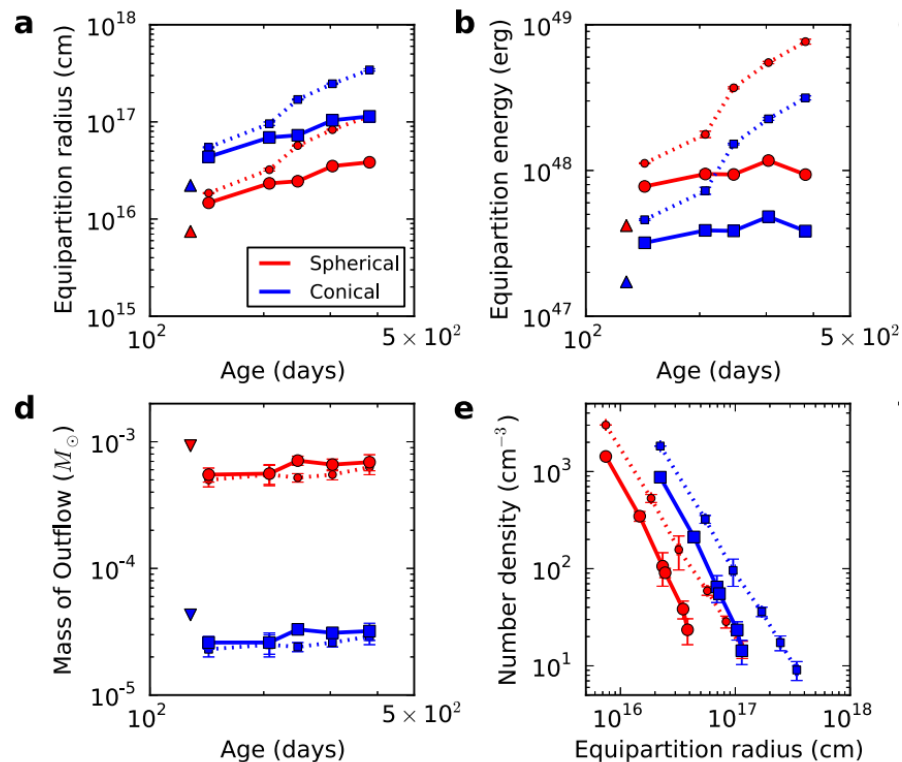


Blagorodnova et. al. 2018b

Highly ionized outflows from TDEs



Circumnuclear gas



Jiang et. al. 2018b

Alexander et. al. 2016

TDEs as probes

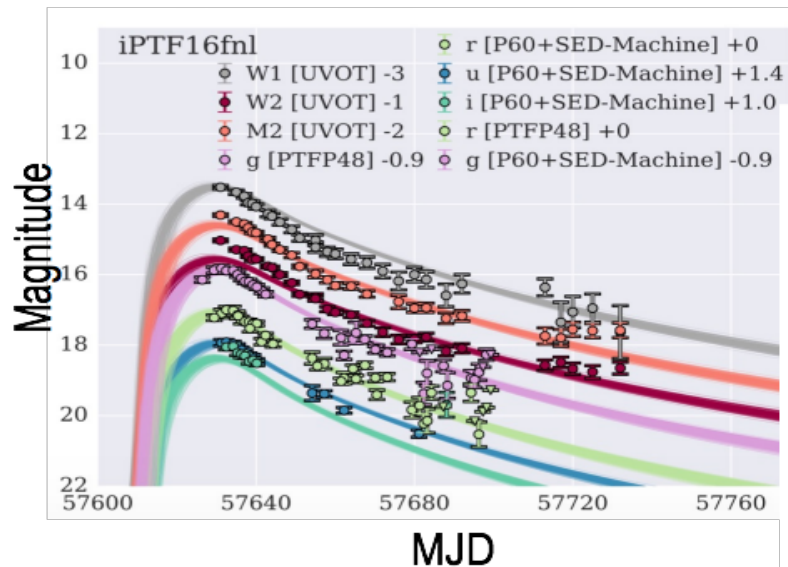
SMBH:

- Mass distribution for SMBH and IMBH
- Spin distribution

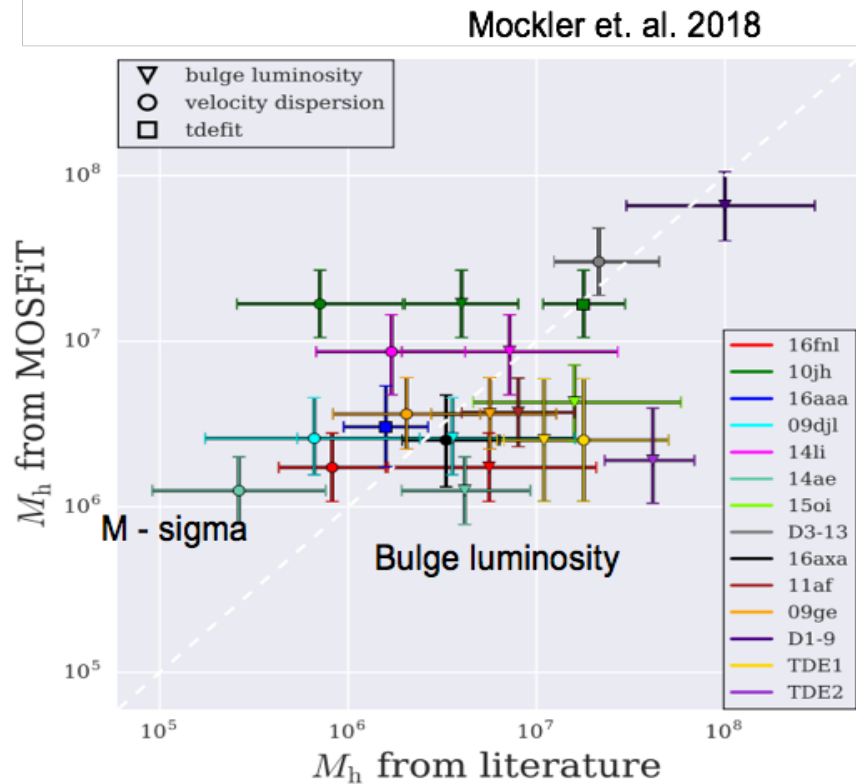
Host galaxy

- Stellar populations in TDE host galaxies
- Stellar dynamics in TDE hosts
- Circumnuclear gas properties

SMBH / IMBH mass distribution

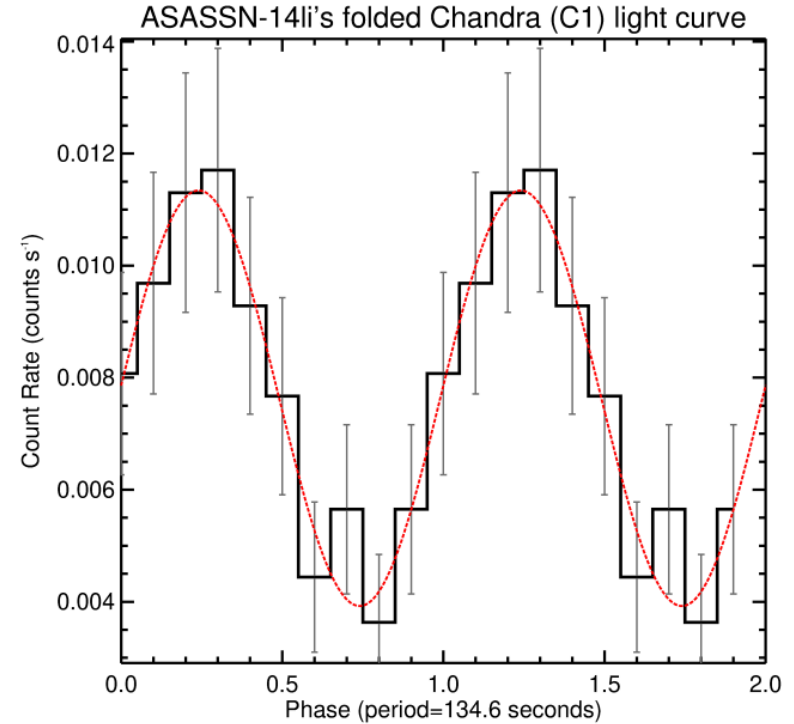
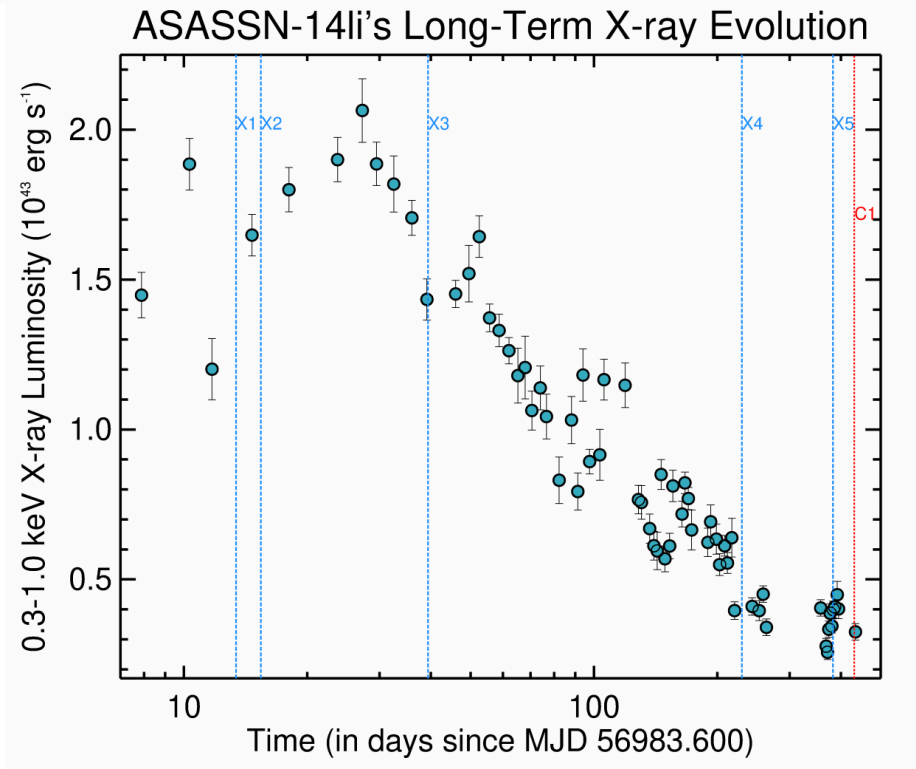


Models from Guillochon et. al. 2013



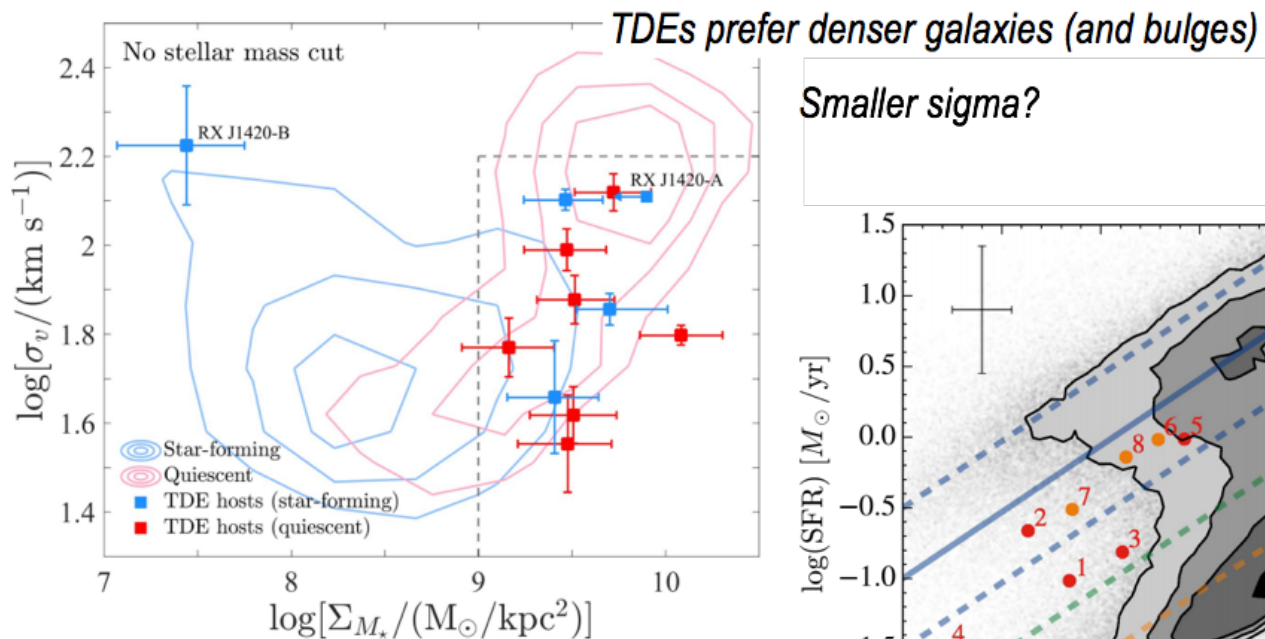
BH spin distribution

Disk is precessing every 134s – spin SMBH $a=0.5$



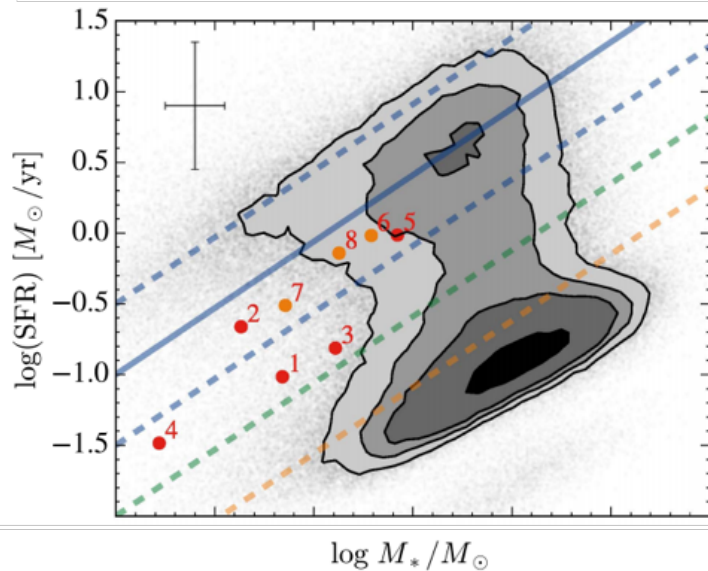
Pasham et. al. 2018

Host galaxy population



Graur et. al. 2018

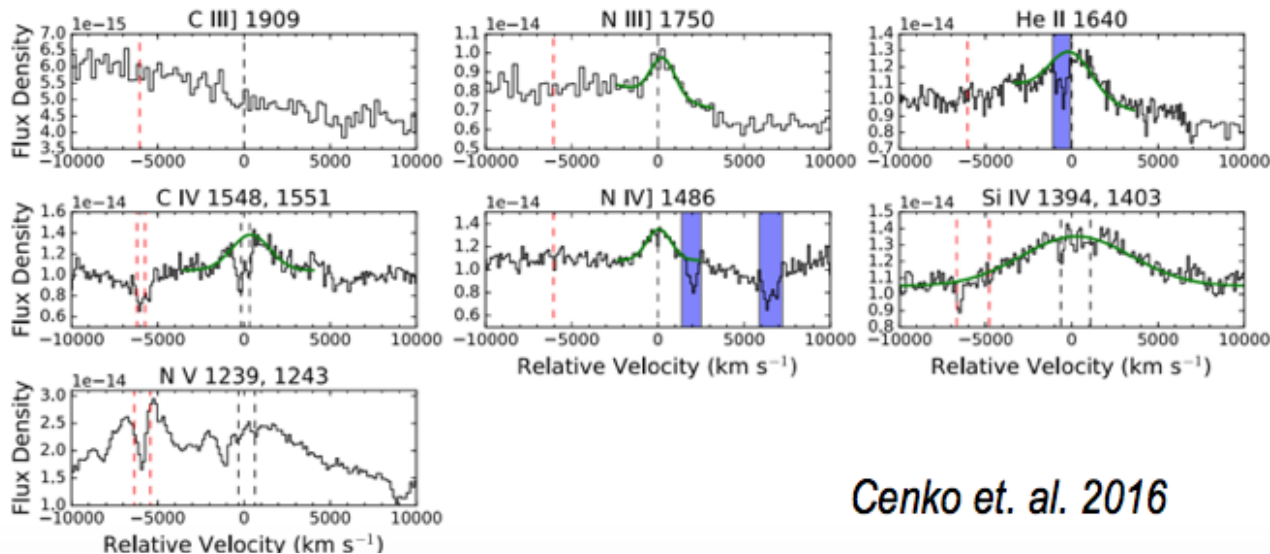
Smaller sigma?



Law-Smith et. al. 2017

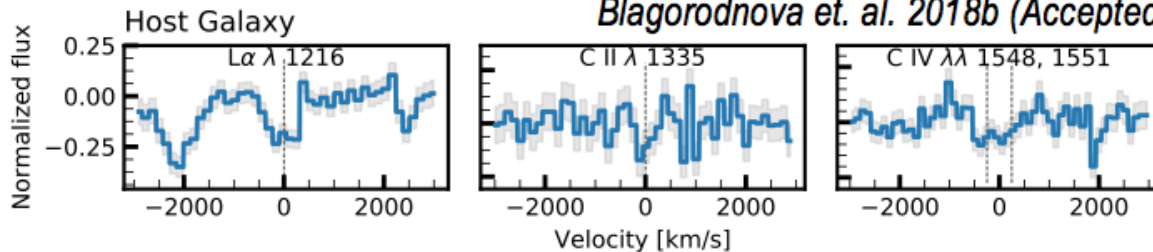
Gas properties in host galaxies

Add citation

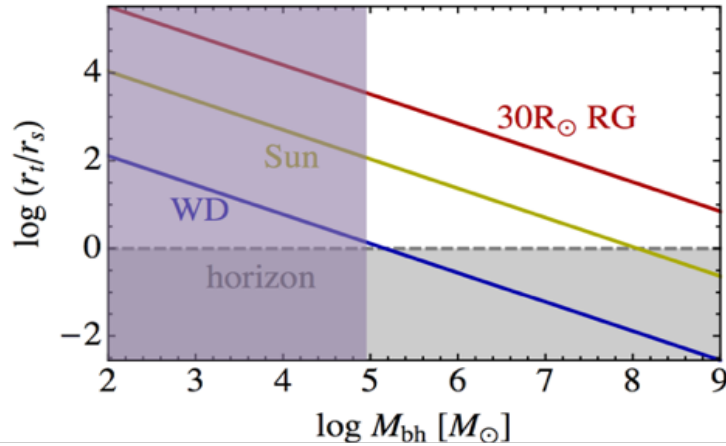


Cenko et. al. 2016

Blagorodnova et. al. 2018b (Accepted)



Exploration of alternative signatures of TDEs (I)

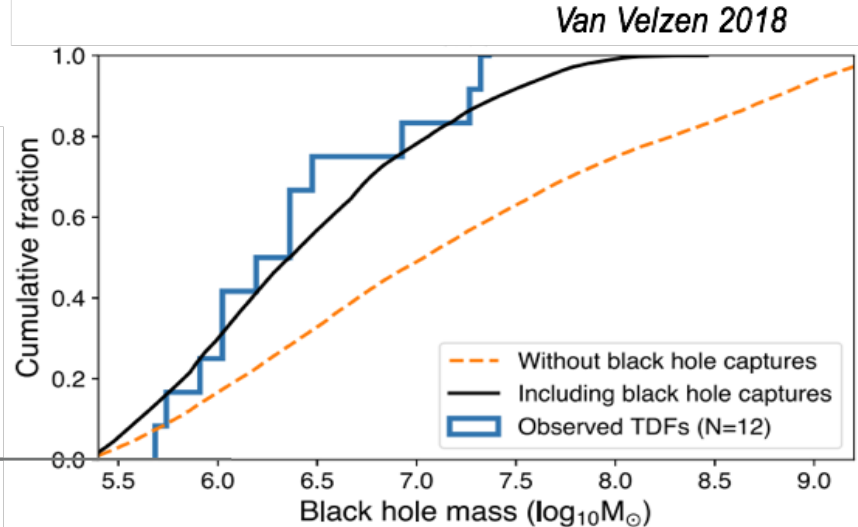


MacLeod et. al. 2014

Perley et. al. 2018
AT2018cow?

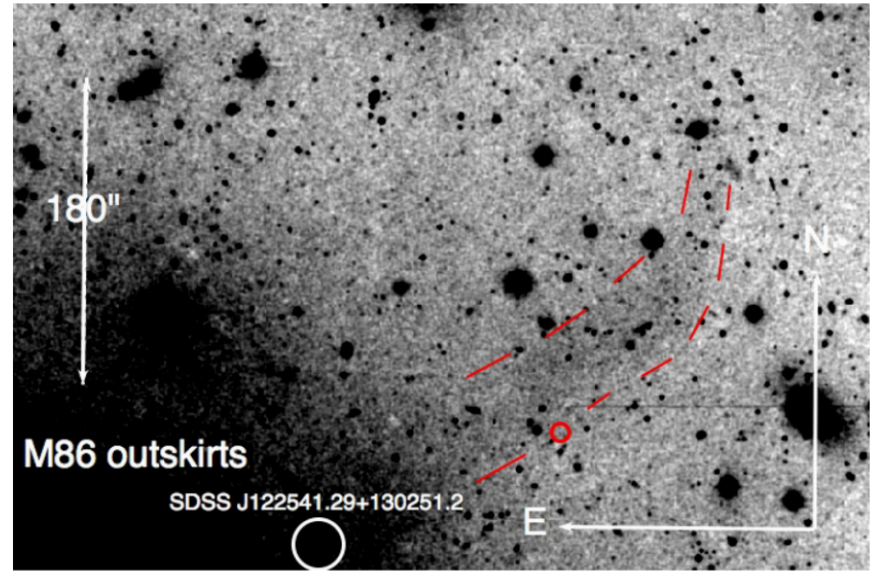
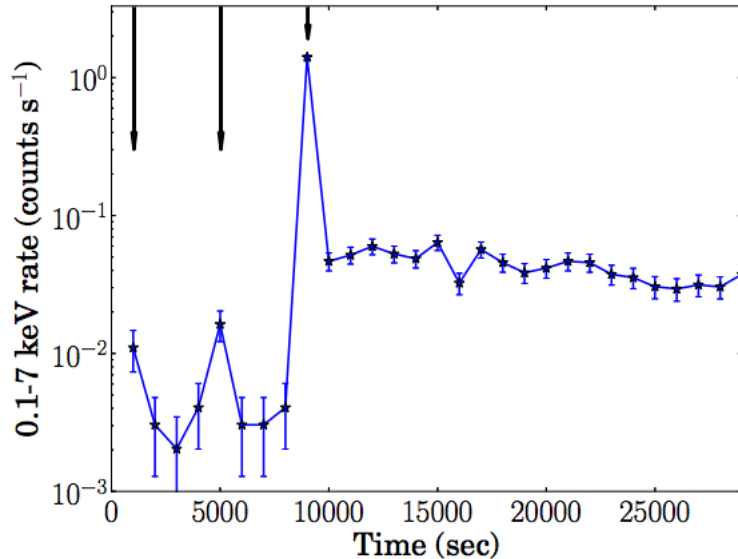


4.2



Exploration of alternative signatures of TDEs (II)

- Fast X-ray transients with quasi-periodic bursts. Eddington luminosity for a $10^{4.5} M_{\odot}$ IMBH?



Projects

Projects (I)

Prime TDA–MSS aspects for TDEs (before doing all the exciting science):

- MSS to support identification and classification of imaging–based TDE candidates (*SRG/eROSITA, ZTF, Subaru Transient Survey, MAXI, Tomoe Gozen, Black Gem*) either through follow–up (*Kyoto 3.8, SEDM*) or *pre–discovery host characterization (DESI, SDSS–V)*
- MSS to compile sample of host galaxies with well–constrained properties (*SDSS–V, DESI*)
- Multi–epoch MSS for spectroscopic selection of TDEs (*SDSS–V Black Hole Mapper*)

Projects (II) – Spectroscopic alerts

- Use spectroscopic surveys to discover TDEs (among other transients) in the galaxies observed by DESI, PFS, SDSS V projects.
 - Set of libraries to match transients in galaxies (SNe, TDEs, lensed SN Ia...)
 - Raise spectroscopic alerts

Projects – RCF for TDEs

- Redshift Completeness Fraction for TDE
 - Include nuclear transients, including AGN
 - Establish a flux / magnitude variability to allow for the sample

