

# Searching for Variable Dwarf Galaxies with the Young Supernova Experiment

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The Transient and Variable Universe

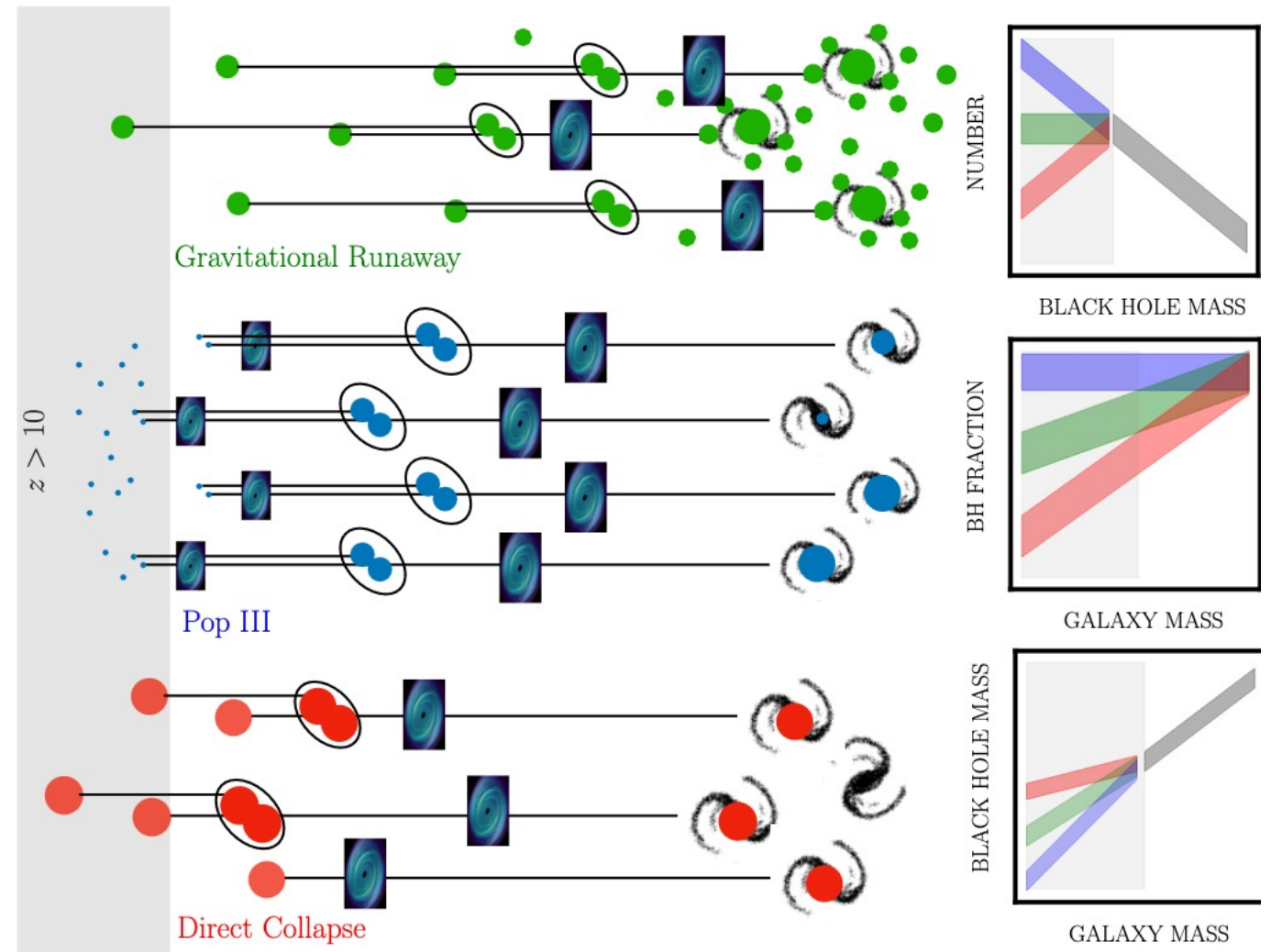
June 20, 2023



**WASHINGTON STATE**  
UNIVERSITY

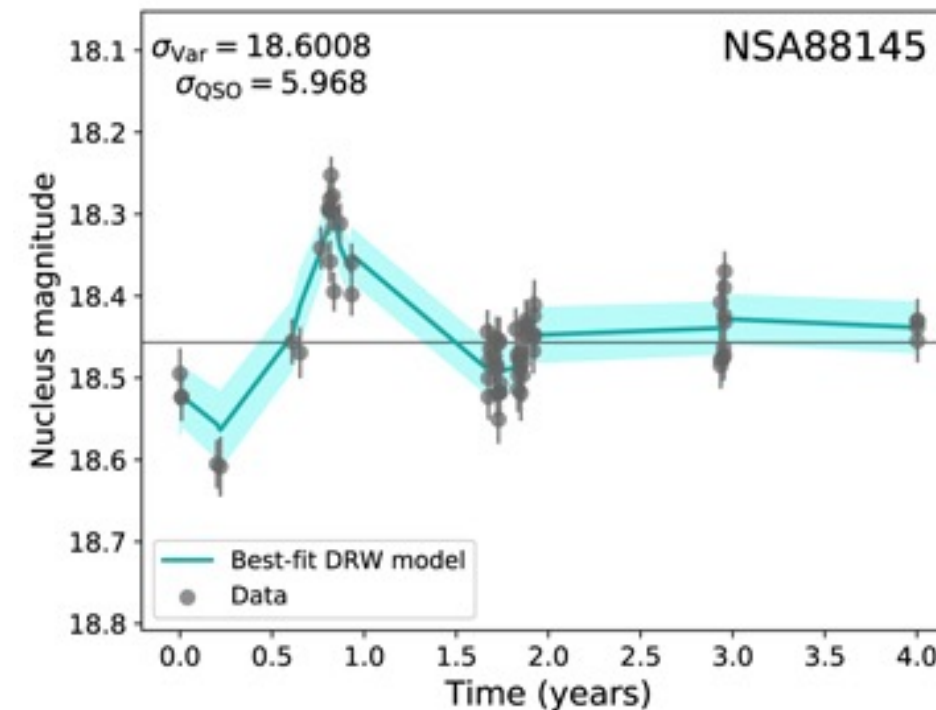
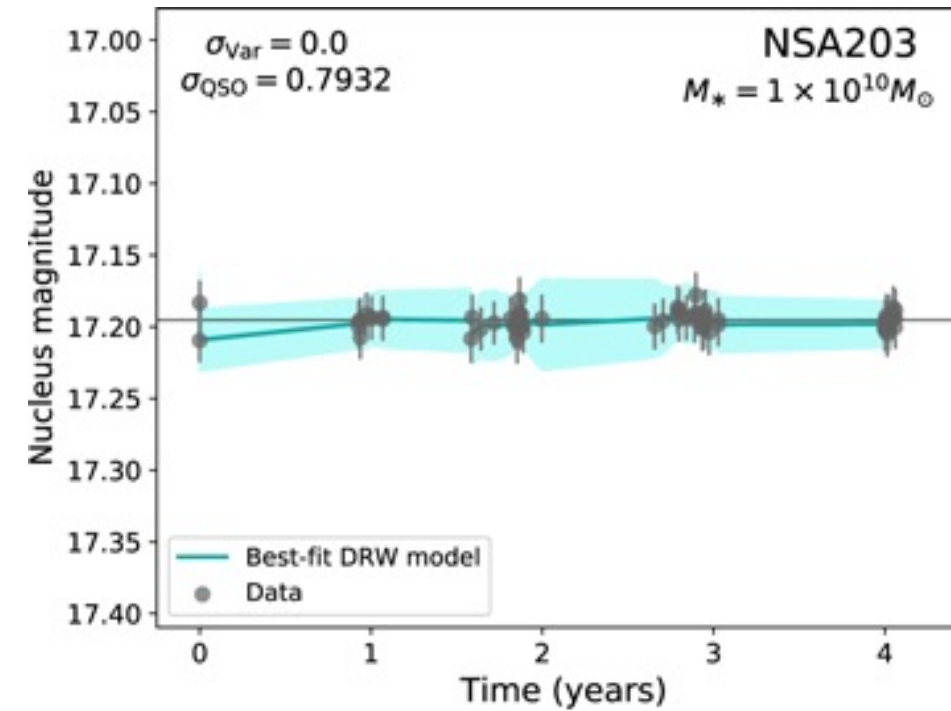
# Supermassive & IMBHs

- SMBH formation unconstrained
- Low-mass difference
- Indirect detection



# AGN Variability

- Stochastic
- Damped random walk<sup>†</sup>

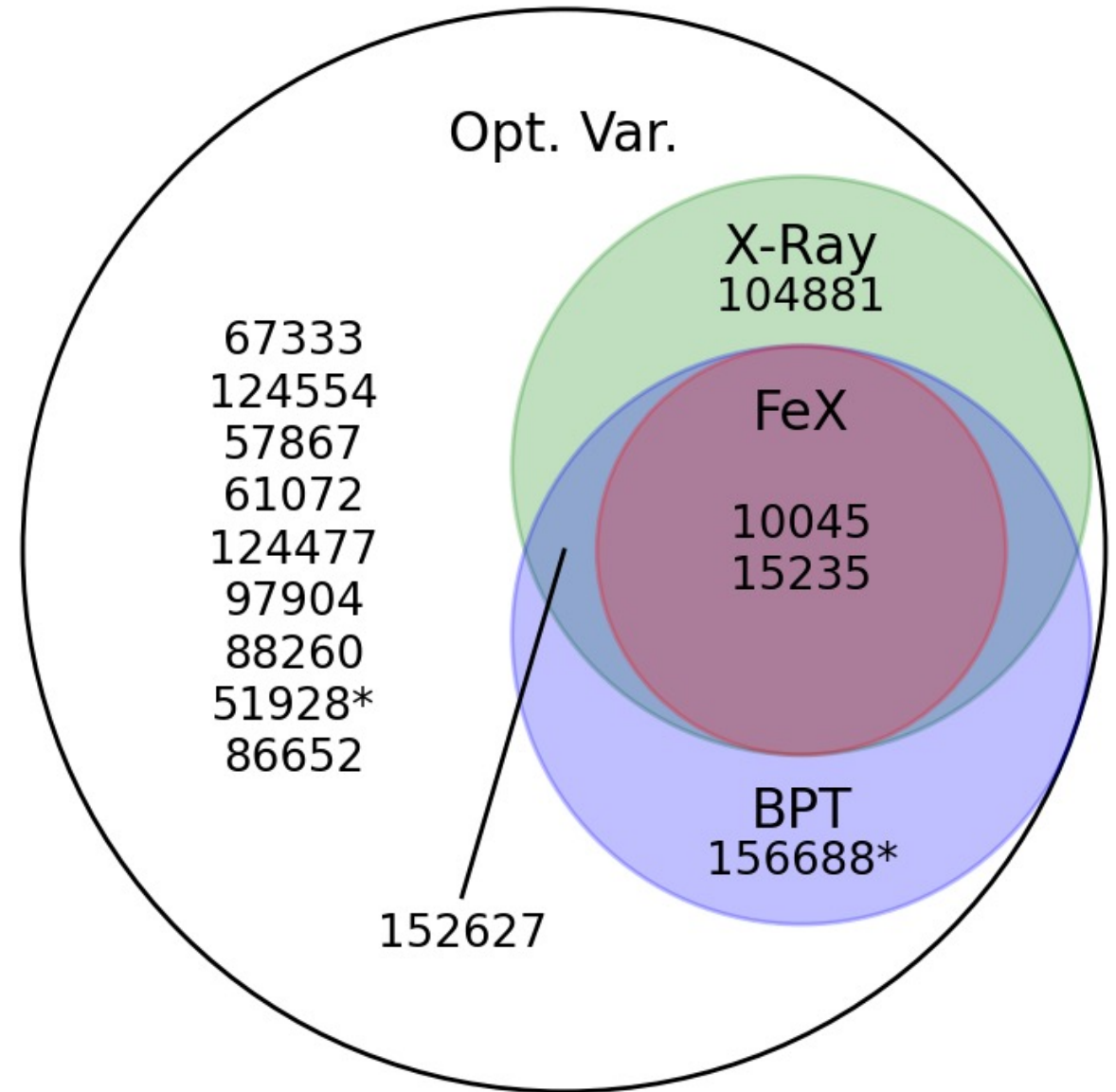
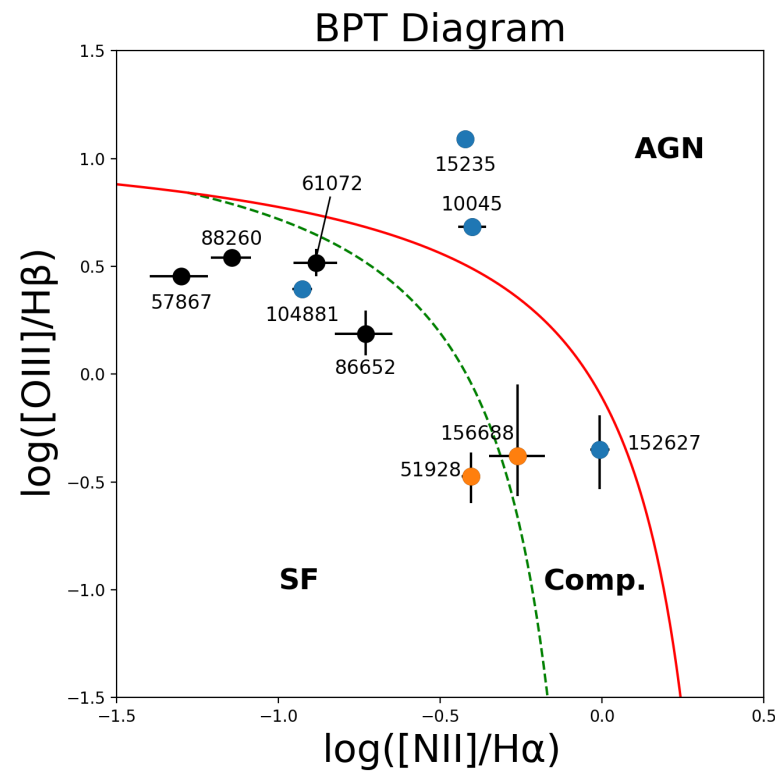


<sup>†</sup> Kelly et al. 2009

Baldassare et al. 2020

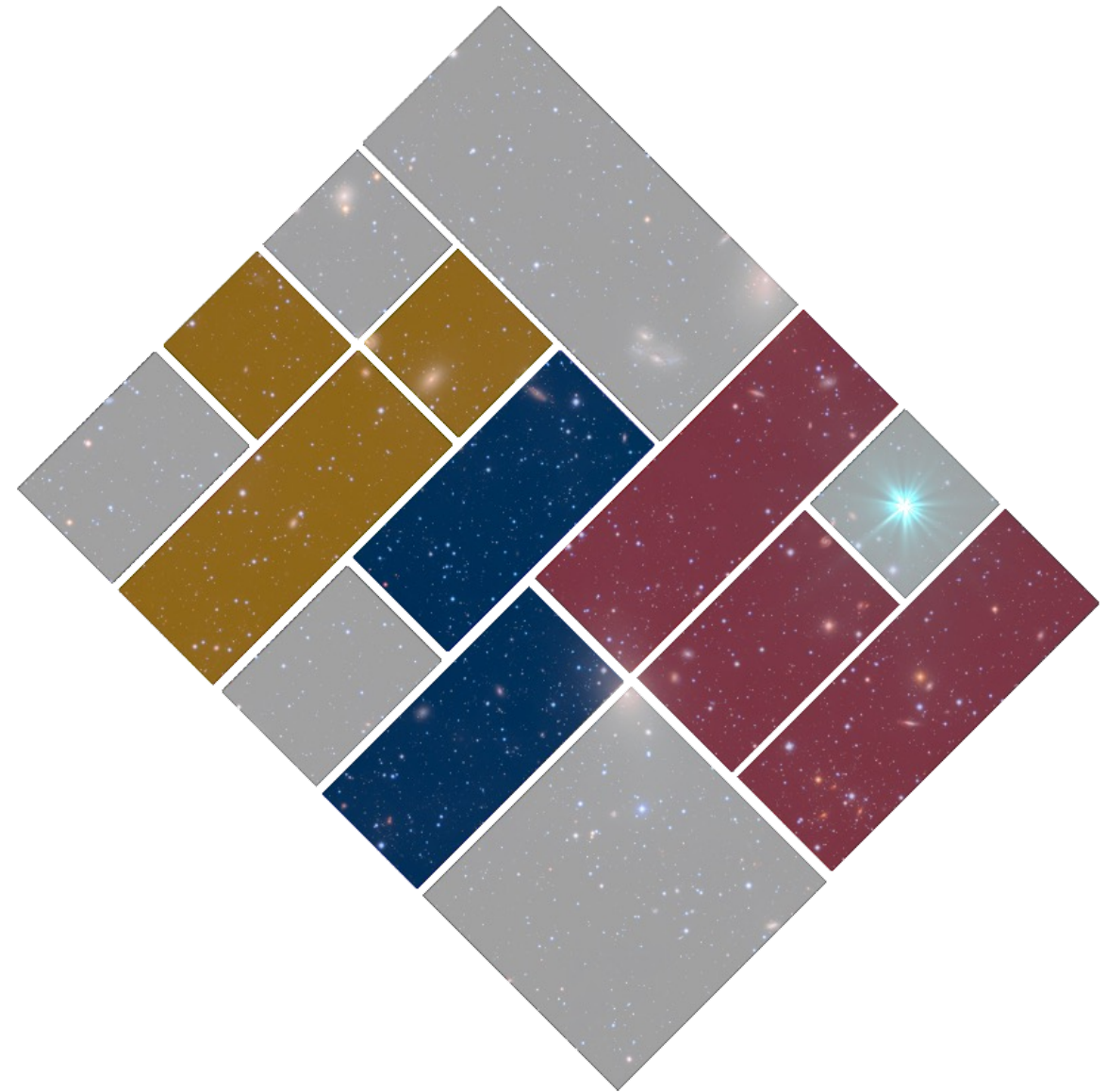
# Variability for AGN Detection

- Fairly cheap
- Less-biased against dwarfs



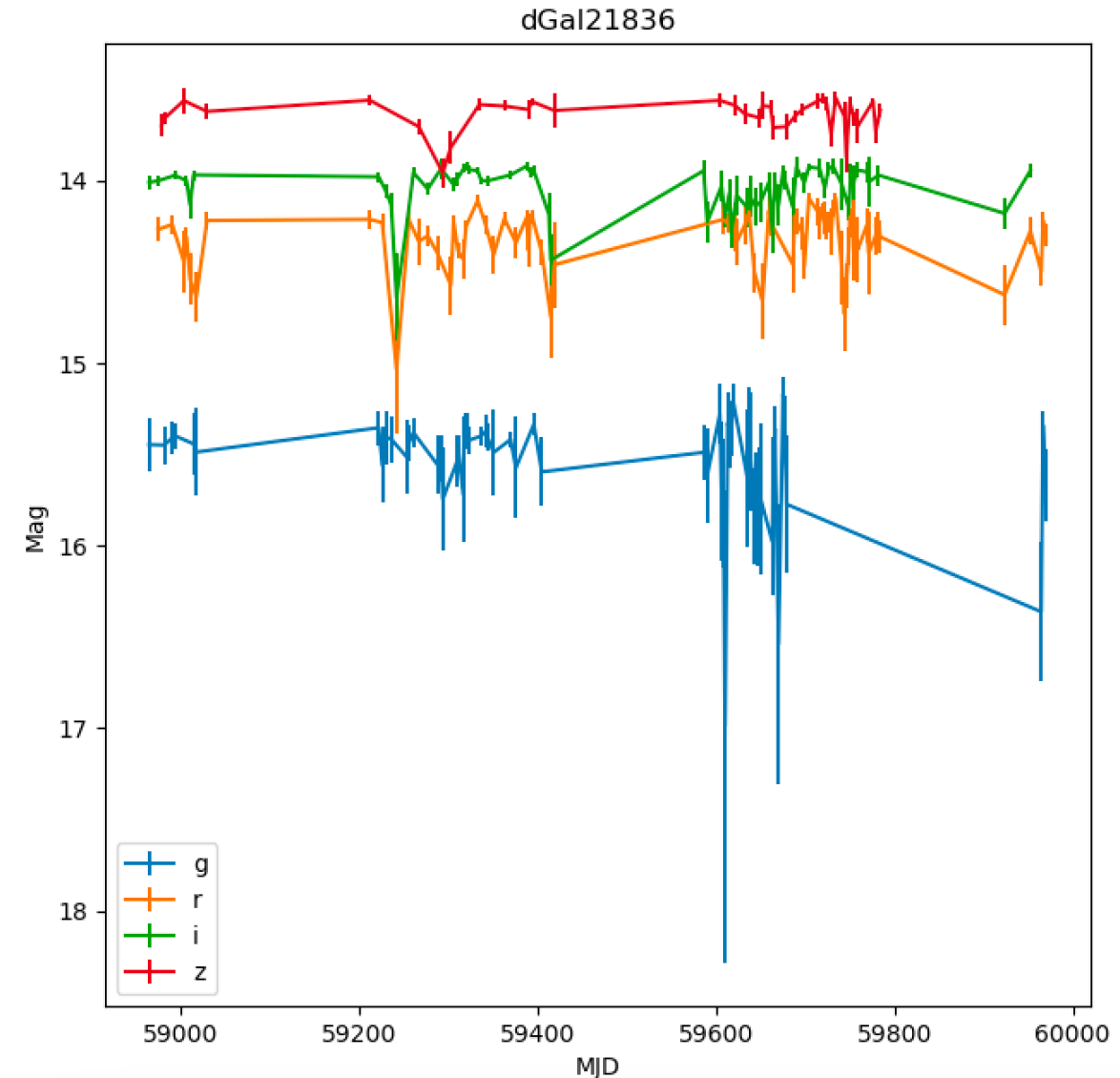
# The Young Supernova Experiment

- PanSTARRS
- 1512 deg<sup>2</sup>
- 3-day cadence
- *griz* bands
  - Depth ~ 20.5-21.7



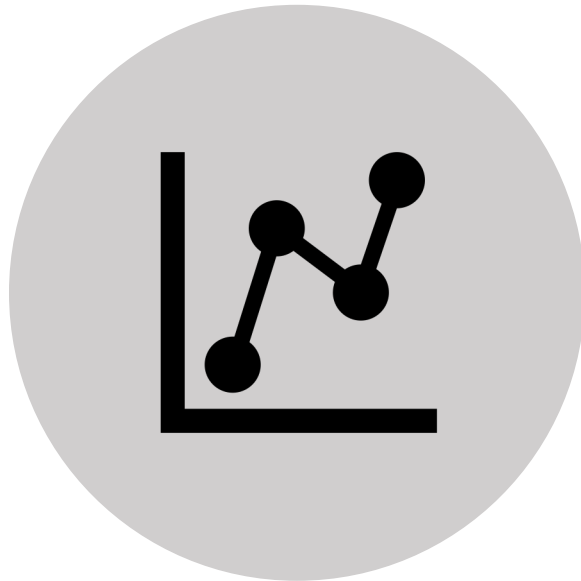
# YSE Light Curves

- > 55k targets in YSE fields
  - NSA, SDSS, GAMA
- Photometry pipeline
- QSO\_fit<sup>†</sup>
- Fractional variability<sup>†</sup>



<sup>†</sup> Butler et al. 2011, <sup>†</sup> Schleicher et al. 2019

# Preliminary Results



QSOs: 64 of 477



Max frac var: ~20



~10% occupation