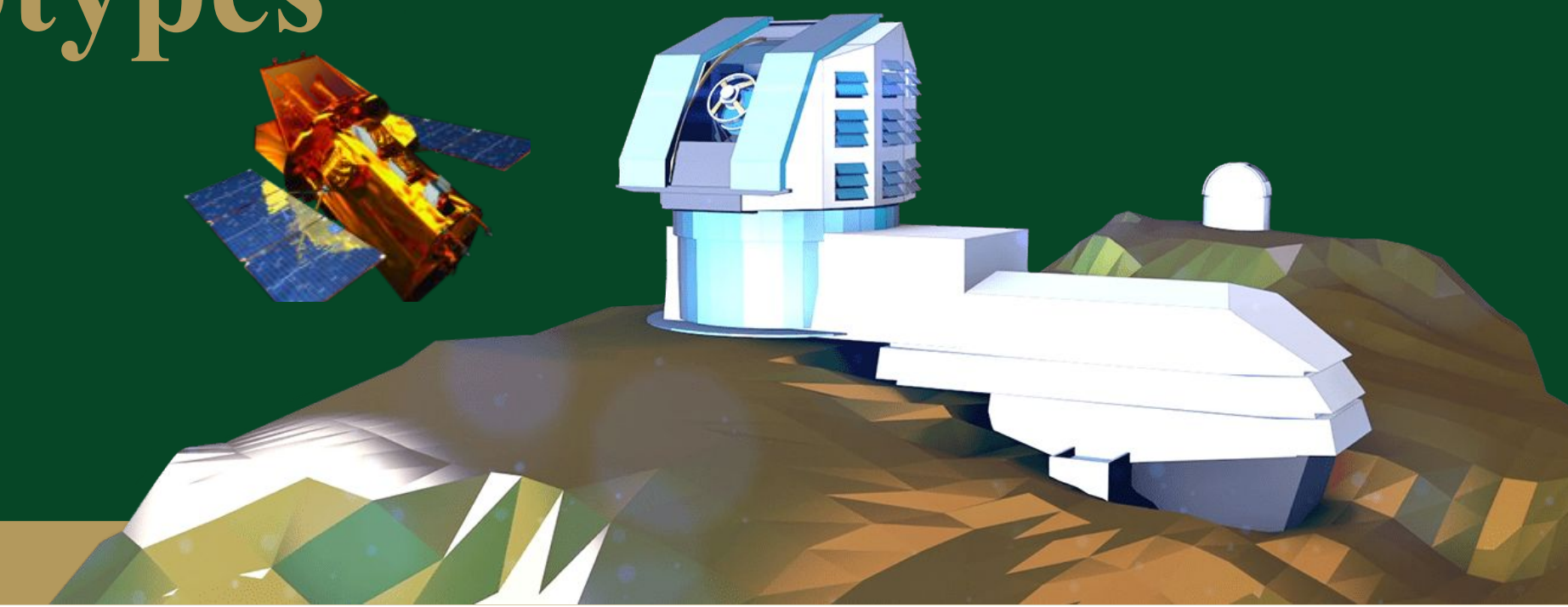




Ultraviolet Insights: Distinguishing Type Ia Supernova Subtypes with Two Decades of *Swift* UV Photometry

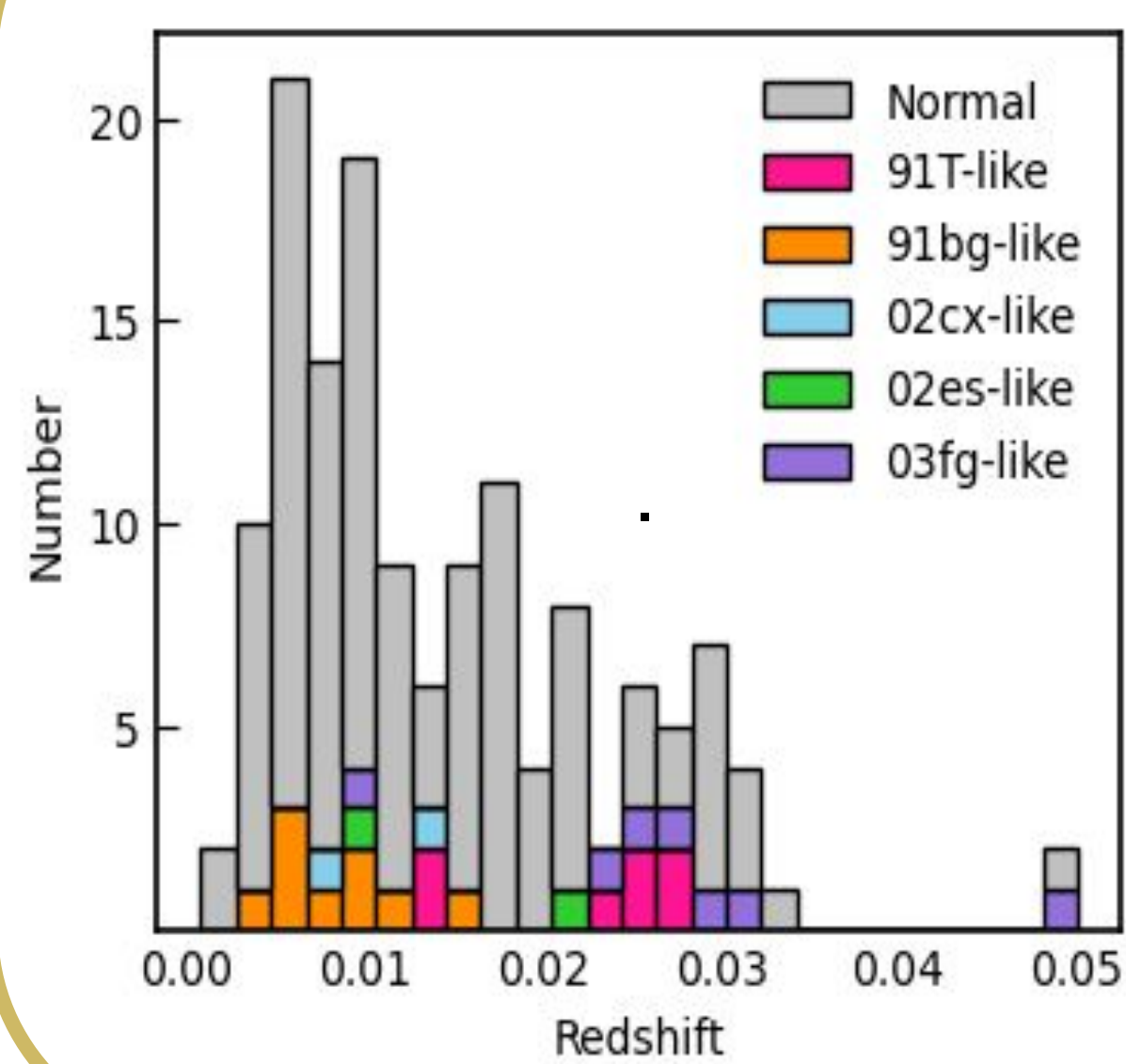
Presenter: **Grace Showerman**¹; Advisors: **Benjamin Shappee**², **Willem Hoogendam**², **Dhvanil Desai**²
¹Department of Physics and Astronomy, Michigan State University, East Lansing, MI 48824, USA
²Institute for Astronomy, University of Hawai'i, Honolulu, HI 96822, USA



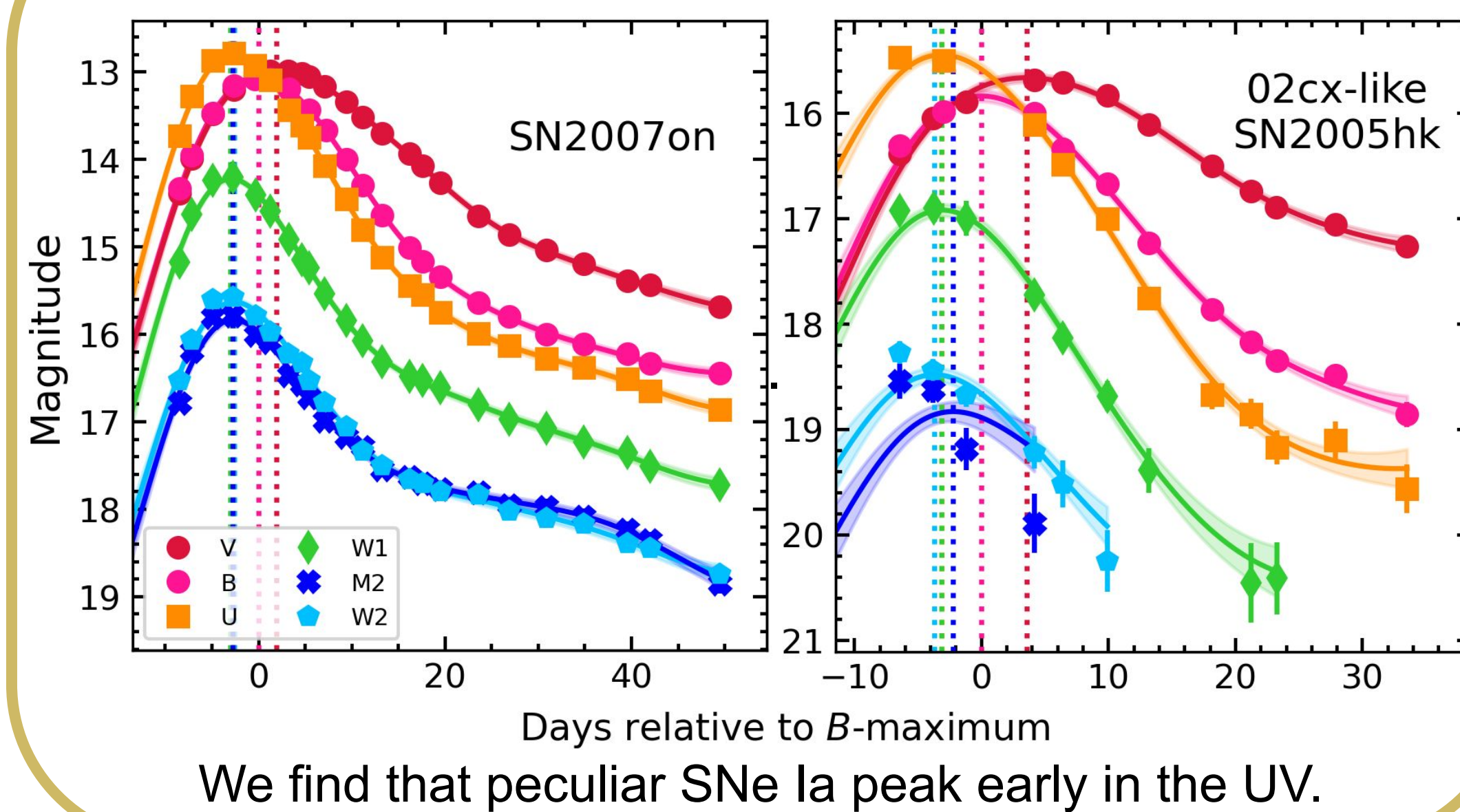
Swift UV Diagnostics

Using *Swift* observations of Type Ia supernovae (SNe Ia) in the local universe, we present a novel method for classifying SN Ia subtypes using peak timing and decline rate parameters derived from Gaussian Process light curve fitting.

Sample Selection



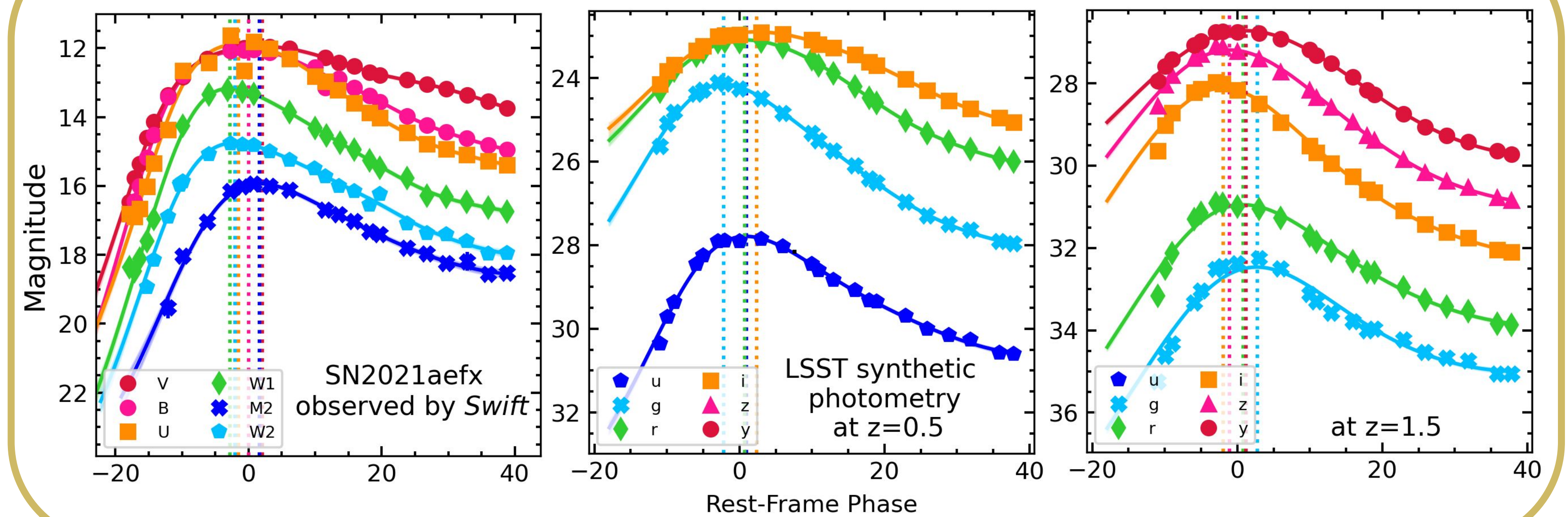
Gaussian Process Fitting



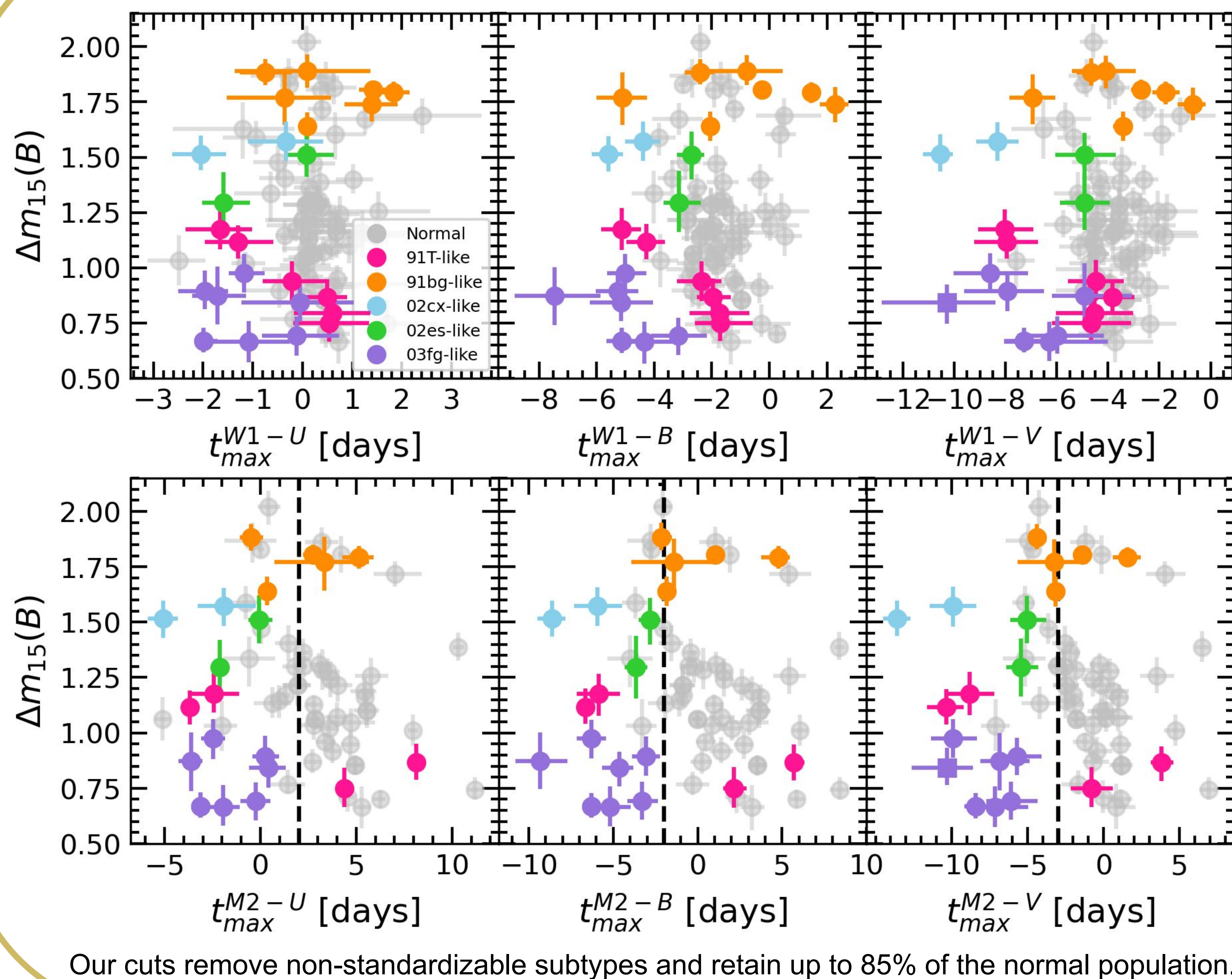
LSST Synthetic Photometry and Diagnostics

We mangle SN2011fe spectra with *Swift* observations to produce synthetic LSST photometry at redshifts $z \geq 0.5$ to evaluate the efficacy of our diagnostic at high redshift.

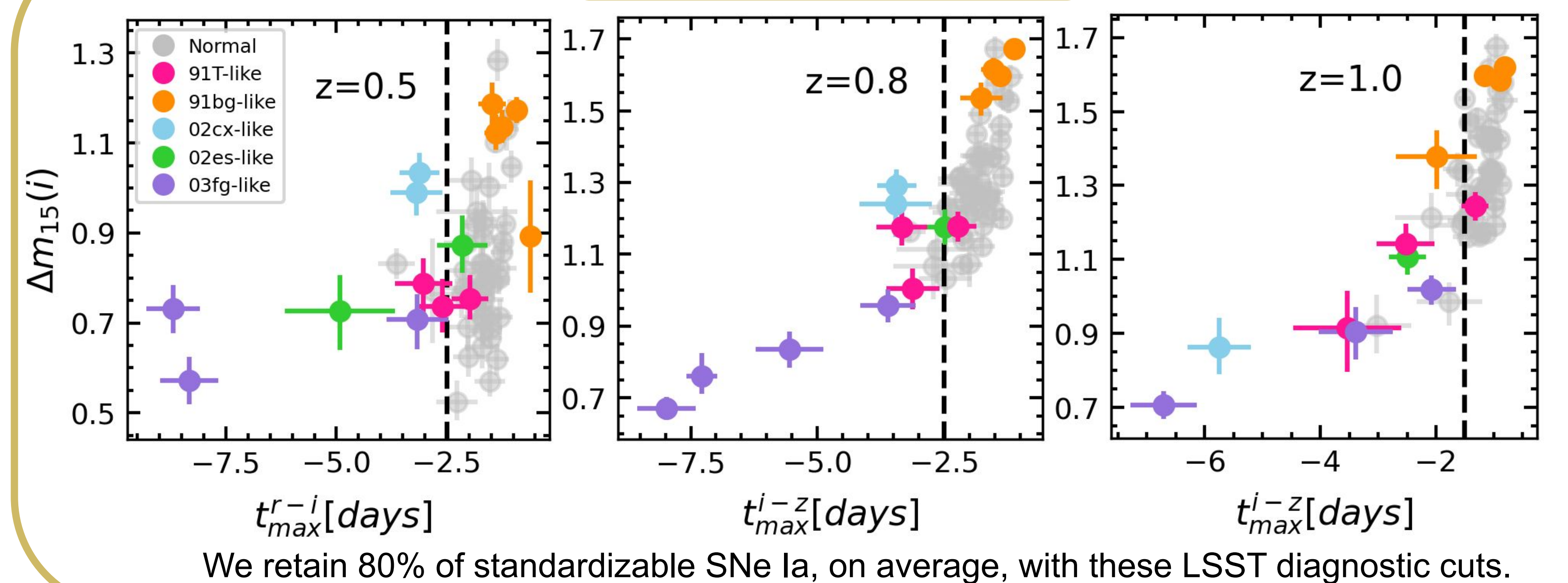
Synthetic LSST Photometry at $z \geq 0.5$



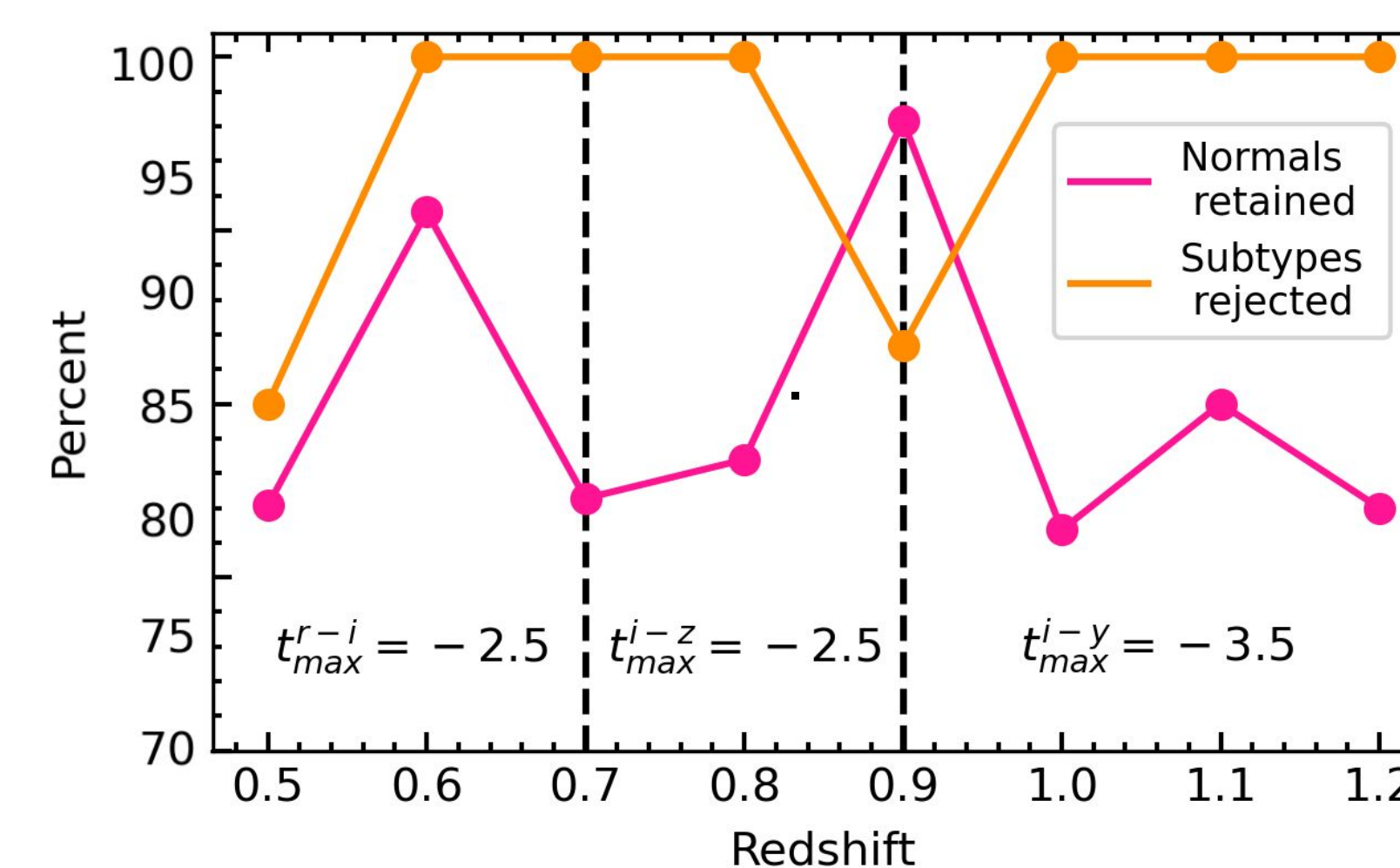
Swift UV Diagnostics and Standardizability Cuts



LSST Diagnostics



Standardizability at High Redshift



References

- Brown, P.J., Breeveld, A.A., Holland, S., Kuin, P., & Pritchard, T. 2014, *Ap&SS*, 354, 89.
- NASA/Goddard Space Flight Center. *Illustration of Swift*. Retrieved from <https://swift.gsfc.nasa.gov>
- SLAC National Accelerator Laboratory. *Illustration of Vera Rubin Observatory*. Retrieved from <https://www6.slac.stanford.edu/lst>