

Processing M. Hakan Ozsarac
Science NASA, ESA, CSA, STScI

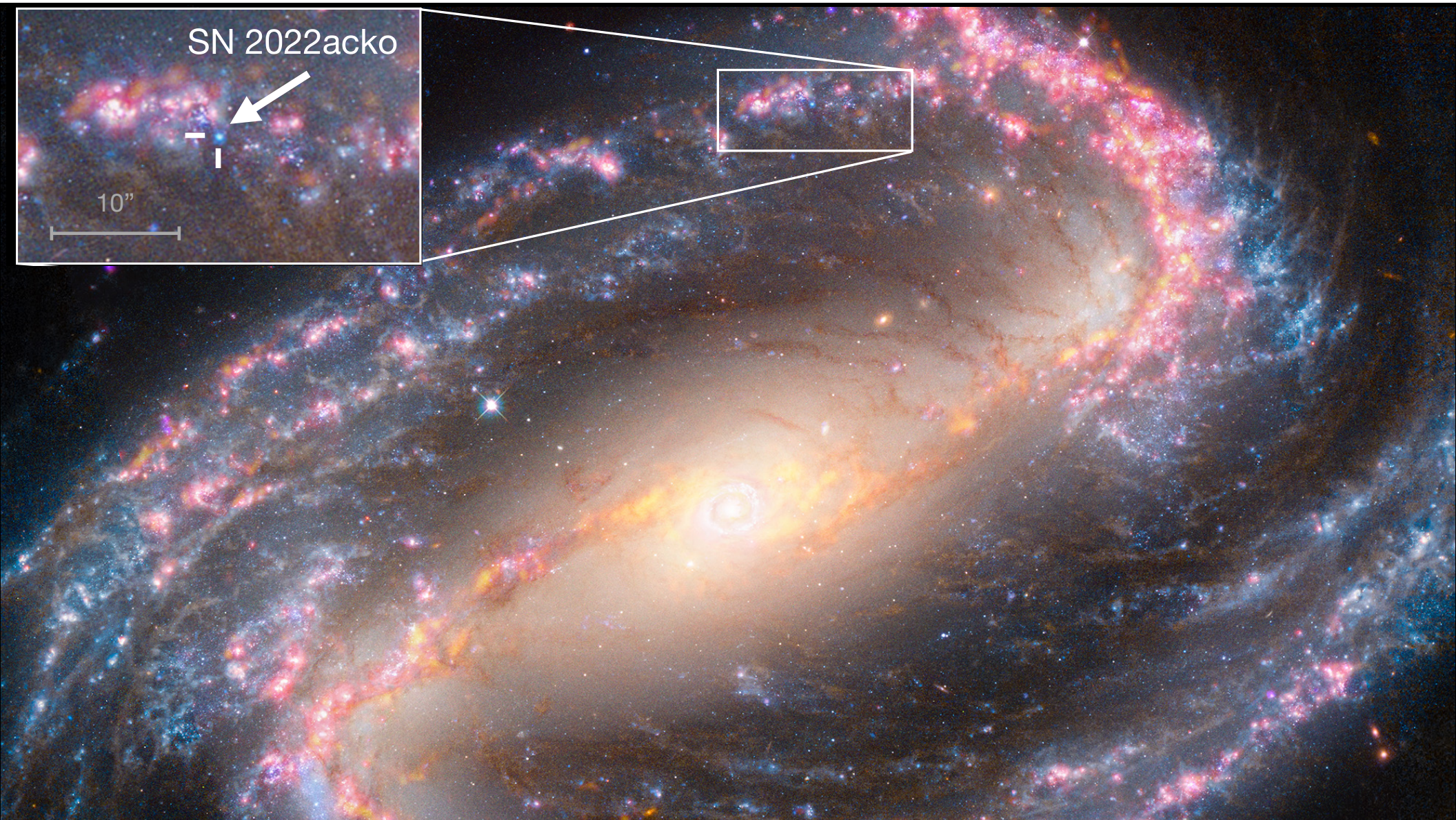
GATHERING EARLY UV OBSERVATIONS OF TYPE II SUPERNOVAE

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University of Arizona*

DLT40, GSP

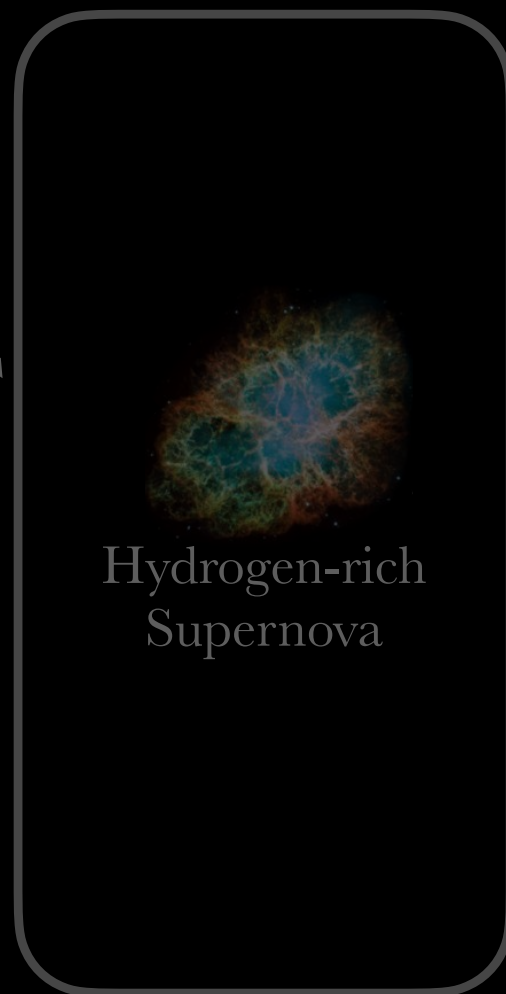
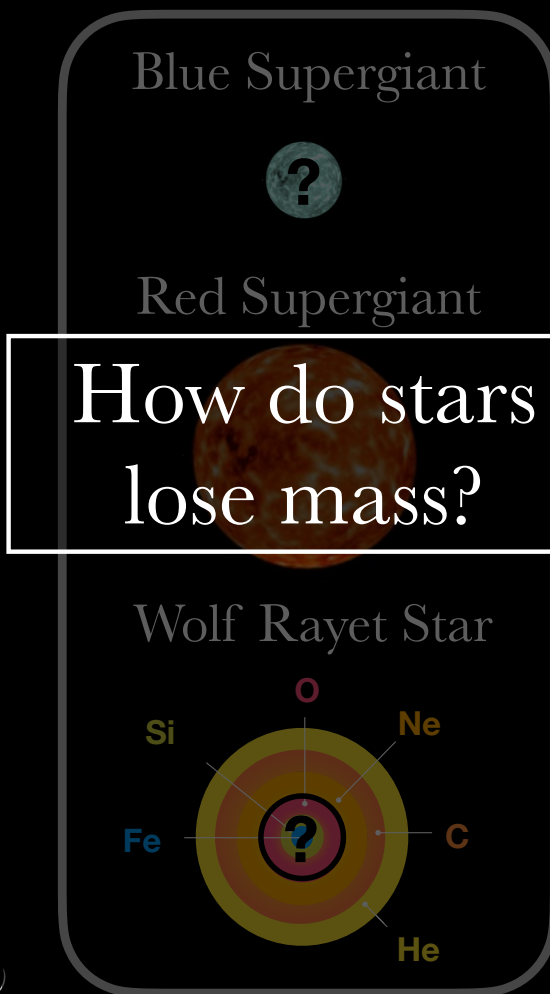
PC: M. Haken Ozsarac



SN 2022acko

10''

MASSIVE STAR EVOLUTION

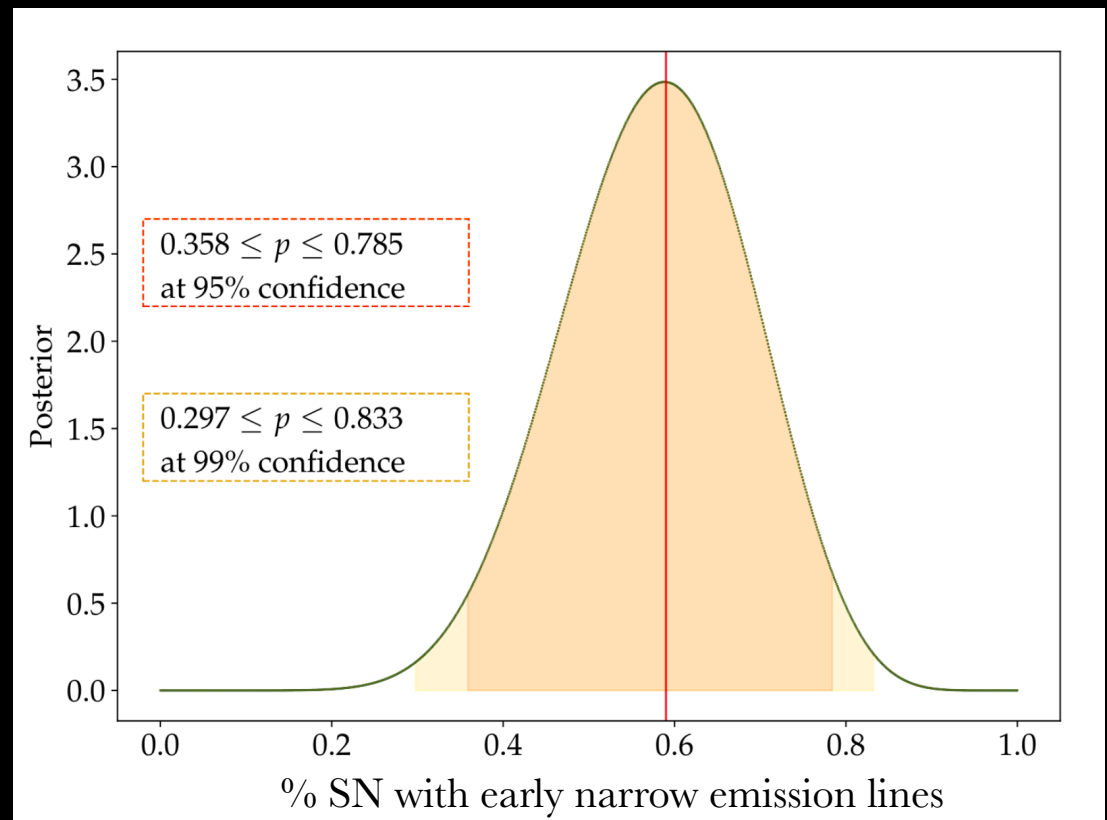


Quiescent RSG Mass Loss

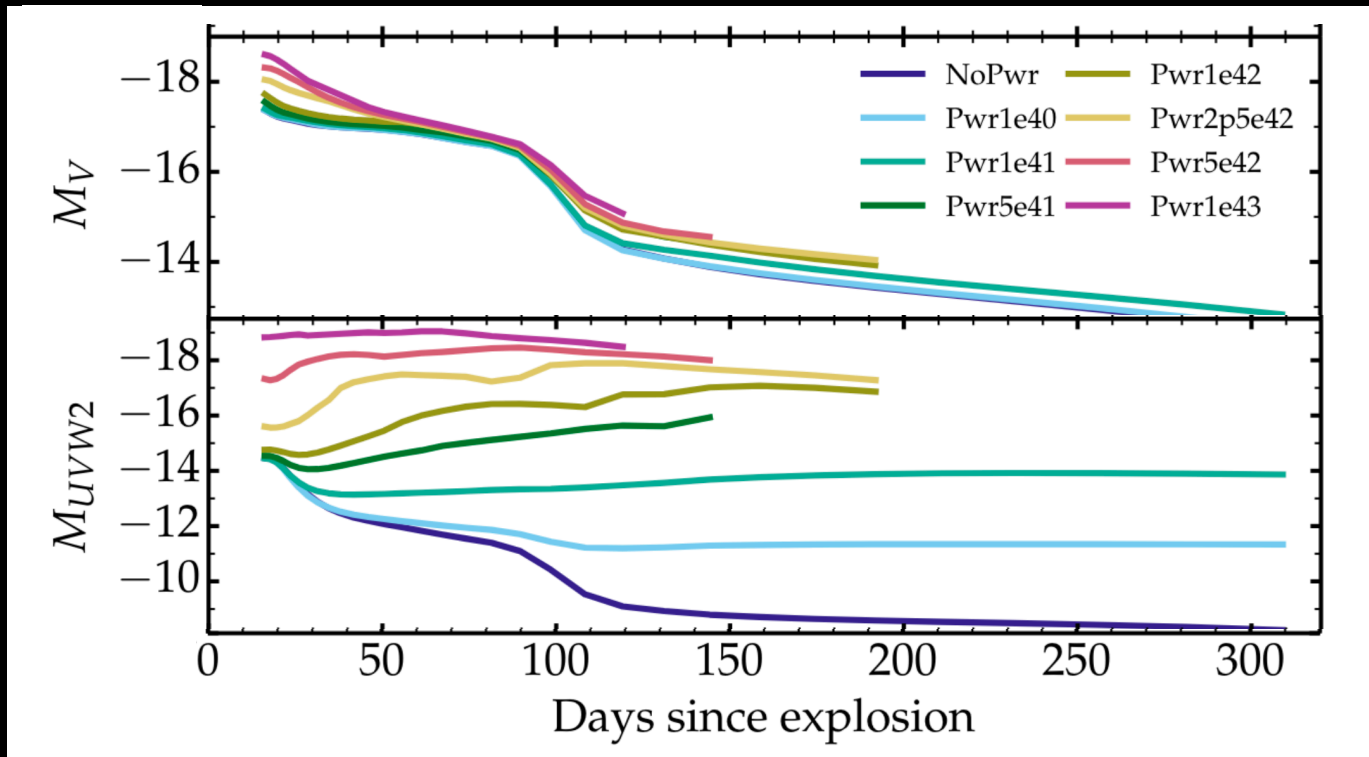
$$10^{-6} M_{\odot} / \text{yr}$$

Supernova Evidence for RSG Outburst/Superwind

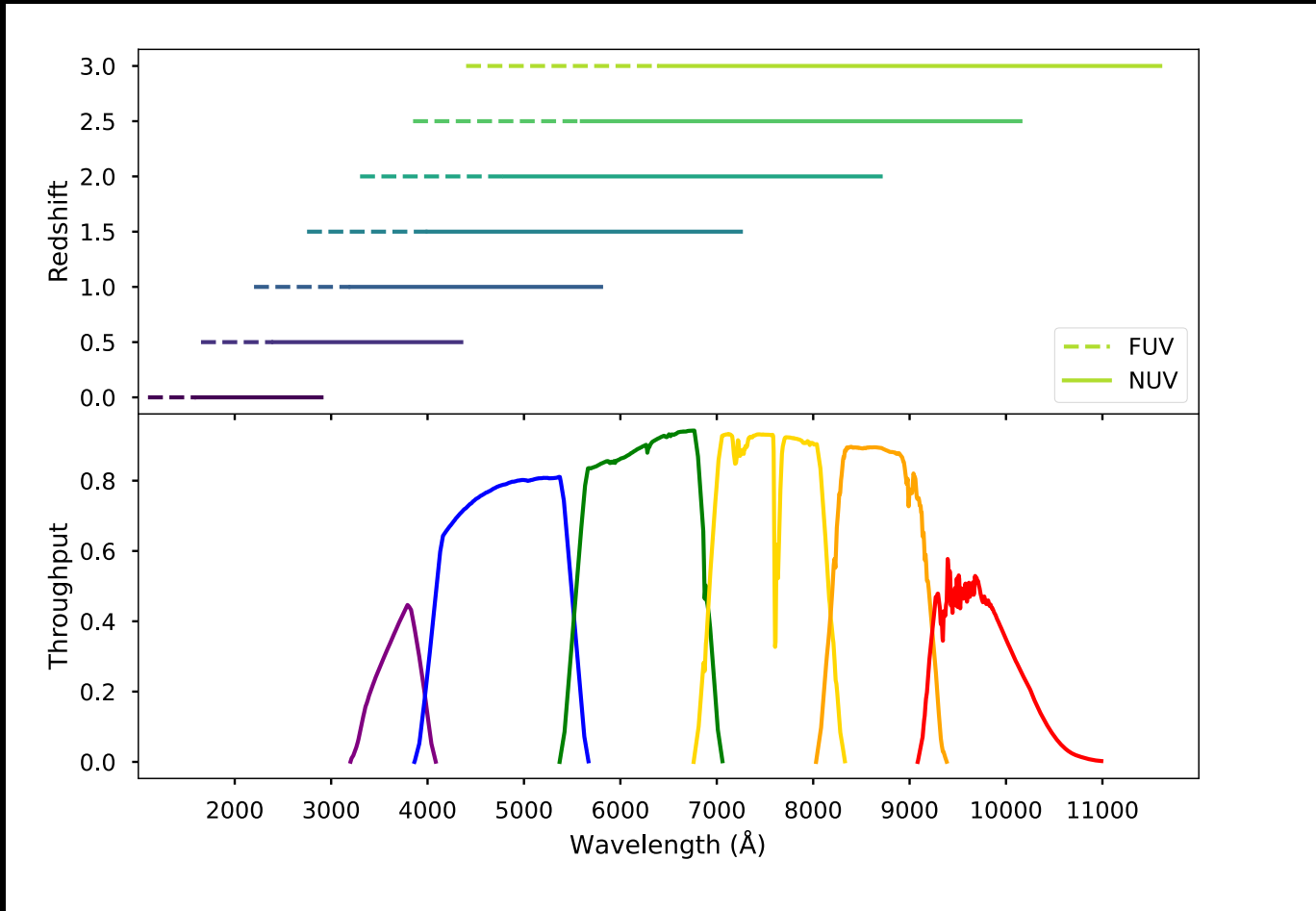
- Rapid lightcurve rise
- Early narrow emission
- Late narrow emission



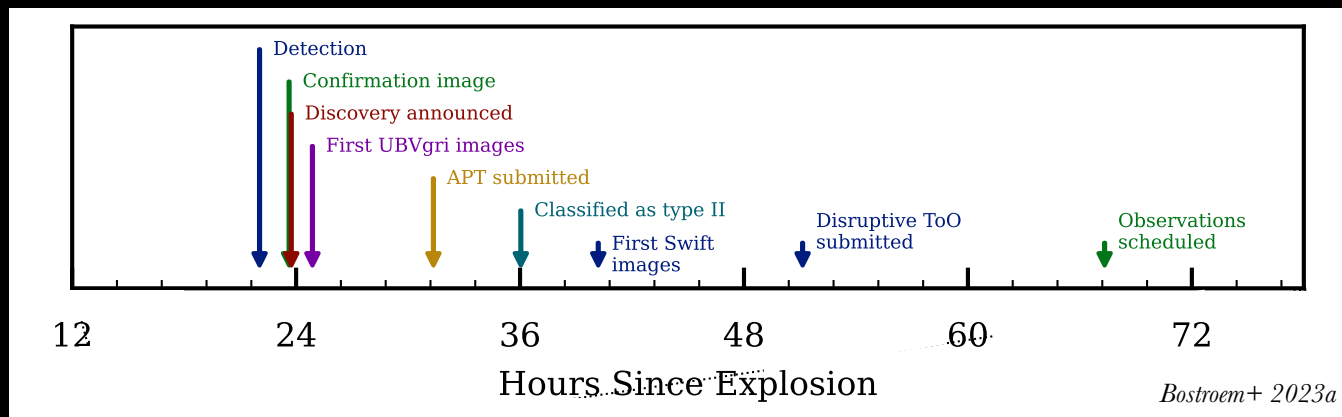
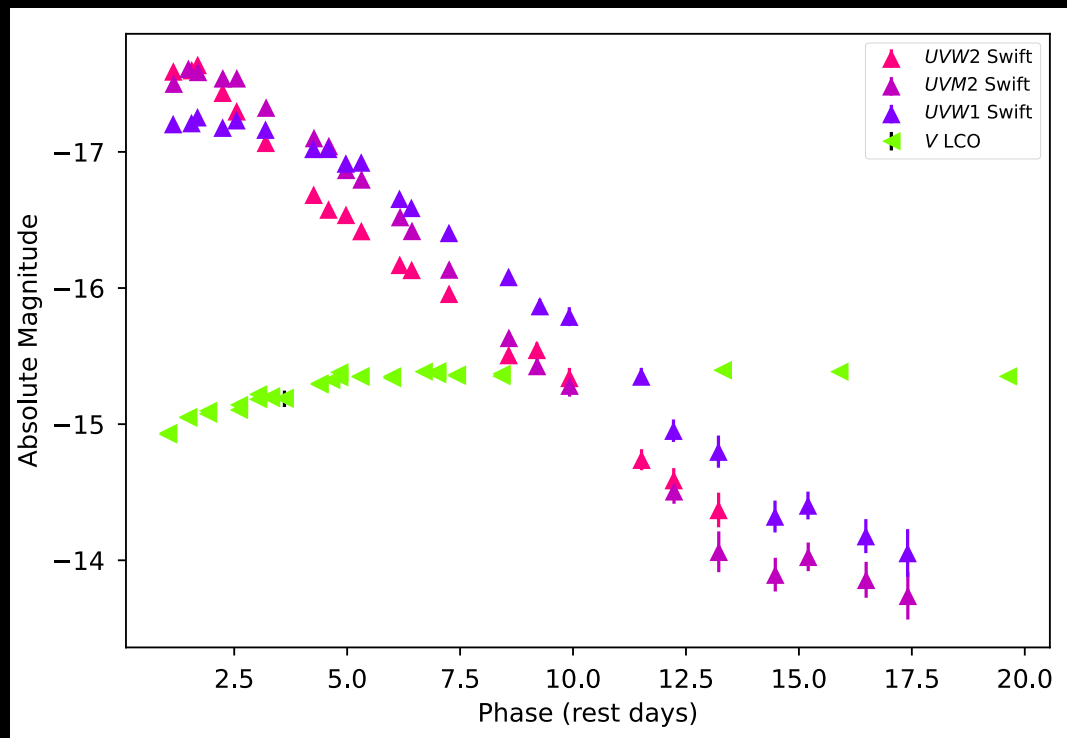
UV as a Probe of Mass Loss



Essential to Interpret the High Redshift Universe



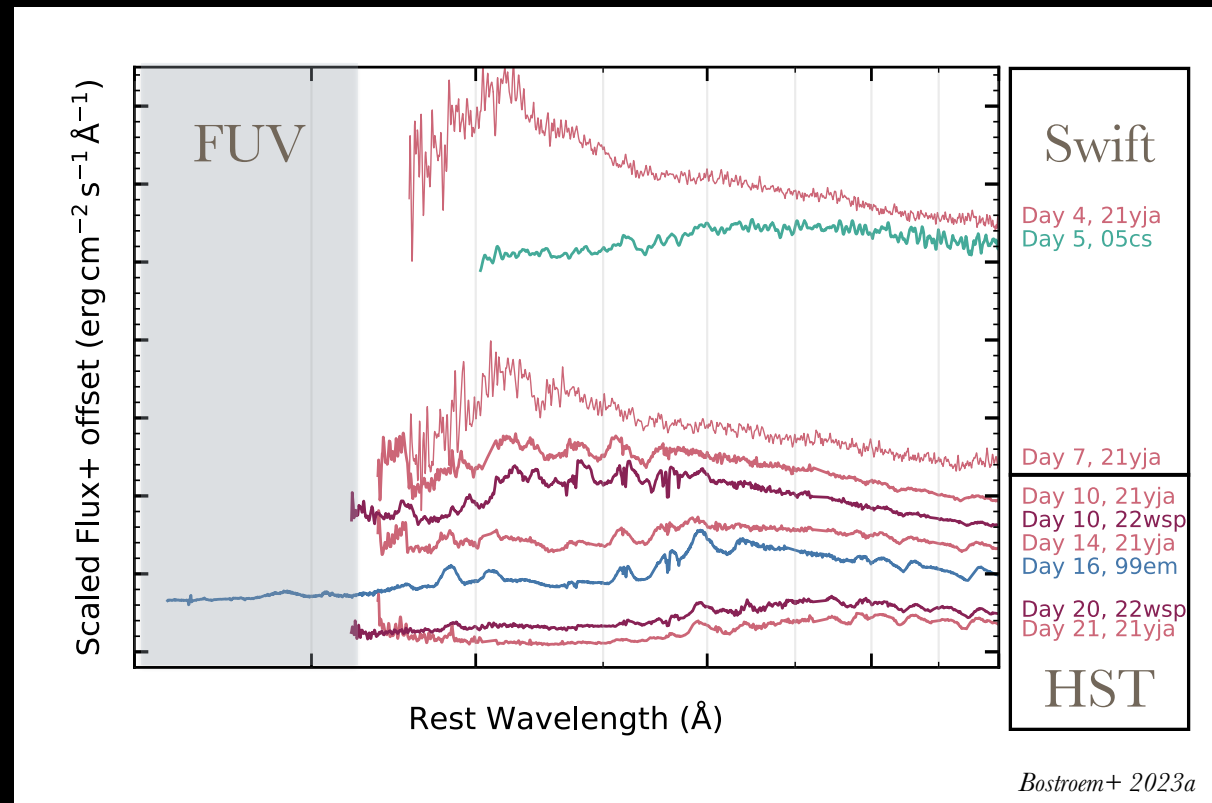
Why is this hard?



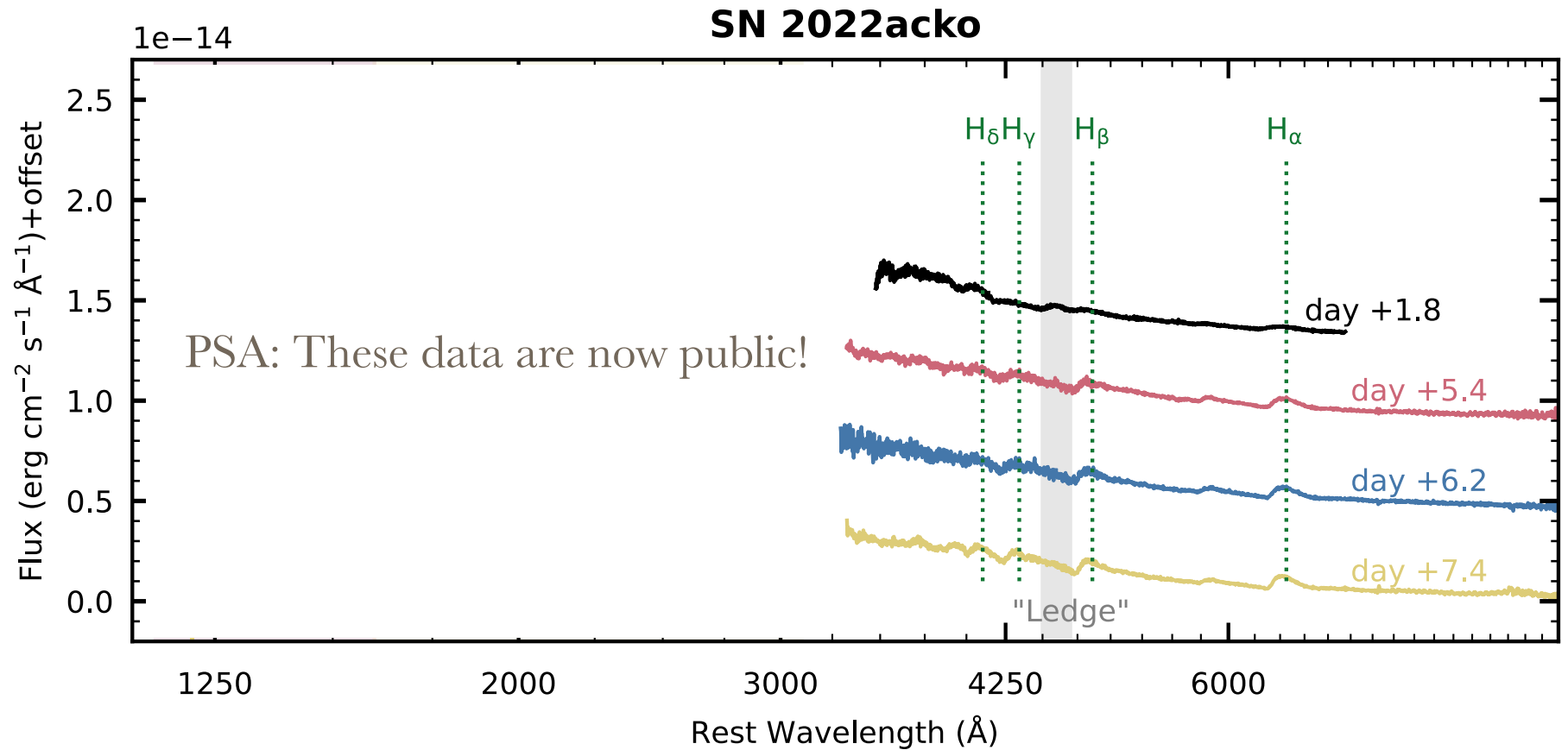
Lack High Quality UV Observations

Earliest Type II Observations:

- SN 1979C (interacting, IUE)
- SN 1987A (compact progenitor, IUE)
- SN 1999em (day 16, HST)
- SN1998S (day 13, HST)

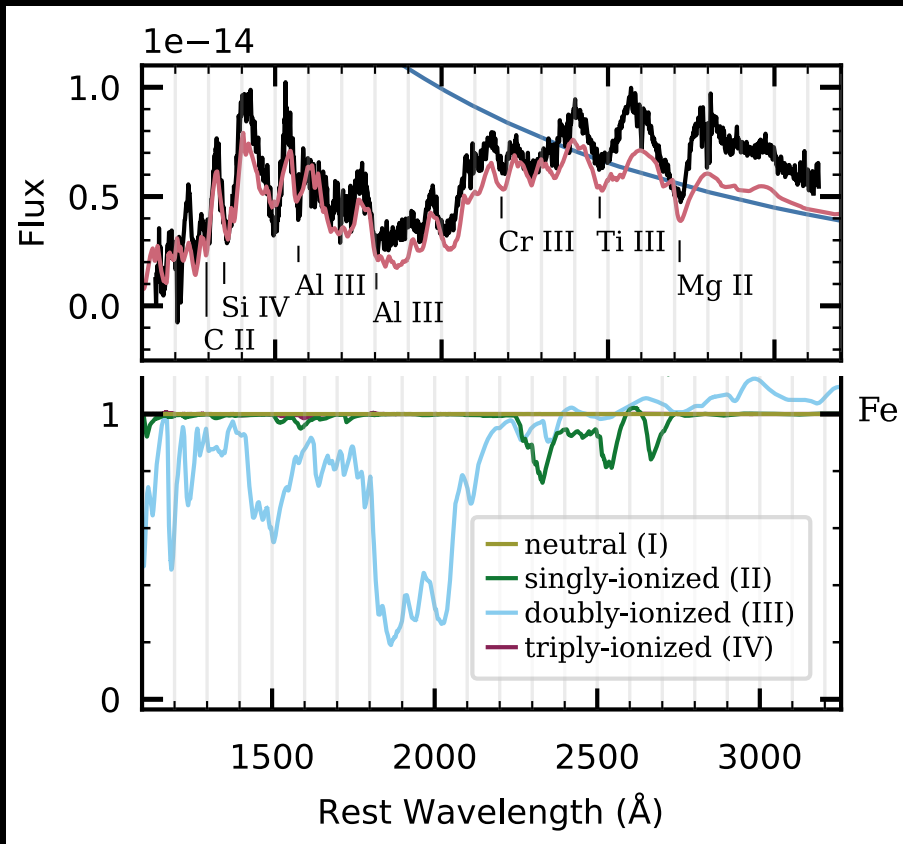


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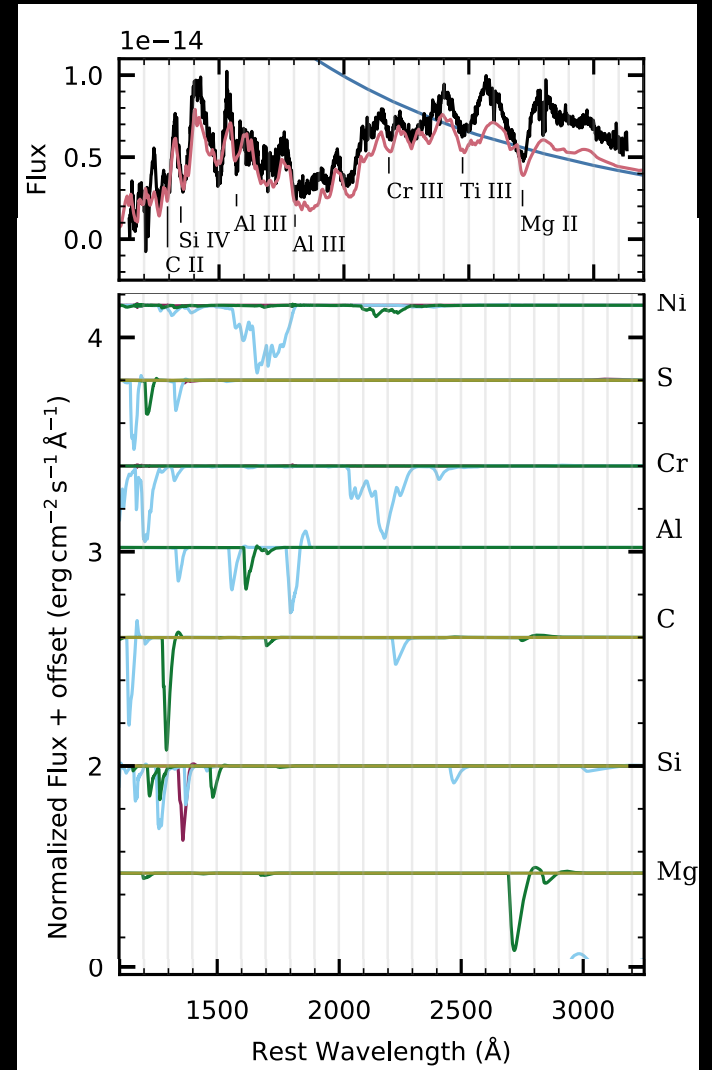


Identify metal ions

First test of this modeling framework at this phase

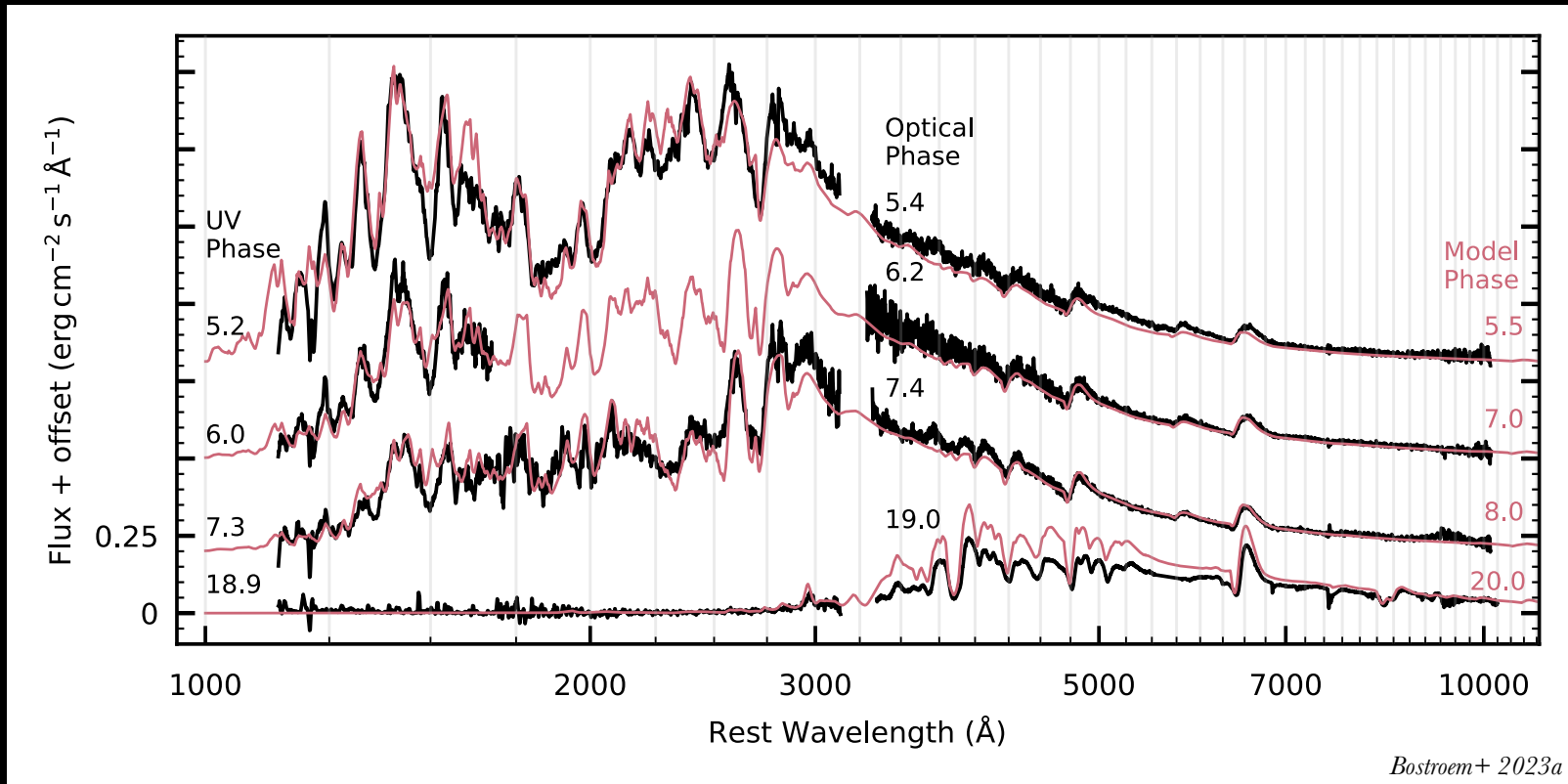


Bostroem+ 2023a

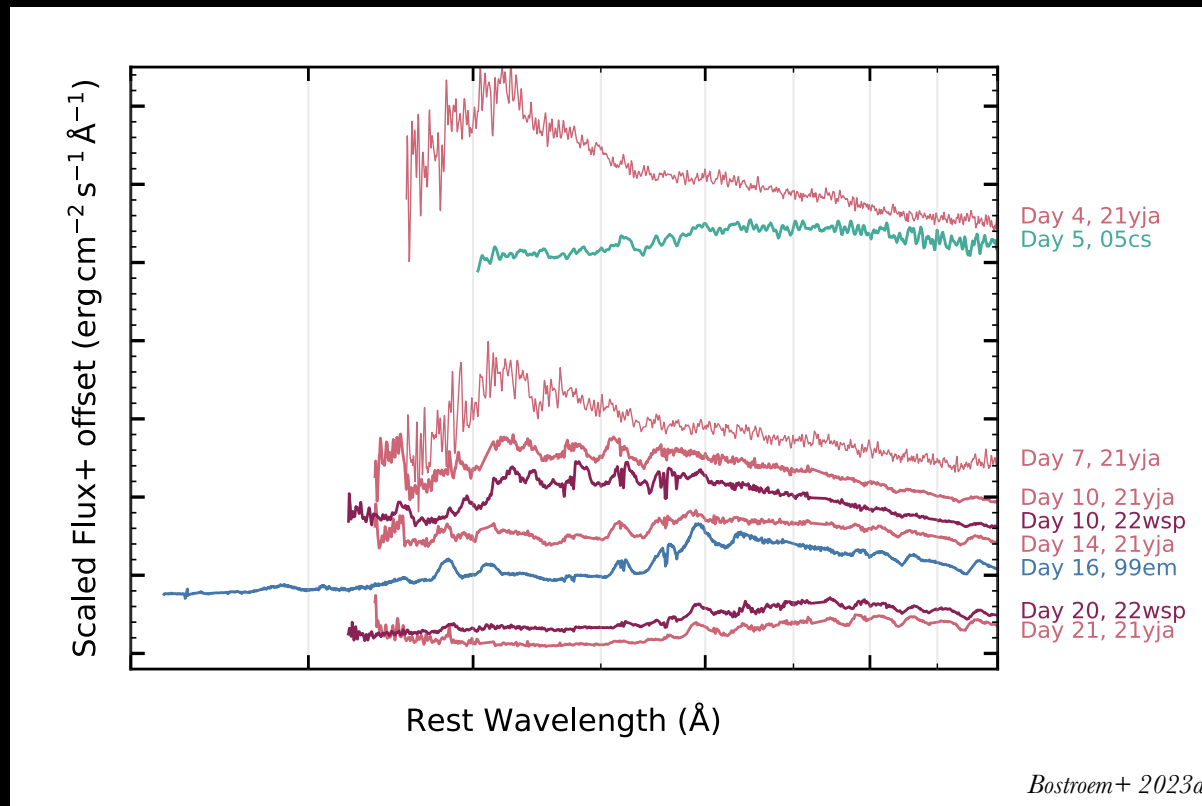


Model Evolution

- No CSM
- Challenge: color evolution

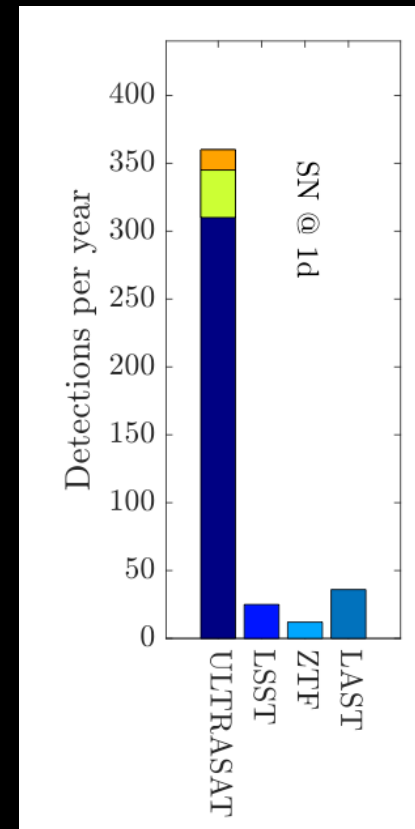


UV Diversity of Type II_P Supernovae



Future of UV Transient Astronomy

- Ultrasat (2026):
 - NUV wide-field imaging
 - 3-6 yr mission (concurrent with LSST)
 - all sky: $m < 23.5$ mag
 - ToO trigger time: 15 min
 - High and low cadence observations



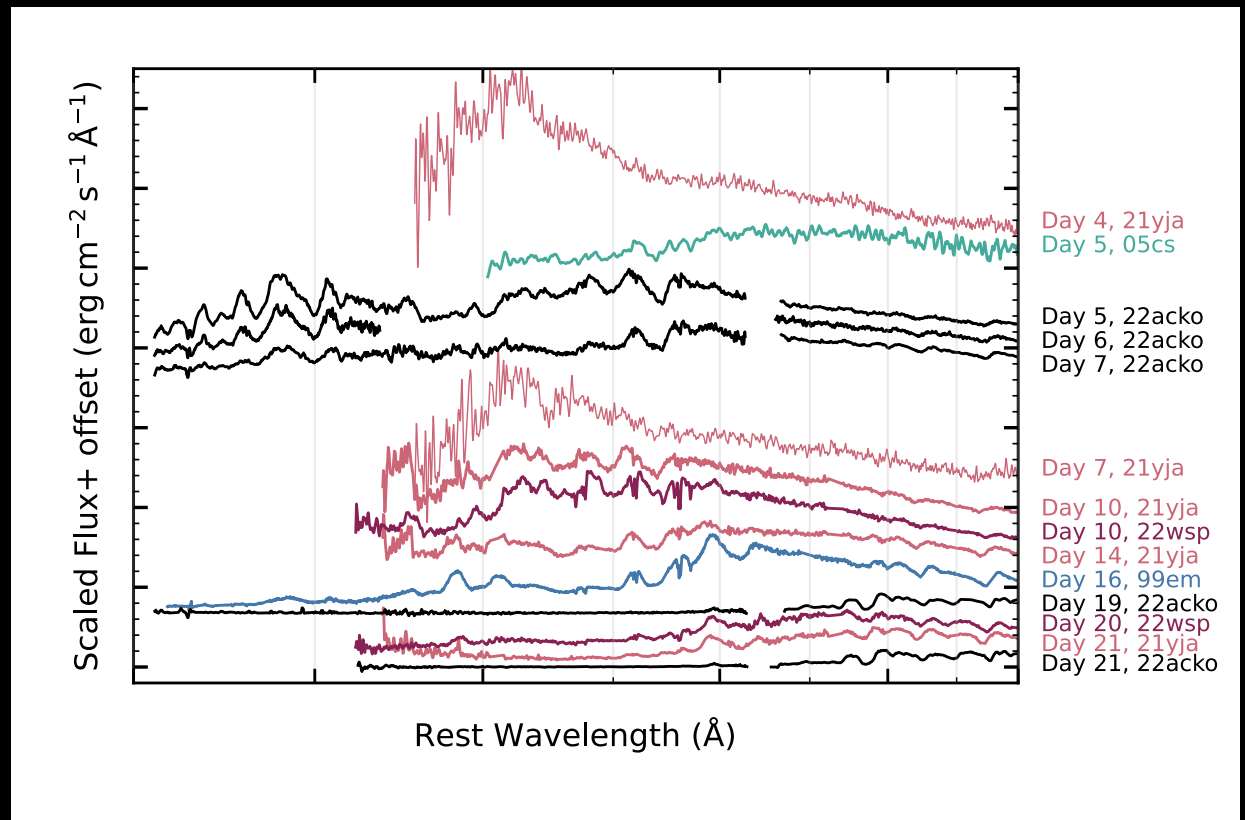
Shartzvald+ 2023

Future of UV Transient Astronomy

- UVEX (proposed 2028 🙌)
 - FUV and NUV: 1390-2700Å
 - Wide-field imaging: $m < 25.8$ mag
 - $R > 1000$ spectroscopy
 - < 3 hour ToO response

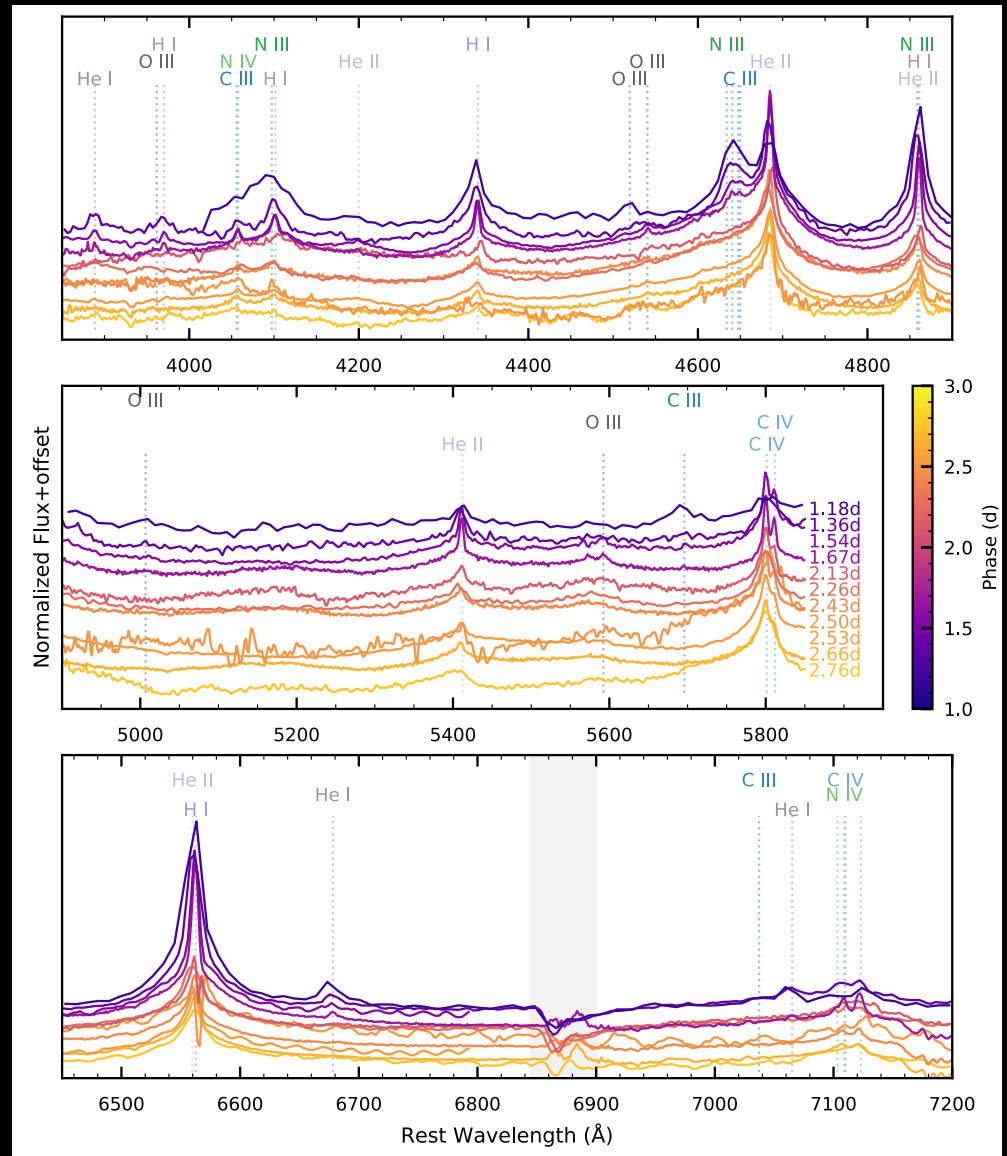
Wish List

- More than 1 per epoch
- Add interacting SNe (stay tuned for SN 2023ixf)
- More FUV
- Early model grid
- Ultrasat and UVEX

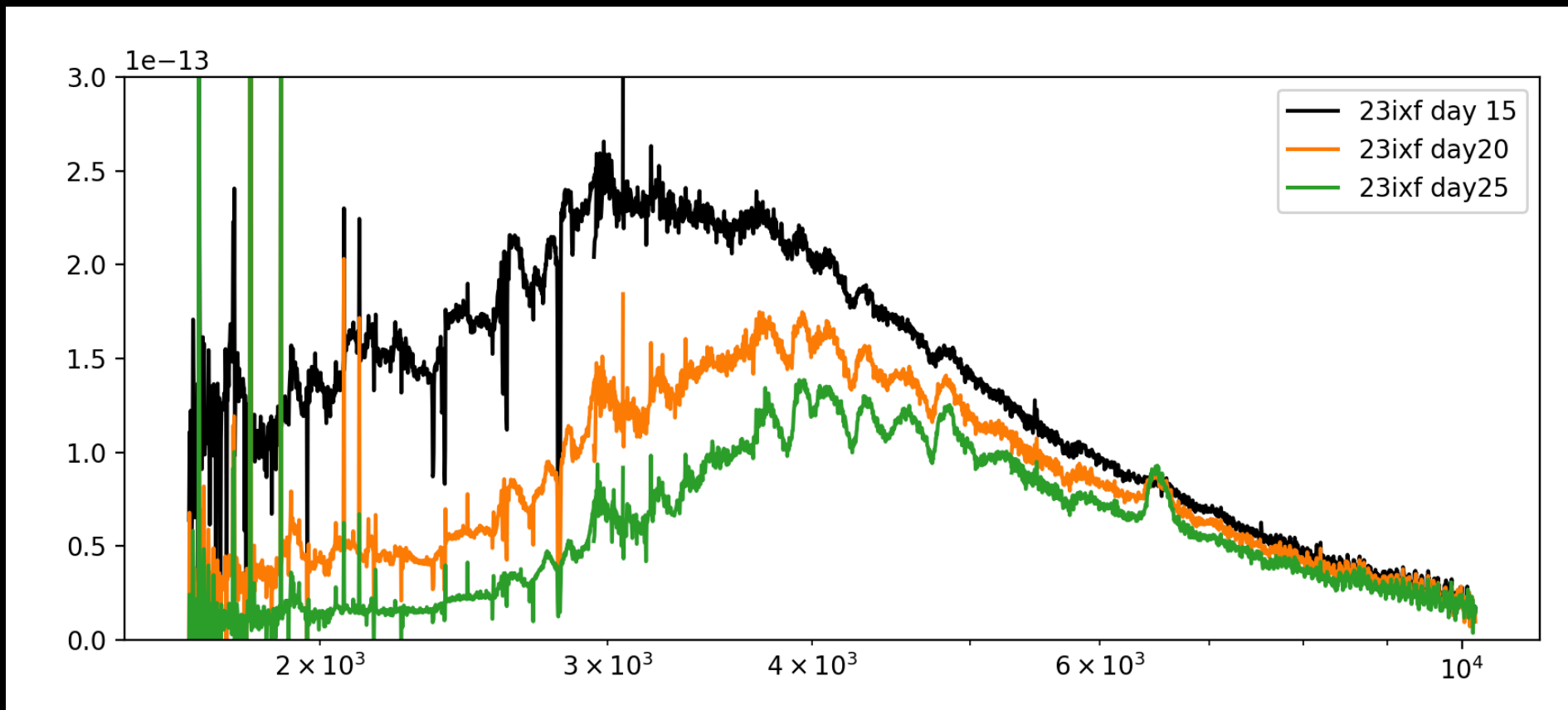


Thank you

SN 2023ixf Early Time Series



SN 2023ixf UV



SN 2023ixf UV

