Ultraviolet Spectroscopic Analysis of Tidal Disruption Event AT 2022dsb

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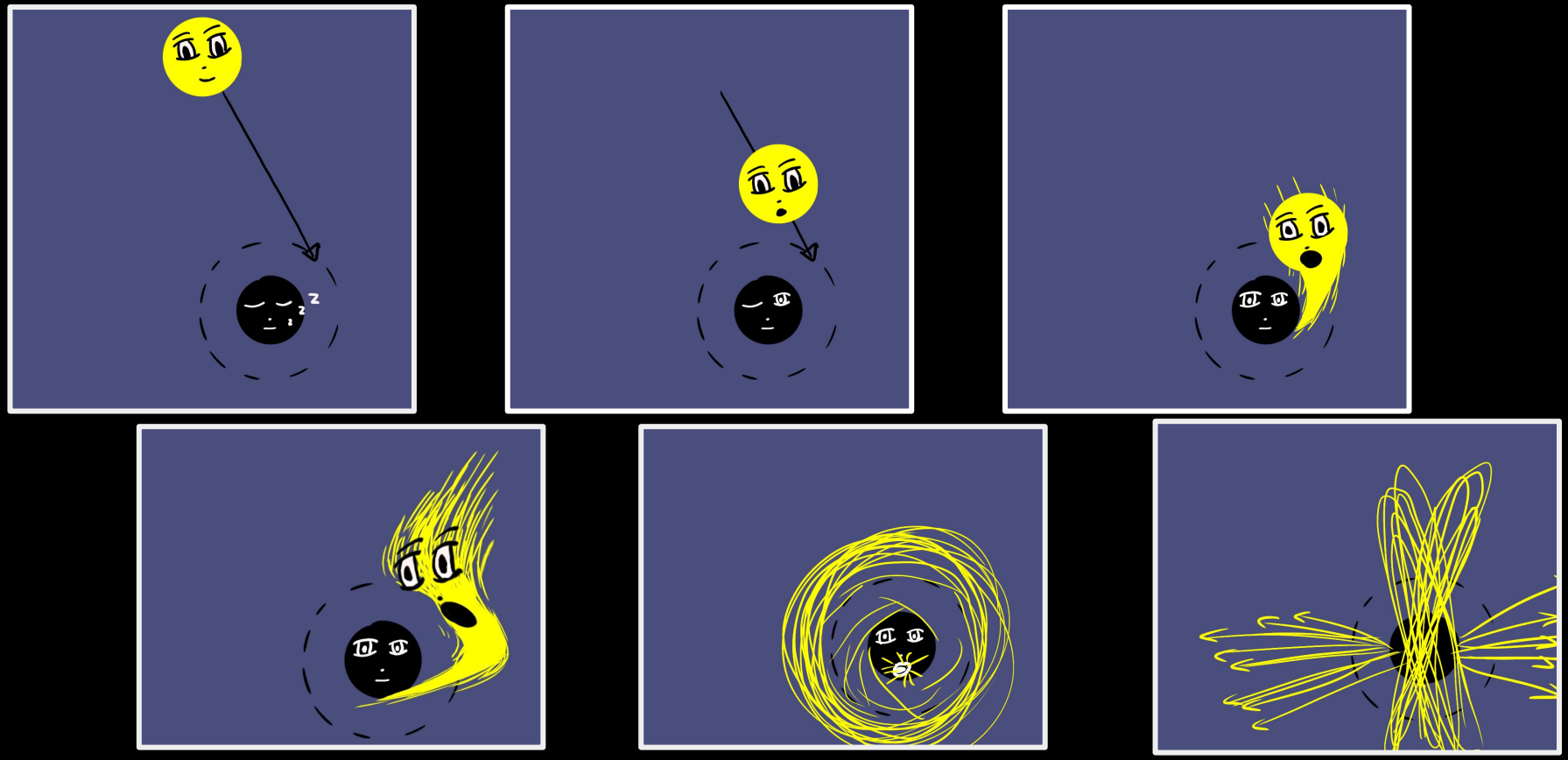
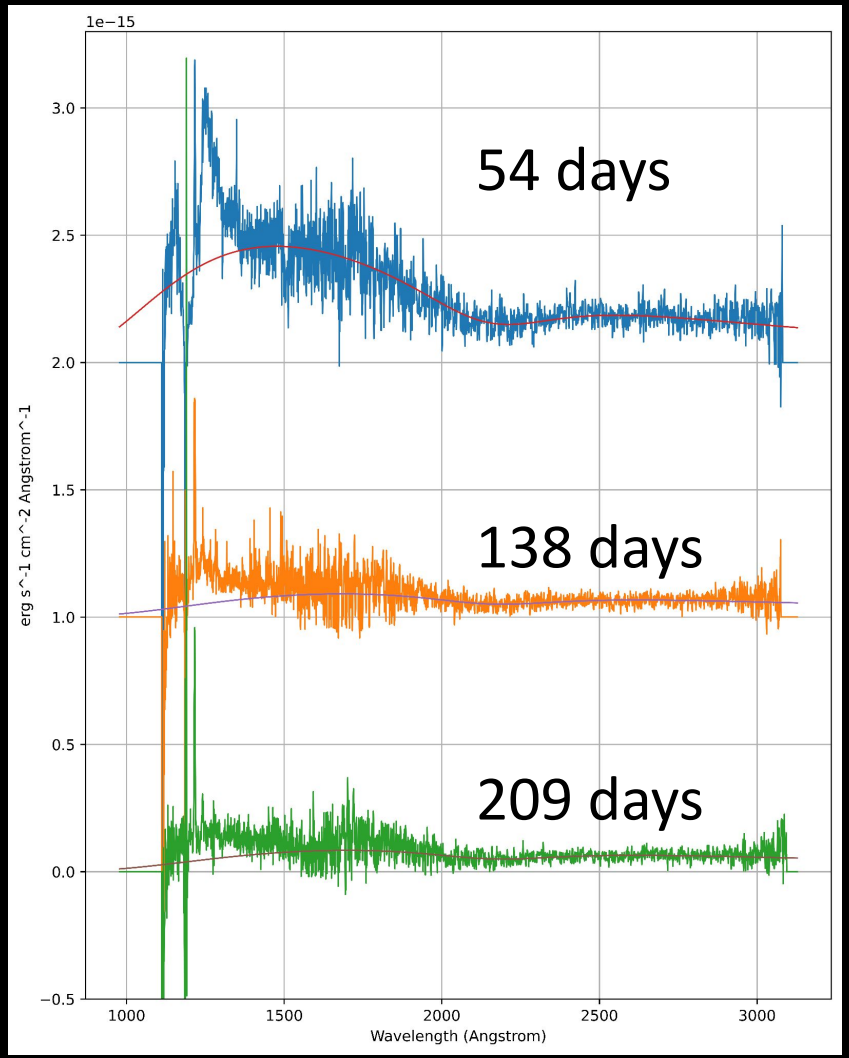
What is a Title Disruption Event?

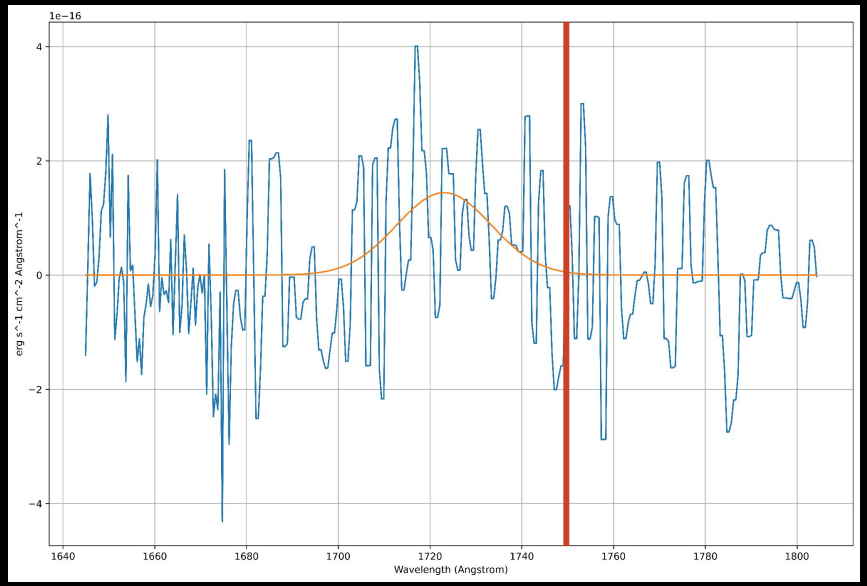


UV Spectra

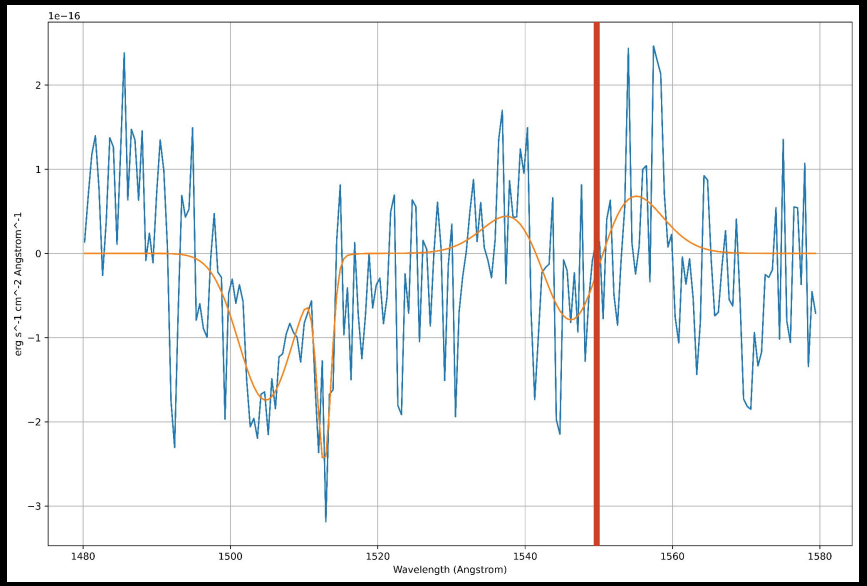
- Spectra taken with STIS on Hubble
- Well-fit by blackbody with dust extinction
- Decreasing temperature: 27,000K -> 18,000K -> 17,000K



Blueshifted features

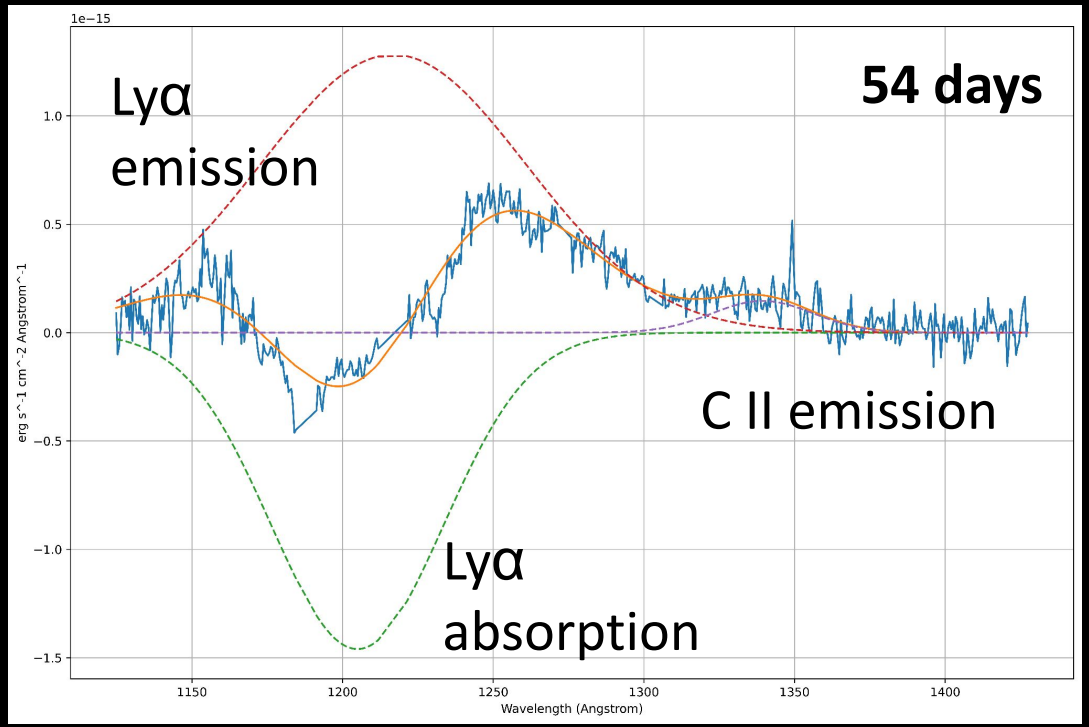


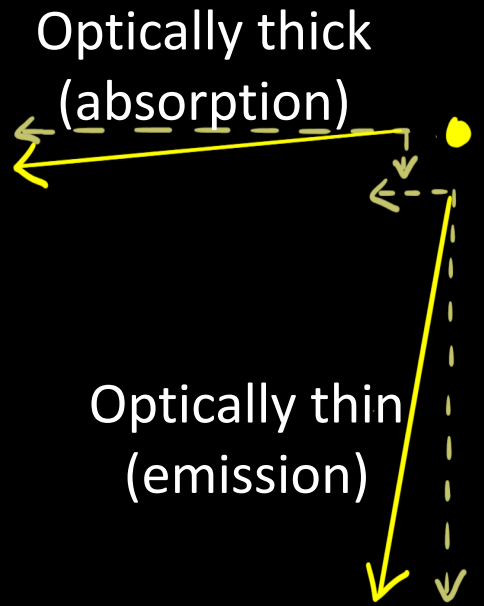
N III λ 1750 Å



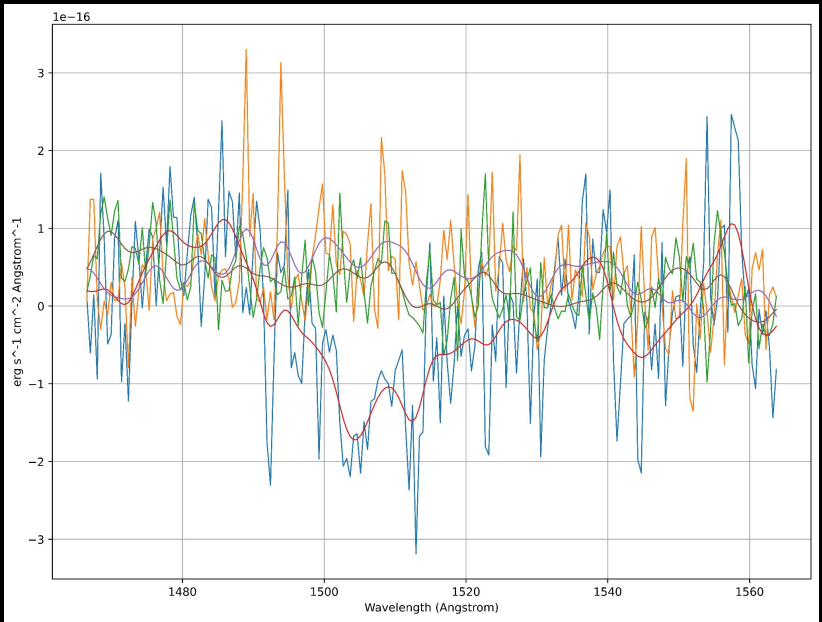
CIV λ 1548, 1551 Å

Overlapping Absorption and Emission





Disappearing Features



blue/red: 54 days
orange/purple: 138 days
green/brown: 209 days

- Example: CIV λ 1548, 1551 Å
- Possible implications:
  - Less energy to absorb causing features to vanish
  - Decrease in donut puffiness causing these winds to no longer be aimed at us

Summary

- HST Spectroscopy reveals a star getting ripped apart by a supermassive black hole
- High variability in observed features
- Over the course of months accretion rate drops -> the TDE disk cools
- Possible overlapping features (including absorption/emission of same line)

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