

## **AT 2022dbl: A spectroscopically confirmed repeated partial TDE**

*Tuesday, 15 October 2024 15:05 (15 minutes)*

Partial TDE (pTDE) complements the classical full TDE (fTDE) picture, predicted to have higher occurrence rate than fTDE. Although it is still hard to distinguish a pTDE from a fTDE through a single flare, a repeated pTDE can provide multiple flares for a robust identification. In this talk, I will introduce the discovery and follow-up observations of a highly-confident repeated pTDE, AT 2022dbl. Two separate optical/UV flares have been observed in 2022 and early 2024, with no bright X-ray, radio or mid-infrared counterparts. To identify a repeated pTDE, one needs to prove both “TDE origin” and “only one star is involved.” In this event, the TDE origin for both flares is supported by the quiescent galaxy background (SDSS spectrum), the typical TDE photometric features (similar blackbody temperature of  $\sim 26,000$  K, declining radii after peak, similar rise and decline phases as ZTF TDEs, etc.), as well as the typical TDE-H+He/Bowen features (Broad Balmer, Bowen and possible He II emission lines). To support that only one star is involved in both flares, the similar emission lines in the spectra provide the strongest evidence by now. Given the short orbital period of  $\sim 2$  yrs, the rise or absence of the third flare can judge the correctness of this identification. ( “The unluckiest star: A spectroscopically confirmed repeated partial tidal disruption event AT 2022dbl” , Lin, Jiang, Wang et al., 2024, ApJL, 971, L26.)

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