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Tidal Disruption Events and Their Connections to Repeating Nuclear Transients

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Tidal disruption events (TDEs) are one of the most dramatic nuclear transients in which a star is destroyed by the intense tidal force of supermassive black holes in a few hours, generating a flare luminous enough to outshine the entire host galaxy. Since its first detection in the 1990s, the number of detected events have been steadily growing thanks to ongoing surveys and telescopes, such as Pan-STARRS, ATLAS, and ASAS-SN, reaching approximately one hundred. The number will dramatically growth by the observations of future transient surveys such as LSST and ULTRASAT. Early TDE candidates are mostly characterized by a single peak in luminosity. However, as more TDEs have been observed, a few surprises have emerged. One notable surprise is the observation of repeated nuclear transients with a range of peak-to-peak timescales, including quasi-periodic eruptions. Although the origin of such events have not been confirmed, some may have close correlations with TDEs. In this talk, I will review the theory of TDEs, focusing on the types of TDEs that can produce repeating flares.

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