

HOW STARS GET THORN APART BY SUPERMASSIVE BLACK HOLES

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Abstract. When a star comes too close to a massive black hole (with a mass of 10^5 - 10^8 M_{Solar}), it may be shredded by the black hole's tidal forces. As the star is disrupted, its internal energy is released and the fallback of object's debris on the black hole produces a bright flare, which, according to theoretical predictions, can be seen from X-ray to UV and optical wavelengths and can last several weeks to years.

In the last decade, the study of such events, called Tidal Disruption Events (TDEs), gained momentum from advanced numerical simulations on the theoretical side and from detections of dozens of TDEs by wide-field sky surveys on the observational side.

I will briefly review the theoretical picture of TDEs, main mechanisms and parameters affecting the outcome of a stellar encounter with a black hole, and main open questions stemming from simulations and observations. I will also address the prospects of the Legacy Survey of Space and Time, expected to begin in 2025 at the Vera Rubin Observatory in Chile, in discovering TDEs and significantly enlarging their sample.

References

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