

Abstract Submitted
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Searching for Stars Disrupted by a Supermassive Black Hole That Lived to Tell the Tale¹ REWA CLARK BUSH, Cabrillo College, SAMANTHA C. WU, California Institute of Technology, ARIADNA MURGUIA-BERTHIER, Northwestern University, ROSA WALLACE EVERSON, ENRICO RAMIREZ-RUIZ, University of California Santa Cruz — The center of the Milky Way is a crowded place—a swarm of millions of stars orbiting a central supermassive black hole. It is estimated that approximately once every 100,000 years, a star’s orbit may veer close enough to the black hole that it becomes severely altered by gravitational effects, yet not so close as to fall in. During this close encounter—called a “tidal disruption event” (TDE)—extreme tidal forces exerted on the star cause it to lose mass and gain energy. A TDE may span mere hours; they are so transient that we rarely observe one in action. But what if we could locate the remnants of these events, the hundreds of thousands of stars in the Milky Way that may have survived a TDE and lived to tell the tale? What stories might they bring us from some of the most energetic encounters with extreme gravity? Our research aims to study the long-term evolution of TDE star remnants computationally, with the goal of determining strategies to find them observationally. We used initial hydrodynamical models of TDE remnants that were then mapped into a stellar evolution code to examine the properties of these stars millions, and even billions, of years after the initial disruption event.

¹Lamat REU, University of California Santa Cruz, National Science Foundation

Rewa Bush
Cabrillo College

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