

**BLACK HOLES IN DENSE STAR CLUSTERS**  
**Aspen Center for Physics**  
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POSTER TITLE: Coronal Emission Line Light Echoes Following Tidal Disruption Events

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We present the first results from time-dependent photoionization calculations that model the emission line spectrum produced when ambient circumnuclear gas is illuminated by a tidal disruption flare. One year after the tidal disruption event (TDE) the spectrum is dominated by narrow Balmer lines and lines due to highly ionized iron ([Fe X] 6376 and [Fe XI] 7894). Over roughly a decade the high-ionization iron lines fade as [Fe VII] features and [O III] 5007 become bright. The Balmer lines, [O III] 5007, and [N II] 6583, may be observable more than 100 years after the TDE. However, using the emission lines alone, it will be difficult to distinguish a late time TDE host galaxy from a star forming galaxy. Our models support the claim that extreme coronal line emitters, which were recently identified in SDSS, are light echoes from TDEs. We discuss the prospect of using these light echoes to probe of the circumnuclear environments of quiescent galaxies and to constrain the extreme UV & soft X-ray components of TDE flares.