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Before the Great Eruption of Eta Car Unveiled by a Light Echo

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The Great Eruption (GE) of Eta Car in the mid-1800s was a spectacular astronomical event, visible to the naked eye (Smith & Frew 2011). It's the proto-type of eruptive mass loss, luminous blue variables, and supernova impostors. Prior to the discovery of light echoes, the only observations of Eta Car's historical eruption were visual estimates of its brightness and approximate colors. Light echoes (LEs), reflections of light from transients off of interstellar dust, offer us the opportunity to re-observe Eta Car's eruption with modern instrumentation (Rest et al. 2012). In prior work, this allowed us to obtain spectrophotometric time series from the 3rd historic peak (Prieto et al. 2014) as well as from the plateau phase (Smith et al. 2018a,b), showing that the Great Eruption was unusually red, and had extremely fast ejecta with up to 10,000 km/s. In my talk, I present one echo that shows at least 4 repeating peaks, equally spaced by ˜5 years. This light echo is inconsistent with the historic light curve as well as the other light echoes! I show that the most likely scenario is that this echo originates from periodic periastron collisions, well before and leading up to the first documented historical event in 1838.

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