

Celebrating 20 years of Swift Discoveries



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The puzzling long GRB 191019A: Evidence for Kilonova Light

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GRB 191019A was a long Gamma-ray burst (GRB) that triggered Swift/BAT and lasted about 65 s and, as such, originally thought to have a core-collapse origin. However, no associated supernova was detected following the optical afterglow despite deep follow-up, which suggested that the burst was caused by the merger of two compact stellar objects. This is also supported by the published properties of its host-galaxy ($z=0.248$), which is a massive and passive galaxy, unusual for a collapsar event.

We thus re-analyzed unpublished GROND multi-band ($g'r'i'z'$ JHKs) data obtained between 0.4 and 15 days post trigger and obtained additional late-time LBT imaging. Image subtraction confirmed the optical counterpart in all four optical bands and suggested the presence of a rebrightening around 1-2 days, with magnitude and peak timescale compatible with an AT2017gfo-like KN at the same redshift.

Incorporating publicly available Swift-XRT data, a joint fit of an afterglow plus a kilonova model revealed a better match than an afterglow-only scenario. Our findings strongly suggest that GRB 191019A belongs to the increasing list of binary-merger long GRBs like GRB 211211A and GRB 230307A.

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