

Celebrating 20 years of Swift Discoveries



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Orphan Afterglows - AT 2023sva and the State of the Field

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There have been hundreds of optical afterglows detected through follow-up observations of well-localized long gamma-ray burst (LGRB) triggers, many made possible by Swift's X-ray Telescope's precise localization capabilities. The advent of state-of-the-art time-domain surveys including the Zwicky Transient Facility have also enabled the serendipitous discovery of optical afterglows without an associated GRB trigger. If post-facto searches through GRB archives do not find observed associated gamma-ray emission to these optically-discovered afterglows, they are known as "orphan" afterglows. There have been six examples of orphan afterglows with confirmed redshift measurements in the literature. Determining the physical origin of these events is extremely important, as their studies allow us to probe many open questions in GRB science, including understanding the true rate and angular structure of LGRB jets along with determining how important mass-loading is for successful jets. In this talk, I will give a brief overview of the state of the orphan afterglow field, highlighting major results from different works in the literature. I also will present multi-wavelength (optical from various ground-based facilities, radio from VLA and uGMRT, and X-ray from Swift) analysis of the latest orphan afterglow AT 2023sva, a luminous and radio-loud event that shows evidence for possessing a structured jet. I will end my talk by placing AT 2023sva within the context of the orphan afterglow and LGRB population as a whole.

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