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Understanding the nature of SNeIa with ZTF

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With measured distances to >100,000 SNeIa, LSST is the future of supernova cosmology. However, two uncertainties beyond LSST's control will likely dominate any cosmological analysis: a nearby sample is needed to anchor the Hubble diagram, and the rate, diversity and intrinsic properties of SNeIa must be precisely measured to ensure that our understanding of dark energy is unbiased.
The Zwicky Transient Facility (ZTF) is specifically designed to achieve both of these goals. Observing half of the visible sky every two nights, and spectroscopically typing all events to z=0.05, the ZTF dataset is both 10 times larger than any existing dataset, but also unbiased. Upon conclusion, with measured distances to over 5000 SNeIa, ZTF will be the primary anchor for the LSST Hubble diagram. In the meantime, this dataset is ripe to understand the intrinsic properties of SNeIa. With >2000 cosmological SNeIa already identified, classified and analysed, I will discuss the first results from this survey. Highlights include measurements of the photometric properties of SNeIa and their diversity, how these properties correlate with their local environment and how to optimally, and unbiasedly, standardise the luminosity of these events for use in a cosmological analysis. Understanding these relationships is key to the success of LSST, but only ZTF can measure them.

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