



Improved Constraints on Type Ia Supernova Host Galaxy Properties using Multi-Wavelength Photometry and their Correlations with Supernova Properties

Ravi R. Gupta, Chris B. D'Andrea, Masao Sako, Charlie Conroy, Mathew Smith, Bruce Bassett, Joshua A. Frieman, Peter M. Garnavich, Saurabh W. Jha, Richard Kessler, Hubert Lampeitl, John Marriner, Robert C. Nichol, Donald P. Schneider

(Submitted on 29 Jul 2011)

We improve estimates of stellar mass and mass-weighted average age of Type Ia supernova (SN Ia) host galaxies by combining UV and near-IR photometry with optical photometry in our analysis. Using 206 SNe Ia drawn from the full three-year SDSS-II Supernova Survey (median redshift of $z \approx 0.2$) and multi-wavelength host-galaxy photometry from SDSS, GALEX, and UKIDSS, we present evidence of a correlation (1.9σ confidence level) between the residuals of SNe Ia about the best-fit Hubble relation and the mass-weighted average age of their host galaxies. The trend is such that older galaxies host SNe Ia that are brighter than average after standard light-curve corrections are made. We also confirm, at the 3.0σ level, the trend seen by previous studies that more massive galaxies often host brighter SNe Ia after light-curve correction.

Comments: The Astrophysical Journal (in press)

Subjects: **Cosmology and Extragalactic Astrophysics (astro-ph.CO)**

Cite as: **arXiv:1107.6003v1 [astro-ph.CO]**

Submission history

From: Ravi Gupta [[view email](#)]

[v1] Fri, 29 Jul 2011 15:57:25 GMT (371kb)

[Which authors of this paper are endorsers?](#)

Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

astro-ph.CO

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1107](#)

Change to browse by:

[astro-ph](#)

References & Citations

- [INSPIRE HEP](#)
([refers to](#) | [cited by](#))
- [NASA ADS](#)

Bookmark([what is this?](#))



