

**UBVRI CCD Photometry of
The Type Ic Supernova SN 1994I in M51:
The First Two Months**

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SN 1994I was discovered in nearby spiral galaxy, M51, on April 1, 1994. SN 1994I is located on a spiral arm, 18" southeast of the nucleus of M51. SN 1994I was initially classified as Type II supernova from the spectra obtained on April 3, then as Type Ib supernova from the spectra of April 4, and finally as Type Ic supernova since April 8 (Clocchiatti et al 1994, IAUC 5972). Type Ic supernovae are much rarer than other types of supernovae. There has been no Type Ic supernovae the good light curves of which were available before SN 1994I. Therefore SN 1994I provides an excellent opportunity to investigate the properties of Type Ic supernovae.

We present a study of SN 1994I based on UBVRI CCD photometry. We obtained UBVRI CCD photometry of SN 1994I using the Seoul National University Observatory 60cm telescope from April 4 to June 2. The light and color curves of SN 1994I show several interesting features: (a) The supernova reached the maximum brightness on April 8.2 at B-band ($B = 13.68$ mag) and on April 9.1 at V-band ($V = 12.89$ mag). Adopting a distance modulus to M51 of $(m - M)_0 = 29.2$ mag and a reddening for SN 1994I of $E(B - V) = 0.45$ mag (Iwamoto et al 1994, preprint), we obtain values for the absolute magnitudes, $M_V = -17.7$ mag and $M_B = -17.4$ mag. This result shows that SN 1994I was ~ 2 mag fainter at the maximum brightness than Type Ia supernovae ($M_V(\text{max}) = -19.6$ mag and $M(\text{max}) = -19.6$ mag, Sandage et al (1994, ApJ, 423, L13)); (b) The light curve around the maximum is much narrower than that of other types of supernovae; (c) The light curve after the maximum declines more steeply than that of other supernova; (d) The color gets redder from $(B - V) \approx 0.6$ mag on April 4 to $(B - V) \approx 1.3$ mag on April 17, and gets bluer afterward. The color at the maximum brightness is $(B - V) \approx 0.9$ mag, which is ~ 1.0 mag redder than the mean color of Type Ia supernovae.

A narrow peak and fast decline after the maximum in the light curve of SN 1994I indicate that the progenitor of SN 1994I might be a lower mass star compared with the progenitors of other supernovae (see Iwamoto et al 1994, Nomoto et al 1994, preprint).

**SPH Simulations of Close Encounters Between a Neutron Star
and a Main Sequence Star**

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In dense stellar systems such as the core of globular clusters, rather frequent encounters between a neutron star and a main-sequence star are expected. Depending on the pericentral