

**H47a          Properties of Hypernova SN 2003dh/GRB030329**

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The spectra and light curve of SN 2003dh, identified in the afterglow of GRB030329, are modelled using 1-D radiation transfer codes. It is shown that SN 2003dh had a high explosion kinetic energy ( $\sim 4 \times 10^{52}$  erg in spherical symmetry), supporting the case for association between hypernovae and gamma ray bursts. However, it was not as bright as SN 1998bw, ejecting only  $\sim 0.35 M_{\odot}$  of  $^{56}\text{Ni}$ . The spectra of SN 2003dh resemble those of SN 1998bw around maximum, but later they look more like those of the less energetic hypernova SN 1997ef. Our model suggests a density distribution similar to that used for SN 1998bw at  $v > 25,000 \text{ km s}^{-1}$  but more like that of SN 1997ef at lower velocities. The mass of the ejecta is  $\sim 8 M_{\odot}$ , somewhat less than in the other two hypernovae. The progenitor must have been a massive star ( $M \sim 35 - 40 M_{\odot}$ ), as for other hypernovae.