

Supernova explosions, gravitational collapse and gamma-ray bursts

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(1) If the formation of massive ($\gtrsim 3M_{\odot}$) and compact remnants of core-collapse supernovae (with the massive progenitors, $M > 30-40 M_{\odot}$) can always be accompanied by the gamma-ray burst (GRB) phenomenon, and (2) if we take into account that the threshold for $e^{-}e^{+}$ pair production in a GRB source depends on an angle between photon momenta, and (3) if the γ -rays are collimated right *in* a GRB source, then another model of GRB source is possible. In such a model (Sokolov et al., 2006, Astronomy Reports, 50, 612) the compact source ($< 10^7$ cm) must always have some radiating *surface* (but not an event horizon) and, respectively, always occupy some finite volume. Such an object can have both a strong regular magnetic field and a nonuniformly-radiating surface connected with it. The list of basic assumptions of the scenario describing the GRBs with the energy release $< 10^{49}$ ergs is given and observational consequences of the compact GRB model are considered.