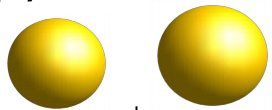
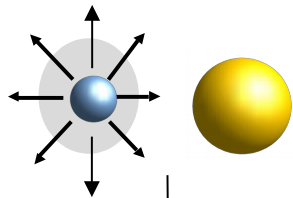


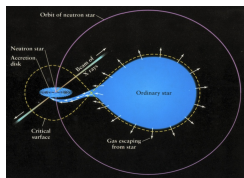
(a) 15 + 12  $M_{\text{sun}}$



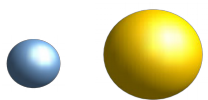
(b) First SN



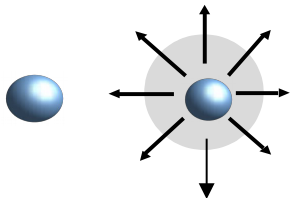
(c) X-ray binary phase; e.g. Cen X3



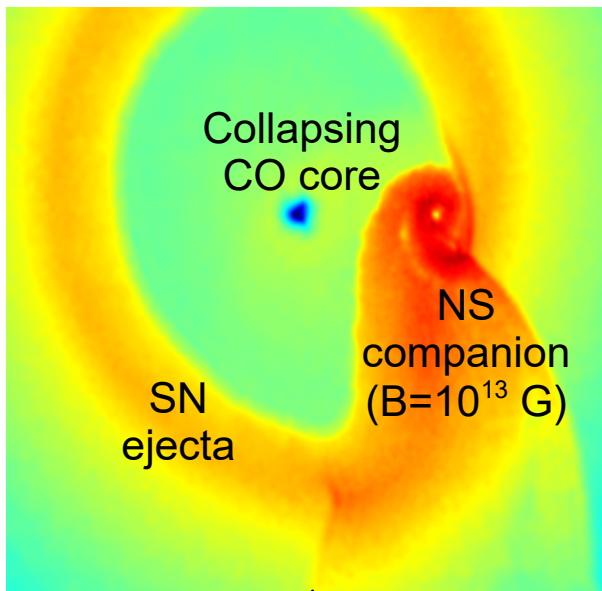
(d) NS + CO core



(e) Second SN



(f) SN accretion onto the NS



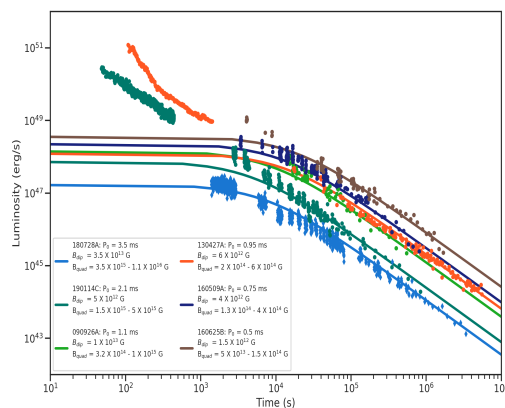
vNS at the SN center

NS collapses forming a BH

(h) Plateau and late afterglow

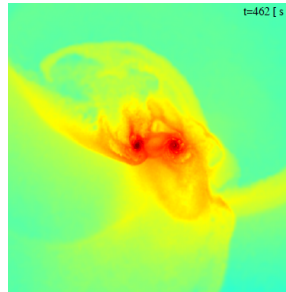
vNS powering the SN ejecta

X-ray afterglow



(i) Optical SN

(g) Prompt (MeV) and GeV



QED process: e+e- plasma (UPE-MeV)

BH+ B field (10^14 G)+ SN ejecta (synchrotron-GeV)

