Rates and Rotation: Core-Collapse SN

Rate Determined from Observations

1 per 50–140 yr: Capellaro et al. (1997)

5–40% Produce Black Holes: Fryer & Kalogera (2001)

Rotation Less Well-Known

Fast Cores (No Magnetic Breaking): Heger (1998)

$J_{Core} \approx 6 \times 10^{49}\ g\ cm^2\ s^{-1}$:

Slow Cores (Magnetic Breaking Strong):

Spruit & Phinney (1998)

$J_{Core} \approx 0$

Spruit, Heger, & Woosley are Working on an Intermediate Solution

Bottom Line – $J_{Core} \lesssim 6 \times 10^{49}\ g\ cm^2\ s^{-1}$