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Stellar Collapse and Explosion: Relativistic AMR Simulations ANDREW MACFADYEN, Institute for Advanced Study, WEIQUN ZHANG, KIPAC/Stanford — Numerical simulations of the collapse of massive rotating stars, accretion disk formation and relativistic jet propagation relevant for explosions producing supernovae, gamma-ray bursts (GRBs) and their afterglows will be presented. Outflows driven from the accretion disk formed after core collapse may be responsible for accretion-powered supernova, independent of any GRB-producing jet which may also be produced. The simulations are performed with RAM, a newly written relativistic hydrodynamics code with adaptive mesh refinement (AMR). The importance of AMR for resolving thin structures in relativistic flow is emphasized. RAM will be described and test calculations presented.

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