

II

ASYMMETRIES IN COLLAPSE, BEYOND THE
BASIC SUPERNOVA MECHANISM

Introduction

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In Part I of this book, we discussed the basic neutrino-driven mechanism for supernovae. However, with the observation of SN 1998bw (a.k.a GRB 980425), we discovered a new type of outburst that may be produced by stellar collapse: Gamma-Ray Bursts. Studies of energetic outbursts may make up 1% of all “supernova” explosions. These outbursts have been termed hypernovae or jet-driven supernovae.

Part II of this book deals with these rare, but highly interesting explosions which arise from stellar collapse. This field is still in its infancy, and some of what is stated here will not hold true in the future. Most of the models are essentially using the same simplified physics routines used by theorists studying the neutrino-driven mechanism back in the 1960s. But the chapters here will give a flavor of the range of ideas that have been proposed to explain these objects.