



# Cosmic Catastrophes: Exploding Stars, Black Holes, and Mapping the Universe

By J. Craig Wheeler

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From supernovae and gamma-ray bursts to the accelerating Universe, this is an exploration of the intellectual threads that lead to some of the most exciting ideas in modern astrophysics and cosmology. This fully updated second edition incorporates new material on binary stars, black holes, gamma-ray bursts, wormholes, quantum gravity and string theory. It covers the origins of stars and their evolution, the mechanisms responsible for supernovae, and their progeny, neutron stars and black holes. It examines the theoretical ideas behind black holes and their manifestation in observational astronomy and presents neutron stars in all their variety known today. This book also covers the physics of the twentieth century, discussing quantum theory and Einstein's gravity, how these two theories collide, and the prospects for their reconciliation in the twenty-first century. This will be essential reading for undergraduate students in astronomy and astrophysics, and an excellent, accessible introduction for a wider audience.

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### **Bibliography**

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## **Editorial Review**

### From Publishers Weekly

Supernovae occur when a star blows up: in its death throes, a star gone supernova "becomes as bright as an entire galaxy." University of Texas astrophysicist Wheeler is one of the world's experts on such stellar explosions and the forces behind them. This accessible, painstaking work of astronomical exposition brings to a general readership Wheeler's knowledge of stars, supernovae and their cousins. The first chapter covers the life cycles of "ordinary" single stars, which coalesce, burn, turn yellow, then red, then dark. Wheeler then gets to the weird stuff: binary stars, which orbit each other in pairs, and to white dwarves, accretion disks, pulsars and the density of the universe. From models of supernovae, the volume proceeds to specific observed explosions, especially to SN 1987A, which emerged from the Large Magellanic Cloud in February of that year and brought with it experimental confirmation of all sorts of theories. The most famous end-stage product of a star's demise is the black hole, a locus of gravity so dense nothing that goes in can ever come out. Wheeler moves from black holes into space-time and gee-whiz cosmology and to supernova-related theories about the universe's expansion; these issues have been set forth in a glut of popular books, and though Wheeler's exegeses are useful and clear, it's the star-level science here that really shines. This book evolved from a longstanding and popular course taught by Wheeler: its careful explication and organization, designed to attract readers with no knowledge of physics, are welcome by-products of its collegiate origin. 33 halftones and 15 line drawings. (June)

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### From Scientific American

For 25 years, Wheeler, a professor of astronomy at the University of Texas at Austin, has taught a course called *Astronomy Bizarre*. Its aim is "to introduce some of the exotica of astronomy for which one has little time in the standard introductory course for nonscience majors." Exotica, indeed, populate this book that derives from the course. Accretion disks, supernovae, neutron stars, black holes and gamma-ray bursts march through, all presented with a clarity that doubtless comes from Wheeler's long experience in teaching astrophysics to "bright, interested, but nontechnically trained students." And then he gets to what might be called superexotica: wormholes, time machines, quantum gravity and string theory. It is heady stuff, as he says. So is what he calls "the deepest issue that drives both physicists and theologians." It is, "Why are we here?"

### *EDITORS OF SCIENTIFIC AMERICAN*

#### Review

"Wheeler's exposition uses elegant word descriptions based on deep physical insight, rather than mathematical expressions, and thus the book is accessible to nontechnical persons.... A sweeping survey, comprehensive and well written." -Choice

### **2007 Outstanding Academic Title -- Choice Magazine**

"...a scholarly yet readable account of violent events in the Universe...The author is one of the world's leading experts in these fields and he writes with immense authority...I have no doubt that it will run to many editions." --Patrick Moore: BBC Sky at Night

"A great deal of information is packed into this small book...all of it explained in Wheeler's extremely lucid

fashion...Five or six thumbs up for this one!" --Review from the Online Bookstore of the American Association of Variable Star Observers

## **Users Review**

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#### **Don Gonzales:**

This book untitled Cosmic Catastrophes: Exploding Stars, Black Holes, and Mapping the Universe to be one of several books that will best seller in this year, here is because when you read this publication you can get a lot of benefit into it. You will easily to buy that book in the book store or you can order it by means of online. The publisher with this book sells the e-book too. It makes you more readily to read this book, because you can read this book in your Smartphone. So there is no reason for you to past this reserve from your list.

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