

CAN
STARS
FIND PEACE?



 Universities Press

G SRINIVASAN

THE PRESENT REVOLUTION IN ASTRONOMY

Contents

<i>Foreword</i>	<i>v</i>
<i>Preface</i>	<i>ix</i>
Part 1: A Historical Perspective	1
1. What Are the Stars?	3
2. Stars in Their Youth	16
3. White Dwarf Stars	26
4. The Principles of Statistical Mechanics	35
5. Fermi–Dirac Distribution	59
6. Quantum Stars	74
7. The Chandrasekhar Limit	87
8. The Absurd Behaviour of Stars: Not All Stars Will Have Energy to Cool	105
9. Guest Stars	112
10. Supernovae, Neutron Stars and Black Holes	120
<i>A Profile of Subrahmanyan Chandrasekhar</i>	144
Part II: The Life History of Stars—A Modern Perspective	155
11. To Burn or Not To Burn	157
12. What Does the Future Hold for the Sun?	176
13. Life History of Intermediate Mass Stars	192
14. Diamonds in the Sky	208
15. Exploding Stars	221
<i>Epilogue</i>	245
<i>Suggested Reading</i>	250
<i>Index</i>	251

THE PRESENT REVOLUTION IN ASTRONOMY

This series is intended to convey the excitement of astronomy at the dawn of the new millennium. It is aimed at readers from diverse backgrounds in science.

In this volume of the series, the story of the life history of the stars is narrated in a lucid manner, with the necessary physics background developed in a systematic fashion. The first part deals with the great developments of the 1930s. This includes the great discovery by Chandrasekhar and the subsequent prediction of supernovae, neutron stars and black holes. The second part of the book is devoted to a discussion of the modern perspective of stellar evolution.

G Srinivasan began his career as a solid state physicist and later switched to astrophysics. After his PhD at the University of Chicago, he worked at the IBM Research Laboratory, Zurich, Switzerland; Chalmers University of Technology, Goteborg, Sweden; Cavendish Laboratory, University of Cambridge; Raman Research Institute, Bangalore. He is a Past President of the Astronomical Society of India as well as the Division of Space and High Energy Astrophysics of the International Astronomical Union. He is a Fellow of the Indian Academy of Sciences and a former Jawaharlal Nehru Fellow.

This series of splendid and accessible books is very timely for it aims to survey the contemporary scene at an introductory level. The readers will find Dr Srinivasan, an internationally acclaimed leader in this enterprise, to be a clear and enthusiastic guide to the wonders and mysteries of the cosmos.

Lord Martin Rees

Astronomer Royal

Master of Trinity College, Cambridge

I know of no other book on the evolution of stars of a similar scope and breadth that is so accessible for undergraduate students.

E P J van den Heuvel

Professor of Astrophysics

University of Amsterdam,

The Netherlands

Cover image: This stunning picture of the supernova remnant Cassiopeia A (Cas A) is a composite of images taken by three of NASA's Great Observatories. Infrared data from the Spitzer Space Telescope are coloured red; optical data from the Hubble Space Telescope are yellow; and X-ray data from the Chandra X-ray Observatory are green and blue.

Credit:

X-ray: NASA/CXC/SAO; Optical: NASA/STScI; Infrared: NASA/JPL-Caltech/Steward/O.Krause et al

www.universitiespress.com



Universities Press

G Srinivasan: Can Stars Find Peace?

ISBN 978 81 7371 742 0



9 788173 717420