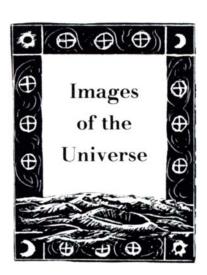


Astronomy is a science where the amateur and the professional interact constructively. This book is a testament to that relationship. *Images of the Universe* includes articles written by sixteen leading amateur and professional astronomers. They provide a lively and upto-date view of our surroundings in space. The solar system, stars and galaxies all come under close scrutiny. Answers are provided to questions that have puzzled people throughout the ages, such as how and when was the universe created? Modern cosmology is discussed by Martin Rees and the first one second of the universe is put under the microscope by Paul Davies. Colin Ronan looks back on advances that astronomers have made in the last hundred years. Patrick Moore and David Hughes write on the outer planets, and comets and meteors respectively. Jacqueline Mitton examines the stars, the birth place of the elements. Heather Couper and Nigel Henbest turn their attention to the Milky Way, the hazy band of light that is the end-on view of our Galaxy; and Malcolm Longair looks beyond this and into the deep sky.

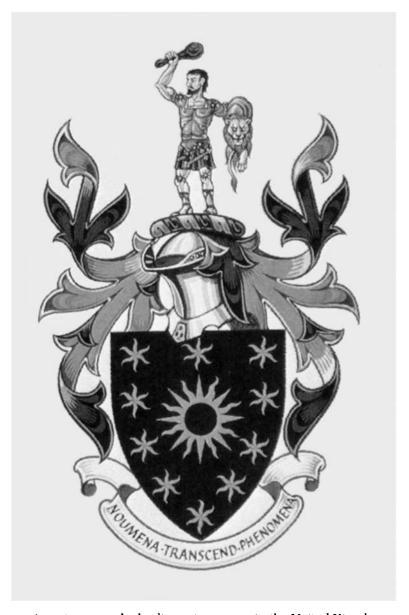
A good picture is the goal of most astronomers, whether it be beamed back to Earth by way of sophisticated and expensive technology, shot with a camera or simply drawn. In this book a special emphasis is placed on images of our universe produced by both amateurs and professionals.

This book will appeal to anyone interested in present-day knowledge of our surroundings in space. An awareness of our position in space may help the reader, but no specialist knowledge is essential.



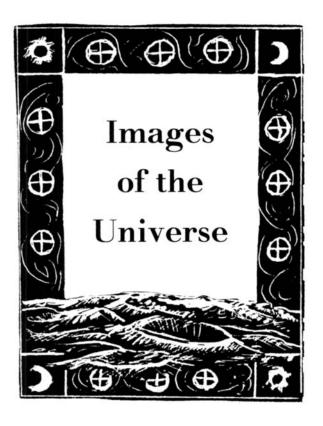






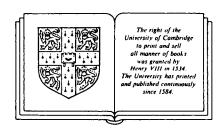
A century ago the leading astronomers in the United Kingdom combined to form the British Astronomical Association. British astronomers have now joined together to produce this volume in celebration of the founding of the BAA in 1890.





EDITED BY

Carole Stott



CAMBRIDGE UNIVERSITY PRESS

CAMBRIDGE

NEW YORK · PORT CHESTER · MELBOURNE · SYDNEY



> Published by the Press Syndicate of the University of Cambridge The Pitt Building, Trumpington Street, Cambridge CB2 1RP 40 West 20th Street, New York, NY 10011-4211, USA 10 Stamford Road, Oakleigh, Victoria 3166, Australia

> > © Cambridge University Press 1991

First published 1991

Printed in Great Britain by Butler & Tanner Ltd, Frome and London

A catalogue record for this book is available from the British Library

Library of Congress cataloguing in publication data available

Images of the universe/edited by Carole Stott

p. cm.

Includs index.

ISBN 0 521 39178 4 (hb); ISBN 0 521 42419 4 (pb) 1. Astronomy. I. Stott, Carole.

. Astronomy. I. Stott, Carole QB43.2.I43 1991

520—dc20 91–26321 CIP

ISBN 0 521 39178 4 hardback ISBN 0 521 42419 4 paperback



Contents

	Foreword viii	
1	Major advances in astronomy since 1890 Colin Ronan 1	
2	The inner planets Richard Baum 20	
3	Jupiter John Rogers 40	
4	Saturn encountered Richard McKim 52	
5	Uranus, Neptune and Pluto Patrick Moore 63	
6	Comets and meteors David W. Hughes 77	
7	The Sun Iain Nicolson 93	
8	Stellar evolution Jacqueline Mitton 110	
9	Variable stars John Isles 121	
0	Supernovae Paul Murdin 138	
1	The story of the pulsars Francis Graham-Smith 155	
12	The Milky Way Galaxy Heather Couper and Nigel Henbest	166
13	Active galaxies and quasars Malcolm Longair 178	
[4	The first one second of the universe Paul Davies 199	
15	Origin of the universe Martin J. Rees 215	
	Acknowledgements 236	

vii



Foreword

It is a pleasure to write a Foreword to this interesting and informative book, and particularly so in view of its being a tribute to a body that I greatly admire: the British Astronomical Association. The fact that the royalties will go towards promoting astronomy under the auspices of the BAA is an added bonus, and one with which I fully agree as I endeavour to improve the financial climate for the subject we all love.

The early history of the BAA makes fascinating reading, as those familiar with the 1890 edition of the *English Mechanic and World of Science* will know. There, one reads of the problems of the BAA's predecessor, the Liverpool Astronomical Society, and of the activities of such authors as E. Walter Maunder and William Huggins, and the Reverend T. E. Espin, the latter moving to a parish not far from Durham where he established a fine reputation in a variety of fields. One also notices that E. E. Baley, Deputy Chief Cashier of the Bank of England was nominated as a scrutineer for the elections for the Council. There is food for thought here!

Turning to the role of amateurs in contemporary astronomy, this is considerable in so many ways. Planetary science could not do without them — for studies of comets, meteor streams and meteorites, and other observations, too. Equally important is the network of talented people eager and willing to disseminate the results of the professionals both in the UK and abroad. In this the BAA plays a most important part. The interaction of the amateur and the professional in astronomy is probably stronger than in any other science and to the benefit of both, and citizens as a whole.

I know that the authors of these articles have gained much pleasure from writing them; may the readers gain even more, and may their number be astronomical!

Professor Arnold Wolfendale, FRS
Astronomer Royal

viii