FOREWORD

This volume entittled "Lecture Notes and Essays in Astrophysics" is the first of a series containing the invited reviews and lectures presented during the biannual meetings of the Astrophysics Group of the Royal Spanish Physical Society ("Real Sociedad Española de Física"; RSEF). In particular, it includes the conferences and reviews presented during the Astrophysics Symposium held in Madrid (Spain) in July, 2003, during the First Centennial of the RSEF.

Our aim is to offer to the specialized public, and particularly to graduate and postgraduate astrophysics students, a number of selected comprehensive reviews on current topics presented by expert speakers ("Lecture Notes"). These are complemented by a set of chapters on more specific topics ("Essays").

This first volume gathers a set of lectures that we are very pleased to present. In the first one, Rafael Rebolo describes the Very Small Array (VSA) experiment and reviews the expected recent results on the angular power spectrum of the Cosmic Microwave Background that set constraints on cosmological parameters.

White Dwarfs are the final remnants of low and intermediate mass stars. Their evolution is essentially a cooling process that lasts for $\sim$10 Gyr and allows us to obtain information about the age of the Galaxy, setting a clear lower limit on the age of the Universe. Jordi Isern and Enrique García-Berro describe the state of the art of the White Dwarf cooling theory and discuss the uncertainties still remaining.

John Beckman and coauthors give a brief, historically based, survey of kinematic observations, essentially of rotation curves of spiral galaxies, produced as techniques have advanced and new wavelength ranges have been opened to observation, and of the Physics which can be derived.

Agustín Sánchez Lavega and coauthors review our current understanding of the general circulation at cloud top levels in the atmospheres of the giant planets Jupiter and Saturn. The interest in these planets has grown strongly in recent years in view of their similarities with the recently discovered giant extrasolar planets.

The final years of the 20th century and the initial years of the 21st century are witnessing a revolution in the construction of large telescopes. This has been possible thanks to the availability of both thin mirror technologies and growing computing power. Astronomy is clearly benefiting from this. Indeed the turn of the century has been rich with new discoveries, from the detections of Extrasolar Planets to the discovery of the the farthest galaxies ever seen or the detection of acceleration in the expansion of the Universe. Spain is leaving her imprint on the telescope making revolution and is promoting the construction of a 10 meter class telescope at the "El Roque de Los Muchachos" observatory, on the Island of La Palma, Spain. The Gran Telescopio Canarias (GTC) is currently at an advanced stage of construction, with science operation expected to start early in 2006. José Miguel Rodríguez Espinosa introduces us to first hand technical considerations on the development and

construction of new-generation telescopes and astronomical instrumentation.

Recent results on Cool Stars, Hot Subdwarfs or Fullerenes in the Interstellar Medium, among several subjects covered, can also be found in the Essays of this book which we hope will provide an interesting insight into selected topics of modern Astrophysics.

The editors are indebted to the Spanish Ministry of Science and Technology (project AYA2001-1657) and to the Royal Spanish Physical Society for finantial support.

Minia Manteiga and Ana Ulla
President and Secretary of the Astrophysics Group
Real Sociedad Española de Física