FOREWORD

On behalf of the Astrophysics Group of the Royal Spanish Physical Society (Real Sociedad Española de Física – RSEF), we are very pleased to present the second volume of the series "Lecture Notes and Essays in Astrophysics". This book contains a selection of the invited reviews and lectures presented during the II Astrophysics Symposium at the XXX biannual meeting of the RSEF, both having taken place in Ourense (Spain) in September 2005 during the International Year of Physics.

Again, our aim is to offer to the specialized public, and particularly to graduate and postgraduate astrophysics students, selected comprehensive reviews on hot topics lectured by expert speakers ("Lecture Notes"). As in the first volume, these are complemented by a set of chapters on more specific topics ("Essays").

This second volume contains a selection of lectures on a variety of topics that contribute to illustrate the current healthy state of Spanish Astrophysics. The first two "lecture notes" review two space projects with a relevant participation from the Spanish Astrophysical community: the CoRoT and Cassini-Huygens missions. The present-day knowledge about Titan, the solar system object with a physical environment most similar to that at Earth, is carefully revised in a pleasant lecture by Luisa María Lara, Rafael Rodrigo and José Juan López-Moreno. The recent success in the launching and operativity of the CoRoT mission increases even more the interest of the review by Rafael Garrido and Hans J. Deeg illustrating the search for exoplanets by the CoRoT satellite.

The potential discovery of Earth-like planets around other stars will need, apart from sophisticated technological development, the design of techniques for identifying the most representative parameters of their atmospheres and surfaces. Manuel Vázquez, P Montañés Rodríguez and E Pallé review the main results of observations and simulations looking at our planet with low or nearly null resolution, in other words, considering the Earth as an exoplanet.

The advances in technology are permitting for the first time to explore the Universe in a multi-parameter space. Nevertheless, the progress in the scientific exploitation is not keeping pace with the exponential growth of available data. The Virtual Observatory (VO) is an international project aiming to solve this situation, and Enrique Solano, leader of the Spanish Virtual Observatory (SVO) project, will introduce us to the great scientific benefits expected from this initiative.

The presence of oscillations in the solar coronal structures has been known for more than seventy years. MHD coronal seismology provides researchers with an indirect path to determine the physical conditions and parameters of the solar corona which are difficult to measure by direct means. José Luis Ballester reviews our current understanding on this rapidly developing topic and stresses the necessity of new high resolution two dimensional observations and more realistic numerical simulations to infer reliable estimations of the solar corona parameters and of the coronal heating

mechanism.

Star formation in galaxies occurs in a great range of spatial scales which are observed to be grouped around certain typical values. Emilio Alfaro and Federico Elías discuss the structure in cascade of the different star formation scales and its connection with the arrangement of the galactic gas into clouds.

Recent results on evolved stars (AGBs, post-AGBs and Helium Hot Subdwarfs), the Rv extinction factor or radio telescope engineering, among several subjects covered, can also be found in the "Essays" of this second issue of "Lecture Notes and Essays in Astrophysics".

It is the hope of the editors that this book provides, as for the first one of the series, an interesting insight into the selection of topics of modern Astrophysics covered.

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