

Preface

This volume reports the proceedings of the *Joint HELAS and CoRoT/ESTA Workshop* held from November 20 to 23, 2006 in Porto, Portugal. The scientific agenda of this meeting was dedicated to diffusive processes in stars and their influence on stellar evolution and asteroseismic oscillation frequencies, with the further objective to improve stellar and seismic analysis tools. The term *diffusive processes* was broadly interpreted, covering topics spanning from atomic diffusion to secular magnetohydrodynamics of rotating stars. It was thereby possible to put research on diffusive processes into a broader context with other standard and non-standard physical processes, that are now topical within the stellar physics and modelling community.

In view of the extensive asteroseismic data that are becoming available or are expected, both with ground- and space-based observational techniques, we are entering a new era of stellar astronomy, with the opportunity to advance and the possibility to revolutionise our current understanding of the physics, structure and evolution of stars. In order to meet these new challenges, it is very timely to discuss both standard and non-standard physical processes in stars along side the reliability of the models and tools with respect to the numerics. In our opinion the workshop combined both aspects in a balanced fashion, and we hope, that the reader of this volume gets a flavor of the same spirit.

The workshop program consisted of 32 oral contributions, 3 poster presentations, 7 discussion and reporting sessions and 3 active working sessions that provided extra time for the model builders to directly interact and compare stellar models and seismic analysis tools. A total of 35 participants joined in the discussions. The work sessions followed up on previous efforts of the CoRoT/ESTA Team (<http://www.astro.up.pt/corot/>), this time with the primary objective to advance Task 3, which focuses on stellar model comparisons with atomic diffusion. The topics covered here are split in three sections: 1) Diffusive Processes in Stellar Evolution; 2) The Interpretation of Seismic Frequencies; 3) Comparisons of Stellar Evolution and Oscillation Codes. The last section covers and summarises the results of the CoRoT/ESTA Tasks 2 and 3.

The workshop was only made possible through the sponsorship of the *European Helio- and Asteroseismology Network (HELAS)* and the *Centro de Astrofísica da Universidade do Porto (CAUP)*. We are also grateful for the hard work and dedication of the local staff of CAUP. We wish to express special thanks to Elsa Marta Silva, who did an excellent job in actively supporting all organisational aspects of the meeting. We also express many thanks to Manuel Monteiro and Júlio Carreira for their infallible technical support.

Finally, we hope this volume will be helpful for researchers committed to this subject and may contribute to attracting younger researchers to this exciting field of astrophysics.

C.W. Straka, Y. Lebreton and M.J.P.F.G. Monteiro
April 4, 2007

DOI: 10.1051/eas:2007120