

# Preface

This volume is a collection of original review articles resulting from the lectures presented at the *IVth Azores International Advanced School in Space Sciences* on

ASTEROSEISMOLOGY AND EXOPLANETS:  
LISTENING TO THE STARS AND SEARCHING FOR NEW WORLDS  
17–27 July 2016, Horta, Faial, Azores Islands, Portugal  
Website: <http://www.iastro.pt/research/conferences/faial2016/>

This Advanced School was jointly organised by the *Instituto de Astrofísica e Ciências do Espaço* – *Universidade do Porto*, the *Universidade dos Açores* and the *University of Birmingham*. Its main goal was to address the topics at the forefront of scientific research being conducted in the fields of stellar physics and exoplanetary science, being mainly aimed at PhD and MSc students in any field of Astrophysics. The School was an excellent opportunity for the young researchers to network with fellow students and lecturers, thereby promoting awareness of areas outside the main specialisation of the student, and potential cross-fertilisation of techniques and concepts.

The School covered two scientific topics that share many synergies and resources: Asteroseismology and Exoplanets. Therefore, the program was defined with a clear strategy of building opportunities for cooperation and sharing of methods that will benefit both communities. This cooperation has experienced great success in the context of past space missions such as *CoRoT* and *Kepler*. Upcoming photometry and astrometry from space, as well as complementary data from ground-based networks, will continue to foster this cooperation. Observations of bright stars and clusters in the ecliptic plane are being made by the repurposed K2 mission, and NASA's *TESS* and ESA's *CHEOPS* missions will soon start obtaining similar data over the entire sky, thus allowing the detection and precise characterisation of planets around nearby stars. ESA's *PLATO* mission will then build upon these successes by providing photometric light curves on a wealth of stars. Ground-based spectroscopy from state-of-the-art instruments will complement the satellite data for the brightest stars in the sky. This includes projects such as the Stellar Observations Network Group (SONG) and a whole new generation of high-

precision spectrographs being developed for the ESO, like the Echelle SPectrograph for Rocky Exoplanets and Stable Spectroscopic Observations (ESPRESSO).

Lectures at the School included both a teaching and hands-on component, respectively consisting of a series of theoretical courses and tutorials. These were presented by a group of young, dynamic lecturers, who have already established themselves as leaders in their respective fields of research. This volume is then the collection of these lectures, covering in detail several critical methods and descriptions that are central to the School's two main thematic lines. As such, this volume constitutes a valuable and timely review that should prove useful to a new generation of PhD students and young postdocs in the fields of Asteroseismology and Exoplanets. We would like to thank all lecturers for accepting the challenge to take part in this School and for submitting the manuscripts for inclusion in this volume.

We are very grateful for the hard work and dedication invested by all participants in the School, in particular by the students, who have contributed to a very pleasant and friendly atmosphere (the evenings spent at Peter's shall never be forgotten!). A special thanks goes to the Chair of the Local Organising Committee, João Miguel Ferreira (Universidade dos Açores), for his dedication and thorough planning, and to Elsa Silva for her invaluable support over the entire duration of the School.

The organisation of the School and the publication of the present volume were supported by the *Instituto de Astrofísica e Ciências do Espaço – Universidade do Porto* (IA–U.Porto) through funds from European Commission's SPACEINN Project on 'Exploitation of Space Data for Innovative Helio- and Asteroseismology' (FP7-SPACE-2012-312844), as well as by the *Fundação para a Ciência e a Tecnologia* (FCT) through national funds (UID/FIS/04434/2013, PTDC/FIS-AST/1526/2014) and by FEDER through COMPETE2020 (POCI-01-0145-FEDER-007672, POCI-01-0145-FEDER-016886). The School also received support from the *Governo dos Açores* (81-9/168-1355), the *Stellar Astrophysics Centre – Aarhus University* through Grant DNRF106 from the *Danish National Research Foundation*, the *University of Birmingham* through funds from the *UK Science and Technology Facilities Council* (STFC), and from a private donation made by Eng.<sup>o</sup> Adelino Campante.

Birmingham, UK  
 Porto, Portugal  
 Porto, Portugal  
 March 2017

Tiago L. Campante  
 Mário J.P.F.G. Monteiro  
 Nuno C. Santos

Asteroseismology and Exoplanets: Listening to the  
Stars and Searching for New Worlds  
IVth Azores International Advanced School in Space  
Sciences

Campante, T.; Santos, N.; Monteiro, M.J.P.F.G. (Eds.)  
2018, XVI, 282 p. 74 illus., 53 illus. in color., Hardcover  
ISBN: 978-3-319-59314-2