

## Preface

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**Abstract.** This volume is a collection of original articles resulting from the contributions presented at the international conference:

SEISMOLOGY OF THE SUN AND THE DISTANT STARS 2016  
USING TODAY'S SUCCESSES TO PREPARE THE FUTURE  
TASC2 & KASC9 Workshop – SPACEINN & HELAS8 Conference  
11–25 July 2016, Angra do Heroísmo, Terceira, Açores Islands, Portugal  
Website: <http://www.iaastro.pt/research/conferences/spacetk16/>

## Rationale for the Conference

For the last 30 years, since the meeting on Seismology of the Sun and the Distant Stars held in Cambridge, in 1985, the range of seismic data and associated science results obtained has far exceeded the expectations of the community. The continuous observation of the Sun has secured major advances in the understanding of the physics of the stellar interiors and has allowed us to build and prepare the tools to look at other stars. Several ground facilities and space missions have completed the picture by adding the necessary data to study stars across the HR diagram with a level of detail that was in no way foreseen in 1985.

In spite of the great science successes, astero- and helioseismic data still contain many secrets waiting to be uncovered. The opportunity to use the existing data and tools to clarify major questions of stellar physics (mixing, rotation, convection, and magnetic activity are just a few examples) still needs to be further explored. The combination of data from different instruments and for different targets also holds the promise that further advances are indeed imminent. At the same time we also need to prepare the future, as major space missions and ground facilities are being built in order to collect more and better data to expand and consolidate the detailed seismic view of the stellar population in our galaxy.

This conference aimed at reviewing the major science achievements resulting from the extensive data collections available from space missions and ground facilities, as well as the tools the community has developed to study and explore those data. This also included the planning of asteroseismic activities of the TESS mission in preparation for its launch. The present view is fundamental to

prepare the forthcoming facilities that will provide the data necessary to address challenging questions that have not yet been answered with the current data. The optimal way to achieve that goal was one of the expected outcomes of the conference, with an impact on how the astero- and helioseismology community prepares the future.

The meeting also cover major synergies with related fields, which benefit from a deeper understanding of the structure and evolution of the sun and stars across the HR diagram. These included topics covering the characterization of planet hosts, and their exoplanets, the description of stellar populations and impact on Galactic evolution, as well as star and planet formation and the early evolution of planetary systems.

## Organization

The conference was jointly organized by;

- *Instituto de Astrofísica e Ciências do Espaço* (<http://www.iaastro.pt/>),
- *Universidade do Porto* (<http://www.astro.up.pt/>) and
- *Universidade dos Açores* (<http://www.uac.pt/>).

The organization also involved *Fundação Gaspar Frutuoso* (<http://fgf.uac.pt/>), a private institution created by the *Universidade dos Açores*.

The scientific program occupied five working days from the 11th to the 15th (but with a social event taking place the 10th, together with the football celebrations of that day in Portugal!). It was a very dense program with a long list of communications (total of 82 oral communications and 83 posters), including:

- 2 Special Invited Reviews (40 min): Opening and closing presentations.
- 14 Invited Reviews (30 min): Review presentations on key topics of the conference.
- 14 Invited Contributions (20 min): Overview of specific work done of great impact.
- 6 Requested Oral Contributions (15 min): Reviews on the coordination of major actions done within TASC and SPACEINN.
- 43 Oral Contributions (15 min): Proposed oral presentations selected from the 76 proposals we received.
- 2 Poster sessions (1 min for 1 slide per poster): short report on the 83 posters displayed in the conference venue.
- 1 Public Talk (40 min): Talk presented at the site of the *Universidade dos Açores* for the general public.

The meeting was a great scientific success, with several new results being presented. Namely, the latest results obtained with KEPLER data and the major deliverables of the SPACEINN Project, as well as an update on the efforts towards the preparation of the asteroseismic component of the TESS mission. The organizers thank, in particular, the contribution of the speakers and all the participants, whose role was critical in making this conference such a scientific (and social) success.

### Scientific Organizing Committee:

Conny Aerts	Belgium
Sarbani Basu	United States of America
Timothy Bedding	Australia
William Chaplin	United Kingdom
Jørgen Christensen-Dalsgaard	Denmark ( <i>Co-Chair</i> )
Margarida S. Cunha	Portugal
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Eric Michel	France
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### Local Organizing Committee

Margarida S. Cunha	IA U.Porto ( <i>Co-Chair</i> )
João Miguel T. S. Ferreira	U.Açores ( <i>Co-Chair</i> )
Paulo Peixoto	IA U.Porto
Elsa Silva	IA U.Porto

### Sponsors

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- The *Instituto de Astrofísica e Ciências do Espaço*, through the *Centro de Astrofísica da Universidade do Porto* (IA U.Porto), with funds from the European Commission's SPACEINN Project on *Exploitation of Space Data for Innovative Helio- and Asteroseismology* (FP7-SPACE-2012-312844),
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- The conference also received support from the *Governo dos Açores* (SRTT-DRT 81-9-168/1418).
- The *Câmara Municipal de Angra do Heroísmo* provided the venue – *Centro Cultural e de Congressos* – where the conference took place. The organization would like to thank the excellent technical support at the venue by Mr. Rúben Machado and his team.

## Participants

There was a total of 169 participants in the conference, from 20 countries. The list includes:

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13. Baudin, Frederic ..... IAS
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15. Beck, Paul ..... CEA, Paris-Saclay
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25. Campante, Tiago ..... University of Birmingham
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**Figure 1.** Group photo of the Conference, taken outside the conference venue by Victoria Antoci.