

Preface

These Proceedings bring the record of the invited and contributed talks presented, as well as poster presentations displayed, at the conference on binary stars held at the Thermotechnisch Institute of KU Leuven in Kasteelpark Arenberg, Leuven, 16–19 September 2013. The aim of the conference was to bring together theoreticians and observers, to review the status of and to present our capability to match models with new high-quality observations, and to identify problems that stand in the way of a proper understanding of stellar physics. The overarching questions that motivated us to organise the conference were: (1) Which aspects of theory appear to be most in need of improvement in light of observations? (2) What observational advances are most needed by theorists to advance the models? and (3) What enhancements in data modelling are most critically needed as we enter the era of ultra-high precision photometry?

It is our hope that these Proceedings reflect our impression that we are in fact well prepared for this new era in stellar physics opened recently by a “quantum leap” in photometric precision brought about by the *Kepler* Space Mission. We are happy to see a tremendous effort in pushing modelling and observations to these new limits. It would be naive to expect that a single conference could solve all issues and problems, but we are optimistic that current developments, both theoretical and observational, are leading us in the right direction.

Another purpose of this conference was to present the research results on binary stars achieved in the framework of the Advanced Grant “Probing Stellar Physics and Testing Stellar Evolution through Asteroseismology”, funded by the European Research Council under the European Community’s Seventh Framework Programme (FP7/2007–2013)/ERC grant agreement No. 227224 (PROSPERITY), to the international community. During the conference, ERC/PROSPERITY results were placed into context of recent binary star research by several of the invited speakers whose participation was funded from ERC/ PROSPERITY. The proceedings were also funded from the ERC/PROSPERITY project.

The Scientific Organizing Committee was comprised by Douglas Geis (USA), Christian Hummel (Germany), Robert Izzard (Germany), Carla Maceroni (Italy), Krešimir Pavlovski (co-chair, Croatia), Andrej Prša (USA), John Southworth (UK), Keivan Stassun (USA), Andrew Tkachenko (co-chair, Belgium), and Guillermo Torres (USA). It is our pleasure to acknowledge with thanks their efforts to help prepare the scientific program. However, by far the greatest burden lay on the shoulders of Andrew Tkachenko and Katrijn Clemer and their Local Organising Committee. Our acknowledgement goes also to the session chairpersons for their precise time-keeping (in order of appearance): Don Kurtz, Doug Gies,

Rolf Chini, Nancy Evans, Alceste Bonanos, Pierre Maxted, Coralie Neinder, and Rob Izzard.

The conference was held in the lovely and historic city of Leuven in Belgium, and we are grateful to our host, Professor Conny Aerts, the head of the Institute of Astronomy, KU Leuven, for providing the excellent local venue and financial support. For all of us this was a wonderful week, with a touch of the long history of the Catholic University of Leuven dating back to the 13th century, and a promising and clear view to the future of binary star research.

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