Gaia and the unseen
The brown dwarf question

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Scientific Organizing Committee

Beate Stelzer (INAF-OAPa, Palermo),
Céline Reylé (UTINAM Obs.Besancon),
Coryn Bailer-Jones (MPIA, Heidelberg),
David Barrado y Navascués (CAB, Madrid),
Davy Kirkpatrick (IPAC, California),
France Allard (CRA, Lyon),
Hugh R. A. Jones (UHerts, Hatfield),
Jacqueline K. Faherty (Carnegie DTM, Washington),
Mario G. Lattanzi (INAF-OATo, Torino),
Richard L. Smart (INAF-OATo, Torino)

Local Organizing Committee
INAF - Osservatorio Astrofisico di Torino

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Beatrice Bucciarelli,
Catia Cardoso,
Maria Teresa Crosta,
Marica Sarasso,
Roberto Morbidelli,
Tullia Carriero

Sponsorship

Gaia Research for European Astronomy Training - European Science Foundation
Istituto Nazionale di Astrofisica
Universitá Degli Studi di Torino
Spaceland

FOREWORD

On the 19th December 2013 the Gaia satellite was successfully launched beginning one of the most ambitious experiments in the history of Astronomy. That this is not just a rhetorical statement is shown by the extraordinary consensus in the community and the large coordinated effort to fully exploit the expected wealth of data. Gaia will will make astrometric measurements of everything from minor planets, to stars and galaxies all the way out to Quasi-Stellar Objects (QSOs) impacting many facets of astronomical research.

In this workshop we wanted to investigate how Gaia science would specifically impact brown dwarf research. While only a handful of the closest and most massive or youngest brown dwarfs will be directly observed, Gaia will still have profound indirect impact on this area of research. For instance, as discussed in detail within these proceedings, Gaia will re-define the structure of the Galaxy and yield precise distances for clusters and moving groups that may be flush with brown dwarf members. Gaia will also yield distances to thousands of stars for which brown dwarfs may piggy-back on if found to be co-moving and assumed to be co-evolving.

Overall, the meeting – entitled “Gaia and the Unseen: The Brown Dwarf Question” – was very successful. We attribute this to both the mix of different expertise among attendees and the open format which encouraged the discussion of new ideas and the development of new collaborations. As this volume is being finalized, the Gaia mission is finishing its commissioning phase and entering its formal observation stage. The precepts for a successful mission are all positive and we await the first results planned for the end of 2015. This meeting came at an optimal time to focus ground based observational campaigns on Gaia targets. Moreover it provided a forum for discussing the developments required of simulation and model work to fully exploit the science of the mission, much of which is enumerated in detail within these proceedings. In the next few years, large sky surveys will increase the number of known brown dwarfs by an order of magnitude. As demonstrated in these proceedings, the Gaia mission will both directly and indirectly provide distances to many 1000s of these brown dwarfs for the calibration of their properties. We, indeed, live in exciting times.

We would like to thank the Gaia Research for European Astronomy Training (GREAT) European Science Foundation (ESF) research networking programme, the Istituto Nazionale di Astrofisica, the Universitá Degli Studi di Torino and Spaceland for their financial support. The hard work and support of the local organising committee from the Osservatorio Astrofisico di Torino made the meeting both easy logistically and enjoyable. The scientific organising committee were crucial for the original GREAT proposal and for the definition of a program that was flexible and interesting. Finally, the during and after meeting contributions of the attendees will, we hope, make the whole effort scientifically useful for the exploitation of the Gaia results and the development of brown dwarf research in the future.

Richard L. Smart, David Barrado y Navascués, Jacqueline K. Faherty

Cover caption: From Bouy et al. this volume, a color magnitude diagram of the DANCe Pleiades survey with the limit of Gaia shown.