# From solar physics to astrophysics: the Sun as Rosetta stone for understanding astrophysical processes

*Rome, July 3, 2012*

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# The Sun: new tools and ideas in observational solar astrophysics

*Rome, July 5-6, 2012*

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## Sponsorship

EAST European Association for Solar Telescopes
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# FOREWORD

The EWASS 2012 conference held in Rome, July 1-6, 2012, hosted two events on solar physics research, the Special Session "From Solar Physics to Astrophysics: The Sun as Rosetta Stone for understanding astrophysical processes" and the Symposium "The Sun: new tools and ideas in observational solar astrophysics".

The first event has brought together specialists in different fields of astrophysics, with the aim of discussing those processes which take place on the Sun as well as in very different astrophysical contexts. Although occurring at different spatial, temporal, and energetic scales, these processes have their own nature in common, being the representation of the same physics at different scales. With an improved angular, temporal, and spectral resolution, with respect to the past, new generation solar telescopes offer a unique opportunity to study details of the physical mechanisms that are unattainable in other astrophysical contexts. Several examples of this were presented during the special session, e.g. the contribution given by helioseismology to asteroseismology, by the knowledge of flares and magnetic reconnection processes in the Sun to similar phenomena occurring in compact objects (e.g., collimated jets of plasma in black hole accretion disks), and of the regeneration process of the magnetic field via the dynamo mechanism. Never as now the Sun is therefore providing an essential key of interpretation for several astrophysical and basic physics processes.

The Symposium highlighted the fact that present-day research on solar astrophysics needs even higher spatial, temporal and spectral resolution observations, which imply the development of new large aperture telescopes and innovative technologies for space-borne and ground-based applications. Actually, in this area of astrophysics, as well as in other fields of science, original ideas and tools are likely to arise from such specialized developments that require the interaction between different research communities, as well as international partnerships. For these reasons researchers from all over the world met at the Symposium to present the status of the most relevant projects in experimental solar research, to review the science drivers and motivations, and to foster collaborations and discussions on future perspectives.

Researchers involved in several fields of astrophysics with theoretical, observational or technological backgrounds attended the two events. These proceedings collect the contributions received from the 32 oral presentations and 20 posters presented. These contributions are introduced by the review paper from the plenary talk "European Solar Physics: moving from Soho to Solar Orbiter and beyond" presented at the EWASS2012 conference by Prof. Sami K. Solanki.

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