This project is supported by the European Commission´s FP7 Capacities Programme for the period April 2013 – March 2017 under the Grant Agreement number 312495.

WP 30: Solar Physics Networking

Lead Institution: **INAF**

Partticipants: **IAC, KIS, INAF, UiO, QUB, UCL-MSSL, AISAS, UWR, IAA-CSIC**

ABSTRACT

Aim of this work-package was **to foster collaborations among different solar physics groups**, **promote the interaction and cooperation among researchers of different level of expertise**, as well as to **encourage and promote synergies with other fields**. The actions undertaken in this work-package have been: exploitation of ground- and space-based data; enhancement of collaborations with other communities and projects; **promotion of collaborations between the new generation of scientists and experienced researchers through short stays and training actions** to acquire competences in relevant fields of solar physics. More specifically, the first task of this WP was to organize **four Meetings** whose objective was to put in contact different solar physics communities and researchers involved in different fields of research. The second task concerned the **Mobility of young researchers** with the goal to reinforce the contacts between different groups and to allow young researchers to begin early to establish international collaborations. The third task concerned the organization of: a) **Summer/Winter Schools** for PhD students and novel post-doc researchers on topics related to the development of new instrumentation for solar observations, diagnostic tools, hot solar research topics and fields of mutual interest for solar and stellar physicists; b) **Thematic Workshops** matched with the training schools.

30.1: Meetings on solar physics (INAF)

Synergies between ground- and space-based solar research
Norway (UiO – Mats Carlsson)
OSLO, 5 – 8 August 2013

Goal: to **foster collaborations between ground and space solar projects.**

This Meeting was expected:
1) to provide a forum to discuss the **use of current and future observational solar facilities**, and how to optimise their scientific returns;
2) to **identify** the potentially paradigm-shifting **observations that will become possible with the next generation ground- and space-based solar telescopes** and their advanced instrumentation;
3) to **foster collaborations** between researchers working at the development of ground- and space-based projects and creation of synergies between research programs at different wavelength bands.

- 60 Participants
- 17 Invited talks
- 28 Contributed talks
- 15 e-posters
- Presentations available on-line at http://folk.uio.no/matsc/oslo-13/program.html

Solar and stellar magnetic activity

Italy (INAF – Fabio Reale)
Palermo, 2 – 5 February 2015

To **review the current understanding of magnetic fields in the Sun and similar stars** and to discuss future directions of research.

The goals of the Meeting were:
1) to provide a forum to review the advances of solar and stellar magnetic activity studies;
2) to discuss future directions of research on solar and stellar magnetic field;
3) to **foster collaborations** between researchers working in solar and stellar physics and creation of synergies between different research programs.

- 61 Participants
- 15 Invited talks
- 25 Contributed talks
- 13 e-posters
- Presentations available on-line at http://www.astropa.unipa.it/Solarnet2015/Proceedings/Proceedings.html

The Sun, the stars and solar-stellar relations
Germany (KIS – Markus Roth)
Freiburg, 31 August - 4 September 2015

To review the state of knowledge in helioseismology, which studies the interior of the Sun through observations of the waves observed at the surface, and the application of its tools and techniques to other stars, so called asteroseismology.
This Meeting had the following goals:
1) to provide a forum to discuss new discoveries and advances in our understanding of the interior structure, dynamics and activity of the Sun and other stars;
2) to consider the study of the Sun in the wide scenery of its evolutionary history;
3) to identify common problems and common strategies in solar and stellar physics from the theoretical and the observational point of view;
4) to foster collaborations between researchers working in solar and stellar physics and creation of synergies between different research programs.

- 84 Participants
- 13 Invited talks
- 46 Contributed talks
- 22 posters
- Presentations available on-line at http://www.iac.es/congreso/solarnet-3meeting/

The physics of the Sun from the interior to the outer atmosphere
Spain (IAC – Elena Khomenko)
Lanzarote, 16 -20 January 2016

To provide a coherent picture of the Sun as a single physical system.
This meeting has the following goals:
1) to provide a forum to discuss recent advances in the study of the solar interior, solar dynamics and dynamo, mechanisms of sunspot and active regions formation, and links between the subsurface dynamics, flaring and CME activity;
2) to identify the new problems in the study of the solar interior and atmosphere, and of the solar dynamics and magnetism;
3) to foster collaborations between researchers working at the study of the Sun's interior and solar atmosphere and creation of synergies between solar research programs at different wavelength bands.

Scientific Programme

The scientific program includes the following topics:

1. Solar internal structure from helioseismology
2. Solar cycle: convection, rotation, dynamo, and flux emergence
3. Theoretical radiative transfer and spectropolarimetry
4. Photospheric dynamics and magnetism;
5. Chromospheric dynamics and magnetism;
6. Corona and transition region: dynamics, magnetic fields and heating mechanisms
7. Energetic events, flares and CMEs and space weather
8. Upcoming telescopes and instruments

30.2: Mobility of Young Researchers (IAC)

The mobility programme has been designed to reinforce the contacts between different groups and to **allow young researchers to begin early to establish international collaborations**.

This task was achieved by means of a dedicated program:

★ Availability of institutions to host young researchers for short stays (up to 2-3 months). It was initially planned to offer this possibility to a total of 16 young researchers.
★ The program supported travel costs up to 600 EUR per fellow, and accommodation and subsistence costs up to 200 EUR per week.
★ Periodic calls aimed at selecting a number of candidates preferentially directed at Ph.D. students and young researchers from EC countries.
★ The selection of the granted proposals was announced on March 31st and Sept 30th of each year.
★ The mobility had to start during the 6-month periods starting in July 1st and Jan 1st
★ The student's proposals was evaluated by the Mobility Evaluation Committee (MEC) composed by:

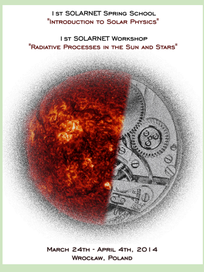
- ★ Andres Asensio Ramos (IAC)
- ★ Ales Kucera (AISAS)
- ★ Markus Roth (KIS)
- ★ Mihalis Mathiudakis (QUB)
- ★ Francesca Zuccarello (INAF)

Name	Nationality	University PhD	Host Institution	Topic	Duration
Christopher Nelson	United Kingdom	University of Sheffield	National Solar Observatory	Ellerman bombs	4 weeks
Eamon Scullion	United Kingdom	University of Sheffield	The Queen's University of Belfast	Alignment DST-ROSA	10 weeks
Iker Sánchez Requerey	Spain	Instituto de Astrofísica de Andalucía	Instituto de Astrofísica de Canarias	Inversions with SIR	8 weeks
Ivan Milic	Serbia	Astronomical Observatory	Centre National de la Recherche Scientifique	2D/3D radiative transfer	8 weeks
Petros Syntelis	Greece	Academy of Athens – University of Athens	University of St. Andrews	MHD models of flux emergence	14 weeks
Rebecca Hewitt	United Kingdom	Queen's University Belfast	Università degli Studi di Roma Tor Vergata	Magnetic bright points	8 weeks
Mariachiara Falco	Italy	Università degli Studi di Catania	Kiepenheuer-Institut fuer Sonnenphysik	Magnetoconvection in sunspots	14 weeks
David Mactaggart	United Kingdom	Abertay University	Istituto Nazionale di Astrofisica	Study of ephemeral active regions	9 weeks
Alice Cristaldi	Italy	Università degli Studi di Roma Tor Vergata	Instituto de Astrofísica de Canarias	Inversion of CRISP data	6 weeks
Richard Morton	United Kingdom	Northumbria University	Stockholm University	Modeling of chromospheric fibrils and other small-scale chromospheric structures	4 weeks
Rohan Louis	India	Leibniz Institut fur Astrophysik Potsdam	Instituto de Astrofísica de Andalucía	Spectropolarimetry of small-scale transients in sunspots	7 weeks
René Kiefer	Germany	Kiepenheuer Institute for Solar Physics	NSO	Study of p-modes and their relation to solar activity	12 weeks
Maciej Lucasz Zapior	Poland	University of the Balearic Islands, Spain	Astronomický ústav AV CR v.v.i, Slovakia	Prominence seismology in different optical depths. Prominence seismology In different optical depths	6 weeks
Damien Przybylski	Poland	Monash University, Australia	Instituto de Astrofísica de Canarias, Spain	Simulations of torsional oscillations in a flux tube	6 weeks
Luca Giovannelli	Italy	University of Rome Tor Vergata, Italy	Kiepenheuer-Institut fuer Sonnenphysik, Germany	FPI and bidimensional spectroscopy, and the emergence rate of bipolar magnetic elements in the Quiet Sun	6 weeks
Vincent Boning	Germany	Kiepenheuer Institute for Solar Physics	New Mexico State University	Time-distance helioseismology	8 weeks
David Mactaggart	United Kingdom	Abertay University	Istituto Nazionale di Astrofisica	Mechanisms of formation of orphan penumbrae	9 weeks
Mariarita Murabito	Italy	Università degli Studi di Catania, Italy	Instituto de Astrofísica de Andalucía	Spectro-polarimetry of sunspots	11 weeks
Bahar Bidaran	Iran	Alzahra University	University of Oslo	Magnetic bright points	9 weeks
Roberta Forte	Italy	University of Rome Tor Vergata, Italy	Harvard-Smithsonian Center for Astrophysics	Magnetograms pipeline and flare forecasting algorithm	7 weeks

Country of origin of selected YR (20):
- ❖ 5 +1 UK
- ❖ 5 IT
- ❖ 2 PL
- ❖ 2 GE
- ❖ 1 ESP
- ❖ 1 SE
- ❖ 1 GR
- ❖ 1 INDIA
- ❖ 1 IRAN

Country of host Institution:
- ✧ 5 ESP
- ✧ 4 USA
- ✧ 2 +1 IT
- ✧ 2 UK
- ✧ 2 GE
- ✧ 1 FR
- ✧ 1 SK
- ✧ 1 SW
- ✧ 1 NO

30.3: Training (Schools and Thematic Workshops) (INAF)



1st Solarnet School (UWR)
"Introduction to Solar Physics Workshop"
and
1st SOLARNET Workshop:
"Radiative processes in the Sun and Stars"
24 March – 4 April 2014, **Wroclaw, Poland**

SOC: A. Berlicky, M. Collados, F. Zuccarello
LOC: A. Berlicky, U. Bąk-Stęślicka, M. Stęślicki, S. Kołomański, E. Niemczura

- 40 Applications
- 20 Participants
- 10 Lecturers
- 4 Speakers

The presentations and the materials provided by the lecturers are available at school.astro.uni.wroc.pl/materials.php

2nd SOLARNET School (AISAS):
"Ground- and space- based solar instruments"
and
2nd SOLARNET Workshop: "Methods in high resolution and synoptic solar physics"
5 – 15 October 2014, **Tatranska Lomnica, Slovakia**

SOC: A. Berlicki, L. R. Bellot Rubio, M. Carlsson, M. Collados Vera, A. Kučera (chair), S. Matthews, M. Mathioudakis, M. Roth, F. Zuccarello
LOC: J. Ambroz, M. Bodnarova, P. Gomory, J. Koza, M. Kozak, A. Kucera (chair), P. Schwartz, J. Rybak

- 19 Applications
- 12 Participants
- 8 Lecturers (School)
- 25 Speakers (Workshop)

The presentations and the materials provided by the lecturers are available at www.solarnet-east.eu/meetandworksh/solshandwork

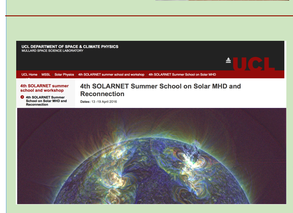
3rd SOLARNET School (IAA-CSIC)
"Solar magnetic fields: modeling and measuring techniques"
and
3rd SOLARNET Workshop: "Polarization in the Sun The Solar System and beyond"
18-23 May 2015, **Granada, Spain**

- 26 participants
- 8 Lecturers

Lecture slides, as well as inversion codes for the hands-on exercises are available at //spg.iaa.es/School)

The Workshop included the following sessions:
- Instrumentation (ground, space, laboratory)
- Diagnostics and Interpretation
- Solar Photosphere
- Solar Chromosphere, Transition Region, Corona
- Polarization in the Solar System and Exoplanetary Systems
- Stellar Magnetic Fields

63 participants, 19 invited reviews, 30 contributed talks and 6 posters.

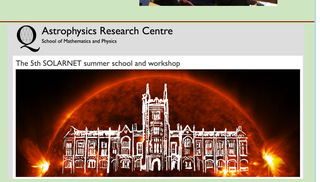


4th SOLARNET School (UCL-MSSL)
"Solar MHD and Reconnection"
And
4th SOLARNET Workshop: "Solar eruptive events: Observations and Modelling"
13-22 April 2016, **London, UK**

Primary topics of the school:
- MHD waves and instabilities
- Kinetic processes in MHD
- 3-D reconnection
- Particle acceleration and transport

- 41 participants
- 16 female (39%)
- 39% female speakers

5th SOLARNET School (QUB)
"Waves and Oscillations in the Solar Atmosphere"
And
5th SOLARNET Workshop: "Heating Mechanisms in the Solar Atmosphere"
25 August – 2 September 2016, **Belfast, UK**



- 25 early career researchers from 10 different countries (UK, Germany, Austria, Belgium, Norway, Sweden, Spain, USA, Algeria, Georgia.
- 11 attendees were women.
- The Workshop was attended by 48 researchers 13 different countries (UK, Germany, Austria, Belgium, Italy, Norway, Sweden, Spain, USA, Algeria, Georgia, India, Bulgaria).
- 23 attendees were early career researchers
- 15 attendees were women.

IV SOLARNET Meeting
Lanzarote, January 16-20, 2017