



5th SOLAR POLARIZATION WORKSHOP

A workshop in honor of Jan Olof Stenflo

organized by
Institute of Astronomy ETH Zurich
and
Istituto Ricerche Solari Locarno (IRSOL)

17 – 21 September 2007, Ascona, Switzerland

FIRST ANNOUNCEMENT

SCIENTIFIC GOALS

The aim of the workshop is to explore, in depth, the physics and origin of polarized radiation in the solar atmosphere as well as its diagnostic use for understanding the Sun. Through polarization measurements one can diagnose magnetic fields in cosmic objects. Magnetic fields pervade all astrophysical plasmas and govern most of the variability in the universe at intermediate time scales. In addition to the Zeeman effect, polarization can also be generated by various other physical processes that involve coherent scattering, which carries signatures of a variety of atomic and molecular processes, like quantum interferences between energy levels, optical pumping, coupling with the nuclear spin, etc., and produces observed polarized features that have so far evaded theoretical explanation. These coherency phenomena give rise to a richly structured polarized spectrum that bears little resemblance to the ordinary intensity spectrum and therefore is known under the name “Second Solar Spectrum”. The door to this new world of polarization physics could be opened with the introduction of ZIMPOL (Zurich Imaging Polarimeter) a decade ago, which brought the required polarimetric sensitivity.

Great advances have been made in recent years in the area of high resolution spectropolarimetry. New results in the quantum theory of polarized light scattering in the presence of magnetic and electric fields have helped in the interpretation of a wealth of new data

brought by new major solar telescope facilities and novel polarimeter systems. The Workshop will deal with the theoretical understanding of relevant polarization physics, the observational advances, and the efforts to develop novel instrumentation for advanced polarimetry. The theoretical contributions will address the still enigmatic quantum aspects of the Second Solar Spectrum, polarized radiative transfer in multidimensional, magnetized and scattering atmospheres, and molecular physics. The observational contributions will deal with the behavior of the polarized spectral structures in the presence of magnetic fields, the observed behavior of the Zeeman and Hanle effects and their diagnostic use to determine the fractal-like, small-scale structure of solar magnetic fields. The problems of stellar polarimetry and stellar magnetic fields will also be discussed. In the area of instrumentation, the polarimetric use of new telescope facilities on the Canary Islands and on Maui (Hawaii) as well as novel polarimetric systems at various solar observatories will be reviewed.

BACKGROUND

The Solar Polarization Workshops were initiated by J.O. Stenflo in collaboration with V.V. Ivanov and H. Frisch a decade ago. The previous Workshops were

SPW1, 1995, St.-Petersburg, Russia
SPW2, 1998, Bangalore, India
SPW3, 2002, Tenerife, Spain
SPW4, 2005, Boulder, USA

Since the Workshop topic has been the major research field of J.O. Stenflo's group at the Institute of Astronomy of ETH Zurich for the last 25 years, the SPW5 is held in honor of Jan Stenflo on the occasion of his retirement from ETH Zurich, and is organized in close collaboration with Istituto Ricerche Solari Locarno (IRSOL), which is the home base of ZIMPOL and which has established itself internationally through its work on solar polarization.

SCIENTIFIC ORGANIZING COMMITTEE

S.V. Berdyugina (Institute of Astronomy, ETH Zurich, Switzerland, Chair)
M. Bianda (Istituto Ricerche Solari, Locarno, Switzerland)
V. Bommier (Observatoire de Paris, Meudon, France)
C.U. Keller (Astronomical Institute, Utrecht University, Netherlands)
J. Kuhn (Institute for Astronomy, Hawaii, USA)
E. Landi Degl'Innocenti (Universita di Firenze, Firenze, Italy)
G. Mathys (European Southern Observatory, Santiago, Chile)
K.N. Nagendra (Indian Institute of Astrophysics, Bangalore, India)
S.K. Solanki (Max-Planck Institute for Solar System Research, Katlenburg-Lindau, Germany)
J.O. Stenflo (Institute of Astronomy, ETH Zurich, Switzerland)
J. Trujillo Bueno (Instituto de Astrofisica de Canarias, Tenerife, Spain)

LOCAL ORGANIZING COMMITTEE

E. Altoni (Istituto Ricerche Solari, Locarno)
M. Bianda (Istituto Ricerche Solari, Locarno, Chair)
B. Codoni (Institute of Astronomy, ETH Zurich)
D.M. Fluri (Institute of Astronomy, ETH Zurich)
P. Jetzer (Institute of Theoretical Physics, University of Zurich)
R. Ramelli (Istituto Ricerche Solari, Locarno)

TOPICS TO BE DISCUSSED

Second Solar Spectrum
Polarization physics in magnetized media
Nature of solar magnetic fields as revealed by polarimetry
Polarized radiative transfer: numerical and analytical methods
Molecular polarimetry
Coronal radio and infrared polarimetry
Polarimetric instrumentation for ground-based and space observatories
Stellar polarimetry and magnetic fields

THE FORMAT OF THE MEETING

We plan a number of invited review talks setting the stage for each topic discussed, followed by shorter invited talks on specific hot results and contributed talks being selected from submitted abstracts by prospective participants. Presentations of poster highlights and breaks for poster viewing are planned in the end of each scientific session. All presentations will be published in a proceedings book.

VENUE

The Workshop will take place at the Centro Stefano Franscini (CSF), the international conference center of ETH Zurich located in the South of Switzerland, on a beautiful hill above Ascona called Monte Verita (www.csf.ethz.ch). Ascona and Locarno (home of IRSOL) are charming neighboring towns residing by the spectacular Lake Maggiore. It's one of the best loved tourist destinations in Switzerland. Tourist information on Switzerland and canton Ticino can be found at www.myswitzerland.com/en/welcome.cfm, www.ticino-tourism.ch, and www.maggiore.ch. The detailed information on registration, transportation, accommodation and social programme will be provided in the second announcement and the web page of the Workshop in the fall of 2006.

PRE-REGISTRATION

For receiving further announcements please make a pre-registration at www.irsol.ch/spw5.

DEADLINES

1 November 2006 Pre-registration
1 April 2007 Registration and abstract submission

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