

SOLARNET-FoMICS summer school, Sept. 9-14, 2019  
Solar spectropolarimetry: From virtual to real observations

Università della Svizzera italiana (USI) and Istituto Ricerche Solari Locarno (IRSOL)

**Program with list of lecturers and lessons**

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**Juan Manuel Borrero, Leibniz-Institut für Sonnenphysik (KIS)**

1. Polarized light, the Stokes vector, and the transfer equation of polarized radiation
2. Absorption and dispersion and the classical and quantum-mechanical Zeemann effect
3. Simple analytical solutions and numerical solvers
4. The SIR code, *hands-on*
5. The SIR wrapper for MuRAM simulations, and synthetic spectra, *hands-on*
6. Comparison of circular and linear polarization with parallel and perpendicular components of the magnetic field, *hands-on*
7. Height of formation and response functions, *hands-on*
8. Basics of inversions of Stokes profiles, *hands-on*

**Oskar Steiner, KIS & IRSOL**

1. Fundamentals of the numerics of hyperbolic partial differential equations
2. Aspects of computational astrophysics and concrete implementations
3. Case studies of MHD simulations

**Flavio Calvo, Institute for Solar Physics Univ. Stockholm**

1. Downloading and booting of the Virtual Box
2. Simulation data handling
3. Simulation data handling, *hands-on*
4. From simulations to virtual observations
5. From simulations to virtual observations, *hands-on*

**Adur Pastor Yabar, Leibniz-Institut für Sonnenphysik (KIS)**

1. Observational polarimetric data access I, *hands-on*
2. Observational polarimetric data access II, *hands-on*

**Renzo Ramelli, Istituto Ricerche Solari Locarno (IRSOL)**

1. High precision polarimetry at IRSOL

**Jaime de la Cruz Rodríguez, Institute for Solar Physics Univ. Stockholm**

1. Introduction to NLTE radiative transfer
2. NLTE effects in spectral line formation
3. Partial redistribution effects and NLTE response functions
4. FAL-C synthesis, and the effect of NLTE electron densities, *hands-on*
5. PRD effects in the Ca II H&K lines, *hands-on*
6. Computation of response functions in NLTE, *hands-on*

**Rolf Krause, Università della Svizzera italiana**

1. Supplementary skills lecture on career development

**Matthias Kraushaar, Centro Svizzero di Calcolo Scientifico (CSCS)**

1. Introduction to High Performance Computing at CSCS
2. Visit of the Swiss National Supercomputing Center (CSCS)