



The Sun: the Earth light source

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We have implemented at Department of Physics of University of Rome Tor Vergata a project called "The Sun: the Earth light source". The project obtained the official endorsement from the IAU Executive Committee Working Group for the International Year of Light.

The project, specifically designed for high school students, is focused on the "scientific" study of Sun light by means of a complete acquisition system based on "on the shelf" appropriately CMOS low-cost sensor with free control s/w and self-assembled telescopes.

The project (hereafter stage) plan is based on a course of two weeks (60 hours in total). The course contains 20 hours of theoretical lectures, necessary to learn basics about Sun, optics, telescopes and image sensors, and 40 hours of laboratory. During the course, scientists and astronomers share with high schools students, work activities in real research laboratories.

High schools teachers are intensely involved in the project. Their role is to share activities with university teachers and realize outreach actions in the home institutions. Simultaneously, they are introduced to innovative teaching methods and the project in this way is regarded as a professional development course.

Sun light analysis and Sun-Earth connection through light are the main scientific topics of this project.

The laboratory section of the stage is executed in two phases (weeks):

First phase aims are the realization of a keplerian telescope and low-cost acquisition system. During this week students are introduced to astronomical techniques used to safely collect and acquire solar light;

Second phase aims is the realization of a low-cost instrument to analyse sunlight extracting information about the solar spectrum, solar irradiance and Sun-Earth connection.

The proposed stage has been already tested in Italy reached the fifth edition in 2014. Since 2010, the project has been a cornerstone outreach program of the University of Rome Tor Vergata, the Italian Ministry of Education and the National Program for the diffusion of Scientific Degrees (Progetto Lauree Scientifiche or PLS). In the last years has been mainly aimed to underline the connections between Astronomy, Astrophysics and the new materials involved in the astronomical techniques. The Sun has always been used in the course as a key element since the final product was the production of a self-constructed solar telescope able to be used to monitor the solar activity through Wolf's number estimation. In the third edition the project has been extended to other three Universities on the Italian territory: University of l'Aquila, University of Camerino and University of Calabria.

Over the years more than 80 students and 50 teachers were directly involved and more than 50 different high schools on all the national territory, reaching thousands of their students in the final dissemination part of the program. 25 telescopes are currently in use in high school institutes all-over Italy.

A book describing the project has been published by Springer in 2013 (*STUDENTI-RICERCATORI per cinque giorni "Stage a Tor Vergata"* Editors: Liù M. Catena, Francesco Berrilli, Ivan Davoli, Paolo Proposito, ISBN: 978-88-470-5271-0 (Online)), the link to the book describing the project and reporting student interviews is at: <http://link.springer.com/book>