



Piano Lauree Scientifiche

Laboratorio di Tecniche astronomiche per la Fisica Solare degli Stage PLS a Tor Vergata

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atticon9372 VII-C-16 101° Congresso Nazionale della Società Italiana di Fisica

The Sun is the light source of Earth.

An important day in the scientific investigation of light was when Newton, in a sunny day, made a hole in his window shutter allowing a sunlight beam to enter his darkened room.

The consequence was a stunning multicolored luminous band analogous to a rainbow.

The ability of XVI-XVII century scientists (e.g., Della Porta, Copernicus, Galilei, Gregory, Newton) to use optics to bend light beams was also the beginning of modern Astronomy.



Based on an experimental learning perspective, our project aims are:

- to get closer to the use of optics to investigate light physical nature
- to use light to investigate the universe;
- to be aware of the scientific method;
- to support the students in a conscious choice of the University courses.

IAU Executive Committee Working Group for the International Year of Light has endorsed your project “The Sun: the Earth light source” as a recognized Cosmic Light program in support of the IYL.

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August 10, 2014

Prof. Francesco Berrilli
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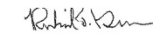
Dear Prof. Berrilli,

I want to inform you officially that the IAU Executive Committee Working Group for the International Year of Light has endorsed your project “The Sun: the Earth light source” as a recognized Cosmic Light program in support of the IYL. That means that the proposed program did not achieve cornerstone status, but was regarded favorably to have strong regional potential. This endorsement means that the Working Group found that your proposal met many of the criteria for connection to IYL themes, clear objective, and potential for valuable impact.

The Working Group noted positively the educational content of the program and the proven track record of the activity. Even if limited to Italy, the proposers are encouraged to expand the scope beyond 10 schools if possible – are remote training and remote observing possible modes? For the mechanics of linking your program to the IAU IYL website, please get in touch directly with Sze-leung Cheung (cheungszeleung@iau.org), who supports IAU IYL activities through the IAU Office for Astronomy Outreach.

We wish you every success in moving the program forward to become a part of the IYL.

Sincerely,



Dr. Richard Green
Chair, IAU WG on IYL

cc: Sze-leung Cheung

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.



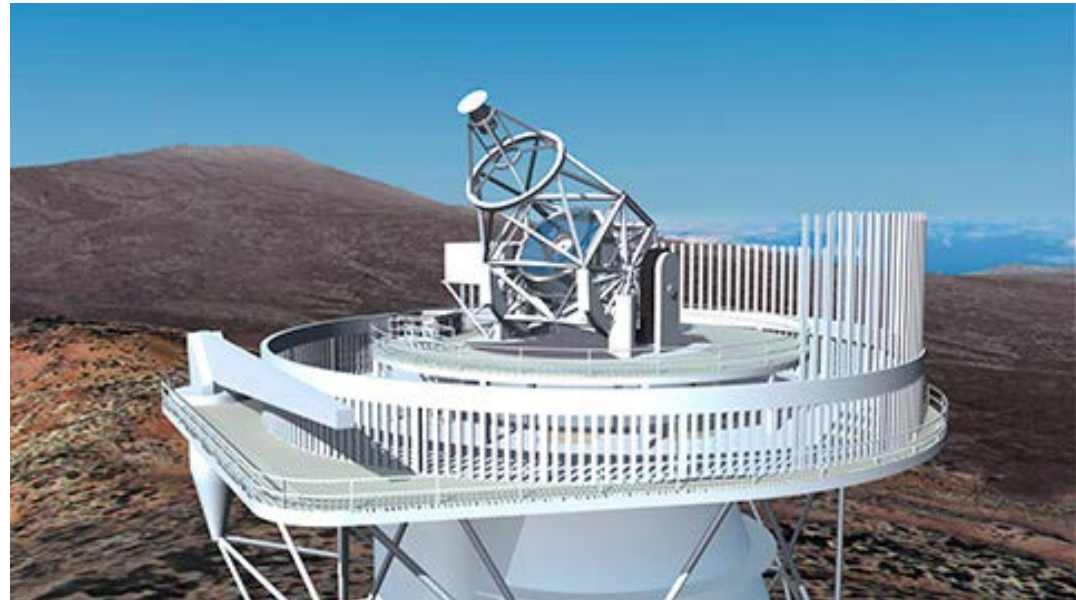
The stage plan is based on a course of **two weeks** (60 hours in total). The course contains **20 hours** of **theoretical** lectures, necessary to learn basics about Sun, optics, telescopes and image sensors, and **40 hours of laboratory**. During the course, scientists and astronomers share with high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



SSA: Space weather refers to the environmental conditions in Earth's magnetosphere, ionosphere and thermosphere due to the Sun and the solar wind that can influence the functioning and reliability of spaceborne and ground-based systems and services or endanger property or human health.

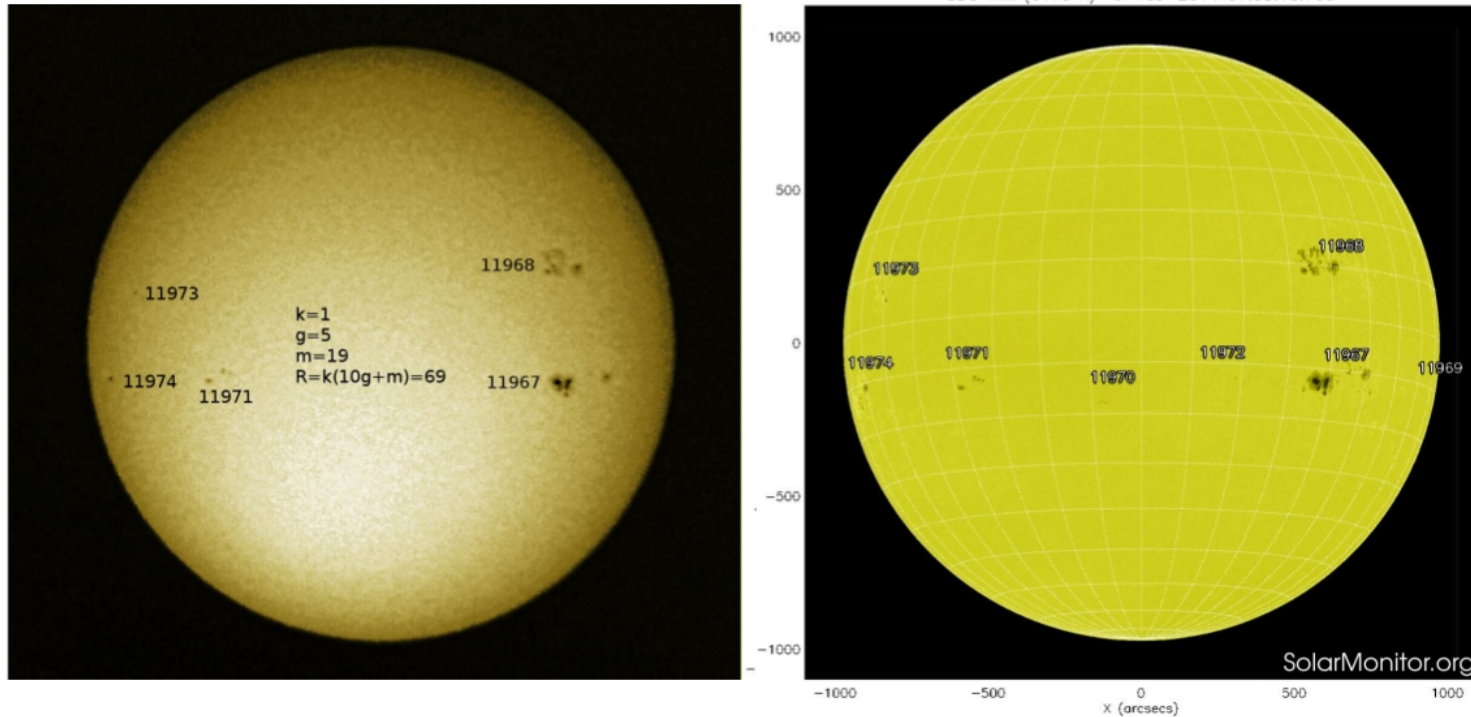
The EST Project –focused on the conceptual design study of the European Solar Telescope– finished successfully in 2011. This webpage is no longer updated but is kept available as a repository of useful information for interested people.



The laboratory section of the stage is executed in two phases (one week each):

1. 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;
2. 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.





Over the years more than 80 students and 50 teachers where 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.



The project was endorsed and recognized as Cosmic Light program in support of the IYL by the IAU Executive Committee Working Group for the International Year of Light



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)

