



United Nations  
Educational, Scientific and  
Cultural Organization



**Fundația Horia Hulubei**  
Horia Hulubei Foundation  
Bucharest, ROMANIA



**UNESCO Chair in Sustainable Development  
through Research and Education in Modern Physics**

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**Romania**

**Horia Hulubei Foundation**

**Progress Report**

**of the UNESCO Chair on Sustainable Development through Research and  
Education in Modern Physics**

Period of activity: April 2010 – May 2011

The Chair has been established by an agreement between UNESCO and Horia Hulubei Foundation, Bucharest-Magurele, Romania, signed on March 23, 2010.  
([www.unescochair-hhf.ro](http://www.unescochair-hhf.ro))

# Activities

## I. Scientific events

**1. Workshop on high school physics:** innovative teaching, hands-on science, gates to research, July 12 – 18, 2010, Seismologic Station Cheia, <http://www.infp.ro/cheia-workshop/>

The workshop took place in the conference hall of the Hotel Cheia and in the seismologic station Muntele Rosu - Cheia. At Cheia School. About 70 lecturers, teachers and students participated to the workshop.

The workshop programme has been composed of lectures and oral presentations, exhibitions of low-cost scientific equipment for school laboratories, and satellite events. The lectures were oriented on two directions: educational sciences and teacher training. Educational science lectures covered issues like European educational programs, PHYSWARE approach, Fibonacci or Pollen projects, IBSE, students physics tournament, etc. Teacher training lectures covered some of the most interesting directions of modern physics, like nanophotonics, biophysics, cosmology and astrophysics, modern Earth physics, nanophysics, etc. The lecturers were noted scientists from Germany, Israel, Italy, Romania, Serbia, Slovenia, USA.

Oral presentations have been given by teachers and students, and some of them covered some elementary research, for instance devoted to light pollution, processing of drinking water, etc. They involved teachers from Moldova, Serbia, Slovenia and Romania.

An exhibition of various devices to be utilized in school labs, made by students and teachers using low-cost materials, have been presented at Cheia School.

Satellite events, consisting of demonstrative lessons addressed by international and Romanian specialists, have been organised in Maneciu, Targu Mures, Turnu Severin and Sibiu, with the support of respective County Inspectorates.

For several days, the venue of the workshop was the seismologic station Muntele Rosu - Cheia, of the National Institute of Earth Physics, where the participants could visit the seismometric system and become familiar with the scientific activities of the station.

The workshop was financed by ICTP/CEI (about 85%), National Institute for Materials Physics, Magurele-Bucuresti (about 8%) and the National Authority for Scientific Research (ANCS, about 7%).

The proceedings of the workshop has been published on the Symposia supplement of the ISI journal JOAM (Journal of Optoelectronics and Advanced Materials).

**2. Workshop on :** Moho discontinuity in the light of modern physics, Magurele, January 13, 2011, on the occasion of the 100th anniversary of the Mohorovicic discontinuity - UNESCO celebration. The workshop was organized in collaboration with the National Institute for Earth Physics and the Romanian Commission for UNESCO.

**Topics included:** Structure of the crust on Romania territory from deep reflection and refraction profiles • Reference seismological European model • Identification of Moho discontinuity from conversion phases • Seismicity in the crust • Geometrical constraints for the configuration of Vrancea seismic area in intermediate lithosphere.

The most of participants are staff members of the national research institutes from the Magurele Platform of Physics.

## **II. Cooperation with African scientists**

### **1. ICTP African School on Nanoscience for Solar Energy Conversion, Addis Ababa, 3-7 May 2010**

The African School on Nanoscience for Solar Energy Conversion, Addis Ababa, 3-7 May 2010, an ICTP scientific event outside Trieste (see the web site: [http://cdsagenda5.ictp.trieste.it/full\\_display.php?smr=0&ida=a09181](http://cdsagenda5.ictp.trieste.it/full_display.php?smr=0&ida=a09181)), provided the opportunity of direct contacts between members of the UNESCO Chair and African scientists. A short report of these contact is available (see the Chair web site: [www.unescochair-hhf.ro](http://www.unescochair-hhf.ro)).

### **2. Working stage of a Togolese PhD student**

In September 2010, the Chair organized a short working stage at the National Institute for Materials Physics, Magurele-Bucuresti, for Mr. Ayi Hounsi, who visited Romania as a Eugen Ionesco fellow (grant provided under the auspices of Union des Universites Francophones). Mr. Hounsy, who is preparing his PhD with an investigation of applications of some Togolese clays (containing zeolites) in brick fabrication, measured several physical and structural proprieties of such clays in the laboratories of the aforementioned institute.

A new working stage for Mr. Hounsy has been included in the IBSP, submitted to UNESCO in March 2011; the project is under evaluation.

## **III. Participation in international Conferences within UNITWIN/UNESCO Chairs programme**

A conference on “Sustainable Development in Conditions of Globalization: Implementation of UNESCO Strategy for the Second Half of the UN Decade of Education for Sustainable Development”, was held in Moscova, 7-8 December, 2010.

The Conference was organized by the Commission of the Russian Federation for UNESCO, UNESCO Moscow Cluster Office, Coordinating Committee of UNESCO Chairs in the Russian Federation, Russian Academy of Public Administration under the President of the Russian Federation, and had the following topics:

1. “Scientific and theoretical foundations of the sustainable development concept”;
2. UNESCO Strategy for the Second Half of the UN Decade of Education for Sustainable Development (2005-2015);
3. “Legal aspects of society’s transition to sustainable development”;
4. “Stability of ecosystems: the role of a civil society”;
5. “Business as tool of the world development”;
6. “State-private partnership in development of the Baikal region”.

A representative of our UNESCO Chair has participated to this conference and has presented an oral contribution on “ Activity of the UNESCO Chair on Sustainable Development through Research and Education in Modern Physics”, **established at Magurele-Bucharest, Romania**”.

The proceedings of this conference are under preparation.  
Also, our representative has discussed with several representatives of different UNESCO Chairs and national UNESCO Commission from Russia, Moldavia, France, Latvia, Turkey, Japan, etc.

#### **IV. Educational activities**

The Chair opened on its web site a series of Lecture notes. The first courses posted are

##### **Course on Photovoltaics, by Prof. Daniela Dragoman**

[Chapter 1: Physical bases of the photovoltaic effect](#)

[Chapter 2: Conversion efficiency of solar cells](#)

[Chapter 3: Configurations of solar cells](#)

[Chapter 4: Multijunction solar cells](#)

**and**

##### **Course on Thermodynamics, by Prof. Radu Lungu**

[Part 1](#)

[Part 2](#)

Professor Sabin Stoica

Chairholder