

Workshop on Physics Education

11th & 12th of December 2014, Trieste, Italy

<http://indico.ictp.it/event/7299/>

<http://see-cei-era.seenet-mtp.info/meetings/workshop-in-trieste/>

Organized by

International Center of Theoretical Physics (ICTP), United Nations Educational Scientific and Cultural Organization (UNESCO Office Venice), European Physical Society- Committee of European Integration, Southeastern European Network in Mathematical and Theoretical Physics (SEENET-MTP), the European Science Education Academy and it is by the Central European Initiative (CEI Trieste) and the large scale European Policy Support Action Inspiring Science Education)

Background

A Consortium consisting of [EPS](#), [ICTP](#), [UNESCO Office Venice](#) and SEENET-MTP, supported by [CEI Trieste](#) is implementing the Project “**Towards the integration of the physics community in CEI countries into the ERA**” during year 2014. This project is part of activities of the [EPS Committee of European Integration](#).

The aim of project is to bring together scientists from Balkan and Central Europe, their partners all over the Europe, EU officials and science policy experts, to establish a strategic partnership between leading scientific institutions and researchers from South-Eastern, Central-East and Western European countries, as well as to consider concrete calls and forthcoming calls for joint projects in physics, sciences and education

The main goals of project are to establish a strategic and project partnership between leading scientific institutions and researchers from SE-CE and European countries and to identify specific actions and to prepare joint applications of to Horizon 2020 Programme and similar European Programmes. This workshop is the 3rd and the closing one in frame of the project. The previous two are:

- [Workshop in Bucharest](#), 25 – 27 May 2014
“Widening Participation of CEI Countries in the EU Research Programs” – Training-Research in Physics, and
- [Workshop in Sofia](#), November 23 – 25, 2014
“Promotion of physics in the CEI countries and Integrating Access to Research Infrastructures in Europe”

It is also the 3rd workshop of the European Science Education Academy, the main partner in organization of the specific workshop and its output.

Rationale of the Workshop

In recent times, Europe faces both a remarkable decrease in the interest of young people in Science, Technology, Engineering and Mathematics [STEM] subjects and a decline in the uptake of STEM careers. This general disinterest amongst young Europeans is more evident in the natural sciences. These shortages could not only affect the future of tertiary education systems but also jeopardize the pillars for a knowledge based society and economy in Europe.

During the past decade, this issue has been the focus of considerable attention and several documents have been published on this matter. For instance, the first of these reports - Europe needs more scientists (European Commission [EC], 2004) - stated that the spotlight should not be only focused on promoting more students to STEM careers but on improving the educational system itself. Another of these reports - Science Education in Europe: Critical Reflections (Osborne and Dillon, 2008) - states that even though there are several known shortcomings (curriculum, pedagogic, assessment), the real challenge is to re-imagine science education and try to both make it appealing and fit the needs of all students, whether they will go on to work in scientific and technical subjects, and those who will not. Following this work, the EC commissioned a report - Science Education NOW: A Renewed Pedagogy for the Future of Europe (EC, 2007) - that focused at successful projects that worked with the way science is taught in schools, concluding with an appeal to promote inquiry based science teaching techniques (Inquiry Based Science Education - IBSE) as a basis for improving the way science is taught in schools.

Following these recommendations, there have been many efforts focused on introducing IBSE at European level during the past years. From pioneering initiatives such as the Pollen project, which was implemented in 12 cities in Europe and provided initial guidelines for the implementation of IBSE to PATHWAY project - a project funded by the EC to promote the effective widespread use of IBSE in primary and secondary schools in Europe, which was implemented in 13 countries and has managed to offer professional development courses to more than 10,000 science teachers and the on-going large scale initiative called [Inspiring Science Education](#) that is developing a repository of tools and online labs to facilitate the introduction of IBSE in school classrooms across European countries.

A [workshop](#) organized by the European Physical Society (EPS) was held in 2013 (Crete, Greece) where several science education stakeholders discussed the aforementioned issues and strengthened the importance of promoting IBSE techniques and the importance of collecting the results of projects like PATHWAY to

develop effective training programmes. This meeting laid the foundations for establishing a European education platform lead by education stakeholders, the [European Science Education Academy](#). The European Science Education Academy was endorsed by EPS in October 2013. The [second European Science Education Academy Workshop](#) took place in Bayreuth, Germany in March, 2014. The aim of the second workshop was to set-up the organizational framework of the European Science Education Academy and to discuss its operational scheme.

The aim of the European Science Education Academy is to set the pathway toward a standard-based approach to teaching science by inquiry, to disseminate methods and exemplary cases of both effective introduction of inquiry to science classrooms and professional development programmes, to support the adoption of inquiry based teaching by demonstrating ways to reduce the constraints presented by teachers and school organisation and finally to deliver a set of guidelines for the educational community to further explore and exploit the unique benefits of the proposed approach in science teaching.

The European Science Education Academy is expected to offer:

- Guidelines and methods for the introduction of inquiry based approaches in school practice in European countries (e.g. [Best Practices in IBSE](#))
- Guidelines and methods for the organisation of effective teachers' preparation programmes (e.g. [Guidelines for Designing Effective Outreach Programmes](#))
- Organisation of international events (conferences, training courses, contests) to promote inquiry based education (e.g. [International Year of Light School Competition](#))
- Consultation services to policy makers and curriculum developers for the effective integration of inquiry based science education in the national settings.
- An extended web-based repository with relative materials (training courses, lesson plans, best practices in inquiry based science education) (e.g. [Inspiring Science Education](#))

At the core of the European Science Education Academy exploitation strategy is its [teachers professional development programme](#). The programme is focusing on science teachers, instructional leaders and curriculum developers. Facilitating the Inspiring Science Education resources (a series of guidelines, scenarios of practice, tools, online labs and show cases from the numerous European schools) the programme can support participants to introduce innovative aspects in their school

settings. The programme is offered by the [Open Discovery Space infrastructure](#) in the form of webinars, interactive online sessions, 2 to 6 day long courses (e.g. [ise.ea.gr](#)) and field visits and observations in schools all over Europe.

Scope of the Workshop

In the framework of the specific workshop, the Consortium and the European Science Education Academy) aims to bring together scientists, EU officials and science education policy experts, as well as representatives of several SEENET-MTP nodes and partners to establish a strategic partnership between leading scientific institutions and researchers from SE and CE Europe with their partners from Western Europe, to develop a roadmap for the qualitative upgrade of science Education in Europe.

The aims of the workshop are the following:

- To present the developments on Science Education Academy, participants and their institutions;
- To consider the funding opportunities in 2015 for the common activities; The aim is to explore the Erasmus + framework of teachers professional development programmes and the Horizon 2020 Science With And For the Society actions focusing on innovative teaching methods as a framework for the development of teachers professional development courses in Balkan Countries (first of all Bulgaria, Greece, Serbia, Romania) and Italy;
- To present International Initiatives in the Balkan Countries and EPS Committee of European Integration;
- To set the pathway for the next steps in 2015, as International Year of Light (e.g. common activities and projects, competitions, summer courses).