



NEWSLETTER
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discover the COSMOS

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Introduction



By Prof. Kourkoumeli Christina, National & Kapodistrian University of Athens, Coordinator of Discover the COSMOS project

Dear All,

We would like to welcome you in our first issue of Newsletters of the "Discover the COSMOS" EU funded project. In this issue you can have a quick but concrete view about our project's description, the Consortium, leading stories, activities, up to now events and upcoming initiatives that our project partners and collaborators are elaborating throughout the life cycle of the project.

Just a few words about the project:

The "Discover the Cosmos" coordination action aims to demonstrate innovative ways to involve teachers and students in eScience through the use of existing e-infrastructures in order to spark young people's interest in science and in following scientific careers.

We hope that you will enjoy it!

Who we are

The consortium of the project is composed of participants coming from 8 EU countries and USA.

The coordinator partner is the **Institute of Accelerating Systems and Applications (IASA)** – GR

Project Partners:

1. Institute of Accelerating Systems and Applications (IASA)
2. CERN
3. Institut d'Astrophysique de Paris (IAP)
4. University of Coimbra (UoC)
5. University of Glamorgan (UoG)
6. Cambridge University (CAM)
7. Liverpool John Moores University (LJMU)
8. Technical University of Dresden (TUD)
9. University of Birmingham (UoB)
10. Ellinogermaniki Agogi (EA)
11. Núcleo Interactivo de Astronomia (NUCLIO)
12. Science View
13. Ministry of Education, Arts and Culture (BMUKK)
14. Universidad Complutense de Madrid (UCM)
15. Lawrence Berkeley National Laboratory (LBL)



What we do

The “Discover the COSMOS” is a **coordination action** project under the FP7-INFRASTRUCTURES-2011-2.

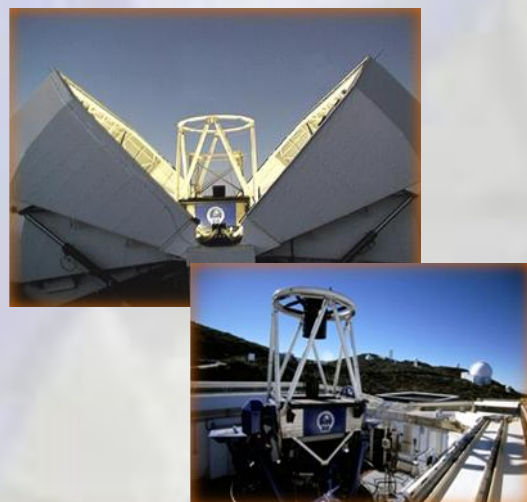
The **main objectives** of the Discover the COSMOS Project are:

- Select a series of eScience initiatives that successfully introduce the scientific methodology in school science education
- Integrate these initiatives under a common educational approach and develop the Discover the COSMOS Demonstrators that could be exploited and widely used from the educational communities in Europe and beyond
- Implement the Discover the COSMOS Demonstrators at large scale in Europe and organize a series of raising awareness activities that will introduce students and teachers to eScience.
- Validate the proposed approaches and activities in order to identify their impact in terms of the effectiveness and efficiency.
- Design and implement a systematic raising awareness strategy.
- Create virtual learning communities of educators, students and researchers.

What we use

“Discover the COSMOS” utilizes the following *e- Infrastructures*:

- **ATLAS** (www.atlas.ch) is a particle physics experiment at the Large Hadron Collider at CERN.
- **CMS** (<http://cms.web.cern.ch/cms/>) is a particle physics experiment at the Large Hadron Collider at CERN.
- The **Large Hadron Collider (LHC)** is a particle accelerator used by physicists to study the smallest known particles – the fundamental building blocks of all things.
- **Gaia** (<http://www.esa.int/science/gaia>) is an ambitious ESA mission to chart a three-dimensional map of our Galaxy.
- **The Faulkes Telescope Project** (<http://www.faulkes-telescope.com/>) offers access to two 2-metre telescopes, one in Hawaii and the other in Australia.
- **The Liverpool Telescope**, <http://telescope.livjm.ac.uk>, is a fully robotic astronomical telescope.



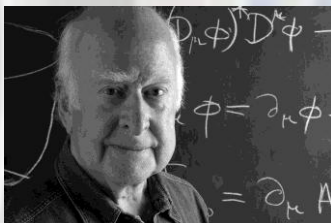
Lead Stories

Sir Peter Higgs meets HST2012 Participants a day before the 'discovery' announcement at CERN



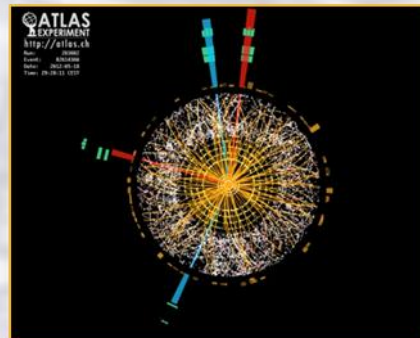
On **3 July, 2012**, just one day before the ATLAS and CMS experiments at CERN presented their latest results in the search for the long-sought Higgs boson, a very special surprise was waiting for the participants (42 teachers from 25 countries across the world) of CERN's High School Teachers Programme. Sir Peter Higgs, responding enthusiastically to the invitation made by Prof. John Ellis (King's College London), met with the teachers and spent nearly 30 minutes in a Q&A session facilitated by Mick Storr (Coordinator of CERN's High School Teachers Programme). As Mike Seymour (Professor of Particle Physics at the University of Manchester) noted, "this is the best summary of what led up to the publication of his paper I have seen him give".

The session can be seen in YouTube, clicking on this link: <http://youtu.be/TvV9xSr0UpU>



"Discover the COSMOS" Summer School during a Great Discovery

During July 2012 at the Discover the COSMOS Summer School organized By Ellinogermaniki Agogi (EA) in Panormo, Crete and in the Greek High School Summer School organized by Hellenic Physical Union (EEF) jointly with EA at the same place, 25 European teachers and 45 Greek students had the opportunity to use the ATLAS experiment interactive educational tool, HYPATIA, and hunt for the Higgs boson announced by the high energy physics community.



On **July the 4th** a new particle which has properties similar to those of the elusive Higgs particle, predicted by the mechanism which gives mass to the particles, was announced by simultaneously by the two large CERN experiments, ATLAS and CMS after many years of searches! The teachers and students had the chance to try to "recognize" such a particle from its decay to four leptons using educational tools which the consortium has built and put at their disposition few hours after the official announcement!

Professor Christina Kourkoumelis (Depart. of Physics, National & Kapodistrian University of Athens) project coordinator of Discover the COSMOS project and one of the main team members of the Greek CERN Team had made a

statement during the Summer Course about this great discovery:

"CERN's announcement of the discovery of "a new" particle is the greatest moment in my scientific career for a number of reasons. I had had the information (under embargo) available for weeks now, since I am a member of the discovery group (with my group of the University of Athens, a member of the ATLAS experiment since 1996). But when the moment of the announcement came, I was very moved! My group has contributed to the experiment at all stages, initially constructing in Greece a part of the detector and then in the physics searches and in particular, in the hunt of Higgs decaying to four leptons. The announcement comes as a big reward but we are proceeding to more detailed studies. Already two PhD students are waiting to finish their thesis."

Discover the COSMOS project in EDEN conference

During EDEN conference in Portugal, Rosa Doran (NUCLIO) gave a presentation entitled **"Scenarios for a changing paradigm in education: learning environments and research based cases"** on behalf of the Discover the COSMOS consortium. Despite the large number of participants at this event, the session at which the presentation took place attracted ten science education specialists. Yet a representative of the Ministry of Education was present and showed big interest in pursuing further conversations about the usability of the presented tools and resources in schools at a national level. A short abstract of the presentation is the following: "The golden age of science education seems to be around the corner. New discoveries attract our attention on a daily basis and emerging ICT possibilities make the knowledge transmission a very demanding and challenging effort. **The Galileo Teacher Training Programme** is a network of educators supporting the implementation of innovative methods for addressing science topics in classroom. Via training educators online or face-to-face we aim to provide all the necessary tools to shift the knowledge acquisition skills

into an unforgettable experience for students and educators. Among other tools a very successful research project among educators and students is the International Astronomical Search Collaboration where students find new asteroids while learning important ICT and science research skills. This and other tools are very rich cases of a very innovative methodology for the teaching of curricula science content. They are an integrating part of the European funded project "Discover the Cosmos" (DtC). This is a pan-European effort that aims to bring to classrooms all over Europe a learning experience based in the use of real data and replicating real science research methods. In DtC we are involving all important stakeholders to ensure an optimal outcome of the effort. Trainers, teachers, students, families, curriculum authorities and scientists are being involved in discussion and brainstorming sessions that will lead to a roadmap for the use of real science methods for science teaching in schools".



European Week of Astronomy and Space Science (EWASS)

Attended by 25 scientists and science educators, **Discover the COSMOS project** was presented by Rosa Doran (NUCLIO) in a special symposium organised in the framework of EWASS 2012 entitled "Astronomy Education in Europe". The abstract presented was entitled "Being born in 2009 – the responsibility of a living legacy of IYA2009" and is as follows: The Galileo Teacher Training Programme (GTTP) was one of the cornerstones of IYA2009. Since

the ephemeris GTTP have reached over 10 000 educators around the globe. How to maintain the achieved successes? How to face the different challenges in the different parts of the globe ensuring the same rights and access for cutting edge science education tools and resources ? How to ensure no student will have to face the growing digital divide? How to provide equal support for educators from all over the world in a fair and sustainable environment? This and other equally important challenges are already written in the next chapters of this programme's goals.

With programmes like "Discover the Cosmos" and "Open Discovery Space", such opportunities will flourish and the introduction of cutting edge science in classrooms will be literally at a distance of a click. These European Commission funded projects will help educators change the way they deliver knowledge by engaging students in the path of discovery. This new vision for science education being seeded in Europe can set the tone for a new relation between content and the learning path.

This type of tools associated with GTTP network construction model will ensure that these opportunities will reach a broad audience and a rich repertory of success stories will certainly feel the pages ahead.



Global Hands-On Universe (GHOU) 2012 Meeting

Discover the COSMOS was presented in the GHOU Annual Meeting in Morocco, this July. Partners from all over the world were

interested in the approach of the project and were interested in piloting a few of the DtC Demonstrators in their countries: Austria, China, India, US. The presentation by Rosa Doran (NUCLIO) was attended by sixty partners from fifteen different countries.

International Astronomical Union - General Assembly (IAU-GA) 2012



On the 27th of August, Discover the COSMOS was presented as an integral part of the GTTP efforts in Europe during the special session SPS11 – IAU Strategic plan and the global office of astronomy for development – attended by 35 participants. The presentation that was held during this session was entitled: "The GTTP Movement: Engaging young minds to the beauty of science and space exploration". On the 30th of August, our project was also presented in the same event during the Commission 46 (Education) special session as a best practice as a best practice for science education. Thirty members of the commission as well as experts in astronomy education were present in the session.

Finally, on the 31st of August, DtC was presented during the Data Intensive Astronomy Special Session 15 with the following abstract entitled "**Discover the Cosmos: Bringing cutting edge science to schools across Europe**". The session was attended by thirty members of the research community and astronomy education promoters.

Discover the COSMOS in action

The Discover the COSMOS framework

The approach is based on teaching science by inquiry and aims to support the adoption of inquiry based teaching by demonstrating ways to reduce the constraints presented by teachers and school organization, to demonstrate and disseminate methods and Exemplary cases of both effective introduction of inquiry to science classrooms and professional development programmes, 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 implementation of the Discover the COSMOS Framework aims to add its contribution towards the improvement of the quality of science teaching. The proposed approach is based on three main axes that could facilitate the uptake of IBSE: It a) presents a pedagogical framework to teaching science by inquiry that outlines instructional models that will help teachers to organize effectively their instruction, b) deploys a series of methods to motivate teachers to adopt inquiry based techniques and activities in their classrooms and c) offering access to a unique collection of tools and applications (linked with the science curricula) that have proven their efficiency and efficacy in promoting inquiry based education and that are expanding the limitations of classroom instruction. Such an approach enabling all stakeholders (teachers, teachers' trainers, curriculum developers, policy-makers) to examine their own practices in the light of the best performing approaches that set the standards on what can be achieved and provides them with a unique tool to bring about improvements in their everyday practice.

The consortium presents a series of exemplary teaching practices, resources and applications that provide teachers with experiences that enable them to achieve scientific literacy, criteria for assessing and analyzing students' attainments in science and learning opportunities that school programmes afford. The Discover the COSMOS repository of best practices will be the window onto live scientific experiments and phenomena, ongoing research, and the personalities and stories of working scientists across Europe. In this way science education could act as the mediator among people in different countries reducing at the same time prejudices and stereotypes and increasing social cohesion. The direct interaction with science or the doing of science reflect a fundamental pedagogy to provide students with personal and direct experiences which then can build upon in their own ways.



Agenda

Some of the up to date activities

1. International Cosmic Particle Day 2012, Presentation of Discover the COSMOS (26/09/2012)
2. European Planetary Science Congress 2012 in Madrid (23-28/09/2012)
3. Presentation of Discover the COSMOS in the International Conference on Science Communication, "Journées Hubert Curien" in France (02-07/09/2012)
4. IAU-GA 2012 : Oral presentation during IAU-GA 2012 in Beijing. GTTP/DC teacher training session for Chinese teachers (20/08/2012)
5. CERN Programme for Physics High School Teachers 2012 (HST2012): A 3-week residential programme for High School teachers in CERN (1-21/07/2012)
6. COSPAR 2012, GTTP/DC teacher training session during the 39th COSPAR scientific assembly, Mysore, India (14-22/07/2012)
7. Teacher training with EU-HOU and Discover the COSMOS in Global-HOU in Morocco (08-13/07/2012)
8. 1st DISCOVER THE COSMOS Summer School in Crete, Greece (01-06/07/2012)
9. Discover the COSMOS Visionary Workshop with German Physics teachers at CERN (03-08/06/2012)
10. Teacher Training "Discover the COSMOS" Session in Chile (09-14/01/2012)

11. The CERN exhibition in Athens, Greece (10-27/11/2011)

Some of the upcoming events

1. Discover the Cosmos High School Students Workshop in cooperation with NTW High School Students Workshop at CERN (07/10-12/10/2012, 31/10-03/11/2012)
2. NTW Project weeks at CERN for High School Students (07-19/10/2012)



Collaborations

During the life cycle of the project there are lots of collaborative activities with other projects and Organizations:

- [GLORIA](#) project
- DtC Workshops based on “[Down to Earth](#)” project resources (part of the Discover the Cosmos resource library, developed by the Faulkes Telescope Project at Univ. of Glamorgan)
- [Open Discovery Space](#) project
- Training event in partnership with [Learnit3D](#)
- [Dark Sky Awareness](#) (DSA) and the [Galileo Teacher Training Program](#) (GTPP)
- Training event in partnership with [The World At Night](#) (TWAN)
- Close collaboration with [Hands-on-Universe \(HOU\) network](#) of teachers.



Contests

Science contests have proven their efficacy in motivating teachers to adopt a scientific methodology that helps them expand the limitations of classroom instruction. Moreover, the provoking of students' curiosity may also be achieved prior to engaging them to certain activities by involving them to science contests. Among various award some of the winners will have the chance to participate to some of the project's main events (summer schools, conferences) with their expenses covered from the project.

Our contests:

1. Particle Physics Video-Competition (IN)VISIBLE?!

Target group: high school students
(maximum age 20) type: national (GE)

Registration until: **15/06/2012**
Due to: **31/10/2012**

2. Educational Scenario Contest

Target group: Teachers Type: national (GE)

Registration until: **01/10/2012**
Due to: **31/12/2012**

In the following months a list of national and international contests will be organized by the consortium.

Further details:

<http://www.discoverthecosmos.eu/contest>



Further Information

Follow us on Web

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