



## Discover the Cosmos Deliverable

### D4.6 Final Report on Implementation Activities (National Level)

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#### Short Description:

This report documents the implementation activities of Discover the COSMOS undertaken at national level throughout the second year of the project, as the activities of the first year have been described in Deliverable 4.5. This deliverable is best read in conjunction with the final reports on local and international level implementation activities.

**List of Recipients:** Discover the COSMOS participants



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### 1. Introduction

In addition to the local and international implementation activities there are the national implementation activities for Discover the Cosmos (Discover the Cosmos). They are structure in different formats:

- Training and demonstration activities with the aim to promote interaction and collaboration between members of the national education community. These events are designed to encourage the promotion of professional practice interchange, sharing of experiences, support and collaboration alliances, and network between members of different parts of the country and communication channels establishment. The involvement of the science community is an integrating part of these events in order to promote the establishment of links between schools and research facilities.
- National contests for secondary schools
- Masterclasses and e-Masterclasses that integrate the use of eScience tools and e-infrastructures in school environments. These events promote the use of reach scientific data and instruments in a user friendly environment while involving students and teachers on their use.

The use of the tools and resources available for Discover the Cosmos was promoted in these events and in particular the pilot of the use of Discover the Cosmos Demonstrators.

This document has a detailed list of the activities implemented by all the partners during the second year of Discover the Cosmos.

Table 1 provides a summary of the most important national level implementation activities undertaken by the Consortium partners during the aforementioned period. All activities are listed in the Annex.



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Title of Activity	Type of Activity	Date(s) of Activity	Number of Teachers and Students participated	Participating Institute(s)
Teachers Programme at CERN	T	November 2012 – February 2013 (3 events)	91 teachers	CERN
NTW/GTP/Discover the Cosmos teacher training workshop	T	October 2012 – March 2013 (6 events)	74 teachers	TUD
Discover the Cosmos demonstrations in other workshops	T	September 2012 – November 2012 - (4 events)	118 teachers, 5 trainers, 4 scientists	NUCLIO
IMC/ DISCOVER THE COSMOS teacher training Workshop	MC	March 2013 (3 events)	50 teachers	TUD
Discover the Cosmos Training Workshops – Academia do Cosmos	T	November 2012 – June 2013 (16 events)	160 teachers, 7 trainers, 4 scientists	NUCLIO
ATLAS Masterclasses	MC	February 2013 to March 2013v (2 events)	160 students, 24 teachers	IASA / EA
NSO teacher training	T	April to June 2013 (3 events)	47 teachers	LJMU
Summer Schools	SS	July and August 2013	72 High School students	UB and EA
Universe in the Classroom	T	June to July 2013 (2 events)	23 teachers	UoG

MC=Masterclass; T= Training Seminar or Workshop; SS=Summer School

Table 1: Most important national level activities implemented for Year Two of the Discover the COSMOS Project



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### 2. National Level Implementation Activities (some highlights)

#### 2.1 National Masterclasses

Masterclasses are a complete experience for students composed by a talk by an expert and a hands-on workshop on the science topic addressed by the session. They are usually greeted with great enthusiasm by the student who can feel the real research environment for some time. Several examples were promoted in the framework of Discover the Cosmos collaboration with schools and Universities.

##### 2.1.1 Universe in the Classroom

A full 5-hour workshop covering both the Faulkes Telescope Project and National Schools' Observatory (both part of "Discover the Cosmos"). The aim of this talk was to encourage teachers to work with FT and NSO, to engage school students in STEM subjects through astronomy. The workshop includes demonstrations of software such as SalsaJ, Stellarium and DS9, and other "Discover the Cosmos" resources currently available online. Participants work with laptops/PCs to carry out a variety of activities, such as using SalsaJ to analyse FITS files and create Hertzsprung-Russel diagrams and animations of asteroids and solar rotation.





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### 2.1.2 ATLAS Z and ATLAS W Masterclasses

#### **ATLAS Z Masterclass**

Sixty Greek high-school students accompanied by twelve teachers came to the University of Athens for one day in order to learn about particle physics, CERN and become researchers for a day. The event was held at the Department of Physics of the University. In the morning, lectures were given by professors from the University of Athens and Ellinogermaniki Agogi, and in the evening a laboratory was held where students used the HYPATIA event display to look for Z bosons. Finally the students compared their results in a videoconference with those of students performing the same exercise at the Slovak University of Agriculture (Faculty of Engineering), the Napoli Unit of the Italian Institute for Nuclear Physics, the Kepler Center for Astro and Particle Physics in Tübingen, Germany, and the Institute of Astro and Particle Physics at the University of Innsbruck, Austria.

#### **ATLAS W Masterclass**

One hundred Greek high-school students accompanied by fifteen teachers came to the University of Crete for one day in order to learn about particle physics, CERN and become researchers for a day. The event was held at the Department of Physics of the University. In the morning, lectures were given by professors from the University of Crete and Ellinogermaniki Agogi, and in the evening a laboratory was held where students used the MINERVA event display to look for W bosons. Finally the students compared their results in a videoconference with those of students performing the same exercise at three Portuguese universities – University of Aveiro, University of Porto and the Engineering School of the Technical University of Lisbon.

## 2.2 Summer Schools

### 2.2.1 Summer school organized by EA and the Greek Physics Society

Summer School for High School Students organized by EA and the Greek Physical Society at Ancient Olympia from August 26 to 31<sup>st</sup>. It was a 5-day training session for high school students



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where they are introduced to modern physics, large infrastructure tools and as part of their training use advanced simulation applications and data analysis tools that enables them to analyze almost real scientific data recently collected from some science facility or lab.



### 2.3 Training Sessions

During the second year of the project many teacher training sessions took place. The main objective was to help teachers be acquainted with the methodology proposed, the use of eScience tools and eInfrastructures available, the use of the existing demonstrators and motivate them to build their own scenarios. The expectation is now being built in the adaptation of the presented ideas to the schools curricula and seeing the birth of scenarios tailored for the specific needs of each country, regions, school, discipline, grade level, etc. The process started successfully and many seeds are now waiting to grow in the next school year.



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### 2.3.1 Teacher training workshop in the UK

The workshops included: Brief Intro Talk to outline particle physics research at the LHC at CERN and principles of particle detectors; Workshop – using MINERVA and HYPATIA software to detect W and Z decays respectively, and also to measure the mass of the Z boson. Accompanying teachers left with a resource pack, including a memory stick with all talks, worksheets and software.



### 2.3.2 Discover the Cosmos Workshop for teachers in Cyprus

A Discover the COSMOS workshop with 34 Cypriot physics teachers was held jointly by CERN and IASA at the Pedagogical Institute of Cyprus under the support of the Ministry of Education and Culture and the University of Cyprus. The workshop took place almost two weeks after the signature of an agreement under which the Republic of Cyprus will become an Associate Member State of CERN in the pre-stage to Membership. The workshop took place in Nicosia in October 2012.

The agenda of the event:





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**Επιμορφητικό Σεμινάριο**  
**«Το Πείραμα του Αώνου στη Σχολική Τάξη»**  
 Σάββατο 20 Οκτωβρίου 2012  
 Ίδρυμα Παιδαγωγικού Ινστιτούτου, Λευκωσία, Αίθουσα 213

Επισημμένες από ομόλογοι του κόσμου εργάζονται στο Ευρωπαϊκό Κέντρο Πρωτόνων Ερευνών (CERN) ανελκυστών δεδομένα από συγκρούσεις σωματιδίων στον LHC (Large Hadron Collider), τον περιβόητο Μεγάλο Επιταχυντή Αδρονίων, την περιρμητική μηχανή που κατασκευάστηκε στα σύνορα μεταξύ Ελβετίας και Γαλλίας, προέκυψε για μια υπέροχη κυκλική στήλη, ένα μικρό δακτύλιο μήκους 27 χιλιομέτρων και διάμετρος 100-120 μέτρων κενό από τα γραφικά λυδάκια της παροχής, βασίζονται στον LHC τον πιο ισχυρό και περιπλοκό επιταχυντή σωματιδίων που δημιουργήθηκε ποτέ, οι ερευνητές ελπίζουν να βρουν κλειδιά απάντησης σε μια σειρά από θεμελιώδη, αλλά ακόμη ανύπνητα, ερωτήματα της Φυσικής.

Την ίδια ώρα μια διεθνής ομάδα επιστημόνων και εκπαιδευτικών, υπό την εποπτεία της καθηγήτριας του Πανεπιστημίου Αθηνών, κας Χριστίνας Κουκουμυηλή σχεδίαζε εκπαιδευτικές εφαρμογές και εργαλεία για την παρουσίαση πολυμέσων φυσικών φαινομένων όπως αυτών που λαμβάνουν χώρα στο εσωτερικό του LHC, στη σχολική τάξη. Μέσω μιας σειράς διαδραστικών εφαρμογών και εργαλείων οι μαθητές μπορούν να επεξεργαστούν πραγματικά δεδομένα από τα πειράματα που εκτελούνται στο CERN. Με αυτό τον τρόπο επιτυγχάνεται η σύνδεση του σχολείου με ένα ερευνητικό κέντρο αρχής ενώ οι μαθητές έχουν την ευκαιρία να γνωρίσουν από κοντά τη δουλειά γνωστών ερευνητών.

Με αφορμή την φιλοξενία της διεύθυνσης του CERN στο Πανεπιστήμιο Κύπρου, το Υπουργείο Παιδείας και Πολιτισμού και το Παιδαγωγικό Ινστιτούτο διοργανώνουν ένα επιμορφητικό σεμινάριο για εκπαιδευτικούς με στόχο την παρουσίαση των εφαρμογών αυτών αλλά και σειράς προτάσεων για την αποτελεσματική σύνδεση του «πειράματος του αώνου» στην εκπαιδευτική διαδικασία.

**Πρόγραμμα Σεμιναρίου**  
 Σάββατο 20 Οκτωβρίου 2012  
 Παιδαγωγικό Ινστιτούτο Κύπρου

**09:30 – 09:45**  
 Χαιρετισμοί – Εισαγωγή στο Σεμινάριο  
 Σάββας Σάββας  
 Καθ. Φυσικής / Σύμβουλος Φυσικής στο ΥΠΠ

**09:45 – 10:30**  
 Σύνδεση του CERN με τη Σχολική Τάξη:  
 Διαδραστικά Εργαλεία & Εφαρμογές  
 Άγγελος Αλεξόπουλος  
 Τομέας Εκπαίδευσης, CERN

**10:30 – 10:45**  
 Διάλειμμα

**10:45 – 12:15**  
 Ανάλυση δεδομένων του Πειράματος ATLAS με τη χρήση του Προγράμματος HYPATIA  
 Γεώργιος Βασιλειάδης  
 Εθνικό & Καποδιστριακό Πανεπιστήμιο Αθηνών

**12:15 – 12:45**  
 Σύντομη Ανάλυση & Κλείσιμο του Σεμιναρίου  
 Σπυριδούλα Σάββας Σάββας

Some moments of the training event:





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### 2.3.3 Training Academies in Portugal



In Portugal a series of Training workshops on the use of specific eScience tools and resources from the Discover the Cosmos repository and demonstrators were promoted. In these sessions, teachers from different parts of the country meet and were trained on the use of new material. During the events they have the opportunity to use the eScience tool or eInfrastructure being presented (Faulkes Telescope, Coimbra's Observatory archives, EUHOU Radio Antenas). It is also a space where they had the opportunity to meet peers from other schools, discuss their experiences and share results and ideas. Scientists were also present in most of the session and very interesting discussion about implementation of real research in classroom were raised during the events. The majority of the events ended with a science café where they had the opportunity listen to scientists sharing cutting edge topics on Astronomy and Space Research. Most of the participants were teachers that previously attended Visionary Workshops who had time to reflect and make some pilot trials on the use of some resources in classroom. They shared their vision on the result of Discover the Cosmos in their schools, the advantages and disadvantages of its use (as reported in the PRW and Summative report).





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The complete list can be found in the table presented in annex to this document.



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### 2.3.4 Discover the Cosmos in cooperation with NTW Teachers Workshop at CERN

#### Teacher Training Workshop for Gemarn teachers

Date of Event: 24 – 29/03/2013

Place of Event: CERN, Switzerland



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#### Content:

1. Particle Accelerators – Bernhard Holzer (CERN)
2. Particle Physics – Rolf Landua (CERN)
3. Anti-matter – Michael Doser (CERN)
4. Particle detectors – Werner Riegler (CERN)
5. Cosmology – Michael Kobel (TU Dresden)
6. Visits of CERN equipment and experiments (ATLAS, LINAC, LEIR, AD, LHCb/CAST)
7. Particle physics masterclass
8. Educational materials and resources
9. Cloud Chamber Workshop

2 times per year a group of teachers, who are active and qualified members of the German Network "Netzwerk Teilchenwelt" visit CERN in the framework of the Germans Teachers Program (CERN). During their visit they hear lectures about particle physics, visit CERN experiments, discuss with scientists and colleagues about the newest achievements in research and learn how to introduce science to the classrooms and how to interest students for particle physics.



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The program "Netzwerk Teilchenwelt" is run by the IKTP at TU Dresden, funded by the federal ministry of education and research (BMBF) and under the patronage of the German Physical Society (DPG).

See: [www.teilchenwelt.de](http://www.teilchenwelt.de)

### School Students Workshops

Date of Event: 31/10 – 03/11/2012      Place of Event: CERN, Switzerland

Each year 2 groups of about 30 high school students, which are active members of the program conducted by the German network "Netzwerk Teilchenwelt", are invited to visit CERN for 4 days to deepen their knowledge in particle physics and to get in touch with CERN's scientists.

The German "Netzwerk Teilchenwelt" is a network of 22 particle and astro-particle institutes in Germany and gives access to modern science for 3.500 students and 300 teachers a year. Throughout the year, about 100 young scientists demonstrate in schools and school labs all over Germany through particle physics masterclasses and cosmic-ray workshops how modern science works. Furthermore interested students and teachers are welcome to engage in particle physics and are invited to workshops at CERN and do their own research projects.

See: [www.teilchenwelt.de](http://www.teilchenwelt.de)

### 2.3.5 CERN - Blended Learning Course

#### CERN-Teacher Training (Preparation seminar for the CERN teacher training)

Date of Event: November/2012      Place of Event: Wels/Linz - Austria





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Several teachers, scientists, science center staff and stakeholders were coming together to discuss and present the activities of schools and research institutes (CERN, Uni Linz, Uni Salzburg, HEPHY, PSI) and of EU projects like Discover the COSMOS. This was the preparation seminar for the Austrian teacher training programme at CERN where teachers get first insights and presentation of services and resources.

### 2.4 Contests

#### 2.4.1 Mini-Congresso Solar (Portuguese National Contest)



Participants were challenged to use images from the Sun taken by the Observatory of Coimbra during the month of April and build a science experiment. Students and teachers had to produce an activity in the classroom using at least one of spectroheliograms made available on the website of Discover The Cosmos. This activity had to be presented in the form of an IBSE scenarion. The best scenarios were presented by students in the Mini Solar Congress, at the Astronomical Observatory of the University of Coimbra. The winners will have a research-day

at the Astronomical Observatory of the University of Coimbra (October 2013). Some of the students participating in the contest:



The winner group, from Escola Secundária Adolfo Portela, produced an experience where they used the images to prove that the Sun rotates with different speed in the poles and the equator:



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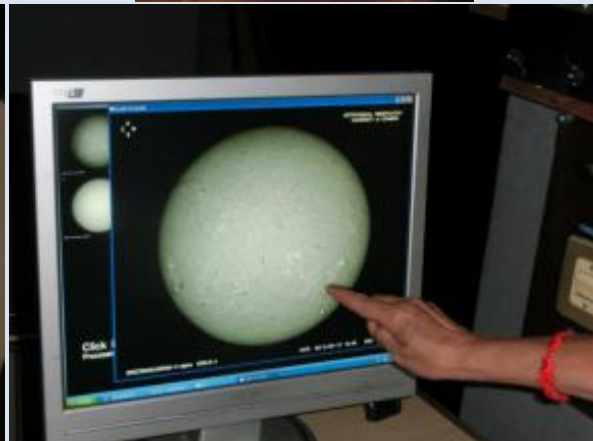
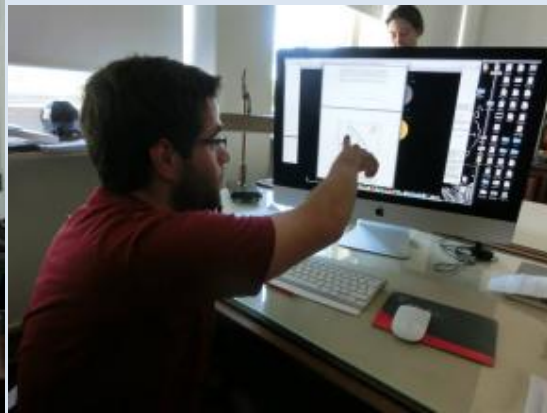
They become very famous in their locality



Students had the possibility to visit the observatory in September 2013, interact with several planetary scientists, see the telescope taking an image from the Sun and further explore the science being done at the observatory.



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### 3. Conclusions and Steps Ahead

During this phase of the project the main aim was to walk hand-in-hand with teachers and provide the necessary support for their path in Discovering the Cosmos. Some needs and barriers were addressed, effective actions taken into adapting the experience to local needs and last but not least, the construction of a support network for the continuation of the process. Teachers have to face a variety of challenges in their daily practice: lack of ICT skills, extensive curricula, lack of interest of students for science topics among others. Discover the Cosmos was addressed by many teachers as a very interesting proposal to help them address some of this issues. Students involved in the activities were eager to learn more and hopeful for more experiences like the ones they have been exposed to. The numbers achieved during the second year are as follows

Country	National level Activities (2 <sup>nd</sup> year)			
	Events	Teachers	Students	Other
Germany	14	250	40	0
Greece	5	46	232	0
Portugal	17	381	462	22
Switzerland	3	91	0	0
UK	10	260	50	1
Spain	1	45	5	0
Austria	5	69	0	18
<b>Total 1<sup>st</sup> Year</b>	<b>36</b>	<b>740</b>	<b>979</b>	<b>134</b>
<b>Total 2<sup>nd</sup> Year</b>	<b>55</b>	<b>1142</b>	<b>789</b>	<b>41</b>
<b>Total (M24)</b>	<b>91</b>			
<b>Indicator (M24)</b>	<b>50</b>			

Table 2: Total indicators for the second year of the project



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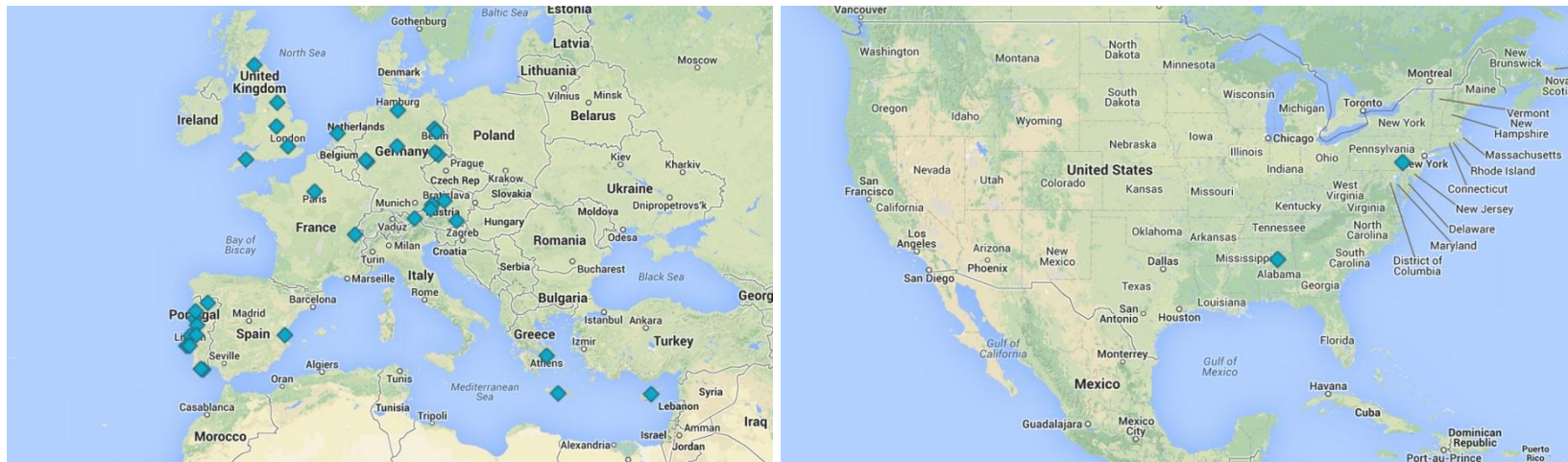
Discover the Cosmos have reached over 1100 teachers and nearly 800 students across Europe in implementation actions at a national level during the second year of the project. The project is ending but the future legacy will certainly endure.



## Discover the Cosmos Deliverable

### 4. ANNEX

Table 1 and 2 show lists of all national level implementation activities conducted during the project's second year (September 2012 – August 2013). The type of the event is marked according to the following table:



Distribution of national implementation activities in Europe and US (partner members of this consortium)



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### 4.1.1 Year 2012 / Month 1 to 4 (M13-M16)

Type	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	Partner
<b>September 2012</b>							
<b>T - N</b>	Discover the Cosmos demonstration during an ODS Visionary	September 29th	Vila Nova de Gaia, Porto	Visionary Workshop for the Open Discovery Space project where Discover the Cosmos repository was presented and a sample demonstrator used (Universe Notebook)	Teachers Trainers Scientists	42 2 2	NUCLIO
<b>October 2012</b>							
<b>T - N</b>	CERN Research Projects	07.10.-19.10.2012	CERN	Each year ten of the most active students of the German network "Netzwerk Teilchenwelt", are invited to a two week research workshop. They realize their extensive research works, supervised by their local institution and a scientist from CERN.	students	10	TUD



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Type	Event	Date (Project Month)	Location	Purpose	Participants	N° part. per category	Partner
				Depending on the federal state, students can contribute this work as a particular achievement ("BeLL") or so-called fifth test component in the grade of their high school diploma. Furthermore, some of these student works have been rewarded with prizes in various awards.			
<b>T - N</b>	James Webb Space Telescope Workshop	08/10/2012	York, UK	A 1-hour workshop covering both the Faulkes Telescope Project and National Schools' Observatory (both part of "Discover the Cosmos") as part of the JWST training workshop. The aim of this talk was to encourage teachers to work with FT and NSO, to engage school students in STEM subjects through astronomy. The workshop includes	high school teachers	20	UoG



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Type	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	Partner
				demonstrations of software such as SalsaJ and Stellarium.			
<b>T - N</b>	Discover the Cosmos demonstration during an ODS Visionary	October 13th	Faro, Portugal	Visionary Workshop for the Open Discovery Space project where Discover the Cosmos repository was presented and a sample demonstrator used (Impact Crater)	Teachers Trainers Scientists	27 2 2	NUCLIO
<b>T - N</b>	Online Discover the Cosmos teacher training	18.10.2012	online	Several teachers are asked for their needs in using scientific tools and infrastructures and were afterwards trained in using best practices and demonstrators in their classrooms. Also a poll was done which teachers are willing to act as a trainer for further teachers. Most of the participants are eager to do this but with little support of advanced members of the Discover	teachers	4 teachers 2 stakeholder	BMUKK



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Type	Event	Date (Project Month)	Location	Purpose	Participants	N° part. per category	Partner
				the Cosmos user's community.			
<b>T-N</b>	DPG-advanced training in particle physics for physics teachers	19/10 – 23/10/2012	Centre of physics, Bad Honnef	Teacher training in Discover the Cosmos particle physics tools and services	teachers	40	TUD
<b>T - N</b>	The experiment of the century in the school classroom	20/10/2012	Pedagogical Institute, Nicosia, Cyprus	<a href="http://discoverthecosmos.eu/news/163">http://discoverthecosmos.eu/news/163</a>	Cypriot teachers and teacher trainers	34	CERN, IASA
<b>T - N</b>	NTW/GTP/DISCOVER THE COSMOS teacher training Workshop	21.-26.10. 2012	CERN	1 week workshop at CERN in cooperation with GTP: lectures about particle physics, visit CERN experiments, discuss with scientists and colleagues about the newest achievements in research and learn how to introduce science to the classrooms and how to interest students for particle physics.	teachers	31	TUD



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Type	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	Partner
<b>T - N</b>	Academia do Cosmos (Training sessions on the use of digital soft. and science research projects implementation)	27/10/2012	Centro de Interpretação Ambiental da Pedra do Sal: Cascais - Portugal	Citizen Science	School teachers	15	NUCLIO
<b>T-N</b>	Discover the Cosmos High School Students Workshop in cooperation with NTW High School Students Workshop at CERN	31/10 – 03/11/2012,	CERN - Geneva	Each year 2 groups of about 30 high school students, which are active members of the program conducted by the German network "Netzwerk Teilchenwelt", are invited to visit CERN for 4 days to deepen their knowledge in particle physics and to get in touch with CERN's scientists.	30	High school students	TUD
<b>November 2012</b>							
<b>T – N</b>	CERN Blended Learning Course	05.-06.11.2012	WELIOS, Wels and University Linz	Seminar for preparation of teacher training at CERN	30	14 teachers 4 stakeholder 9 scientists 3 science center staff	BMUKK
<b>T - N</b>	Particle physics training for teachers in	07/11/2012 an	University of Bonn	Teacher training in	teachers	18	TUD





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Type	Event	Date (Project Month)	Location	Purpose	Participants	N° part. per category	Partner
	Bonn	14/11/2012		Discover the Cosmos particle physics tools and services			
<b>T - N</b>	Greek Teachers Programme at CERN	15-18/11/2012	CERN, Switzerland	<a href="http://indico.cern.ch/conferenceDisplay.py?confId=217943">http://indico.cern.ch/conferenceDisplay.py?confId=217943</a>	Greek teachers and teacher trainers	25	CERN
<b>T - N</b>	Discover the Cosmos demonstration during an ODS Visionary	November 17th	Torres Novas, Portugal	Visionary Workshop for the Open Discovery Space project where Discover the Cosmos repository was presented and a sample demonstrator used.	Teachers Trainers Scientists	27 2 2	NUCLIO
<b>T - N</b>	"MINT-EC Camp" on particle physics	21-24/11/2012	Dresden - TUD	High school students from Germany are searching for answers about the big bang and the development of the universe. With scientists from the University of Dresden they were experiencing the world of quarks and electrons and how they can be	teachers	18	TUD



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Type	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	Partner
				measured.			
<b>T - N</b>	Discover the Cosmos presentation during an ODS Visionary	November 24th	Lisbon, Portugal	Visionary Workshop for the Open Discovery Space project where Discover the Cosmos repository was presented and a sample demonstrator used (Moon Research)	Teachers Trainers Scientists	22 4 3	NUCLIO
<b>T - N</b>	Academia do Cosmos (Training sessions on the use of digital soft. and science research projects implementation)	24/11/2012	Centro de Interpretação Ambiental da Pedra do Sal: Cascais - Portugal	Black Holes with Salsa J	School teachers	15	NUCLIO
<b>T - N</b>	Astrophysik und Hochenergiephysik am CERN - Austrian Teacher Training	25.-30.11.2012	CERN	Presentations, demonstrations, exhibitions and visits at CERN in the framework of the Austrian teacher training programme. Teachers get in touch with the scientific world and services, tools and teaching materials of several projects as Discover the Cosmos were	Teacher, teacher trainer, teacher trainees	26	BMUKK, CERN



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Type	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	Partner
				offered to them.			
<b>December 2012</b>							
<b>T - N</b>	UK Teachers Programme at CERN	10-13/12/2013	CERN, Switzerland	Demonstration of DtC eScience tools, portal and activities to UK teachers taking part in the National Teachers Progr. at CERN.	UK teachers and teacher trainers	30	CERN
<b>T - N</b>	Academia do Cosmos (Training sessions on the use of digital soft. and science research projects)	15/12/2013	Centro de Interpretação Ambiental da Pedra do Sal: Cascais - Portugal	Salsa J and Exploring Mars	School teachers	15	NUCLIO

Table 3. .National Implementation Activities 2012

### 4.1.2 Year 2013 / Month 17 to 24

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
<b>January 2013</b>							
<b>T - N</b>	Academia do Cosmos (Training sessions on the use of digital soft. and science research projects implementation)	19/01/2013	Centro de Interpretação Ambiental da Pedra do Sal: Cascais - Portugal	Hands-on Astronomy	School teachers	20	N U C L I O
<b>T - N</b>	Discover the Cosmos training event during the Eco Schools National Meeting	January 26 <sup>th</sup>	Agueda, Portugal	Workshop for teachers during a ecoSchools national event where Discover the Cosmos resources were presented and a practical example explored	Teachers Trainers	50 3	N U C L I O
<b>T - N</b>	National workshop for students of the Greek Physical Society	27.01.2013	Athens	Student Education	high school students	50	I A S A



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
							+
<b>February 2013</b>							
<b>T - N</b>	Discover the Cosmos Training Academies	01/02/2013	Chaves	Training Workshops, officially certified by our Ministry of Education with 25 hours. Many participants had previously participated in the Visionary Workshops. We use the opportunity to Promote PRW	Teachers Trainers	20 2	N U C L I O
<b>T - N</b>	Academia do Cosmos (Training sessions on the use of digital soft. and science research projects implementation)	16/02/2013	Centro de Interpretação Ambiental da Pedra do Sal: Cascais - Portugal	Citizen Science	School teachers	15	N U C L I



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	N° part. per category	P a r t n e r
							O
<b>T - N</b>	UK Teachers Programme at CERN	18-21/02/2013	CERN, Switzerland	Demonstration of Discover the Cosmos eScience tools, portal and activities to UK teachers taking part in the National Teachers Programme at CERN.	UK teachers and teacher trainers	36	C E R N
<b>T - N</b>	67. Fortbildungswoche des VFPC	26.02.2013	Faculty of Physics, University of Vienna	Discover the Cosmos Training Workshop: A Workshop presenting Discover the Cosmos services and materials in the framework of the 67. Fortbildungswoche des Vereins zur Förderung des physikalischen und chemischen Unterrichts (VFPC). Stellarium, Demonstrators as well as robotic telescopes were	10	10 teachers	B M U K K



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
				presented and trained with the teachers. The workshops duration was 3 hours. Several participants want to get more involved in several activities and projects which were presented.			
<b>T - N</b>	Astro-Night Wien	26.02.2013	Institut für Astrophysik, Vienna	Discover the Cosmos Training Workshop	15	15 teachers	B M U K K
<b>T - N</b>	ATLAS Z Masterclass	28/2/2013	University of Athens	Participation in IPPOG masterclass	Greek High school teachers  Students	12  60	I A S A  / E



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
							A
<b>March 2013</b>							
<b>T - N</b>	Discover the Cosmos Training Academies	02/03/2013 to 17/03/2013	Vila Nova de Gaia	Training Workshops, officially certified by our Ministry of Education with 25 hours. Many participants had previously participated in the Visionary Workshops. We use the opportunity to Promote PRW	Teachers Trainers	40 2	N U C L I O
<b>T - N</b>	IMC/ DISCOVER THE COSMOS teacher training Workshop	9.3. 2013	Dresden	Teacher training in Discover the Cosmos particle physics tools and services	Teachers	13	T U D
<b>T - N</b>	NTW/ DISCOVER THE COSMOS teacher training Workshop	13.- 14.3. 2013	Meißen	Teacher training in Discover the Cosmos particle physics tools and	Teachers	15	T U D





## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
				services			
<b>T - N</b>	IMC/ DISCOVER THE COSMOS teacher training Workshop	14.3. 2013	Berlin	Teacher training in Discover the Cosmos particle physics tools and services	Teachers	22	T U D
<b>T - N</b>	IMC/ DISCOVER THE COSMOS teacher training Workshop	18.3. 2013	München	Teacher training in Discover the Cosmos particle physics tools and services	Teachers	15	T U D
<b>T - N</b>	ATLAS W Masterclass	16.03.2013	Iraklio, Crete	Participation in IPPOG masterclass	Greek high school students  Teachers	100  12	I A S A  / E A
<b>T - N</b>	Discover the Cosmos Training	23 to 25/03/2013	Quarteira	Training Workshops,	Teachers	20	N



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
	Academies			officially certified by our Ministry of Education with 25 hours. Many participants had previously participated in the Visionary Workshops. We use the opportunity to Promote PRW	Trainers Scientist	3 1	U C L I O
<b>T - N</b>	NTW/GTP/DISCOVER THE COSMOS teacher training Workshop	24.-29.3. 2013	CERN	1 week workshop at CERN in cooperation with GTP: lectures about particle physics, visit CERN experiments, discuss with scientists and colleagues about the newest achievements in research and learn how to introduce science to the classrooms and how to interest students for particle physics.	teachers	28	T U D



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
<b>April 2013</b>							
<b>T - N PRW</b>	Discover the Cosmos Training Academies	06/04 to 08/06/2013	Coimbra	Training Workshops, officially certified by our Ministry of Education with 25 hours. Many participants had previously participated in the Visionary Workshops. We use the opportunity to Promote PRW	Teachers Trainers Scientist	20 3 1	N U C L I O
<b>T - N</b>	NSO teacher training	12.04.13	Herstmenceaux, Est Sussex	Full-day DtC Practice workshop that included various demonstrations of DtC tools and e-Infrastructures,	teachers	8	L J M U
<b>T - N</b>	Academia do Cosmos (Training sessions on the use of digital soft. and science research projects	13/04/2013	Centro de Interpretação Ambiental da Pedra do Sal: Cascais - Portugal	Sun4all	School teachers	15	N U C L



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	Partner
	implementation)						IO
<b>T - N</b>	Astroparticle physics training workshop for teachers	17.4. 2013	Dresden	Teacher training in astroparticle physics tools and services	Teachers	10	TUD
<b>T - MC - N</b>	Particle Physics Masterclass	17/4/2013	UB	Talks & workshops incl use of Minerva software tool	students aged 17/18 from a number of different schools	~120	UB
<b>T - N</b>	Academia do Cosmos (Training sessions on the use of digital soft. and science research projects implementation)	20/04/2013	Centro de Interpretação Ambiental da Pedra do Sal: Cascais - Portugal	Planetaria Software	School teachers	15	NUCLIO
<b>T - N</b>	Astroparticle physics training	27.4. 2013	Zeuthen	Teacher training in	Teachers	10	T



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
	workshop for teachers			astroparticle physics tools and services			U D
<b>May 2013</b>							
<b>T - N PRW</b>	Discover the Cosmos Training Academies	04 to 25/05/2013	Aveiro	Training Workshops, officially certified by our Ministry of Education with 25 hours. Many participants had previously participated in the Visionary Workshops. We use the opportunity to Promote PRW	Teachers Trainers Scientist	20 3 1	N U C L I O
<b>T - N</b>	Academia do Cosmos (Training sessions on the use of digital soft. and science research projects implementation)	18/05/2012	Centro de Interpretação Ambiental da Pedra do Sal: Cascais - Portugal	Astronomy@myBackPack	School teachers	15	N U C L I O



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
<b>T - N</b>	NSO teacher training	25.05.2013	SpaceGuard Knighton, Powys UK,	Full-day teacher training workshop to introduce teachers to robotic telescopes and undertake various data analysis and manipulation activities.	teachers	12	L J M U
<b>June 2013</b>							
<b>T - N</b>	"Universe in the classroom" teacher training workshop (full)	07.06.2013	Tiverton, Devon, UK	A full 5-hour workshop covering both the Faulkes Telescope Project and National Schools' Observatory (both part of "Discover the Cosmos"). The aim of this talk was to encourage teachers to work with FT and NSO, to engage school students in STEM subjects through astronomy. The workshop	teachers	11	U o G



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
				includes demonstrations of software such as SalsaJ, Stellarium and DS9, and other "Discover the Cosmos" resources currently available online. Participants work with laptops/PCs to carry out a variety of activities, such as using SalsaJ to analyse FITS files and create Hertzsprung-Russel diagrams and animations of asteroids and solar rotation.			
<b>T - N</b>	JWST - N Teacher CPD Event	9 to 11.06.2013	Royal Observatory, Edinburgh, Scotland	Teacher training event to use JWST as a context for teaching space science and astronomy, with an introduction to Gaia for which we have planned a	Teachers	25	U C A M



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	N° part. per category	P a r t n e r
				similar event next year and which will promote our online platform hosting the Discover the Cosmos resources.			
<b>T - N</b>	Discover the Cosmos High School Students Workshop in cooperation with NTW High School Students Workshop at CERN	12/06 – 15/06/2013	CERN - Geneva	Each year 2 groups of about 30 high school students, which are active members of the program conducted by the German network "Netzwerk Teilchenwelt", are invited to visit CERN for 4 days to deepen their knowledge in particle physics and to get in touch with CERN's scientists.	High school students	30	T U D
<b>T - N</b>	NSO teacher training	14.06.13	Royal Astronomical Society, London	Full-day teacher training workshop to introduce teachers to robotic	teachers	27	L J M





## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
				telescopes and undertake various data analysis and manipulation activities.			U
<b>T - N</b>	Academia do Cosmos (Training sessions on the use of digital soft. and science research projects implementation)	15/06/2013	Centro de Interpretação Ambiental da Pedra do Sal: Cascais - Portugal	Extra-solar planets	School teachers	15	N U C L I O
<b>July 2013</b>							
<b>T - N</b>	Discover the Cosmos Scenarios – Dark Skies Rangers	July 1 <sup>st</sup> 2013	Cascais	Special training on the use of DSR tools and resources (integrated in Discover the Cosmos Portal) given by Connie Walker	Galileo Ambassadors	10	N U C L I O
<b>T - N PRW</b>	Discover the Cosmos Training Academies	01 to 03/07/2013	Caldas da Rainha	Training Workshops, officially certified by our Ministry of Education with	Teachers Trainers	20 4	N U C



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
				25 hours. Many participants had previously participated in the Visionary Workshops. We use the opportunity to Promote PRW (Special participation of Prof. Connie Walker)	Scientist	1	L I O
<b>T – N SS</b>	Physics Summer School	10-11/7/2013 (M23)	UB	Labs to include a PP computer Lab using Minerva software	Y12 students from different schools all over the UK	50	U B
<b>T – N</b>	Universe in the classroom” teacher training workshop (full)	11/07/2013	Institute of Education, London, UK	A full 5-hour workshop covering both the Faulkes Telescope Project and National Schools’ Observatory (both part of “Discover the Cosmos”).	teachers	12	U o G
<b>T - N</b>	Particle Physics workshop aT - Nly	12/7/2013 (M23)	University of Leicester	Talk and workshop using	high school	25	U



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
	organised Teacher Update conference			Minerva software	teachers  IOP representative	1	B
<b>August 2013</b>							
<b>T - N</b>	Summer School for High School Students organized by EA and the Greek Physical Society	August 26-31, 2013	Ancient Olympia	5-day training session for high school students	high school students from all around the nation	22	E A
<b>Non Fixed Dates (2012 – 2013)</b>							
<b>T - N</b>	IASC		National	An international program devoted to Asteroid Search <a href="http://nuclio.org/iasc/">http://nuclio.org/iasc/</a>	Schools Teachers Students	50 60 450	N U C L I



## D4.6 Final Report on Implementation Activities (National Level)

	Event	Date (Project Month)	Location	Purpose	Participants	Nº part. per category	P a r t n e r
							O
<b>T - N</b>	<b>Mini-congresso solar (Solar colloquium)</b>	May, 9 June and 13 June	Astronomical Observatory of the University of Coimbra	National contest proposing innovative ways to use the daily spectroheliograms from the Observatory of Coimbra	students teachers	12 3	U O C
<b>T - N</b>	The <b>contest</b> 'El Universo a tu manera' ('The Universe, in your own way')	February to May, 2013	National	<a href="http://houspain.com/concurso/">http://houspain.com/concurso/</a>	Teachers  Students	45  5	U C M

Table 4. National Implementation Activities 2013