Discovery Space
Newsletter
Nr. 2/2005

INDEX

Dear DSpacers,

I am pleased to communicate with you through our second newsletter that has the intention to inform you about the results of the Science Contest that was organised in the framework of the DSpace project.
The Science Contest has now been completed. Best projects have been selected and presented during European Science Week 2005, with the respective teams traveling to Athens (Ellinogermaniki Agogi premises, Pallini) for the Award Ceremony. We have decided to devote this issue to the science contest and to present the complete program of the events and all relevant information. Overall the Science Contest as well as the Award Ceremony was a great success, both in terms of participation as well as of scientific level.

Enjoy our second newsletter and we are waiting you in our DSpace web site, www.discoveryspace.net.

Dr. Elias Vagenas,
Editor of the DSpace Newsletter

DSpace and the Science Contest

The aim of the DSpace service is to demonstrate an innovative approach that crosscuts the boundaries between schools, research centers and science thematic parks and the wider public and involves users in extended episodes of playful learning. The service offers a "feel and interact" user experience, allowing for learning "anytime, anywhere", open to societal changes and at the same time feeling culturally conscious. These pedagogical concepts and learning practices address implementing a set of demonstrators (scenarios for both formal and informal learning settings), employing advanced and highly interactive visualization technologies and also personalised ubiquitous learning paradigms in order to enhance the effectiveness and quality of the teaching and learning process. As the DSpace service is open for different categories of users (students, educators, researchers and the wider public, e.g. visitors of science parks) the scenarios of use have to vary

significantly in order to cover the different users needs. These scenarios will be one of the basic vehicles for the promotion and the dissemination of the service to the user communities. Each scenario will be accompanied with supportive material for the users. The material will include links to the normal school curriculum, guidelines, and sample worksheets for the students, as well as references and additional information for the wider public. The DSpace scenarios will be categorized in two main groups. The first group will include scenarios for the specific educational purposes of the school or university curriculum (scenarios to be used in formal learning settings). The second group will include more open scenarios as they will be designed for the wider public (e.g. the visitors of a science park). The Science Contest of DS pace was a scientific contest that was designed to be an open scenario in the general field of astronomy and astronomical observations which launched in mid-March 2005 and was completed at the end of November 2005.

About the Science Contest

The Science Contest of DSpace project focused on raising public awareness for scientific and technological developments by motivating the wider public to actively participate in the process of realizing the beneficial impact of science and technology on our day-to-day lives. One way of successfully raising awareness and interest on science, especially among the youth, was to present science and scientific research through challenging activities combining intelligence, existing knowledge and innovation.

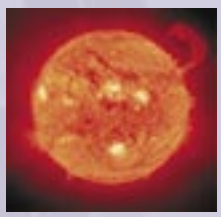
Participation

The Science Contest addressed three age groups. The contest topics, evaluation criteria and presentation format were common for each age group, but eventually nine (9) final winners were foreseen, three (3) from each group. The age groups were defined according to educational level and perceptual abilities, as follows:

Age group 1: Students less than 15 years old
Age group 2: Students between 15 and 18 years old
Age group 3: Adults

All participants were allowed to enter the contest either individually or in pairs (projects developed by groups of more than 2 people were not accepted).

Description of the 1st phase of the Science Contest



During 1st phase, the participants utilized a data base of astronomical observations conducted by the telescopes of the DSpace Network of observatories. According to their selection from the pool of the 5 suggested contest topics:

1) The Sun
2) Planets and Moons
3) Asteroids
4) Birth and Death of Stars
5) Galaxies

the participants were expected to design, develop and implement projects and activities with the use of the provided telescopes' data base and under the guidance and the continuous support of a team of experts in the field. Participants were free to use additional scientific material from other sources, but the use of at least one observation from the DSpace service's Resources Database/Library was obligatory.

The Science Contest participants were asked to create scenarios and well-defined small projects to express their ideas, to seek for answers to scientific issues and to subsequently analyze and interpret the material used, formulating their final answer or viewpoint that will conclude their project. All projects were presented and assessed following specific criteria applied by the DSpace project's Scientific Committee.

An initial selection procedure was established which led to the creation of a pool of the 30 best projects. This evaluation / selection procedure was followed independently for each of the three groups, resulting to the 10 best projects from each group that were qualified for the 2nd phase of the contest. Participants had also to describe their request for new observations that were going to be conducted by the DSpace Network of Robotic Telescopes, if they succeeded to qualify to the 2nd phase of the contest.

Description of the 2nd phase of the Science Contest

The observation requests of the 30 best teams qualified to the 2nd phase of the contest were scheduled in the software of the DSpace service's Network of Robotic Telescopes. In this phase the participants were assigned a specific task based on each project's main idea. Since the time in which the participants were provided with their observations depended on exogenous parameters such as weather conditions and visibility of the specific astronomical subject during the period of the 2nd phase, the requested task as well as the overall evaluation did not depend on whether the participants included these observations in their project or not.
The final submission included the initial project of the 1st phase as well as the answer to the task given in the 2nd phase.

Evaluation Process

The evaluation process went through two phases.

Pre-Selection Phase

All projects were presented and assessed following specific criteria that were applied by the DSpace

project's Scientific Committee.
An initial selection procedure was established and led to the creation of a pool of 30 projects.
This evaluation / selection procedure was followed independently for each of the three groups, resulting to the 10 best projects from each group that were qualify for the 2nd phase of the contest.

Final Phase:

The 30 integrated projects were evaluated by the DSpace project's Scientific Committee who finally came up with:

a) three (3) best projects from the first age category,
b) five (5) best projects from the second age category,
c) two (2) best projects from the third category, and
d) one (1) distinguished project.

Awards Ceremony

Throughout the European Science Week 2005, i.e. 21st - 27th of November 2005, and in the framework of World Year of Physics 2005, the Closing Event of DSpace Science Contest took place at Ellinogermaniki Agogi Premises. Several Events were connected to the Science Contest, such as Sun observations, Hands-on Astronomy lessons. In addition, an one day scientific conference was organised, where presentations by invited speakers were given.

In the next pages a more anlytical description of the different events is given.

Events

During the Science Week 2005 several events were organized in the framework of the DSpace project at Ellinogermaniki Agogi premises.

Sun Observation

On Saturday, 26th of November 2005, a Sun Observation took place at Ellinogermaniki Agogi Premises. About 300 visitors had the chance to perform real-time observations of the Sun.

Hands-on Experiments in the Classroom

On Friday, 25th of November 2005, an one-hour lesson at Ellinogermaniki Agogi High School was devoted to the presentation of hands-on experiments by Dr. Sandra Voss from Science Projects. Students had the opportunity to construct with everyday things paper rockets, and to get an idea of the expanding universe.

Hands-on Astronomy in the Classroom

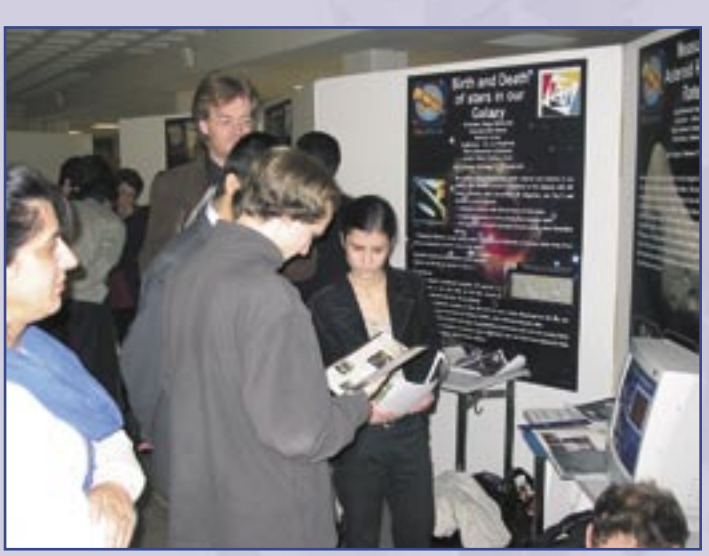
On Thursday, 24th of November 2005, an one-hour lesson at Ellinogermaniki Agogi High School was devoted to the presentation of hands-on astronomy by Dr. Sandra Voss. Students had the opportunity to construct with everyday things their own small telescopes.

Telescopes in the Classroom

On Wednesday, 23rd of October 2005, an one-hour lesson at Ellinogermaniki Agogi High School was devoted to Telescopes. A portable telescope was presented and the characteristics of it were presented. Furthermore, general features of telescopes and their use were discussed.

Stands

During the Science Week 2005, the eleven (11) best project were presented in their dedicated stands in Ellinogermaniki Agogi Premises. Members of the Greek Astronomical Society presented to the visitors a series of telescopes and demonstrate their use to the students and the visitors.



Prizes and Winners

The winners of the 3 categories were:

Age group 1: Students less than 15 years old

"Sun Rotation"
Name of Student: Alexander Kiselyov
Affiliation: Secondary School Nr.40, Riga, Latvia
Rank: 1st place

The Sun is the largest and heaviest body in our solar system and rotates on its axis. Studying the differential rotation of the sun can help us understand the conditions in different layers of the sun, and monitor sunspot activity. To measure the solar rotation period, the easiest way is to measure the difference in position of a sunspot on the face of the sun as it revolves. Sunspots, that appear as dark patches on the Sun's surface, are relatively cool areas caused by a loop in the Sun's magnetic field. Using SkyWatch data, I identified and measured the distance between two sunspot positions in different moments of time and translated these into degrees of solar longitude, to calculate the Sun's rotational velocity.

Age group 2: Students between 15 and 18 years old

"Solar Rotation's Effects on Earth"
Names of Students: 1) Belle Tamir
2) Nitzan Atia
Affiliation: Sharet High School, Netanya, Israel
Tchernichovsky High School, Netanya, Israel
Rank: 1st place

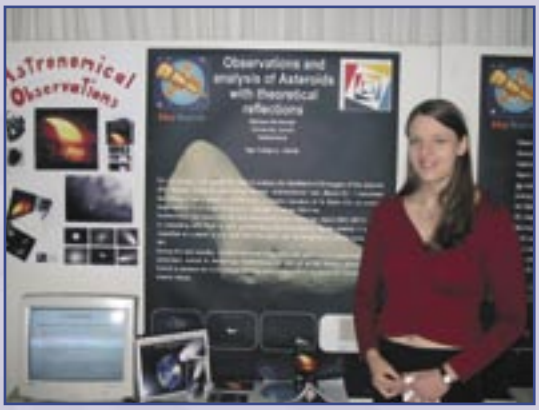
Study of manifestation of the solar rotation in the Earth environment meet with difficulties:
a) A group of spots will mask modulation of the Earth environment from each individual source;
b) Life time of sunspots is about 1-2 months, what limits the number of observed cycles by 1 or 2.
For solution of this problem we test individual sunspot on the Sun during the minimum of solar activity 1996-1997 (when individual spot's effect dominates). For identification 27-d modulation we searched "echo" – effect, when dominant time interval between bursts-responses must be close to period of modulation by solar rotation - 27 day.

For test we used magnetosphere Kp-index. As it may be seen from the figure lower - numerous intervals between peaks have duration 26-28 days, close to solar rotation period.
Second proxy from the Earth environment, what we tested, was cosmic ray (CR) flux from Galaxy. This flux is modulated by solar wind. We used data of Moscow (Russia) and Ohulu (Finland) CR monitors. We overlapped on the observational variations sinus-like model (yellow) with 27 days period and show very good coincidence between them. This result means that in favorable situation solar rotation may influence on the Earth really.

Age group 3: Adults

"Observations and analysis of Asteroids with theoretical reflections"
(Asteroid 2017 Wesson and the Trans-Neptunian Object 2003 UB313)
Name of adult: Barbara Burtscher
Affiliation: University Zurich, Switzerland
Rank: 1st place

For my project, I set myself the task to analyse the SkyWatch-CCD-images of the asteroid 2017 Wesson. Using the astronomy-software "Astrometrica" and „Maxim DL". I calculated that Wesson has a speed of 22.589 km/s, a rotation duration of 1h 55min 47s, an average brightness of 14.42 magnitudes and a diameter of about 256.8 km.
Furthermore I am observing the new discovered trans-neptunian object 2003 UB313 which is competing with Pluto in size. Astronomers are instructed to decide whether it is to be classified as a planet or not. Until then the object will not be given an official name by the IAU.
During the next months, I observe this and other asteroids at the school observatory of the secondary school in Heerbrugg (Switzerland) as well as at the Semper-observatory in Zurich to analyse the CCD-images with the same tasks and to compare the results with reference values.



DSpacers' snapshot

All students, teachers, adults, DSpace's Scientific Committee, and partners were photographed. The photo was taken at the main entrance of Ellinogermaniki Agogi.

Edition

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