



Advanced Technologies in Education

“CONNECT and D-SPACE projects”

Menelaos Sotiriou
Q-Plan



CERN, 15-17 June, 2006



Industry



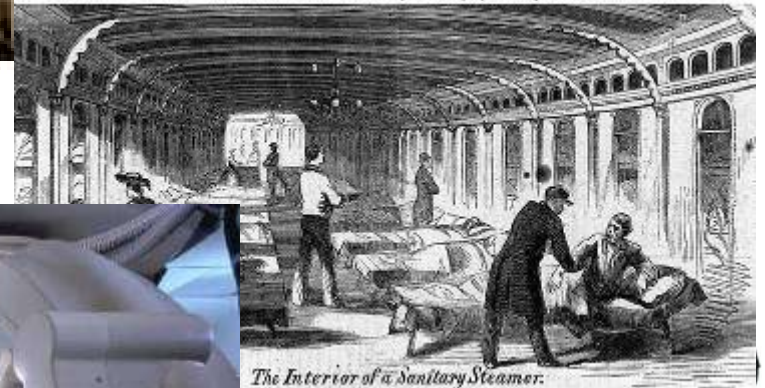
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Photo # NH 58897 Interior of Civil War hospital ship, possibly USS Red Rover



The Interior of a Sanitary Steamer.

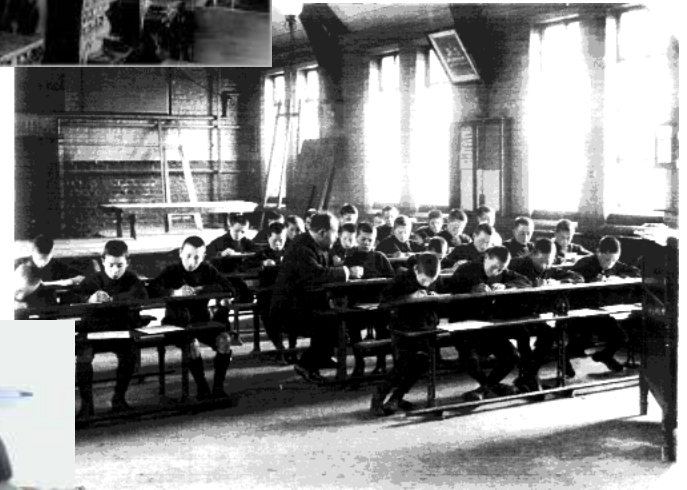


Medicine

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Education



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Attitude towards S&T



- During the last decade some attempts have been made to **evaluate the impact of efforts and investments made in Science and Technology Education worldwide**, for example the two large scale studies [TIMSS, 1994 and PISA, 2000]. Among other things these two studies have explored the achievement and the attitudes towards S&T of the students' population in many countries of the world. The main findings of these studies are that **the average achievement of the students' population is relatively low** in most of the southern European countries.
- Additionally while the vast majority of students hold positive attitudes towards S&T at the **early schooling stages** (70-80% of the 4th graders in all countries), this situation is considerably moderated at the **later stages**.





Current practice is not adopting the results of research



- For many years a considerable number of pedagogues and educational practitioners (e.g. Comenius, Pestalozzi, Montessori and Dewey) **have stressed the importance of visualisation and of hands-on experiences as vital components to the learning process.**
- As a result of these perspectives, many different pedagogical methods have been developed, especially those to be used in lower grades at elementary schools.
- **But as the age of the students increases, more theoretical and abstract the teaching and the learning tends to be.**





Motivation – One of the most important parameters in the learning process



- Emerging trends in education are moving towards learner-centered approaches.
- In these, **learning becomes an active process of discovery and participation based on self-motivation rather than on more passive acquaintance with facts and rules.** The ideas of collaboration and joint construction of knowledge have also found their way into the school system.
- Still, this construction is often mostly theoretical and do not involve real products.





Main questions and concerns for the future



How will we apply what we have learned about teaching and learning to help students prepare for their life in the information society?

Will students be motivated to achieve better?

Will classroom environments promote outcomes like process skills, problem solving abilities, teamwork, stronger self concepts, career goals that include science and transfer of knowledge to novel situations?

Will learning environments be enhanced by effective use of new tools?

What will be different and what will look the same in the classroom and the teaching methods of the future?





Working hypothesis

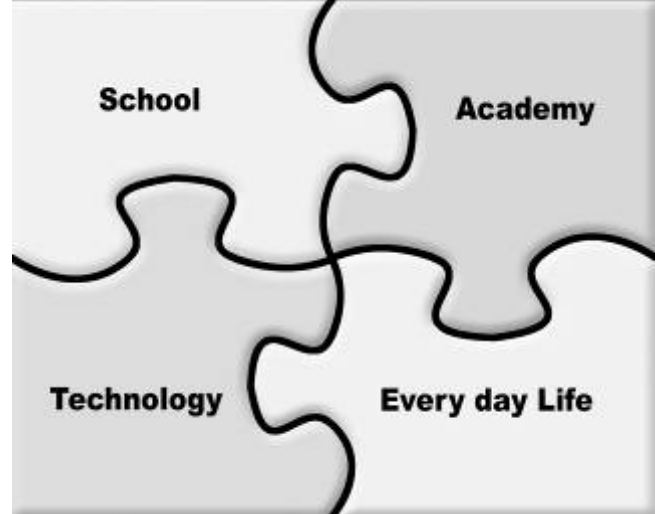


- Amending the traditional scientific methodology for experimentation with visualization applications and model building tools will help students and learners in general to articulate their mental models, make better predictions, and reflect more effectively.
- Additionally, working to reconcile the gaps and inconsistencies within their mental models, system models, predictions and results, will provide the learners with a powerful, explicit representation of their misconceptions and a means to repair them.





The vision



We should point to a future hybrid classroom that builds on the strengths of formal and informal teaching and learning strategies in ways that can support learning of all students.

Our vision for the school of the future is that it will not be an island, a self-contained campus, a counterworld. The school of the future will be able to emit and absorb along different wavelengths, be immersed in contemporary culture, be open to the emotions, facts and news of its time. It will be permeated by society, but not unprotected: the relationship between school and society will be one of osmosis, where the advanced pedagogical tools filter, guide, and act as a membrane and interface.







Discovery Space

D-Space: Web access to a network of robotic telescopes around the world



www.discoveryspace.net



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The network of the robotic telescopes



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GO OBSERVING

Perform your observations in four simple steps

Select Telescope
First you have to choose the model telescope for your observation. The system will inform you about the availability of the specific telescope. In case that the specific telescope is not available the system will provide you with some other options.

Select Object
Select the astronomical object you would like to observe. It is important to take into account all the conditions described in the relative form and the sky map of the selected telescope.

CHOOSE TELESCOPE

Telescope 1
 Telescope 2
 Telescope 3

NEXT

SELECT OBJECT

Select the astronomical object you would like to observe. It is important to take into account all the conditions described in the relative form and the sky map of the selected telescope.

View the Sky map

Select the astronomical object you would like to observe from the object list by choosing the +

http://www.dboverspace.net/vwSelectObject.as...

[Sun](#) [Planets & Moon](#) [Astronomy](#) [Stars](#) [Galaxies](#)

[select an object by clicking it]

Internet

SEE WEATHER

Weather in Spain

NEXT

ENTER OBSERVATION REQUESTS (do experts proceed you how to be a registered user)

Title: (provide the title of your request/object)

Object Name:

Public: No Yes

Date:

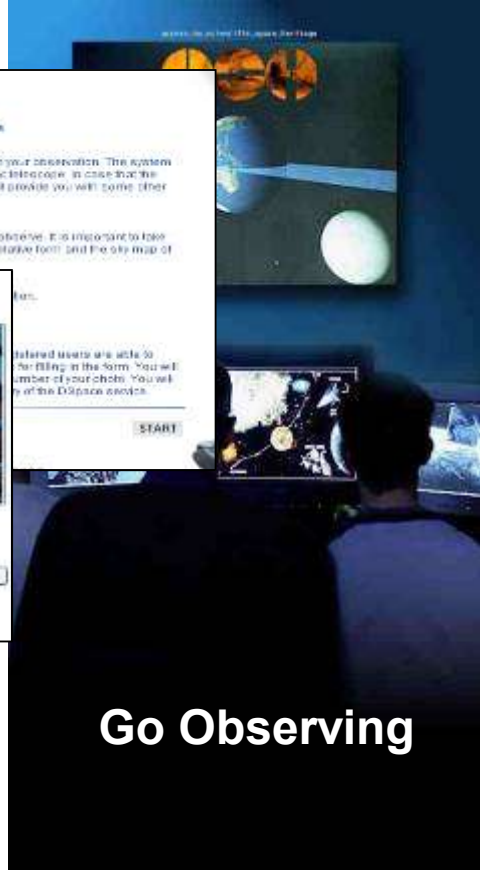
Start Time: (HH:MM)

Repeat Count: times

Orbit:

Clear: 50
 Blue: 50
 Wind: 50
 Hum: 50
 Infrared: 50
 Ultra violet: 50
 Narrow: 50

Submit



Go Observing





Discovery Space - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://www.discoveryspace.net/index.asp?Cat_ID=577

Home > About > News

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The SkyWatch 2006 Awards Ceremony
June 2006

News Archive

62% of europeans (EU-25), consider Astrology as a scientific subject
(Source: S&T Eurobarometer)
Published on the 11th of January 2006

DSpace Newsletter 1
Published on the 5th of January 2006

DSpace Newsletter 2
Published on the 5th of January 2006

DSpace Newsletter 3
Published on the 18th of May 2006

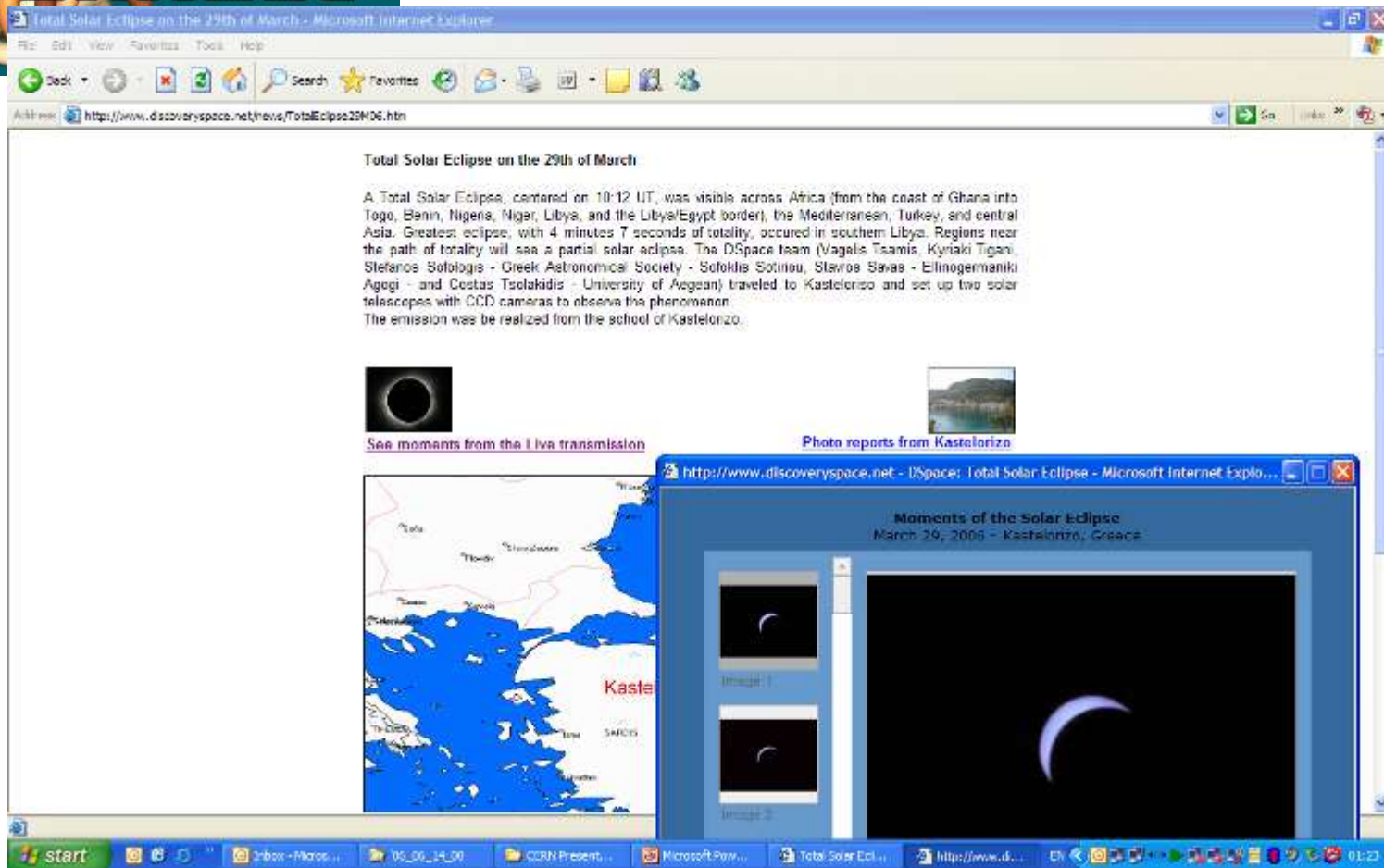
Total Solar Eclipse on the 29th of March

DSPACE Dissemination workshop
1 April 2006

Astronomy Picture of the Day

e: TEN

start | Inbox - Micros... | '06_06_14_00 | CERN Present... | Microsoft Pow... | Discovery Spa... | http://www.d... | EN



Total Solar Eclipse on the 29th of March

A Total Solar Eclipse, centered on 10:12 U.T, was visible across Africa (from the coast of Ghana into Togo, Benin, Nigeria, Niger, Libya, and the Libya/Egypt border), the Mediterranean, Turkey, and central Asia. Greatest eclipse, with 4 minutes 7 seconds of totality, occurred in southern Libya. Regions near the path of totality will see a partial solar eclipse. The DSpace team (Vagelis Tsamis, Kyriaki Tigani, Stefanos Sofologos - Greek Astronomical Society - Sofoklis Sotiriou, Stavros Savas - Ellinogermaniki Agogi - and Costas Tsolakidis - University of Aegean) traveled to Kastelorizo and set up two solar telescopes with CCD cameras to observe the phenomenon. The emission was be realized from the school of Kastelorizo.


[See moments from the Live transmission](#)

[Photo reports from Kastelorizo](#)

Moments of the Solar Eclipse
March 29, 2006 - Kastelorizo, Greece





Scenarios of use






Home > Resource Center > Scenarios of use

formal

- schools 
- universities 

informal

- science centers 
- amateur astronomers 
- science contests 

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Sidebar:

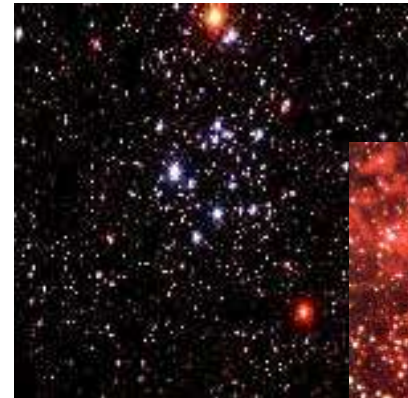
- SCENARIOS OF USE
- TRAINING
- LIBRARY
- The SkyWatch 2006 Awards Ceremony June 2006
- e-TEN
- EUROPEAN UNION

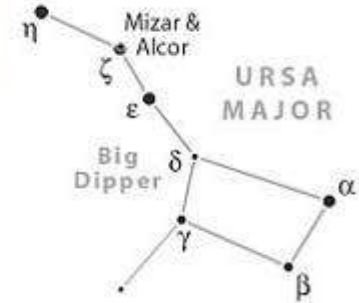
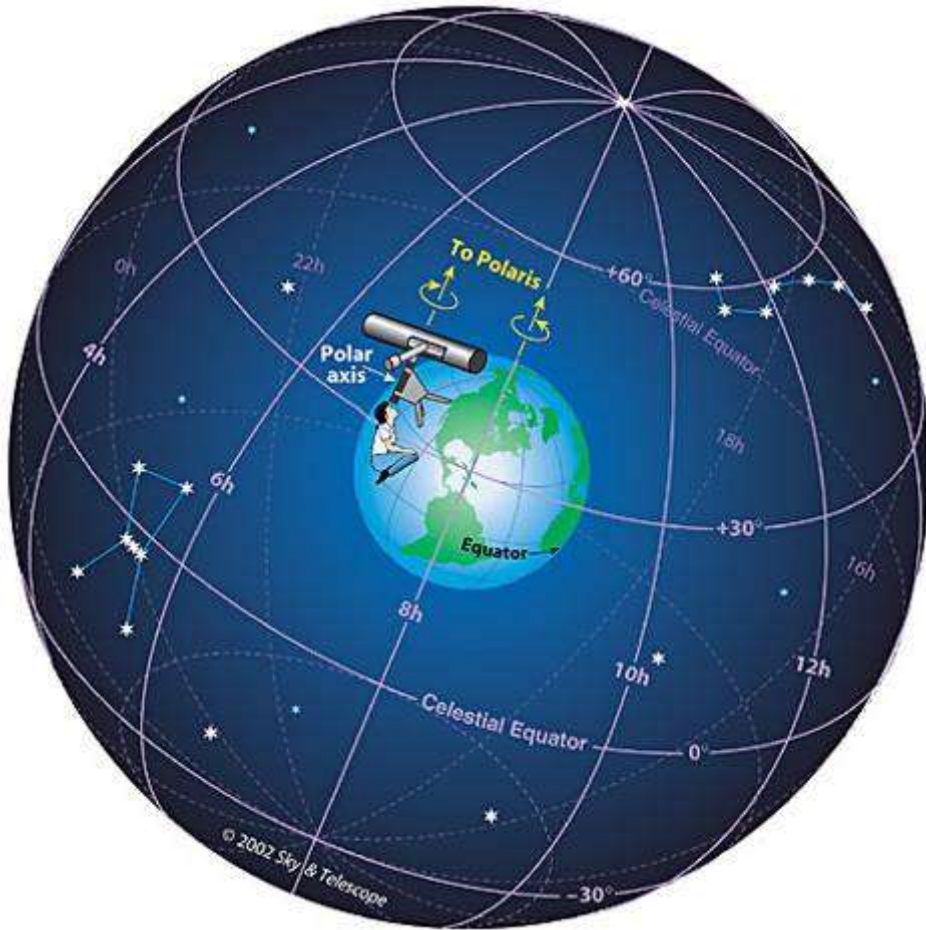
Latest News:



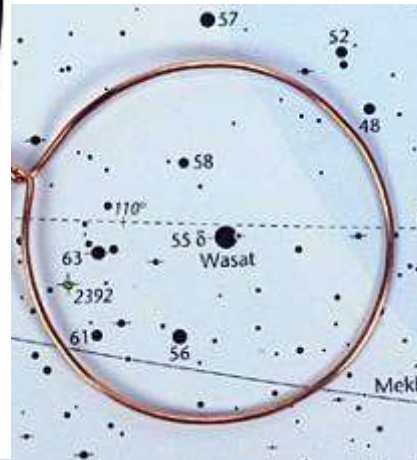


- The Sun
- The Solar System
 - Eclipses in the solar System
 - Kepler's Laws in the Solar System
- Stars
 - The colors of the Stars
 - Spectroscopy of the Stars
- Galaxies and Quasars
 - Measuring the Mass of the Quasars in the Universe.
 - What is the weight of the Black Hole in the Galaxy Center.
 - Populations of the stars and nebulae in our Galaxy – Milky Way.
- The Universe
 - The Evolution of the Universe – Hubble's Law





Astronomy Basics



Scenarios for schools and Universities



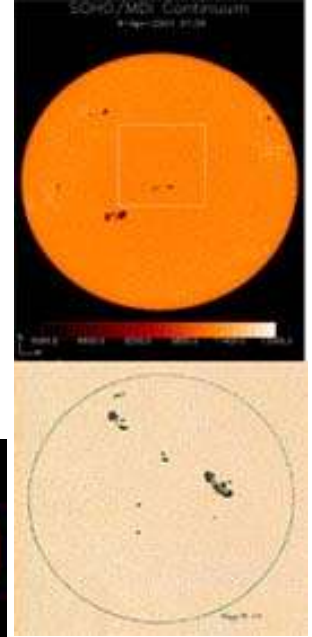

- Aims
- Objects
- The Research Question
- General Knowledge
- Background in the specific topic (e.g. Physics)
- Astronomical Background
- Mathematics and computer background
- Required information
- Stages of Project
- Recommended site (general knowledge)
- Recommended sites for Data



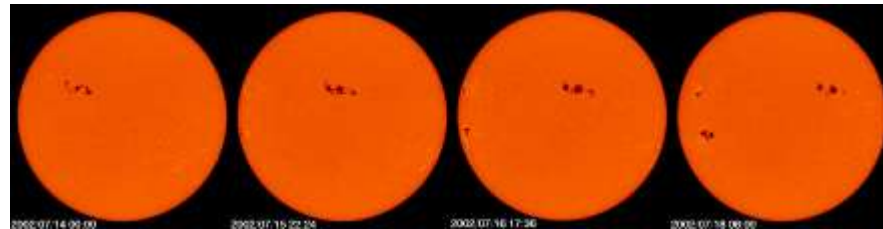
Sample Scenarios



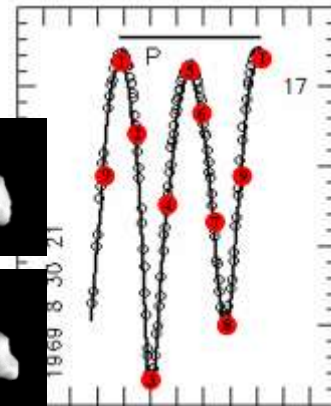
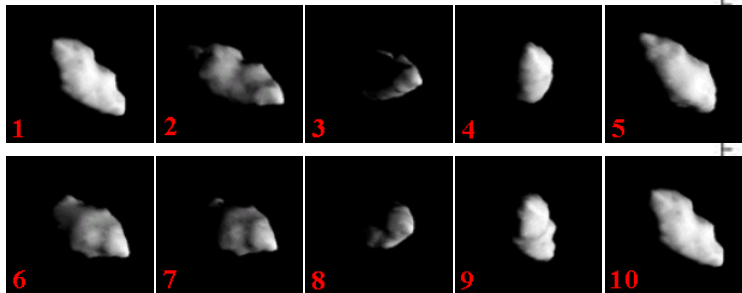
- The Rotation of the Sun, from Galileo to the present time



- The Rotation of the Sun

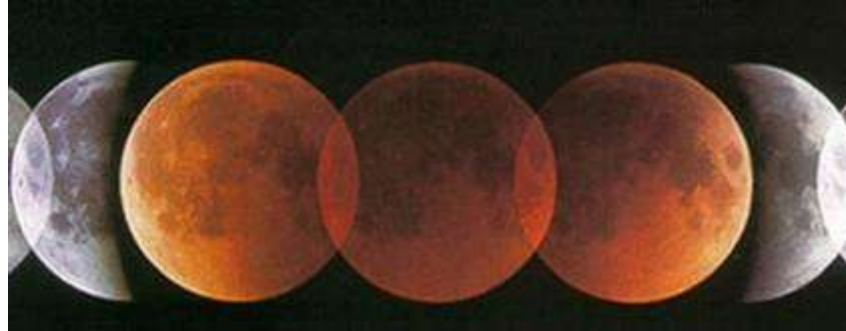


- Asteroids Rotation





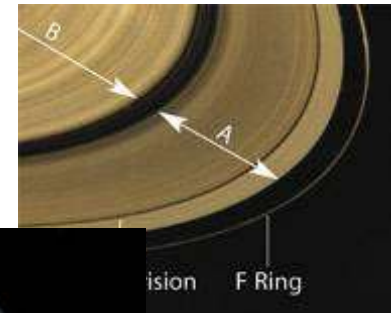
Scenarios for amateur astronomers and individuals



Observing and Photographing Lunar Eclipses



Tips for Imaging a Partial Solar Eclipse



An observing guide for Saturn



Educational Activities



Scenarios provide students the opportunity:

- To make astronomical observations
- To collect data
- To analyze the astronomical data
- To exchange opinions
- To communicate their results



Training workshops



- Training Workshop at the Observatory Science Centre, UK
- Training Workshop in the framework of the Second International
- Astronomical Summer School, Bulgaria
- The Observatory Science Centre Astronomy Festival (September 2005)
- Summer School in Crete, Greece, July 2006





Supporting Science Contests



Sky-Watch Contest European Science Week 2005



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d-space

Supporting Science Contests

Sky-Watch 2006 Contest, the continuation



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SkyWatch 2006

Science Education through
Interactive Utilisation of a Global Network of Robotic Telescopes

Welcome to the web site of the SkyWatch 2006 contest

The contest is realised in the framework of  

SkyWatch Contest 2006
The contest is now on its final phase!
Each one of the participants for the proposals that were accepted to the final phase will soon be contacted individually by DSpace Team with info about how to proceed.
[Click here to learn more about the contest](#)

Search:

Topics of the Contest


HelpDesk


Ask the Astronomer




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Connecting schools to science centres



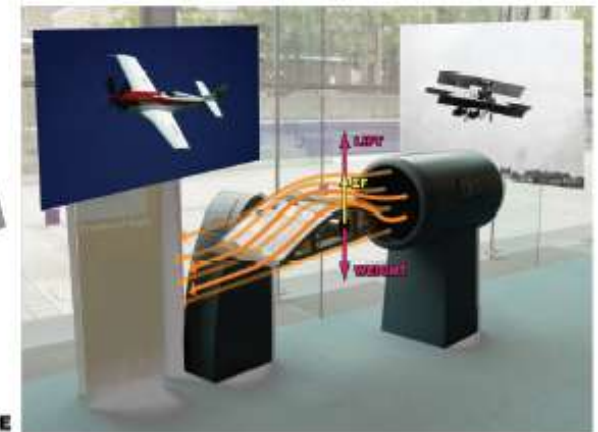
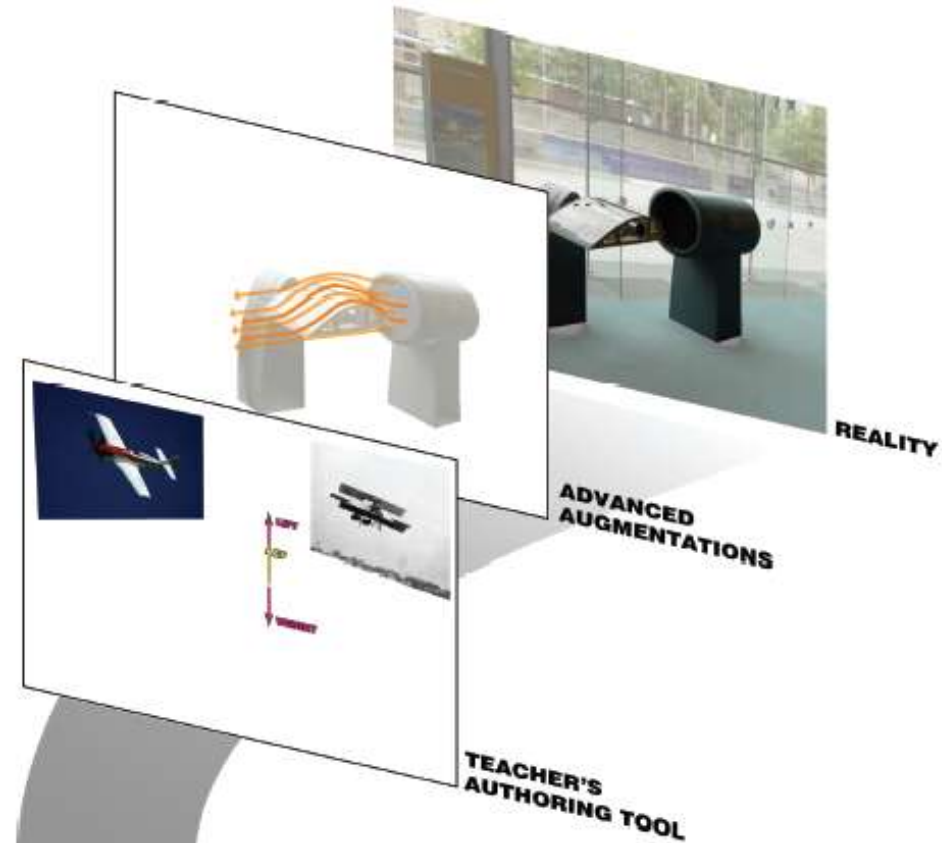
Augmented Reality applications for science learning in museums & science centres



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From Reality to Augmented Reality



CONNECT EXPERIENCE



← MUSEUM MODE

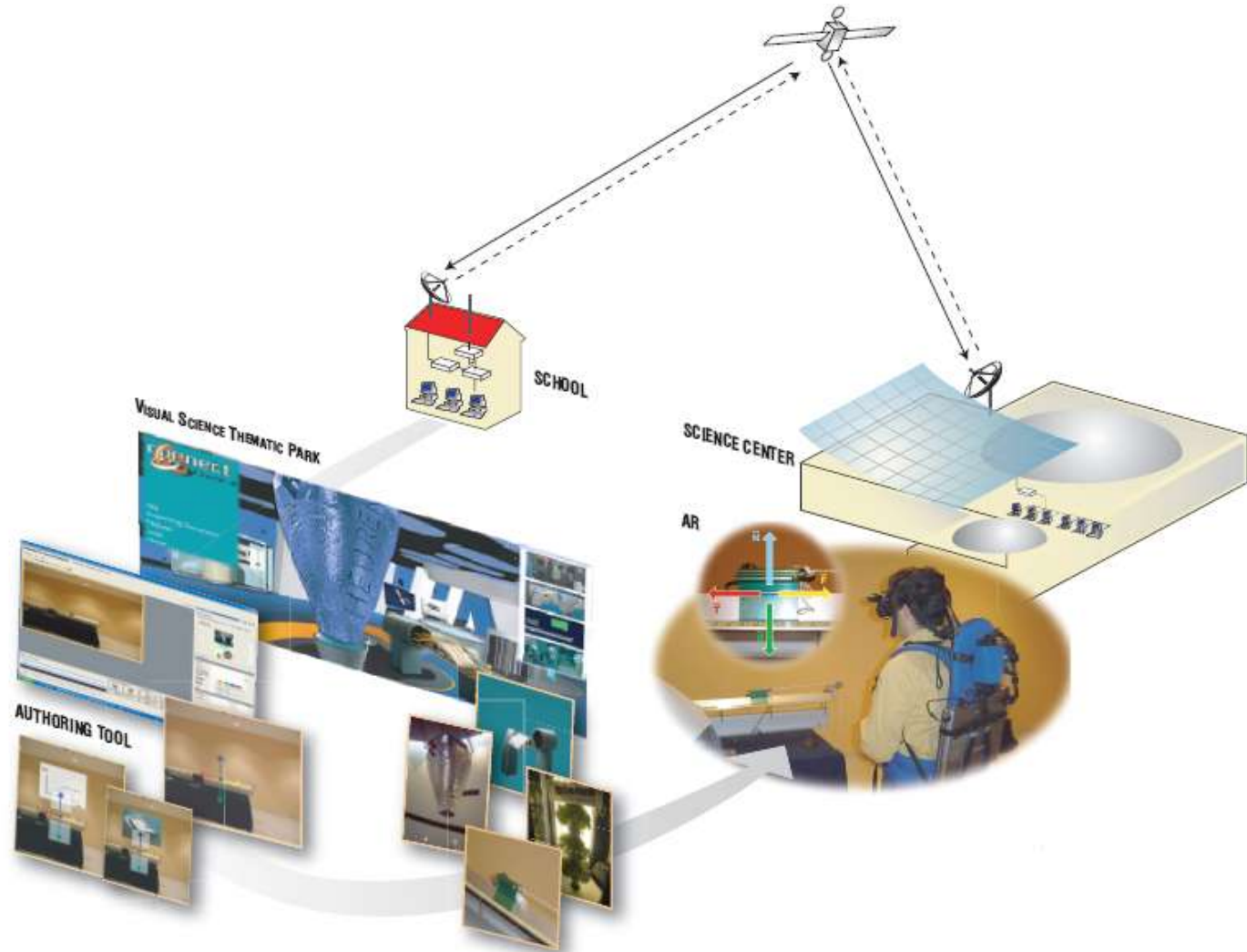
INTERNET



SCHOOL MODE →



Connecting school to science museum





The Augmented Reality system



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Test Run

- *Three month duration*
- *One experiment per pilot site*
- *Two schools “connected”*

Teachers will be guided initially (test run) and little by little will be left free to design the scenarios (final run, phase B).

Final Run

Phase A:

- *Five month duration*
- *One experiment per pilot site*
- *Up to 10 schools “connected”*

Phase B:

- *Five month duration*
- *More experiments per pilot site*
- *Up to 10 schools “connected”*





CONNECT Scenarios



During the **Preparatory phase**
the **teacher** or the **museum educator**
prepares the **AR visualisations** to be seen
by the **students**

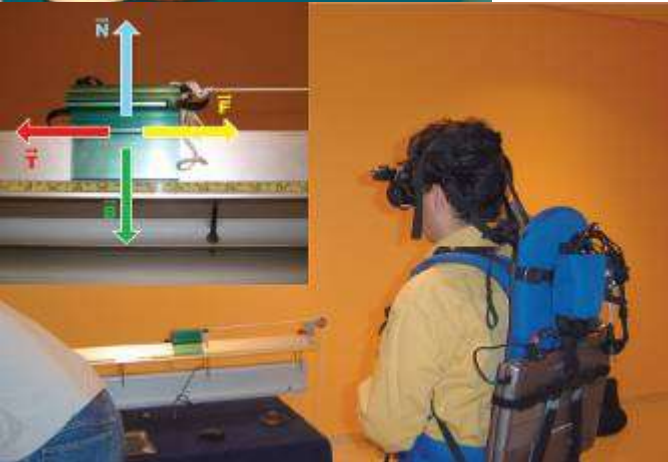


Studying friction

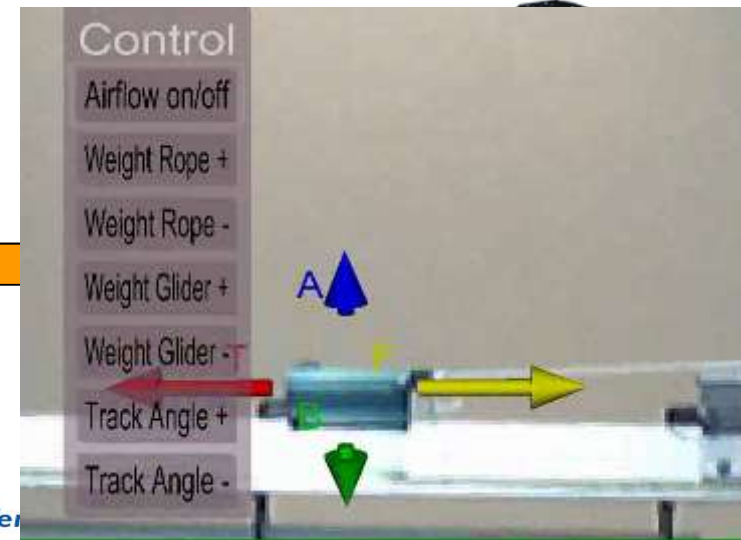


Visit Activities

Demo of friction and the other forces available,
Seeing graphs,
Frictionless motion



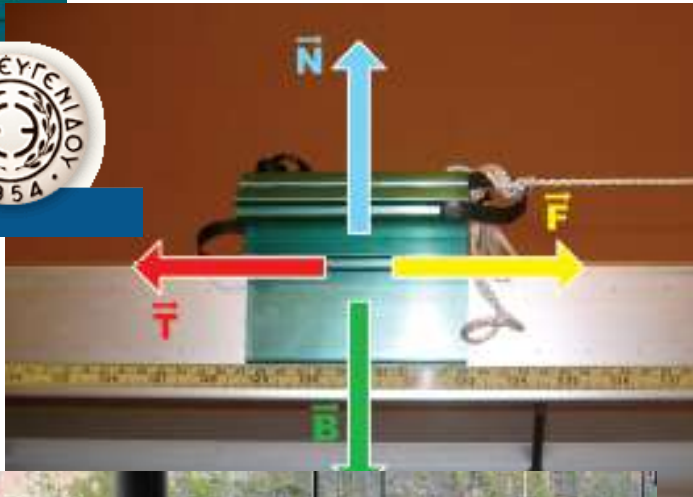
CVD to AR



Augmented Exhibits



What makes things stop?



Hot Air Balloon



Why do airplanes fly?



Photosynthesis





Trials in 4 countries



C

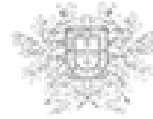




Consortium



INSTITUTE FOR
Learning Innovation



Ministério da
EDUCAÇÃO



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More info about the project:
CONNECT @ www.connect-project.net
D-Space @ www.discoveryspace.net

Thank you and see you in the
Workshops and the stand
in the exhibition

