esa
European Space Agency's Newsletter on Education

No 2 March 2002

EDUnews

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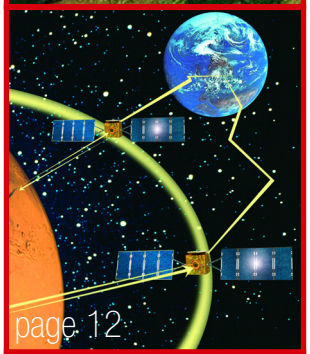

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esa Education Office

http://www.estec.esa.nl/outreach

PHYSICS on Stage 2

Dear EDUnews reader,

This second issue of the education newsletter for the European Space Agency is published to coincide with the Physics on Stage 2 festival, being hosted at ESTEC in the Netherlands from 2-6 April.

As reported in January's newsletter, we are looking forward to welcoming 400 teachers and educational experts from 22 European countries, who have been selected through national events as the most motivating individuals with the most innovative projects for teaching physics.

The programme for the week includes presentations from the delegates, themed workshops, special theatrical performances and a lively fair where participants can showcase their work and exchange ideas. All ESTEC staff are invited to pop in during the week and join the fun! See www.physicsonstage.net for the programme and more information.

Since the first issue of this newsletter, many new developments have taken place in ESA's education projects, as you will see from the wide range of articles inside. We hope you enjoy this issue - feel free to send any comments or suggestions to us at education@esa.int

Contents

Students and space technology make a dream come true

From start to finish the World Solar Challenge is 3010 km

Wind tunnel tests performed on a scale model of the Nuna

Testing Nuna on the DAF test circuit at St. Oedenrode

The Dutch solar car Nuna, built from European space technology, won the World Solar Challenge, a 3010 km race right across Australia for cars powered by solar energy. Having set off from Darwin on Sunday 18 November, Nuna crossed the finish line in Adelaide on Wednesday 21 November in a record-breaking time of 32 hours 39 minutes. The average speed of the car was 91 kilometres per hour, also a new record. On the fourth day Nuna had to travel 830 km - never before had such a distance been accomplished within one day. But Nuna pushed the limits by driving at a top speed of more than 100 km per hour.

Nuna entering Glendambo, the next to last control stop
Photo ANP

It must have been European know-how that made Nuna leave all other 42 solar cars behind. The streamlined machine was built by eight Dutch students from the universities of Delft and Amsterdam. It uses advanced space technology, provided to the team via ESA's Technology Transfer Programme, enabling the car to reach a theoretical top speed of over 160 km per hour. The aerodynamically optimised outer shell consists of space-age plastics to keep it light and strong. The main body is made from carbon fibre, reinforced with Kevlar, a material used in satellites, but nowadays also in high performance equipment like bullet-proof vests. The car's shell is covered with the best dual junction and triple junction gallium-arsenide solar cells, developed for satellites A small strip of solar cells on the side of the car is very special for a different reason: the communication equipment is powered by a strip of cells that originally belonged to the NASA/ESA Hubble Space Telescope. These cells were part of a large solar array, retrieved by ESA astronaut Claude Nicollier and brought back to Earth in 1993 with a Space Shuttle. They were donated to the Alpha Centauri Team as a special mascot.

The Nuna vehicle with the Alpha Centauri Team
Photo H-P van Velthoven

To fulfil their mission, the student team had collected an impressive line-up of supporters. ESA not only provided them with engineering support via its Technology Transfer Programme, but also with general support from the Education Office, headed by former ESA astronaut Wubbo Ockels, who was also adviser to the team. Dutch energy company Nuon was the main sponsor, and the association of plastic producers APME and the Technical University of Delft strongly supported the team. An extensive tour is now planned, visiting schools in the Member States of ESA. This educational programme will emphasise the value of space technology for a more sustainable world and show in a tangible manner how the dreams of youngsters can become reality.

On 21 November 2001 Nuna crossed the finish line of the World Solar Challenge in Adelaide, Australia
Photo ANP

Couldn’t be without it!

Couldn't be without it! is a new project that will be carried out jointly by ESA, ESO, CERN and EMBL. These four leading research organisations aim to show how fundamental research is relevant to the daily lives of Europeans and call attention to the appealing and fascinating opportunities that lie ahead in the world of research and development.

Modern technologies, such as tools and devices, cures and therapies, or technical services that make life safer, more convenient and enjoyable, are everywhere - and we use them as a matter of course. But how many people in Europe realise that the concepts behind such technologies were once the stuff of fundamental research?

In the course of the project *Couldn't be without it!* interested people in Europe will have the opportunity to identify the top ten technologies they ‘can't be without’. These preferred technologies will subsequently be made known through the media and live shows transmitted on the Internet. It will be shown how these top technologies have emerged, and how they actually work. Moreover, people facing a choice of career - thus, young people in particular - can find out how they might contribute to inventions that Europeans (and people in other parts of the world) ‘wouldn’t be without’ before long!

Couldn't be without it! will comprise four main activities:

- A Europe-wide survey that will establish the top ten technologies that most affect people's daily lives.
- Educational kits, distributed to catalyse interest in the project amongst school classes.
- A series of live webcasts in several European languages. These will show the relationship between the top ten selected technologies and fundamental research in simple language and attractive images. The main live-show will take place during the 2002 European Science and Technology Week.
- The publication of the outcome of the survey on the web space, which is expected to become a useful, permanent, educational resource.

The official launch of *Couldn't be without it!* will take place in the Technopolis Science Centre in Belgium on 22 March.

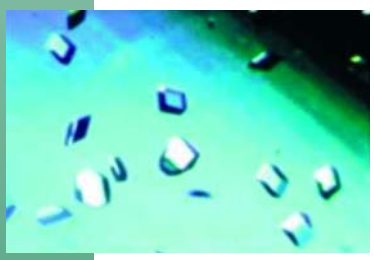
Photo Parthus Technologies

Couldn't be without it! is an initiative of the following European International Research Organisations: CERN, the European Organisation for Nuclear Research, ESA, the European Space Agency, ESO, the European Southern Observatory and EMBL, the European Molecular Biology Laboratory. The European Fusion Development Agreement (EFDA), the European Synchrotron Radiation Facility (ESRF) and the Institut Laue-Langevin (ILL) are also involved. The European Commission provides funds to match those contributed by the participating organisations.

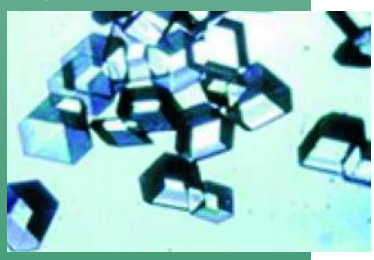
Outreach experiments onboard FOTON M1

Following the hugely successful parabolic flight campaigns, the Education Office is giving students the opportunity to fly their experiments on FOTON in October 2002. FOTON is a Russian recoverable satellite with a typical flight duration of around 15 to 20 days, and its objective is to conduct experiments in weightlessness with microgravity levels better than 10^{-5} g. It is derived from the Vostok family of manned capsules, which was used by Yuri Gagarin. For the first time ESA has offered room for 3 student experiments, weighing no more than 2.5 kg each, on a FOTON mission.

Insulin grown on Earth



Insulin grown in space



Floatin' Proteins

Four students from the University of York are working on an autonomous experiment that will grow proteins in microgravity conditions. This will hopefully give some physical results on the gravitational effects on crystal lattice structure and purity, but also some important chemical and biological information about the proteins themselves.

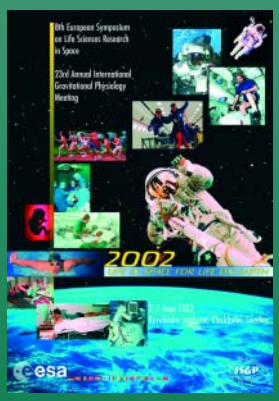
Winograd

The second experiment is being prepared by four undergraduates from the University of Edinburgh, and involves the investigation of the effects of microgravity on the behaviour of microbial communities. The experiment has two parts: the study of the arrangement and growth of a community of different types of bacteria within a Winogradsky column, and the effect of gravity on the phototaxis (the capacity to move towards a source of light) of these bacteria. This could have implications for the transportation of microorganisms to other planets, as well as development of atmospheres away from Earth.

Chondro

Two students from the Swiss Federal Institute of Technology in Zurich are working on the development of an experiment that will investigate the growth of 3-dimensional cartilage structures from their basic components, called chondrocites. This experiment will try to help in the development of new methods to artificially produce good quality cartilages, so that they can be used for implantation in humans.

"Life in Space for Life on Earth" Stockholm 2002



The **ESA Life Sciences Symposium** will take place in Stockholm, Sweden from 2 to 7 June. Students from 4 different continents have submitted their abstracts as part of a Young Researchers (YR) initiative for the opportunity to present their research at the symposium and 'win' their expenses. The top YR has the chance to publish their full paper with Acta Physiologica Scandinavica.

European Universities will be able to connect via Learnlink (Internet-based software) to the symposium live, with the aim to transmit to groups of students across Europe. Please contact Rebecca.Forth@esa.int if you are interested in participating.

Early registration continues until 5 April. For more information, please visit the website at: http://www.spaceflight.esa.int/users/symposium/

The Earth Space Alphabet:

An educational dictionary for primary schools

ESA Education Office is developing a dictionary for primary schools combining new methods of education in space, science, and art: the Earth Space Alphabet.

What is it all about?

The Earth Space Alphabet tries to meet the overwhelming need that exists for education on space. It will give basic information about the Earth, space, space technology and ESA missions. Kids have a natural interest in space, and the Alphabet will be attractive for primary school students from 6 to 11 years.

The objectives are

- to involve primary school kids in space
- to present what space is and how to discover it
- to provide educational and practical experience for kids through an artistic and fun approach to space topics
- to increase the number of educational tools offered by ESA.

Why is this alphabet special?

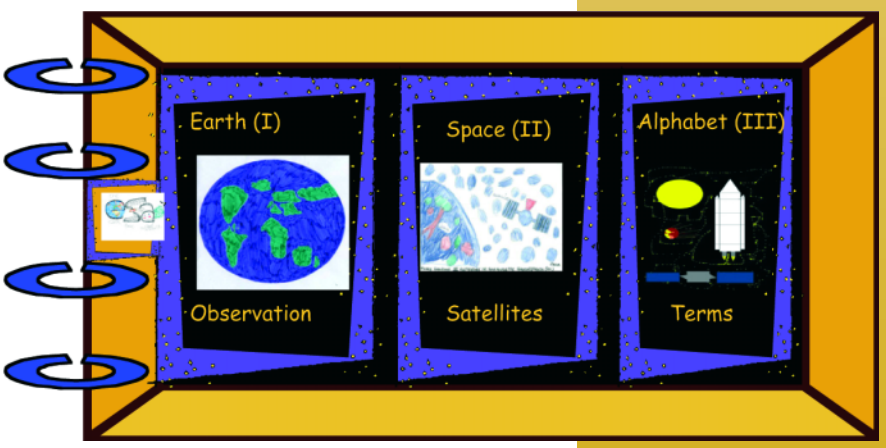
The Earth Space Alphabet will be a sort of dictionary, with each letter of the alphabet explaining one term accompanied by an image or drawing. Each letter has three entries: one covering a term from Earth Observation, the second a term from space technology and the third general space terms and science. All aim at different age groups.

The dictionary will not only contain this alphabet, but possibly also friezes and posters for the classroom, accompanied by worksheets. It is planned to give more detailed information about selected terms behind “doors” on the pages that the children can open like doors on an advent calendar – which will also add the fun of discovery within the book!

Impact in the classroom/ at home

The kids will discover the words from many angles and dimensions though the entertainment of the image and the content, linking art-drawing and science

with the help of their teachers or parents. The Earth Space Alphabet covers the following activities in the primary school curriculum: mathematics, language, geography, history, arts and science.



If you want to contribute with your comments please do not hesitate to e-mail us at education@esa.int

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EDUSPACE -

The European Earth Observation website for secondary schools

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The EDUSPACE entry page

This website has been developed under the umbrella of EURISY by ESA and its national and industrial partners. It will be opened to all schools before summer 2002. It aims to provide European students and teachers with a new learning and teaching tool, to offer an entry point to space image data and in particular a wide-spread visibility of Earth Observation applications for science and day-to-day use. It encourages teachers to use Earth Observation data by providing ready-made projects. It is supposed to stimulate the curiosity of students with attractive images and other resources and tools. The site also includes means to facilitate collaborative work with other schools, especially within Europe.

A site for beginners and experts

EDUSPACE addresses subjects linked to satellites, computers, digital images, etc. at very different levels of understanding. Novices have to be encouraged, but at the same time expert teachers have to be able to find interesting material to work with. Therefore special attention is given to including a solid grounding on the techniques behind Earth Observation from satellites, which is remote sensing from space. This approach is richly illustrated and provides a complete overview of the different aspects of how electromagnetic energy can be used to sense the Earth. The material on the website can be used in many different ways – several databases

are available, including small animations that can be used for teaching such subjects as geography, science and the environment, physics, chemistry, computer science, and even arts. Ideas and relevant material presented on the website can be used for just one or a series of lessons, but can also be taken as a basis for a longer project.

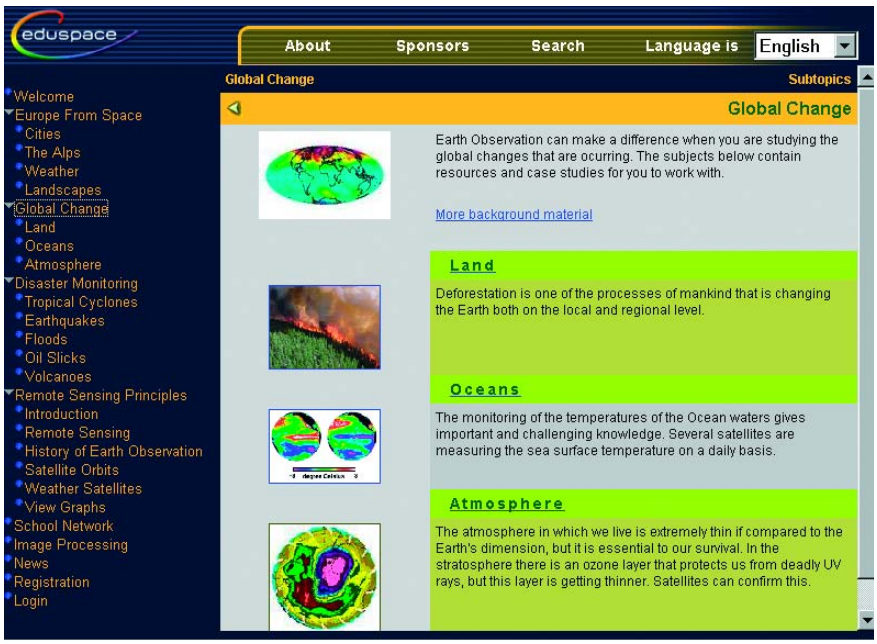
Contents and structure of the website

The website is free of charge for registered school classes and provides access to Earth Observation data from satellites. Moreover the presented data is linked to exercises for image interpretation and to the use of simple, but also advanced techniques in digital image processing. EDUSPACE consists of a tree structure with the following main branches:

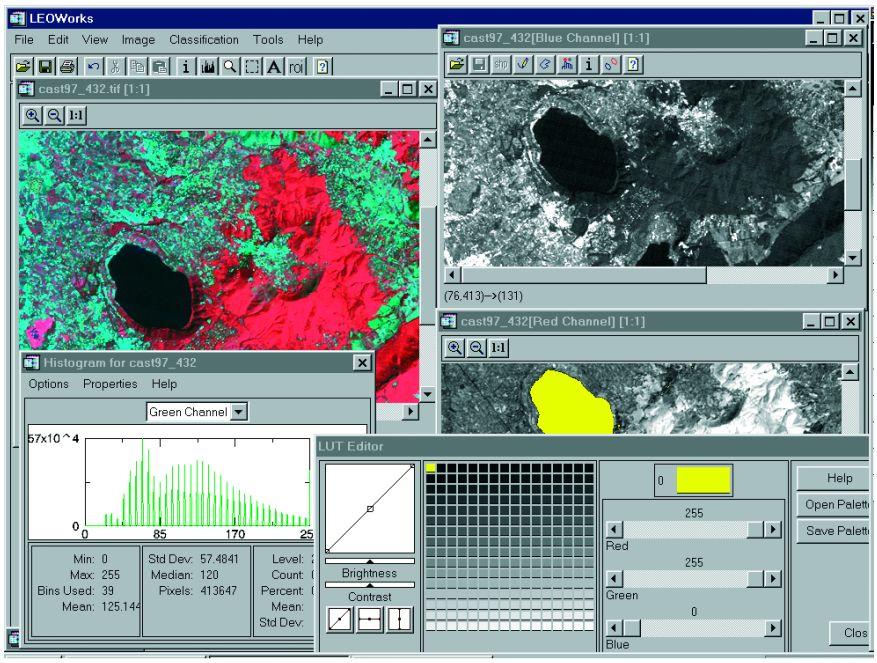
- Europe From Space
- Global Change
- Disaster Monitoring
- Remote Sensing Principles
- Image Processing Tools
- School Network and Discussion Forum
- News, Helpdesk and Links.

Each of these items has several sub-themes and in the deeper layers one can find, for example, resources, background information, project-ideas and fully developed case studies.

- **Resources** consist of databases of satellite images from different sensors, ready for selection and downloading.
- **Projects** are presented in the form of suggestions to teachers and students. They refer to activities connected with satellite image interpretation. Some projects are just easy exercises that imply the use of tools and data available on the website, while others can be developed further, requiring teamwork or collaboration with other schools throughout Europe.
- **Case Studies** are collections of material for more in-depth studies of a selected area. The topic is often of a general nature and the case can be seen as a practical application of geographically independent environmental issues. Case Studies include rich illustrations, satellite images, texts and links. The material can be used either following traditional working methods or can be downloaded, visualised and studied in a computer environment, for which a dedicated PC-based software called LEOWorks is provided. To use this tool a beginner will find an exhaustive tutorial.
- **Background**: links to illustrated texts related to the Case Study.
- **Links**: Specific links can be activated to retrieve further information and material from other sources worldwide. This will help students to collect facts and methods of work.



The first page of the theme “Global Change”, with on the left an overview of the EDUSPACE website content



The image processing software LEOWorks allows novices to take the first steps in image data understanding and experts to do a full-scale image analysis

Some of the project ideas

The site hosts a growing quantity of teaching material and exercises. Here are just some examples:

"My Home Town Seen from Space". Students have to provide a detailed interpretation of a satellite image of the area where their school is located. Tiles of satellite images are included in the site and are available free of charge. Different ideas are suggested, e.g. to produce a well-annotated postcard size satellite map of the hometown to be mailed/emailed to friends or to a collaborating school. EDUSPACE holds satellite images and descriptions of many cities in Europe with the idea that a school class would produce a much-improved caption as a result of a project. Of course such a report is greatly welcome and will be put on-line together with the names of the authors!

One of the many images provided to students to work with: the city of Copenhagen

"Interactive Meteosat". A school that has signed up for this project can deliver to the website a weather observation once per day. This observation will automatically be shown in the Meteosat image of the day. Schools can examine all observations for their particular location and thereby understand the local weather changes in time and space. The activity is conceived as an on-going project with no specific start and end dates. Schools can join and leave the project at any time. It is also meant to stimulate contacts between schools: in a collaborative project they can propose and conduct in-depth work concerning meteorology, climatology, etc.

"The Alps from Space". A view of the Alps made of high-resolution satellite data is available on the site. Students are invited to zoom in and discover the alpine landscape and environment. Exercises and project ideas to explore areas of interest, such as the location of a school in a new and more synoptic mode are proposed. Satellite images might be compared with photographs taken from scenic points and an interpretation key of space imagery can be worked out.

EDUSPACE provides a full coverage of the Alps. The Aletsch Glacier is among the landscapes that can be more closely inspected

The educational image processing tool LEOWorks

For registered classes, image processing software can be downloaded free of charge. This software introduces teachers and students to the world of digital image processing, then encourages them to explore and finally to use it in a meaningful way. The different modules allow grey-scale and colour manipulation of an image in a well-controlled and enjoyable way. A more advanced student can find useful applications to enhance and analyse a satellite image and even perform an automatic classification. There are tools for image annotation (to construct a satellite image map) and to extract image information (thematic information such as the

Laboratory work for a school class visiting ESA/ESRIN in Frascati, Italy

perimeter of a town or the roads), which can be saved as layers of a geographical information system.

A Network of Schools

EDUSPACE aims at stimulating the contacts between schools of Europe. After a school has registered the information becomes available to all visitors. Within certain projects such as the "Interactive Meteosat" a possible partner will immediately be visible, as the location and name of the school will be included in the Meteosat image. Of course, the list of participating schools can be browsed and e-mail addresses extracted. EDUSPACE also provides a helpdesk function where teachers can post questions or suggestions – and also new material they or their classes have produced.

A visiting school class: After the presentation in ESRIN there was a field exercise using maps and satellite images

Outlook

The EDUSPACE Website will contain more satellite data and more teaching material as time progresses. The series of animated viewgraphs will be enriched, and more case studies and project ideas will be added. The website database structure is conceived to hold different languages using the same illustrative material. It is envisaged to provide at least French, German, Italian and Spanish translations.

Contact the EDUSPACE team for further information or just to pay us a visit!

Helpdesk: eduspace@esa.int

website: http://www.eduspace.eurisy.org

SSETI spring workshops

The objective of the Education Office's Student Space Exploration and Space Initiative (SSETI) is the distributed design, construction and launch of micro-satellites through a network of students, educational institutions and organisations via the Internet.

The many European students involved in this ambitious project are due to embark on its Phase-B, which is the detailed design of the satellite. A small workshop will be held at ESTEC from 25 to 27 February at which the system requirements will be reviewed, and another one, also at ESTEC, is scheduled from 22 to 26 April to which at least one student from each team has been invited and where the whole spacecraft will become under critical review, marking the end of Phase-B.

For more information, please consult the websites
http://www.estec.esa.nl/outreach/sseti/
or
http:///www.sseti.net

The "Young Friends of the Agency" database –

a new interactive tool for enhanced communication with young Europeans

The European Space Agency, in line with its commitment to stimulate young European to purse a career in Science and Technology, has started a broad range of initiatives and projects. We believe in the marketing approach, i.e. attractiveness, and this can surely be enhanced by using modern communication tools.

Hence, we have developed the "Young Friends of the Agency" database, which will provide a user-friendly, truly interactive online platform through which young Europeans will get to know the educational side of ESA. Our experience shows that there are thousands of young people in all European countries and beyond that are eager to know how they can get involved in something as motivating and challenging as building a micro-satellite with fellow students spread all over Europe or participating in a major worldwide space event or eventually spending a training period among ESA experts. But we also know that sometimes the information is not distributed in an effective way. Today, the Internet gives us a terrific tool to reach out to millions of people and create virtual communities around any given theme. This is what we would like to achieve with this database. We have tried to keep it simple to use and we are confident this will allow us to take full advantage of the potential of the web.

The database will be an important element of the ESA Educational Portal (http://www.esa.int/education). A first level of the database will be reserved for a more general public. After a few clicks and entering a little basic information, every interested individual will become part of a large community of like-minded people interested in space subjects, space exploration and technology and their educational implications. Those registered will regularly be informed of the ESA activities in the field of space education, related opportunities and more.

The most interesting and challenging feature, however, will be reserved for young Europeans qualifying for one of the ESA traineeship programmes. ESA offers a wide range of traineeships (Young Graduate Trainee scheme, internships, etc.) and a few others are being initiated (e.g. PhD Grants scheme). Their educational value is enormous both for the individuals and for European industry and research. These potential candidates will be directed to the relevant part of the site. They will find all of the information about opportunities offered by ESA, its working environment and professional fields. This will allow them to make the right choice based on a wealth of information.

The site will of course enable on-line completion of the application form with additional features like predefined fields and the possibility to attach further documents of interest. Once the application process is completed, along with the acknowledgement of their application, registered individuals will receive an ID and a password.

Such a tool will provide ESA management with a constantly up-to-date, searchable database that will not only ease and streamline the pre-selection process for trainees, but will also permit an upstream analysis of the available skills and the possible shortcomings.

We are confident that this website will soon become a very useful tool for would-be trainees and ESA staff and managers alike. We invite you all to let us have your comments and views on it in order to make it more and more responsive to your needs.

Winter School for PhD Students

Call for Candidates

Satellite Applications to Archaeology,
Natural Site Monitoring and Urban Planning

Calling all students in the second or final year of their PhD thesis involving remote sensing techniques! EURISY and the International Space University are holding a Workshop from 31 October to 4 November, in Strasbourg, France on the theme of archaeology and urban planning. This event will be co-sponsored by the European Space Agency and UNESCO.

Under the patronage of Professor Hubert Curien, President of EURISY, the aim is to bring together twenty selected PhD students for a series of lectures and workshops in the company of international experts.

Closing of this event on Monday 4 November, or for those who are interested in the possibility of participating in a conference entitled "Space Applications for Heritage Conservation", and organised by EURISY, with co-sponsorship from the Council of Europe, the European Space Agency (ESA), the International Space University (ISU), NASA and UNESCO.

For further details on the Winter School and Conference: http://www.eurisy.asso.fr

An ESA Special Event in connection with the

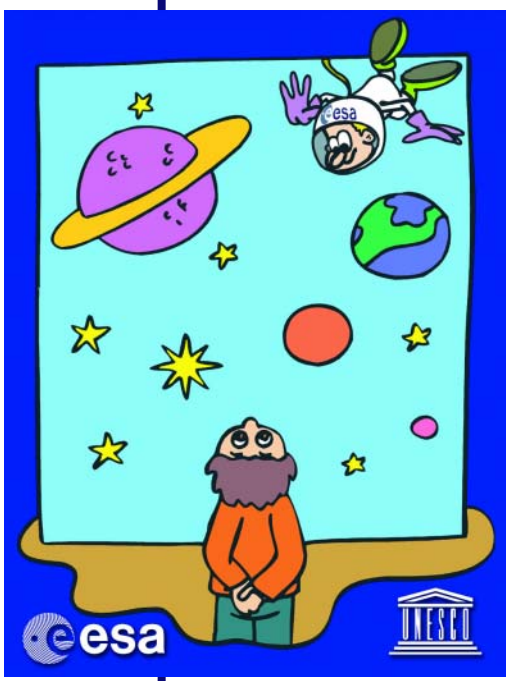
World Space Week 2002

6 and 7 October

ERASMUS ISS User Information Centre ESA/ESTEC, Noordwijk, The Netherlands

The European Space Agency (ESA), in cooperation with UNESCO, is inviting the general public, educators and students to ESA/ESTEC in The Netherlands, as part of the World Space Week 2002 activities.

ESA/ESTEC is opening the doors to the International Space Station Information Centre for two days of SPECIAL EVENTS*:



Sunday 6 October

GENERAL PUBLIC - OPEN DAY

- Astronaut presentations on 'Space and Daily Life'
- Unique tour 'backstage' at Europe's largest Space facility
- 3D tour of the International Space Station

Monday 7 October

EDUCATION DAY

- Educational information from a European Astronaut on 'Space and Daily Life'
- Unique tour 'backstage' at Europe's largest Space facilities
- 3D tour of the International Space Station

Essay Contest

UNESCO, in cooperation with the European Space Agency and other space agencies, is holding an international essay contest for students on the World Space Week theme 2002 "Space and Daily Life". The aim of the contest is to encourage students all over the world to think about how space is affecting, improving and helping them in their daily life. Students will put forward their ideas on how space will influence the development, security and well-being of society in the future. The contest is open to all high-school students between 15 and 18 years. For more information, please visit the UNESCO website: http://www.unesco.org/science/earthsciences

For more information and to register for these SPECIAL EVENTS visit
www.esa.int/worldspaceweek

World Space Week Official Website: http://www.spaceweek.org

*Events of interest to visitors/students aged 12 and above

The Education Office and the World Space Week 2002:

Space and daily life

The United Nations have declared 4 to 10 October "World Space Week".

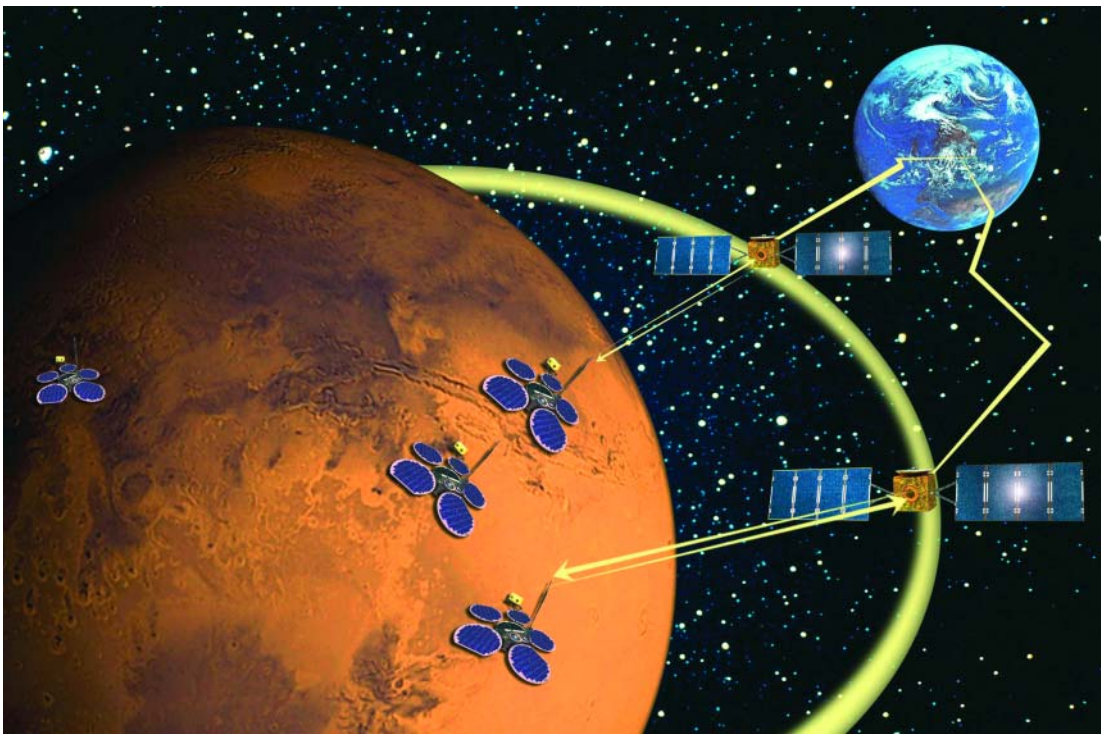
For several years now, the United Nations have declared the week from 4 to 10 October "World Space Week", 4 October being the celebration of the launch of Sputnik 1 in 1957, and 10 October the anniversary of the first treaty on space in 1967. A theme is defined every year, on which projects at local, regional, national or international level are developed. The "Spaceweek International Association" is responsible for the co-ordination of the events. The official website is http://www.spaceweek.org.

The Education Office has decided to propose a project this year to make young Europeans imagine their future, applying their knowledge from school. We will ask them to think about what life in space will be like in 45 years' time (as 2002 is the 45th anniversary of the launch of Sputnik), giving special thought to a permanent establishment on Mars.

Our project **Space and daily life... in 45 years – the case of the Martian Base** is being developed with Parsec, a French education association (http://www.astrorama.net). Teachers will be free to choose the emphasis they want to put on the project according to the age of the children or the discipline they teach.

Disciplines that could be involved:

- Life sciences: what exists on Earth that makes it habitable for human beings, and what exists or should be made on Mars so that human beings can live there (air, temperature, water, food)
- Physics / chemistry: which technologies exist on Earth that will be needed on Mars (electricity, manufacturing of water and atmosphere, vehicles on the surface of Mars or between Mars and Earth, communications)
- Maths: calculation of surfaces (habitation, cultures), volumes (air, water), masses (food, propellants), distances (travel, speed of light for communications) associated to human habitation and living
- Arts / architecture: design a base that will provide all basic needs for man



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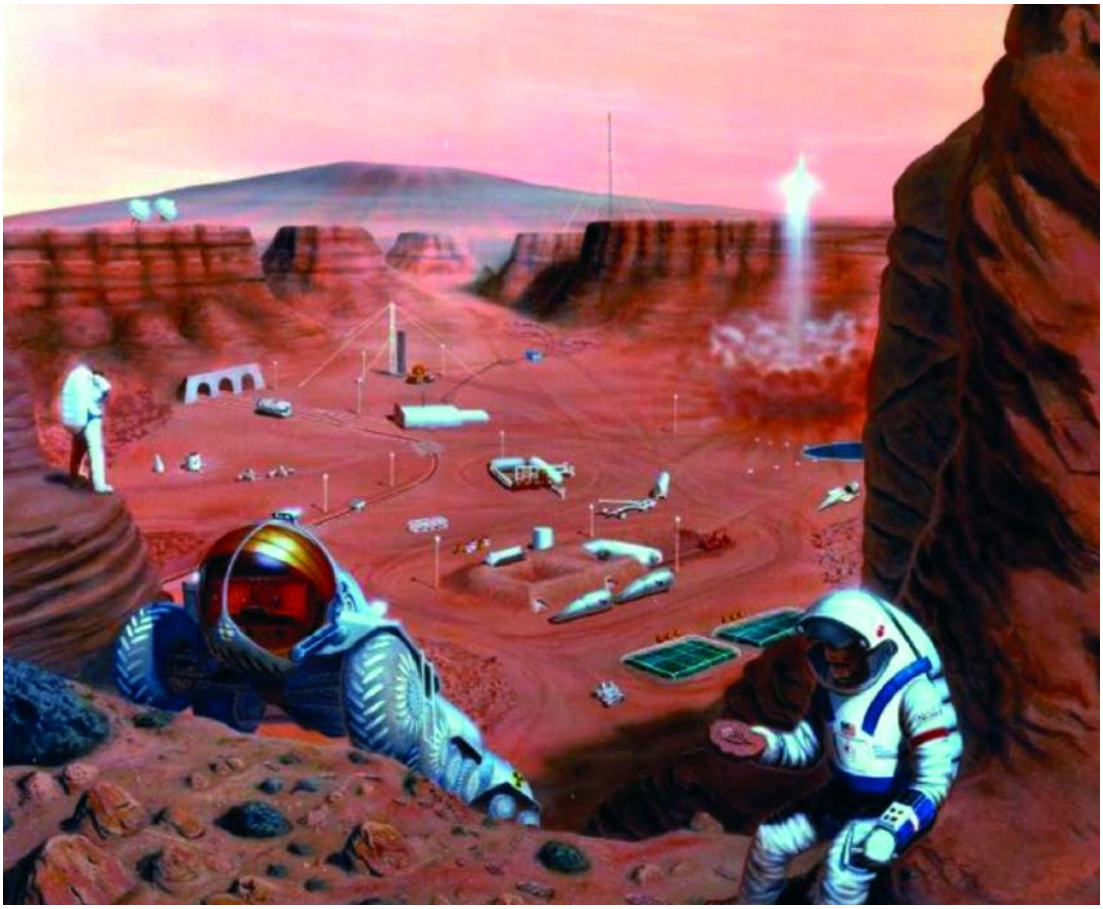


- Geology/geography (choice of the terrain), psychology or sociology (number of people, choice of the professions, what has to be provided to them for a "good" life)

This project is adaptable to various age groups, from primary (with simple analysis) to secondary level, with deeper analysis of the necessary technologies. In the best case, all disciplines should be combined. Classes, groups and individuals can compete. In all cases, the choices made for the project have to be explained and justified, thus also exercising language skills (mother tongue or foreign languages).

Orbit:	227940000 km (1.52 AU) mean distance from Sun
Diameter:	6794 km
Martian day:	24 hours, 37 minutes and 22 seconds
Martian year:	669 Martian days, 687 Earth days
Average temperature:	218 K (-55° C)
Minimum temperature:	140 K (-133° C) (at the winter pole)
Maximum temperature:	300 K (27° C) (summer dayside)
Surface area:	about the same as the land surface area of the Earth

The children will have to discuss what is needed, whether it exists on Mars, or how it can be provided. The teacher will have guidelines for the systems that have to be planned. This activity is supposed to take place during the World Space Week itself, and proposals should therefore be sent to ESA before 31 October. National winners will be selected based on the completeness or innovation of the project and solutions. From these, European winners will be chosen. Their projects will be presented on the website. The European winners will then be able to compete at World level with all the projects of the World Space Week.

The project can be found on http://www.esa.int/education and will be included in a printed document grouping a selection of World Space Week projects translated into the various languages of the ESA Member States. Questions concerning the project or requests to receive the paper copy (mentioning the language needed) should be sent to education@esa.int as from 1 May.

Houston, we have a mission!

"The New Face of Space" is the theme of the 53rd world congress and exhibition of the International Astronautical Federation (IAF), the largest international space organisation linking governments, science and industry. This year, the IAF congress will be held together with the 34th scientific assembly of COSPAR in Houston, Texas, from 10 to 19 October 2002 as World Space Congress 2002 and will highlight the essential role of space in current and future communication networks.

The European Student Outreach Programme to the IAF (a European Space Agency initiative) encourages the youth of Europe to actively prepare for, and participate in, the building of their future through a better knowledge of (space) technology and sciences, with the aim of ensuring an appropriately skilled workforce for the 21st century.

ESA has initiated a project in close co-operation with the local organisation and the IAF to sponsor the travel and accommodation for a significant number of European students to attend the World Space Congress.

We invite you on behalf of ESA and the IAF to participate in this event. Full details on how to apply and the terms of participation are explained on our website: http://www.estec.esa.nl/outreach/iaf

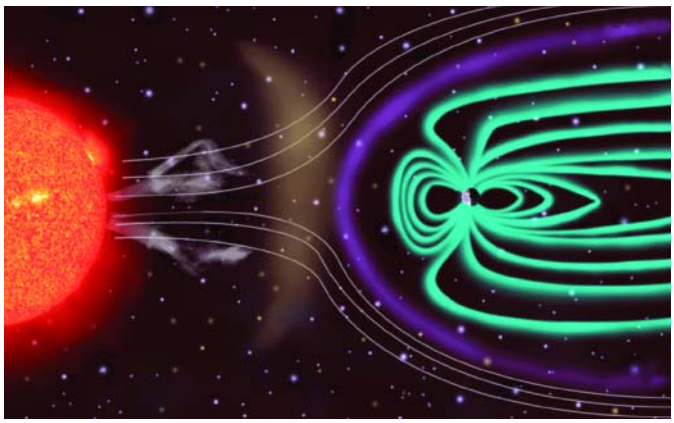
We hope to see many of you in Houston in October!

If you have any further questions do not hesitate to contact us at student.iaf@esa.int

The 2002 Alpbach summer school

The 2002 summer school will take place from 23 July to 1 August in Alpbach, Austria, and its focus will be on "Space Weather - Physics, Impacts and Predictions". Participants will hear about the impact of space weather events on technological systems in space and on the ground, scientific instruments and data sets for space weather applications. Two competing teams will design an Operational Space Weather Mission, a Space Weather Data Centre and a Space Weather Prediction Centre.

More information is available at:
http://www.asaspace.at/alpbach/alpbach.htm



Successful Space Station Design Workshop

Thirty students from all over Europe took up the challenge of designing a space station and coming up with other innovative ideas during the Space Station Design Workshop organised at ESTEC from 17 to 23 February 2002 in ESA's unique "Concurrent Design Facility". The students were divided into two competing teams and had to fulfil a mission statement generated by ESA in close co-operation with the University of Stuttgart. The interdisciplinary approach to the task of designing a space station favoured, in addition to aerospace engineering students, the participation of students specialised in architecture, law and business administration. The highlight of the first day of the workshop was a three-hour sketching class giving a different perspective on design work. After an exciting and challenging week, the results were unveiled on the last day of the workshop during a graduation ceremony and a reception.

For more information on the workshop, please consult the websites
http://www.estec.esa.nl/outreach/SSDW/
http://www.irs.uni-stuttgart.de/SSDW/

The ESA Education Office

Education is one of the mandatory activities of the Agency, and the Education Office tries to reach out to students, teachers and the general public throughout Europe.

Wubbo J. Ockels is the Head of the Education Office

Isabelle Duvaux-Béchon is responsible for primary and secondary school education, ESA internal co-ordination and the new ESA Education website development;

Piero Messina deals with universities and other higher education institutions as well as education-related organisations (e.g. Eurisy);

Corinne Flandy keeps a professional eye on our budgets, commitments, contractual arrangements etc.

Llierni Arana looks after the SSETI virtual community;

Mónica Miguel Lago is now developing material for kids using space and remote sensing;

Caroline Pujol organises the IAF Outreach Programme that will take some 200 European students to Houston for the World Space Congress in October this year;

Inaki Rodriguez Rebolledo maintains contacts with European Student Organisations and organises the Foton flight opportunity for students;

José Sanchez Troncoso is the expert on IT, web and databases;

Nicole Sentse is in charge of the Student Parabolic Flights Campaign that will take place in Bordeaux next July;

Helen Wilson co-ordinates Physics on Stage. She is also involved with the educational activities of EIROForum.

What is ESA?

The European Space Agency is Europe's gateway to space. Its mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the people of Europe.

ESA has 15 Member States: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. Canada has special status and participates in some projects under a cooperation agreement. By coordinating the financial and intellectual resources of its members, ESA can undertake programmes and activities far beyond the scope of any single European country. ESA is an entirely independent organisation, although it maintains close ties with the European Union with whom it shares a joint space strategy.

ESA's job is to draw up the European space plan and carry it through. The Agency's projects are designed to find out more about the Earth, its immediate space environment, the Solar System and the Universe, as well as to develop satellite-based technologies and promote European industries. ESA also works closely with space organisations outside Europe to share the benefits of space with the whole of mankind.

ESA has its headquarters in Paris and it is here that future projects are decided upon. However, ESA also has centres throughout Europe, each of which has different responsibilities:

- ESTEC, the European Space Research and Technology Centre, is the design hub for most ESA spacecraft and is situated in Noordwijk, the Netherlands.
- ESOC, the European Space Operations Centre, is responsible for controlling ESA satellites in orbit, and is in Darmstadt, Germany.
- EAC, the European Astronaut Centre, trains astronauts for future missions and is situated in Cologne, Germany.
- ESRIN, the European Space Research Institute, is situated in Frascati, near Rome in Italy. Its responsibilities include collecting, storing and distributing satellite data to ESA's partners and acting as the Agency's information technology centre.

In addition, ESA has liaison offices in the United States, Russia and Belgium, a launch base in French Guiana, and ground and tracking stations in various parts of the world.

ESA's mandatory activities (Science Programme and the general budget) are funded by a financial contribution from all the Agency's Member States, calculated in accordance with each country's gross national product. In addition, ESA conducts a number of optional programmes. Each country decides in which optional programme it wishes to participate and the amount of its contribution.

What's coming up:

The final event of **Physics on Stage 2** will take place at ESTEC from **2 to 6 April 2002**. Check http://www.physicsonstage.net

The **ESA Life Sciences Symposium** will take place in Stockholm, Sweden from **2 to 7 June**. Further information at http://www.spaceflight.esa.int/users/symposium/

Beyond the ISS: The Future of Human Spaceflight. The 7th ISU Annual International Symposium will be held in Strasbourg from **4 to 7 June**. http://www.isunet.edu/other_programs/symposium.htm\

The 5th **Student Parabolic Flight Campaign** will take place in Bordeaux, France in **July 2002**. More information at http://www.estec.esa.nl/outreach/parabollic/

The **2002 Alpbach Summer School** will take place from **23 July to 1 August**, and its focus will be "Space Weather - Physics, Impacts and Predictions". More information at: http://www.asaspace.at/alpbach/alpbach.htm

ESA is supporting the **World Space Week** that will take place from **4 to 10 October 2002**. More information at http://www.spaceweek.org/

ESA is inviting European students to the **World Space Congress** in Houston, Texas, USA from **10 to 19 October 2002**. For more information and application please visit http://www.estec.esa.nl/outreach/iaf

The Eurisy Winter School will bring together PhD Students and experts on the theme "**Archaeology and Urban Planning**" in Strasbourg France from **31 October to 4 November**. This will be followed by the conference "**Space Applications for Heritage Conservation**". Further info at http://www.eurisy.asso.fr

If you would like to sign up for or inform us about a specific event, please send an e-mail to education@esa.int

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