



CERN Education Programmes

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CERN

Education Group

Head Teacher Programmes and Visits Service

Overview

What is CERN

Strategic Missions

Communication

Education

CERN teacher programmes

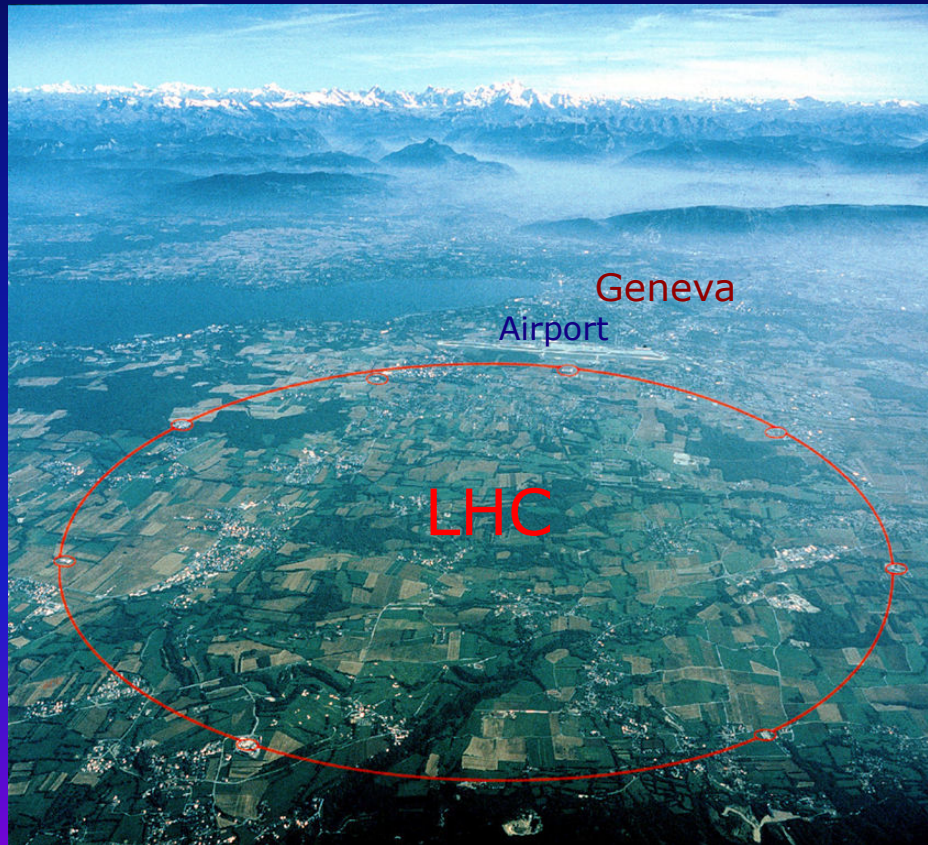


What is CERN ?

CERN is the largest science laboratory in the world

CERN has built the largest particle accelerator in history - the LHC

The LHC will produce particles that existed only shortly after the Big Bang





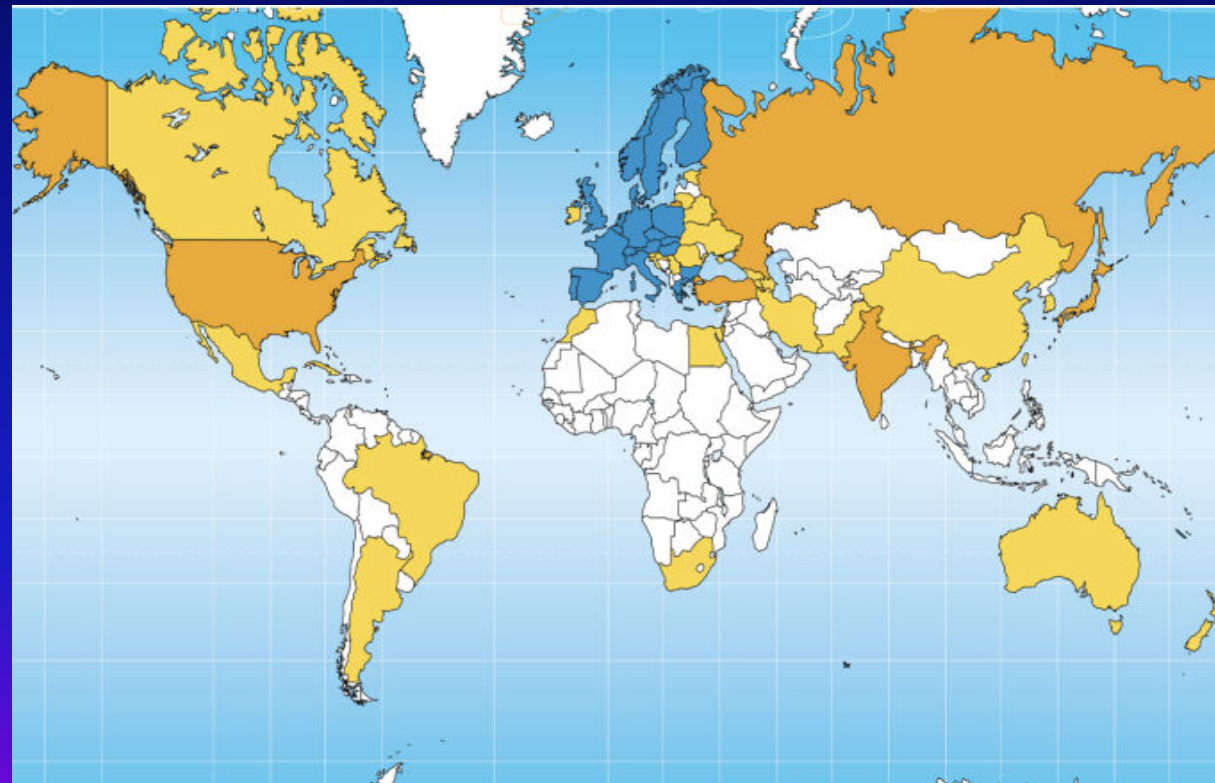
Who works at CERN ?

Scientists from 108 countries

2400 CERN Staff
+ 350 fellows + associates

7150 Visiting physicists

70 % from member states
25 % from observer states
5 % from other states

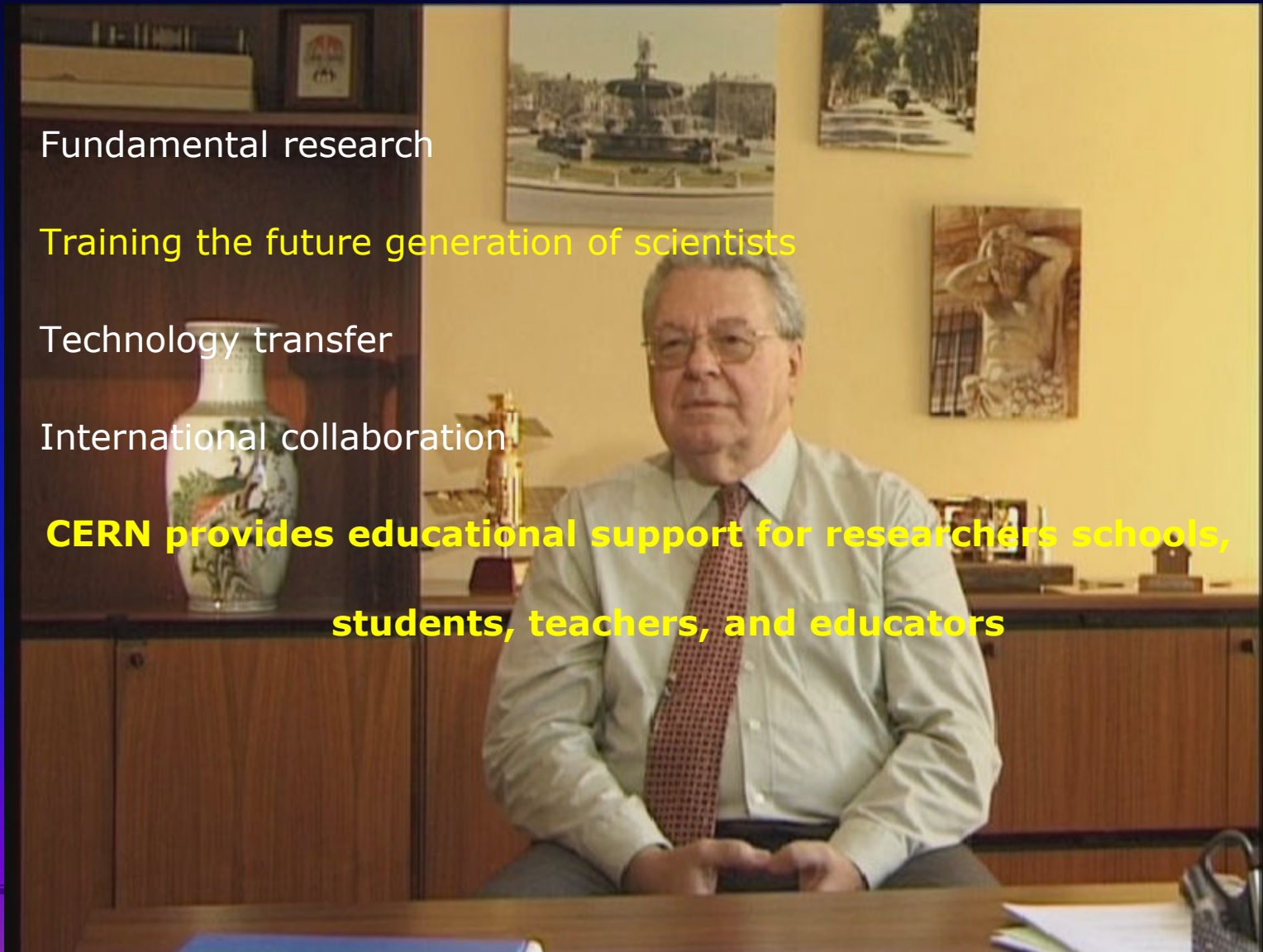




Recent CERN Director General Robert Aymar

- Fundamental research
- Training the future generation of scientists
- Technology transfer
- International collaboration

**CERN provides educational support for researchers schools,
students, teachers, and educators**



CERN ex-Director General Robert Aymar

One of CERN's strategic missions is to help train tomorrow's scientists

CERN provides support for schools, students, teachers, and educators





CERN has a broad range of communication activities

400-600 media visits per year (TV, newspapers, radio)

Visitor programme (60,000 visit request - 25,000 accepted - 50 % schools)

Permanent and temporary exhibitions (Microcosm and 'Globe')

Open day (2008: 50,000+ visitors)

Public webpages

Live webcasts



The Education Group

CERN teacher courses

Creation and provision of teaching resources

Video-“Chats” :

virtual meetings between CERN scientists and school classes

Web-Lectures (teacher courses, colloquia, seminars, etc)

Science In School Journal

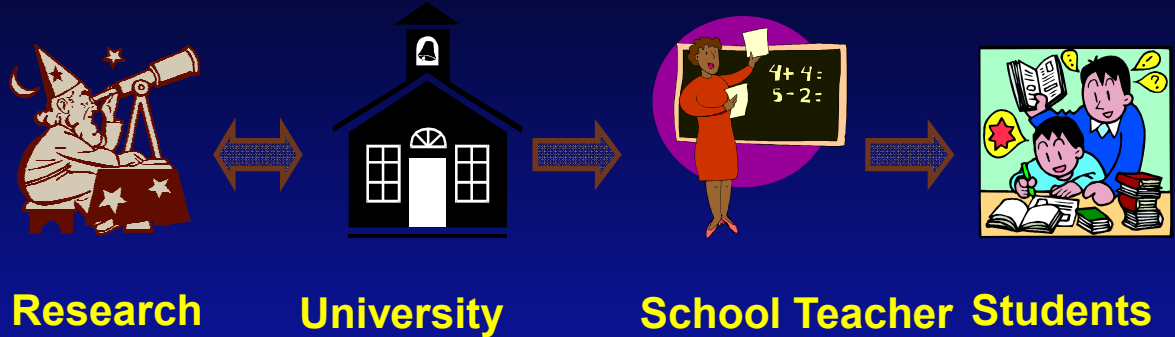


Science On Stage Festival

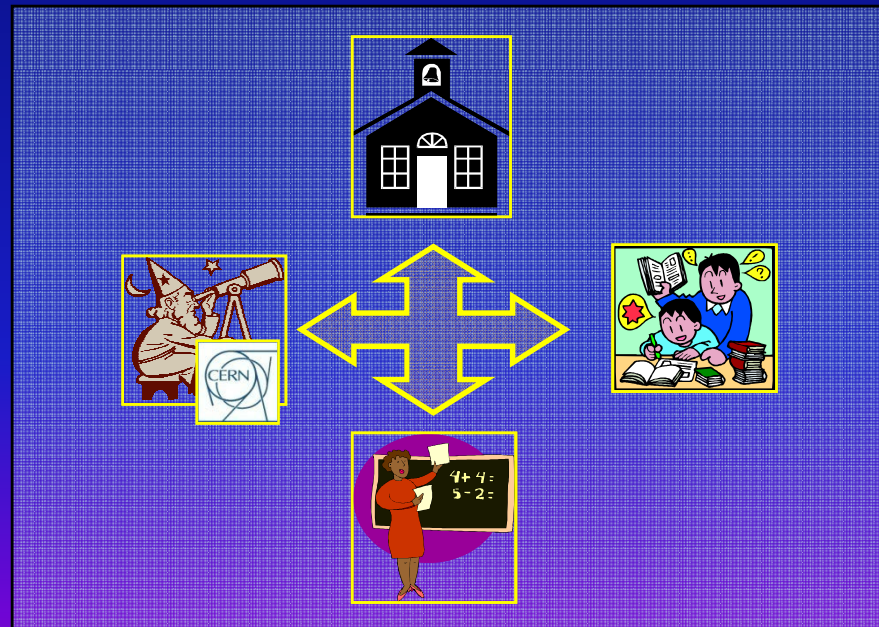


Role of CERN education group - Bring modern research closer to schools

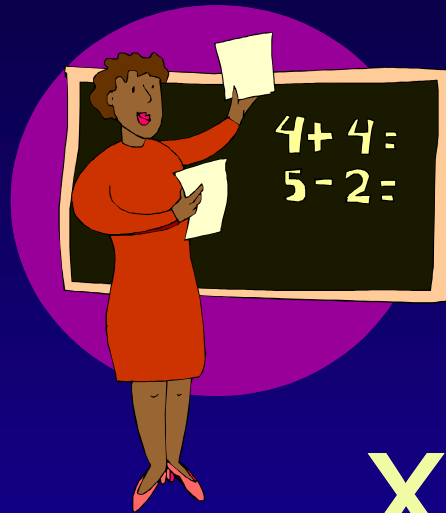
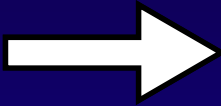
OLD



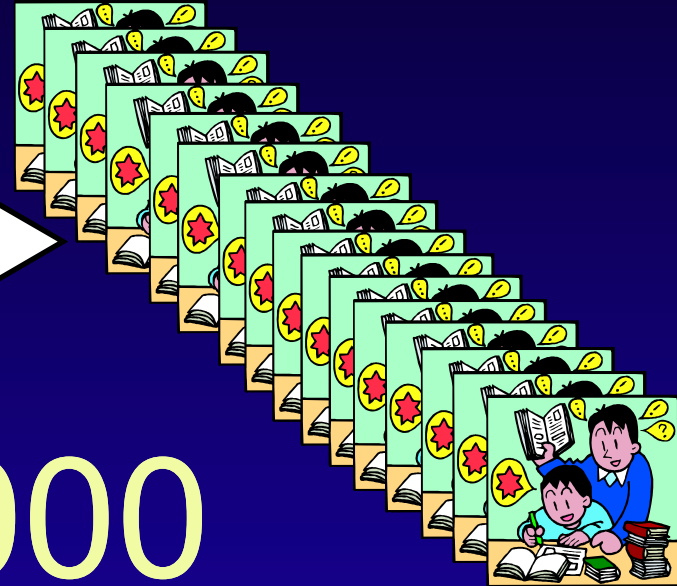
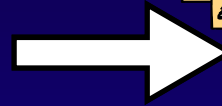
NEW



Looking for multiplicative factors



x 1000



School Teacher

School Students



What are we trying to achieve with the help of physics teachers ?

1: RAISE AND MAINTAIN THE INTEREST OF STUDENTS IN MODERN SCIENCE

Motivate them to continue scientific education at school
Help them to better understand the physical world

Improve scientific literacy

2: INSTIL A FEELING OF MYSTERY AND DISCOVERY POTENTIAL

Motivate students to take up physics at universities

Prepare the future generation of physicists

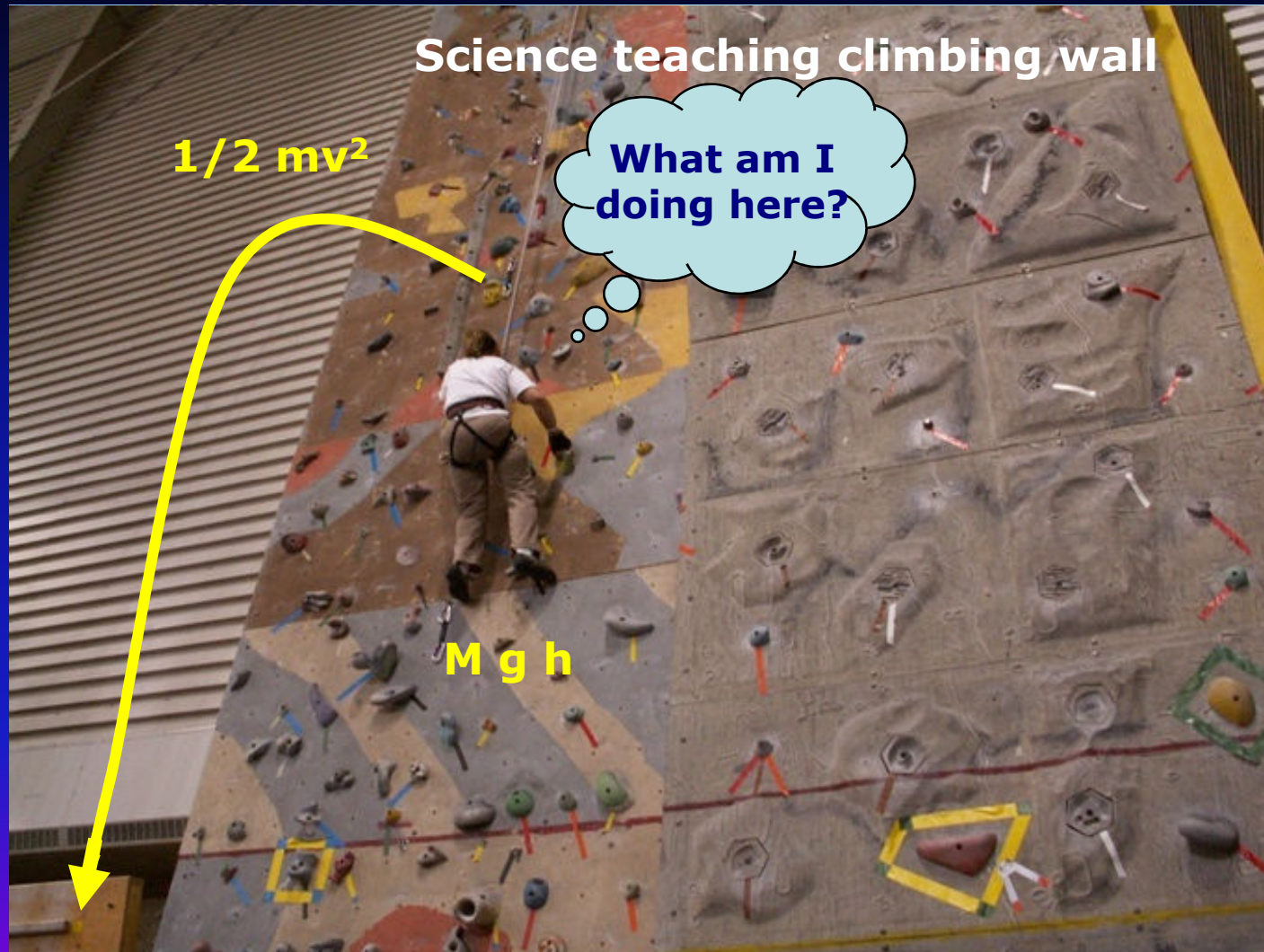
SCIENCE IS ALIVE !



How researchers view science



How school students view science





Take students on a sight-seeing tour ...



Link modern physics to school curriculum



Residential Teacher Programmes

Basic content

- Lectures
 - Introductions to CERN, Particle Physics, Cosmology, the LHC Experiments, Particle Accelerators, Medical Applications of Particle Physics, and the GRID
- Visits to experimental facilities
- Hands-on activities
- Working group activities
- Opportunities to meet working research physicists in a variety of informal settings.

All lectures are recorded, web archived and made publicly available

CERN teacher programmes

International “High School Teacher” school (3 weeks)

Fully funded by CERN for MS participants (programme, travel, accommodation)

Participants from all over the world funded externally

In English

National schools (1 week)

In their mother tongue (speakers from the national science community)

External funding of travel, accommodation

Build networks between teachers and with scientists inside country

International weekend schools (3 days)

Partially funded by CERN for MS participants (programme, accommodation)

In English

Content of CERN Teacher Schools

Lectures:

Particle Physics

Cosmology

Accelerators (LHC)

Detectors

Applications (IT, Medicine)

Guided tours:

LHC experiments

Antimatter factory (AD)

PS/LEIR

CLIC

Computing Centre - GRID

Activities:

Interactive teacher lab

Educational Resources

Games, Quiz

Lesson reviews (Q+A)



3 - week Summer School



30-40 participants, mainly from member states - held in English

Fully funded by CERN (travel, accommodation, food, lectures)

Lectures: Particle physics, cosmology, accelerators, detectors

Seminars: Antimatter, medical applications, ...

Working Groups: Bubble chambers, teacher lab, stories, ...

Guided Tours: LHC experiments, Antimatter factory

Social events - networking - Alumni contacts

28 June - 18 July 2009



3-day weekend programme

≤ 50 participants (mainly member states)

In English

Partially funded by CERN (accommodation)

Lectures on:

particle physics and cosmology

accelerators and detectors

antimatter, medical applications

Guided tours:

LHC experiments

Antimatter Factory

14 - 17 May 2009



1-Week Programmes

20-40 participants (from same country or language group)

In the language of the participants

No course fee, but external funding for travel, accommodation, subsistence

Goal: 20+ programmes per year

In collaboration with teachers and scientists from member states

Funding: teacher education funds, ministries, local authorities, foundations

2006: Pilot schools (Finland, Hungary, Sweden)



NTP Programme Organisation

Collaboration

CERN education group + for each country:

CERN 'patron' e.g. scientist from the country resident at CERN

National coordinator(s) e.g. teacher, administrator resident in the country

National agencies, foundations to assist with funding



Outcome

- Newly inspired, motivated and confident teachers
- Inspire and motivate students
- Communicate with their colleagues
- Communicate with the general public
- Act as ambassadors for science, physics, particle physics, CERN

Excellent examples among many teachers who have attended our programmes



Arthur C. Clarke

- “When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong.” •
- “The only way of discovering the limits of the possible is to venture a little way past them into the impossible.”
- “Any sufficiently advanced technology is indistinguishable from magic.”

Summary

CERN has broad range of education activities based on

- Information
- Communication
 - Visits (priority schools)
- Education programmes
 - Teachers (multiplicative factor)

Constant review and development

We are always looking for new partners



Thank You

- Varna Municipal Authorities
 - President of Municipal Council Mr Gutsanov
 - Deputy Mayor Mr Bazitov
- Regional Educational Inspectorate
- The organisers of the exhibition
 - Margarita Dimitrova
 - Svejina Dimitrova
- Participating teachers and their students
- YOU

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Thank You

- CERN Education Group Colleagues
- CERN Collaborators
- Lecturers and guides
- Sponsors
 - IN2P3
 - Cosmos a l'Ecole
 - Schools
- Alain de Bellefon
 - decede lundi 23 fevrier 2009 dans un accident de voiture lors d'une mission sur le site de l'Observatoire Pierre Auger en Argentine
- Vous



Au Revoir

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