CERN-Teacher Cooperation

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CERN
Directorate Services Unit
Education Group
Coordinator Teacher Support 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

2600 CERN Staff
+ 350 fellows + associates

7150 Visiting physicists

70 % from member states
25 % from observer states
5 % from other states
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 (2004: 30,000 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

Research    University    School Teacher    Students

CERN March 2008
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

Science teaching climbing wall

What am I doing here?

\[ \frac{1}{2} mv^2 \]

M g h
Take students on a sight-seeing tour ...

The origin .... Universe

Dark Energy

Dark Matter

Black Holes

Antimatter

Particles

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
3 - week Summer School

30-40 participants, mainly from Europe - 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

29 June - 19 July 2008
3-day weekend programme

≤ 50 participants (mainly Europe, large number from UK)

In English

Partially funded by CERN (no travel)

Lectures on:
particle physics and cosmology
accelerators and detectors
antimatter, medical applications

Guided tours:
LHC experiments
Antimatter Factory

13 - 16 March 2008
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

Goal: 10-15 programmes per year

In collaboration with teachers and scientists from member states

Funding: teacher education funds, ministries, foundations

2006: Pilot schools (Finland, Hungary, Sweden)
## Typical Timetable

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<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
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<tbody>
<tr>
<td><strong>Morning</strong></td>
<td></td>
<td>CERN Particle Physics Accelerators</td>
<td>CERN Particle Physics Detectors</td>
<td>Detectors Cosmology Lecture review</td>
<td>Cosmology Spin-offs Educational resources</td>
<td>Lecture review Programme review WG Reports</td>
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<td><strong>Afternoon</strong></td>
<td>Welcome Introduction</td>
<td>Visit (AD) Teachers lab/WG</td>
<td>Lecture review Teachers lab/WG</td>
<td>Visit (LHC exp.) Geneva</td>
<td>Educational resources Teachers lab</td>
<td>DEPARTURE</td>
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<td><strong>Evening</strong></td>
<td>Team building</td>
<td>Evening activity</td>
<td>Free evening</td>
<td>Dinner</td>
<td>Quiz</td>
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~ 650 Teachers
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
Thank You

- CERN Education Group Colleagues
- CERN Collaborators
- Lecturers
- Sponsors
  - Financial
  - Schools
- YOU

Have a safe journey home

AU REVOIR

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