Welcome to HST 2005 !

Rolf Landua

Head of CERN Education Group

4 July 2005

- 1. Why Scientists should care about education
- 2. CERN teacher programmes
  - Goals
  - 3-week Teacher Course (4-22 July)
  - 3-day Teacher Course (30 Sep - 2 Oct)
  - Future directions
- 3. CERN students programmes
  - University: Summer Students
  - High School, 17-18 y: Visits, Websites, Webcasts
  - High School, 14-16 yr: new ideas

1. Why we (CERN) should care

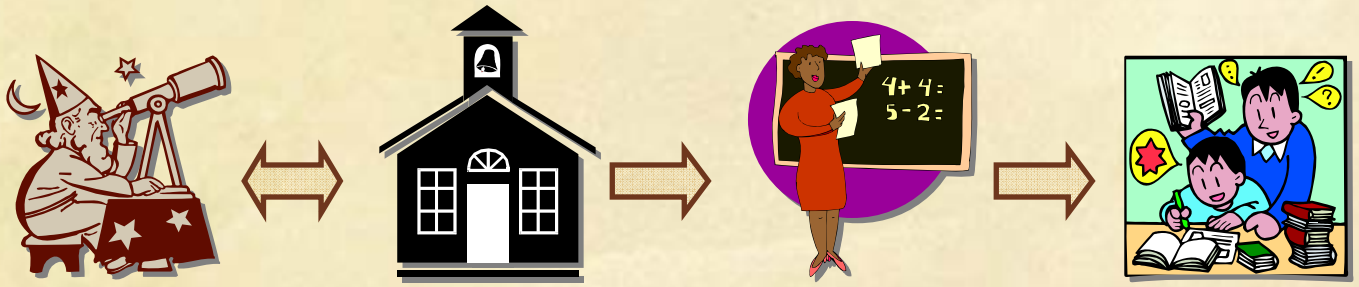
Uninterested Students → Uninformed Citizens

→ Society: research directions, funding

→ Future generation of researchers?
(prediction: 700,000 scientists/engineers will be missing in Europe in 2015)

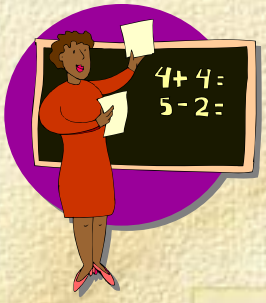
→ Teachers: crucial link to (many) students

Science Education today



Research **University** **School Teacher** **Students**

Research:	Isolated from schools and students (society)
University:	Emphasis on future researchers (not teachers)
Teachers:	Knowledge gap about frontier research
Students:	Motivation?



High School Physics

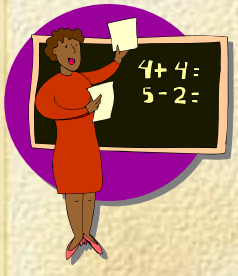
Deductive and remote from daily life

Covers A.D. 1680-1840

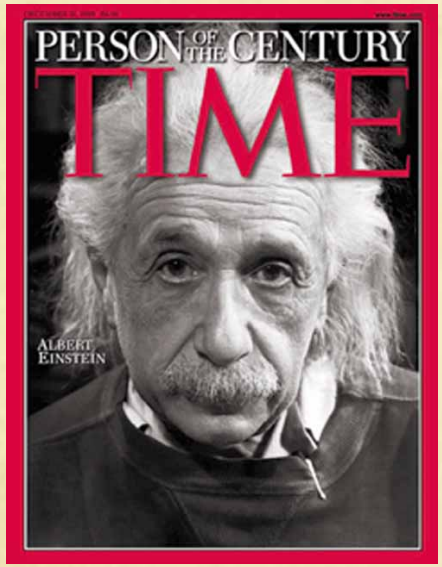
Topics: *Free fall, kinetic energy, centrifugal forces, Ohm's law, Coulomb's law, geometrical optics, thermodynamics, ...*

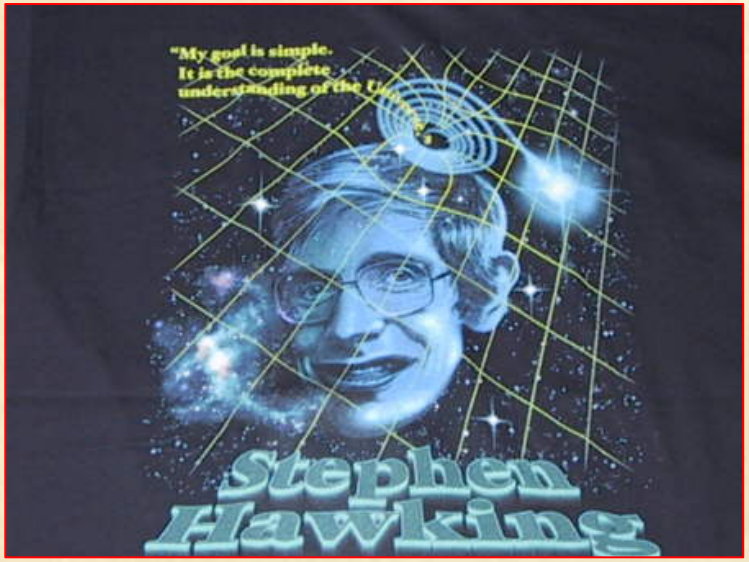
Will this entice bright young students?

Will they see a connection between this and state-of-the-art technology/science?



In schools, where are ...





Antimatter
Black Holes
Time Dilatation
Dark energy

Gravitation
Dark Matter
Big Bang
Vacuum Fluctuations

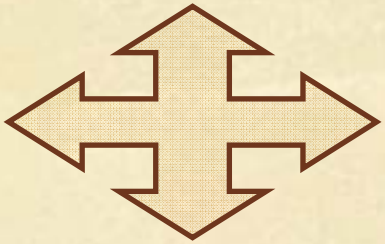
Science can be (presented) interesting !

Science+Vie Junior, 2001:

164,000 copies, 1.89 million readers aged 15+

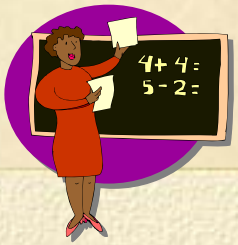
These magazines report about ... us

University



Students

Resear
ch



School
Teacher

Establish direct contact between all parties

Bring the fascination of frontier research to the class-room

Positive results:

Teacher	**Decreased knowledge gap** **More confident in teaching 'modern' subjects**
Students	**Excitement about 'cool' discoveries** **Stimulation of interest in science**

Link modern physics to curriculum

Topic / Level	<12 yr	13-16	>16 yr	All
Mechanics				
Electro-magnetic				
Optics				
Thermo-dynamics				

2. CERN Teacher Programmes

If you'd like to stay for three days or three weeks, CERN has the programme for you!

Keep up-to-date with research in particle physics, experience a dynamic, international environment: register for one of our programmes and meet up with teaching colleagues from all over Europe.

2005 Physics Teachers @ cern

A three day meeting for teachers gathering at CERN from all over Europe. The programme includes seminars, visits and educational activities.

To participate you need to fill in the application form. An evaluation board will select the participants.

See the PhysicsTeachers@CERN2005 webpage for more information.

CERN HST HIGH SCHOOL TEACHERS

This is the longest - and most complete - programme aimed at Physics high-school teachers who would like to spend the first three weeks of July at CERN. Teachers attend lectures and workshops and produce their own resources. Everything is published on a dedicated website where you can also find detailed programmes and schedules.

National Programmes for teachers

Upon request we can put you in touch with national representatives of CERN member states who help organise programmes for teachers from their country.

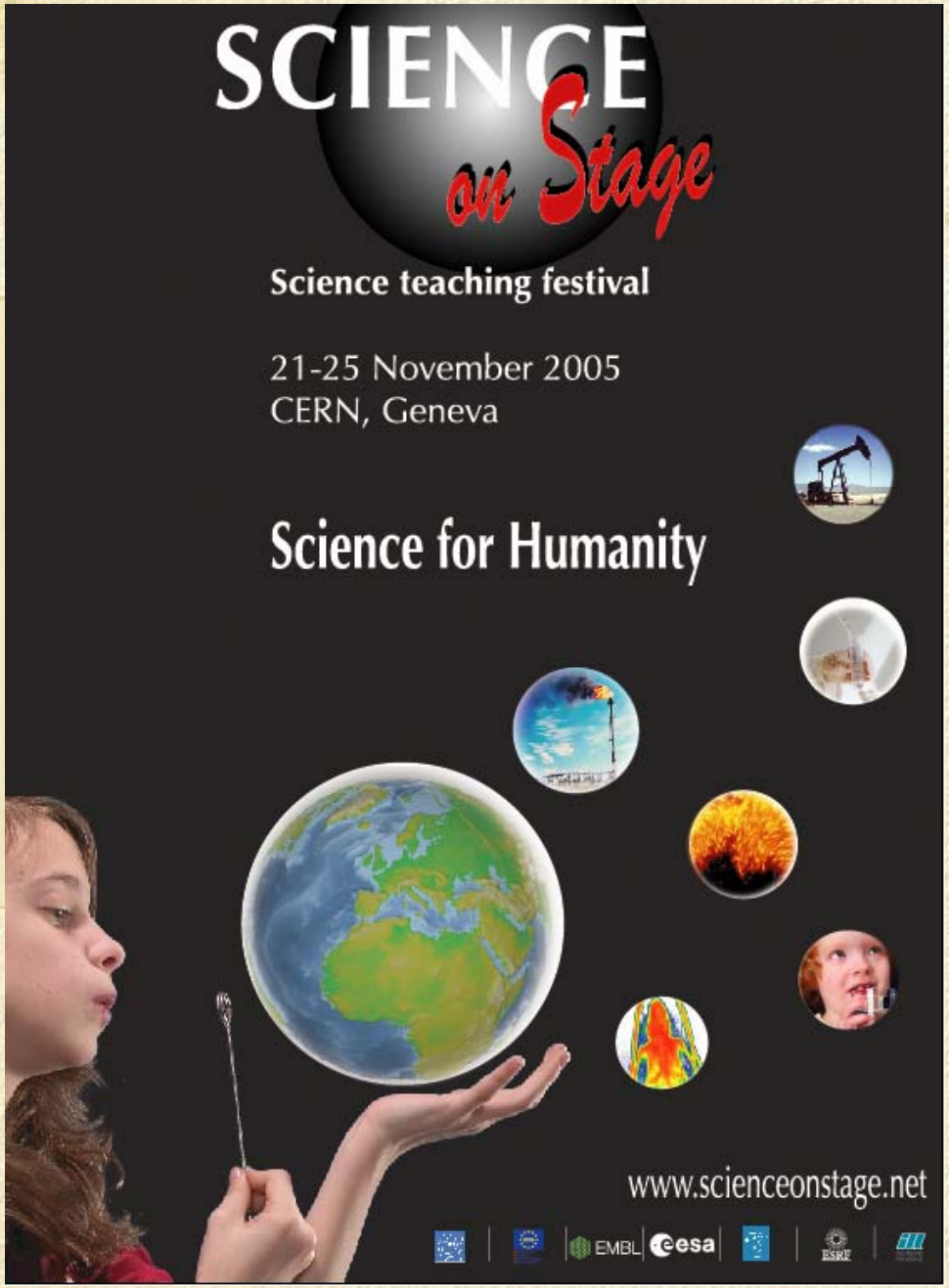
3-week Teacher Course ("HST")

International (in English), 4-22 July,
~30 participants
'In-depth' course
Lectures, seminars, visits, workshops

3-day Teacher Course ("PhT")

International (in English), 30 Sep - 2Oct,
~45 participants
'Immersion' course
Lectures, visits, discussions

Science On Stage 2005



Science On Stage

EIRO* Initiative for European Science Teachers (29 countries)

(*European Institutional Research Organisations =

CERN, EFDA/ITER, EMBL, ESA, ESO, ESRF, ILL)

Make science teaching more attractive to young people

Teacher **Teacher**

LEARNING	**Exchange of good practice, successful ideas**
MOTIVATION	**Competition on national and European level**
STIMULATION	**Scientists give authentic news from 'frontier'**

Science On Stage 2005

'Science for Humanity'

Science On Stage Festival - 21-25 November 2005 - CERN

- **350 participants:**
  - **Science-teaching fair**
  - **Presentations, Performances by Teachers**
  - **Seminars+workshops (by EIRO scientists)**
  - **Innovations disseminated via Web, CD/DVDs**

Future directions

‘National’ Teacher Schools

- Language & Curriculum Oriented
- One week (Mon-Fri), no particular
- Lectures, Seminars, workshops
- Use of classroom-ready tools

Resident teachers

- 2-3 months grants
- Development of teaching modules (with scientists)

More for Teachers ...

Educational Resources

Newsletters

School Visits

Online Resources (interactive games)

Ask an Expert

- **Submit question via Web**
- **Answer by researcher**
- **FAQ section**

3. CERN for students

University: Summer Students (2-3 months)
High School, 17-18 y: Visits, Websites, Webcasts
High School, 14-16 yr: Games, quiz

Mission AE05

Top 10 Mysteries of the Universe

Educational Web-Sites

Two examples (out of many):

ESA

CERN

QuickTime™ and a
H.263 decompressor
are needed to see this picture.

Web-Casting

Goal	**inform about modern research**
	provide new class-room ready tool
Target	**School students (12-16 years)**
How	**60 min Internet broadcast with live audience**

2000:	**Antimatter - Mirror of the Universe**
2002:	**Life in the Universe ?**
2003:	**Sci-Tech “Couldn’t be without it”**

For Students

Increase interest by more frontier science into classrooms

Less emphasis on mathematical/deductive approach

Role model function of (young) scientists - ambassadors !

“ This could be me …”