

Croatian Teachers Programme

CERN, 29 March – 2 April 2015

Vuko Brigljević, Mirko Planinić, Ivica Puljak

CERN – Europski centar za fiziku čestica



Što je CERN?

1. Istraživanje

- Traženje odgovora na fundamentalna pitanja o strukturi, postanku i razvoju svemira
 - Najveći laboratorij na svijetu
 - Jedan od najvećih centara izvrsnosti na svijetu

CERN je "laboratorij svijeta"

Le Monde, srpanj 2010.

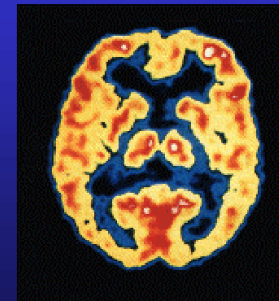
Što je CERN?

2. Visoka tehnologija

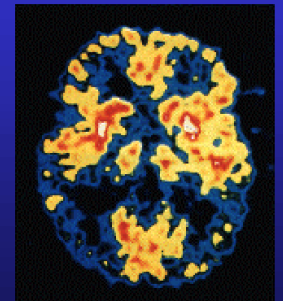
- Pomicanje granica znanja nužno znači i razvoj novih tehnologija
- Primjeri
 - World wide web
 - Medicina



Metabolizam mozga kod Alzheimerove bolesti: PET skener



Normal Brain



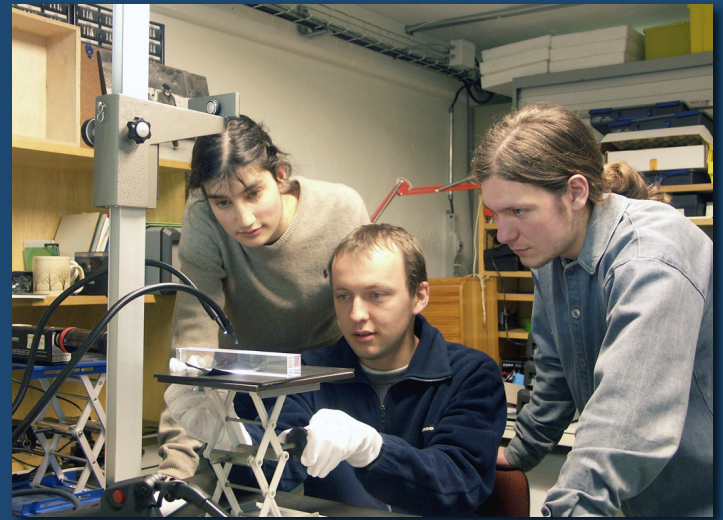
Alzheimer's Disease

~30 000 akceleratora u svijetu
~17 000 se koristi u medicini

Što je CERN?

3. Obrazovanje

- Obrazovanje budućih inženjera i znanstvenika
 - U vrlo *kompetitivnom* i *međunarodnom* okruženju



Što je CERN?

4. Suradnja

- Povezivanje država i naroda kroz znanstvena istraživanja



CERN was founded 1954: 12 European States

“Science for Peace”

Today: 21 Member States

~ 2300 staff
~ 1620 other paid
personnel
~ 10500 users
Budget (2014) ~1000
MCHF

Member States: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Israel, Italy, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom

Candidate for Accession: Romania

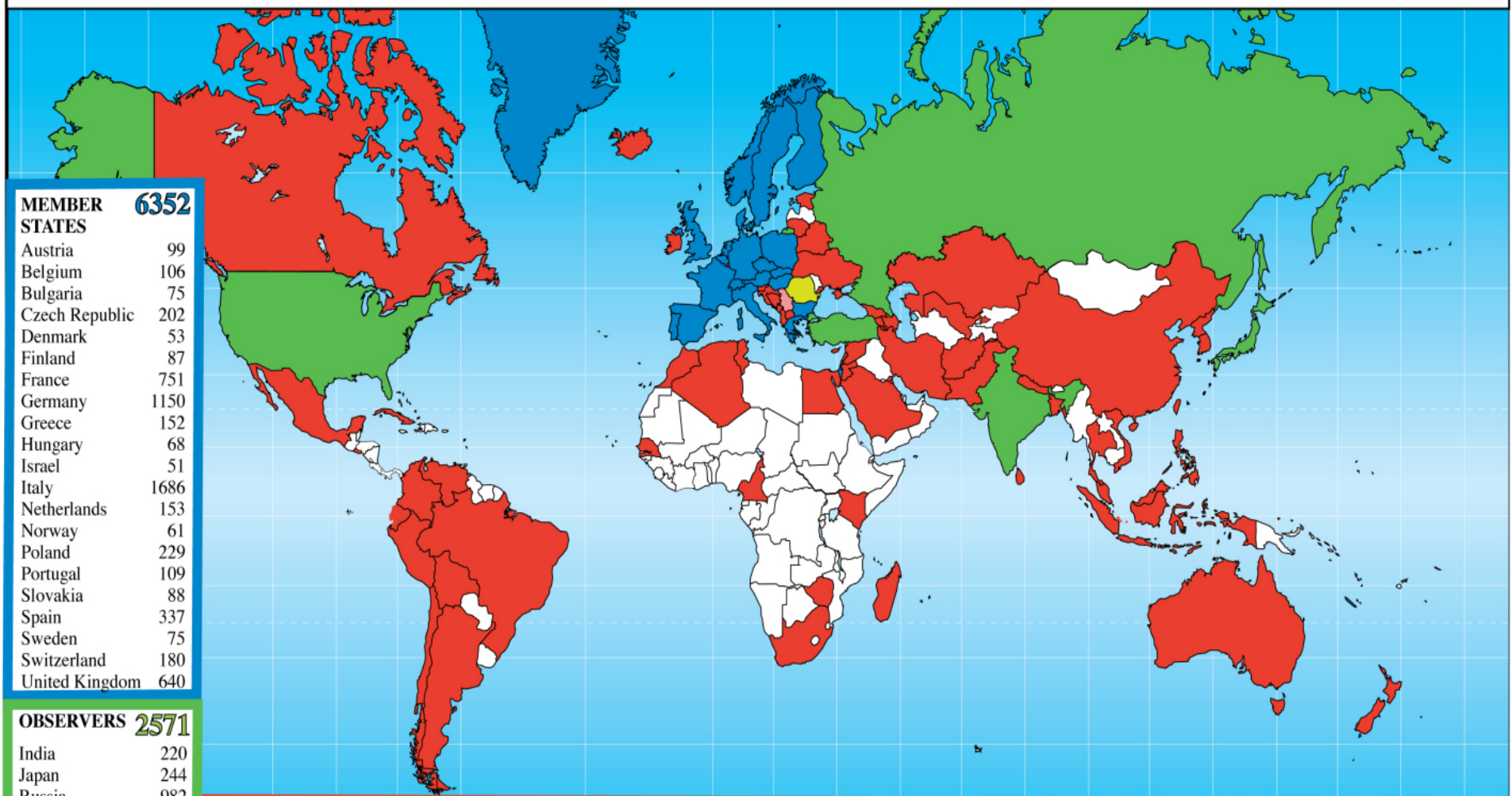
Associate Member in Pre-Stage to Membership: Serbia

Applicant States for Membership or Associate Membership:

Brazil, Cyprus, Pakistan, Russia, Slovenia, Turkey, Ukraine, Croatia

Observers to Council: India, Japan, Russia, Turkey, United States of America; European Commission and UNESCO

Distribution of All CERN Users by Nationality on 14 January 2014



MEMBER STATES 6352

Austria	99
Belgium	106
Bulgaria	75
Czech Republic	202
Denmark	53
Finland	87
France	751
Germany	1150
Greece	152
Hungary	68
Israel	51
Italy	1686
Netherlands	153
Norway	61
Poland	229
Portugal	109
Slovakia	88
Spain	337
Sweden	75
Switzerland	180
United Kingdom	640

OBSERVERS 2571

India	220
Japan	244
Russia	982
Turkey	146
USA	979

CANDIDATE FOR ACCESSION 118

Romania	118
---------	-----

ASSOCIATE MEMBERS IN THE PRE-STAGE TO MEMBERSHIP 41

Serbia	41
--------	----

OTHERS

Bolivia	3	Cuba	7	Iran	28	Madagascar	4	Philippines	1	Tunisia	6		
Afghanistan	1	Bosnia & Herzegovina	1	Cyprus	16	Ireland	22	Malaysia	15	Saudi Arabia	3	Ukraine	55
Albania	2	Brazil	108	Ecuador	3	Jordan	2	Mauritius	1	Senegal	1	Uzbekistan	4
Algeria	8	Cameroon	1	Egypt	19	Kazakhstan	1	Mexico	64	Singapore	2	Venezuela	9
Argentina	11	Canada	134	El Salvador	1	Kenya	1	Montenegro	3	Sint Maarten	2	Viet Nam	9
Armenia	25	Cape Verde	1	Estonia	16	Korea, D.P.R.	1	Morocco	12	Slovenia	27	Zimbabwe	2
Australia	25	Chile	12	Georgia	36	Korea Rep.	117	Nepal	5	South Africa	16		
Azerbaijan	8	China	280	Gibraltar	1	Kuwait	1	New Zealand	7	Sri Lanka	5		
Bangladesh	4	China (Taipei)	45	Hong Kong	1	Lebanon	12	Pakistan	41	Syria	2		
Belarus	47	Colombia	30	Iceland	4	Lithuania	19	Palestine (O.T.)	4	Thailand	12		
		Croatia	35	Indonesia	1	Luxembourg	4	Peru	8	T.F.Y.R.O.M.	1		

1415

CERN-ovi edukacijski programi

Scientists at CERN

Academic Training Programme



Young Researchers

CERN School of High Energy Physics
CERN School of Computing
CERN Accelerator School



Physics Students

Summer Students Programme



CERN Teacher Schools

International and National Programmes



CERN-ove škole u Hrvatskoj



CSC 2007: 20 -31 August 2007 in Dubrovnik, Croatia
Organized in collaboration with the University of Split (FESB)



GRID Technologies

The Grid track delivers unique theoretical and hands-on education on some of the most advanced GRID topics.

Programme Highlights

Software Technologies

The Software track addresses the most relevant modern techniques and tools for large scale distributed software development and handling as well as for computer security.

Physics Computing

The Physics Computing track focuses on informatics topics specific to the HEP community. After setting-the-scene lectures, it addresses ROOT and Data Acquisition and Technologies.

Lecturers

Helene Cordier
François Flückerger
Rudi Frühwirth
Robert G. Jacobsen
Erwin Laure
Sebastian Lopienski
Axel Naumann
Alberto Pace
Klaus Schossmaier
Heinz Stockinger

tCSC2013

The First **thematic** CERN School of Computing 3rd -7th June 2013, Split, Croatia

Organised by CERN in collaboration with the University of Split (FESB)



Mastering State of the Art Computing



2nd Thematic CERN School of Computing

CERN
School of Computing

15-20 June 2014
Europe/Zurich timezone

Search



3rd Thematic CERN School of Computing

CERN
School of Computing

17-23 May 2015
Europe/Zurich timezone

Search

- Overview
- General Information
- Scientific Programme
- Timetable
- Weekly timetable
- Lecturer's contributions
- Lecturer's biographies
- Registration
- Participant List
- CSC Live**
- Photo Gallery
- CSC main site

Thematic CERN School of Computing 2014

The **CSC Live** web site is open !

"Future high-throughput scientific computing"



Overview

General Information

- Timetable (draft)
- Weekly timetable (draft)
- Lecturer's contributions
- Lecturer's biographies
- Registration
- Participant List
- CSC main site

Thematic CERN School of Computing 2015

"Efficient, Parallel Programming and I/O for Big Data in Science"



CERN Teacher Programmes



Education

[Home](#) | [Contact us](#) | [CERN Home](#)

Search

this site All CERN

[Teacher Programmes](#) | [Teaching Resources](#) | [Visit CERN](#)



Teacher Programmes

Keep up-to-date with the latest developments in particle physics and related areas, and experience a dynamic, international research environment. CERN offers you the possibility to participate in special programmes for teachers and meet with teaching colleagues from your country or from all over Europe.



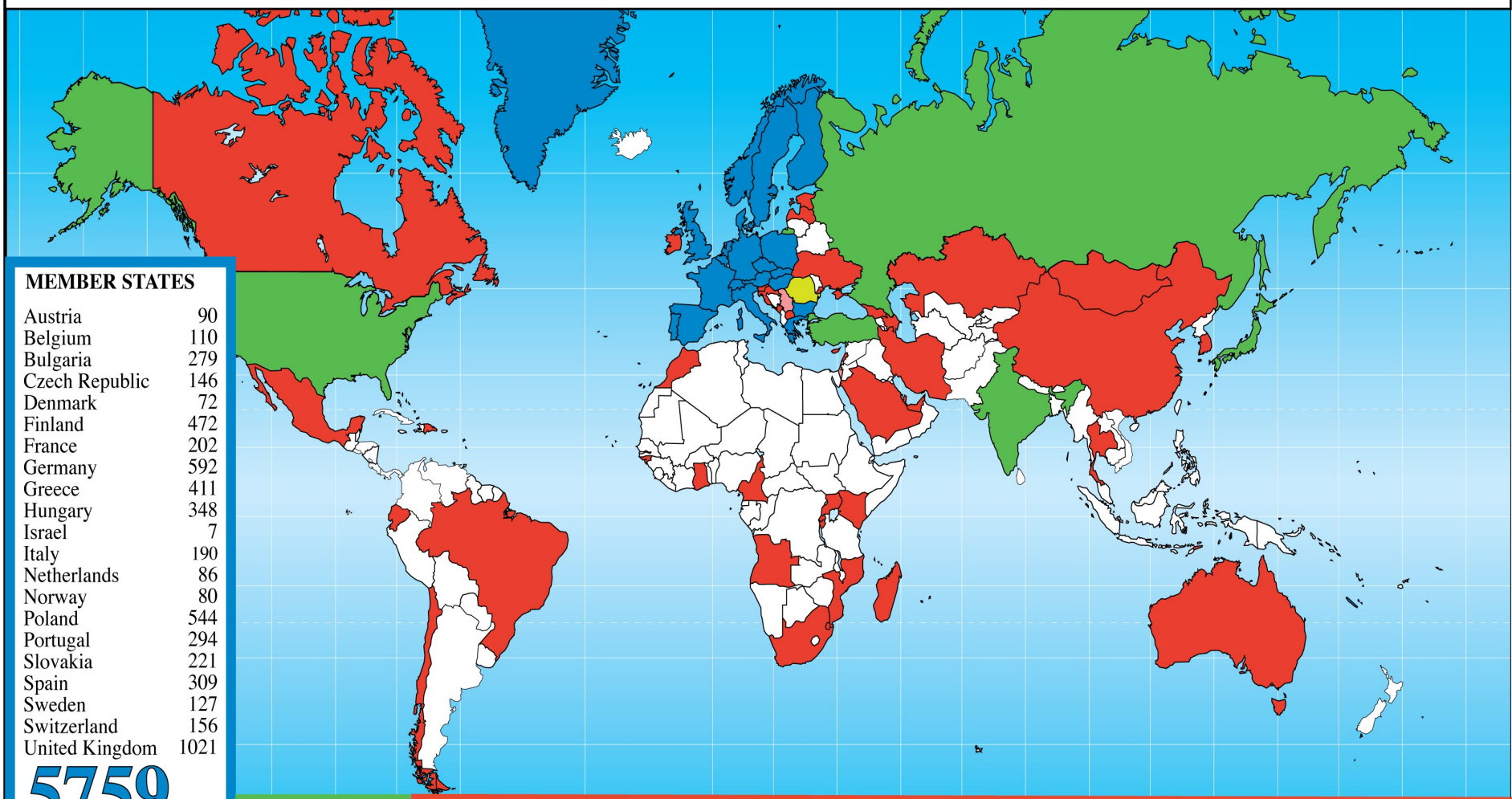
High School
Teacher
Programme



The **High School Teacher Programme** is a comprehensive international course held in English, aimed at teachers who would like to spend the first three weeks of July at CERN. The next session will take place from 5 to 25 July 2015.

The **National Teacher Programmes** are held in one of the national languages of CERN Member States. These programmes are also open for teachers from other countries (including non-member states) speaking the same language. Teacher programmes for participants from non-member states can also be organized, but are only held in their national language if competent lecturers speaking this language are available. Click [here](#) to find out more about their content, when the next session is planned for your country, to access the agenda, to find archived material of previous sessions and contact information.

Teacher Programme Participants 1998 - 2013



MEMBER STATES

Austria	90
Belgium	110
Bulgaria	279
Czech Republic	146
Denmark	72
Finland	472
France	202
Germany	592
Greece	411
Hungary	348
Israel	7
Italy	190
Netherlands	86
Norway	80
Poland	544
Portugal	294
Slovakia	221
Spain	309
Sweden	127
Switzerland	156
United Kingdom	1021

5759

CANDIDATE FOR ACCESSION

Romania	12
---------	----

ASSOCIATE MEMBER IN THE PRE-STAGE TO MEMBERSHIP

Serbia	14
--------	----

OBSERVER STATES

India	2
Japan	5
Russia	163
Turkey	3
USA	65

238

OTHERS

Angola	4	China	1	Ireland	5	Morocco	2	Swaziland	1
Australia	5	Croatia	1	Kazakhstan	3	Mozambique	17	Thailand	7
Azerbaijan	1	Cyprus	8	Kenya	4	Qatar	1	T.F.Y.R.O.M.	11
Brazil	83	Dominican Rep.	2	Latvia	1	Rwanda	17	Timor-Leste	4
Burundi	1	Ecuador	2	Lebanon	1	Sao Tome	3	Uganda	3
Cameroon	3	Estonia	37	Madagascar	2	Saudi Arabia	1	Ukraine	57
Canada	3	Georgia	55	Malta	36	Singapore	2	U.A.E.	1
Cape Verde	3	Ghana	6	Mexico	6	Slovenia	21		
Chile	3	Guinea Bissau	1	Mongolia	1	South Africa	6		
		Iran	1	Montenegro	13	South Korea	44		

490

High school teachers programme



High School Teacher Programme

[Home](#)[HST Programme](#)[Goals](#)[Financial support](#)[Participants](#)[HST2015](#)[Housing](#)

Applications for HST2015 are now being accepted!

Konrad Jende on Thu, 11/27/2014 - 15:01

The application for HST2015 is now open! The deadline for application is 15 February 2015. Please consult the [HST2015 job website](#) directly.

[Read more](#) [Add new comment](#)

[APPLY FOR HST2015](#)

[Search](#)

Prva i jedina polaznica (do sada) iz Hrvatske:

Marina Furkes, prof. iz Koprivnice

National programmes for teachers



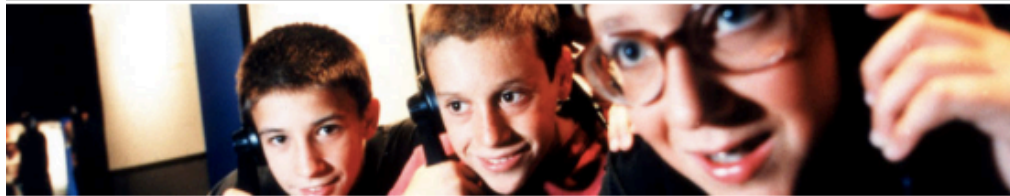
Education

Home | Contact us | CERN Home

this site All CERN

Search

| Teacher Programmes | Teaching Resources | Visit CERN



National Programmes for teachers



-  Austria
-  Belgium
-  Bulgaria
-  Croatia
-  Czech Republic
-  Denmark
-  Dominican Republic
-  Estonia
-  Finland
-  France
-  Georgia
-  Germany
-  Greece
-  Hungary
-  Israel
-  Italy
-  Lithuania
-  Netherlands
-  Norway
-  Poland
-  Portugal
-  Russia
-  Slovak Republic
-  Spain
-  Sweden
-  Switzerland
-  Turkey
-  Ukraine
-  United Kingdom

National Programmes for Teachers

This programme is delivered in one of the national languages of CERN Member States. It is also open for teachers from other countries (including non-member states) speaking the same language. Teacher programmes for participants from non-member states can also be organized, but are only held in their national language if competent lecturers speaking this language are available. The lecture materials and the archived video recordings of the lectures are a unique resource for all physics teachers from the participating country.

CERN provides all scientific, administrative and technical support for the programme, such as scientific content and provision of national language facilitators, lecturers and guides. Travel and subsistence funds, covering accommodation and meals, are expected to be provided by national authorities or by other sources, e.g. educational foundations.

Croatian Teachers Programme - Osnivači



Mirko Planinić, PMF Zagreb



Vuko Brižjević, IRB Zagreb



Ivica Puljak, FESB Split

U ime hrvatske zajednice fizičara visokih energija **CROHEP**

Osnovna ideja programa

- ▶ Uspostaviti dugoročni program edukacije nastavnika fizike u CERN-u
- ▶ 2015. godine napraviti pilot projekt
 - Koji je upravo u tijeku
 - Zahvaljujući sponzorima
 - Prvenstveno CERN-u, Gradu Zagrebu i Hrvatskom fizikalnom društvu, PMF – Zagreb, IRB – Zagreb i FESB – Split
 - Selekcija nastavnika od strane organizatora
 - S obzirom da dosadašnje zajedničke aktivnosti
- ▶ Ukoliko pilot projekt bude uspješan predložiti program MZOS-u, AZOO-u i osnivačima škola za dugoročno financiranje
 - Tražiti financiranje i iz drugih izvora
 - Selekcija nastavnika nakon javnog natječaja
 - Jedne godine srednjoškolski profesori, a druge godine profesori iz osnove škole

Osnovne svojstva programa

▶ Trajanje:

- Tri radna dana
- Dva dana na putu

▶ Period:

- Proljetni praznici

▶ Program

- Jutro: predavanja
 - Teorijska fizika čestica
 - Eksperimentalna fizika čestica
 - Kozmologija i astročestična fizika
- Poslijepodne: posjete i laboratorijske vježbe
 - Povijest CERN-a, akceleratori, kompjuterski centar, veliki detektori, Masterclass, demonstracijski eksperiment, školski eksperimenti

▶ Financiranje

- 1/3 put, 1/3 smještaj, 1/3 ostalo (prehrana, lokalni prijevoz ...)
- Pilot projekt
 - put = Grad Zagreb, smještaj = CERN, ostalo = ravnatelji kroz dnevnicе
- Budući projekti, na primjer
 - put = MZOS, smještaj = osnivači (županije, gradovi ...), ostalo = ravnatelji kroz dnevnicе

Putovanje




Sudionici



Program – Prvi dan

Monday, 30 March 2015







- 09:00 - 12:15 **Monday morning lectures** 
Location: [61-1-009 - Room C](#)
- 09:00 **Introduction to CERN 45'** 
Speaker: Rolf Landua (CERN)
- 09:45 **Lecture on particle physics (1) 1h0'** 
Speaker: Vuko Brigljevic (Institute Rudjer Boskovic (HR))
- 10:45 **Coffee break 30'**
- 11:15 **Lecture on detectors (1) 1h0'** 
Speaker: Mirko Planinic (University of Zagreb (HR))
- 12:15 - 14:00 **Lunch** ([500-R-203 - Foyer](#))
- 14:00 - 17:00 **Monday afternoon visits** 
- 14:00 **SC Visit 1h0'** 
Meeting in front of building 300 at 14:00.
Speaker: Dr. Sascha Schmeling (CERN)
- 15:00 **Transport from Building 300 to Data Centre 15'** (Building 300) 
- 15:15 **Data Center Visit 45'** 
Speaker: Francois Briard (CERN)
- 16:00 **AD Visit 1h0'** 
Speakers: Niels Madsen (Swansea University (GB)), Dr. Yuri Ermoline (Michigan State University (US))
- 19:00 - 20:00 **Reception** 
Conveners: Michaela Alice Oettle (Technische Universitaet Dresden (DE)), Dr. Sascha Schmeling (CERN)
Location: [500-1-201 - Mezzanine](#)

Prvi dan



Program – Drugi dan









Tuesday, 31 March 2015

08:30 - 12:00	Tuesday morning lectures Location: 40-S2-C01 - Salle Curie	
08:30	Lecture on particle physics (2) 2h0' Speaker: Vuko Brigljevic (Institute Rudjer Boskovic (HR))	
10:30	Coffee break 30'	
11:00	Skype conference call to Zadar symposium on physics education 20' ()	
11:20	Lecture on detectors (2) 40' Speaker: Mirko Planinic (University of Zagreb (HR))	
12:00 - 13:00	Lunch	
13:00 - 16:00	Masterclass Location: 61-1-009	
16:00 - 19:30	Treasure hunt	

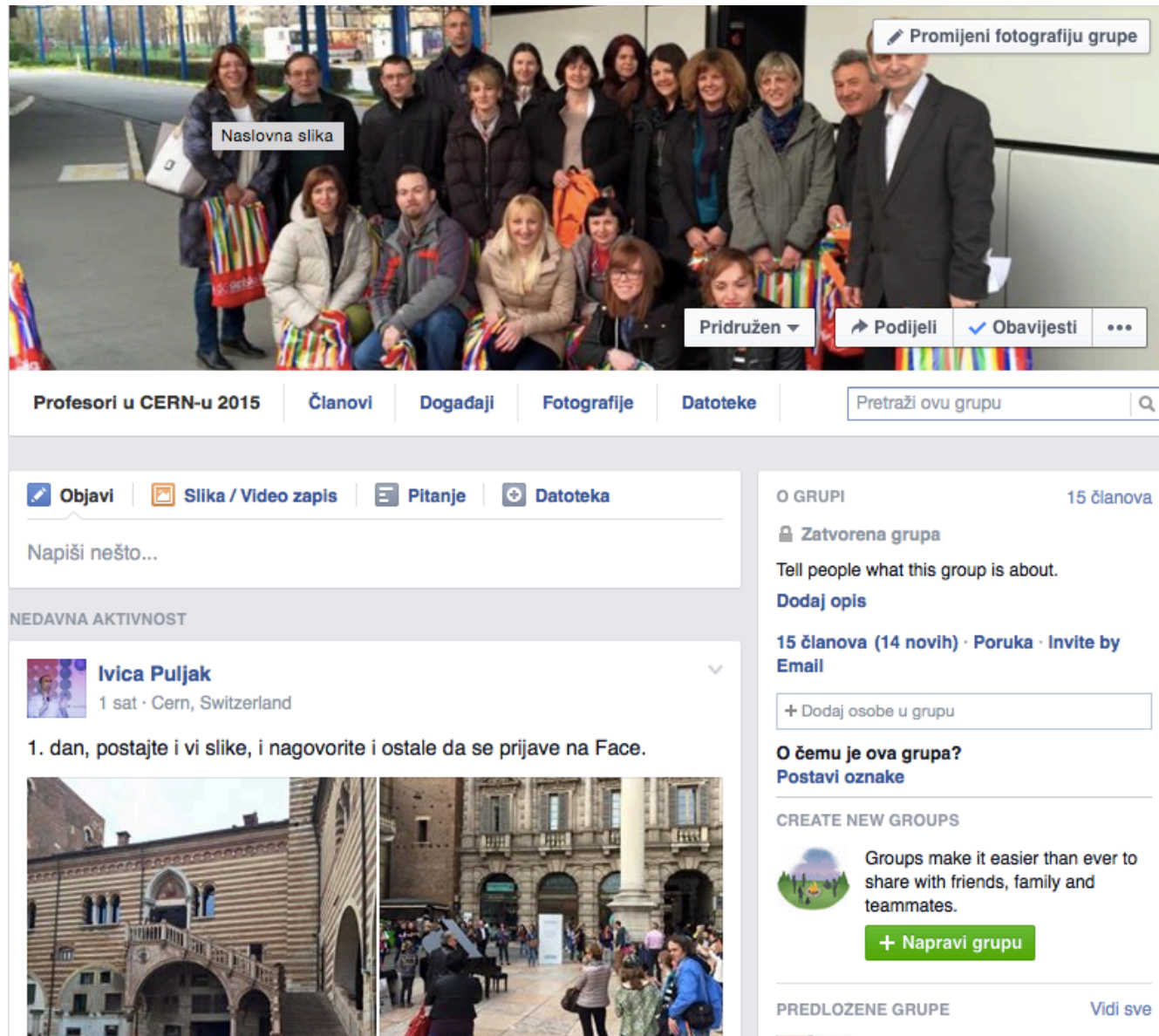


Program – Treći dan

Wednesday, 1 April 2015

- 08:30 - 12:00 **Wednesday morning lectures** 
Location: [61-1-009 - Room C](#)
- 08:30 **Lecture on Astroparticle Physics & Cosmology (1) 1h30'** 
Speaker: Ivica Puljak (Technical University of Split FESB)
- 10:00 **Coffee break 30'**
- 10:30 **Lecture on Astroparticle Physics & Cosmology (2) 1h30'** 
Speaker: Ivica Puljak (Technical University of Split FESB)
- 12:00 - 13:30 **Lunch** ([500-R-203 - Foyer](#))
- 13:30 - 18:30 **Wednesday afternoon visits** 
- 13:30 **Visit to the service cavern of the Compact Muon Solenoid (CMS) 2h0'** (Point 5 @ LHC) 
Meeting at building 39 (HOTEL RECEPTION) at 13:30.
- 15:30 **Coffee break 30'**
- 16:00 **Cloud Chamber Workshop at S'Cool LAB 1h15'** 
Meeting at Building 33 (CERN Reception) at 15:55
Speaker: Zoltan Szillasi (Hungarian Academy of Sciences (HU))
- 17:30 **SM18 visit 1h0'** 
Speaker: Ina Chalupkova (Charles University (CZ))
- 20:00 - 21:30 **Programm Dinner at Cave Valaisanne** 
Convener: Rolf Landua (CERN)

Facebook grupa




Profesori u CERN-u 2015 [Članovi](#) [Događaji](#) [Fotografije](#) [Datoteke](#)


[Objavi](#) [Slika / Video zapis](#) [Pitanje](#) [Datoteka](#)

Napiši nešto...

NEDAVNA AKTIVNOST

 **Ivica Puljak**
1 sat · Cern, Switzerland

1. dan, postajte i vi slike, i nagovorite i ostale da se prijave na Face.



[Promijeni fotografiju grupe](#)

[Pridružen](#) [Podijeli](#) [Obavijesti](#) [...](#)


O GRUPI 15 članova

Zatvorena grupa
Tell people what this group is about.
[Dodaj opis](#)

15 članova (14 novih) · Poruka · Invite by Email

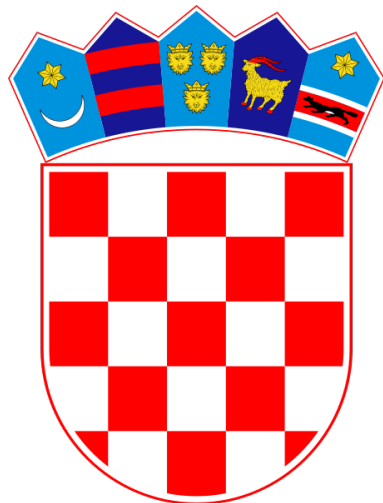
O čemu je ova grupa?
[Postavi oznake](#)

CREATE NEW GROUPS

 Groups make it easier than ever to share with friends, family and teammates.

[+ Napravi grupu](#)

PREDLOŽENE GRUPE [Vidi sve](#)



Croatian Teachers Programme

CERN, 29 March – 2 April 2015

Vuko Brigljević, Mirko Planinić, Ivica Puljak



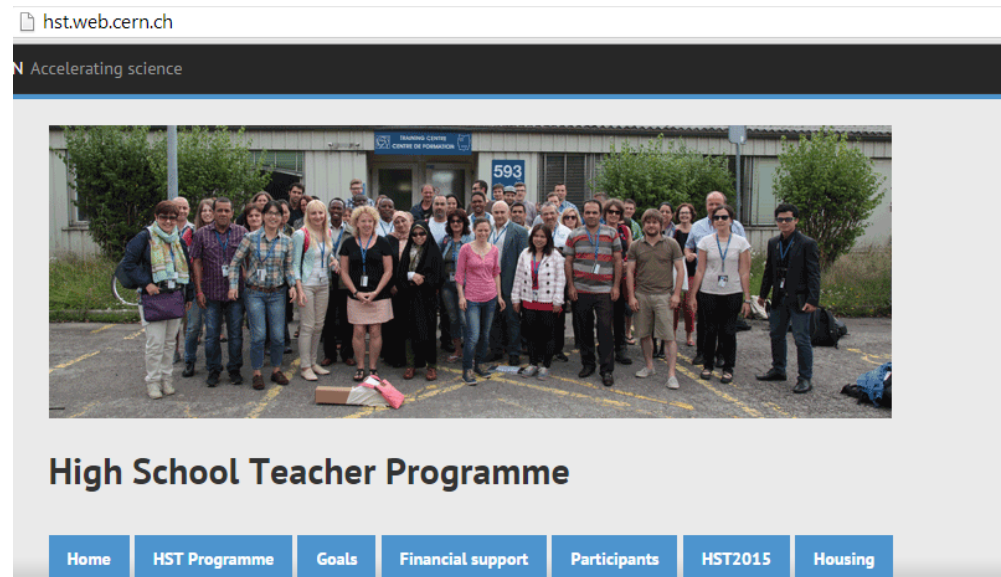
HIGH SCHOOL TEACHER PROGRAMME (HST – 2014)

Marina Furkes, mag.educ.math.et phys.
Gimnazija “Fran Galović” Koprivnica
Croatia

Kako se prijaviti i što je potrebno za prijavu?

Ključna pitanja:

- Zašto se prijavljujem?
- Što očekujem od edukacije?
- Zašto baš ja?
- Koji je moj doprinos edukaciji?
- Kako ću to manifestirati u nastavi/kolektivu?



The screenshot shows the website for the High School Teacher Programme (HST2015) at CERN. The URL is hst.web.cern.ch. The page features a large group photo of participants standing in front of a building with the number 593. Below the photo, the title "High School Teacher Programme" is displayed. A navigation menu includes links for Home, HST Programme, Goals, Financial support, Participants, HST2015, and Housing.

Applications for HST2015 are now being accepted!

Konrad Jende on Thu, 11/27/2014 - 15:01

The [APPLICATION](#) for HST2015 is now open! The deadline for application is 15 February 2015. Please consult the [HST2015 job website](#) directly.

Važno: Prijave do kraja prvog mjeseca!

Što kada me CERN odabere?

- Rezerviraj kartu
- Pripremi se za put/edukaciju

FINANCIJE: (2000 CHF smještaj i hrana + 500 CHF putovanje)

- Pokucaj na mnoga vrata!
- Zahvala onima koji su prepoznali važnost ove edukacije i podržali me u istoj!



Realizacija!

- 54 profesora iz 31 zemlje

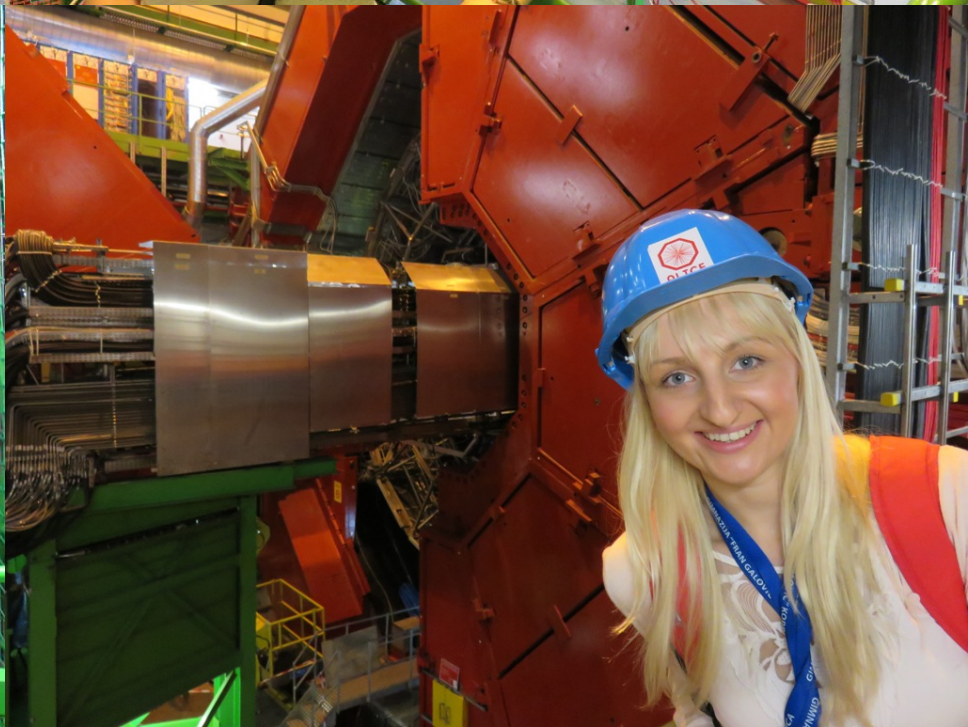


Program!

- 35 sati predavanja
- 10 sati interaktivne komunikacije u obliku pitanja i odgovora
- 15 sati posjeta eksperimentima
- 10 sati radionica
- 25 sati istraživačkog rada u manjim grupama
- prezentacija rezultata rada u grupama

web: <https://indico.cern.ch/event/318730/other-view?view=standard>



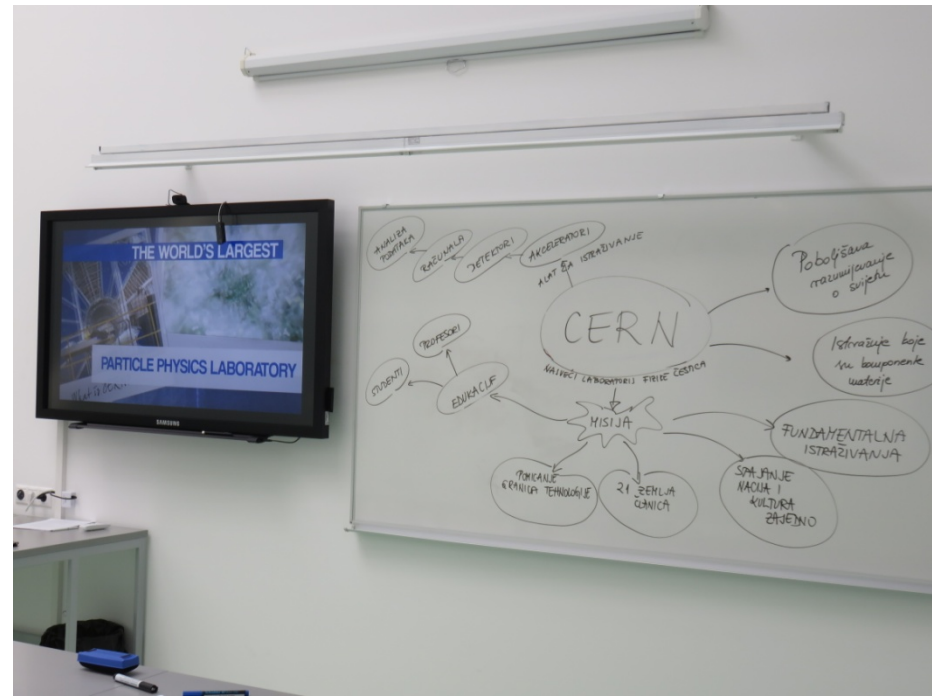
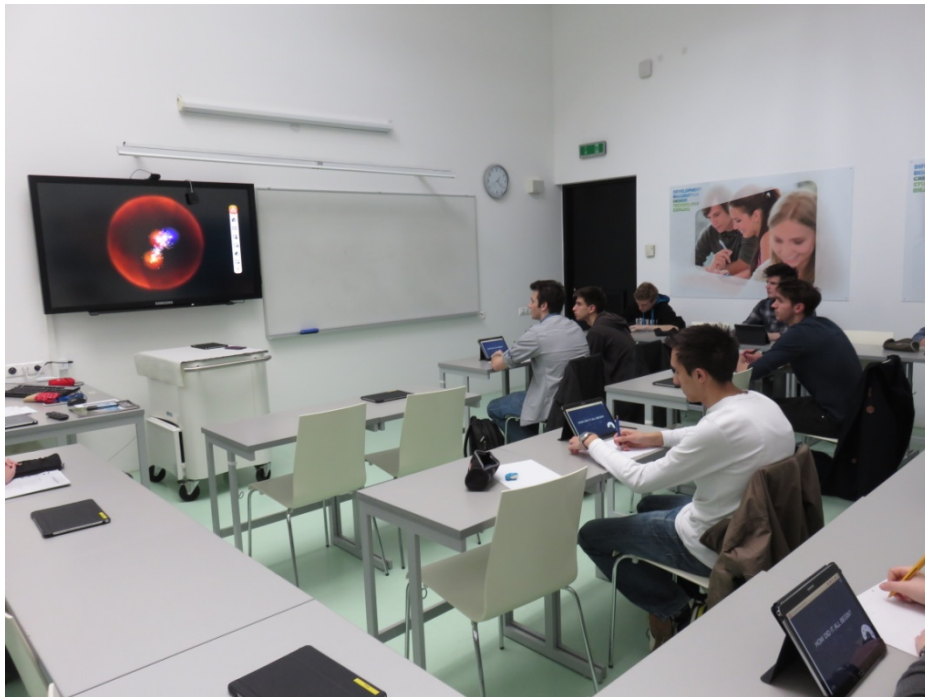




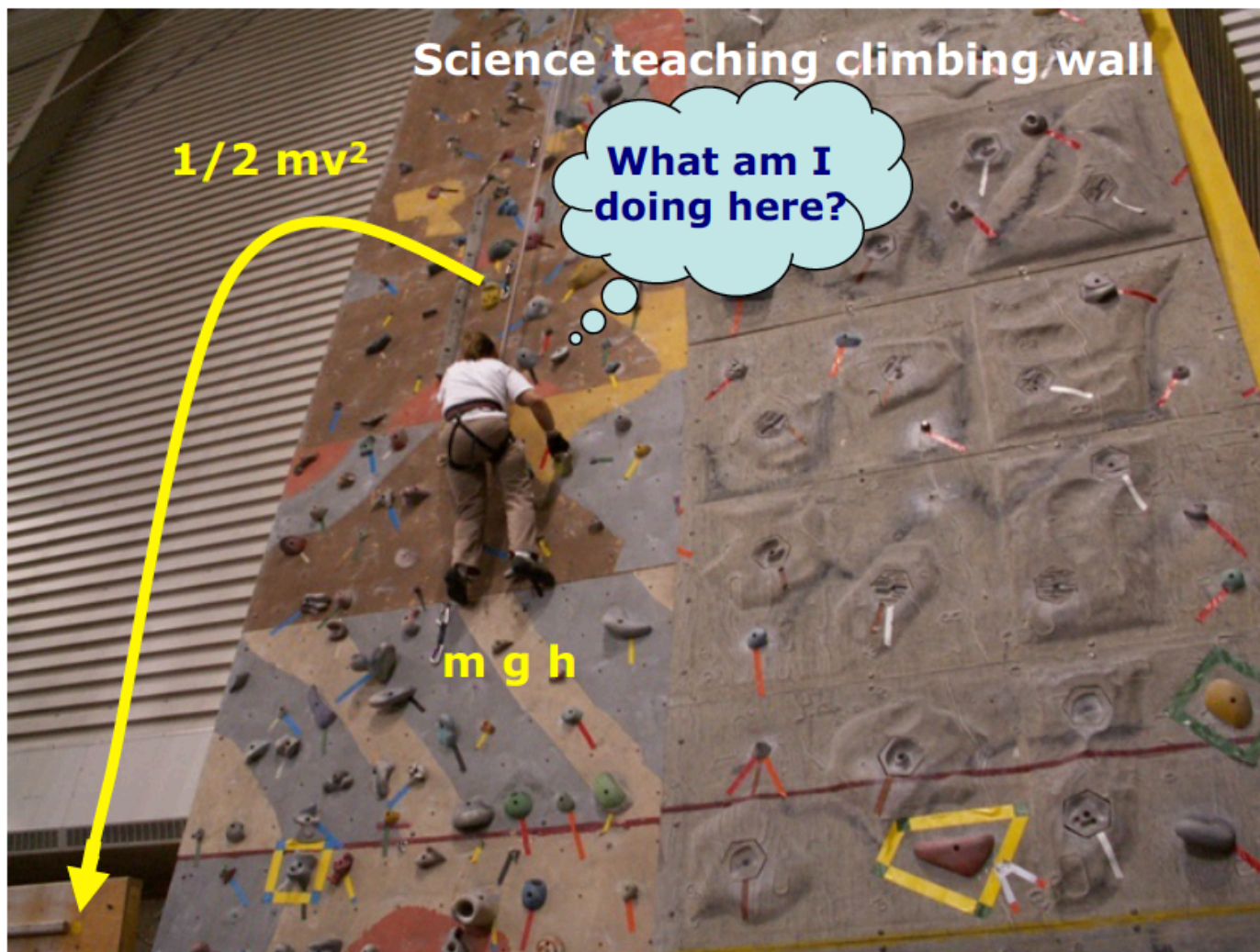
Slobodno vrijeme!



Što nakon edukacije?



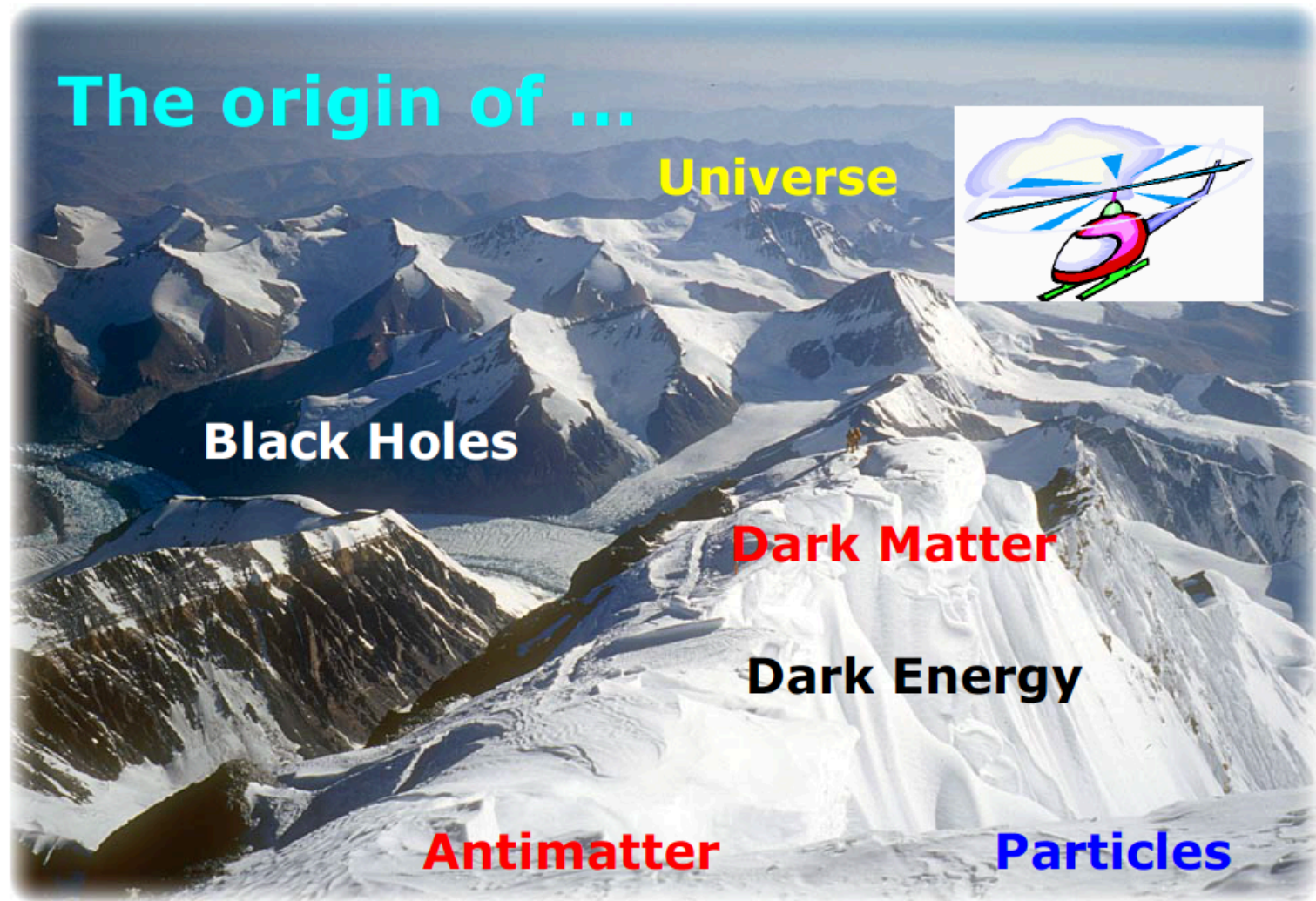
Učenicima znanost možda izgleda ovako!



Ali zapravo izgleda ovako!



Samo je potrebno sve staviti na svoje mjesto!



Za to je potreban tim!



Pozdrav iz CERN-a!



Zahvaljujem na pozornosti!