

# ***Outreach Activities*** ***ETH Zurich***

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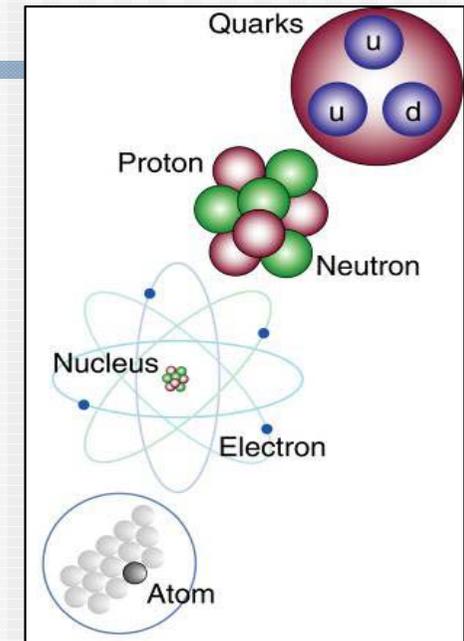
**March 9, 2011**



# How to Teach Particle Physics and use e-Tools

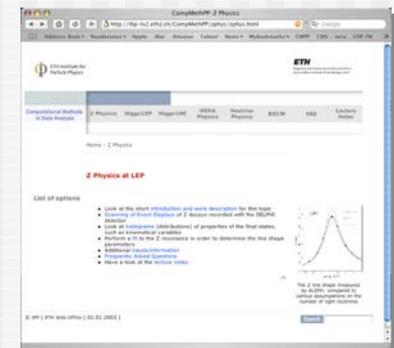
- We give lectures to High-school teachers within standard “Fachdidaktik Physik”
  - ➔ how to convey particle physics to students at the high-school level.
  - ➔ Practical examples: “close to research”; we use Lep-physics, or now also LHC.
  - ➔ let the teachers take the tools and apply them themselves in class.
  
- Note: there is now a special “ETH Förderprojekt“ **“Innovedum”** .
  - ➔ Innovedum is a fund established by the Rector to finance initiatives which explore new ways to sustainably improve teaching and learning.

[www.innovedum.ethz.ch](http://www.innovedum.ethz.ch)



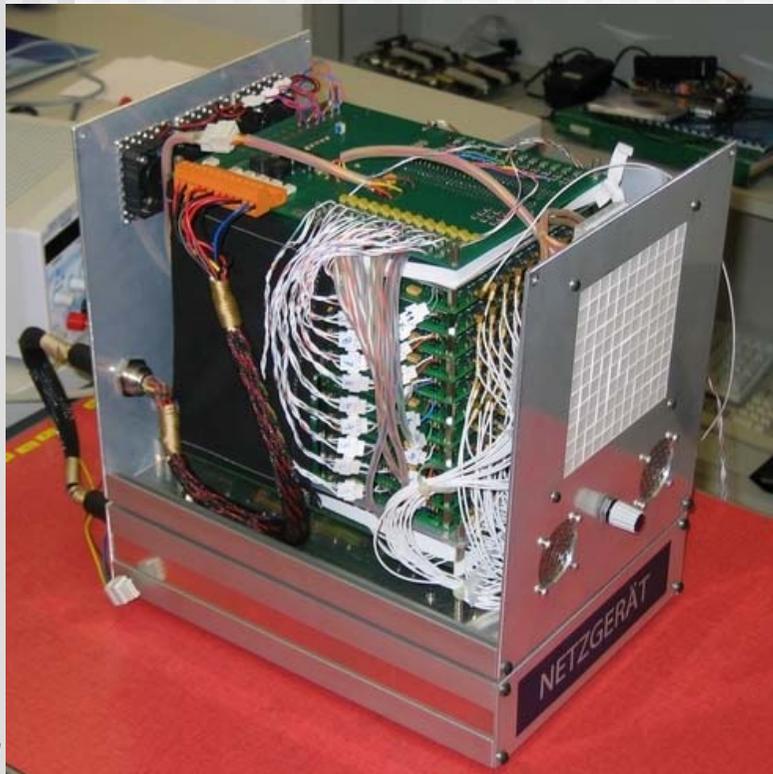
# Learning “close to research”

- Particle Physics events for high-school classes
  - Show particle physics to the students at the high-school level.
  - let them work on practical examples: “close to research”; using Lep-physics (similar to MC, see below)
- We visit the high-schools
  - established contacts through personal contacts
  - through the official ETH table of offers “list of outreach activities” for interested high-schools, and other groups.



# ETH unterwegs

- We visit high-schools (~10 per year) for typically 2-3 days.
  - We have a “Physics stand”: presently dominated by particle physics
  - we use cosmic ray detector to show cosmic muons live.
  - and have animations and explanations for students.



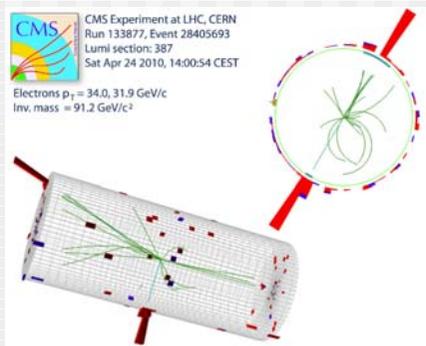
CORACU  
cut open



we use 11x11 scintillators  
with APD mounted on face

# ETH unterwegs

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  - have animations and explanations for students
- Several actions happen:
  - Action day with exhibits, stands and special actions;
  - **Topical talks** for special classes (Schwerpunktsfach ..), talks for the public (not just students)
  - Podium-discussions ....

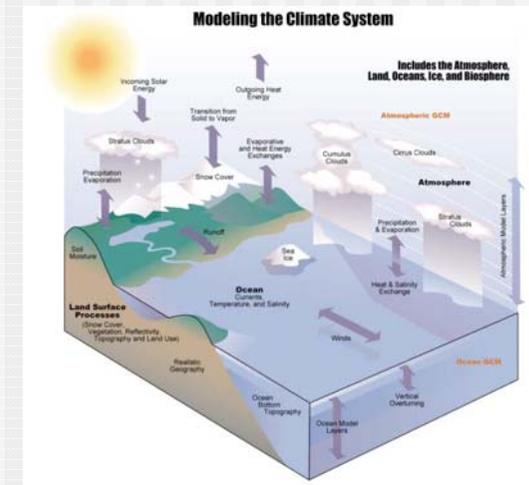
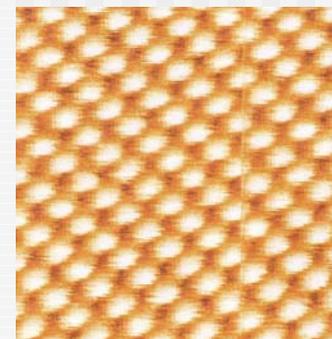


Die <b>Welt der Elementarteilchen</b> und das <b>LHC Projekt</b>	
	Christoph Grab ETH Zürich
ETH <b>Unterwegs</b> 2010 / 2011	

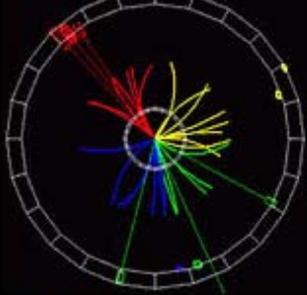
# Studienwoche for High-School students

High-school students visit ETH for one week to do "Physics". Topics are

- **Nuclear/particle physics:** mass spectroscopy (in collaboration with the ion-physics lab) → carbon-14 dating of materials they bring themselves
- **Astrophysics/Astronomie:** observations of planets, sun...
- **Physics of Climate:** Modeling the climate system and visualise effects of input variations.
- **Electron-microscopy** of materials: crystals, CD-surfaces etc...



# Participation in EPPOG Masterclasses



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**Einstein in the 21st Century**

**Hands on Particle Physics**  
International Masterclasses for High School Students

 **EPPOG Masterclasses**  
5<sup>th</sup> International Particle Physics Masterclasses 2009

**Discover the world of Quarks and Leptons with real data**

- What are the fundamental building blocks of matter?
- How can I identify them?
- Which forces hold them together?
- How do these forces work?
- How far have the secrets of forces and matter been understood so far?

Each year about 5000 high school students in 22 countries come to one of about

- 2010: some 25 students
- 2011: some ~40 students