



CERN Students Summer School 2005



Welcome to the 2005
Summer Students

You are ~150 students
from 28 different
countries

Summer Student's team

- Ingrid Schmid
- Laura Silbernagel
- Monica Pepe-Altarelli
- Catherine Jones
- Francesco Ruggiero
- Andreas Schopper
- Jurgen Knobloch
- Mike Seymour
- Fabio Cerutti

CERN: World's largest Particle Physics lab

- Founded in 1954 to consolidate and develop the European science
- Today CERN includes 20 permanent countries-members and as observers: Japan, Russian federation, USA, Turkey, Israel, EU and UNESCO



The advantages of being CERN's user

- ☺ Put in common facilities and tools: Possibility to realize challenging experiments at the frontier of technology and fundamental science
- ☺ Profit from the large community of theorists, experimentalists, accelerator experts
- ☺ Work in a scientific environment dedicated to fundamental science, also giving birth to very important applications (... Like the www)
- ☺ It goes beyond nations, enhancing the human brotherhood

Science highlights at CERN

- Discovery of Neutral Currents 1972
- Discovery of W and Z bosons 1983
- Search and measurement (1988-2001) of the Direct component of CP Violation
- Measurement of the number of light neutrino families (LEP, 1991)
- Prediction of the top-quark mass (LEP)
- Precision test of SM theory and constraints on the Higgs boson mass (LEP 1991-2000)
- Evidence for the quark-gluon plasma (Heavy Ions)
- Creation of anti-Hydrogen in the Lab (2002)

Famous *faces* at CERN

Carlo Rubbia and Simon Van Der Meer
Nobel Price 1984



John Bell
Quantum Physics

Georges Charpak
Nobel Price 1992



Andre Lagarrigue
Neutral Currents



Tim Berners-Lee
The WWW



Jack Steinberger
Nobel Price 1988



Samuel Ting
Nobel Price 1976



July 6th 2005

Fabio Cerutti

Being @ CERN in Summer 2005: Very *hectic and exciting period*

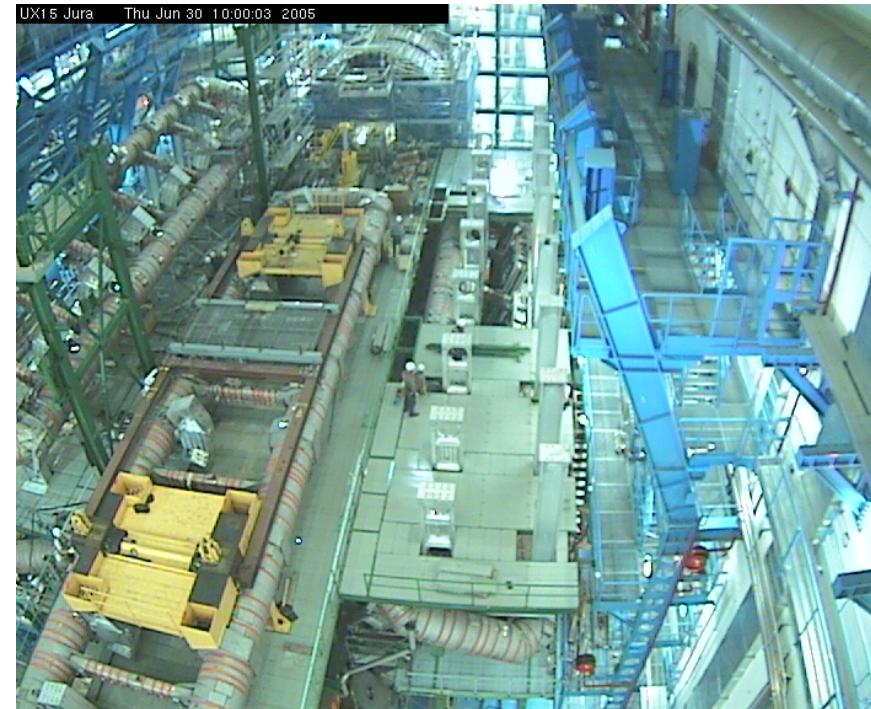
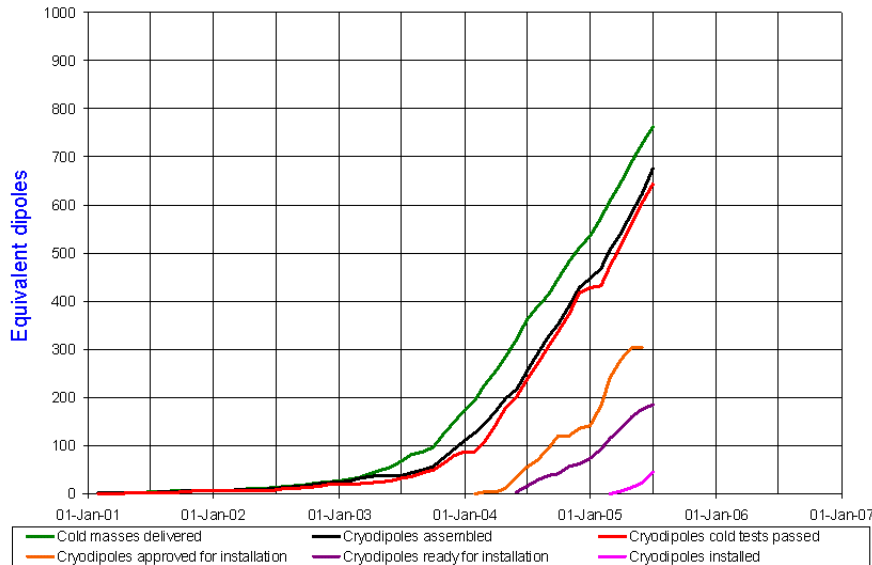
LHC Accelerator and detectors installation is on the way



LHC Progress Dashboard



Cryodipole overview



Updated 30 Jun 2005

Data provided by D. Tommasini AT-MAS, L. Bottura AT-MEL

July 6th 2005

Fabio Cerutti

The CERN Students Summer School

Old tradition: First school held in 1969

It is meant to allow you discover the world of research on elementary forces

Through

 A series of lectures on theoretical and experimental physics

 An individual work within a CERN group

Key point:

Get in contact with the world of research and with the fundamental questions related to it

and especially

Discuss directly with the people involved in it understand their motivations and way of thinking and of working

Topics and professors

Topics : all current items of research in Particle Physics, astrophysics and cosmology at **CERN** and **around the world**

The lecturers are chosen among the **main actors** of each field at CERN and around the World Also on their **pedagogical skills**

The 2005 School program

Introductory lectures:

Introduction to CERN: 2h

Introduction to Particle Physics: 4h

Introduction to Nuclear Physics: 3h

Introduction to Cosmology: 5h

Experimental Particle Physics:

How an experiment is designed: 2h

Accelerator physics: 5h

Detectors: 5h

Physics at Hadronic colliders: 4h

Neutrino Physics: 4h

CP violation: 4h

The 2005 School program

Experimental Physics:

Astroparticle Physics: 3h

Antimatter in the LAB: 2h

Heavy Ions Physics: 3h

Theory:

Fundamental concepts in particle physics: 6h

The Standard Model: 8h

Beyond the Standard Model: 4h

The 2005 School program

Other relevant fields in particle physics research:

Introduction to Statistics: 3h

Introduction to electronics: 3h

Data Acquisition systems: 2h

From raw data to physics results: 2h

Special Seminars:

Isolde Facility

Radiation Protection

Root

Superconducting magnets

The Higgs "saga" at LEP

The GRID

The ILC story

String Theory

The CLIC concept

The 2005 School *program*

Discussion session: every day ~1/2h at the end of the session

Workshops: See Olav Ullaland's presentation

Students Sessions ~6h 9-10 of August

..... some guided visits

... And a Welcome drink today ~16:30



The Summer Student Program is considered a crucial activity by CERN: **your feedback is important to constantly improve the quality/content of the lectures !!!!**

*Suggestions for your **summer** at CERN*



Profit from lectures, seminars, workshops and discussions



Meet your colleagues



Enjoy the region



ASK QUESTIONS and be interactive



Get involved in a "real" experimental work



Discuss with physicists

for admin. problems

Ingrid, Catherine, Laura

for problems/info on lecture(r)s

Fabio: fabio.cerutti@cern.ch

Summer Students' web page @:

<http://humanresources.web.cern.ch/HumanResources/external/recruitment/Summies/default.asp>