

TRANS EUROPE INITIATIVE

Ludwik Dobrzynski

Laboratoire Leprince Ringuet - Ecole polytechnique - CNRS - IN2P3

Prague - Saint Charles University - July 21st 2008

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Definition



IN2P3/CNRS presentation

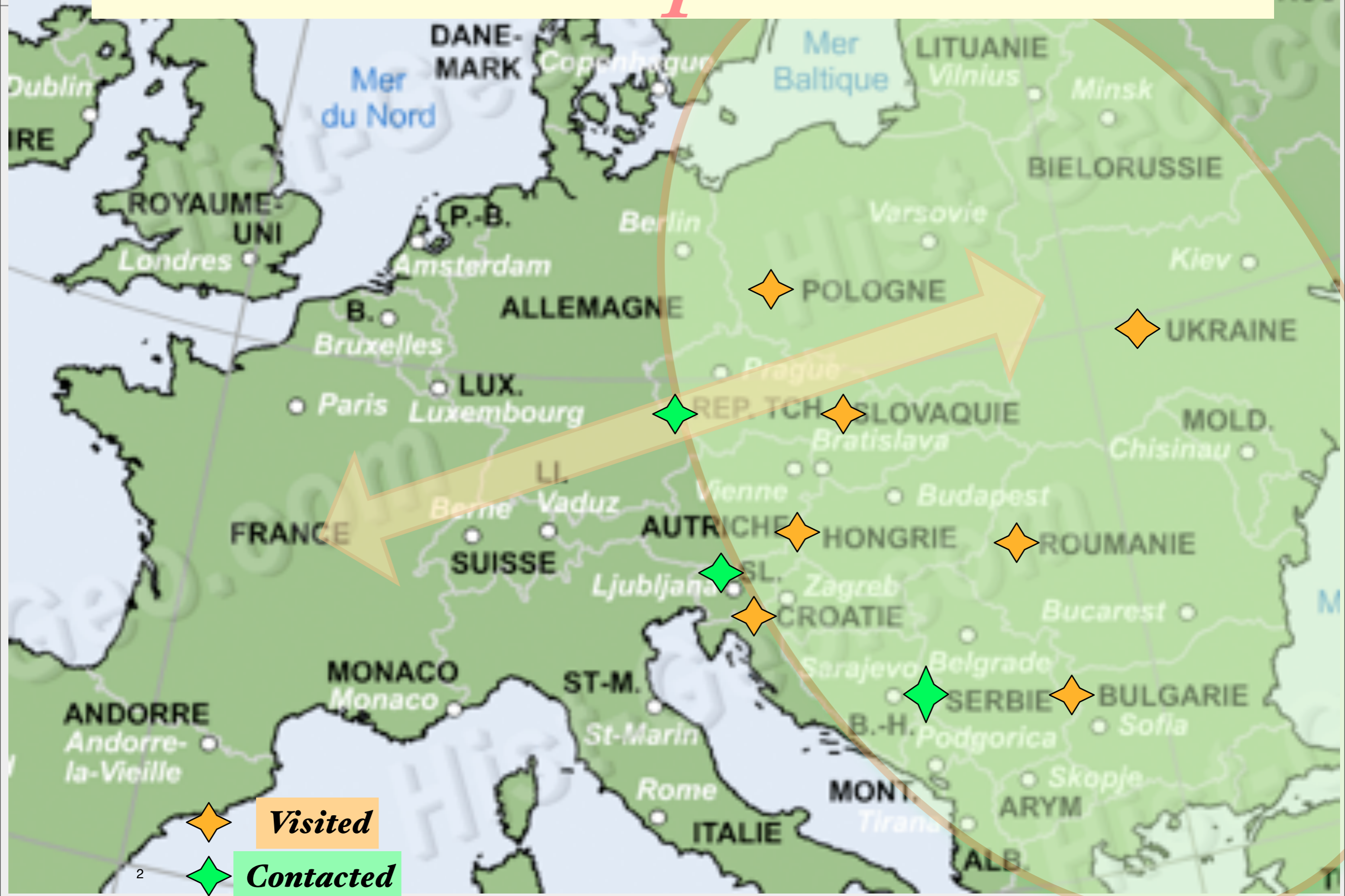


TEI actions



Conclusions

Trans Europe Initiative



The Initiative

The next step is to coordinate the formation and research activities between CNRS/IN2P3 and Central Europe countries. For that purpose CNRS/IN2P3 is setting up a "Trans Europe Initiative" (TEI) which will explore the possibilities of cooperation agreements in HEP between CNRS/IN2P3 and the different countries from Central Europe.

Each country will be visited to evaluate the cooperation possibilities, in close cooperation, when it applies, with the Office of European affairs (CNRS/DAE), the Office of International Relations (CNRS/DRI), and the scientific and the French embassy.

The mission to coordinate the TEI is given to Ludwik DOBRZYNSKI who will form a group of CNRS/IN2P3 scientists, with at least one representative for each of the country to be considered. The group, under his leadership and the authority of the Deputy Director of CNRS/IN2P3 in charge of HEP, will explore the following two domains:

Introduction to IN2P3 - CNRS

Scientific domains :

Particle physics

Hadron and nuclear physics

Astroparticules et neutrinos

Related domains :

Electronuclear cycle

Accelerator R&D

Computing GRID...

CNRS

National Center for Scientific Research

- Not only a funding agency
- Budget 2005: **2.3 B€** (including salaries)
- **26,080** permanent employees
 - **11,644** researchers
 - **14,416** engineers and technical staff
- **6** research departments (all fields)
- **2** national institutes (IN2P3, INSU)
- **1,256** research and service units (**85 %** are joint laboratories) *Strong connections with universities and other research organizations*
- **40** LIA
- **16** UMI

The largest research organization in Europe

IN2P3

National Institute for Nuclear Physics and Particle Physics

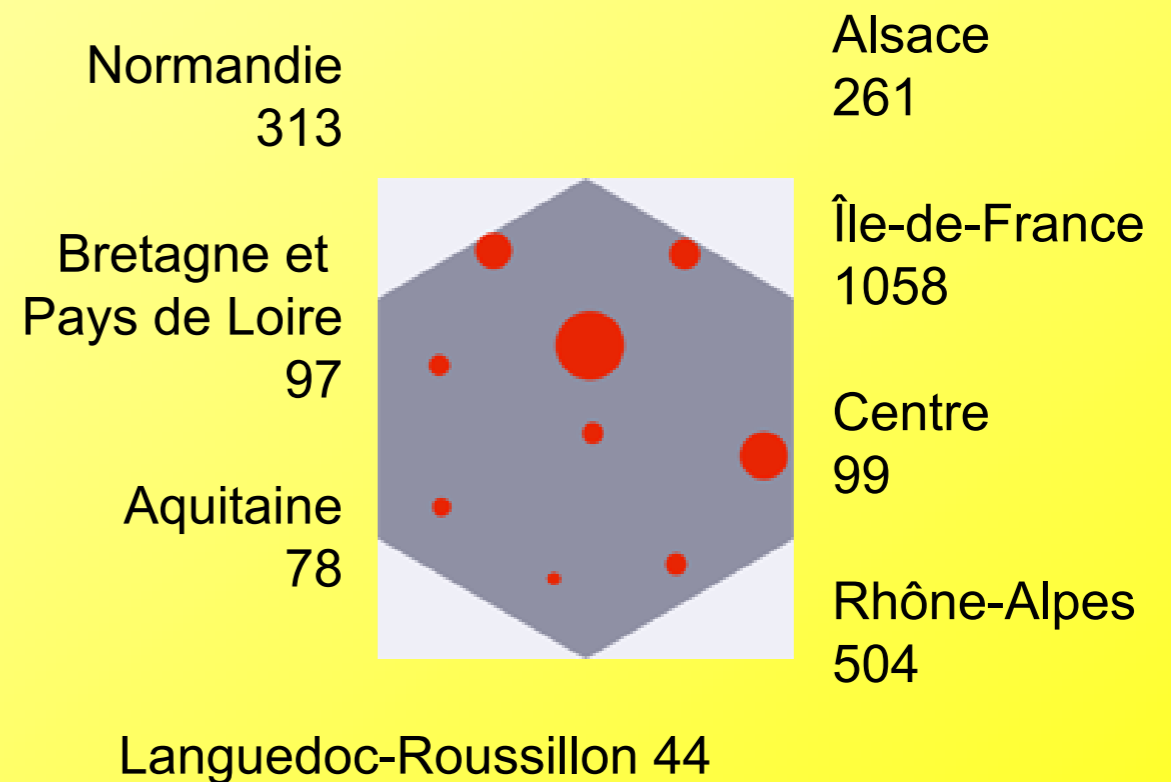
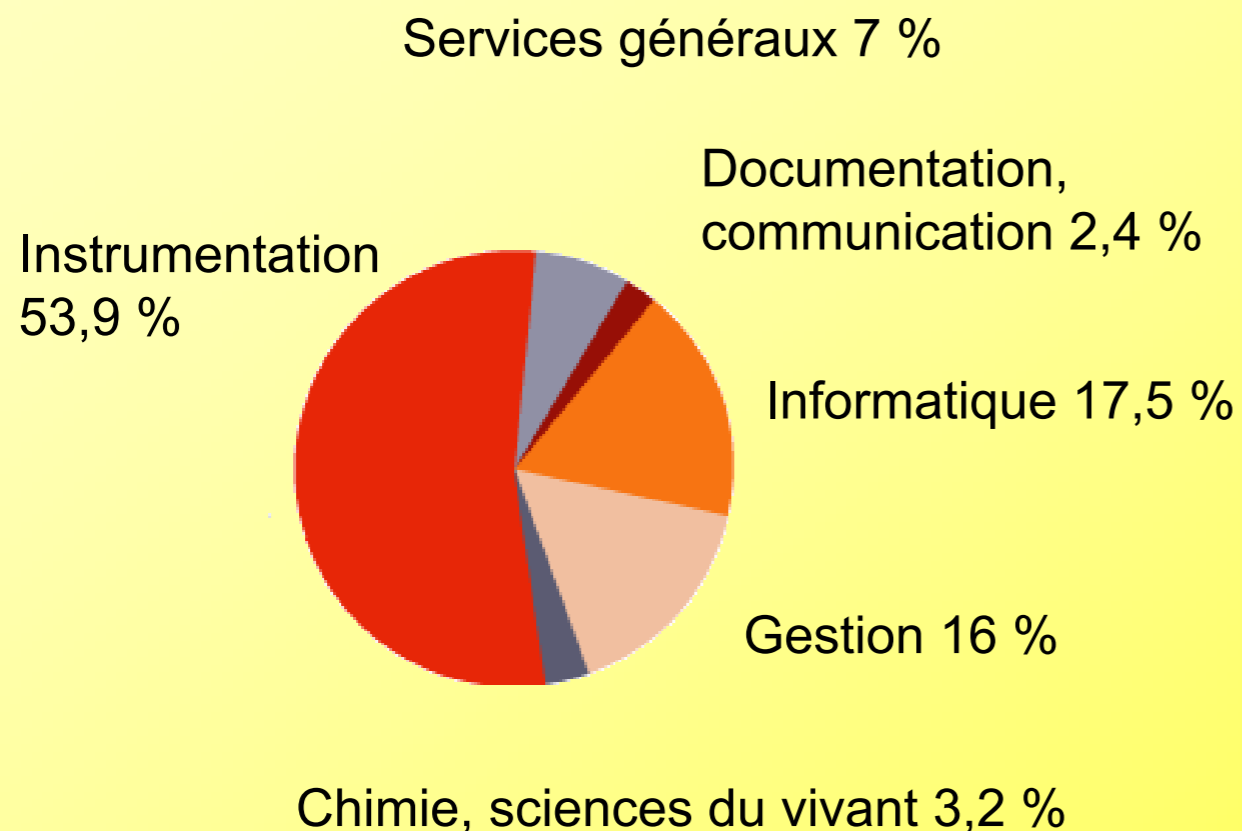
- Budget 2005: **38.7 M€** (excluding salaries)
- **2488** permanent employees
 - **795** researchers
 - **1693** engineers and technical staff
- **18** Laboratories in France
 - **7** in Paris
 - **11** In French regions *CC-IN2P3, LAPP close to CERN*
- Centers
 - Computing Center CC-IN2P3 in Lyon
 - GANIL (Ion Accelerator center)
 - Under ground lab. in Modane
 -

France: CERN Host Country, Budget 2005: **98 M€**

Engineering at IN2P3

Engineers, Technicians and Administrative employees
1550 people

20 Laboratories
2800 personnes



Organisation and actions of IN2P3

□ Key words :

- Large instruments (accelerators, huge detectors)
- Large international collaborations
- Dimension : Europe and World

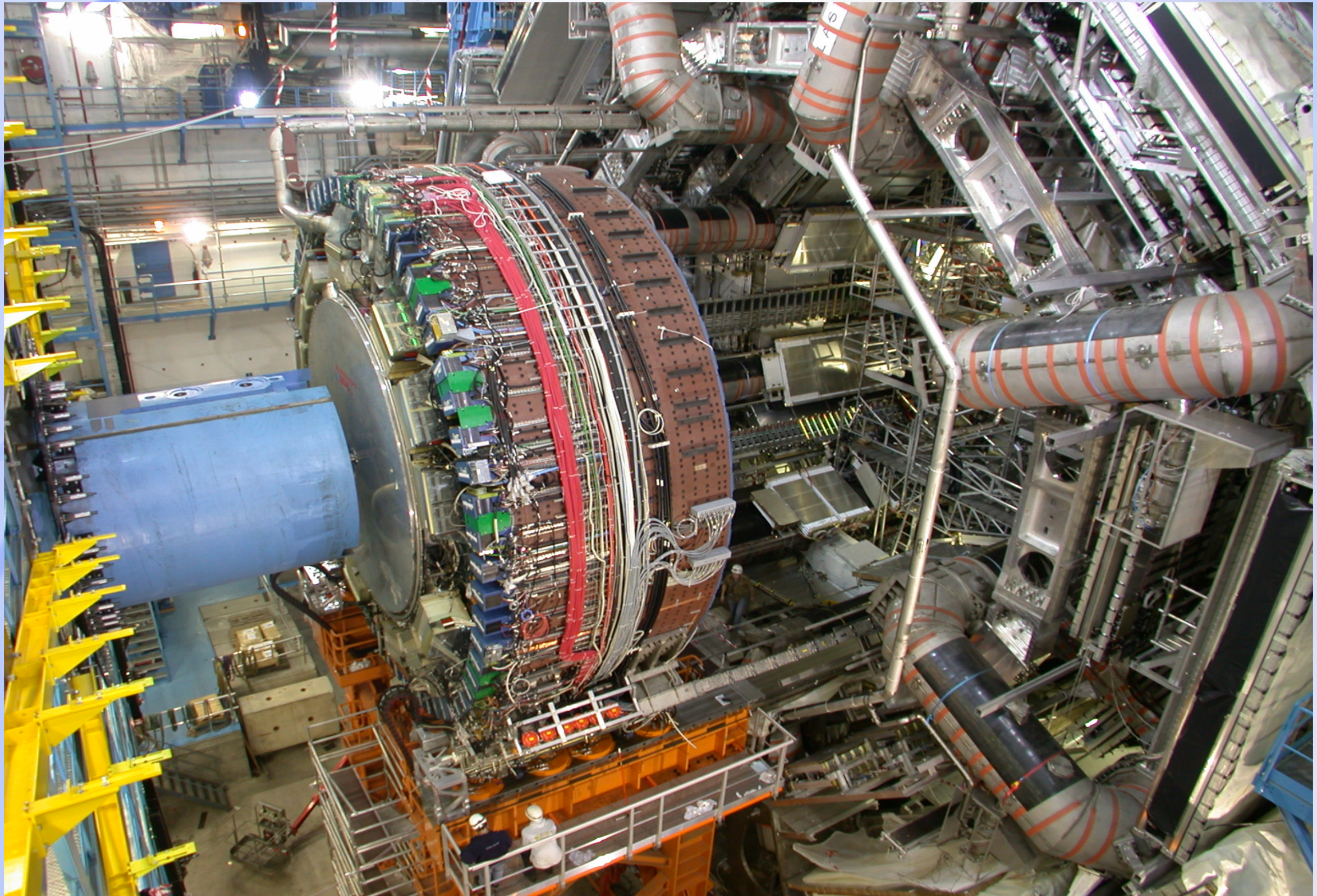
□ We work at Cern (Genève), Ganil (France), Slac (Stanford, USA), Fnal (USA) and Desy (Germany).

Main axes

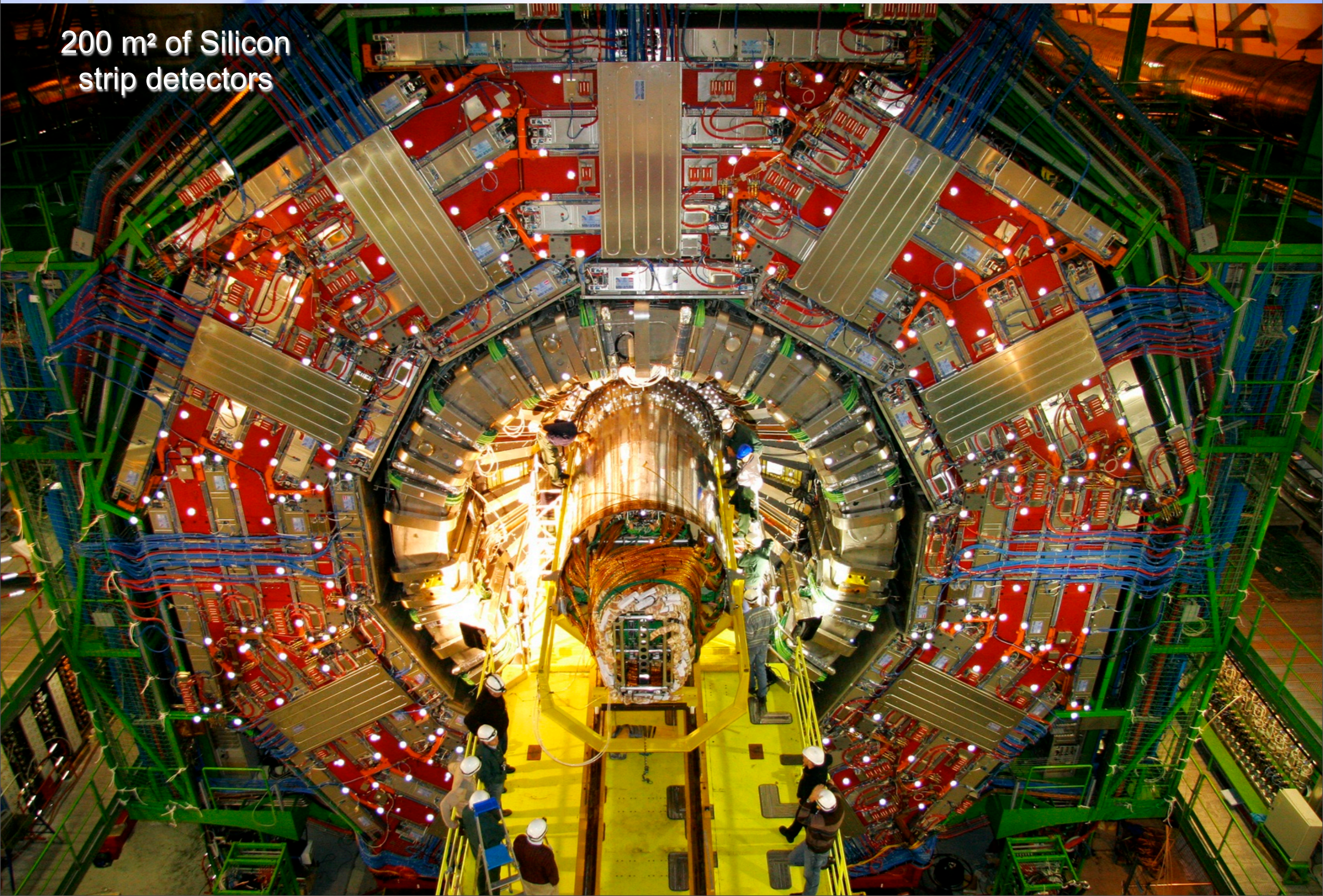
- **Quarks et Leptons**
- **Nucleus**
- **Astroparticule**
- **R&D technology :**
 - Microélectronics,
 - 3D Electronics ...
- **Towards international**
 - ❖ CERN, USA, CEI, ...
 - ❖ LIA : Japon, Chine, Corée,
 - ❖ Initiative Trans Europe :
 - Trans Europe School for High Energy Physics
 - R&D for SLHC and ILC projects
 -

Atlas

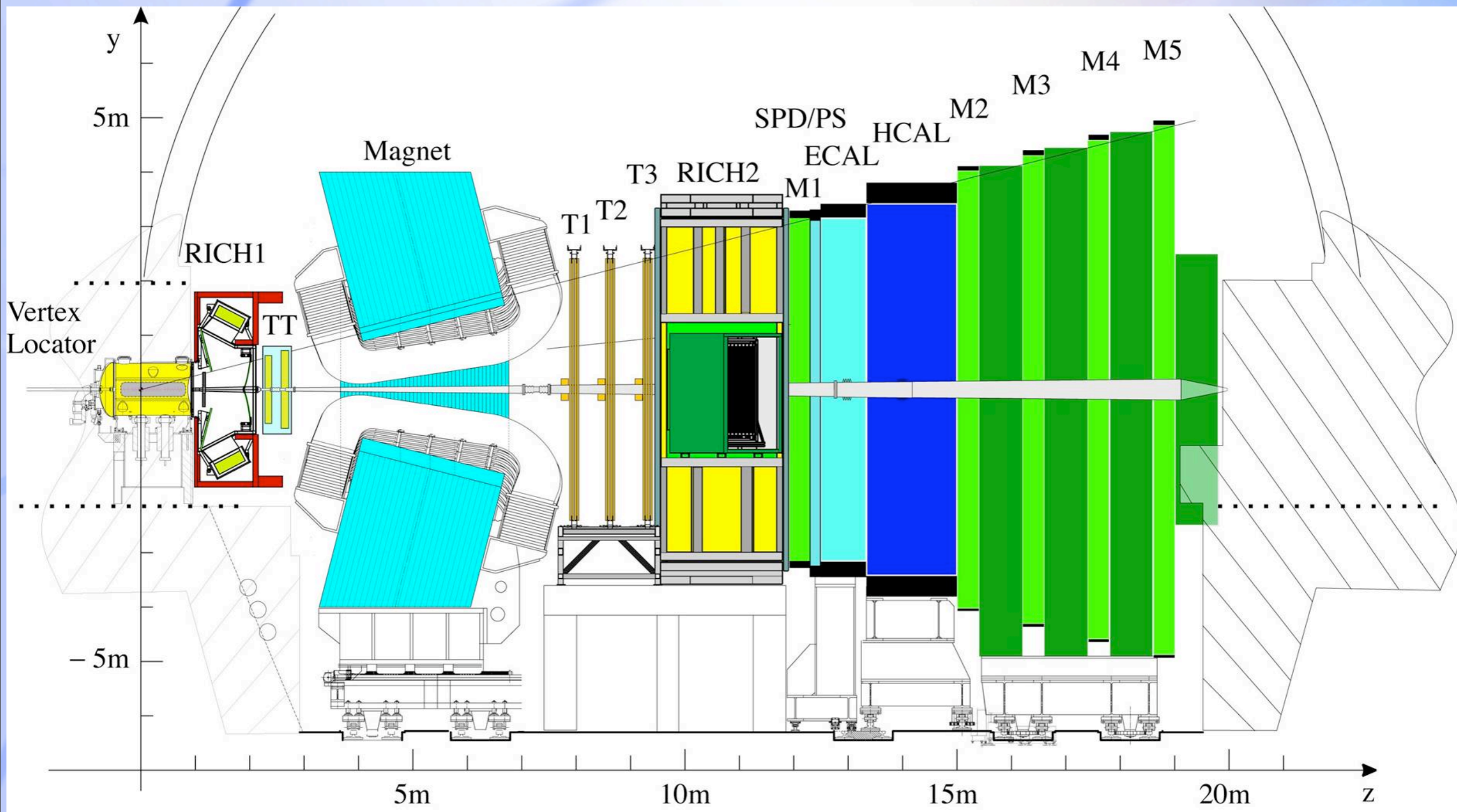
Anncy, Clermont, Grenoble, Marseille, Orsay, Paris



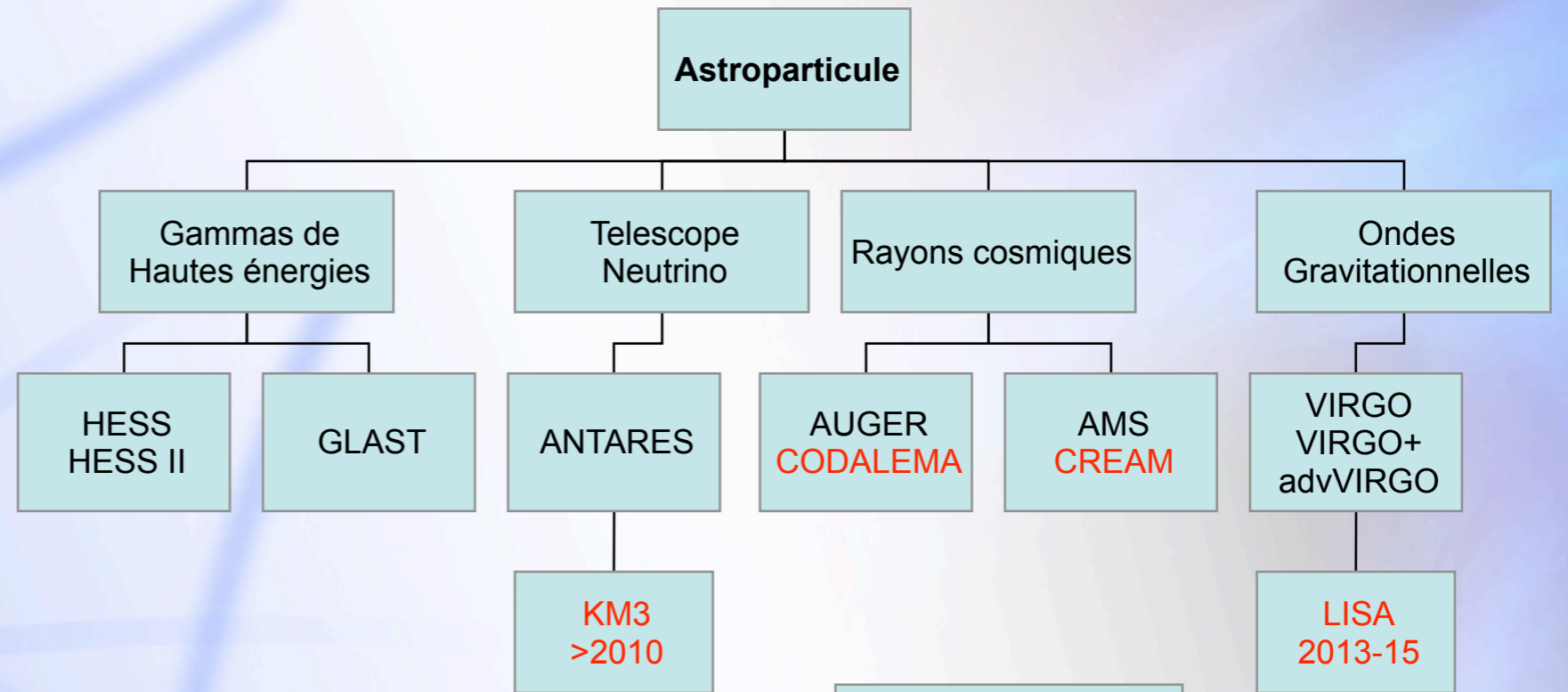
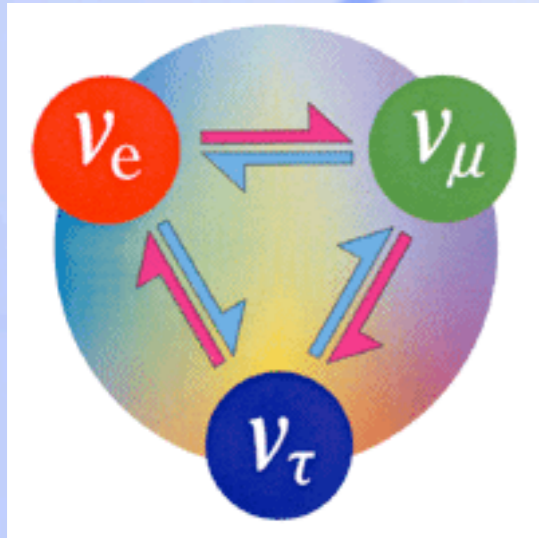
200 m² of Silicon
strip detectors



Le détecteur LHCb

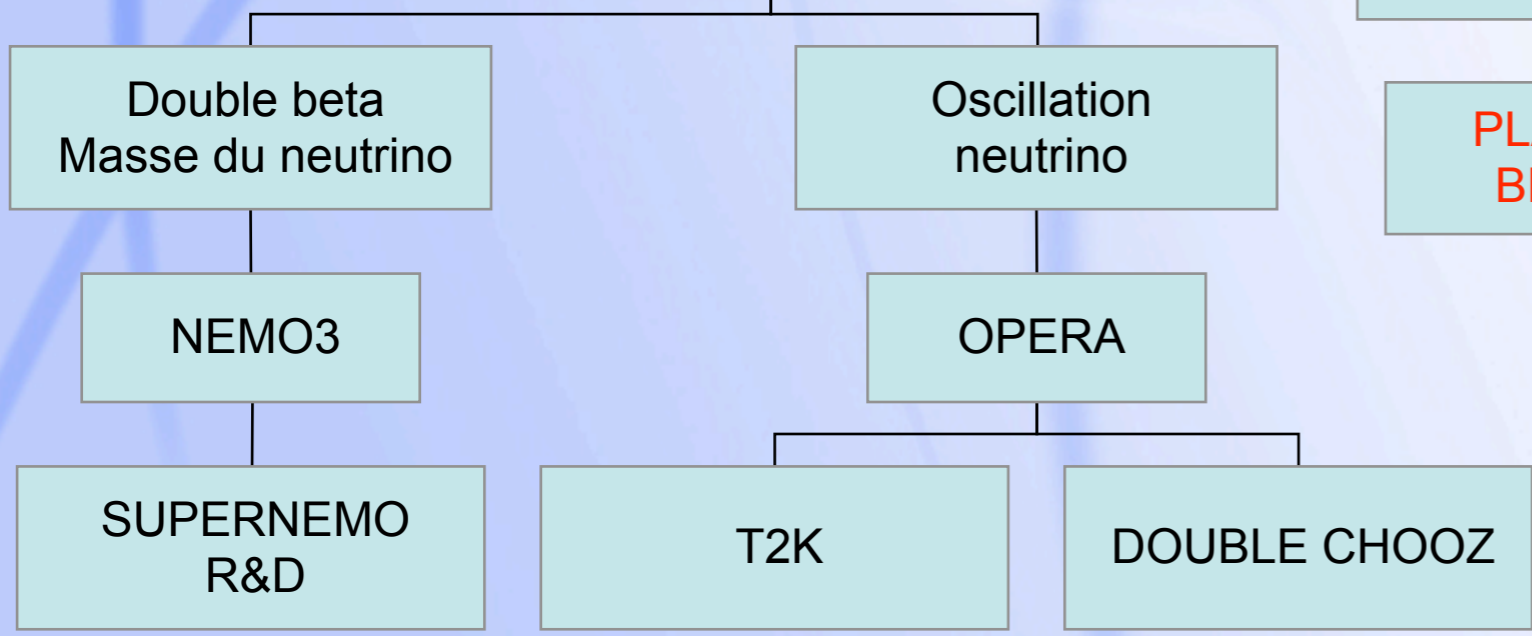
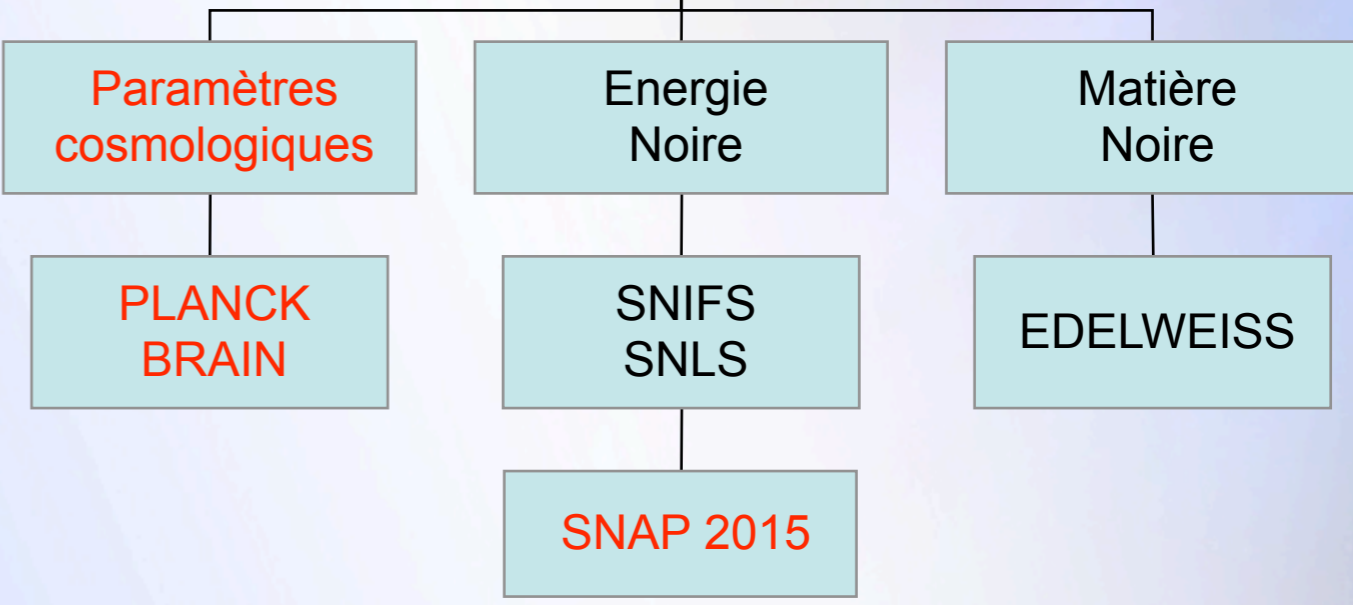


Astroparticule : Present program



Cosmologie

Neutrino

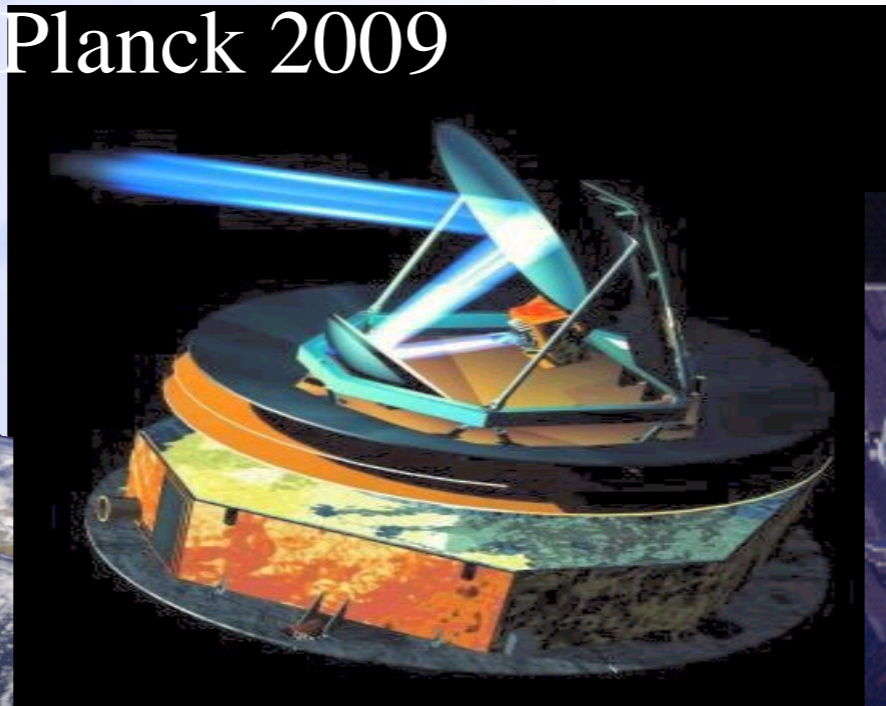


Cosmic rays and Cosmology

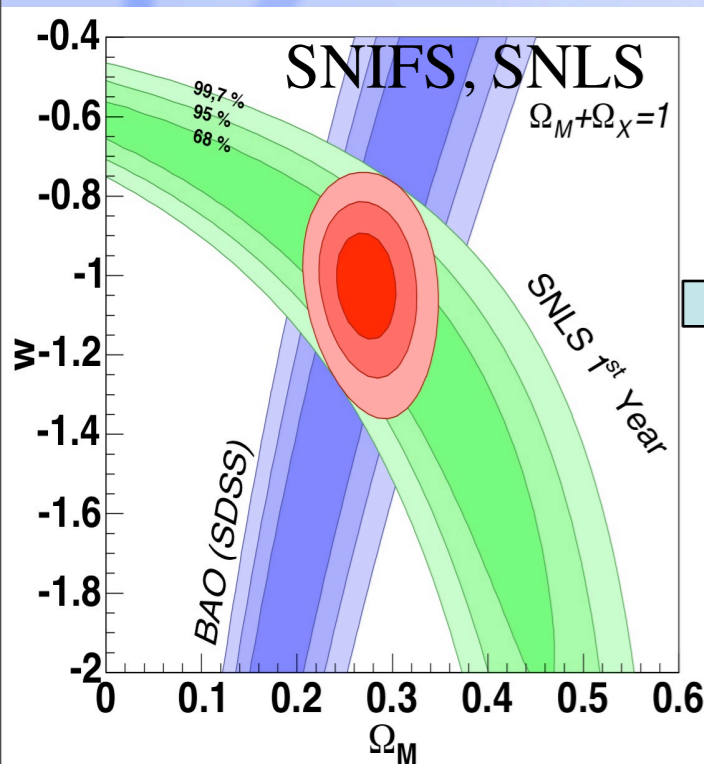
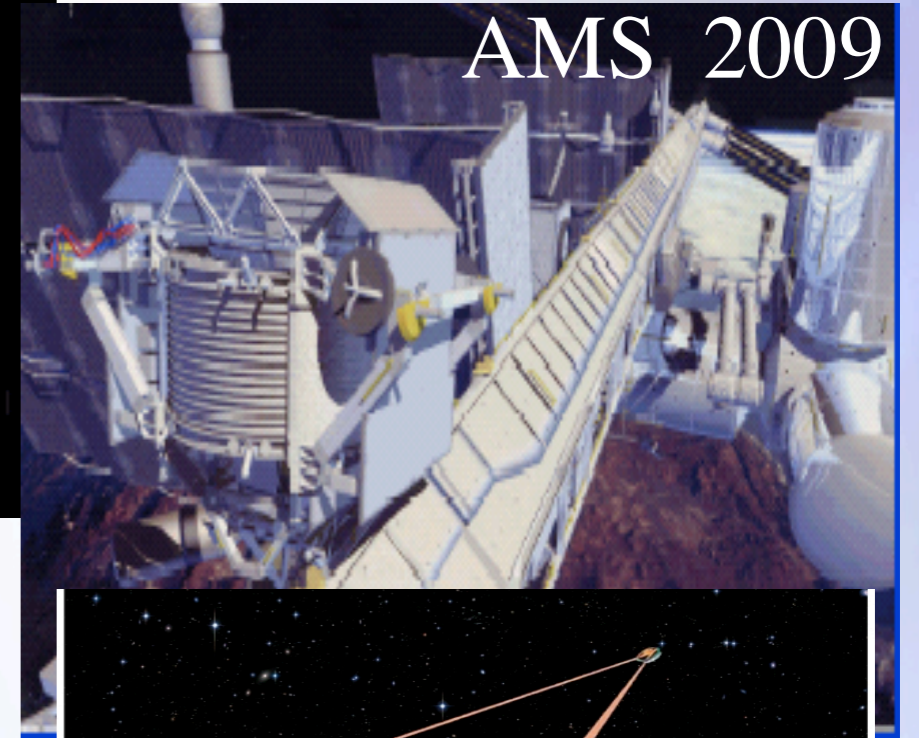
GLAST, 2008



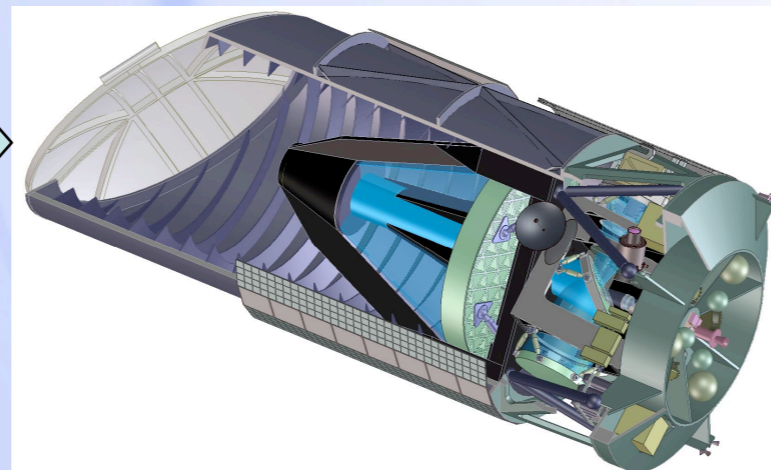
Planck 2009



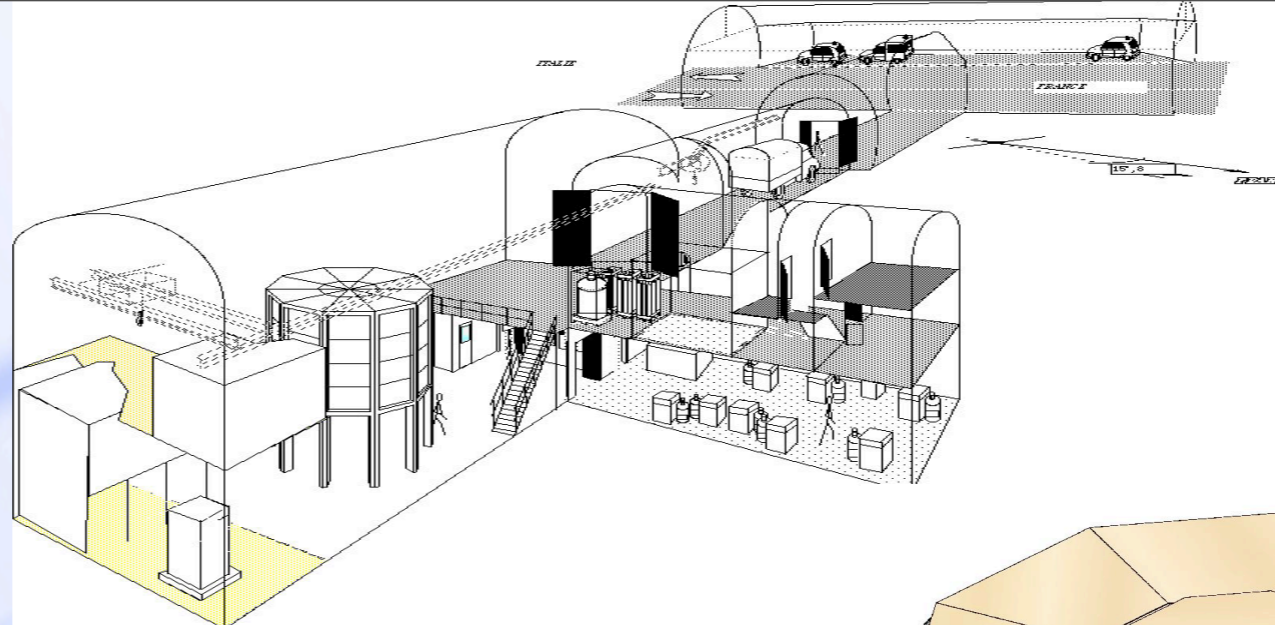
AMS 2009



SNAP/JDEM 2015

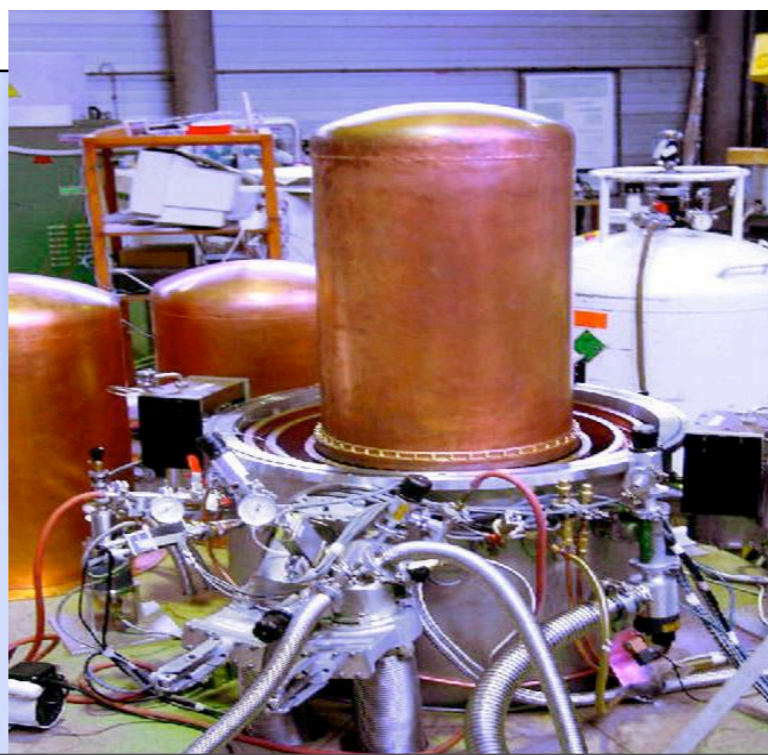
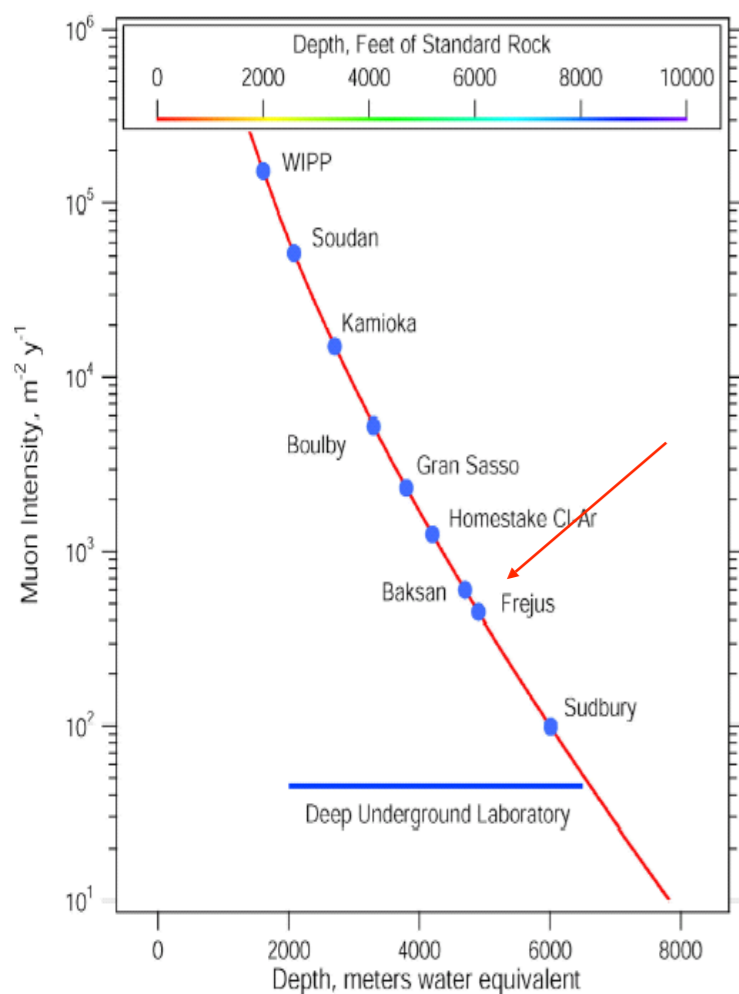
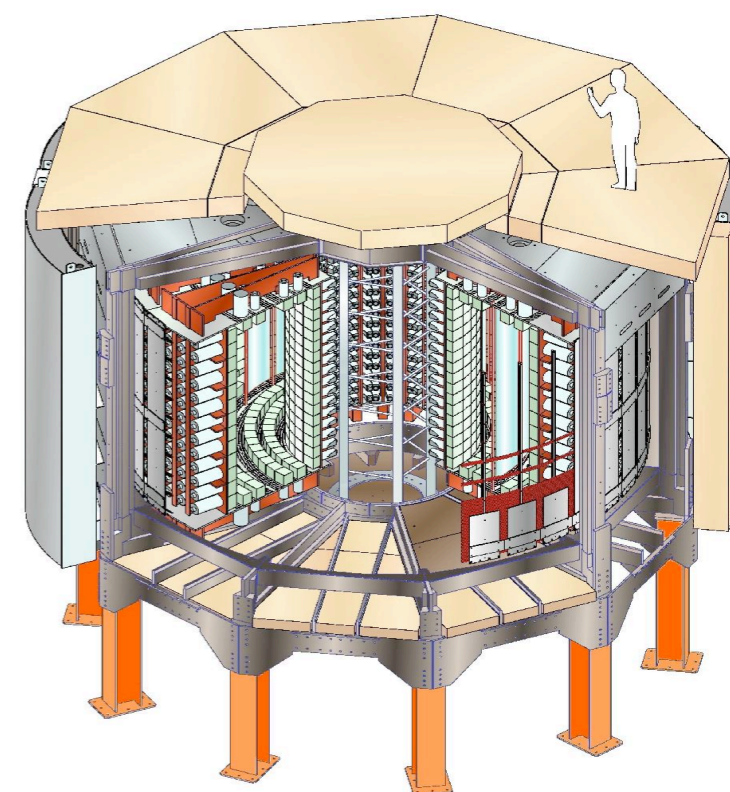


LISA 2015



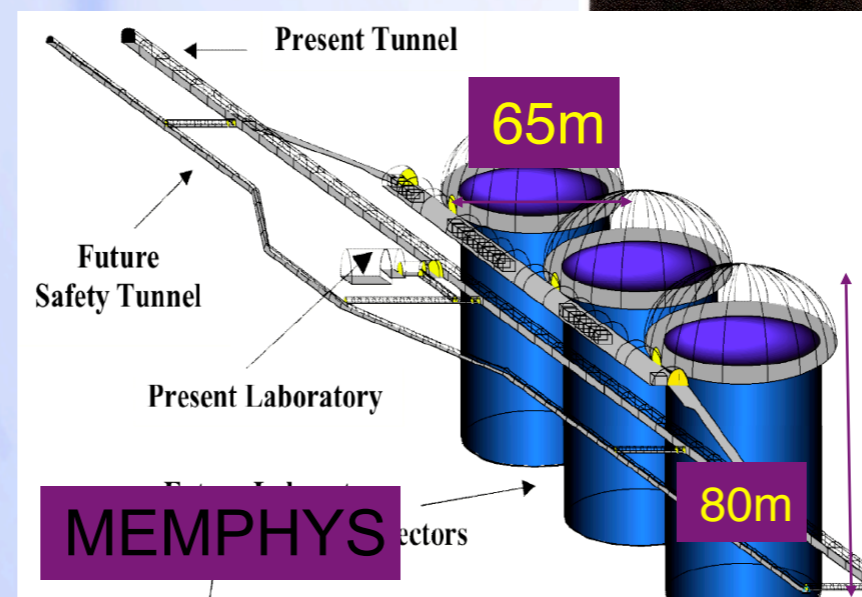
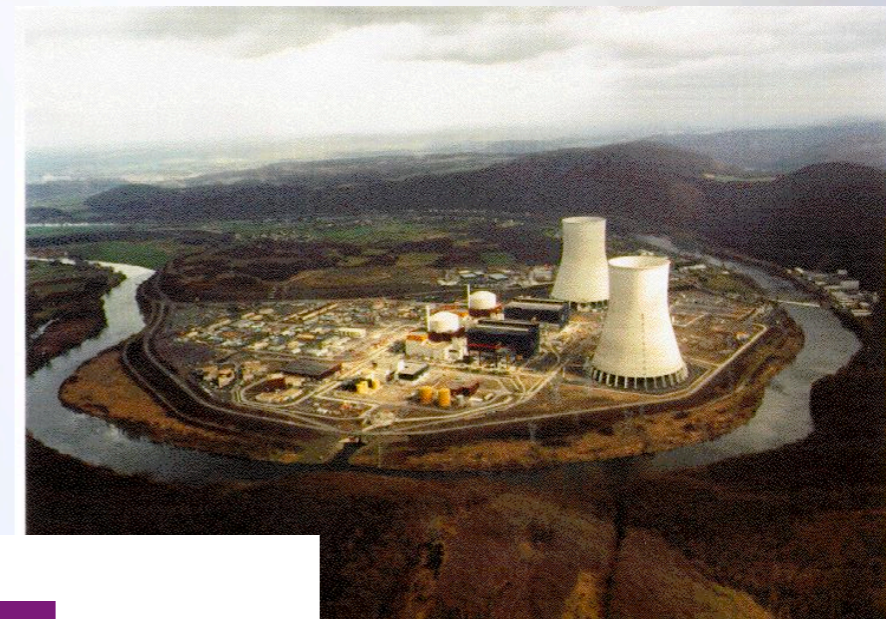
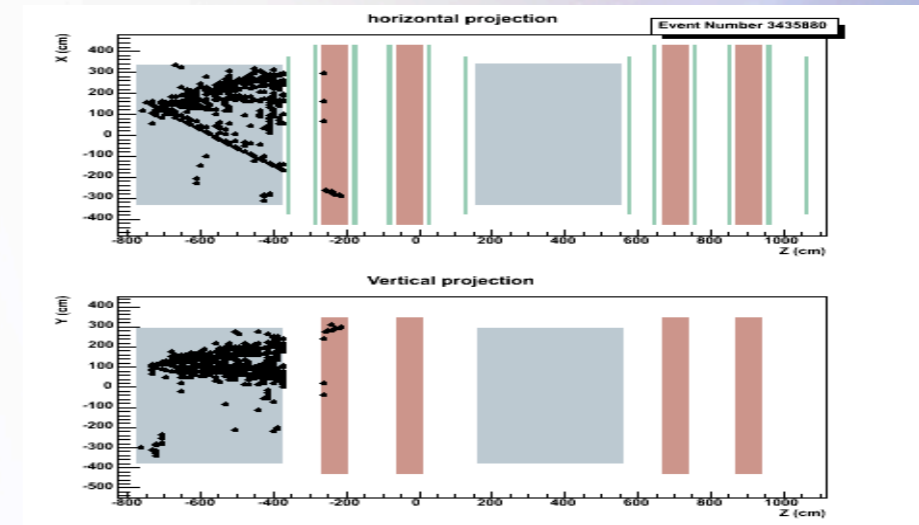
Laboratoire Souterrain de Modane, France

- NEMO3, double désintégration beta (2003-)
- EDELWEISS II, dark matter (2006)
- Faibles radioactivités (ILIAS)
- Search for SHE in nature



Neutrino physics

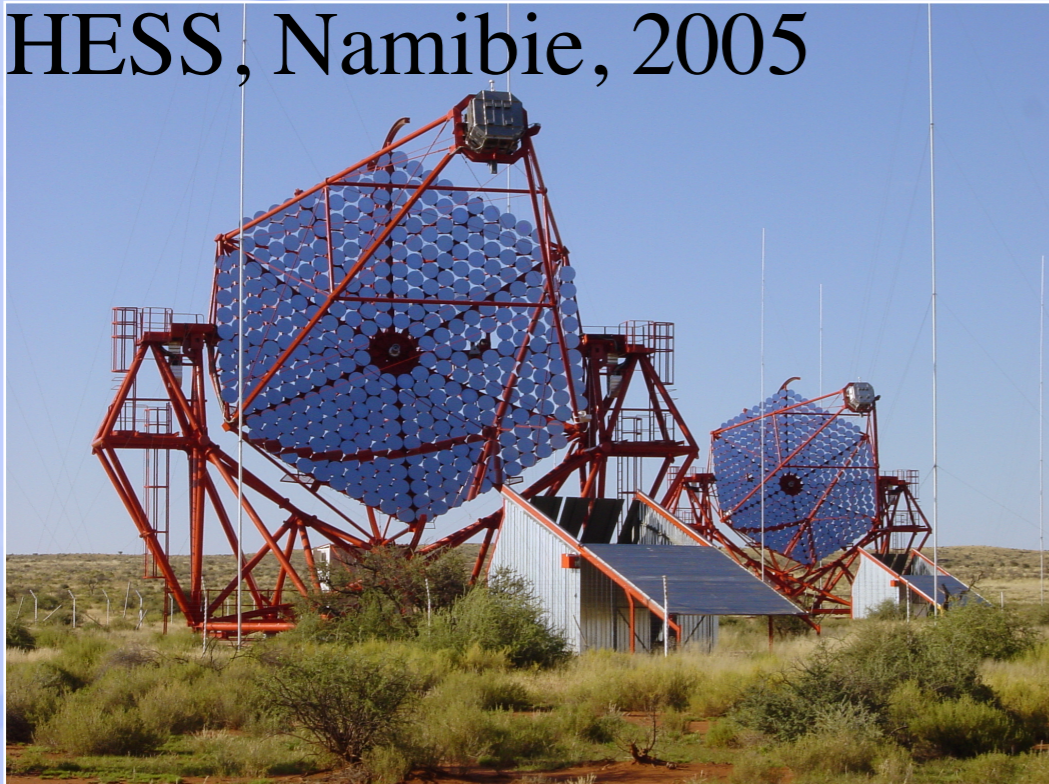
- OPERA(2006)
- Future proche:
 - DOUBLECHOOZ (2008-2009)
 - T2K (2009-2013)
- R&D SuperNEMO, désintégration double bêta (>2010)
- Horizon 2020 :
Détecteur de la classe Megatonne



Cosmic rays :

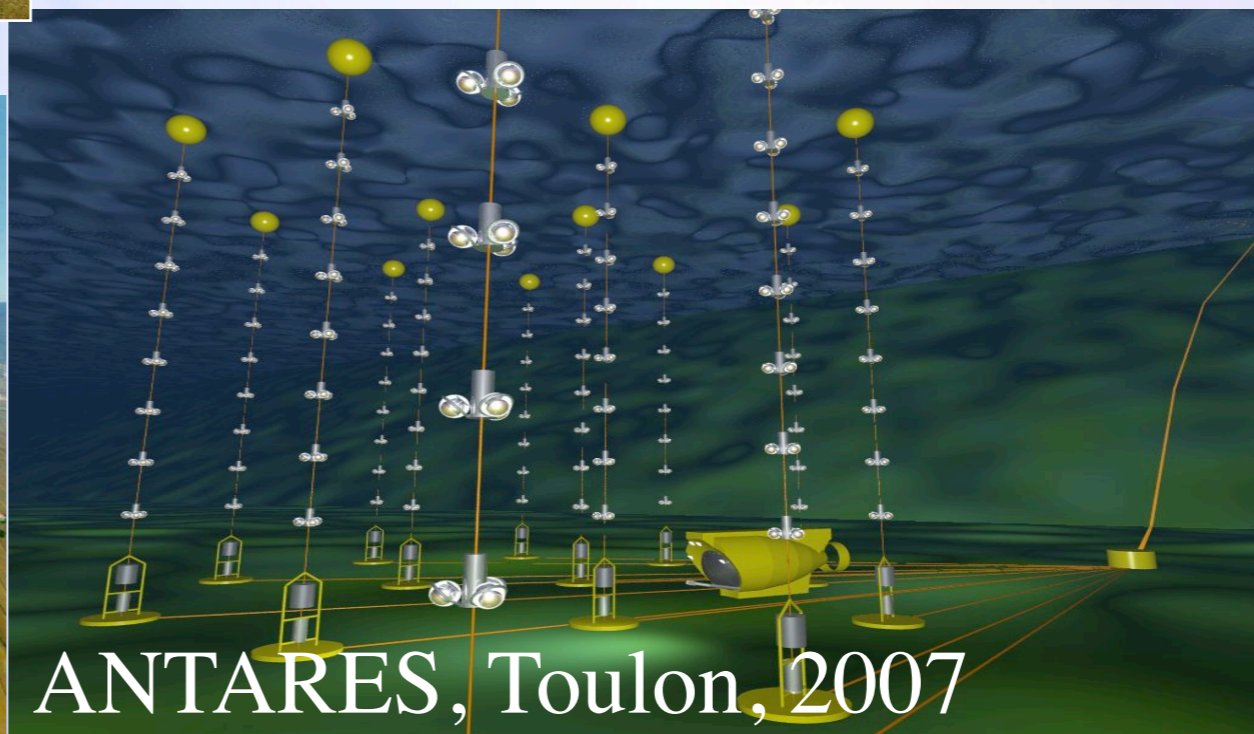
gammas et high energy cosmic's rays, ondes
gravitationel waves, neutrinos

HESS, Namibie, 2005



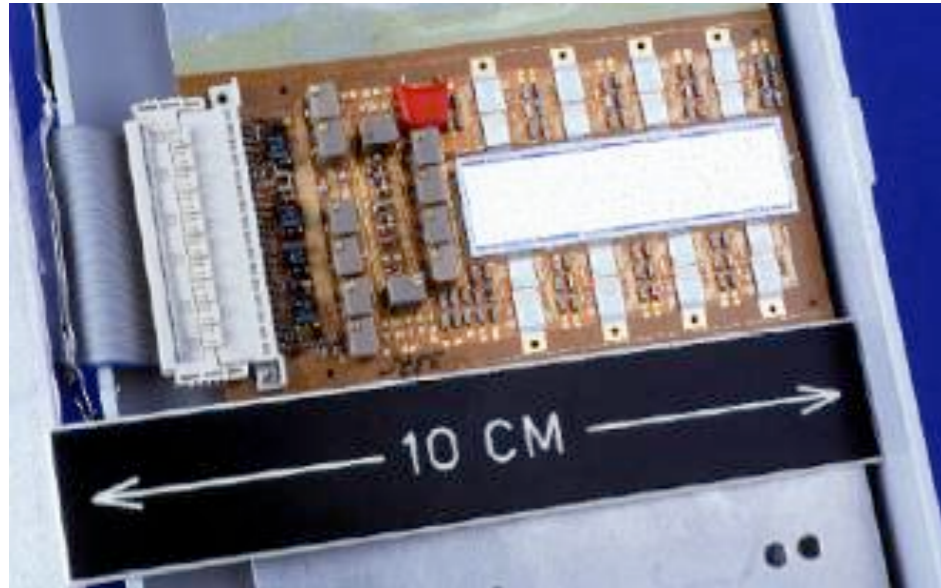
AUGER, Argentine, 2005

VIRGO, Pise, 2007

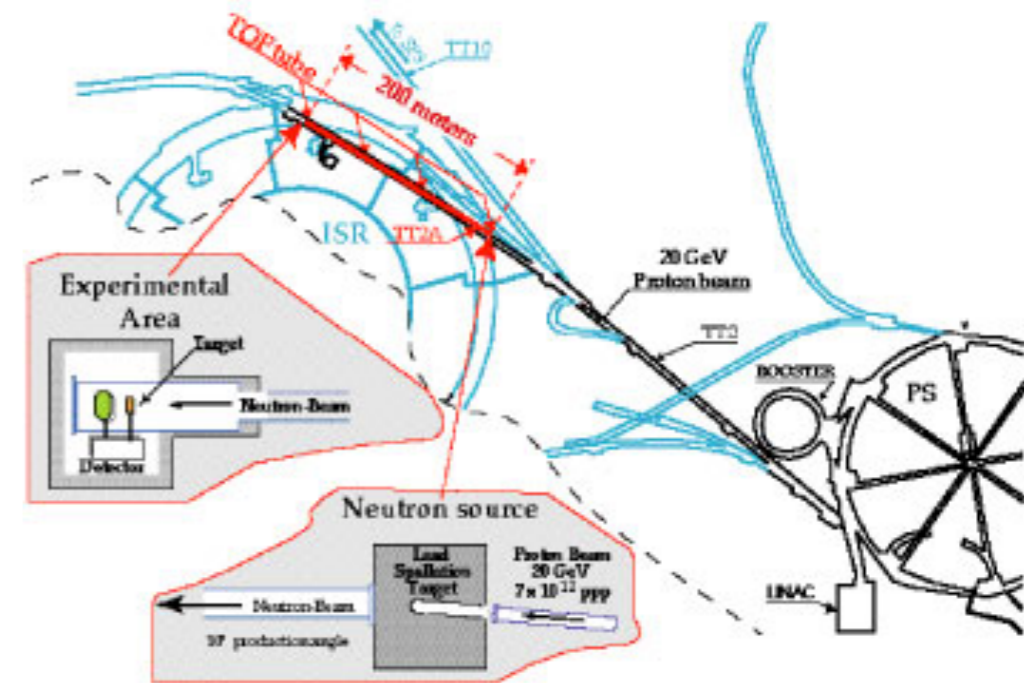


ANTARES, Toulon, 2007

Technology transfert



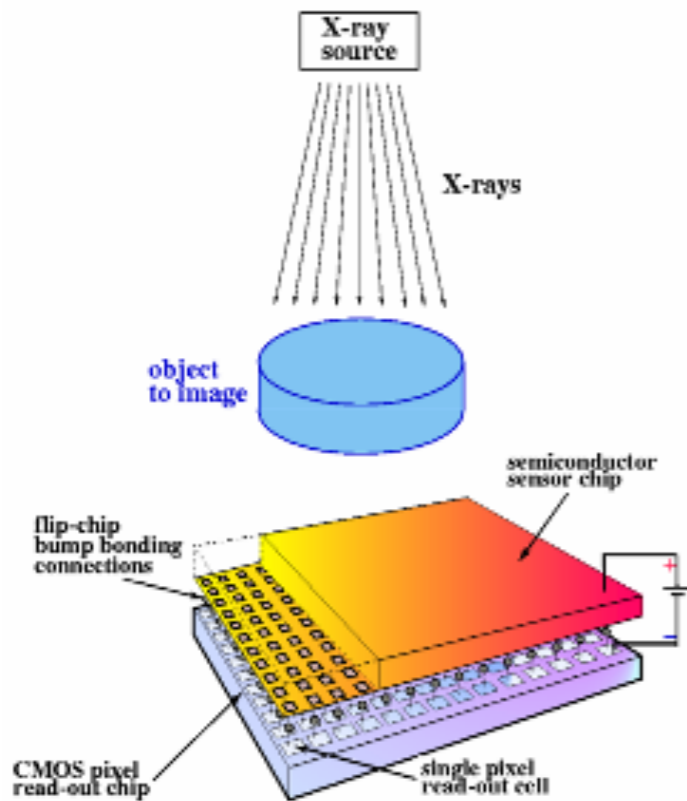
Détecteur au silicium pour une caméra Compton utilisée en imagerie médicale nucléaire



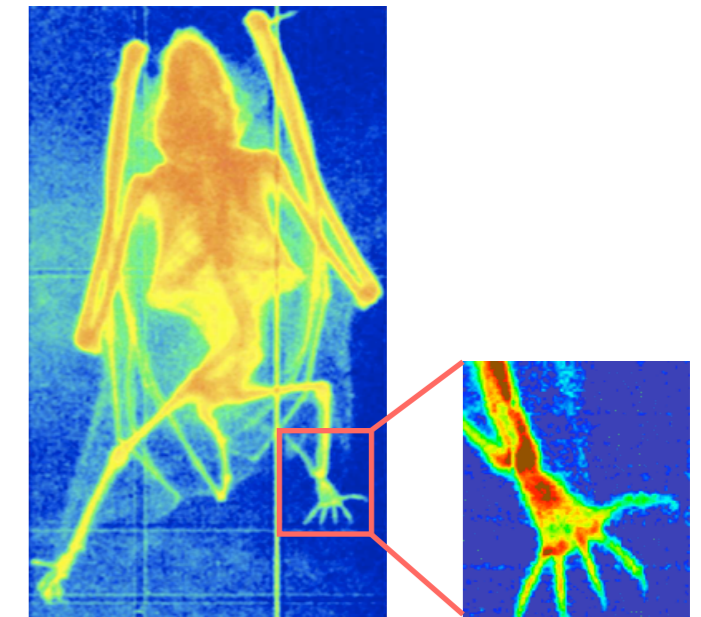
Production de radionucléides pour des applications médicales



Réalisation de couches minces par évaporation ou pulvérisation

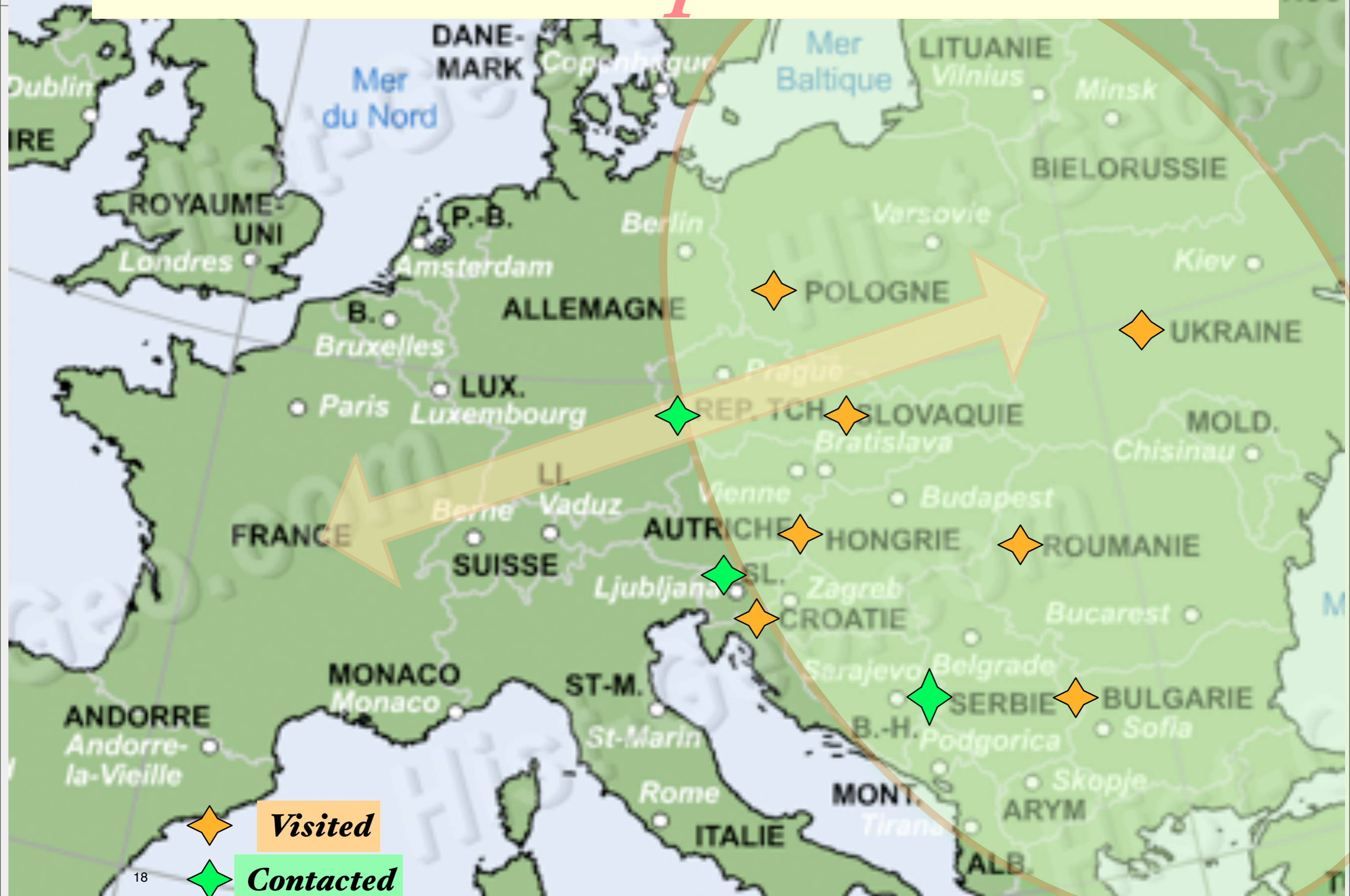


Medipix : Radiodiagnostic médical avec renforcement du contraste et réduction des doses



Radiographie d'une chauve-souris enregistrée au moyen d'un détecteur GEM

Trans Europe Initiative



◆ Visited

◆ Contacted

TEI mission and objectives

TEI has to explore the possibilities of cooperation agreements between IN2P3/CNRS, the different countries from Central Europe which will be visited and the scientific and university structures existing at the french embassies in these countries.

This mission will explore the following two domains:

1. High level education in particle physics

- By developing the interest, in the visited centers and universities, to send their best students to our physics school
- By proposing to the students to follow Master 2 courses in France, opening such the possibility to obtain a PhD support for them, the PhD being developed in co-supervision • by proposing to the students financial support provided by the french embassies for Master 2 or PhD projects in co-supervision.
- By proposing to the French embassies to provide financial support for the selected students

2. Scientific Research

The objective of the mission is also to find common interests between IN2P3 high energy teams and the local visited teams :

- *To participate to a GDRI based on the Physics at LHC*
- To join to experimental works in the HEP domains with French teams
- To consolidate of existing collaboration within LHC/ILC projects
- To share common tools like computing within GRID projects
- To develop in collaboration new instrumentation techniques for the particle detection and/or acceleration. Common R&D programs oriented to the SLHC and ILC projects will be favored.

Trans-European School of High Energy Physics

Buymerovka, Sumy region, Ukraine

July 3-9, 2008



Organization :

Morning : lectures

Afternoon : topical seminars, practical work, student sessions

Program and Organizing committee :

S. Barsuk, LAL/IN2P3-PSud

A. Horzela, INP

T. Lesyak, INP

M.-H. Schune, LAL/IN2P3-PSud

V. Yu. Storizhko, IAP

C. Bourge, LAL/IN2P3-PSud

I. N. Kadenko, Kyiv U.

O. B. Lysenko, IAP

V. Sharyy, IRFU

L. Dobrzynski, LLR/IN2P3

L. N. Lamonova, KINR

V. M. Pugatch, KINR

A. Stocchi, LAL/IN2P3-PSud

Topics :

Standard Model and beyond

Instrumentation for high energy physics

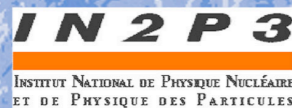
Neutrino physics

Astroparticle physics

Heavy flavours and CP violation

Data analysis technique

Web page : <http://events.lal.in2p3.fr/TESchool/>
Contact : TESchool@lal.in2p3.fr



Tentative Program

Lectures Topical Seminars and Students presentations

Registration and fees

Participants



Location

Practical information for travel

Poster

Photos gallery

Lectures	Professor's name	Allocated time (in units of 50 minutes + 5 minutes questions)
Standard Model and beyond	Sébastien Descotes-Genon	5
Detectors for HEP	Laurent Serin	5
Neutrino physics	Marco Zito	3
Heavy quark	Marie-Hélène Schune	3
Astroparticle physics	TBD	3
Tools for data analysis	Viatcheslav Sharyy	2 + Practical work 2 hours + 1/2 3 hours

The topical seminars are similar to "traditional" seminars presented at our research laboratories. They will present state of the art subjects to the students in a pedagogical way.

Seminars	Professor's name	
Interaction of nuclear environment (HERA-B/CBM/Kiev)	Valery Pugatch	Seminar 1
New ideas for lepton colliders (SuperB/ILC)	TBD	Seminar 2
B-factories	Tadeusz Lesiak	Seminar 3
Higgs search - legacy from LEP and Tevatron searches to LHC discovery	Ivica Puljak	Seminar 4
Beyond SM searches at LHC	Piotr Zalewski/Jan Krolikowski	Seminar 5
Modern cosmology and the problem of dark energy and dark matter	P.I. Fomin	Seminar 6
Silicon vertex detectors and related microelectronics	Adam Czermak	Seminar 7
Calorimetry for future detectors	Sergey Barsuk	Seminar 8
News/highlights on particle physics in the last year	Stephane Monteil	Seminar 9
QCD highlights	Michael Schmelling	Seminar 10

The students should prepare a 5 minutes presentation on a subject they are currently working on or are planning to work on. They should come to the school with the material needed (at least on paper). Sessions are allocated for work with the teachers to prepare the presentation.