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IN2P3 Director



IN2P3

Institut national de **physique nucléaire**
et de **physique des particules**

IN2P3 CSI meeting
Paris June 2013

www.in2p3.fr

With my sincere apologies
Jacques



IN2P3 KEY FIGURES

40 major international projects
17 international research networks

77 M€
annual budget
(excluding salaries)

3 100
researchers,
engineers and
technicians

25 laboratories
and platforms

SCIENTIFIC THEMES

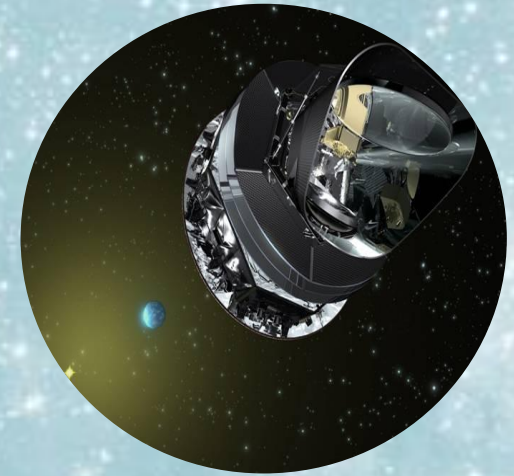
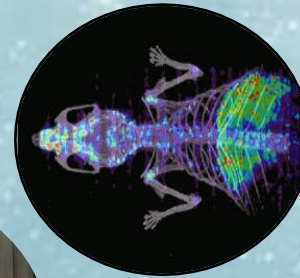
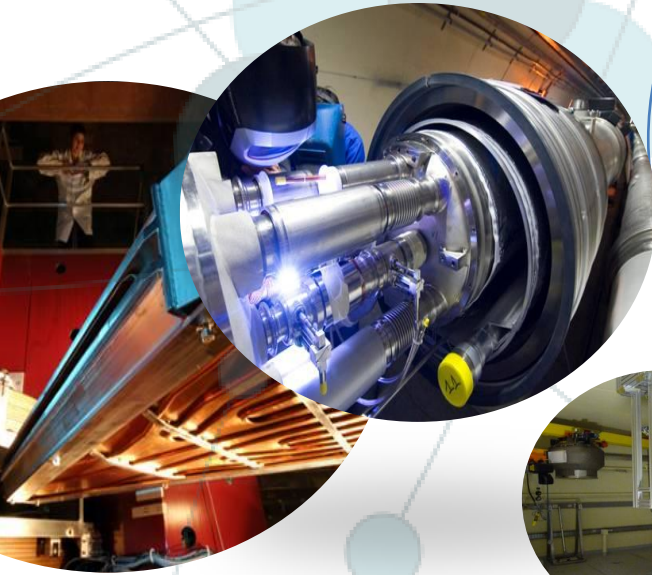
Particle physics
Nuclear and hadronic physics

Matter's most elementary constituents
and fundamental interactions
Structure of nuclear matter

Theory
Instrumentation
Computing grids
Accelerator R&D

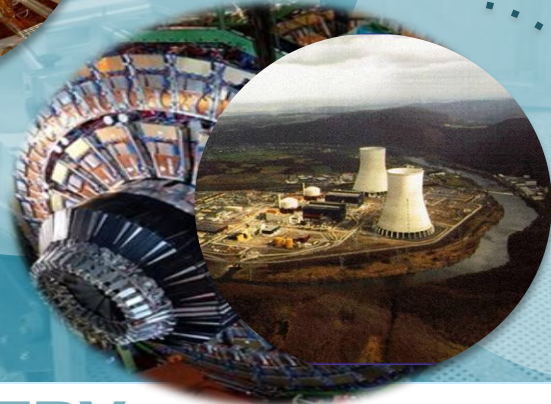
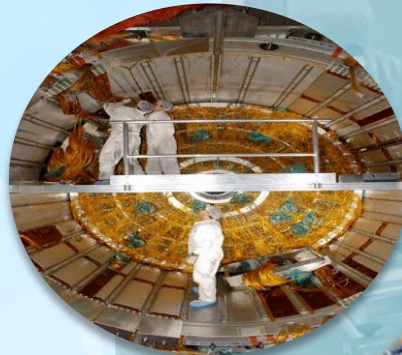
Nuclear energy
Medical applications

Astroparticle physics and neutrinos
Universe's composition and behaviour



ELEMENTARY CONSTITUENTS, FUNDAMENTAL INTERACTIONS

- Particles' mass
- New physics
- Supersymmetry
- Antimatter
- Neutrino's nature and mass

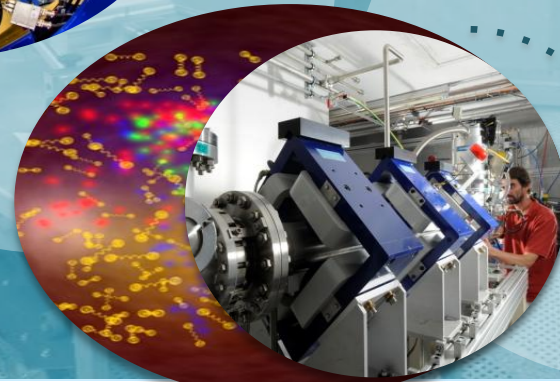
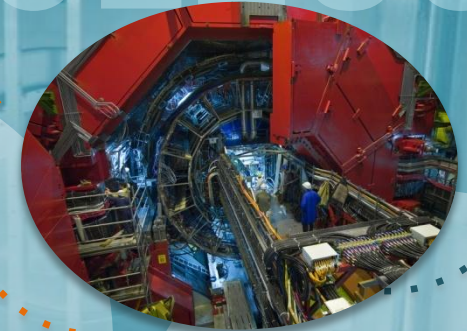
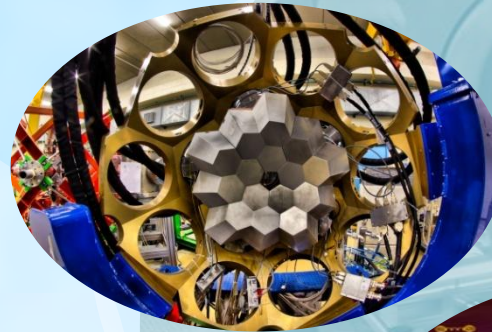


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Conception graphique : Anna Thibaut (IPNL)

COLLISIONS HIGGS BOSON SUPERSYMMETRY DETECTORS ANTIMATTER STANDARD MODEL

PROTON AND NUCLEI: THE EMERGENCE OF COMPLEXITY

- Quark-gluon plasma
- Proton's structure
- Nuclear structure
- Exotic nuclei
- Nuclear astrophysics



EXTREME STATES
EXOTIC NUCLEI

STABILITY
SUPERHEAVY

GLUONS
QG PLASMA

UNIVERSE'S COMPOSITION AND BEHAVIOUR

- Universe's history
- Dark matter and dark energy
- Cosmic rays
- Gravitational waves
- Neutrinos



COSMIC RAYS
DARK ENERGY

UNIVERSE
SUPERNOVAE

BIG BANG
GRAVITATIONAL

LARGE DATA-SET PROCESSING

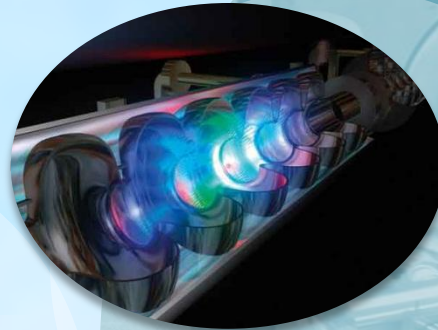
- *European and International level*
- *Major contribution of CC-IN2P3 (Lyon) and TIER-2's*
- High energy physics (LCG)
- Biomedical applications



INFRASTRUCTURES DATA STORAGE NETWORKS
INTERFACES COMPUTING CENTERS LCG

ACCELERATOR R&D, TECHNOLOGICAL PLATFORMS

- Superconducting accelerator cavities and cryotechnology
- Ion and electron sources
- Target/source for radioactive beams
- Beam dynamics
- Laser acceleration



INTENSE BEAMS LASERS SUPERCONDUC
ION SOURCES PLATFORMS CRYOTECHNOLOGY

INSTRUMENTATION, DETECTORS, TECHNOLOGY TRANSFER

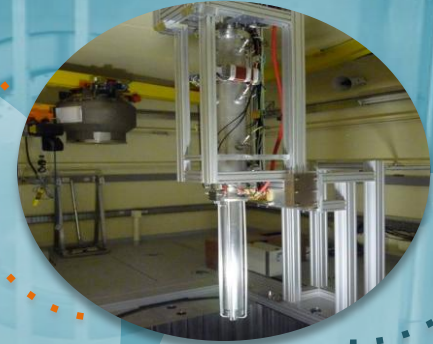
- Silicon detectors
- Photo-detectors, new generation scintillators
- Gaseous detectors
- Bolometers
- Microelectronics



MICROELECTRONICS BOLOMETERS CMOS
HODOSCOPES IMAGERS ULTRA-GRANULARY

BACK-END OF THE NUCLEAR FUEL CYCLE, NUCLEAR ENERGY

- Transmutation of nuclear waste by ADS
- Innovating nuclear systems with low wastes (thorium)
- Waste storage radiochemistry



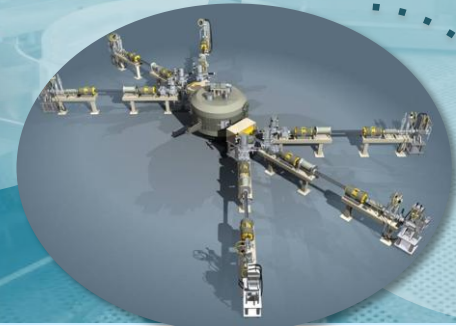
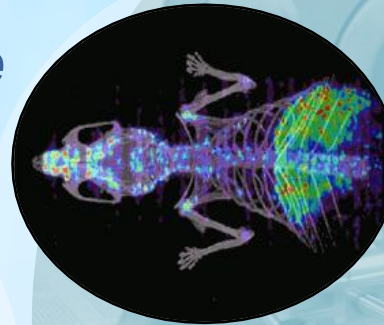
TRANSMUTATION MOLTEN SALTS REACTORS
RADIOCHEMISTRY NUCLEAR WASTES ADS



NEW DIAGNOSTIC AND THERAPY TOOLS

→ *Strong involvement of IN2P3 in the fight against cancer*

- Radioisotopes, radiobiology, radiotherapy
- Dosimetry / beam monitors R&D
- Accelerator technology
- Imaging, simulations (Geant, Gate)



BEAM MONITORS
RADIOBIOLOGY

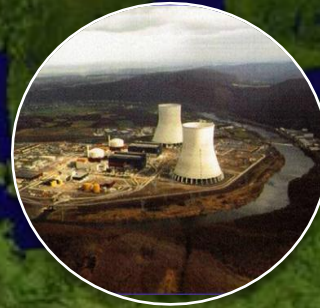
SIMULATIONS
HADRON THERAPY

IMAGING
RADIOISOTOPES

FRANCE : LARGE INFRASTRUCTURES



Spiral2 / Ganil

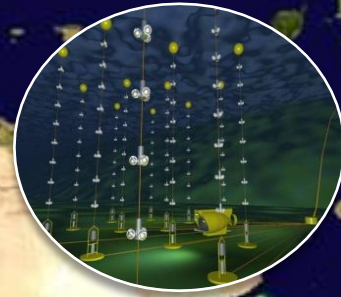


DChooz



CC-IN2P3

Antares



Edelweiss, Nemo / LSM



INTERNATIONAL COLLABORATIONS



Jyväskylä
(Finland)



JINR Dubna
(Russia)



Fair / GSI (Germany)

LHC, Isolde / Cern
(Switzerland)



Opera, Xenon / Gran Sasso
Virgo
(Italia)



INTERNATIONAL COLLABORATIONS

