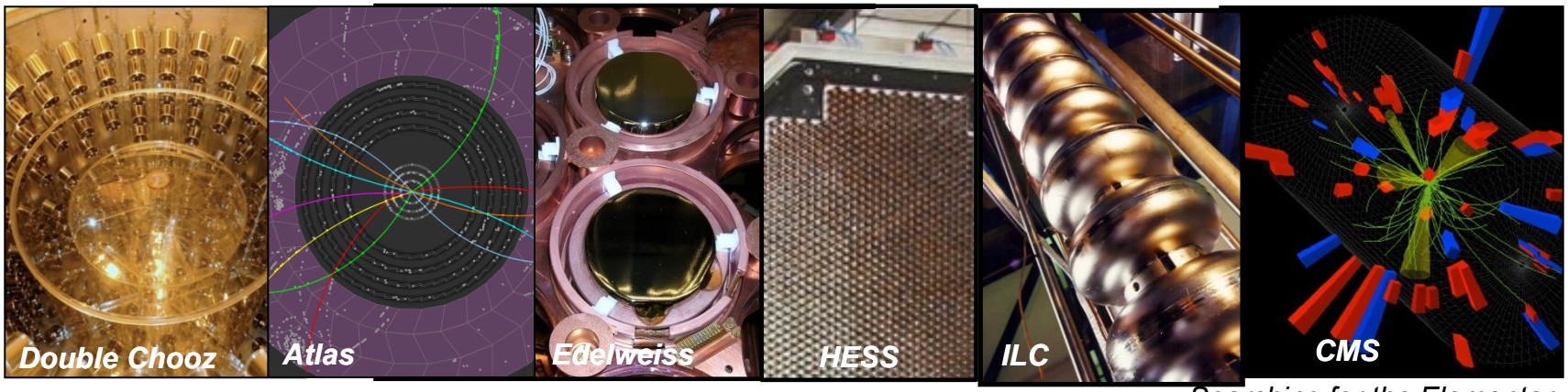
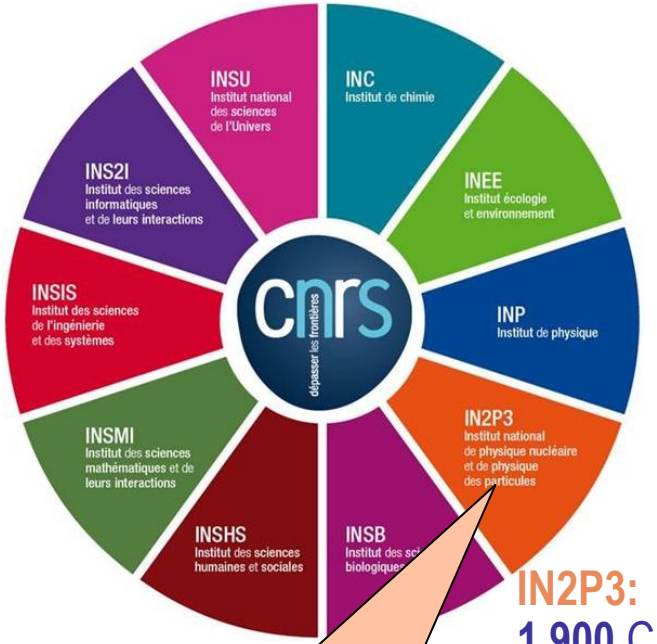
ECFA: Mid-term review France



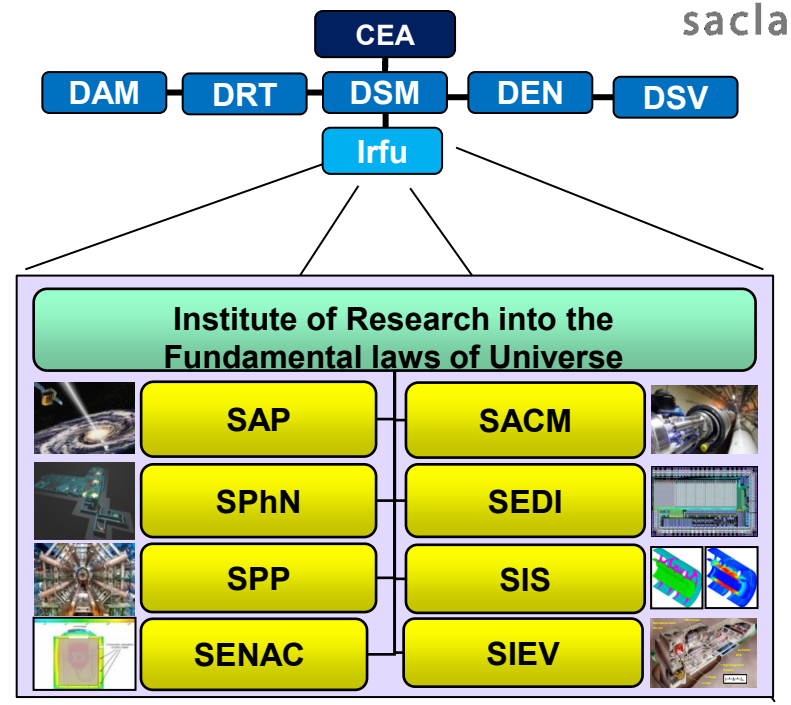
Searching for the Elementary

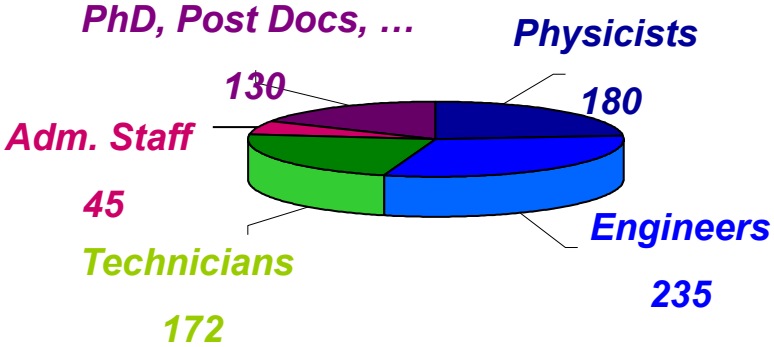
Research Organization for HEP in France



- Particle Physics
- Astroparticles & Neutrinos
- Nuclear Physics
- Accelerators & Nuclear Energy
- Hadronic Physics & Theory

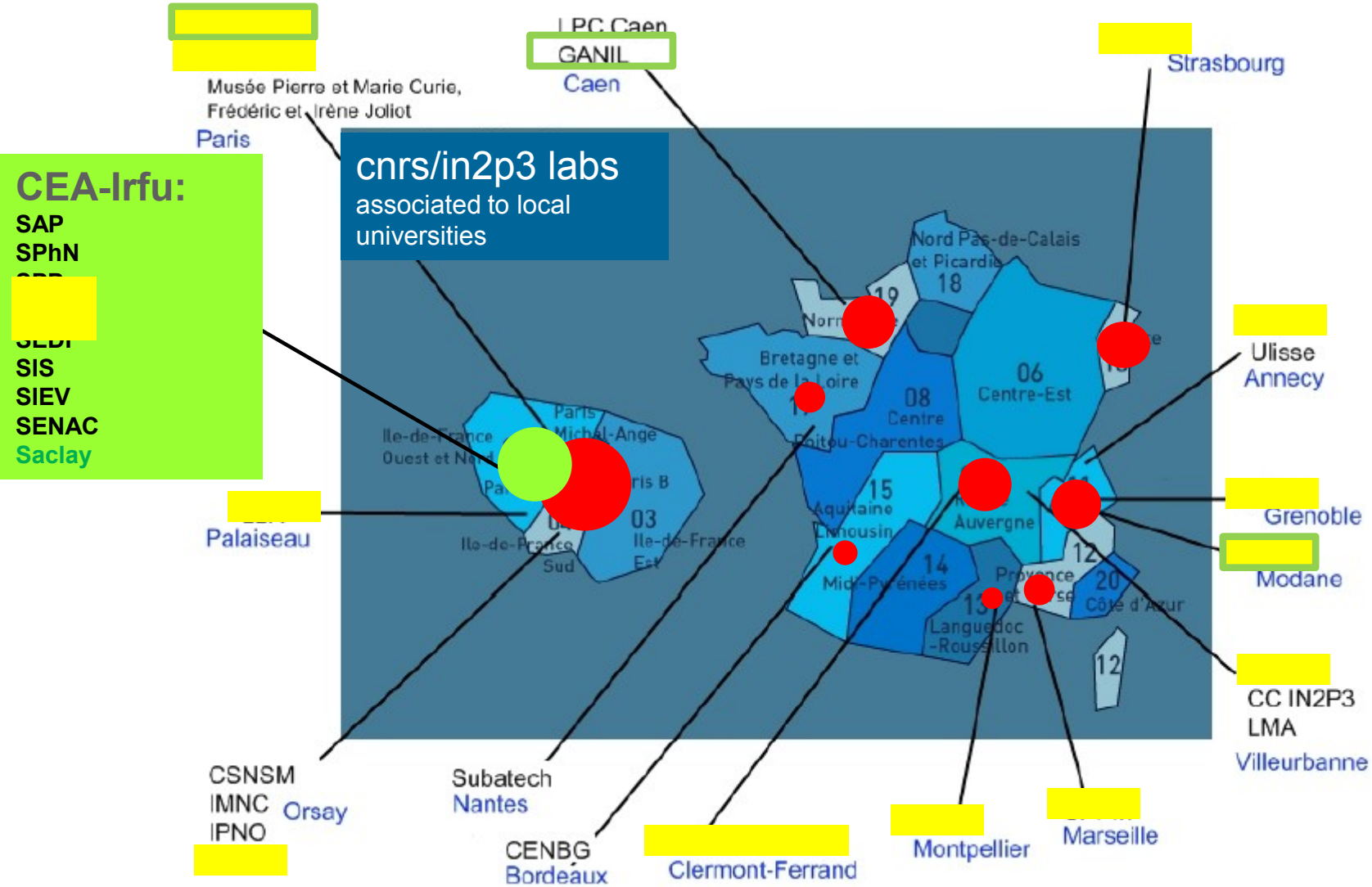
IN2P3:
1 900 CNRS staff
600 university staff
900 physicists
1200 engineers and technicians
400 administratifve staff





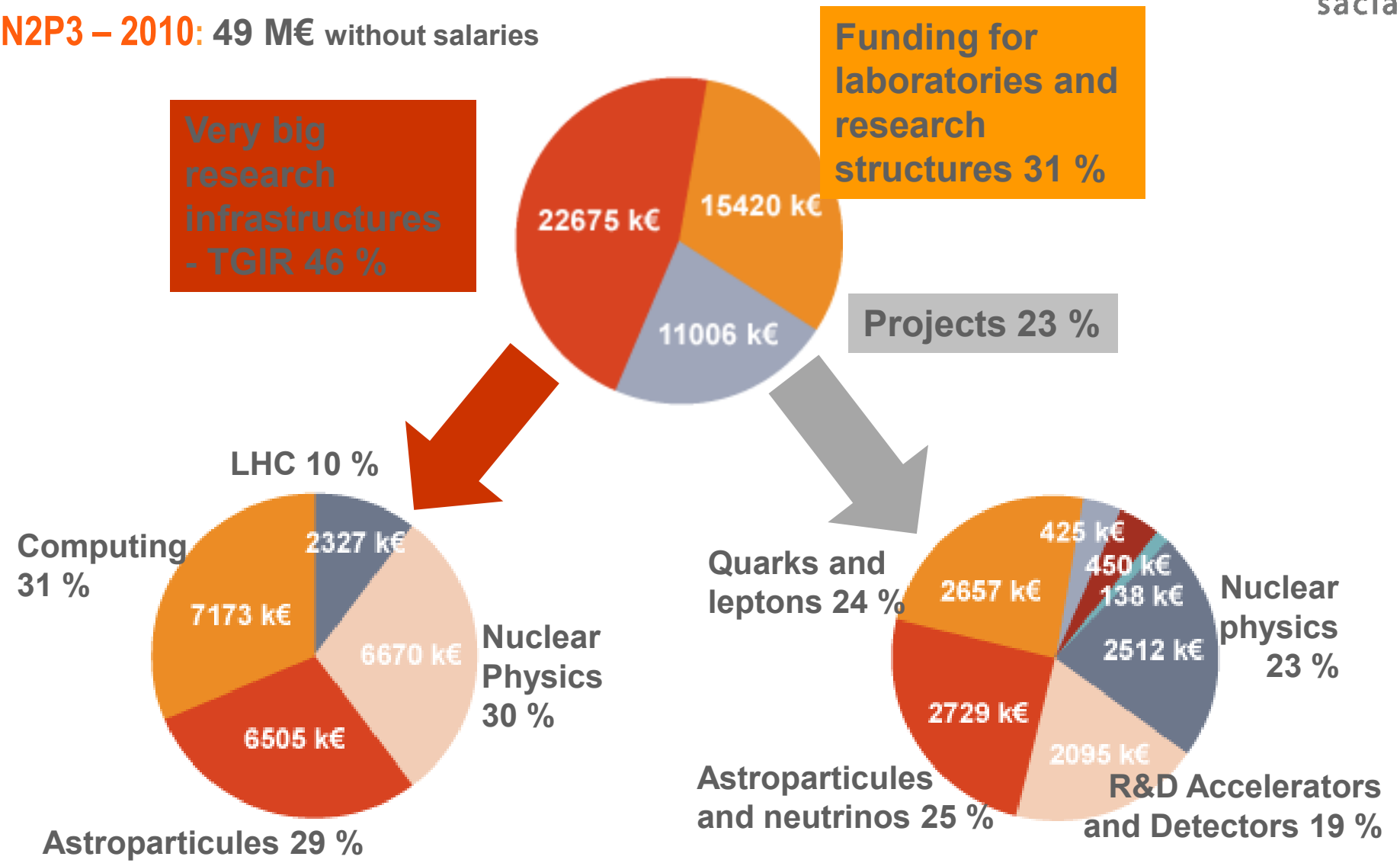
➔ Common prospective IN2P3/IRFU in 2011

HIGH ENERGY LABORATORIES IN FRANCE



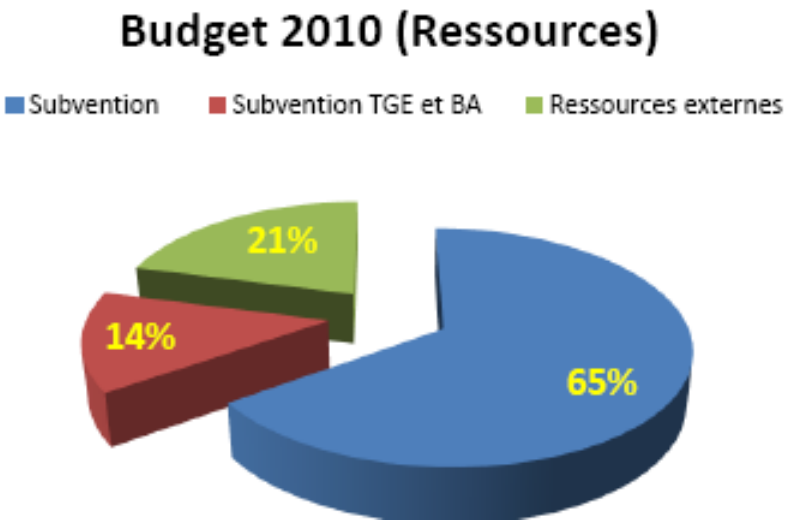
BUDGETS IN2P3 - 2010

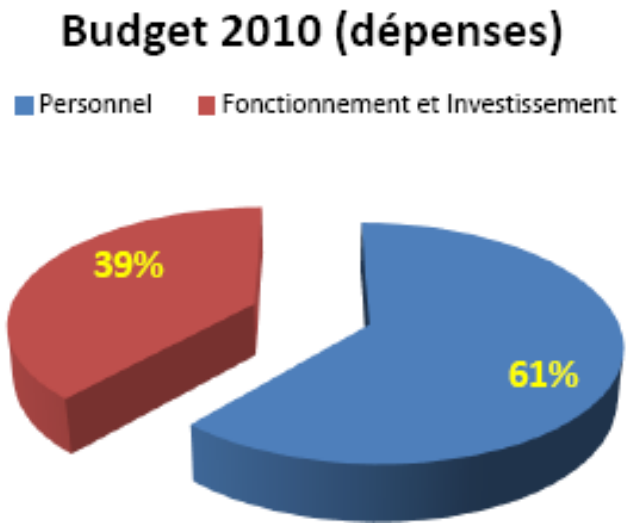
IN2P3 – 2010: 49 M€ without salaries



BUDGETS – IRFU 2010

Total budget 2010: 82 M€ (including salaries)





TGE: XFEL, FAIR, SP II…
Broader Approach for Fusion: IFMIF EVEDA, JT60SA
External Resources: Technology (Iseult), CNES (Space Agency),
European, National and Regional Programs

"External" Funding Sources

ANR: National Research Agency

- funding for innovative projects over 3 years
- favoring collaborations among French laboratories or with industrial partners
- funds for young researchers

➔ **not very well adapted for main HEP program**

Regional Funds: regional infrastructures

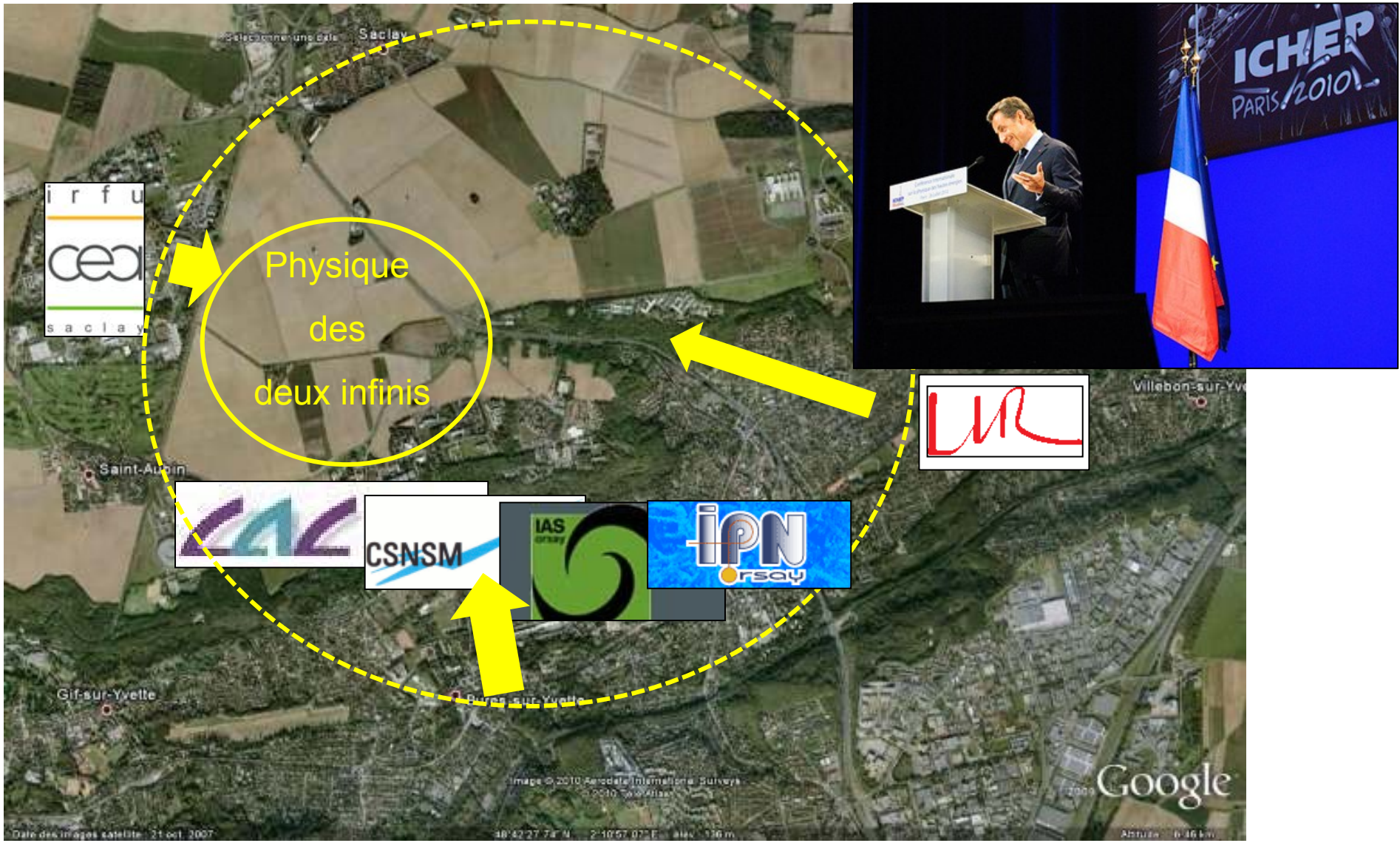
- in relation with industrial partners

European Funding: FP7 DS, PP or I3

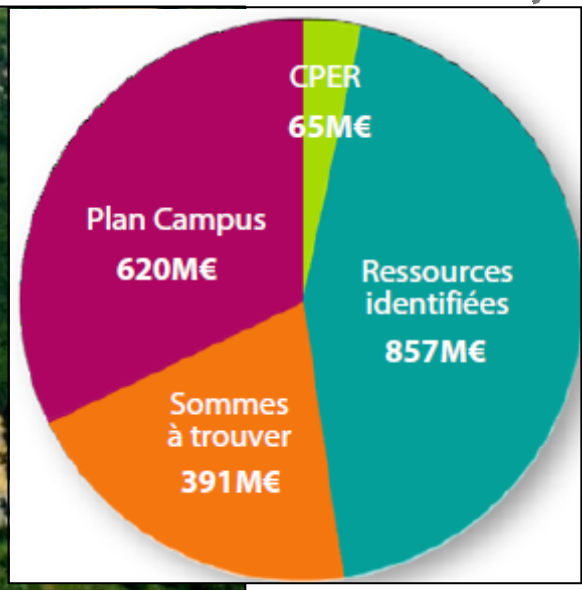
- ERC grants

New regulation on budgetary autonomy of Universities

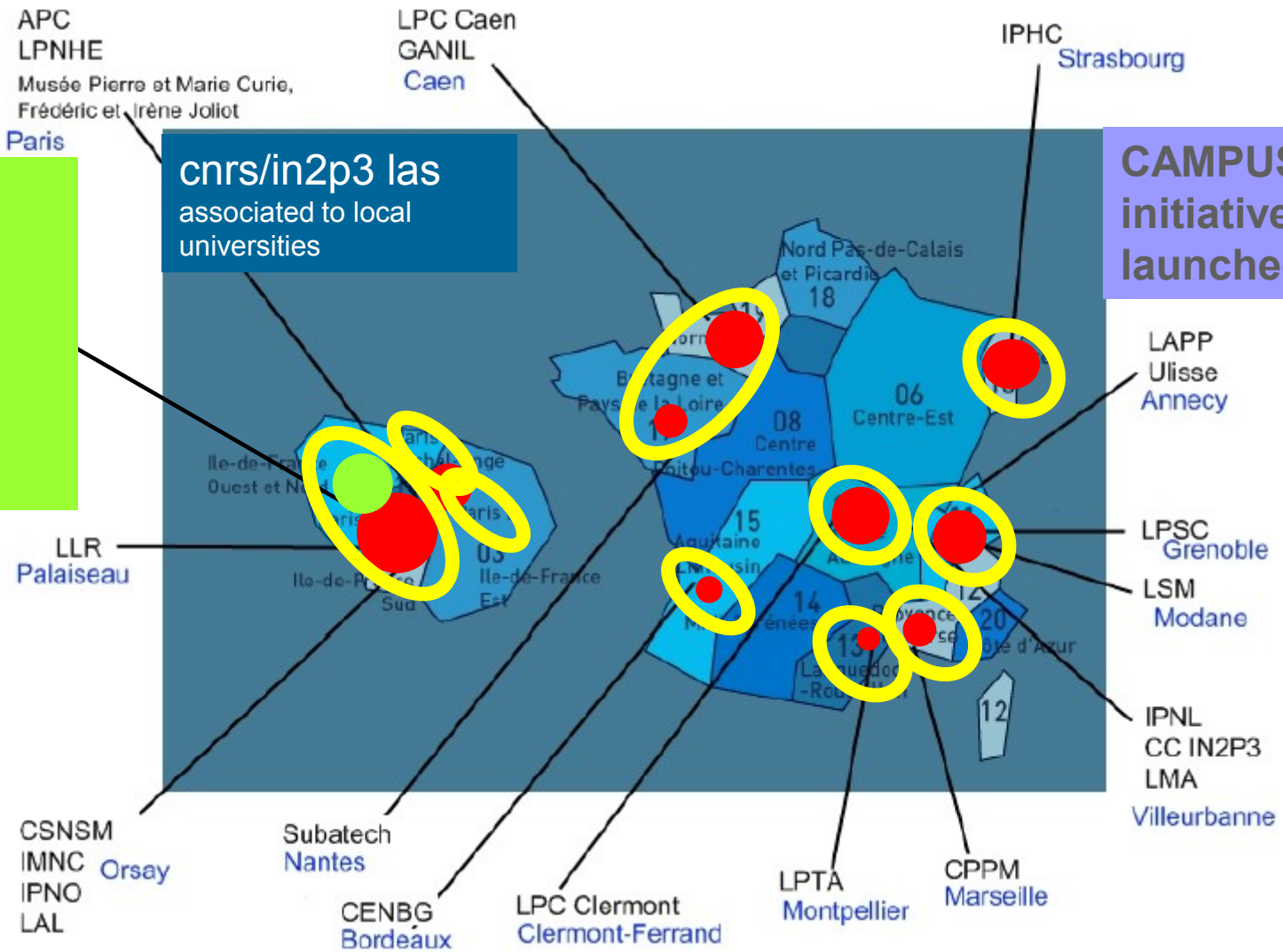
CAMPUS ORSAY-SACLAY : PROJECT FOR P2I



CAMPUS PARIS-SACLAY



CAMPUS PROJECTS : ~10 PROJECTS



2010: Excellence Initiative in France

French Stimulus Package : 35 G€ ➔7.7 G€ the “Excellence Initiative”

Excellence Initiatives: 5-10 excellence initiatives (~ Campus initiative)

“in strong collaboration with economic environment
- initial investment up to 1 G€
- recurrent funding from investments

Excellent Laboratories: research groups or association of laboratories

- call closed on November 22nd
- nearly all IN2P3 and Irfu laboratories are part of a project
- 1 G€ invested – financing from benefits

Excellent Equipment : infrastructures and equipments between 1-20M€

- call closed in September: about 220 projects submitted
- total funding 400M€ for investment, 600k€ invested for running costs

➔ All projects evaluated by ANR

Research Structures in France

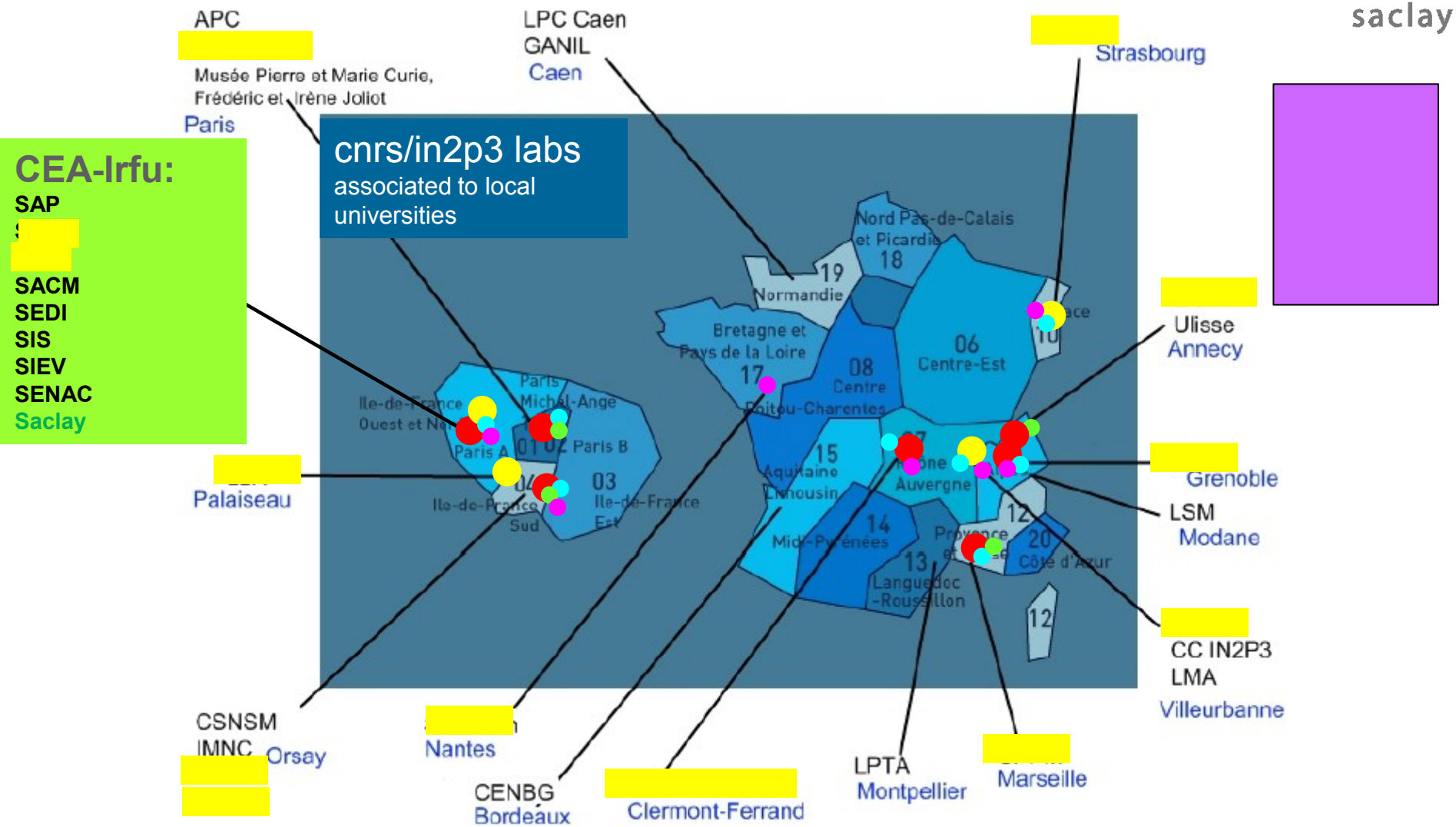
GDR – groupement de recherche - research group :
Terascale, Neutrinos, PCHE, Medical imaging
GIS – groupement d'intérêt scientifique - scientific interest :
P2I, Sources and Accelerators, French Grid, Hadron Therapy, Jannus…
GIP – groupement d'intérêt publique – public interest (industry): MIND, Arronax

PRES – Universitairy and Research Centers : 17 centers in France
Fédérations de Recherche – research federations:
MSIF- **Modélisation, Simulation, Interactions Fondamentales (Annecy area)**
FRIF**- Fundamental Interactions (Paris)**

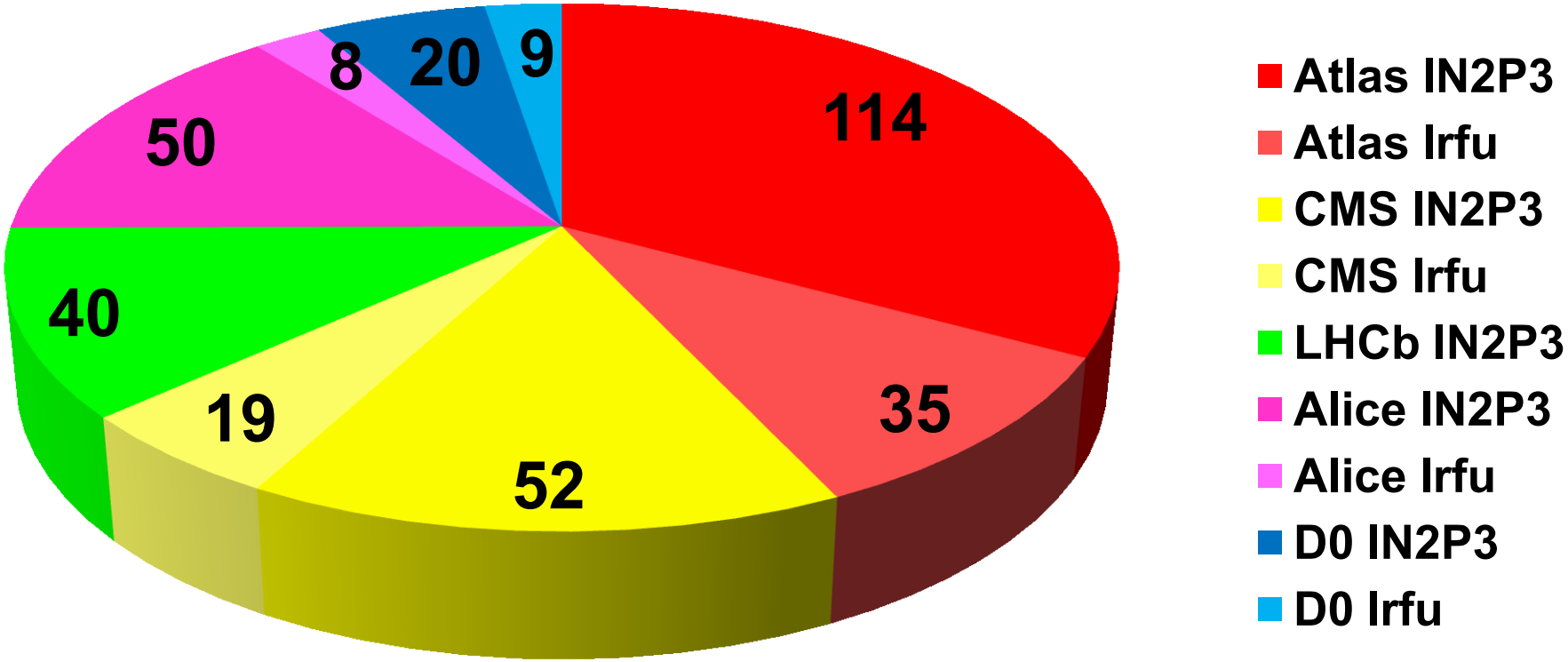
International actions:
International associated laboratories – LIA:
FCPPL France-China Particle Physics Laboratory, FJPPL Japan "Toshiko Yuasa" **, FVPPL Vietnam, FKPPL Korea, KIPAC-APC, ILLPC USA, ILCP Morocco and Sweden**

MC2 visitor program to come to France with US/Canada/Japan on LHC/ILC

HCP EXPERIMENTS – DOMINANT ACTIVITY!



PARTICIPATION IN HCP EXPERIMENTS



Total : 350 Physicists
(students and post-docs included)
In addition ~64 FTE engineers and technicians

Participation in Atlas

Hardware contributions:

- Pixels, em-Calorimeter, had-Calorimeter, muon-system, Trigger
➔Strong implication during data taking and commissioning

Strongest participation in an LHC experiment:
150 physicists
~ 35 engineers & technicians
Yearly Physics Atlas-France Meeting

Software developments:

Electrons, photons, muons, alignment and magnetic fields…

Physics implications:

- EW-physics
- B-physics
-Top physics
- Higgs searches
- SUSY and exotics

Upgrade activities:

2016: Insertable B layer
2020: Tracking upgrade
R&D: 3D technology, front-end electronics, mecanics, cooling
• **MAMMA Collaboration:** large mirco-megas for muon-chambers

CONTRIBUTIONS TO CMS

Hardware contributions:

- Tracking: IPHC, IPNL
- ECAL: IPNL, LLR, IRFU
- Magnet: IRFU

➔Strong implication during data taking and commissioning

Coordinated effort and good complementarily among the groups: 2 yearly CMS-France meetings

Software developments:

b-tagging, particle Flow, photons, electrons, taus…

Upgrade activities:

Trigger, Electronics, muons?

Physics interest:

Electroweak, top, Higgs, SUSY and Exotics

B-Physics Community

LHCb: 44 FTE CPPM, LAL, LAPP, LPC, LPNHE

Hardware contributions: Calorimeter, Electronics, Trigger

Babar: ~10 FTE contributing to final analysis
Babar/Belle : B-Physics Book

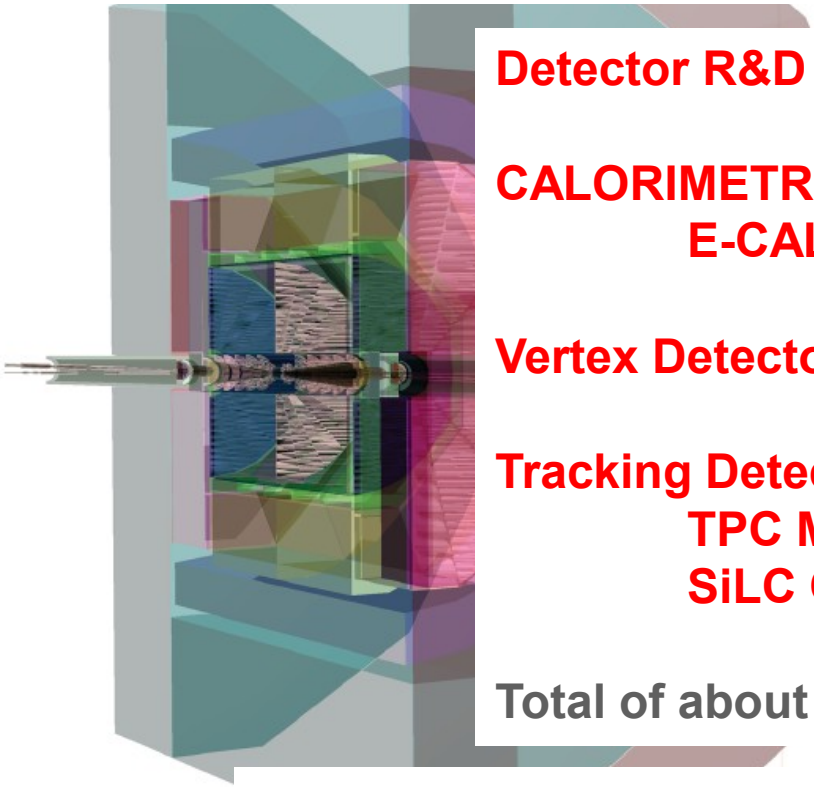
SuperB: contributions to TDR

Fit progams: CKMFitter
UTFit

DETECTOR R&D FOR ILC

Contributions to ILD :
IPHC, IPNL, LAL, LLR, LPC, LPNHE, LPSC, IRFU

Contributions to SiD :
LAPP, LPNHE



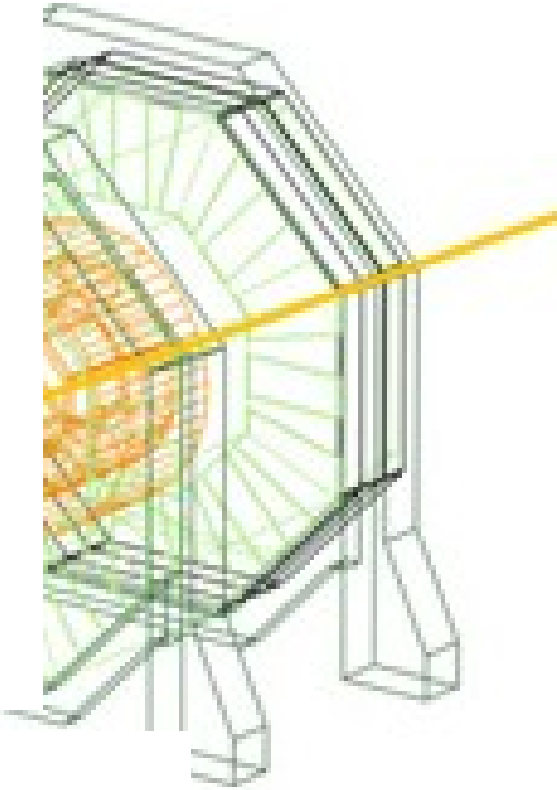
Detector R&D activities:

CALORIMETRIE: CALICE
E-CAL and H-CAL

Vertex Detector: CMOS, 3DIT

Tracking Detectors:
TPC Micromegas
SiLC Collaboration

Total of about 55 FTE



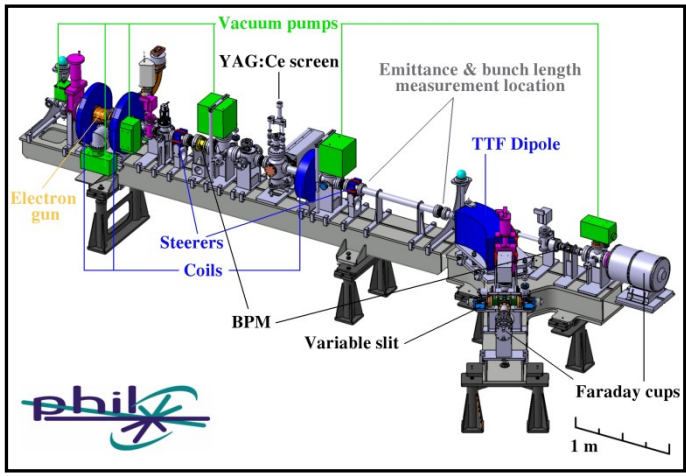
- **European Programs: EUDET (FP-6)**
  AIDA (FP-7)
- **ANR Program: SDHCAL**

ACCELERATOR R&D

LAL-Orsay, IPNO, IRFU ➔ Supratech platform
LPSC, LAPP, LLR: R&D activities

R&D for linear colliders :

- Contributions to ILC-GDE (TTF3, ATF2) and CLIC (CTF3)
- nm stabilisation of final focus
- XFEL production : coupler, cryomodules
- R&D on superconducting cavities
- Simulation of beam dynamics and interaction regions
- PHIL: PHoto Injector at LAL -
  studies for CLIC electron injector
- Participation to SuperB TDR
- Activities on Laser-Plasma acceleration



ACCELERATOR R&D

Upgrades for LHC:

HIPPI – High Intensity Proton Pulsed Injector

IPHI – Proton Injector at High Intensity for SPL

Developments for SPIRAL-2, FAIR and ESS

IFMIF/EVEDA – Deuteron accelerator for material studies for ITER

Irradiation facilities for material science: JANNUS

Radioactive beams : ALTO

Development of an intense positron source: SOPHI

Participation : FP6-CARE, FP6-EuroTeV, FP7-EUCard
Coordination : ESGARDE, FP7-Tiara

Total FTE effort: IN2P3 - 86 IRFU - 51