

WELCOME



Bienvenu(e)s

A new European Laboratory.

Formed on 2020 by the merging of 5 Laboratories in Orsay-France

CSNSM	<i>Centre de Sciences Nucléaires et de Sciences de la Matière</i>
IPN	<i>Institut de Physique Nucléaire</i>
IMNC	<i>Imagerie et Modélisation en Neurobiologie et Cancérologie</i>
LAL	<i>Laboratoire de l'Accélérateur Linéaire</i>
LPT	<i>Laboratoire de Physique Théorique</i>



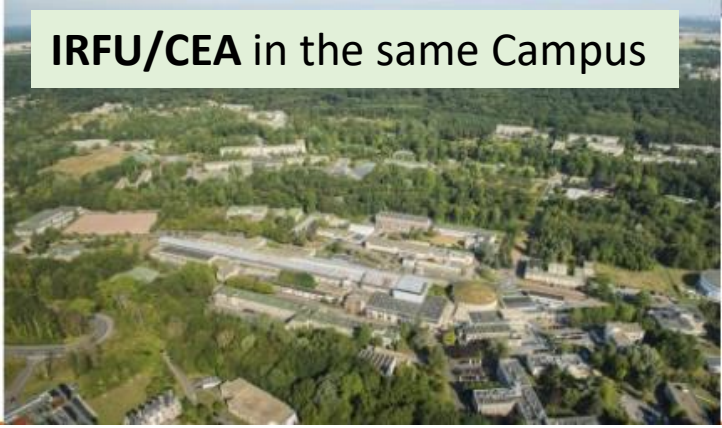
IJCLab : Located in Orsay Campus, 30 Km South-Paris, Campus Paris-Saclay

IJCLab is occupying a large part of the Orsay Campus (~50000m²)



RER B
Bures

IRFU/CEA in the same Campus



RER B
Orsay

Financial plan (CPER) for renewing buildings and research infrastructures

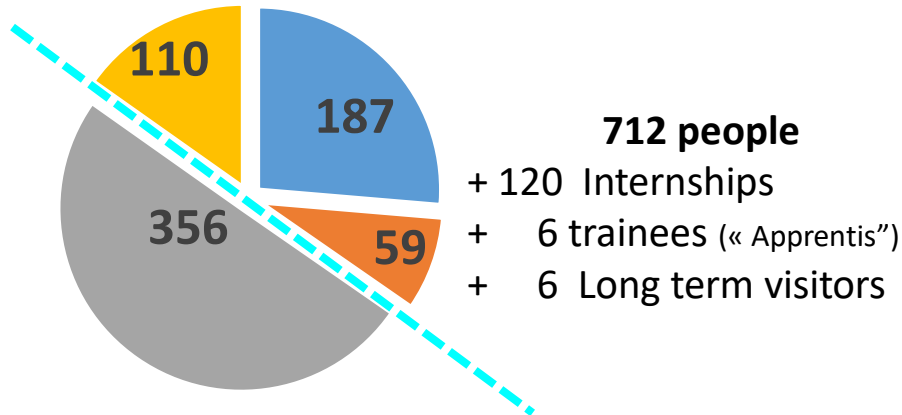
20,6M€	2016-2021
9,1M€	2022-2027



IJCLab staff and guardianships

IJCLab : Personnel Status (including non permanent)

- Researchers CNRS
- Researchers-Teachers
- Engineers + Technicians
- PHD



All in all >800 people present at the laboratory

CNRS (Centre National de la Recherche Scientifique)

- ~17000 researchers + 16000 technical staff
- 10 institutes among them **IN2P3 (Institut national de physique nucléaire et de physique des particules)**
- IN2P3 composed by ~20 large-scale laboratories
- IJCLab is a IN2P3 laboratory
- **IJCLab (~700 people) ~1/4 of HR of the IN2P3.**

University Paris-Saclay

- 275 laboratories : 9000 researchers, 11000 IT (*University and research organism altogether, comprising CNRS and CEA*)
- 13th Shanghai ranking (Physics : 9th World, 1st Europe)
- 48000 students (with 9000 Master, 4000 PHD)

University de Paris

- Specific links with IJCLab in Health Physics



7 Research Poles

31 research teams and 2 Departments

1 Engineering pole

4 Departments with 10 Services

1 Administration Pole

3 Divisions + 1 Service

6 support Services

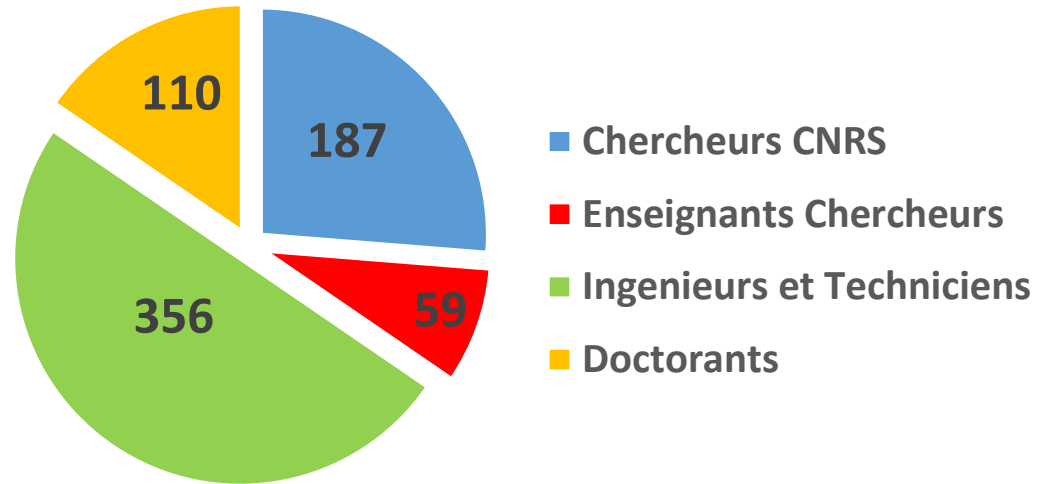
5 Platforms

(with external users)

+ several technical platforms

712 members (530 permanents)

One of the largest laboratories of the CNRS and Paris Saclay
In the network of 8 major European laboratories



120+ internships/year

~800 people present in the laboratory

Instances

CL

CPL

CSS

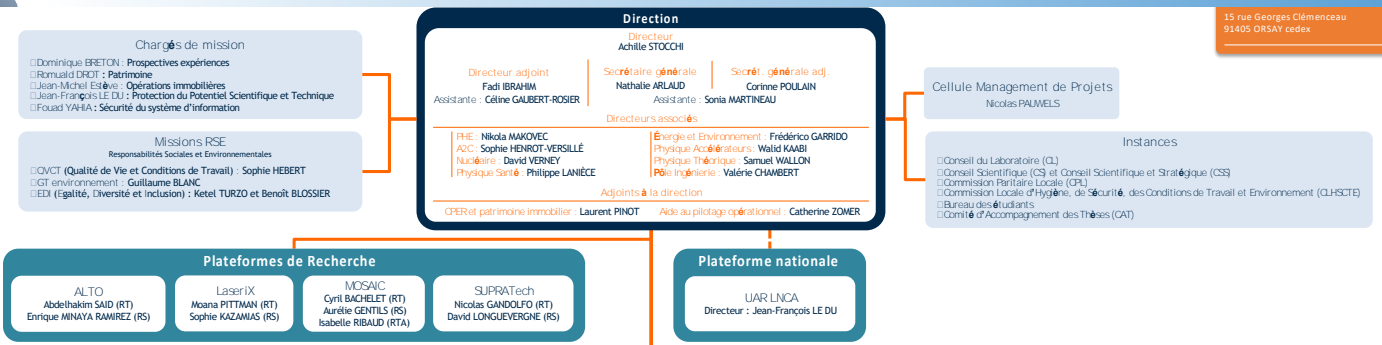
CLHSCTE

CAT

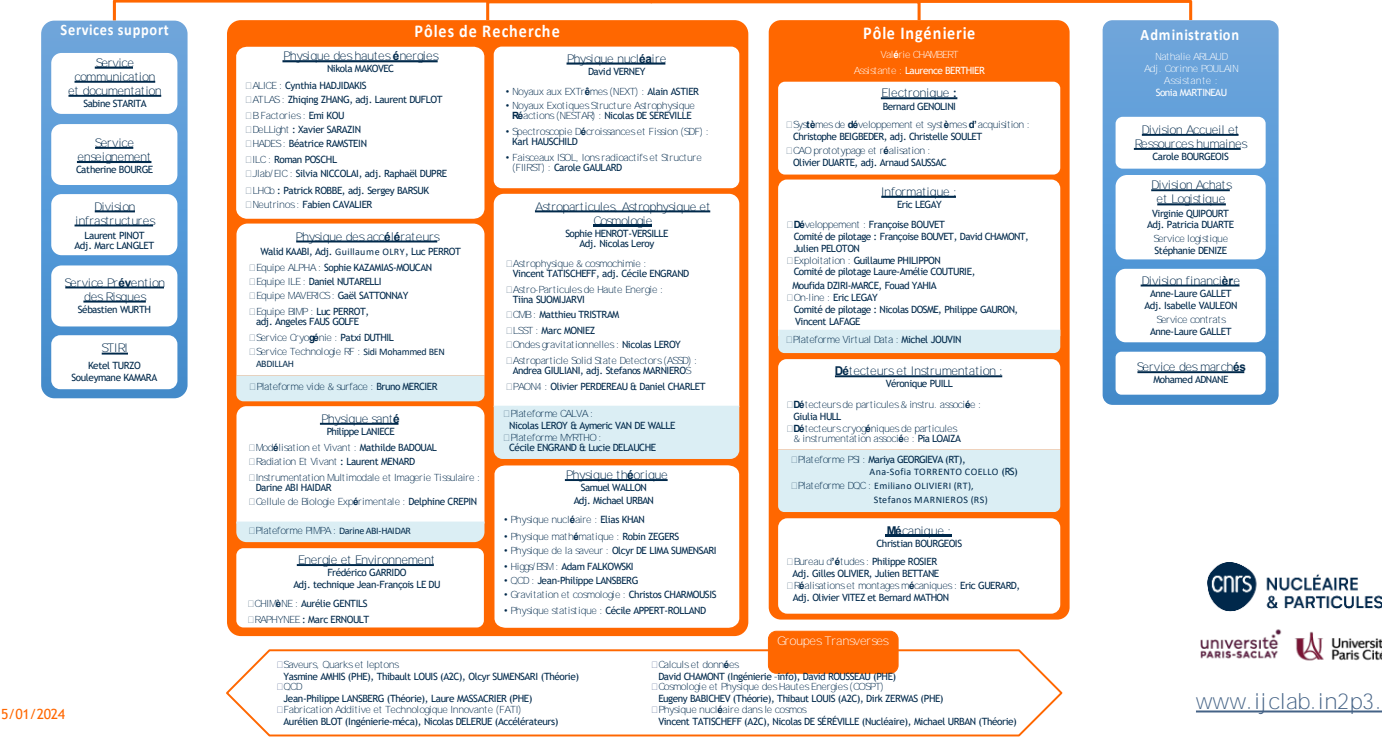
ASTech

COMUTI

New and different organization compared to the former laboratories + new “instances”



IJCLab : organisation sur une 1 page !



6 GROUPES TRANSVERSES

Saveurs: Quarks et Leptons
Yasmine Amhis(PHE), Thibaut Louis (A2C), Olcyr Sumensari(TH) QCD
Jean-Philippe Lansberg(TH), Laure Massacrier(PHE).
Fabrication Additive Technologies Innovantes (FATI)
Stéphane Jenzer(PI-Mécanique), Nicolas Delerue (PA)
Calculs et Données
David Chamont(PI-Informatique), David Rousseau (PHE)
Cosmologie et Physique des Hautes Energies (COSPT)
Eugeny Babichev(TH), Thibaut Louis (A2C), Dirk Zerwas(PHE)
Physique nucléaire dans le cosmos
Nicolas Leroy (A2C), Nicolas de Sérville(PN), Michael Urban(TH)

ARCO (Accelerator Research Center Orsay) pour animer la recherche et le développement en Accélérateurs



www.ijclab.in2p3.fr



IJClab in a nutshell

7 Pôle Scientifiques

All the themes of the "physics of the two infinities" with the presence of strong historical/existing poles, emerging poles and activities at the interfaces.

A2C Astroparticles, Astrophysics & Cosmology ~ 58

PHYSIQUE NUCLÉAIRE
NUCLEAR PHYSICS ~ 61



Theory ~ 72

Health Physics ~ 25

Accelerator Physics ~ 87

Including RF and cryogenic services

Energy and Environnement ~ 34

PHE Physique des Hautes Energies
High Energy Physics ~ 106

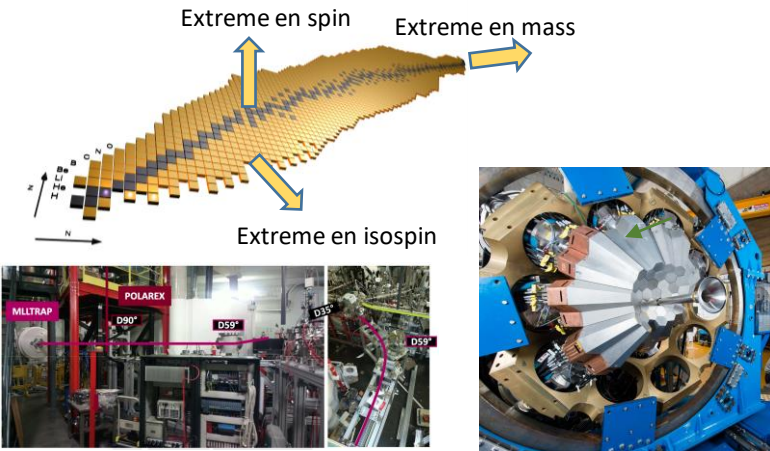
~ 110 PhD



IJCLab : The Research Themes

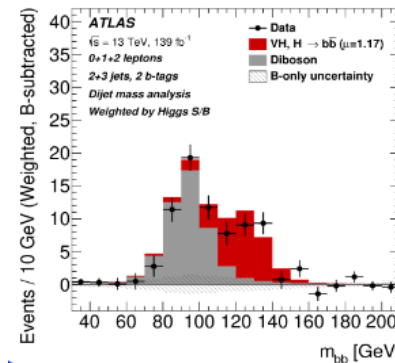
Probing matter at small distances/high energy $E=hc/\lambda$, discover new particles $E=mc^2$

emergent properties of an effective interaction



Nuclear Physics

The standard model and the discovery of the Higgs boson!
The missing piece of the standard model

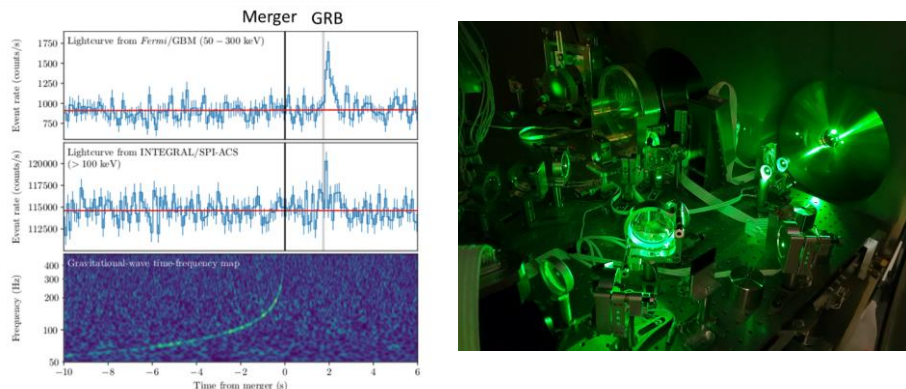


Particle/Hadronic

Understand the constituent elements of matter, their interactions
and how the properties of matter are derived from them

To understand the evolution of the Universe and to study the violent phenomena that occur in it, in connection with high energy physics

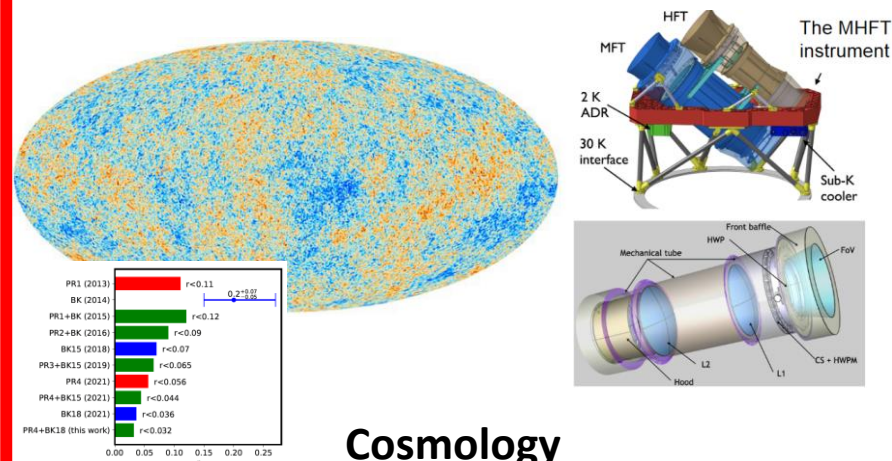
The observation of gravitational waves LIGO/VIRGO Space-time waves, direct observation of black holes / other compact objects



ASTROPARTICLES

Astrophysical events (high energy cosmic rays, black hole fusion, general relativity...)

The early universe seen by the CMB! The first picture of the universe



Cosmology

(evolution of the Universe, inflation, large structures, dark matter and energy)



IJCLab : The Research Themes

Design, develop and build tools to carry out this research

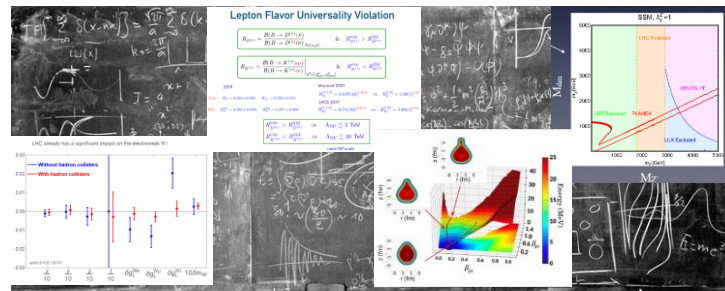


Accélérateurs



Detectors/Instrumentation

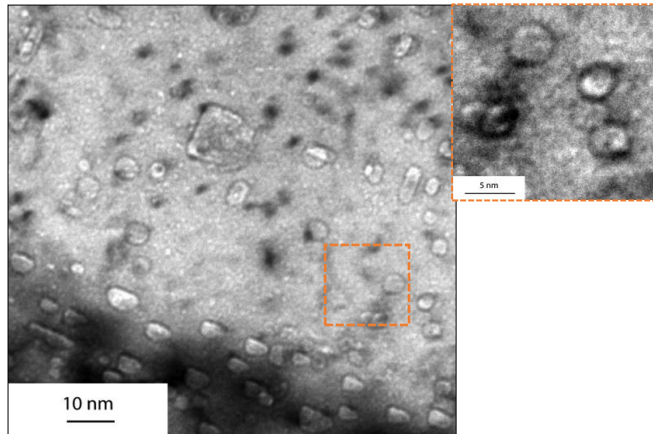
Theory



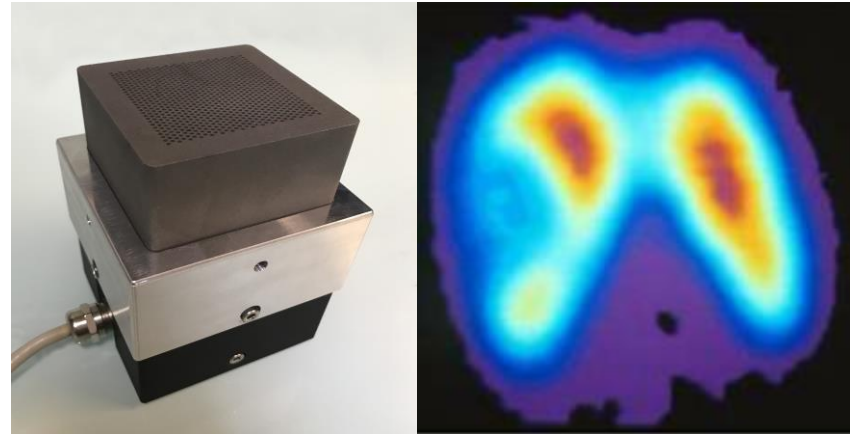


IJCLab : The Research Themes

Tools and concepts applied in areas that have an impact on society



Energy and environment: nuclear energy, radiochemistry and materials



Health physics:
Imaging, radiation therapy, life modeling



~180 staff members

4 Departments :

Electronics / Computing
Instrumentation / Mechanics
with 10 Services

IJCLab in a nutshell – III : Technical Skills

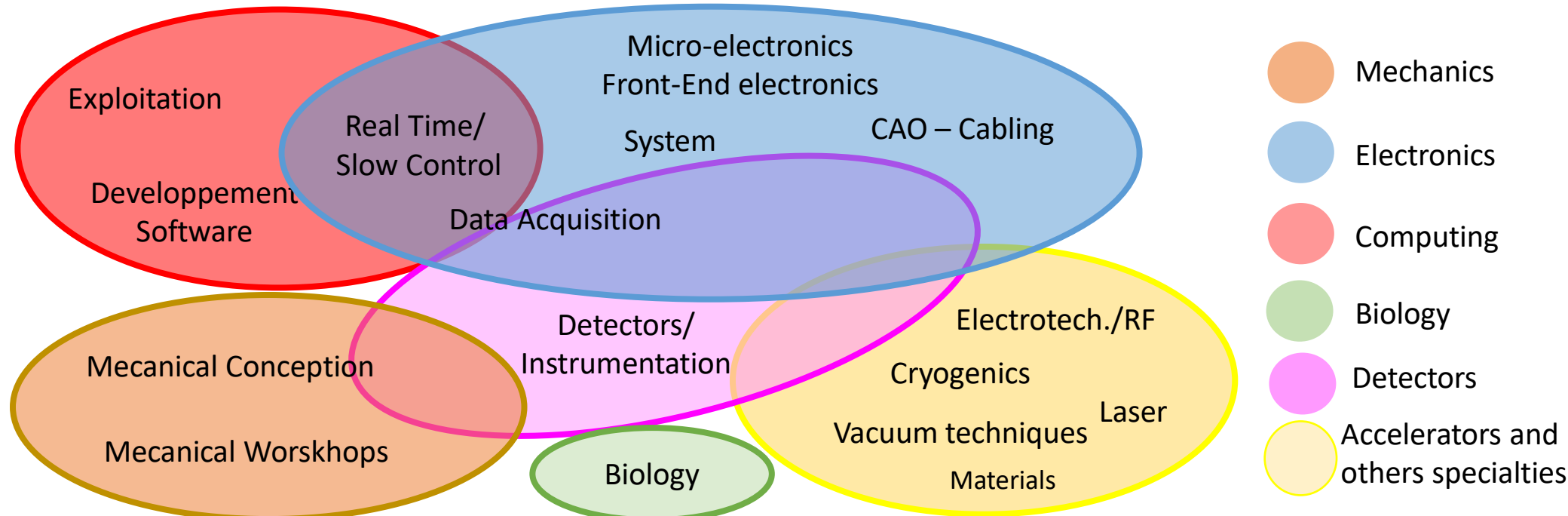
Services in accelerator Pole

- RF
 - Cryogenics
- ~30 staff members

Technical staff with technical skills/expertise

essential pillars for the laboratory to design, draw and build instruments.

- Technical services are fuelled by the challenges of research (R&D and projects)
- The proximity of technical and research teams (integrated teams)
- The ability to combine and make coexist versatility and specialization





IJCLab in a nutshell: Support Services Support

The Support Services are essential to support all scientific and technical activities of the laboratory

Administration

Division accueil et ressources humaines

Division achats et logistique
Service logistique

Division financière
Service contrats

Service des marchés

47 members

A strong and newly structured administrative department
3 divisions
2 departments

3

CeMaP

Project Management Unit. Accompanies and supports project leaders, provides input and advises IJCLab management.

38 members

Management of libraries, common digital library, simplified access to all documentary resources and laboratory productions.

National/international visibility of the IJCLab: external and internal communication, organization of events, heritage activities...).

Support to teaching activities: make the IJCLab a meeting place for students.

Essential for a "laboratory builder". for the success of the new implementation of IJCLab.

Key role, given the specificity of our research activities and all the facilities involved.

International cooperation and links with companies: two pillars of IJCLab

Services support

Documentation

Communication & Événementiel

Enseignement

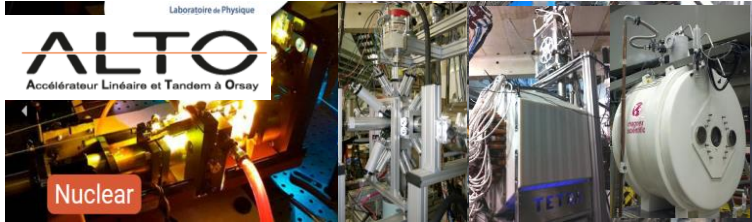
Infrastructures

Prévention des risques

STIRI



IJClab in a nutshell – IV : The Platforms



- **15 MV Tandem** (from proton to aggregates)
- **electron linac** -> radioactive beams by photofission

Nuclear, Health physics, Irradiation

Opened to external users



Several MeV protons, multicharged atomic ions, gold molecules and nanoparticles

Nuclear/A2C, Health physics, Irradiation

Opened to external users



Ion irradiation / implantation and *in situ* characterization techniques (TEM, IBA)

Energy, nuclear materials, Health physics, Irradiation physics and chemistry

Opened to external users

Semiconductor Platform :

Silicon Detector
Characterisation/Production



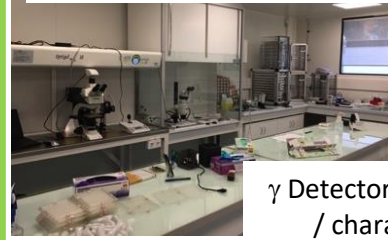
A2C Research themes

CALVA



Cavity locking/Squeezing for VIRGO and ET

Micrometeorite Preparation/analysis



Myrtho

γ Detectors development / characterization

Radiochemistry laboratory Actinides - Bat 107



IJClab in a nutshell – V : The Platforms

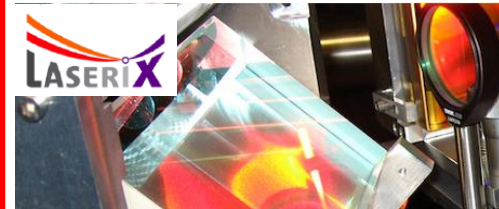
Accelerators research themes/technologies

Opening to Materials, atomic physics, detectors



SUPRATECH

R&D on the superconducting cavities (prepare, package, assemble & test of the superconducting RF cavities).



LaseriX

coherent, intense, brief (50fs to 10 ps) sources in near-infrared (800nm) and EUV (30 to 90 eV)



Vide et Surfaces
In construction

VIRTUAL DATA

Advanced computing
resources infrastructure
Grid / Cloud



Health research themes

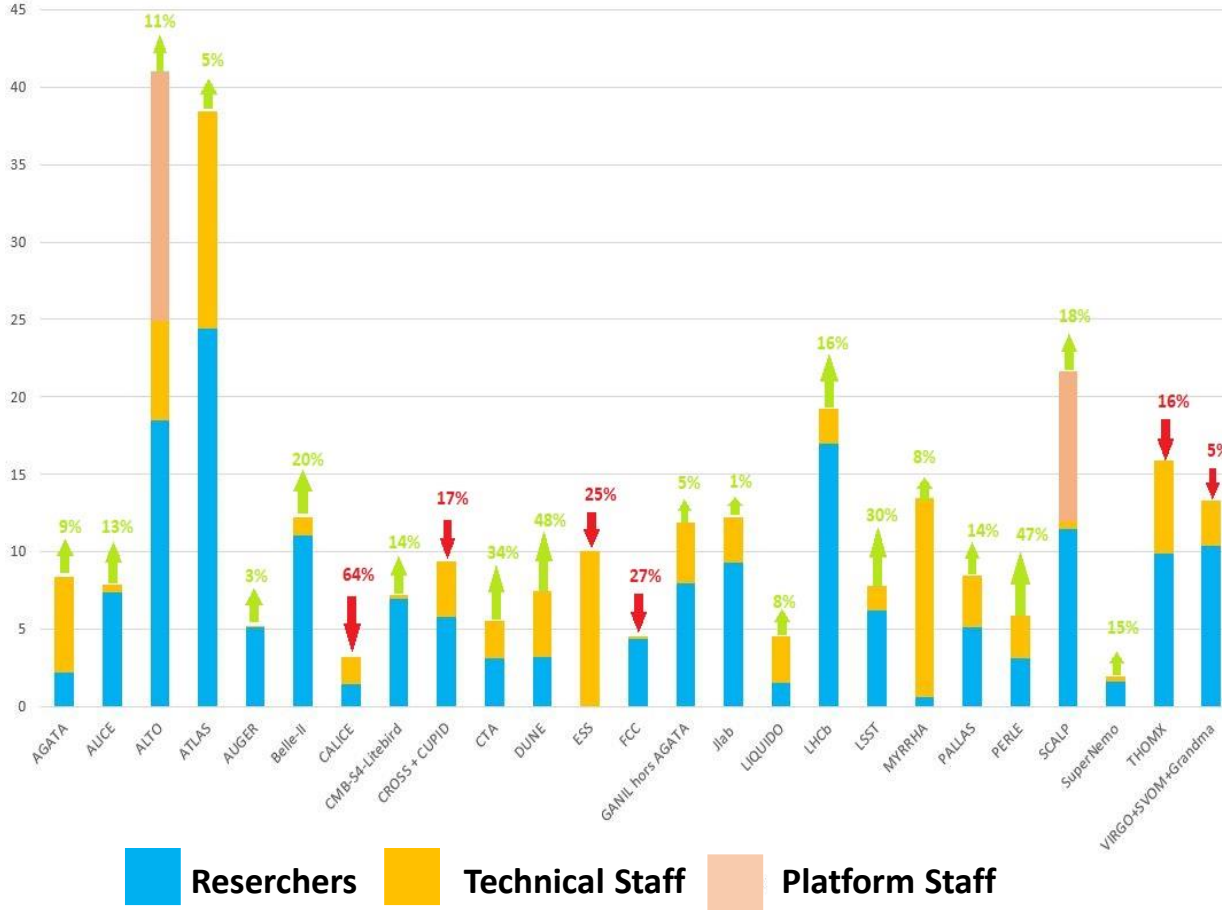


non linear optical biphotonique imaging



Large Project at IJCLab on PHE, Nuclear, A2C, Accelerator Physics

Implications of IJCLab in the largest projects (most with increasing forces)



Technical implications

Some comments/example

- AGATA** - National Technical Leader
- ALTO** - National Platforms/leaders most exp.
- Belle II** - New Spokesperson of IJCLab
- CALICE** - IJCLab Spokeperson
- DUNE** - National Technical Leader
- ESS** - National responsibility with IRFU
- Jlab** - CLAS12 Spokesperson
- LiquidO** - Spokesperson
- LHCb** - New Physics Coordinator
- MyRRHA** - National responsibility with IRFU
- PERLE** - International Technical coordination
- AstroGam** - CoPI M7 Call



Major laboratoires with facilities or facilities in the world where IJCLab is involved

Europe

SCK-CEN-Belgium

CERN

CTA-Spain

DESY-Germany

Dubna-Russia

EGO/VIRGO-Italy

ESS-Sweden

GANIL-France

GSI-Germany

Jyväskylä -Finland

LNCA-France

LNGS-Italy

LNL-Italy

LSM-France

World

Auger-Argentina

LBNL/SLAC-US

Fermilab-US

JLab-US

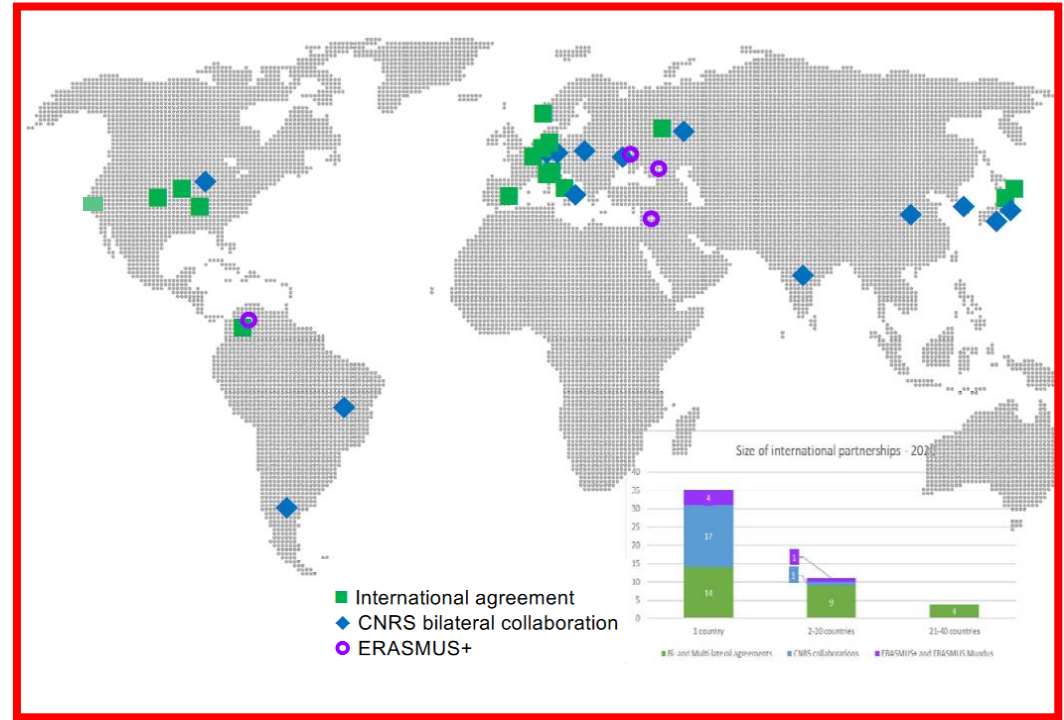
KEK-Japan

LSST-Chili

Riken-Japan

Each year, several bilateral international collaborations are signed with research centers and universities.

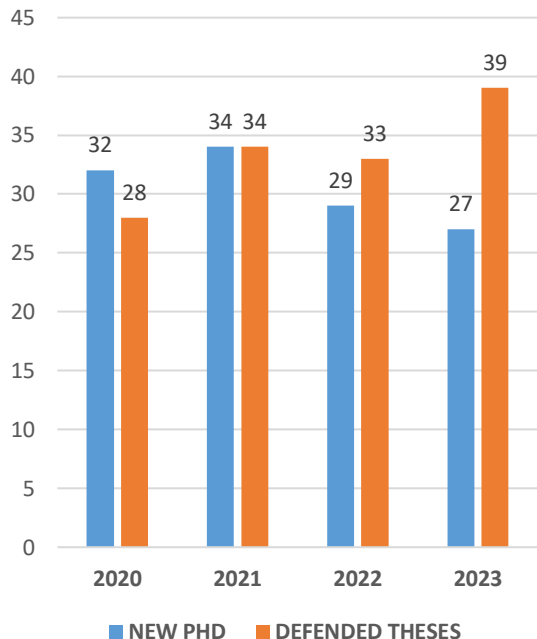
Recent example given below



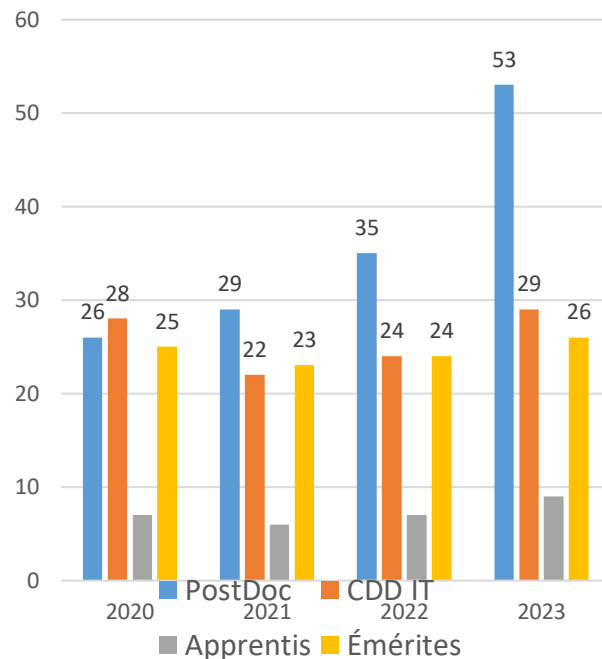


Some significant figures on "students" / young people

PHD/Thèses

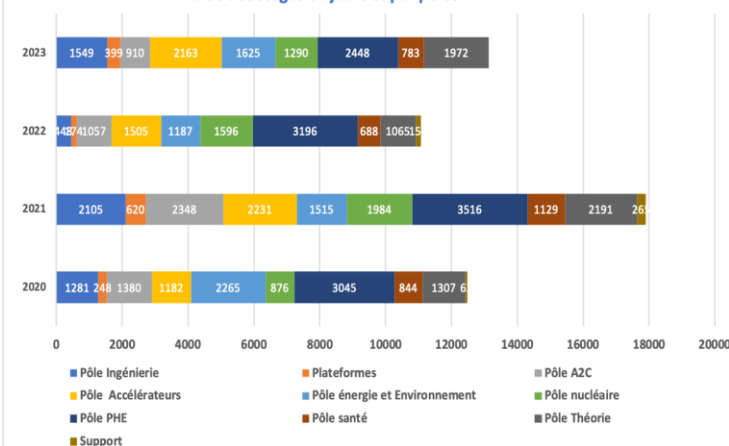


~30 doctorants entrants/an
~30 soutenances de doctorats/an



Une augmentation timide des PostDocs,
à confirmer avec le succès croissant des
différents appels nationaux/européens.

Durée des stages en jours et par pôles



	2020	2021	2022	2023
Nombre de stagiaires	151	210	148	169
Nombre de mois	530	664	436	505
% L	25%	32%	24%	43%
% M1	28%	36%	32%	30%
% M2	47%	32%	34%	27%

Stages - Stratégie visible du laboratoire



IJCLab : “A Year budget”

Assigned by governing bodies	Laboratory operation	~4,0M€
	Specific programs	~4,0M€
Contracts : ANR/Europe/industry/Region...		~6,0M€
Own Resources (overheads, services, ..)		~2.0M€
TOTAL RESOURCES		~16M€

Salary of permanent staff	~40.5M€
Salary of non permanent	~2.5M€
<i>The salaries of the permanent staff are not in the laboratory budget : directly payed by the employers (CNRS/Universities)</i>	



Rénovation et nouvel urbanisme de la Vallée d'Orsay

La transformation de la vallée d'Orsay a accompagné la création d'IJCLab.
Aujourd'hui elle a pris un nouvel élan après la création d'IJCLab.

Extension bâtiment 108



Salle blanche bâtiment 200



Restructuration du Hall D1-D2, de l'IGLOO, bat 201



Entrée du laboratoire – Bâtiment 100

Extension Virtual Data bâtiment 206



Ateliers bâtiment 100



Ateliers bâtiment 200



Hall D3-D4 Bâtiments 201



Cafeteria – Bât.102





Operations CPER 2015-2022.

Operation	Budget used	Budget still available[M€]	End date
IGLEX (D1-D2)	3.6		May-21
Renovation Bat. 104	1.9	2.4	Apr-23
Virtual DATA (Bat 206)	2.2		Aug-20
Workshop "Vacuum & Surface" (D3-D4)	1.2		Apr-22
Ateliers Mechaniques (Bat 100, 200)	2.4		Apr-22
Extension SCALP-JANNuS (Bat 108)	1.5		Apr-22
Construction Plateforme PSI (Bat 200)	0.4		Jul-19
Renovation Bat 100, 102, 103, 200, 208	1.6		Dec-21
Zone Laser area bat 200	1.4		Feb-21
Renovation "Theorie" bat 100		0.5	Sep-23
Renovation Construction Hall bat 106	0.5		Mar-20
TOTAL	16.7	2.9	

9.1M€ CPER 2022-2027.

Ce projet est actuellement en cours de programmation afin de déterminer les opérations spécifiques à mettre en œuvre.

Deux axes :

- Rénovation/restructuration ciblée de certains bâtiments de l'IJCLab pour améliorer l'environnement et la qualité du travail.
- Mise à niveau des bâtiments techniques en vue de la construction de PERLE.



In conclusions, our Manifesto

- **Contributing to projects at all stages:** proposal, design, construction, operation, data analysis, theory
- **Playing a major role in the conception, design and construction of current and future accelerators.**
- **Developing and operating research infrastructures and technological platforms** supporting these research areas as well as original research in health physics and energy
- **Promoting the development of new technologies for science for the benefit of society** and thus supporting national and European industrial competitiveness
- **Welcoming students that the laboratory trains through and for research** in the heart of a world-class academic environment.