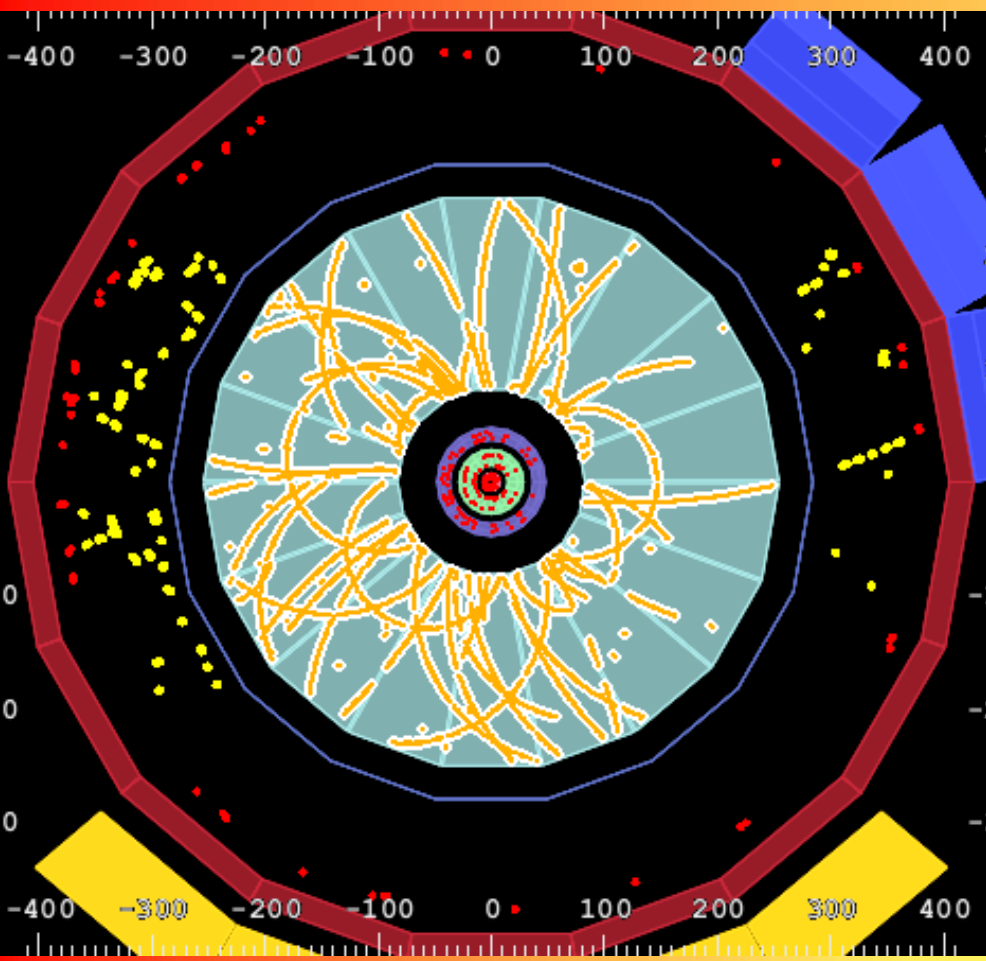


# FCPPL

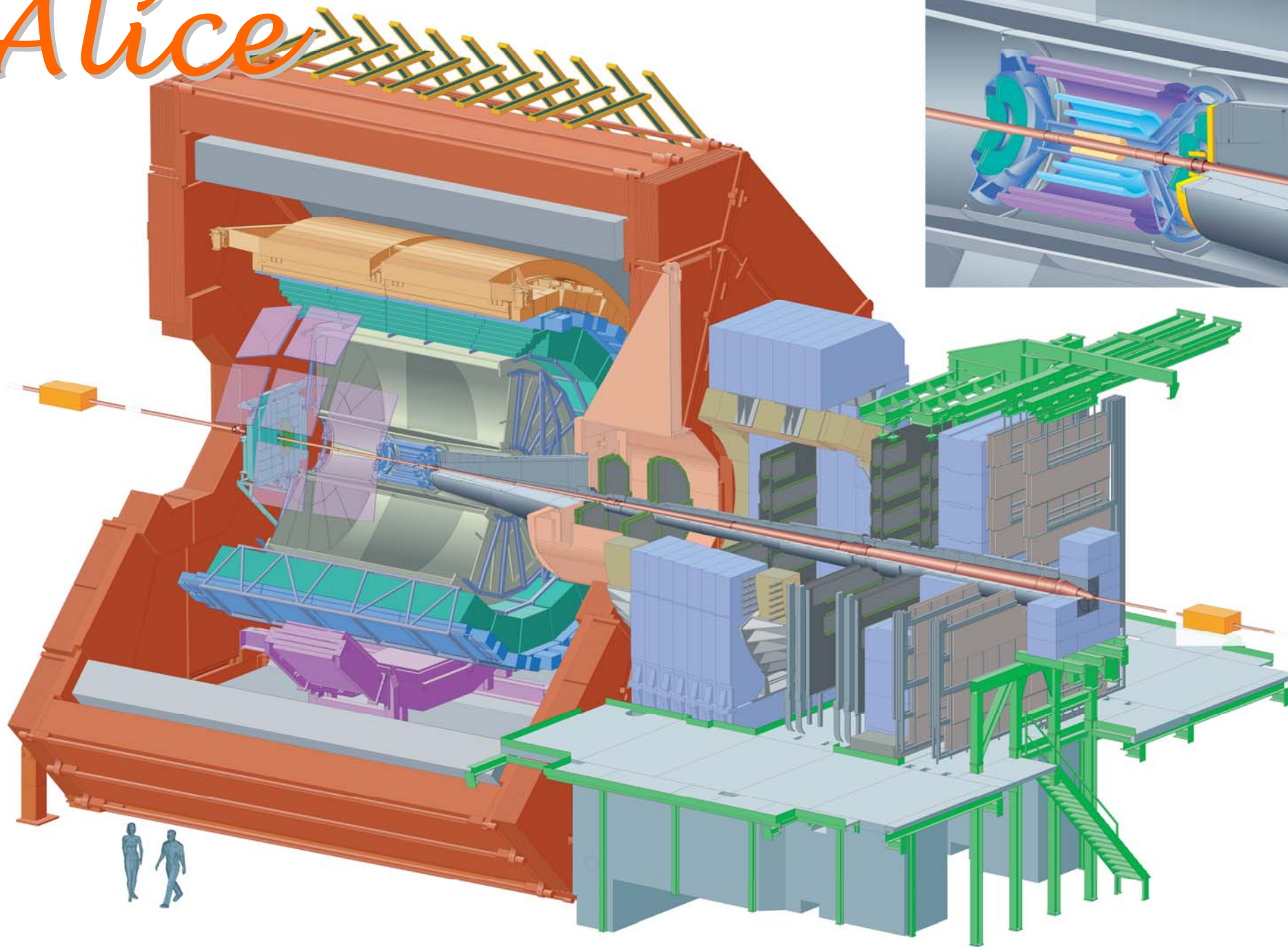
3<sup>rd</sup> FCPPL Workshop, Lyon April 2010



## LHC-CCNU-IN2P3-Alice

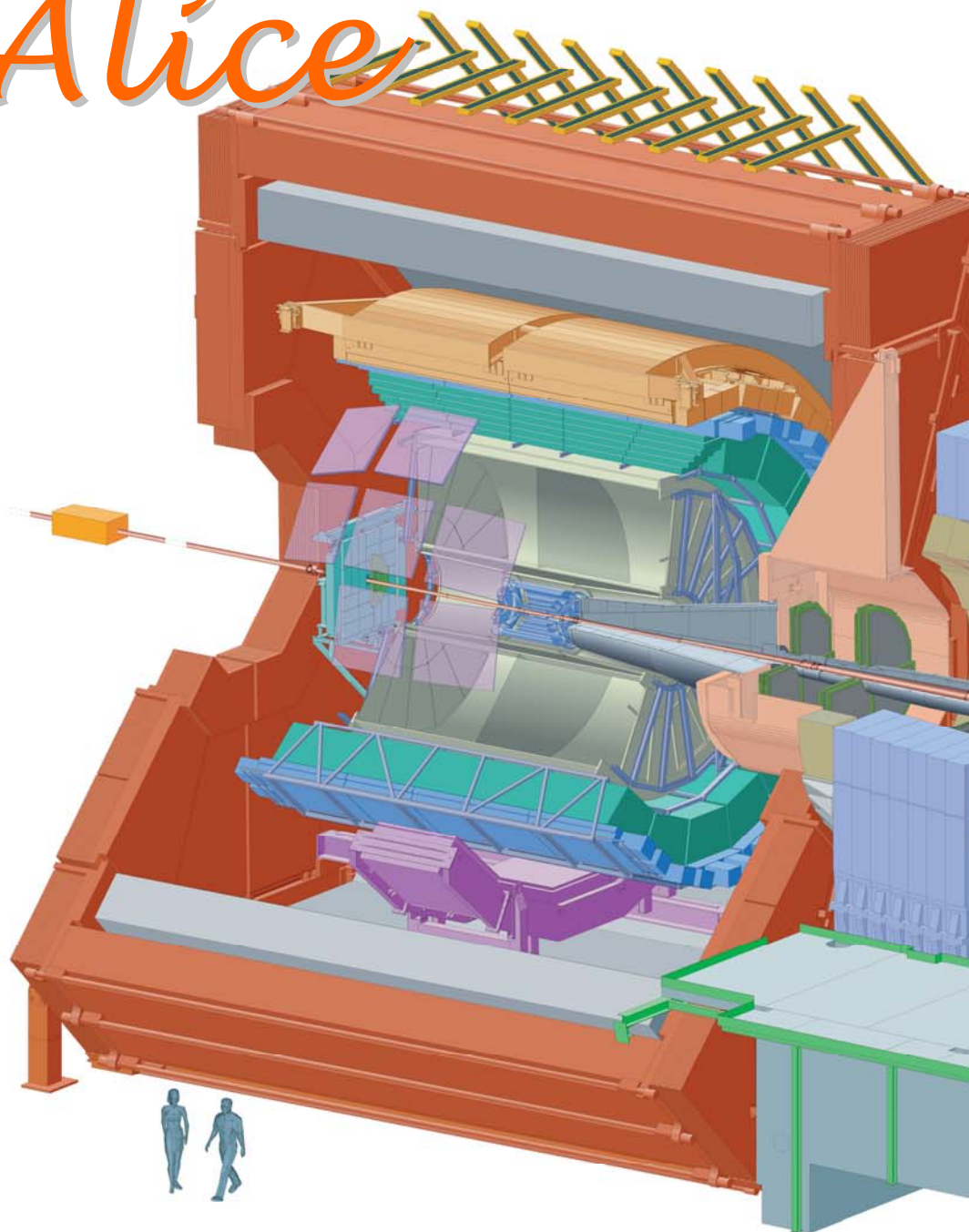
- Alice today
  - Experiment
  - 1<sup>st</sup> steps toward the Physics
- FCPPL-Alice collaboration
  - Involvements
  - Status
  - Plans

# Alice





# Alice



## Central Detectors

Inner Tracking System	100%
Time Projection Chamber	100%
Time-of-Flight	100%
Transition Radiation Detector	40%

## Multiplicity Detectors:

Photon Multiplicity (PMD)	100%
Forward Multiplicity (FMD)	100%

## Spectrometers:

HMPID	100%
Photon Spectrometer	60%
Muon Spectrometer	100%

## Calorimeters:

Zero Degree Calorimeter	100%
EM Calorimeter	40%

## Trigger:

Trigger Detectors	100%
High-Level-Trigger	100%



# Alice Heavy Ion Physics



## Foreword

- LHC : unexplored region → Start of a new era in physics
- ALICE designed to explore and correlate most of the QGP signals

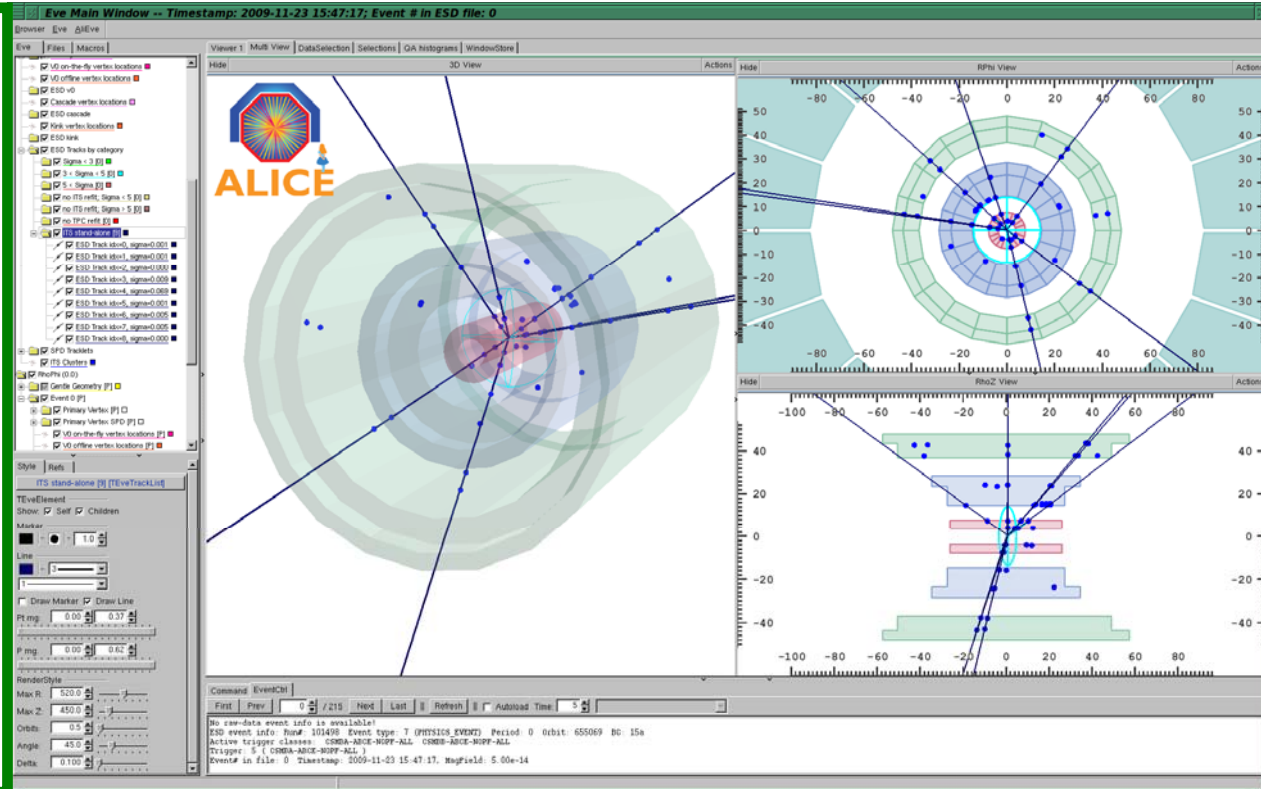
- ❑ Soft probes (from particles produced in the late stage of the collision) :
  - RHIC capabilities and beyond
    - Determine expansion dynamics (different from RHIC)
    - RHIC measurements with extended PID ( $T$ ,  $\mu_B$ ,  $\varepsilon$ , spectra, collective effects)
- ❑ Hard probes (from particles produced in the early stage of the collision) :
  - Jets, photons,  $\pi^0$  at high  $p_T$  : initial QGP density, temperature...
  - Heavy flavours : open heavy flavours (D and B) and quarkonia ( $J/\Psi$ ,  $\Psi'$ ,  $Y_s$ ) both in central barrel ( $e^+e^-$  at  $-0.9 < \eta < 0.9$ ) and muon arm ( $\mu^+\mu^-$  at  $-4 < \eta < -2.5$ ) for QGP properties



➤ 1<sup>st</sup> collisions @ 900 GeV on Nov. 23 2009 : it works !!

## ALICE conditions:

- No magnetic field
- Active subsystems  
ITS V0 FMD ZDC  
EMCAL
- Trigger  
(Coincidence of beams and  $\geq 2$  firing chips in SPD)
- Interaction rate:  $\sim 0.11$  Hz



➤ Data sample collected 284 events (43 min) :  
Sufficient to measure  $dN_{ch}/d\eta$

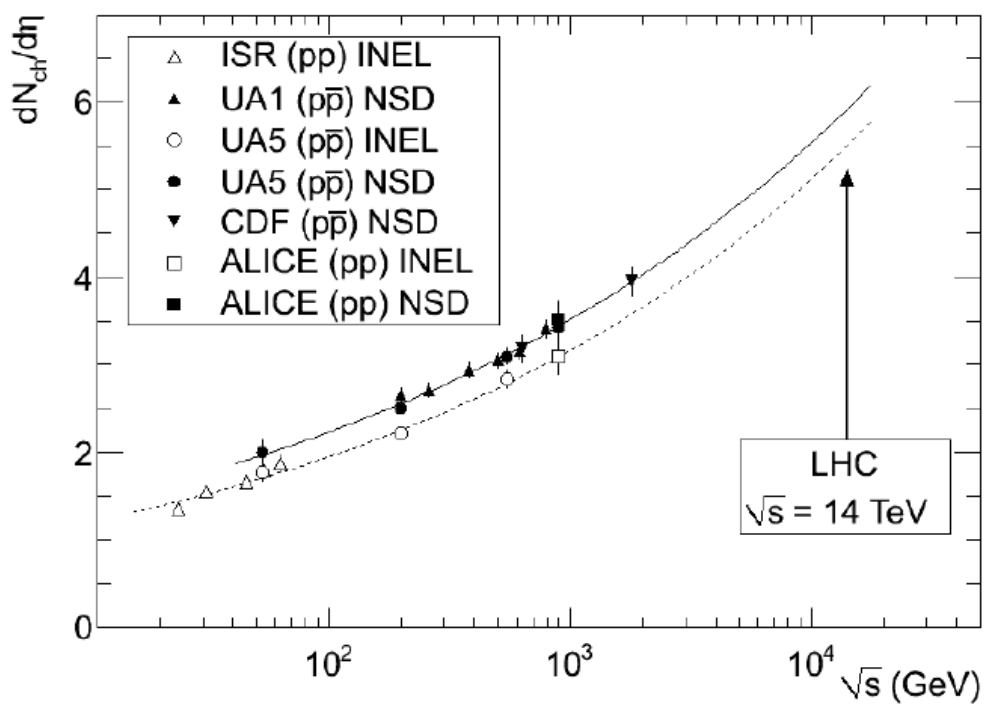


# First LHC physics paper for pp@900 GeV



→ Submitted on Nov. 28<sup>th</sup> 2009  
 → Accepted on Dec. 1<sup>st</sup> 2009

ALICE Collaboration  
 Eur.Phys.J.C65:111-125,2010



$$dN/d\eta = 3.10 \pm 0.13 \text{ (stat.)} \pm 0.22 \text{ (syst.)}$$

➤ 1<sup>st</sup> ALICE results match the observed energy dependence



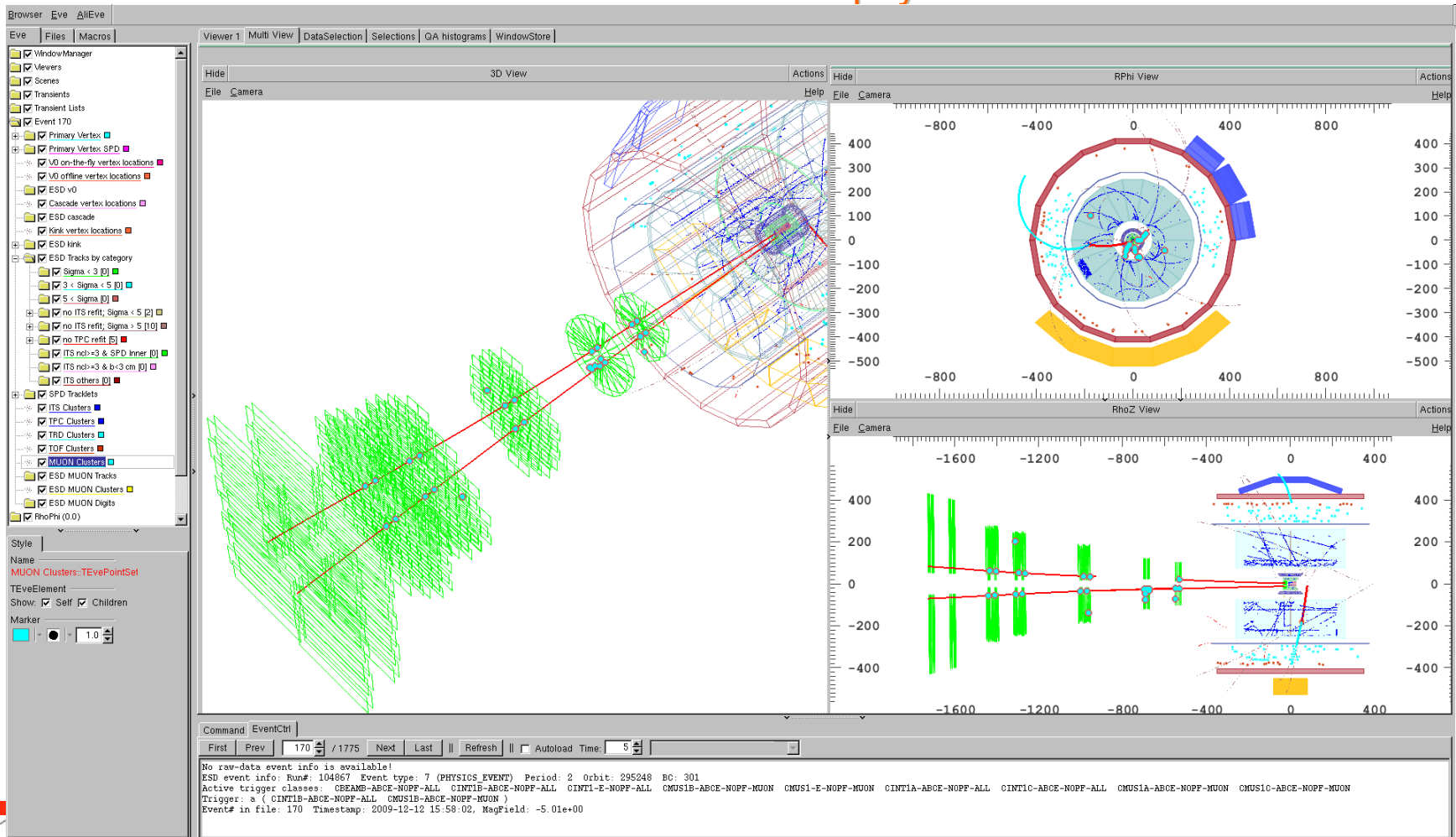




# ALICE and the first stable beams



- ❑ On Dec. 6 2009, *stable beams* declared : Switch on **all ALICE detectors**
- ❑ Until Dec. 14 : **400k events pp@900 GeV** recorded with  $B=0.5T$  and all ALICE detectors included !
- Detailed detector validation and **next-to-first physics**

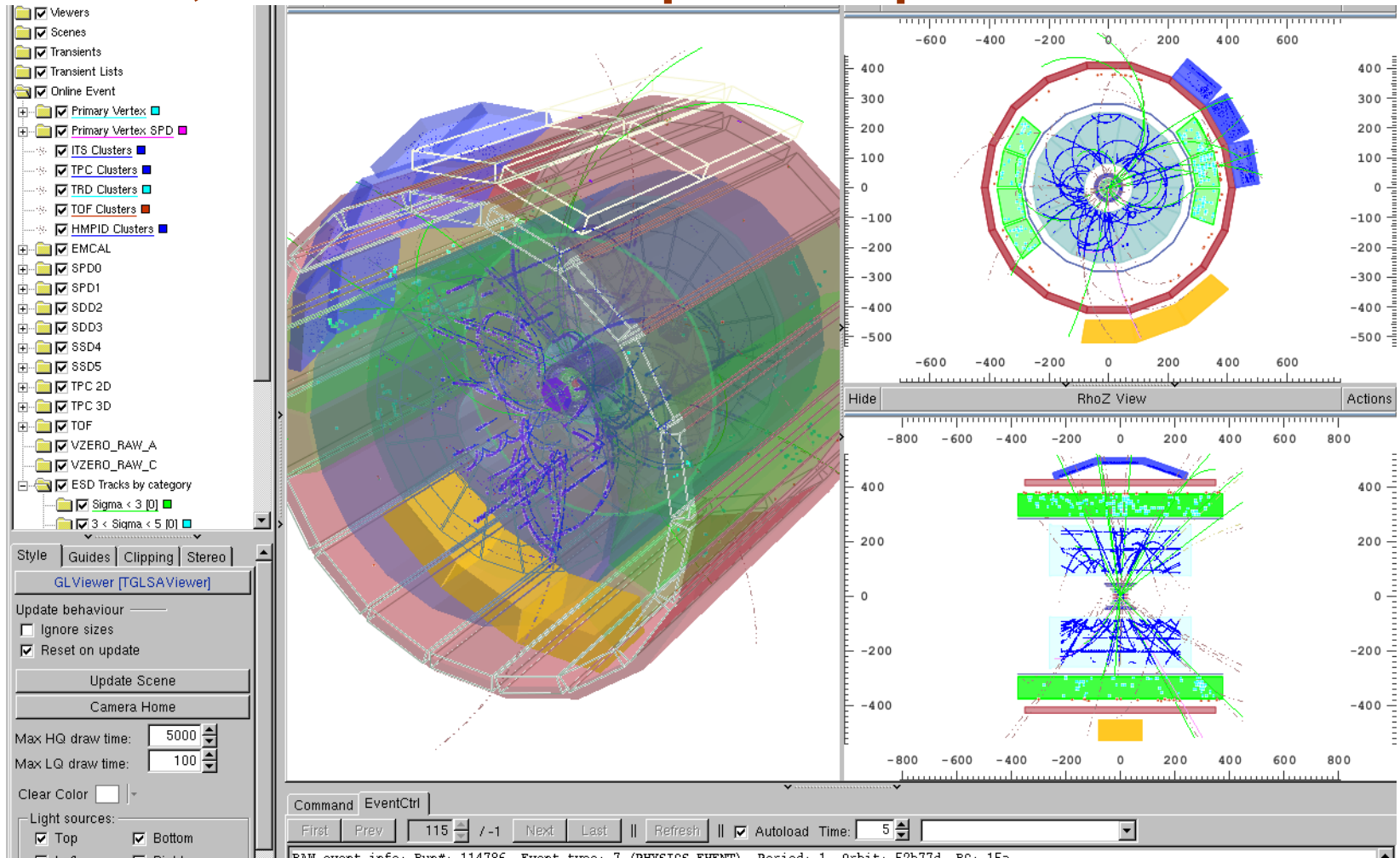




# ALICE towards its physics pgm



## March, 30<sup>th</sup> 2010 : 7 TeV proton – proton collisions



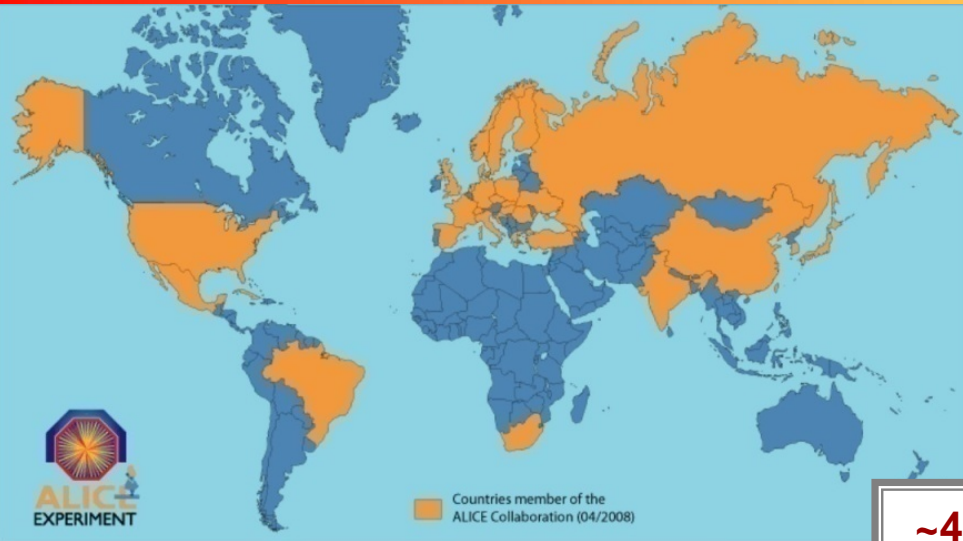
« This is the moment we have been waiting and preparing for. »

Jürgen Schukraft

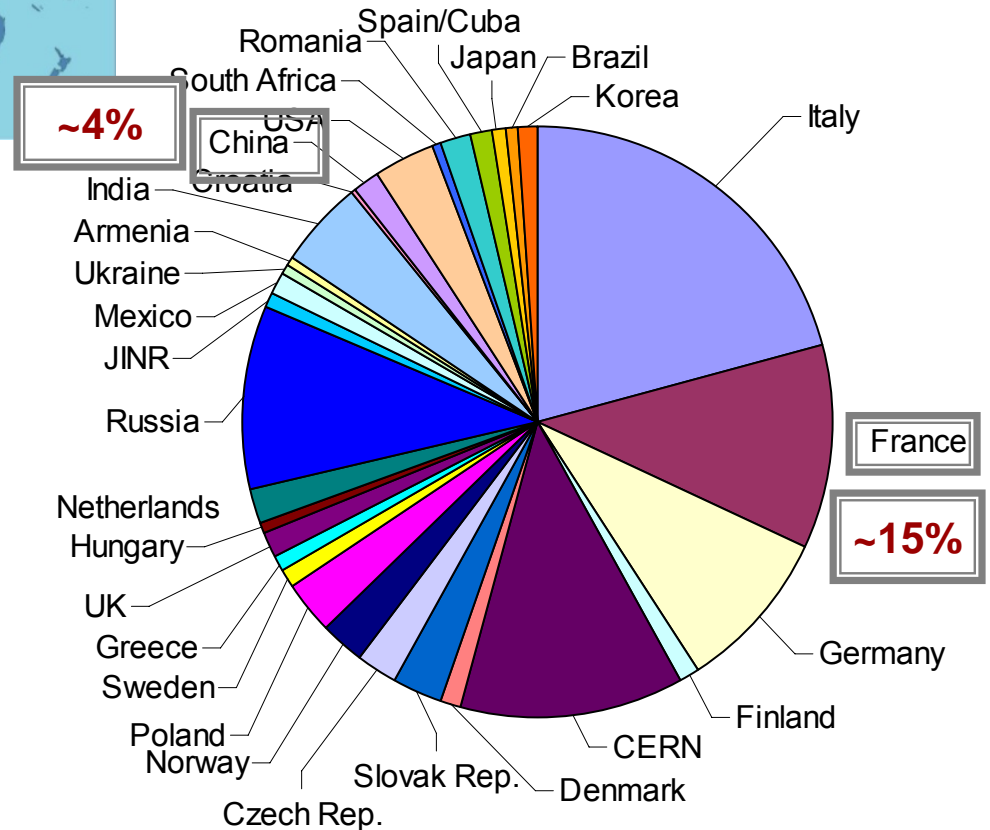




# The ALICE collaboration



1000 members  
109 institutes  
31 countries



# ALICE in China

0 500 km  
0 300 miles



- 3 labs
- 9 physicists
- 7 technical staff
- 8 ph-d students

# ALICE in France



Paris



Strasbourg

Nantes



Clermont-Ferrand



Lyon



Grenoble



8 labs

40 physicists

10 technical staff

11 ph-d students





**ITS/SSD**  
**SUBATECH, IPHC**  
 (+ CERN, Italie, Poland, Russia, Ukrain, Holland, Finland)

**DCAL**  
**SUBATECH, IPHC, LPSC, CCNU**  
 (+ USA, Italy, Japan)

**EMCAL**  
**SUBATECH, IPHC, LPSC**  
 (+ USA, Italy)

**MUON-GMS**  
**IPNL, LPSC**  
 (+ Armenia)

**V0**  
**IPNL**  
 (+ Mexico)

**MUON-trigger**  
**LPC, SUBATECH**  
 (+ Italy)

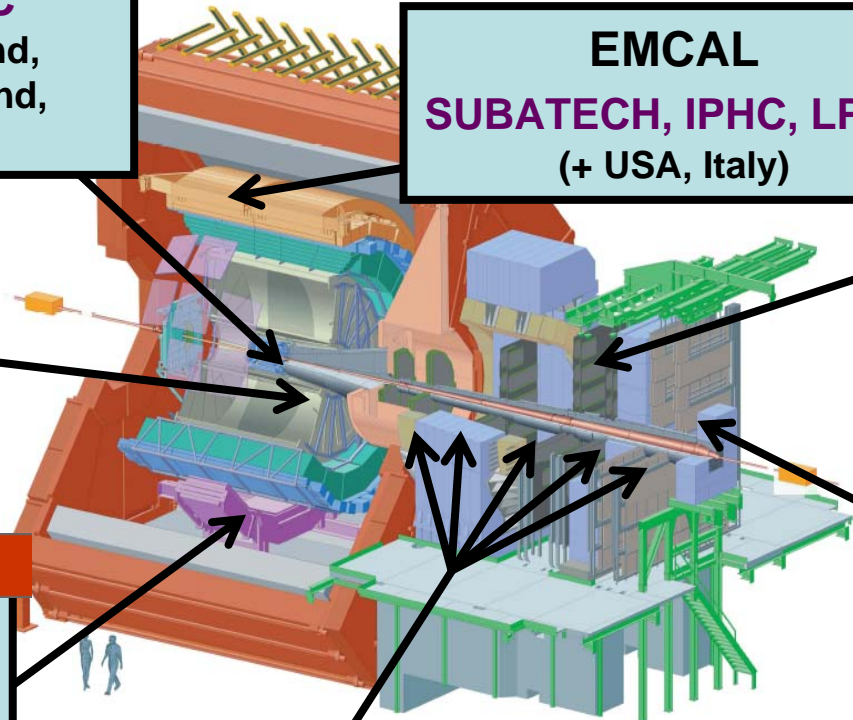
**PHOS**  
**CCNU, CIAE, HUST**  
 (+ CERN, Czech Republic, Germany, Japan, Norway, Poland, Russia)

**MUON-tracking**  
**SUBATECH, IPNO, SACLAY**  
 (+ Italy, India, Russia)

**physics**

- quarkonia & heavy flavours
- soft physics & strangeness
- jets & photons

**offline, online, computing, management**





# The FCPPL-Alice project



## LHC-CCNU-IN2P3-Alice

French Group			Chinese Group		
Name	Title	Affiliation	Name	Title	Affiliation
<u>Leader:</u> Crochet Philippe and Roy Christelle	CR	IN2P3	<u>Leader:</u> Zhou Daicui	Prof.	CCNU
Aphécetche Laurent	CR	IN2P3	Cai Xu	Prof.	CCNU
Bastid Nicole	PR	IN2P3	Yang Chunbin	Prof.	CCNU
Batigne Guillaume	MC	IN2P3	Yin Zhongbao	Ass. Prof.	CCNU
Cheynis Brigitte	CR	IN2P3	Zhou Daimei	Ass Prof.	CCNU
Delagrangé Hugues	DR	IN2P3	Wang Yaping	Lecturer	CCNU
Dialinas Manoel	IR1	IN2P3	Ma Ke	Post-Doc	CCNU
Ducroux Laurent	MC	IN2P3	Sun Liang	Post-Doc	CCNU
Dupieux Pascal	DR	IN2P3	Ding Hengtong	Dr. Student	CCNU
Estienne Magali	CR	IN2P3	Yuan Xianbao	Dr. Student	CCNU
Germain Marie	CR	IN2P3	Mao Yaxian	Dr. Student	CCNU
Grossiord Jean-Yves	DR	IN2P3	Xiang Wenchang	Dr. Student	CCNU
Martinez-Garcia Ginès	DR	IN2P3	Wan Renzhuo	Dr. Student	CCNU
Massacrier Laure	Dr. Student	IN2P3	Zhang Xiaoming	M. Student	CCNU
Pillot Philippe	CR	IN2P3	Zhu Jianlin	Dr. Student	CCNU
Rosnet Philippe	Prof.	IN2P3	Wang Dong	Dr. Student	CCNU
Tieulent Raphaël	CR	IN2P3	Xiang Changzhou	Dr. Student	CCNU
Schutz Yves	DR	IN2P3	Zhang Fan	Dr. Student	CCNU
			Wang Mengliang	Dr. Student	CCNU

- Study of QCD matter with the Alice detector
- 38 members
- Activities : Computing & Physics (photons, jets, muons)



## Theses

- October 09 : Start of two new theses (co-tutorship with Wuhan)
  - Xiaoming Zhang (CCNU) at LPC-Clermont-Ferrand
    - Open heavy flavors via single and dimuons in pp and AA collisions
    - 6 months alternately in France and China over 3 years
    - 2 years from the French Embassy PhD program + 3 months from a grant from French Embassy (3 months still remains to be funded)
  - Renzhuo Wan (CCNU) at IPHC-Strasbourg
    - Neutral pion analyses in pp and AA collisions
    - 1 year in China, 2 years in France
    - 3 years from China Scholarship Council
  
- In (nice) progress :
  - Yaxian Mao (CCNU) at LPSC-Grenoble for her ph-d (Y2)
    - Gamma-hadron correlations
    - 3 years in LPSC-Grenoble
    - 3 years from China Scholarship Council

... See their talks







## Postdoc

- During 2009 :
  - Liang Sun in IPNL-Lyon for one year
    - Analysis of  $\rho, \omega, \Phi$  low mass resonances via dimuon productions
    - 1 year by IN2P3 (1 additional year requested via FCPPL)

## Visits

- Visit of a Chinese physicist (Daicui Zhou) in IPN-Lyon (May 09)
- Visit of a French physicist (Jean-Yves Grossiord) in Wuhan (Nov.Dec.09)
  - Discussion on low mass leptonic physic in the framework of Liang Sun work
- Visit of two Chinese physicists (Daicui Zhou, Yaping Wang - CCNU) in Subatech-Nantes (July 09)
  - Identification of their need for their involvement in the DCal project

## 2<sup>nd</sup> FCPPL Workshop at CCNU

- 4 French physicists from FCPPL-Alice





## Publications/Conferences ...

- ❑ ALICE internal note (ALICE-INT-2009-004)  
L. Manceau, X. Zhang, N. Bastid, P. Crochet, S. Grigoryan and D. Zhou  
*Performances of the ALICE muon spectrometer for charm and bottom production cross-section measurements in proton-proton collisions at 14 TeV*
- ❑ Poster at Quark Matter 2009, March 30- April 4, 2009, USA
  - Yaxian Mao, Gustavo Conesa Balbastre, Yves Schutz, Daicui Zhou, Christophe Furget  
*Jet properties in  $\gamma$ -hadron correlation measurement in ALICE*
- ❑ Talks at QNP2009, Sept. 20-26, 2009
  - Yaxian Mao *QGP tomography with direct photons and jets*
  - Xiaoming Zhang *Measurement of B- & D-hadron Production X-Section in pp Collisions with ALICE Muon Spectrometer*
- ❑ Talks at Journées QGP-France, Sept. 15-18, 2009
  - Yaxian Mao *Direct photon-hadron correlations to probe the HI medium*
  - Liang Sun *Background study in the low mass  $\mu^+\mu^-$  region in ALICE*
- ❑ Several talks in Collaboration Meetings and Physics working group meetings





# FCPPL - Alice project for 2010

Travels & stays for Chinese/French physicists in France/China

- Physics pgm (muons, photons, jets...)
- Dcal project
- Wuhan Tier2

France	Euro/unit	Nb of units	Total (euros)	Requested to: *
Stay costs for French Physicists to Lyon (FCPPL workshop)	3 days * 90	6	1620	IN2P3
Travel costs from IPHC to Wuhan	~1000	3	3000	IN2P3
Stay costs (IPHC in Wuhan)	5 days * 150	3	2250	IN2P3
Travel costs from LPC to Wuhan	~1000	1	1000	IN2P3
Stay costs (LPC in Wuhan)	5 days * 150	1	750	IN2P3
Travel costs from Subatech to Wuhan	~1000	2	2000	IN2P3
Stay costs (Subatech in Wuhan)	10 days * 150	2	3000	IN2P3
Stay costs for 2 Wuhan technicians at Nantes for one and half months	1550	2	4650 (2 * 1.5 months at Nantes)	IN2P3
Stay costs for 2 Wuhan technicians at Grenoble for one and half months	1550	2	4650 (2 * 1.5 months at Grenoble)	IN2P3
Total			22920	

China	Yuan/Unit	Nb of units	Total (Yuan)	Requested to: **
Travel costs for 7 physicists to FCPPL workshop at Lyon	1,000	7	70,000	CCNU
Stay costs for 7 physicists to FCPPL workshop at Lyon for 5 days	1500	7*5(days)	52,500	CCNU
Travels for 3 people from Wuhan to Subatech for upgrade EMCAL (X-Cal) strip module cooperation	10,000	3	30,000	CCNU
Stay costs for 1 Wuhan physicists at Subatech for the X-Cal cooperation	1500	1*7	10,500	CCNU
Travels for 3 Wuhan people to LPSC for upgrade EMCAL (X-Cal) cooperation	10,000	3	30,000	CCNU
Stay costs for 1 Wuhan physicist at LPSC for the X-Cal super-modules	1500	1*7	10,500	CCNU
total			203,500	CCNU







# FCPPL - Alice project for 2010



Funding from France			Funding from China		
Provided by or requested to ***	Type	Euro	Provided by or requested to	Type	Yuan
To be defined	12 months (Liang Sun, Postdoc at IPN Lyon)	To be defined			
French Embassy	Stay for one student from Wuhan at Subatech	4650 (3 months at 1550 Euros)			
French Embassy	Stay for one student from Wuhan at Clermont	4650 (3 months at 1550 Euros)			

- 3 months stay for :
  - a Chinese student from Wuhan at Subatech
  - a Chinese student from Wuhan at LPCClermont (a candidate identified)
  
- 12 months stay for Liang Sun at IPNL-Lyon





# Summary



- FCPPL-Alice Chinese/French collaboration is very fruitful
  - Excellent contributions of students (publications, talks,...)
  
- A future already set :
  - Toward the first physics results with real data
    - proton-proton collisions
    - First heavy ion beam in November
  - Toward the new DCal project

