

14th Workshop of the France China Particle Physics Laboratory (FCPPL2023)

Nov 6 – 10, 2023

Institut Franco-chinois de l'Energie Nucléaire, SYSU Zhuhai Campus

- Short « just-out-of-the-oven » minutes of the Steering Committee
- Wrap-up

Projects supported in 2023

- 28 projects supported in 2023: 190 k€ requested to FCPPL and 70 k€ distributed to projects
- Next Call for Proposal in Dec 2023

French PI	PI Lab	Chinese PI	PI Lab	Title	Acronym
BARBERO Marlon	CPPM	WEI Wei	IHEP	LHC-IHEP-CPPM-ATLAS-R&D: detector R&D	
BARSUK Sergey	IJCLab	HE-Jibo	UCAS Beijing	Charmonia in LHCb	LHCbQQ
BASTID Nicole	LPC Clermont	ZHANG Xiaoming/ ZHOU Daicui	IOPP / CCNU	Study of QCD matter with the ALICE detector	PAP_ZHANG-ZHOU_BASTID_ALICE
BAUDOT Jérôme	IPHC	OUYANG Qun	IHEP	Belle II vertex detector upgrade	BVU
BECHETOILLE Edouard	IP2I	ZHANG Liang	SDU	ASIC development for strip-pixel sensor	PICMIC
BERNARDI Grégorio	APC	YANG Haijun	SJTU	Search for HH production at the LHC	PAP_SITU_APC_HHPS
BOUDRY Vincent	LLR	RUAN Manqi	IHEP	an SiW-ECAL optimized for e+e- collisions	DEV_IHEP+LLR_EPDET
CACCIAPAGLIA Giacomo	IP2I	Zhang Hong-Hao	SYSU	Gravitational Wave signals and Cosmology of Composite Higgs Models	CompoGW
CERNA Cedric	LP2I Bordeaux	HE Miao	IHEP	The JUNO Small Photomultipliers Tube (SPMT) system	JUNO-SPMT
CHARLOT Claude	LLR	Qiang Li	PKU	VBS longitudinal scattering at LHC and future machines	VBSPOL
COYLE Paschal	CPPM	YANG lili	SYSU	Multi-messenger analysis with KM3NeT	KM3ASTRO
DAVIER Michel	IJCLab	LI Liang	SJTU	BABAR measurements and muon magnetic anomaly	PAP_Li_Davier_BABARg-2
DRACOS Marcos	IPHC	Changgen Yang	IHEP	JUNO-IHEP-IPHC-muon-tracker: Adaptation of the OPERA Target Tracker to be used as Top Tracker for JUNO experiment	JUNOTT
DUPRAZ Kevin	IJCLab	TANG Chuanxiang	THU	Compton Source	Compton Source
FAUS-GOLFE Angeles	IJCLab	CHI Yunlog	IHEP	Optics design of a transverse monochromatic scheme for the direct s-channel Higgs production at FCC-ee	MONOCHROM
GASCON Suzanne	IP2I	CHEN Guoming	IHEP	Higgs boson discovery and measurement with photons in CMS	CMSHIGPHO
HERNANDEZ Fabio	CC-IN2P3	QI Fazhi	IHEP	TECHNOLOGIES FOR DATA PROCESSING PLATFORMS FOR HEP EXPERIMENTS	DEV-QI-HERNANDEZ-COMPUTING
LAKTINEH Imad	IP2I	YANG Haijun	SJTU	CALO-SJTU-IPNL-SDHCAL	SDHCAL
LAKTINEH Imad	IP2I	HAN Ran	BISEE (Beijing)	Muon Tomography	TOMO
MARTINEAU Olivier	LPNHE	WU XiangPing	NAOC (Beijing)	Collaboration around the GRAND project	GRAND
MONNIER Emmanuel	CPPM	JIN Shan	NJU	LHC-IHEP-CPPM-ATLAS: Physics at LHC with the ATLAS detector	
NERONOV Andrii	APC	QIANG Yuan	Purple Mountain lab (CAS)	Highest energy gamma-ray sky with LHAASO	LHAASO
PERDEREAU Olivier	IJCLab	CHEN Xuelel	NAOC (Beijing)	BAORadio & Tianlai (21 cm Cosmology)	BAO21cm
ROBBE Patrick	IJCLab	ZHANG Liming	THU	Bc studies and upgrade of ECAL for LHCb	BcECAL2LHCb
SANTOS Daniel et TAO Charling	LPSC Grenoble	YUE Qian	THU	Dark Matter	AST_YUE_SANTOS_UGLAB
SHAO Hua-Sheng	LPTHE Paris	MA Yan-Qing	PKU	Quarkonium studies at the LHC and future facilities	Quarkonium4AFTER
TISSERAND Vincent	LPC Clermont	Wenbin Qian	UCAS Beijing	Measurement of the CKM angle in Bs decays	GammaLHCb
ZHANG Zhiqing	IJCLab	PENG Haiping	USTC	Precision measurements of electroweak parameters at the LHC	LHC-THU/USTC-IJCLab-ATLAS

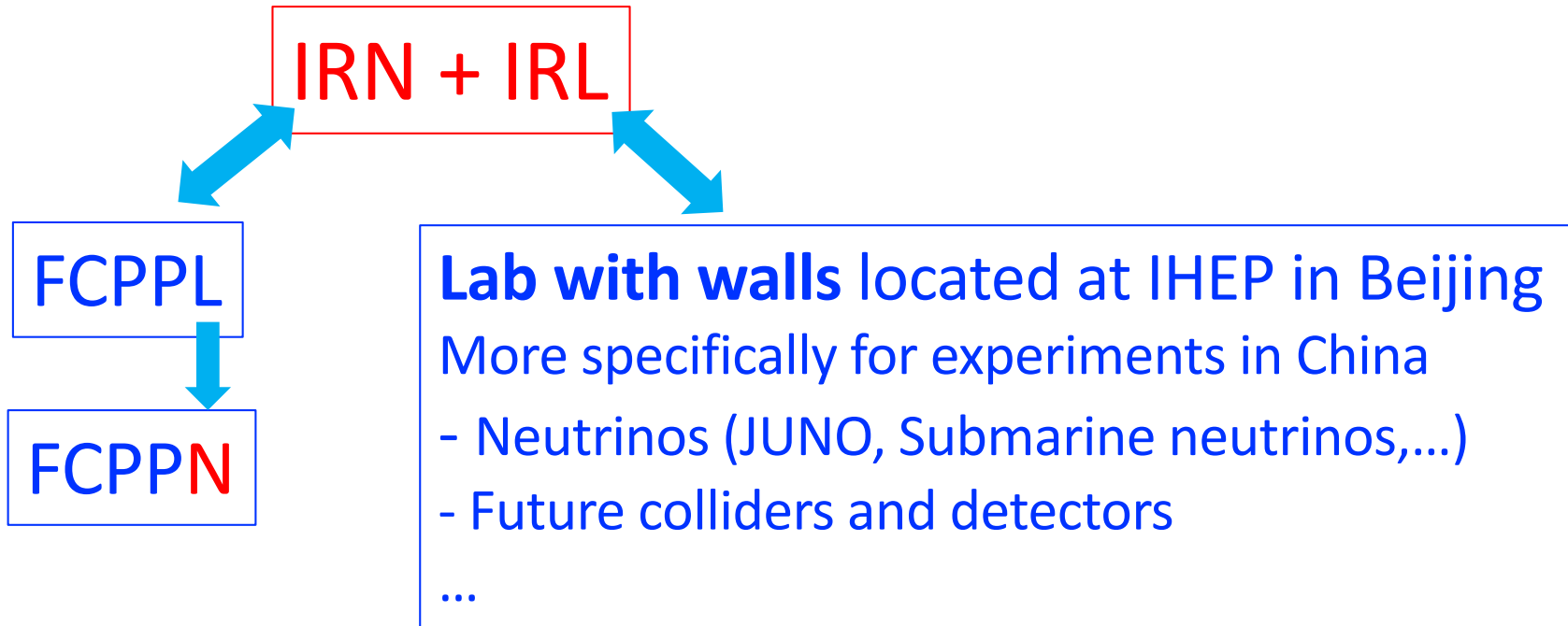
Items of interest

Gang successfully managed to get funding from the MoST:

- The project France China Particle Physics joint Lab (FCPPL) is granted by the MoST, with a budget of 4 million Chinese yuan over a period of three years (Jan. 2023 to Dec. 2025)
- The main goal is to establish a joint lab “with walls”: Personal communications and exchanges will be supported. The main areas of collaboration are LHC, future colliders, JUNO etc., other fields of collaboration are not excluded.

Agreement renewal and evolution

- LIA agreement renewal
 - Two intertwined CNRS collaborative tools IRN + IRL to keep an active support to FCPPL to projects in general an increase possibility of extra funding



- Paperwork to be finalized by the end of this year for an implementation start of 2024

Foster new collaborations...

We will organize mini-workshops (via Zoom or in person) in between the FCPPL workshops, focused on specific topics as for example:

- Experiments (*e.g.* submarine neutrino telescopes,...)
- R&D for future colliders
- R&D for future detectors
- R&D for computing and AI for high energy physics
- ...

allowing the community to brain storm, setup and implement new projects and collaborations in these themes.

For R&D – follow e.g. the ECFA Roadmap

And contribute together to the corresponding DRDs

Gaseous

- DRDT 1.1** Improve time and spatial resolution for gaseous detectors with long-term stability
- DRDT 1.2** Achieve tracking in gaseous detectors with dE/dx and dN/dx capability in large volumes with very low material budget and different read-out schemes
- DRDT 1.3** Develop environmentally friendly gaseous detectors for very large areas with high-rate capability
- DRDT 1.4** Achieve high sensitivity in both low and high-pressure TPCs

Liquid

- DRDT 2.1** Develop readout technology to increase spatial and energy resolution for liquid detectors
- DRDT 2.2** Advance noise reduction in liquid detectors to lower signal energy thresholds
- DRDT 2.3** Improve the material properties of target and detector components in liquid detectors
- DRDT 2.4** Realise liquid detector technologies scalable for integration in large systems

Solid state

- DRDT 3.1** Achieve full integration of sensing and microelectronics in monolithic CMOS pixel sensors
- DRDT 3.2** Develop solid state sensors with 4D-capabilities for tracking and calorimetry
- DRDT 3.3** Extend capabilities of solid state sensors to operate at extreme fluences
- DRDT 3.4** Develop full 3D-interconnection technologies for solid state devices in particle physics

PID and Photon

- DRDT 4.1** Enhance the timing resolution and spectral range of photon detectors
- DRDT 4.2** Develop photosensors for extreme environments
- DRDT 4.3** Develop RICH and imaging detectors with low mass and high resolution timing
- DRDT 4.4** Develop compact high performance time-of-flight detectors

Quantum

- DRDT 5.1** Promote the development of advanced quantum sensing technologies
- DRDT 5.2** Investigate and adapt state-of-the-art developments in quantum technologies to particle physics
- DRDT 5.3** Establish the necessary frameworks and mechanisms to allow exploration of emerging technologies
- DRDT 5.4** Develop and provide advanced enabling capabilities and infrastructure

Calorimetry

- DRDT 6.1** Develop radiation-hard calorimeters with enhanced electromagnetic energy and timing resolution
- DRDT 6.2** Develop high-granular calorimeters with multi-dimensional readout for optimised use of particle flow methods
- DRDT 6.3** Develop calorimeters for extreme radiation, rate and pile-up environments

Electronics

- DRDT 7.1** Advance technologies to deal with greatly increased data density
- DRDT 7.2** Develop technologies for increased intelligence on the detector
- DRDT 7.3** Develop technologies in support of 4D- and 5D-techniques
- DRDT 7.4** Develop novel technologies to cope with extreme environments and required longevity
- DRDT 7.5** Evaluate and adapt to emerging electronics and data processing technologies

Integration

- DRDT 8.1** Develop novel magnet systems
- DRDT 8.2** Develop improved technologies and systems for cooling
- DRDT 8.3** Adapt novel materials to achieve ultralight, stable and high precision mechanical structures. Develop Machine Detector Interfaces.
- DRDT 8.4** Adapt and advance state-of-the-art systems in monitoring including environmental, radiation and beam aspects

Training

- DCT 1** Establish and maintain a European coordinated programme for training in instrumentation
- DCT 2** Develop a master's degree programme in instrumentation

Requests for new membership



Laboratoire des 2 Infinis

ATLAS, Gravitational Waves, Computing



NNU · 南京师范大学
NANJING NORMAL UNIVERSITY

物理科学与技术学院
School of Physics and Technology

CMS group



復旦大學
FUDAN UNIVERSITY

e.g. connected to the ALICE project

2024 CEPC EU Workshop

Marseille - at Hôtel Mercure Vieux-Port in Marseille, France

Week of April 8th 2024

Expect 150 participants



EU Edition of the International Workshop on the Circular Electron-Positron Collider

Week of Apr 8th 2024, Marseille, France



<https://indico.in2p3.fr/e/cepc2020>



Location of next FCPPN Workshops

Sites for the next two workshops in France:

- **Bordeaux (LP2I) in 2024**
final date being finalized
- **Lyon (IP2I) in 2026**



Two candidate sites for the 2025 and 2027 workshops in China:

- CCNU Wuhan



- Shandong University at Qingdao Campus



Great thanks to all of you for having made this workshop a success!

A very successful workshop in many ways:

- It was really great to see each other again in person 😊
- Warm thanks and congratulations to the local organizers
You did an outstanding job preparing, organizing and running the workshop! Great organization! Great banquet!
You really made us feel at home 😊
- The quality of the work and talks presented is really impressive
Thanks to the speakers, the session conveners and the scientific committee, we had a world-class program!

Thanks again to CAS, MoST and university groups,
and to the French Embassy and CNRS/IN2P3 for their support!

Have a nice trip back home

and see you next year in France at the CEPC and FCPPN Workshops!



Numbers and Facts

- **Web site (TWiki):** fcpppl.in2p3.fr
Mailing-list: FCPPL-L@in2p3.fr (466 members!)
- **Funding:** ~ 200k€/yr (FR/CH ~ 1)
for mobility and exchange - *all sources included*
- **Yearly Workshop:**
 - **100+ participants**
lively, dynamic and friendly community
 - Includes Steering Committee meeting



FCPPL Workshop
Wuhan, 03/2009

Beijing (IHEP), 12/2006
(to prepare FCPPL)

Marseille, 01/2008

Wuhan, 03/2009

Lyon, 04/2010

Jinan, 04/2011

Orsay-Saclay, 03/2012

Nanjing, 03/2013

Clermont-Ferrand, 04/2014

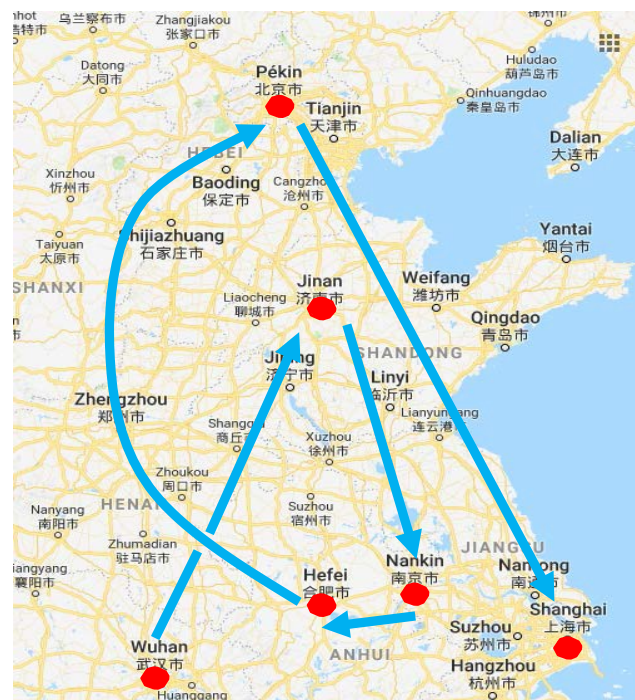
Hefei, 04/2015

Strasbourg, 03/2016

Beijing (THU), 03/2017

Marseille, 05/2018

Shanghai, 24-27/04/2019



Zoom, 13-16/12/2021

Zhuhai, 6-10/11/2023

Bordeaux, 2024

A (stronger) participation of the French Universities involved would be highly appreciated!

- **AMU: 10k€/yr to FCPPL**
- **UCBL, UniStra, UCA ~3-4k/yr each directly to projects related to them**
- **What about the other 9 universities and schools involved?**