The France China Particle Physics Laboratory

The FCPPL is an International Associated Laboratory (LIA) involving a network of laboratories from the IN2P3-CNRS, the Commission for Atomic Energy (CEA) and several universities for the French part, institutes of the Chinese Academy of Sciences (CAS) and universities for the Chinese part. Its main objective is to **initiate, develop and reinforce scientific collaborations between France and China in high energy physics**, with a focus on research activities linked to particle accelerator physics. This includes computing development and deployment, as well as accelerator or detector studies. The support to fields of fundamental research related to particle physics -such as cosmology or astroparticle physics for example- is also an intrinsic part of the FCPPL project.

FCPPL provides financial support to the scientific collaborations established within its framework. But more important, FCPPL has become over the years the **natural channel of exchanges between China and France** on its research themes. FCPPL has therefore fostered the development of a dense and rich network of collaborators, giving birth to a **stable but lively community of French and Chinese physicists**, providing favorable settings for the renewal and development of collaborative research projects. FCPPL is also a **label of excellence in research in high energy physics**, giving more visibility to the research carried out by its members to funding agencies, both in China and in France. Finally, the leaders of the major research institutes in high energy physics of the two countries participate in the FCPPL steering committee. In this respect FCPPL constitutes an appropriate **tool for the harmonization of their politics of research.**

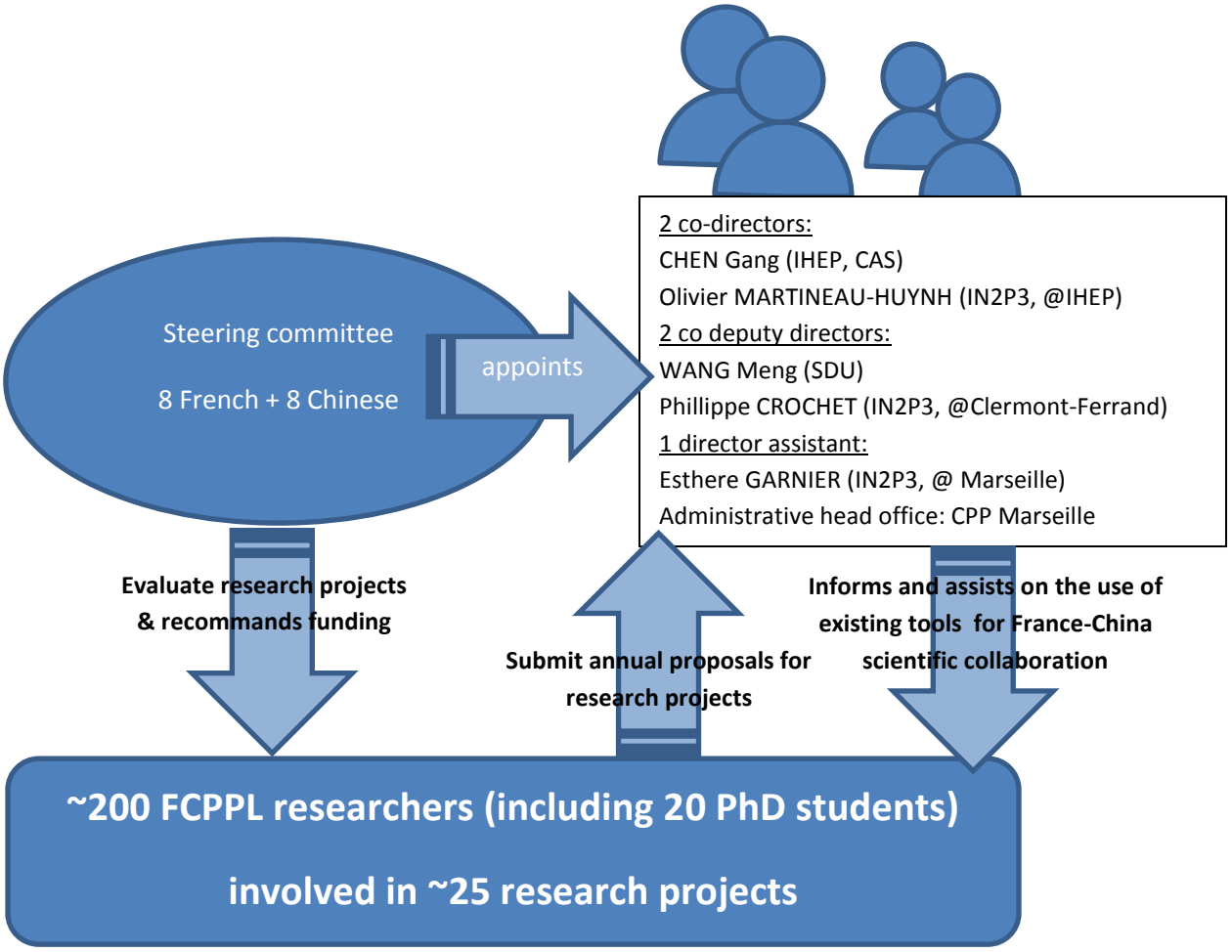
Members:

- CAS: Institute of High Energy Physics (IHEP), University of Science and Technology of China (USTC), National Astronomical Observatories of China* (NAOC)
- Tsinghua University (THU, Beijing)
- Peking University (PKU, Beijing)
- Huazhong Normal University (CCNU, Wuhan)
- Dalian University of Technology (DUT, Dalian)
- Shandong University (SDU, Jinan)
- Nanjing University (NU, Nanjing)
- National Institute of Particle Physics and Nuclear Physics (IN2P3, CNRS): 20 laboratories
- Research Institute on the Fundamental Laws of the Universe (IRFU, CEA)
- Méditerranée University (Marseille)
- Paris-Sud University (Paris)
- Pierre & Marie Curie University (Paris)*
- Blaise Pascal University (Clermont-Ferrand)

* Full member since 2011.

Structure

The FCPPL was created in April 2007 for four years. It has been renewed in 2011 for four additional years. A steering committee composed of 8 French members and 8 Chinese members appoints for 2 years 2 co-directors and 2 co-deputy directors and evaluates on a yearly basis the research projects submitted by the FCPPL researchers.

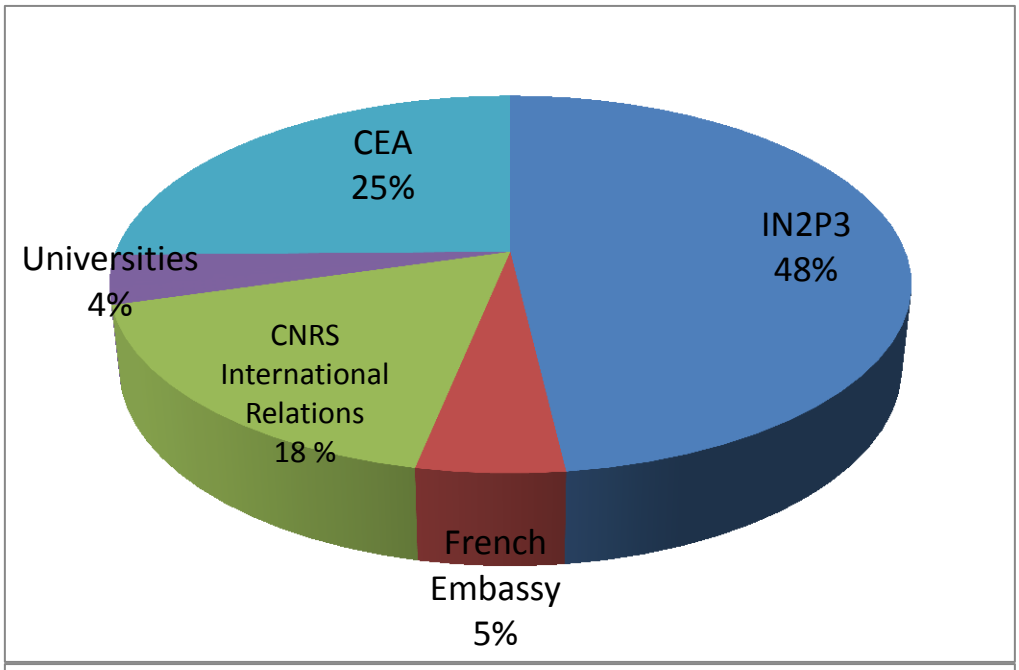


Steering committee members (2011-2015):

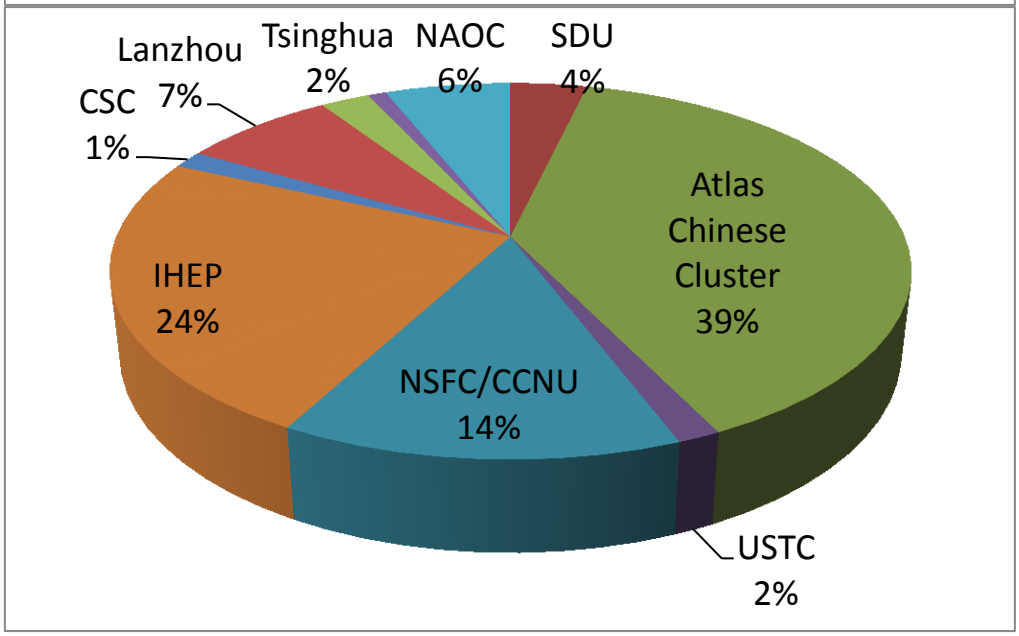
For the French parties: Michel DAVIER (co-Chair), Jacques MARTINO, (Director of IN2P3, represented by Etienne AUGE), Dominique BOUTIGNY (IN2P3), Eric KAJFASZ (IN2P3), Lydia ROOS (IN2P3), Philippe CHOMAZ (Director of IRFU-CEA, represented by Didier VILANOVA), Olivier NAPOLY (CEA), Gilles GERBIER (CEA).

For the PRC Parties: CHEN Hesheng (co-Chair), JIN Shan (IHEP), WANG Yifang (IHEP), CAO Zhen (IHEP), ZHU Shouhua (PKU), CAI Xu (CCNU), WANG Qing (THU), ZHAO Zhengguo (USTC).

Budget (2010)



French contribution: 154k€



Chinese contribution: 140k€

Funded research projects

In 2010, FCPPL supported travels and stays of staff and students in their partner institution for 20 research projects, led in collaboration between France and China in the field of high energy physics.

Work carried out within FCPPL directly led to the publication of 200+ articles and presentations in international conferences. Seven PhD doctors obtained their degree in the framework of FCPPL collaborations and **20 PhD students are presently preparing their PhD within FCPPL.**

Below are listed the projects funded in 2010:

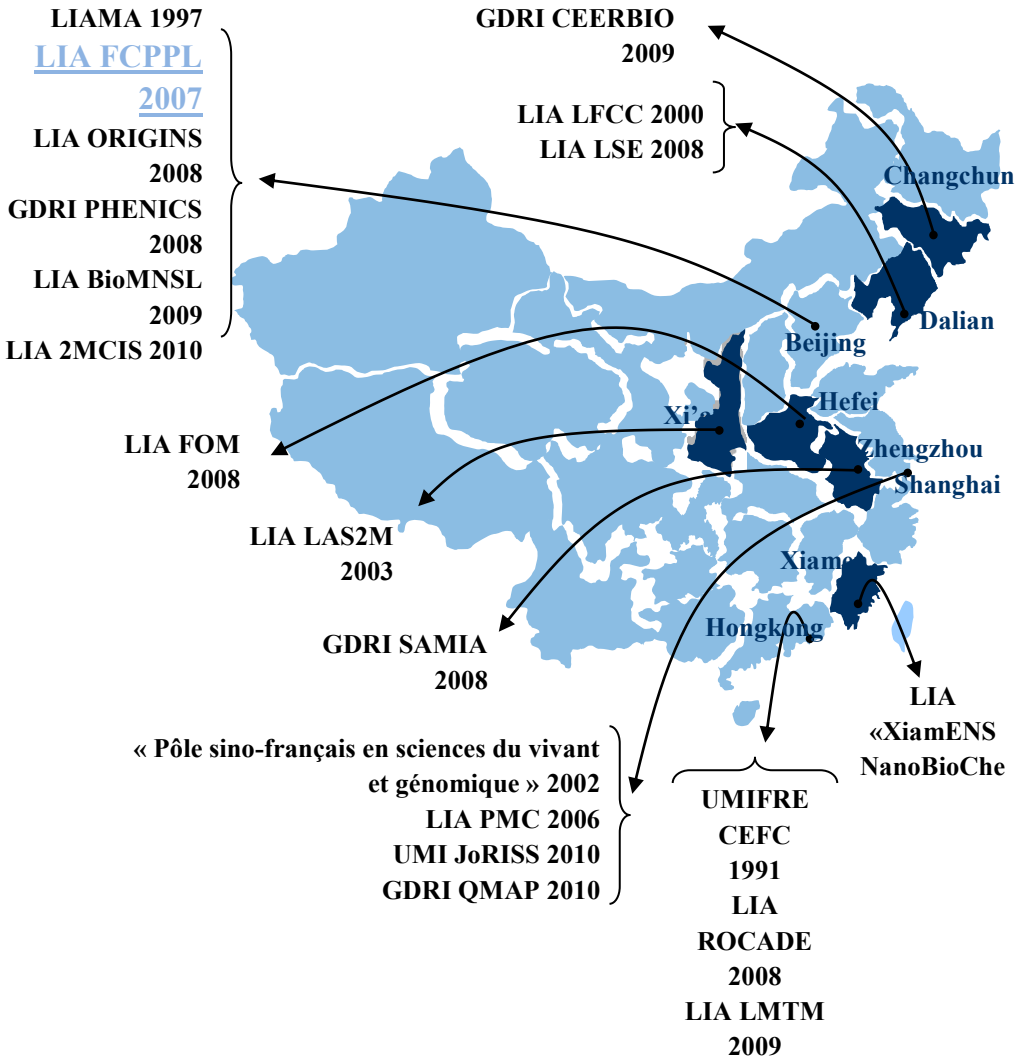
- ★ **Physics on accelerators**
  - Physics at LHC with the ATLAS detector: IN2P3 (Emmanuel MONNIER) and China ATLAS Cluster (JIN Shan)
  - Top physics at ATLAS: CEA IRFU (Bruno MANSOULIE) and China ATLAS Cluster (JIN Shan)
  - Single Top Production and HIGGS Search at ATLAS: IN2P3 (Julien DONINI) and SDU (FENG Cunfeng)
  - Photon calibration for early CMS physics with photons and leptons: IN2P3 (Suzanne GASCON) and IHEP (CHEN Guoming)
  - B physics studies at LHCb: IN2P3 (Patrick ROBBE) and Tsinghua (GAO Yuanning)
  - Study of QCD matter with the ALICE detector: IN2P3 (Philippe CROCHET & Christelle ROY) and CCNU (ZHOU Daicui)
  - e+e- annihilation: vacuum polarization, QCD and tau lepton physics: IN2P3 (Michel DAVIER) and IHEP (YUAN Changzheng)
  - Charm physics at BESIII and impact on CKM elements: IN2P3 (Sébastien DESCOTES-GENON) and IHEP (LI Haibo)
  - Deployment and Operation of the Chinese-French W-LCG infrastructure: IN2P3 & CEA (Eric LANCON) and IHEP (CHEN Gang)

- ★ **Developments related to physics on accelerators**
  - Positron source : IN2P3 (Xavier ARTRU) and IHEP (PEI Guoxi)
  - TPCs for High Energy Physics: CEA IRFU (Paul COLAS) and Lanzhou (LI Yulan)
  - High rate large GRPC detector using new generation electronics: IN2P3 (Imad LAKTINEH) and IHEP (WANG Yi)
  - Read-out ASIC for photomultipliers: IN2P3 (Christophe de LA TAILLE) and IHEP (WANG Zheng)
  - CMOS sensors: IN2P3 (Marc WINTER) and Dalian (TANG Zhen'an)

- ★ **Theory**
  - Exotic hadrons with heavy quarks: IN2P3 (Jean-Marc RICHARD) and IHEP(ZHAO Qiang)
  - New Physics at the LHC: IN2P3 (Giacomo CACCIAPAGLIA) and WANG Qing.

- ★ **Astroparticules & Cosmology**
  - Dark Energy: IN2P3 (Charling TAO) and IHEP & Tsinghua (ZHANG Xinmin)
  - CJPL-LSM Jinping Tunnel characterisation for low radioactivity experiments: CEA-IRFU & IN2P3 (Gilles GERBIER) and IHEP & Tsinghua & Jiatong (YUE Qian)
  - China-France Gamma-Ray Burst Collaboration SVOM : CEA IRFU (Jacques PAUL) and NAOC & IHEP (ZHANG Shuangnan)
  - Cosmic Ray Showers Radio Detection with TREND: IN2P3 (Olivier MARTINEAU-HUYNH) and NAOC & IHEP (WU Xiangping)

French research structures in China and Asia



- LIA : International Associated Laboratory. LIA is «a lab without walls». It associates research teams from CNRS and foreign laboratories. The laboratories members of a LIA put in common for 4 years (renewable once), human and financial resources to perform a program defined in common. These laboratories keep their autonomy, status and location.
- GDRI : International Research Group
- UMI : International Mixt Unit
- UMIFRE : Mixt unit – Research Institute Abroad

The FCPPL is also part of a coordinated effort by IN2P3 to strengthen its links with Asian partners, with the creation of the France Japan Particle Physics Laboratory in 2006, France Korea PPL in 2008 and France Vietnam PPL in 2010. These four LIAs **have strong connections to each other and aim at generating synergies among its members.**