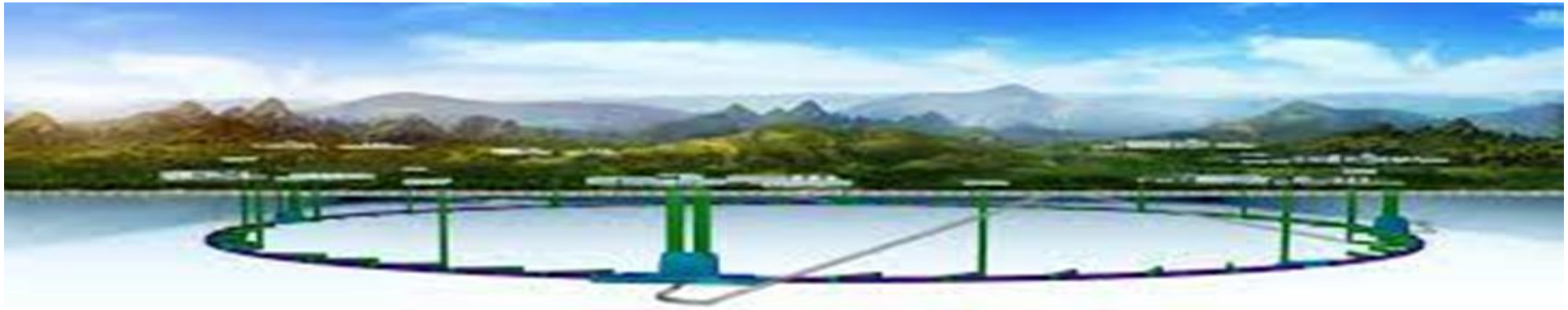
# The Strategy and the Plan

## The Circular Electron Positron Collider

**Xinchou Lou**

**On Behalf of the CEPC Study Group**



# Outline

- Introduction and reminder
- Recent progresses in significant areas
- Shaping up the strategy and the plan
- Summary

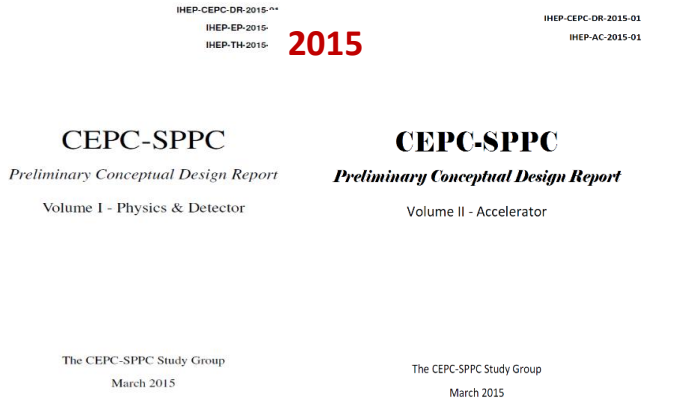
# Introduction and reminder

**CEPC team takes steps to advance, and has been persistent in design and R&D**

2013




2015







http://cepc.ihep.ac.cn

**CEPC physics white papers:**

1. **Higgs physics,** arxiv:1810.09037
   Chin. Phys. C 43(2019) 043002
2. **Flavor physics,** Chin. Phys. C 49(2025) 10
3. **New Physics Search at the CEPC:**
   **a General Perspective**
   Chin. Phys. C 49(2025) 12
4. **Electroweak physics, to be published**
5. **QCD, to be published**

**CEPC**

- compelling physics
- technologically feasible
- near complete package

# CEPC the operation scenarios

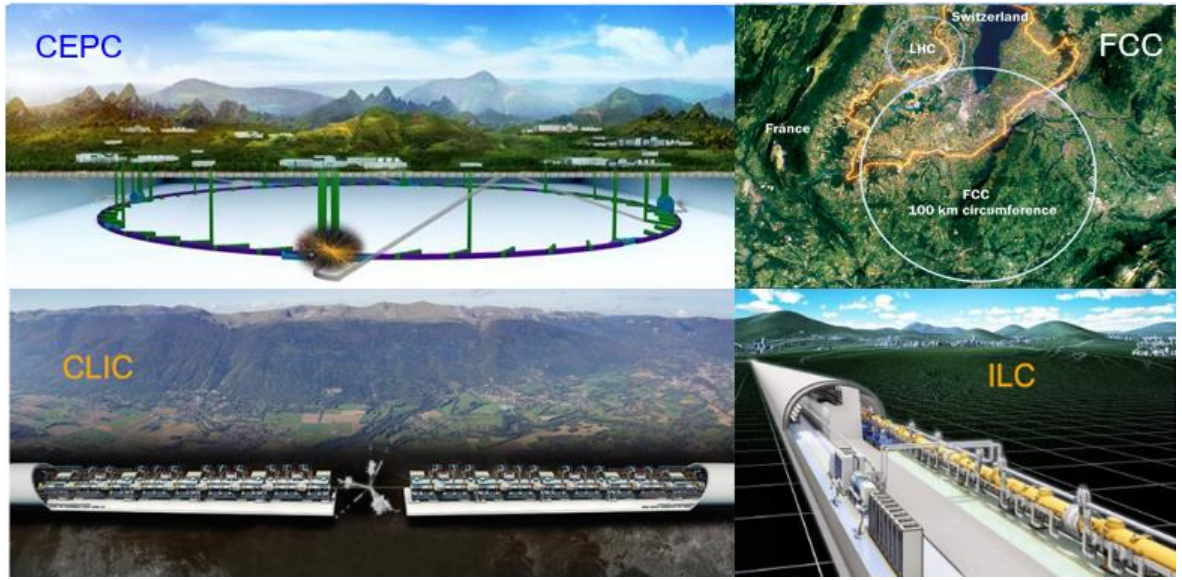
## Baseline scenario

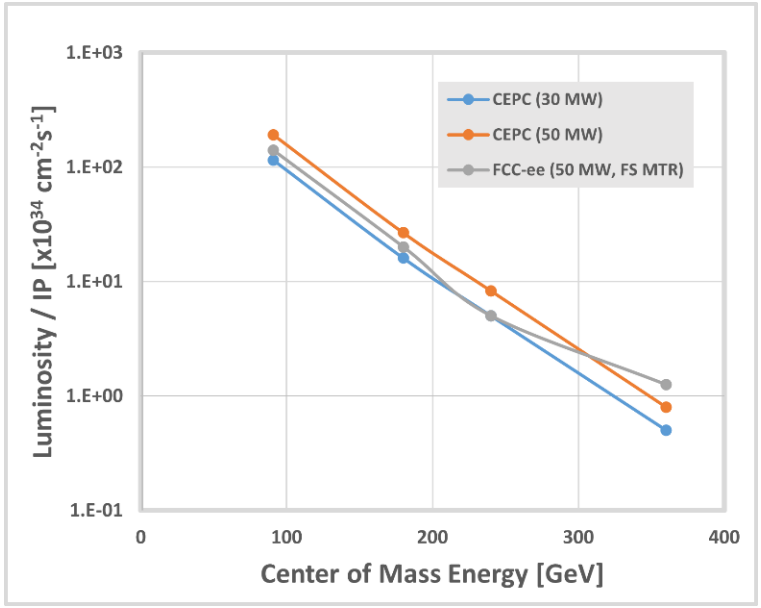
| Operation mode | $\sqrt{s}$ (GeV) | SR power (MW) | $\mathcal{L}$ ($10^{34}$ cm$^{-2}$s$^{-1}$) | $\int \mathcal{L}$/year (ab$^{-1}$) | Years | Total $\int \mathcal{L}$ (ab$^{-1}$) | Event yields |
|---|---|---|---|---|---|---|---|
| $H$ | 240 | 30 | 5 | 0.65 | 15 | 10 | $2.0 \times 10^6$ |
| $Z$ | 91 | 12.1 | 26(*) | 3.2 | 4 | 13 | $5.6 \times 10^{11}$ |
| $W^+W^-$ | 155-170 | 30 | 16 | 1.2 | 1 | 1.2 | $1.0 \times 10^7$(†) |

## Upgraded scenario: with international contribution

| Operation mode | $\sqrt{s}$ (GeV) | SR power (MW) | $\mathcal{L}$ ($10^{34}$ cm$^{-2}$s$^{-1}$) | $\int \mathcal{L}$/year (ab$^{-1}$, 2 IPs) | Years | Total $\int \mathcal{L}$ (ab$^{-1}$, 2 IPs) | Event yields |
|---|---|---|---|---|---|---|---|
| $H$ | 240 | 50 | 8.3 | 2.2 | 10 | 21.6 | $4.3 \times 10^6$ |
| $Z$ | 91 | 50 | 192(*) | 50 | 2 | 100 | $4.1 \times 10^{12}$ |
| $W^+W^-$ | 155-170 | 50 | 26.7 | 6.9 | 1 | 6.9 | $5.5 \times 10^7$ |
| $t\bar{t}$ | 360 | 50 | 0.8 | 0.2 | 5 | 1.0 | $0.6 \times 10^6$ |

# CEPC the comparison & advantages




**直线希格斯工厂无优势，CEPC 在环形方案中有明显优势**（共识：FCC/CEPC只建一个）

**相比欧洲 FCC-ee**
- 性能略好，使用灵活
- 建造成本低，时间短，性价比高

**相比日本ILC和欧洲CLIC**
- 性能好5-10倍
- 覆盖至90GeV能区（Z）
- 隧道可为质子对撞机复用

| | CEPC | FCC | ILC | CLIC |
|---|---|---|---|---|
| 计划开建时间 | 2032 | 2032 | 2030 | 2035 |
| 亮度($10^{34}cm^{-2}s^{-1}$) | 5-8 | 5-8 | ~1 | ~1 |
| 造价(亿人民币) | 380 | 1200 | 500 | 522 |

由于CEPC没有进入十五五建设，丧失时间优势

# Progresses in significant areas

- The Engineering Design of the accelerator
- The Technical Design of a reference detector + R&D plan
- Keeping CEPC the state of the art
- HTS magnet program for a future pp collider
- Industrial partners and suppliers
- The consensus and the organization
- Prepare the CEPC detector (AGORA) for FCC-ee
- Collaboration with CERN (CEPC-FCC)

…

# Progress in significant areas - accelerator

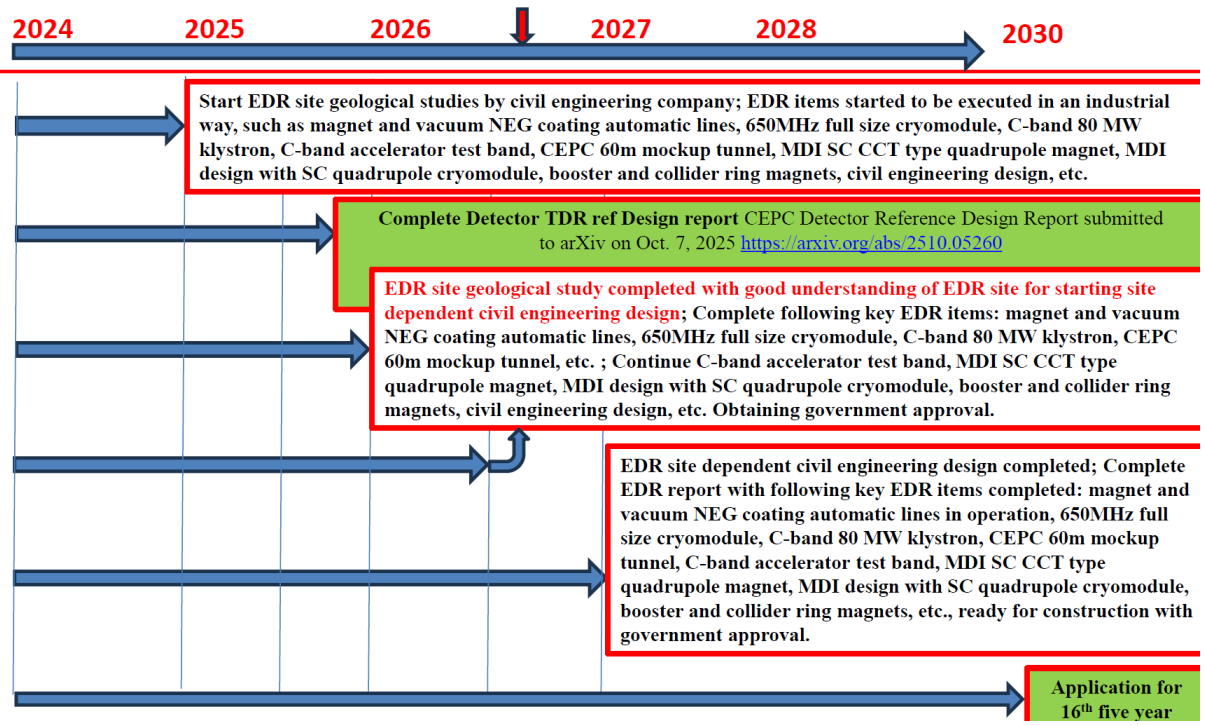
**Steady progress with the EDR process; review and guidance by the IARC committee**

The CEPC International Accelerator Review Committee Meeting in 2026

September 22-24, 2026, IHEP, Beijing, China



## CEPC EDR Milestones and Check Points



# Progress with detector： TDR for the AGORA detector

## International Committee composed of 19 experts in detector physics

| Name | Affiliation | Country/Region |
|---|---|---|
| Daniela Bortoletto (chair) | Oxford | UK |
| Colin Gay | UBC | Canada |
| Bob Kowalewski | U Victoria | Canada |
| Burkhard Schmidt | CERN | CERN |
| Liang Han | USTC | China |
| Paul Colas | Saclay | France |
| Christophe De La Taille | OMEGA, CNRS | France |
| Cristinel Diaconu | CPPM | France |
| Roman Poeschl | IJCLab | France |
| Maxim Titov | Saclay | France |

| Name | Affiliation | Country/Region |
|---|---|---|
| Frank Gaede | DESY | Germany |
| Anna Colaleo | INFN, Bari | Italy |
| Tommaso Tabarelli de Fatis | INFN Milano-Bicocca | Italy |
| Roberto Tenchini | INFN, Pisa | Italy |
| Akira Yamamoto | KEK | Japan |
| Hitoshi Yamamoto | Tohoku U., Valencia | Japan |
| Gregor Kramberger | IJS | Slovenia |
| Ivan Villa Alvarez | Santander | Spain |
| James Brau | Oregon | USA |

## Three review meetings were held from October 2024 to September 2025



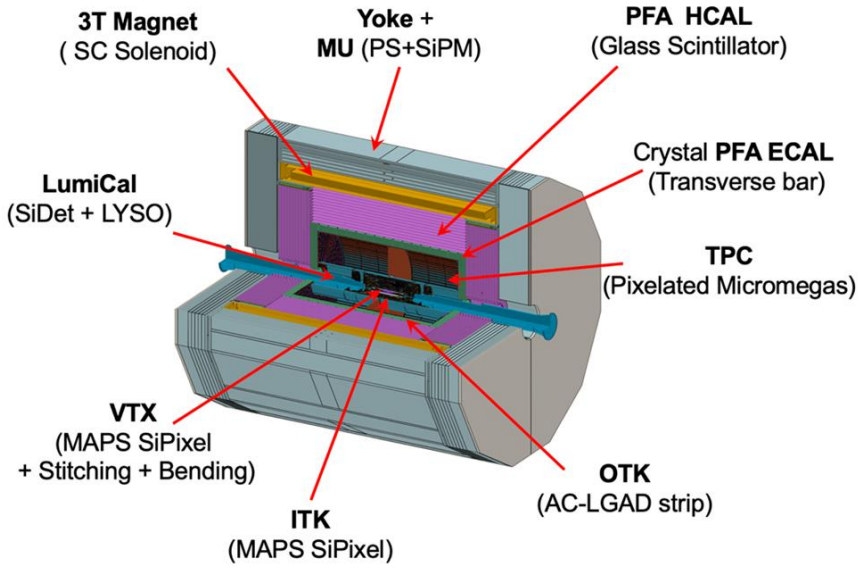






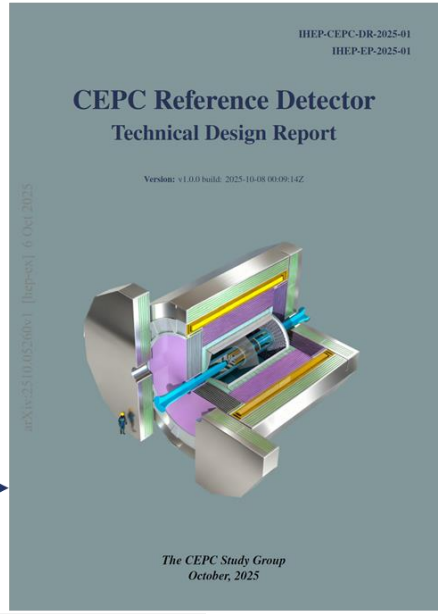
# AGORA as a Reference Detector for CEPC - TDR

- **CEPC reference detector TDR:** Demonstrate readiness for construction of detector for baseline scenario. A detector that could be constructed and commissioned within a decade.
- **After CEPC project approval:** Two CEPC detectors will be selected among international proposals. International collaborations will lead those detector designs and produce corresponding TDRs adapted to the final operational scenarios.




**10×10×12 m³, ~5000 ton**

**19** chapters
**669** pages
**1474** authors
**383** institutes
**43** countries



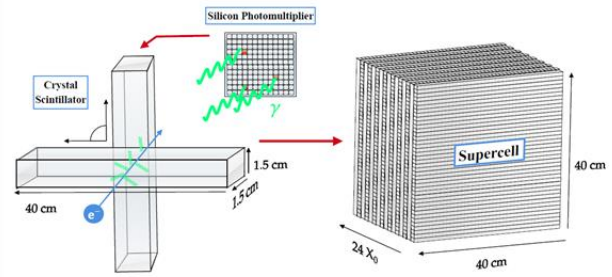

**Both ILD, reconfigured for the circular $e^+e^-$ collider, and IDEA, originally proposed for FCC-ee, are well suited for CEPC**

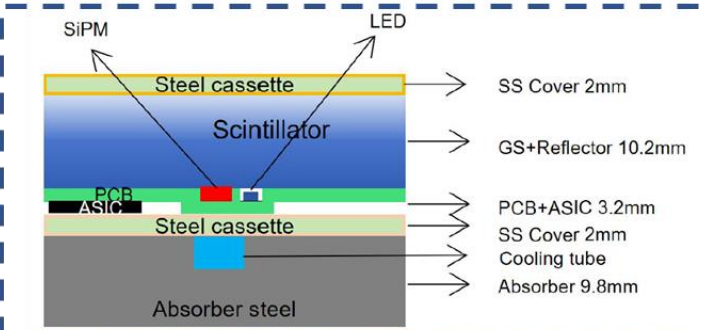
**The AGORA detector, designed for CEPC, is being adapted for use at FCC-ee**

# AGORA - Calorimeter Particle Flow Algorithm (PFA) oriented design

## Electromagnetic Calorimeter (ECAL)

- 24 $m^3$ of BGO crystal bars (1.5×1.5×40 $cm^3$), arranged in the x-y direction alternatively, in perpendicular to the beam, to achieve fine 3D granularity. 570,000 SiPM readout channels.
- Energy resolution from 2025 beam test: $1.96\,\%/\sqrt{E(GeV)} \oplus 0.54\,\%$



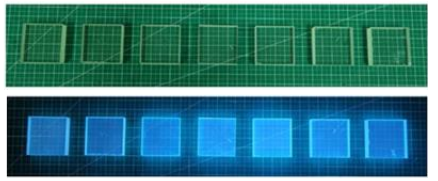




## Hadron Calorimeter (HCAL)

- **85 $m^3$ glass scintillator** tiles (4×4×1 $cm^3$) interspersed with steel plates, 6$\lambda_I$, 5.3 million SiPM readout channels, good 3D granularity
- High sampling ratio (~**30%**) and good energy resolution ~**30%/$\sqrt{E}$**

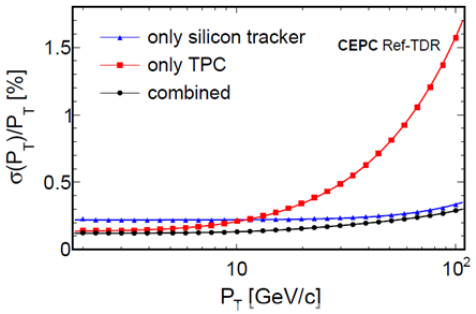
## Key technologies

- **BGO crystal**: expensive, developing BSO as an alternative
- **Glass scintillator**: high-density and large-yield, technically challenging
- **SiPM+ASIC**: different requirements from ECAL and HCAL

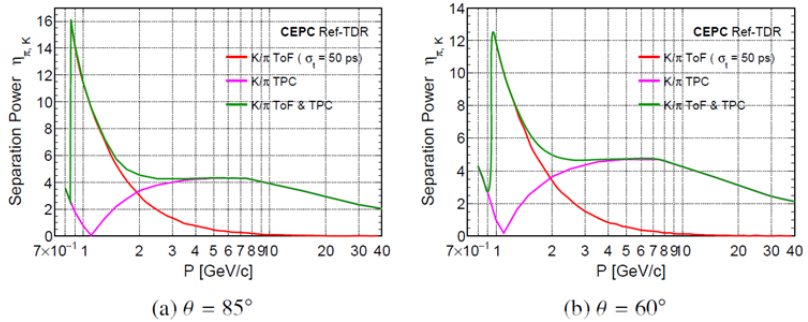


Glass scintillator under natural and ultraviolet light

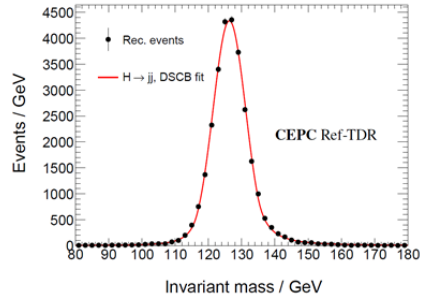
# AGORA - Detector performance highlights



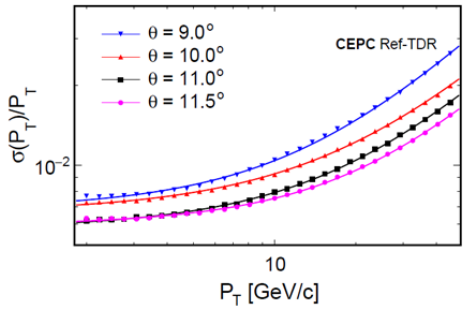

$P_T$ resolution at 85°



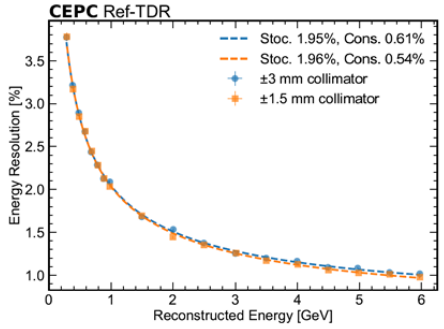

K/π separation power



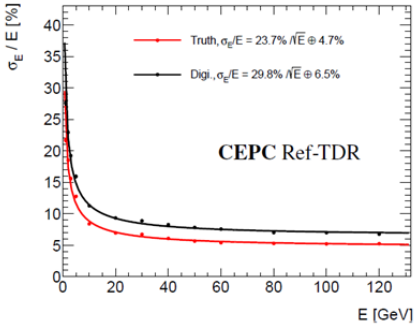

H→jj resolution



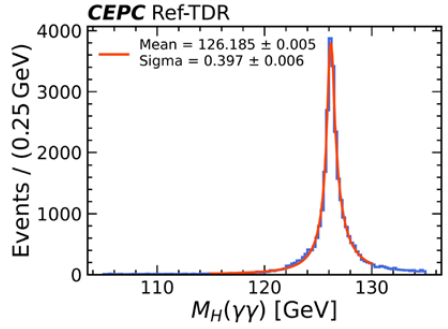

$P_T$ resolution at different angles




EM resolution from beam test




Simulated Hadron resolution



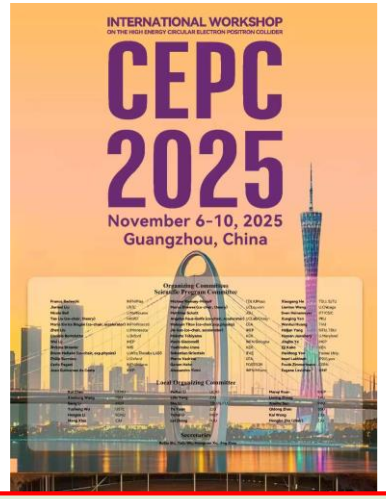

H→γγ resolution

| Tracking efficiency | Tracking $\sigma_{pT}$ | Vertexing $\sigma_{x,y,z}$ | π-k separation | EM resolution | BMR |
|---|---|---|---|---|---|
| **>99.7%** (for p>1 GeV) | **~0.1%** for majority | **< 3.5 μm** | **3σ** (1-20 GeV) | **2%/ √ E ⊕ 0.5%** | **3.87%** (H->gg) |

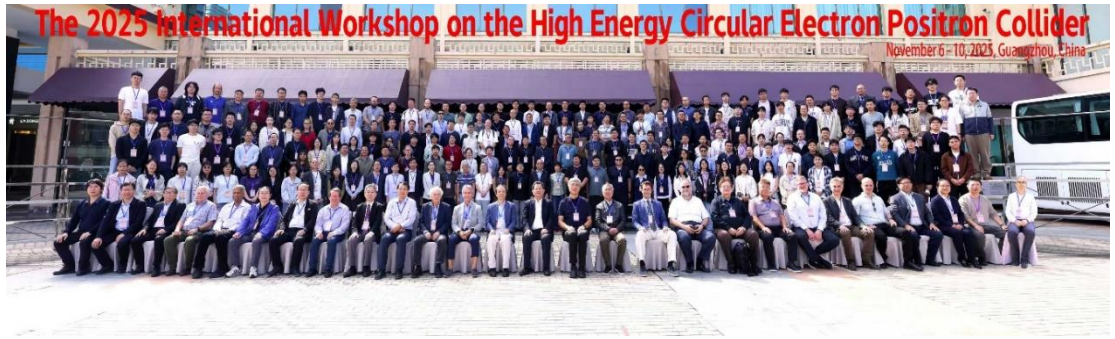
# International collaborations

## workshops and meetings

√




**2025 international workshop on high energy Circular Electron Positron Collider (CEPC)**
**November 6-10, 2025,Guangzhou, China**
https://indico.ihep.ac.cn/event/25300/



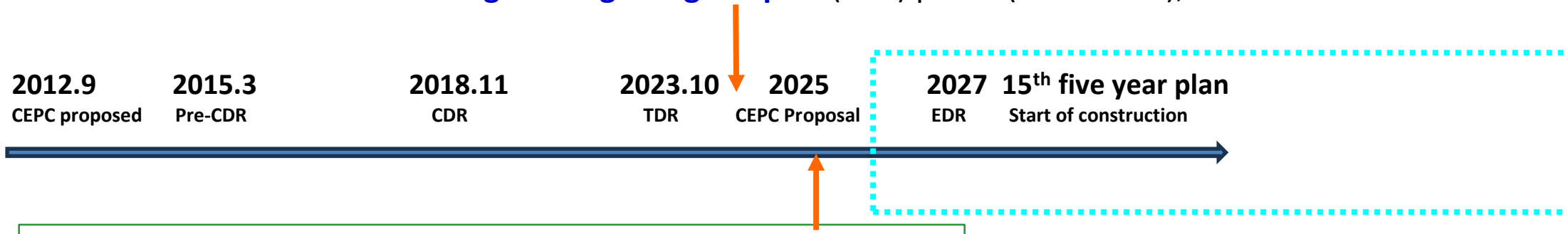

√ **2025 CEPC IAC Meeting**
**Nov. 20-21, 2025**
**Beijing**

√ **2026 HKUST IAS fundamental physics conference**
**January 12-16, 2026,**
**Hong Kong**

√ **2026 EU CEPC Workshop**
**April 7-10, 2026**
**Lisbon, Portugal**

# EDR, TDR of the Ref. Detector and the proposal

CEPC accelerator entered the **Engineering Design Report** (EDR) phase (2024-2027);



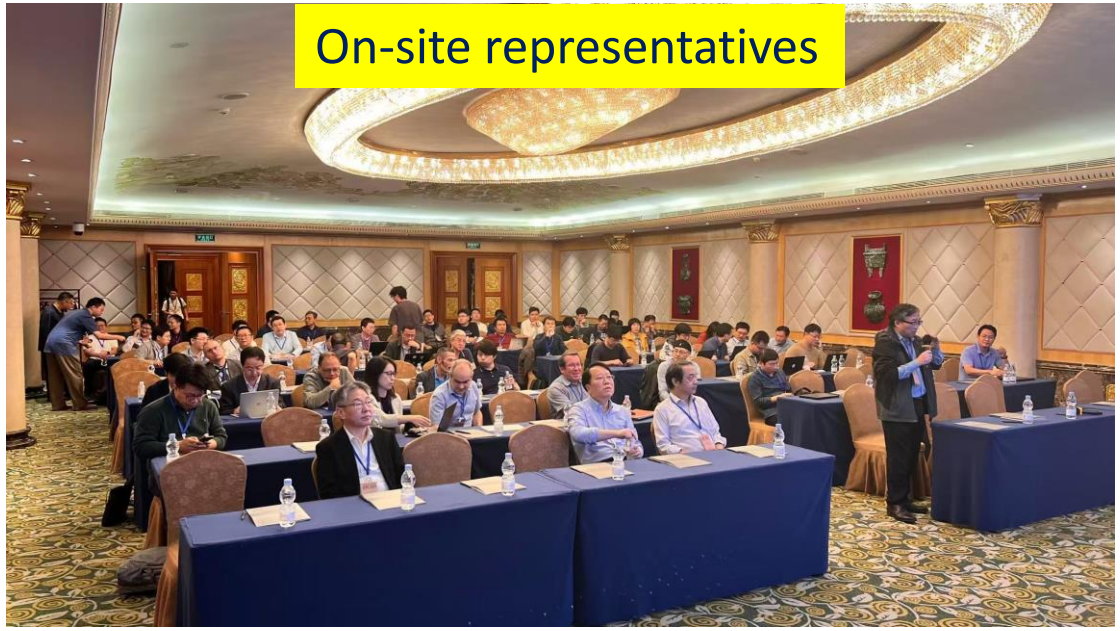

**CEPC Reference Detector TDR** completed
**CEPC proposal** to the Chinese government ~2025 for approval

**Unfortunately, CAS did not support the CEPC proposal in 2025; future plan revised**

# The organization and the consensus

**Representatives from Chinese institutes and universities unanimously agree:**

- **to continue to pursue CEPC in China**
- **to enhance cooperation with CERN on a future $e^+e^-$ Higgs factory**









Townhall meeting of Chinese institutional representatives
at CEPC-2025 workshop, Guangzhou (November 8,2025)

# The organization and the consensus

**IHEP directorate group statement**

**“IHEP, as a leading high energy physics lab, will continue to pursue high energy frontier particle physics research, cutting edge technology development, and the CEPC. “**

**Consequently, IHEP is deploying its innovation funds to support CEPC and to strengthen the program.**

# Reports to and advice from the IAC

- 2 days of reports, discussion and hearing advice from the IAC
- Focused on the path for development, continuing R&D, enhancing international collaboration, and critically important areas to work on for the long term future
- Strong encouragement from the IAC to move forward, to work with CERN (DRD, FCC,..), to be persistent with PWFA, HTS magnets, …




CEPC International Advisory Committee meeting
November 20-21, 2025

# Update to input to ESPP (#153, CEPC)

Letter from Jun Cao (IHEP director), Yifang Wang (CEPC), Xinchou Lou (CEPC)

We are writing this letter to provide **an update on the status of the CEPC project**, which was outlined in ESPP Input #153, The Circular Electron Positron Collider.

Regrettably, **the Chinese Academy of Sciences—the supervising body of the Institute of High Energy Physics (IHEP)—did not include the CEPC in the 15th Five-Year Plan (FYP).** In the past 13 years, the CEPC Study Group, hosted by IHEP, has been working intensively on the design and R&D of the CEPC, with the aim of delivering a Higgs factory before 2040 for the High Energy Physics community in the world. However, this goal is no longer achievable, and **the CEPC schedule has to be delayed.**



Institute of High Energy Physics

*Chinese Academy of Sciences*

Address: 19 Yuquanlu Road, Shijingshan District, Beijing 100049, CHINA
Tel: +86-10-88236076 Fax: +86-10-88233374 E-mail: yfwang@ihep.ac.cn Web: www.ihep.cas.cn

November 27, 2025

Dear Professor Jakobs,

We are writing this letter to provide an update on the status of the CEPC project, which was outlined in ESPP Input #153, The Circular Electron Positron Collider.

Regrettably, the Chinese Academy of Sciences—the supervising body of the Institute of High Energy Physics (IHEP)—did not include the CEPC in the 15th Five-Year Plan (FYP). In the past 13 years, the CEPC Study Group, hosted by IHEP, has been working intensively on the design and R&D of the CEPC, with the aim of delivering a Higgs factory before 2040 for the High Energy Physics community in the world. However, this goal is no longer achievable, and the CEPC schedule has to be delayed.

IHEP management reaffirmed that high-energy physics is our mission and the primary task. The CEPC Study Group will continue to work on the CEPC project, as endorsed by all IB members attending the CEPC annual meeting in Guangzhou this November. We will pursue and complete all the key accelerator and detector R&Ds identified by various review committees, such as silicon detectors and calorimeters, high efficiency klystrons, high performance SRF cavities and modules, automated production lines for magnets and NEG coating of vacuum pipes, etc. We believe that they are highly needed for the construction of any Higgs factory— CEPC or FCC-ee.

IHEP management approved also our strategy about CEPC and the collaboration with FCC-ee. While continuing to work on CEPC and maintaining the team, we will seek closer collaboration with DRD groups and discuss with CERN and FCC management regarding collaboration. If FCC-ee is approved for construction before 2030, we will abandon CEPC and join FCC-ee. Otherwise, we will submit a new CEPC proposal to the Chinese government in 2030.

We will continue our innovative studies for future colliders, including iron-based superconducting HTS cables and magnets for the SPPC/FCC-hh, and plasma wake field accelerators for future very-high-energy linear colliders. We are happy to collaborate with the international community on these topics.

I hope this letter will be useful for the ESG drafting session and the ESPP deliberations.

| Director of IHEP | Chair of the CEPC Steering Committee | Project manager of CEPC |
|---|---|---|
| Jun Cao | Yifang Wang | Xinchou Lou |

**We will continue our innovative studies for future colliders**, including iron-based superconducting HTS cables and magnets for the SPPC/FCC-hh, and plasma wake field accelerators for future very-high-energy linear colliders. **We are happy to collaborate with the international community on these topics.**

I hope this letter will be useful for the ESG drafting session and the ESPP deliberations.

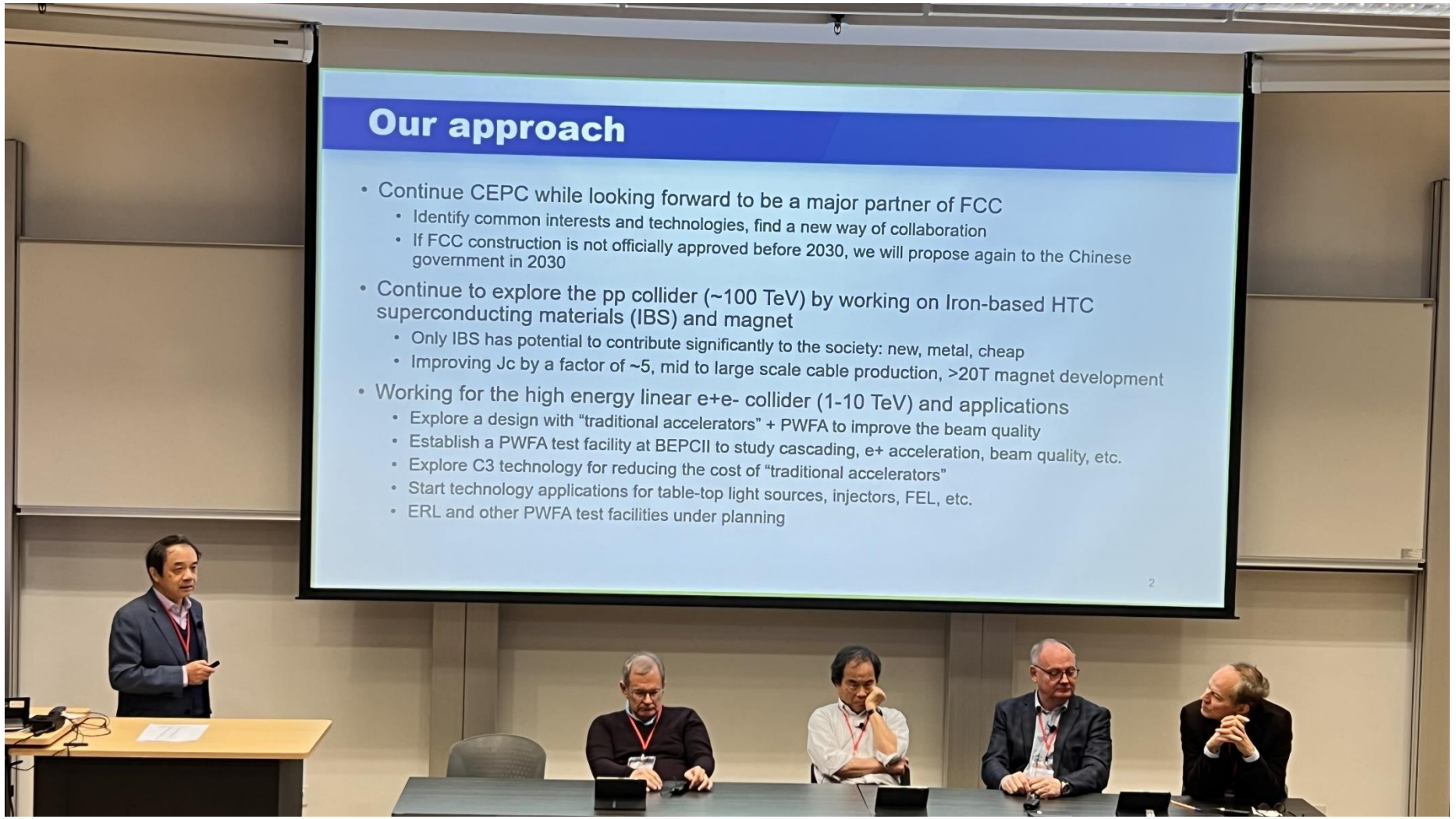
# CEPC 规划 – Strategy & Plan

规划未来，工程-技术设计加深，保持整体，争取国际领先, …

planning, EDR-TDR enhancement, maintain integrated team, aiming at world class levels

# CEPC Plan and Goals

**Yifang first presented the CEPC path forward at HKUST, January, 2026**



# Shaping up the CEPC strategy: plan & goals

Collaborate with international communities, especially with CERN, and prepare to join the FCC organization to contribute to the FCC accelerator and detector in significant ways.

**Build synergetic scientific collaboration to ensure that a future Higgs+Z+W boson factory will be realized, and that Chinese HEP community will be at the forefront of the particle physics programs.**

Prepare to propose CEPC to the Chinese government in 2030 if FCC has not been approved at around 2028

**Build synergetic scientific collaboration to ensure that a future Higgs+Z+W boson factory will be realized, and that Chinese HEP community will be at theforefront of the particle physics programs.**

Establish and carry through programs ranging from PWFA, C3, polarization at e-source etc.; to integrate applicable new advanced technologies in CEPC designs;

Leverage these technologies to explore high energy linear e+e- collider options and applications;

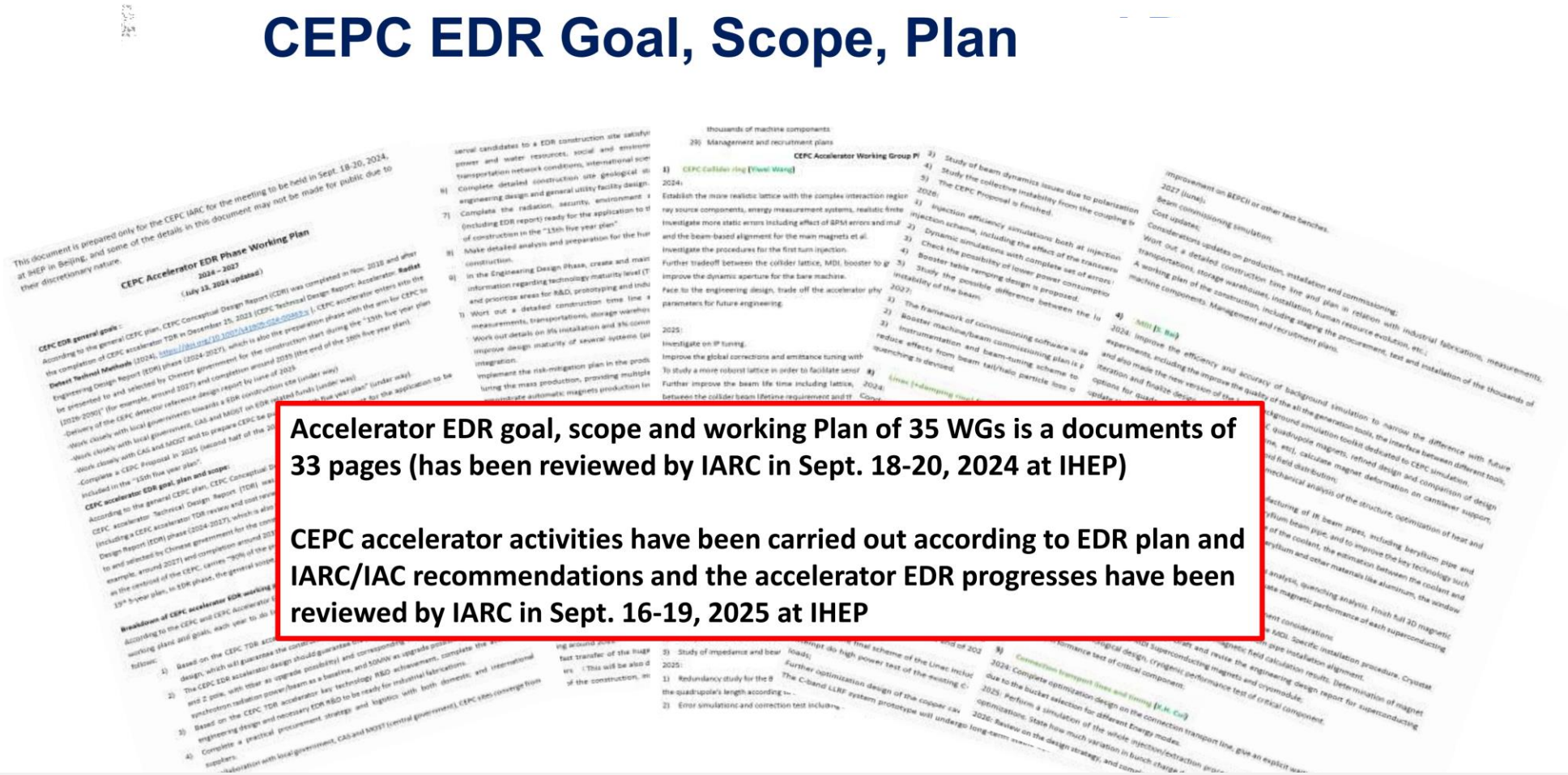
For long term high energy pp collider continue to pursue IBS magnets

**Develop reliable, efficient and cost effective technical systems for CEPC/linear accelerator and the detector. Applications of technologies in other fields.**

Build up and maintain a highly capable scientific and technical team in China as a driving force for CEPC-FCC

**Build synergetic scientific collaboration to ensure that a future Higgs+Z+W boson factory will be realized, and that Chinese HEP community will be at the forefront of the particle physics programs.**

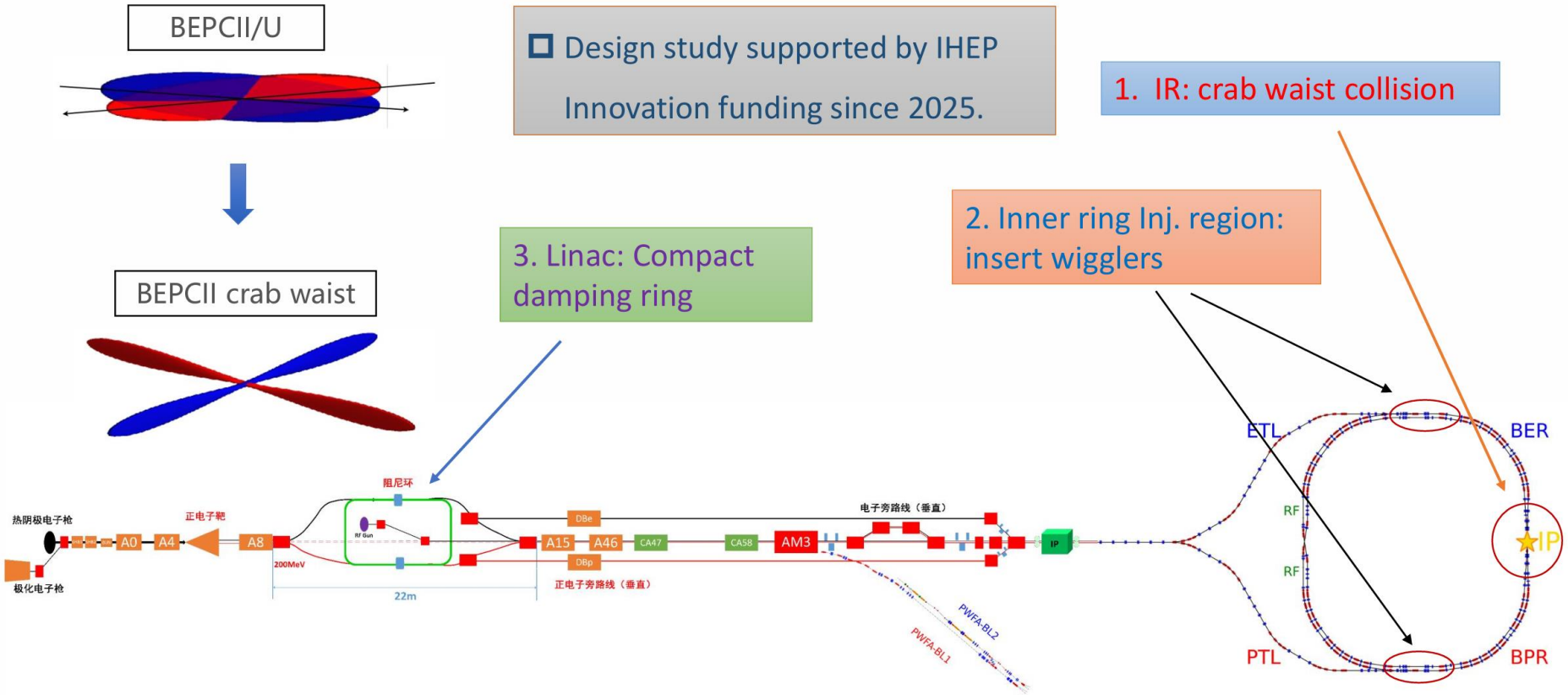
# CEPC accelerator EDR continues




**The CEPC International Accelerator Review Committee, led by Steinar Stapnes, will continue to guide CEPC**

# CEPC Plan and Goals

## For example: Crab-waist scheme – test bed at BEPC-II

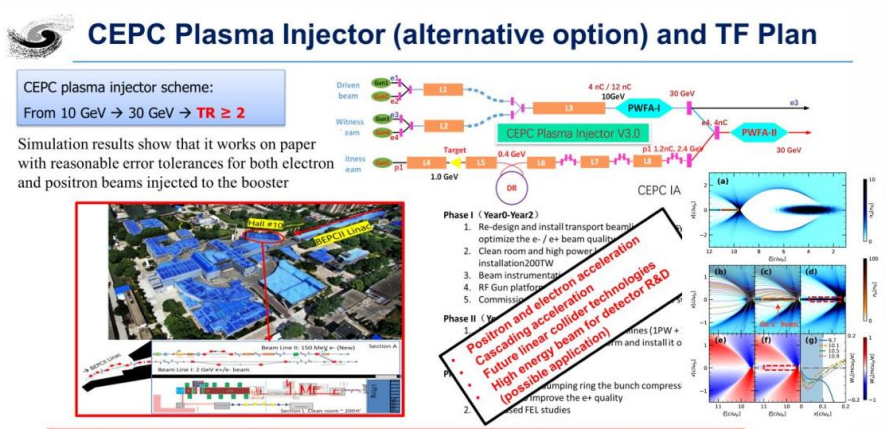


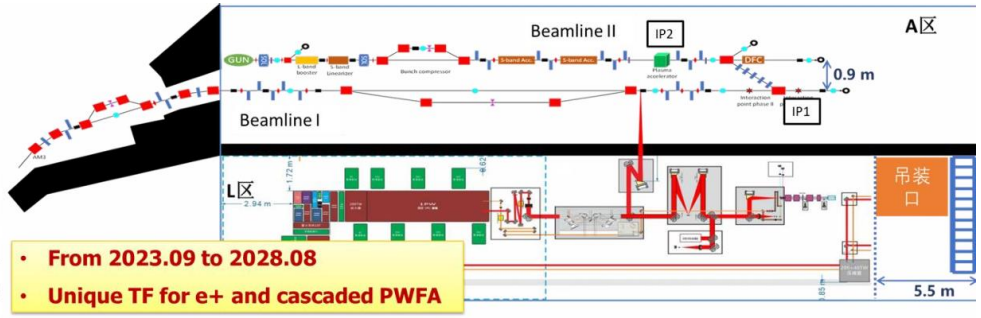

$(L_{BEPCII\text{-}UP}/\ L_{BEPCII})=(13.5/5)x(0.09/0.04)x(12.5/7.5)=10.1$

I⊕Wiggler $\beta_y^*$ CW

# Accelerator R&D and validation plan and goals

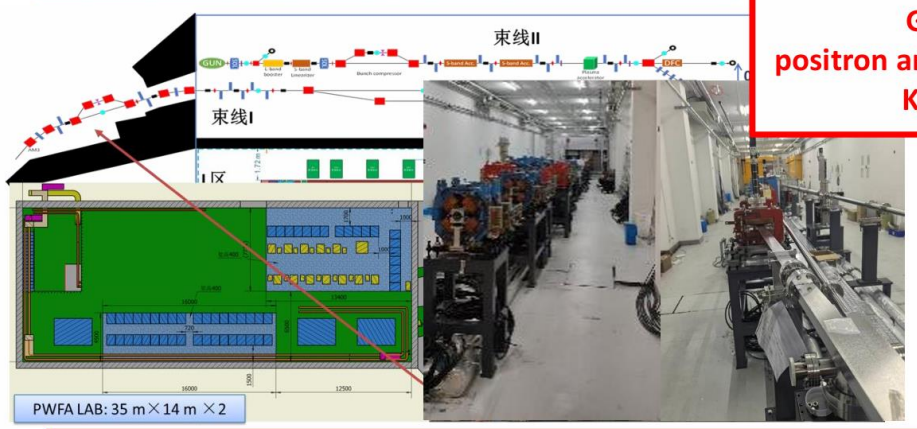
## For example: An IHEP PWFA lab in association with BEPC-II




Beam quality → Beamline I

| Parameters | Unit | BL-I e- (AM3) | BL-I e- (IP1) | BL-I e+ (AM3) | BL-I e+ (IP1) | BL-I e- (IP1, block) | BL-I e+ (IP1, block) |
|---|---|---|---|---|---|---|---|
| Energy | GeV | 2 | 2 | 2 | 2 | 2 | 2 |
| Charge | pC | 2000 | 2000 | 100 | 100 | 9.4 | 0.2 |
| bunch length | ps | 10 | 1 | 10 | 1 | ~1 | ~1 |
| Geo. emittance | mm·mrad | 0.1/0.1 | 0.1/0.1 | 0.4/0.4 | 0.4/0.4 | 0.011/0.005 | 0.04/0.02 |
| RMS beam size | μm | - | 150/150 | - | 300/300 | 30/40 | 54/76 |




**Goals: demonstration of acceleration of positron and electron beams with staging in next few years**
**Key technology for future linear colliders**



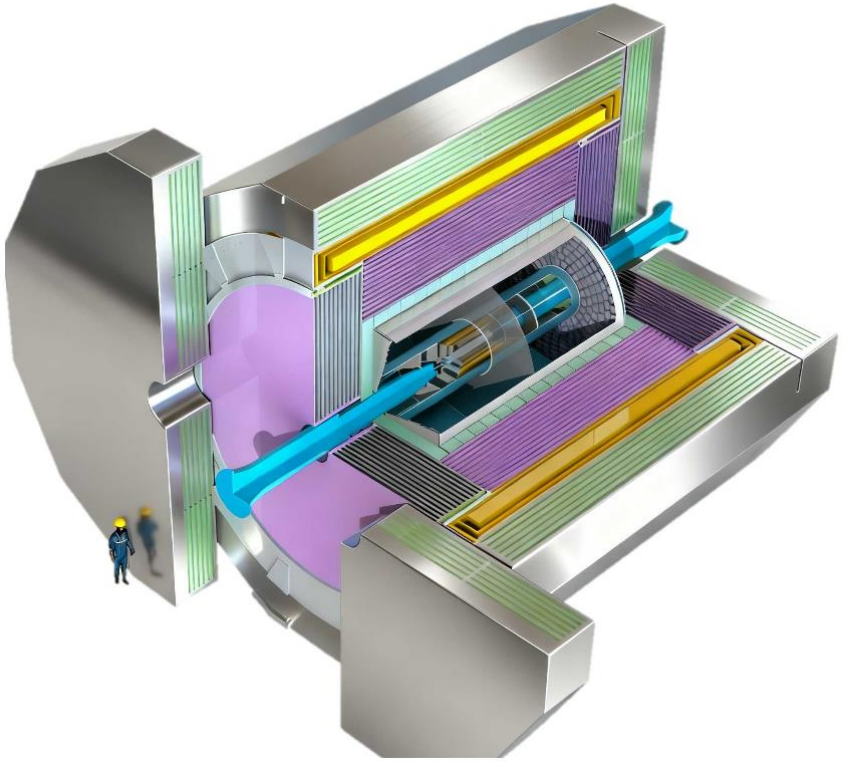


Dazhang Li, Wei Lu and Jie Gao, Research highlights on plasma-based acceleration at IHEP, AAPPS Bulletin (2025) 35:3, https://doi.org/10.1007/s43673-025-00143-z



See Jie Gao's talk

# The CEPC detector – follow-up R&D



- ❑ **prototyping with vital subsystems**
- ❑ **continuing to improve the design**
- ❑ develop combined system to evaluate their performance

| Sub-system | Technologies |
|---|---|
| Beam pipe | Beryllium, $\phi$ 20 mm |
| LumiCal | Silicon tracker + LYSO crystals |
| Vertex | Si Pixels: CMOS MAPS+stitching |
| Inner tracker (ITK) | Si Pixels: CMOS MAPS 55-nm |
| Gas detector | TPC with high granularity |
| Outer tracker (OTK) | AC-LGAD → TOF |
| ECAL | 4D transverse crystal bars |
| HCal | Glass scintillator, SiPM + Fe |
| Magnet | LTS Solenoid |
| Muon | Plastic scintillator bars, SiPM |
| TDAQ | Conventional |
| Back-end electronics | Common |

# CEPC Plan and Goals

**The TDR also documents future detector R&D plan details, many activities are with the DRD Collab.**

**prototyping with vital subsystems； continuing to improve the design**
**develop combined system to evaluate their performance**

**AGORA is designed for CEPC, and can be adapted for use at FCC-ee**

| | |
|---|---|
| **MDI and Luminosity** | • **MDI:** Optimization of collimatc<br>• **Luminosity measurement:** V<br>• **Beam background:** improve |
| **Silicon Detectors** | • **Vertex:** Development of wafer<br>CIS stitching MAPSs with 65nr<br>• **ITK:** HV-CMOS sensor R&D, h<br>• **OTK:** larger size, higher perfor<br>towards multi-channels readou |
| **Gaseous Detector** | • **TPC:** Test and validation of hig<br>back-flow, and electron transm |
| **Calorimeter and Muon Detectors** | • **ECAL:** QA/QC specifications f<br>• **HCAL:** Glass scintillator advar<br>• **Muon:** Enhance light yield anc<br>• R&D of **SiPM** and readout ASI |
| **Detector Magnet** | • Develop longer full-size aluminum-stabilized NbTi Rutherford cable<br>• Enhance mechanical strength, achieving self-supporting structures, and ensuring bonding strength<br>• Cryogenic system and mechanical design |
| **Electronics and TDAQ** | • Prototype verification, front-end chip development, and electronics common interface<br>• Development of advanced trigger algorithms, high-speed transmission technology for trigger electronics, and high-bandwidth distributed parallel computing.<br>• Small-scale experimental verification based on the new ATCA standard architecture |
| **Mechanics and Integration** | • Further design of yoke, sub-detectors, connection structure, and cooling<br>• Service: cabling and piping, electrical & gas system, crane, forks …<br>• Installation scheme optimization, design of the tooling and fixtures |
| **Software and Computing** | • Optimization of geometry coverage.<br>• Study of standalone tracking for displayed vertex.<br>• Simulation for physics impact and new physics. |

# Collaboration with CERN-FCC

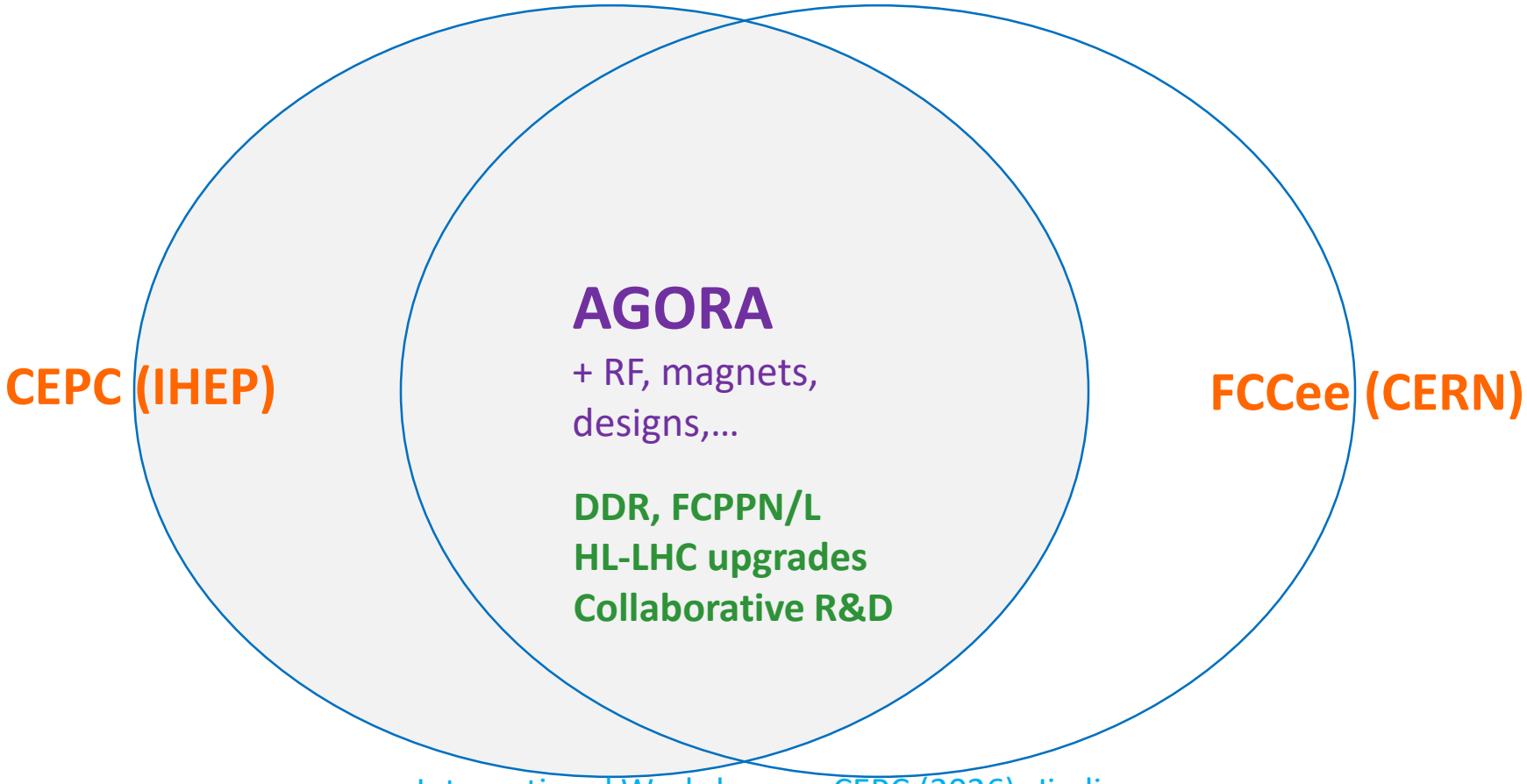



**To forge collaboration at high level**

**Much work to be done**

# Collaborationg with CERN-FCC

- going forward, intensified collaboration with FCC will position the FCC project optimally for ultimate realization at CERN ;
- making AGORA a great detector for FCCee



# Collaboration with CERN-FCC

## Agenda



FUTURE CIRCULAR COLLIDER

AGORA Detector and Physics Plenary Meeting

Wednesday Sep 16, 2026, 9:00 AM → 11:10 AM Europe/Zurich

**Description** Meeting URL:

https://zoom.us/j/99845275219?pwd=JOSplxGdFI1DI5KCKaCbvfwNZ

ID: 998 4527 5219
Password: 773321

**9:00 AM** → 9:15 AM **Introduction**
**Speakers**: Haijun Yang (Shanghai Jiao Tong University (CN)), Jianchun W
Da Costa (Chinese Academy of Sciences (CN)), Dr Miao He (IHEP, CAS)

**9:15 AM** → 9:35 AM **Design, fabrication and mechanical testing of a triangular carb**
**Speaker**: Xiaohui Qian

**9:35 AM** → 9:55 AM **Compact Periscopic Light Guide on Improving the Response U**
**Speaker**: Mingzheng Yang

**9:55 AM** → 10:15 AM **High-granularity crystal calorimeter: recent progress and hig**
**Speaker**: Jack Rolph (Chinese Academy of Sciences (CN))

**Other CEPC Issues Session:**

4:20 PM **Performance study on regarding Top EWK couplings**
**Speaker**: MUSTAPHA BIYABI (高能所)

## Upcoming activities

- **FCC Meetings**
  - 23-25 Sep, BSM at FCC-ee workshop: https://indico.cern.ch/event/1675240/
  - 26–29 Oct, FCC Reconstruction Workshop: https://indico.cern.ch/event/1719015/
  - 16–20 Nov, FCC-ee Tracking & PID Workshop: https://indico.cern.ch/event/1660971/
- **CEPC Day**
  - September 21, Beijing
- **CEPC International Accelerator Review**
  - September 22-24, Beijing
- **CEPC International Workshop**
  - https://indico.ihep.ac.cn/event/28911/
  - Shanghai, from October 22 to 26 2026
- **CEPC European Edition Workshop**
  - Belgrade, Serbia, June 8-11, 2027

# Collaboration with CERN-FCC




**A grass root meeting**

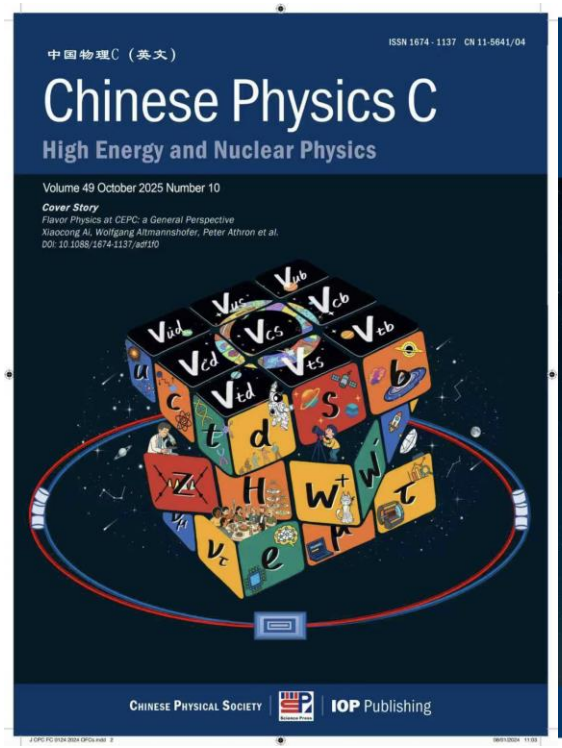
**DRD Round Table**
7:00-9:00pm
Monday, July 13
Shenzhen Hall
Guangzhou

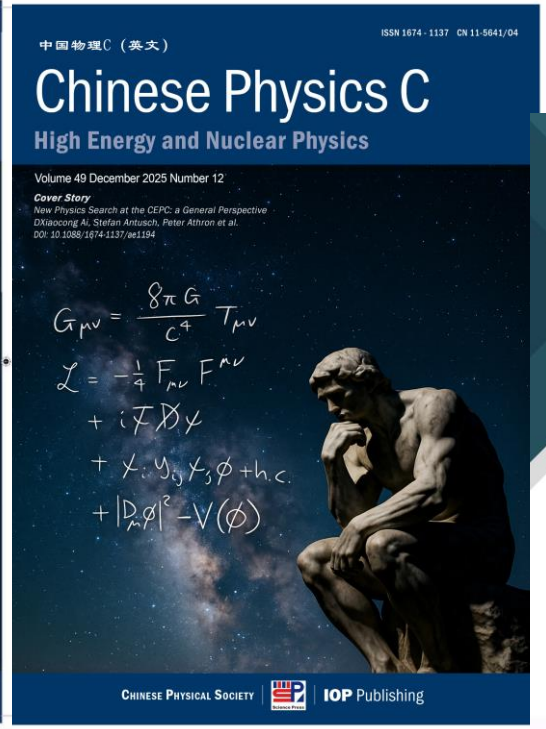
# Physics opportunities and potentials at CEPC &FCCee

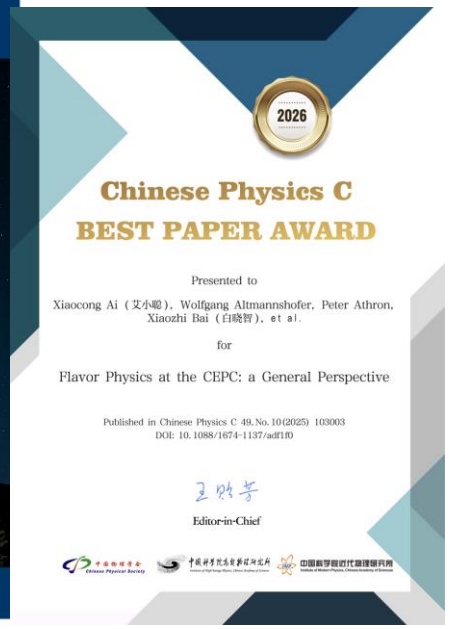
Manqi Ruan

## Physics white papers

- Higgs: 2019, CPC
- ESPPU input, 2019, ArXiv
- Snowmass input: 2022, ArXiv
- Flavor Physics, 2025, CPC
- New Physics, 2025, CPC




## Current Focus: EW & QCD

- Higgs & EW measurements, empowered by AI technologies & iterate with detector optimization
- LEP Legacy data: R value & weak mixing measurements
- Strong coupling constant measurements, jet relevant measurements, comparisons between different hadronization
- Algorithm development, i.e., to reconstruct hadron cascade decay inside jets (aka, “From leaves to the tree”)

International Workshop on CEPC (2026), Jiading

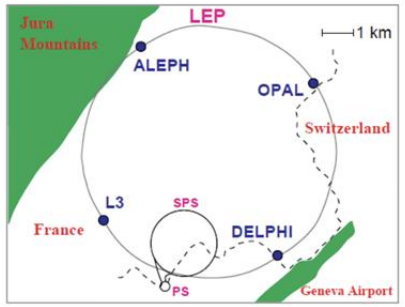
# Physics opportunities and potentials at CEPC &FCCee

## Making good use of legacy LEP data

Yuzhi Che, Jingfei Wu

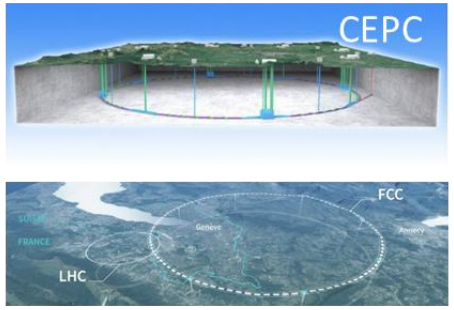
- The DELPHI legacy data and analysis framework have been migrated to IHEP server
- The modern MC generators are also implemented, enabling the legacy data to be exploited more efficiently.

~3.7 millions Z bosons




~ few minutes of

Trillions of Z bosons




Details can be found with Accessible links:

delphi-getting-started

analysis framework

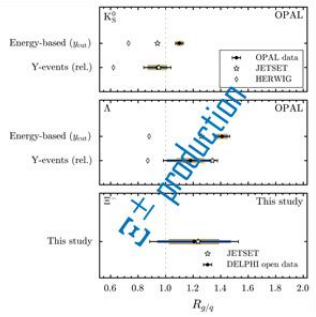
delphi in IHEP

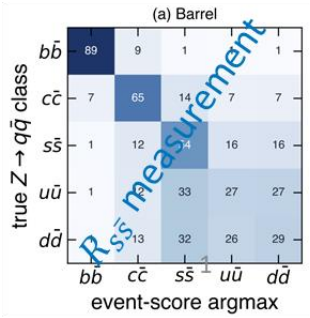
**Testing CEPC physics potentials**

**Even extra physics outcome**

**Legacy data from ALEPH and OPAL will bring to 3X current Z data sample**

- These data have been used for physics and testing CEPC technologies
  - $\Xi^{\pm}$ production in Z jets (Yuzhi Che, Xinchou Lou, Jinfei Wu,....) accepted by CPC
  - First $R_{s\bar{s}}$ measurements (Shuo Han, Manqi Ruan,...)
  - $e^+e^-e^+e^-$ incoherent pair background (Boping Chen)



# Communication & getting organized in China

## Following up on the strategy domestically

- A meeting for Chinese institutes will be organized during this workshop
  - Each institute ought to send one representative to the IB meeting
  - An email will be sent to participants of the workshop

- **Time: 12:30-14:00, Saturday, October 24**
- Place: Boardroom on the 3rd floor of the Sheraton Shanghai Jiading Hotel
- Zoom link: https://zoom.us/j/98473786035?pwd=acg31UVVWUM587vPd1Geb8hhpdJyd4.1
- Draft agenda:
  - FYI to get organized;
  - Update of name/email list;
  - indicate areas of interest per institute in a survey;
  - update of DRD activities;
  - Q&A with the CEPC management;
  - other topics

# International collaborations

## Forthcoming workshops and meetings

### 2026 international workshop on CEPC




During this workshop: the institutional meeting and the Steering Committee meeting will continue to get inputs and have discussions on our strategy

**2026 CEPC IAC Meeting**
**Nov. 16-17, 2026**
**Beijing**

- **Strategic direction and positioning**
- **Priorities for the next phase of R&D**
- **Sustaining and renewing the team**
- **International collaboration and scientific activities**

**2027 HKUST IAS fundamental physics conference**
**January 18-22, 2026**
**Hong Kong**



**2027 EU CEPC Workshop**
**June 8-11, 2027**
**Belgrade, Serbia**

# Summary

- CEPC addresses many pressing & critical science problems in particle physics, and is on the path to converge into a complete package
- We will join FCC-ee fully and contribute significantly, and let go of CEPC, if FCC-ee is approved for construction before 2030; **AGORA, based on the CEPC detector, is put up as a candidate detector for FCC-ee; detector R&D continues and will collaborate within the DRD programs**
- If FCC-ee is not approved prior to 2030, we plan to submit a new CEPC proposal to the Chinese government in 2030
- Will carry out technical validations, enhance the CEPC+FCC-ee designs, pursue new technologies and international collaborations
- Will continue with physics white papers, make good use of legacy LEP data
- Aiming to realize a future Higgs factory, FCCee or CEPC, we have a new roadmap to move forward

# Acknowledgements


- CEPC team's hard work, very fruitful international and CIPC collaborations have been critical to the CEPC program
- Special thanks to CEPC IB, SC, IAC, IARC and IDRC committees for their critical advices, suggestions and supports
- Funding agencies, local governments, CAS and IHEP for their financial supports


Thank You

# BACKUP SLIDES

# CEPC-SppC and FCC Synergy and Collaboration Issues-1



After he European Strategy for Particle Physics: 2026 Update - Recommendations by the European Strategy Group (CERN-ESU-2025-002, Dec.2025) https://cds.cern.ch/record/2950671 , the CERN Council decided to update the European Strategy for Particle Physics https://home.cern/the-cern-council-decided-to-update-the-european-strategy-for-particle-physics/ (May 22, 2026)

Jie Gao

**CEPC and FCCee timelines are becoming quite similar:**
**-CEPC plan to submit the proposal to Chinese government in 2029 for the 16th five-year plan (2030-2025) and if approved to start the construction during 2030~2035**
(in relation with FCCee decision)
**-FCCee will be decided in 2028**

Collaborations with Super KEK B is very important for CEPC
Understand SuperKEK B is the basis to under future advanced e+e- circular colliders (**Type-II in page 7** )

**CEPC participated the FCC public debate on Sept. 18, 2026, and Prof. Y.F. Wang stated CEPC status and CEPC/FCC relation and collaboration issues**




https://www.debatpublic.fr/projet-accelerateur-particules/lequipe-du-debat-interroge-les-porteurs-du-projet-chinois-de

It is important to have at least one Higgs factory as soon as possible for the HEP community worldwide , and Collaborations/Synergy/Contributions between CEPC-SppC/FCC, with common issues could be a subject of discussion

# CEPC-SppC and FCC Synergy and Collaboration Status-2



CEPC accelerator team participated FCC week 2026,
**June 8-12, 2026** https://indico.cern.ch/event/1552126/timetable/
with 8 talks on CEPC key subjects: high efficiency klystrons, high field SC magnets, booster magnet and vacuum chamber fabrication lines, CEPC MDI, CEPC polarization R&D, BEPCII-UP designs

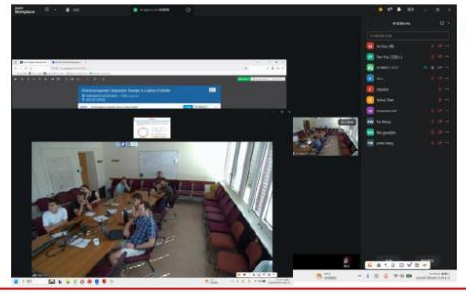
In terms of China-European collaboration in accelerator fields, IHEP is invited to join
GEAR-NG (Global Exchange Accelerator Research - Next Generation) program (2027-2030)
centered in the technologies of next generation Higgs Factories (CERN, DESY, IJCLab…)

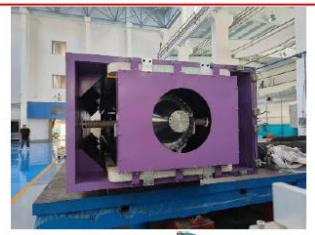
Jie Gao

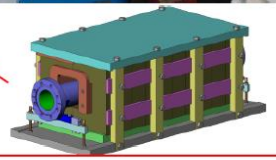
The workshop on electric-magnetic separators between FCC and CEPC on **29th of July, 2026** at 9:00, in room 865/1-D17
the Indico is here:
https://indico.cern.ch/event/1704501/

CEPC EM separator and an alternative kicker design to reduce the impedance

CEPC accelerator member visiting CERN in middle of **August, 2026**, exchanging the experiences on mechanics, mockup tunnel, ground motion, etc…











CEPC accelerator specialists have been invited to give presentation in FCC-ee Accelerator WG Meetings, for example,
-Jiyuan Li, "Strong–strong beam–beam simulations with lattices of circular $e^+e^-$ colliders", FCC-ee accelerator design meeting, Dec. 18, 2025,invited by Frank Zimmermann https://indico.cern.ch/event/1622390/ ,
-Yuanyuan Wei, CEPC IP tunning, FCCee optics tunning workgroup meeting, April 30, 2026, invited by Rogelio Tomas

# CEPC International Collaboration-2

Jie Gao

The 2024 HKUST IAS Mini workshop and conference were held from Jan. 18-19, and Jan. 22-25, 2024, respectively.
https://indico.cern.ch/event/1335278/timetable/?view=standard

The 2025 HKUST IAS fundamental physics conference: Jan. 14-17, 2025, Hong Kong
https://indico.cern.ch/event/1454867/overview

CEPC Workshop EU Edition (Barcelona, Spain) June 16-19, 2025
https://indico.ifae.es/event/2054/overview

The 2026 HKUST IAS fundamental physics conference: Jan. 12-16, 2026, Hong Kong
https://indico.global/event/15407/overview






CEPC Workshop EU, April 7-10, 2026, Lisbon, Portugal
https://indico.cern.ch/event/1598929/

IAS Program on Fundamental Physics, January 18–22, 2027, IAS,HKUST

CEPC Accelerator EDR Highlights and

The 2023 International Workshop on Circular Electron Positron Collider, EU Edition, University of Edinburgh, July 3-6, 2023
https://indico.ph.ed.ac.uk/event/259/overview



The 2024 international workshop on the high energy Circular Electron Positron Collider (CEPC) was held from Oct. 23-27, 2024, Hangzhou, China
https://indico.ihep.ac.cn/event/22089/




The 2025 international workshop on the high energy Circular Electron Positron Collider (CEPC) was held from Nov. 6-10, 2025, Guangzhou, China
https://indico.ihep.ac.cn/event/25300/




CEPC2026 workshop is held in Shanghai Oct.22-26, 2026
https://indico.ihep.ac.cn/event/cepc2026




https://indico.cern.ch/event/1720390/overview

The 2023 international workshop on the high energy Circular Electron Positron Collider (CEPC)
https://indico.ihep.ac.cn/event/19316/




The 2024 international workshop of CEPC EU-Edition were held in Marseille, France, April 8-11, 2024.
https://indico.in2p3.fr/event/20053/overview



FCPPNL, Bordeaux, France, June 10-14, 2024
https://indico.in2p3.fr/event/20434/overview

FCPPNL, Qingdao, China, July 21-25, 2025
https://indico.ihep.ac.cn/event/25400/

FCPPNL, Lyon, France, June 29-July 3, 2026
https://indico.in2p3.fr/event/38713/