Reunion FCC-contacts

vendredi 18 avr. 2025, 13:30 → 15:00 Europe/Paris

13:30 → 14:00 **News + FCC-contacts. Discussion sur la stratégie. Evolution vers la phase pre-TDR** 30m

Orateur: Gregorio Bernardi (APC Paris CNRS/IN2P3)

14:10 → 14:50 **Next steps / Tour de table des EoI et des différentes contributions** 40m

Orateurs: Catherine Biscarat (L2I Toulouse, CNRS/IN2P3, Université de Toulouse), Farès Djama (CPPM), Gaelle Boudoul (IP2I/AICP (CNRS/IN2P3)), Giovanni Marchiori (APC Paris), Jean-Baptiste De Vivie De Regie, Luc Poggioli (LPNHE Paris), Marco Delmastro (LAPP), Nicolas Morange (IJCLab), Stephane Monteil (Laboratoire de Physique de Clermont - UCA/IN2P3), Suzanne GASCON-SHOTKIN (IP2I Lyon/Université Claude Bernard Lyon 1), Vincent BOUDRY (LLR - CNRS, École polytechnique/IPP Paris), Ziad EL BITAR (IPHC)

Current and Future Events

- 3rd US-FCC workshop (15-17/04/25 ANL+FNAL)

- FCC week (19-23/05/25, Vienna)

- the ESPPU open symposium (23-27/06/26, Venice)

3rd US-HF-FCC workshop FNAL/ANL

https://indico.fnal.gov/event/67484/timetable/#20250414.detailed

MDI/IR Systems Tutorial — *John Seeman*
Alvin Tollestrup Auditorium, IARC 09:30 - 10:45

Coffee
Alvin Tollestrup Auditorium, IARC 10:45 - 11:05

Beam-Beam Physics and Modeling — *Spencer Gessner*
Alvin Tollestrup Auditorium, IARC 11:05 - 12:20

Tutorials: Pizza Lunch and Discussions
Alvin Tollestrup Auditorium, IARC 12:30 - 13:00

Full Detector Simulation in DD4HEP — *Wonyong Chung*
Alvin Tollestrup Auditorium, IARC 13:00 - 13:15

Analysis tuturial session supporting slides — *Jan Eysermans*
Alvin Tollestrup Auditorium, IARC 13:15 - 13:30

Welcome by FNAL Director: Fermilab — *Young-Kee Kim*
One West 09:00 - 09:20

The FCC - Update — *Michael Benedikt*
One West 09:20 - 09:40

FCC Feasibility Study and pre-TDR — *Guy Wilkinson*
One West 09:40 - 10:05

FCC Accelerator — *Frank Zimmermann*
One West 10:05 - 10:30

FCC Detectors — *Felix Sefkow*
One West 11:00 - 11:25

FCC CB Matters — *Gregorio Bernardi*
One West 11:25 - 11:40

US HFCC PED Update — *Srini Rajagopalan*
One West 11:40 - 12:05

US HFCC-A Update — *Stephen Gourlay*

FCC-ee Physics Motivation and — *Christophe Grojean*
One West 14:00 - 14:20

Higgs Physics at FCC-ee — *Zhen Liu*
One West 14:20 - 14:40

Precision Physics at FCC-ee — *Frank Petriello*
One West 14:40 - 15:00

Flavor Physics at FCC-ee — *Zoltan Ligeti*
One West 15:00 - 15:20

LC Vision — *Jenny List*

Day of parallel sessions

FCC-ee Detector Challenges — *Carl Haber*
Auditorium, Building 402 09:15 - 09:40

US Proposed Subsystem Concept Panel — *Bob Hirosky et al.*

Utilizing New Technologies — *Artur Apresyan*
Auditorium, Building 402 11:00 - 11:25

Lessons Learned from LHC Detectors — *Steve Nahn*
Auditorium, Building 402 11:25 - 11:45

EIC Synergies — *-Caroline aschenauer*
Auditorium, Building 402 11:45 - 12:05

HL-LHC Reach and FCC-hh Programme — *Heather Gray*
Auditorium, Building 402 12:05 - 12:30

Accelerator Session Summar/Highlights — *Tor Raubenheimer*
Auditorium, Building 402 14:00 - 14:20

PED Session Summary/Highlights — *Louise Skinnari*
Auditorium, Building 402 14:20 - 14:45

Physics Session Summary/Highlights — *Ian Low*
Auditorium, Building 402 14:45 - 15:10

Workshop Closeout — *Sarah Eno*
Auditorium, Building 402 15:10 - 15:30

19-23 May 2025, Hofburg Vienna – Heldenplatz – 1010 Vienna, Austria

The Hofburg lies at the heart of Vienna's Old Town, the best way to reach it is by public transit. Two underground stations as well as bus and tram stops are all within walking distance. Motorists can park their vehicles at nearby car parks (for a fee).

https://indico.cern.ch/event/1408515

FUTURE CIRCULAR COLLIDER

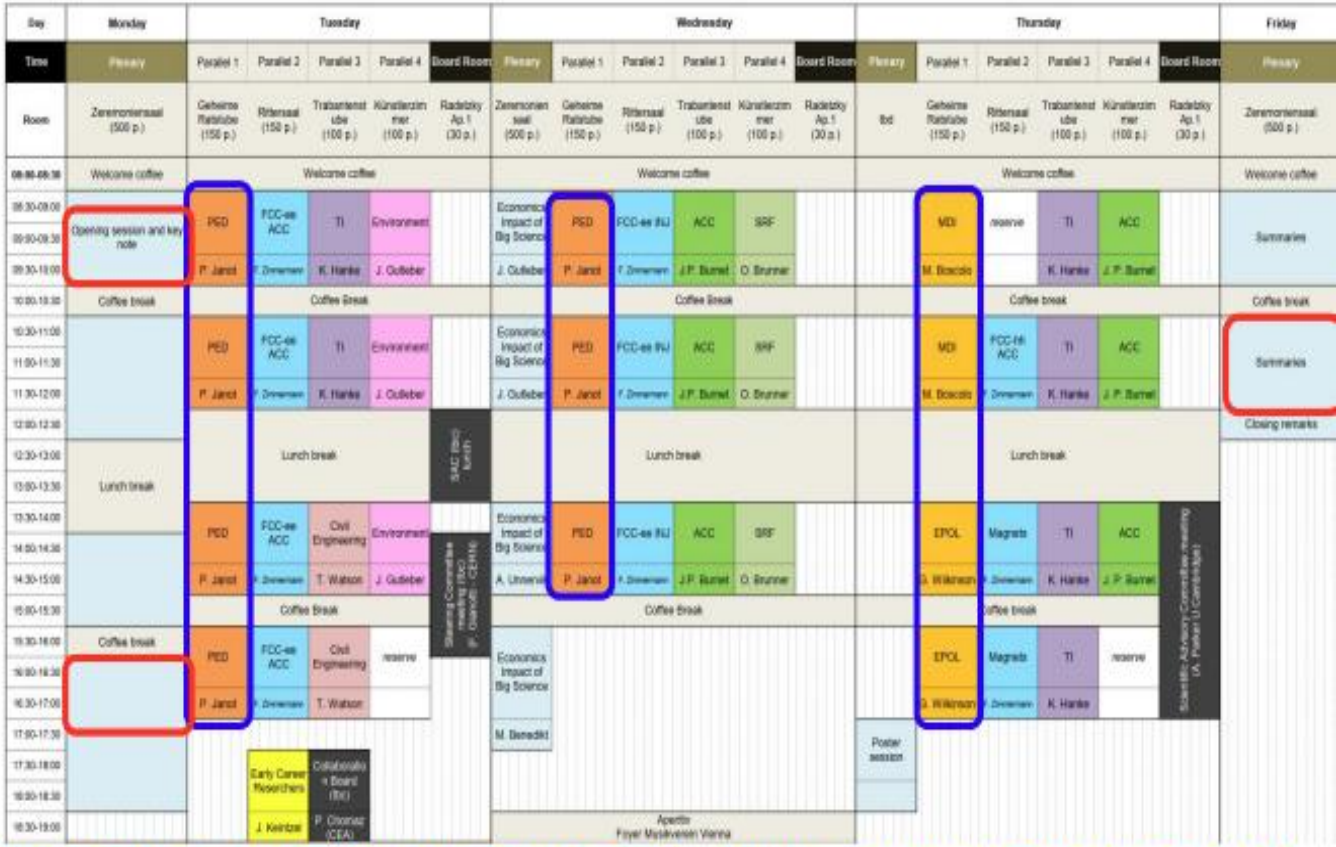
2025 FCC Week

Copied from FCC Week 2024 in San Francisco

- 1 PED plenary session + 1 keynote presentation
- 1 summary talk
- 9 PED parallel sessions
  - Of which 1 MDI, 1 EPOL
- ECR session
  - Only in parallel with CB meeting

Registration fees

- Standard: 550 euros
- Student: 300 euros
- One-day pass: 150 euros
- Zoom: 30 euros



To all work package coordinators (PProg, PPerf, DetCon, S&C, EPOL, MDI) - input needed by Feb. 20

- Please send suggestions for list of topics and speakers for the parallel sessions
- Any volunteer for the summary talk?

444 participants

Participation française actuelle faible à la FCC-week:

Faisons un effort en PED !!!!

Chance	Antoine	FR-CEA, Commissariat à l'Energie Atomique et aux Energies Alternatives	
Dalena	Barbara	FR-CEA, Commissariat à l'Energie Atomique et aux Energies Alternatives	
Philippe	Chomaz	FR-CEA, Commissariat à l'Energie Atomique et aux Energies Alternatives	
Bruant	Quentin	FR-CEA, Commissariat à l'Energie Atomique et aux Energies Alternatives	
Miyazaki	Akira	FR-CNRS/IN2P3	
Maloizel	Alexis	FR-CNRS/IN2P3	
Korsun	Anna	FR-CNRS/IN2P3	
Alharthi	Fahad	FR-CNRS/IN2P3	
Angeles	Faus Golfe	FR-CNRS/IN2P3	
Boudoul	Gaelle	FR-CNRS/IN2P3	IP2I
Marchiori	Giovanni	FR-CNRS/IN2P3	
Bernardi	Gregorio	FR-CNRS/IN2P3	APC Paris
Chaikovska	Iryna	FR-CNRS/IN2P3	
Tamazirt	Juba	FR-CNRS/IN2P3	
Vacavant	Laurent	FR-CNRS/IN2P3	
Le Garrec	Maël	FR-CNRS/IN2P3	
Soos	Roxana	FR-CNRS/IN2P3	CERN
Monteil	Stephane	FR-CNRS/IN2P3	Clermont University
Mytrochenko	Viktor	FR-CNRS/IN2P3	
GOMEZ MARTINEZ	Yolanda	FR-CNRS/IN2P3	LPSC
WANG	Yuting	FR-CNRS/IN2P3	
Wu	Zhibo	FR-CNRS/IN2P3	
Huang	Zuchen	FR-CNRS/IN2P3	
Ghribi	Adnan	FR-GANIL	

Open Symposium on the European Strategy for Particle Physics

	Monday	Tuesday	Wednesday	Thursday	Friday
09:00	**Opening Session**	**Large-scale accelerator projects at CERN, part I**	**Electroweak Physics** Talks (i), (ii) Discussion	**BSM** Talks (i), (ii) Discussion	**Overarching topics** (by ESG Working groups) e.g. National input and others
	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
11:15	**Parallel session I - IV**	**Large-scale accelerator projects at CERN, part II**	**Strong Interactions** Talks (i), (ii) Discussion	**Dark Matter / dark sector** Talks (i), (ii) Discussion	**Overarching topics (cont.)** (by ESG Working groups)
13:00	Lunch Break	Lunch break	Lunch break	Lunch break	**Closeout Session** Closeout talk, final discussion
14:00	**Parallel session I - IV**				
15:00		**Status in China, Japan, US**	**Flavour** Talks (i), (ii) Discussion	**Detector Technologies** status of DRDs, R&D needs, timeline, required resources	**ESG Meeting**
16:00	**Parallel sessions V - IX**	Coffee break	Coffee break	Coffee break	
	Coffee break	**Accelerator Technologies** Status of critical item, R&D needs timeline, required resources	**Neutrinos and Cosmic Messengers** Talks (i), (ii) Discussion	**Computing** Status of critical item, R&D needs timeline, required resources	
	Parallel sessions V - IX				
19:15					

9:00 - 10:45 Opening Session

Parallel Sessions I - IV
11:15 - 13:00 Parallel I - IV, part I
Lunch Break: 13:00 - 14:00

14:00 - 15:30 Parallel I - IV, part II
Very short break; 15:30 - 15:40 to change rooms
15:40 - 17:00 Parallel V - IX, part I
17:00 - 17:20 Coffee break
17:20 - 19:15 Parallel V-IX, part II

16:45 - 19:15 Accelerator Tech.

For each **Physics Block**:
(i) Status, open questions
(ii) How can they be addressed by the various projects
(iii) Discussion

11:15 - 12:30 ESG Session II
12:30 - 13:30 Closeout session

14:30 - 16:30 ESG Meeting

BESSON	Nathalie	CEA
BOBIN	Jerome	CEA
Baldisseri	Alberto	CEA IRFU, Université Paris-Saclay
Titov	Maksym	CEA Saclay, Irfu
Hamel de Monchenault	Gautier	CEA Université Paris-Saclay
Jeanneau	Fabien	CEA-IRFU-Université Paris Saclay

490 participants

Participation française actuelle au Symposium

Bassler	Ursula	LLR - École Polytechnique/IN2P3
Boudry	Vincent	LLR – CNRS, École polytechnique, Inst...
Porteboeuf Houssais	Sarah	LPCA
Teixeira	Ana M.	LPCA - Clermont (CNRS/IN2P3)
Malaescu	Bogdan	LPNHE, CNRS
BLONDEL	Alain	LPNHE, Paris, and DPNC, Geneva
Zito	Marco	LPNHE/IN2P3-CNRS
GASCON-SHOTKIN	Suzanne	Université Claude Bernard Lyon 1/IP2I ...
Marchiori	Giovanni	APC Paris (CNRS/IN2P3)

ROY	Christelle	CNRS
Courtin	Sandrine	CNRS & University of Strasbourg
Collot	Johann	CNRS – LPSC Université Grenoble Alp...
Grasso	Marcella	CNRS-IN2P3
Boudoul	Gaelle	CNRS/IN2P3
Vacavant	Laurent	CNRS/IN2P3
Delmastro	Marco	CNRS/IN2P3 LAPP
Boumediene	Djamel	CNRS/IN2P3, Laboratoire de Physique...
Djama	Farès	CPPM Marseille
Diaconu	Cristinel	CPPM, Aix Marseille University and C...
Monteil	Stephane	FR/CNRS IN2P3 - Clermont University
Panebianco	Stefano Matthias	French Ministry of Research and Innov...
Faus Golde	Angeles	IJCLab IN2P3-CNRS
Morange	Nicolas	IJCLab, CNRS/IN2P3
Winter	Marc	IJCLab/CNRS
Contardo	Didier	IP2I CNRS/IN2P3
Baussan	Eric	IPHC-IN2P3/CNRS
Dracos	Marcos	IPHC-IN2P3/CNRS

Evolution organisation avec Team-Leader/Deputy Team Leader

Next Steps in FCC Collaboration building, from the PED side

We have National Contacts (informally also Regional Contacts), Institute contacts in some countries like the US, but not in all, working on it.

To be more organized, one of the issue is the different way the institutes/Universities are “registered”:

Some have MoU’s, some depend on a National Mou, some have an addendum to the MoU specifying the commitments, some have informal registration (on IFNC excel tables)

We have now a new possibility: Register the institutes under the FCC collaboration, to appear in the CERN Grey book, with a Team Leader (and possibly one or two Deputy Team Leader).

Regarding collaboration building in the pre-TDR phase, the goals are to

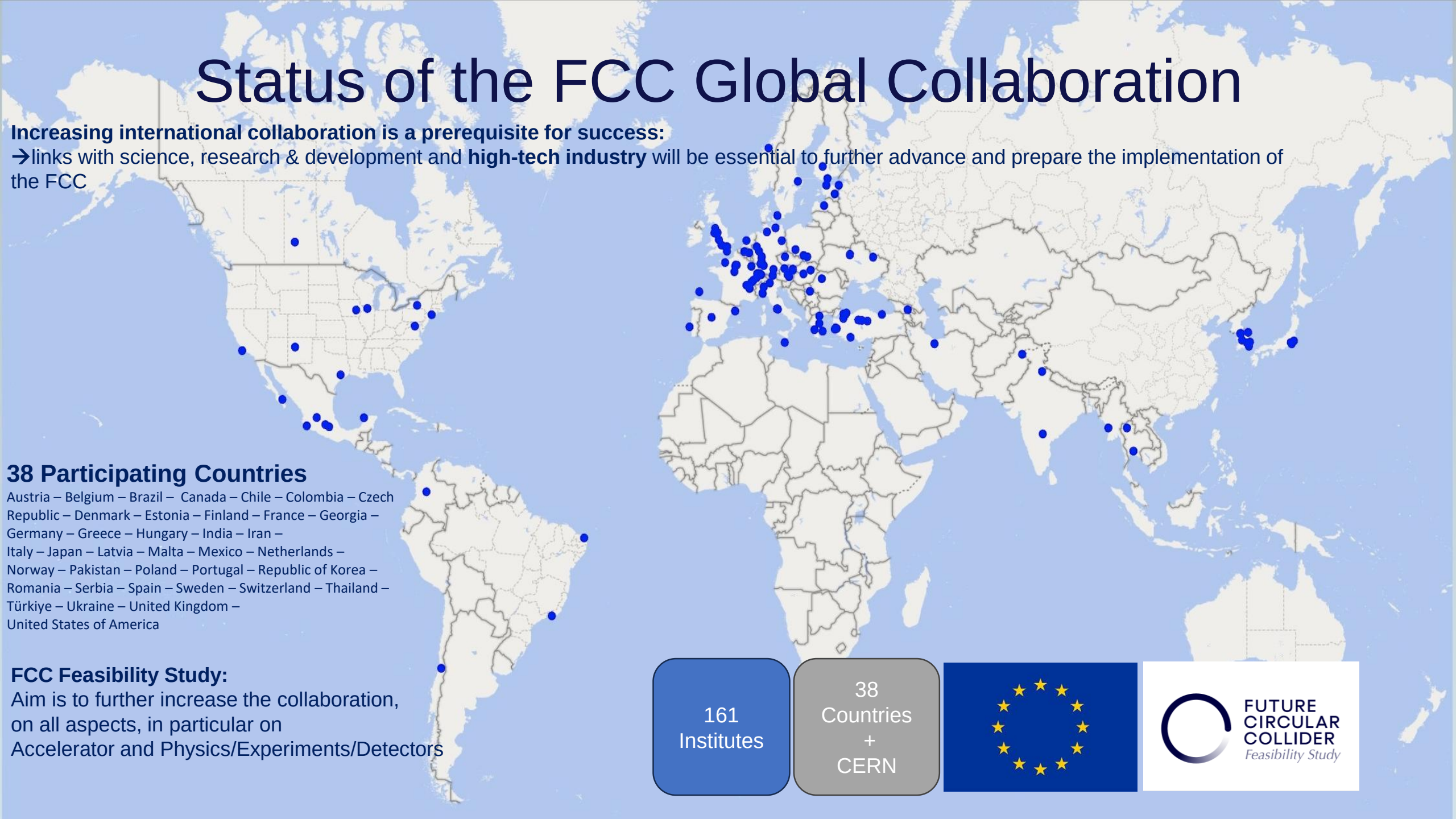
1) Develop “FCC WORLDWIDE” (cf. FCC-PED-WEB.CERN.CH) to better define the overall international organization, for FCC at large (MoU’s) and for FCC-PED (via the Grey book, see below)

2) have the current PED institutes to register in the Grey Book, with a TL and possibly a DTL. At least one of the two must be active in FCC-PED (since in some countries, the “boss” of the institute wants to be institute contact, i.e. TL in this new approach)

3) … see below

Status of the FCC Global Collaboration

Increasing international collaboration is a prerequisite for success:
→links with science, research & development and **high-tech industry** will be essential to further advance and prepare the implementation of the FCC



38 Participating Countries

Austria – Belgium – Brazil – Canada – Chile – Colombia – Czech Republic – Denmark – Estonia – Finland – France – Georgia – Germany – Greece – Hungary – India – Iran – Italy – Japan – Latvia – Malta – Mexico – Netherlands – Norway – Pakistan – Poland – Portugal – Republic of Korea – Romania – Serbia – Spain – Sweden – Switzerland – Thailand – Türkiye – Ukraine – United Kingdom – United States of America

FCC Feasibility Study:
Aim is to further increase the collaboration, on all aspects, in particular on Accelerator and Physics/Experiments/Detectors

161 Institutes

38 Countries + CERN

FUTURE CIRCULAR COLLIDER
Feasibility Study

9 MoU with US Universities + DOE + CASE

- Addendum III to Accelerator Protocol III between CERN and the DOE
  The Department of Energy of the United States of America
- MoU CASE (SBU/BNL), CASE (SBU/BNL), Center for Accelerator Science and Education

- MoU NIU, Northern Illinois University
- MoU Uiowa, University of Iowa
- MoU UH, University of Houston
- MoU Cornell, Cornell University
- MoU UNM, The University of New Mexico
- MoU Duke, Duke University
- MoU MIT, Massachusetts Institute of Technology (MIT)
- MoU UCSB, University of California Santa Barbara
- MoU UCI, University of California Irvine

48 US institutions and their contacts

	contact name	contact email
U.-mass Amherst	Stephane Willocq	Stephane.Willocq@cern.ch
Argonne *	Jinlong Zhang	zhangjl@anl.gov
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Brandeis	Aram Apyan	aram.apyan@cern.ch
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BROWN *	Loukas Gouskos	Loukas.Gouskos@cern.ch
BU	Zeynep Demiragli	zeynep.demiragli@cern.ch
Caltech	Maria Spiropulu	smaria@caltech.edu
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Columbia	John Parsons	parsons@nevis.columbia.edu
Cornell	Anders Ryd	ar322@cornell.edu
Duke	Ashutosh Kotwal	kotwal@phy.duke.edu
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FNAL *	Anadi	acanepa@fnal.gov
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JOHN HOPKINS	Andrei Gritsan	gritsan@jhu.edu
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Michigan state *	Reinhard Schwienhorst	schwier@msu.edu
Minnesota	Nadja Strobbe	nstrobbe@umn.edu

	contact name	contact email
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tufts	Hugo Beauchemin	hugo.beauchemin@tufts.edu
California Berkeley *	Carl Haber	chhaber@lbl.gov
california Santa Cruz *	Mike Hance	mhance@ucsc.edu
UC Irvine	Anyes Taffard	anyes.taffard@cern.ch
New Mexico *	Sally Seidel	seidel@unm.edu
VIRGINIA *	Bob Hirosky	hirosky@virginia.edu
U. Washington *	Shih-Chieh Hsu	schsu@uw.edu

* : registered at the workshop (20/48)

Example of FCC teams in the Grey book

Institute Name	Institute Parent Name	Town	Country	Team Leader & Deputy Team Leader(s)
Department of Physics	University of Tehran	Tehran	Iran	(TL) AZIZI, KAZEM
Department of Physics	University of Zurich	Zurich	Switzerland	(TL) CANELLI, FLORENCIA MARIA (DTL) KILMINSTER, BENJAMIN JOHN (DTL) MACCHIOLO, ANNA
Institut Pluridisciplinaire Hubert Curien	Centre National de la Recherche Scientifique	Strasbourg	France	(TL) EL BITAR, ZIAD (DTL) GOFFE, MATHIEU
LAPP-Laboratoire d'Annecy de Physique des Particules	Centre National de la Recherche Scientifique	Annecy-Le-Vieux	France	(TL) LAMANNA, GIOVANNI (DTL) BRUNETTI, LAURENT
Laboratoire APC - Astroparticules et Cosmologie	Centre National de la Recherche Scientifique	Paris	France	(TL) BERNARDI, GREGORIO (DTL) MARCHIORI, GIOVANNI
Laboratori Nazionali di Frascati	INFN e Laboratori Nazionali di Frascati	Frascati	Italy	(TL) BOSCOLO, MANUELA
Particle Accelerator Physics Laboratory (LPAP-IPEP)	EPFL - Ecole Polytechnique Federale Lausanne	Lausanne	Switzerland	(TL) PIELONI, TATIANA
Sezione di Bologna INFN	Universita e INFN, Bologna	Bologna	Italy	(TL) GIACOMELLI, PAOLO
Sezione di Napoli (INFN)	University Federico II and INFN, Naples	Naples	Italy	(TL) PAOLUCCI, PIERLUIGI (DTL) IORIO, ALBERTO ORSO MARIA
Sezione di Padova	Universita e INFN, Padova	Padua	Italy	(TL) AZZI, PATRIZIA
Sezione di Pavia	Pavia University and INFN	Pavia	Italy	(TL) BRAGHIERI, ALESSANDRO (DTL) GAUDIO, GABRIELLA
Universita & INFN Pisa		Pisa	Italy	(TL) PALLA, FABRIZIO (DTL) BEDESCHI, FRANCO
Universita degli Studi di Udine		Udine	Italy	(TL) PANIZZO, GIANCARLO
Universita e INFN, Ferrara		Ferrara	Italy	(TL) CIBINETTO, GIANLUIGI
VINCA Institute of Nuclear Sciences	University of Belgrade	Belgrade	Serbia	(TL) PANDUROVIC, MILA (DTL) HADRE, JULIE

How to register as a FCC team in the Grey book

Registration of a new FCC Team in the CERN Grey Book for Physics, Experiments and Detectors (PED) activities:

1. The institution signs the MoU for the FCC Feasibility Study (contact: fcc.office@cern.ch) See also Collaboration | Future Circular Collider
2. The institution sends the form 'Appointmentform_TL_DTL.pdf' to the PED Pillar Coordinator Patrick Janot for approval with fcc.office@cern.ch in copy. See also Duties and Obligations of the Team Leader | Users Office
3. Once approved by Patrick Janot, the FCC Study Office liaise with the CERN Grey Book for the registration of the team and the appointment of team leader and deputy/ies.

NB: institutions that participate in activities other than PED cannot request a team in the CERN Grey Book. Their participation and the registration of their members are handled via collaboration agreements (addenda to FCC MoU).

- We can proceed to step 2 since we already have an MOU

Discussion les résultats des inputs, et sur les next steps

Question: What is the preferred next major/flagship collider for CERN ?

ALL	30	4	23	1	0	1	0	3	
Country	FCC (any)	FCC-ee	FCC-ee then FCC-hh	FCC-hh directly	Mu-Coll	LC@CERN (any)	LEP3	None (no explicit pref	Comments
Austria	1		1						FCC not clearly named (but they want QCD and Flavour in the e+e- colli
Brazil	1								LCF smaller cost, higher energy
Belgium	1		1						
Bulgaria									Did not submit a national input (Member state)
Canada								1	No recommendation in their contribution
Croatia	1								
Cyprus									Did not submit a national input (Associate member state)
Czech Rep.	1		1						
Denmark	1		1						
Estonia	1		1						
Finland	1		1						
France	1	1	1						
Germany	1	1							
Greece	1		1						
Hungary	1	1							
India									Did not submit a national input (Associate member state)
INFN	1		1						INFN top management
Israel	1	1							
Italy	1		1						Italian HEP community (Gruppo 1)
Japan						1		1	Highest priority is ILC in Japan (not in the question). They do not explic
Latvia									Did not submit a national input (Associate member state)
Lithuania	1		1						No firm recommendation, circular e+e- collider could be the preparatory
Netherland								1	Main document: no preference, wait for ESG. ECR: Divided votes, CLI
Norway	1		1						
Pakistan	1								Name "HE-LHC" at the same level as "FCC" - maybe wanted to say "H
Poland	1		1						Signed by Zarnecki. LCF is second priority
Portugal	1								
Romania	1		1						
Serbia	1		1						
Slovakia	1		1						
Slovenia	1		1						
Spain	1		1						
Sweden	1		1						
Switzerland	1		1						
Türkiye									Did not submit a national input (Associate member state)
Ukraine	1		1						
United Kingdom	1		1	1					Only FCC tunnel recommended. Large contingents for FCC int and for
United States	1		1						LC Vision with 4xL needs technical review. US has another contribution

Position of big countries on options B, if option A is not feasible

UK:

If FCC is unaffordable or technically unfeasible: In this case, a Linear Collider Facility is an less expensive alternative route to an e+e− Higgs factory at CERN, can be realised on the same timescale or even sooner, and provides attractive possibilities for future energy upgrades.

If CEPC is realized promptly: In this case, efforts could be increased to realise FCC-hh on a shorter timescale; discussion would be needed on the technical roadmap required and the commercial availability, cost, and field-strength of magnets, and the corresponding collision energies that could be achieved. An alternative would be to build a Linear Collider Facility at CERN with initial collision energy > 500GeV, as a complementary facility to CEPC.

If major non-European collider projects proceed then the UK community would wish to collaborate on them. However, the next flagship collider at CERN should be complementary to major efforts elsewhere, and not an identical type of project.

The scenario of ILC being pursued in Japan will be further discussed in the April meeting. We decided to postpone any prioritisation of alternative options until the next community meeting on 28th April when additional information will be available

ITALY: No option B given, concentrate on option A. Irrespective of competing projects worldwide, ensuring that Europe remains at the forefront of HEP. If highly pressing geopolitical situation, we may proceed directly with the construction of the hadronic FCC-hh (skipping FCC-ee),

GERMANY: If China proceeds with CEPC on the announced timescale, physics results from this machine are expected to become available about 10 years earlier… **CERN then has to aim for a complementary and competitive next flagship collider project at higher energies: either a hadron collider** with magnet technology expected to be available at the end of the HL-LHC, **installed in a tunnel of about 90 km circumference, or a linear e+e− collider facility with a centre-of-mass energy of initially at least 550 GeV**

If financial problem for FCC: **an e+e− Linear Collider is an attractive alternative path towards a Higgs factory.**

US: Given the uncertainty in the execution of any plan and the scope of international participation, **a CEPC inclusion in the next 5-year Plan of China should not immediately influence the ESG recommendations or CERN's direction to proceed with FCC-ee**. *The developments in China should be carefully monitored over the next several years and an appropriate strategy should be developed should China demonstrate its intent to move forward with CEPC construction.*

FRANCE (community)

If the construction of an e^+e^- collider comparable to the FCC_{ee} is not firmly established outside of Europe:

- In absence of FCC-ee, a linear e+e- collider facility (LCF) at CERN would be the next best option for a Higgs factory. Somewhat limited statistics at the HZ cross-section peak and a much smaller luminosity at the Z-pole are in part compensated by the possibility to reach at least $\sqrt{s}$ = 500 GeV, allowing a clean observation of the $e^+e^- \rightarrow \nu\nu H$ process, of the top threshold, and a first determination of the Higgs-boson self coupling.
- Energies of $\sqrt{s}$ = 1–3 TeV, as enabled by CLIC technology, would significantly improve these measurements and allow detailed studies of vector-boson scattering. The LCF program could be complemented by a dedicated, high-luminosity Z factory, possibly re-using existing infrastructure at CERN.
- As a last-resort fall-back, LEP3 offers an instantaneous luminosity five times less than FCCee and an energy range limited to about $\sqrt{s}$ = 240 GeV.

If the construction of an e+e− collider comparable to the FCCee is firmly established outside of Europe, and ahead in schedule:

- The LCF would provide sufficient scientific complementarity only if it covers the entire energy range between the $t\bar{t}$ production threshold and the TeV scale on a reasonable timespan.
- Or, the strategy could be the earlier development of a high-energy hh/eh program, ideally in a 91km tunnel@$\sqrt{s}$=85 TeV
- If a new tunnel is not feasible, a collider such as the HE-LHC could be a fallback alternative…
- Both the FCC-hh and the HE-LHC should be complemented by an electron-hadron collider such as the LHeC….it could run in the early 2040's and use improved acceleration techniques based on ERL that will help achieve the sustainability requirements and benefit to future e+e− colliders.

Are we happy with this non prioritizations ?

Should the community or the funding agencies try to do more prioritization for option B and update or submit their input ?

If yes, how ? (The other large countries have all scheduled an additional community meeting to make an update for the 26th of May

There is also the potential to make more updates after Venice, but their impact will be small.

Here after are the slides actually shown at the fcc contact meeting.

The Previous 3 were the updated ones shown on Tuesday at the Pecfa France meeting

Position of big countries if option A is not feasible

UK:

[Cost/ technical unfeasibility]- **FCC is unaffordable or technically unfeasible:** In this case, a Linear Collider Facility is an less expensive alternative route to an e+e− Higgs factory at CERN, can be realised on the same timescale or even sooner, and provides attractive possibilities for future energy upgrades.
International developments]- **CEPC is realised:** In this case, efforts could be increased to realise FCC-hh on a shorter timescale; discussion would be needed on the technical roadmap required and the commercial availability, cost, and field-strength of magnets, and the corresponding collision energies that could be achieved. An alternative would be to build a Linear Collider Facility at CERN with initial collision energy > 500GeV, as a complementary facility to CEPC.
If major non-European collider projects proceed then the UK community would wish to collaborate on them. However, the next flagship collider at CERN should be complementary to major efforts elsewhere, and not an identical type of project.

The scenario of ILC being pursued in Japan will be further discussed in the April meeting. We decided to postpone any prioritisation of alternative options until the next community meeting on 28th April when additional information will be available., then the document will be revised ahead of the 26th May deadline for updating national inputs ahead of the Open Symposium.

ITALY:

No option B given, concentrate on option A

GERMANY:

If China proceeds with CEPC on the announced timescale, physics results from this machine are expected to become available about 10 years earlier… **CERN then has to aim for a complementary and competitive next flagship collider project at higher energies: either a hadron collider with magnet technology expected to be available at the end of the HL-LHC, installed in a tunnel of about 90 km circumference, or A linear e+e− collider facility with a centre-of-mass energy of initially at least 550 GeV**
If financial problem for FCC: **an e+e− Linear Collider is an attractive alternative path towards a Higgs factory.**

US:

Given the uncertainty in the execution of any plan and the scope of international participation, a CEPC inclusion in the next 5-year Plan of China should not immediately influence the ESG recommendations or CERN's direction to proceed with FCC-ee. ***The developments in China should be carefully monitored over the next several years and an appropriate strategy should be developed should China demonstrate its intent to move forward with CEPC construction.***

FRANCE:

494 *If the construction of an e^+e^- collider comparable to the* $\mathrm{FCC_{ee}}$ *is not firmly established outside of Europe:*

495 In absence of $\mathrm{FCC_{ee}}$, a linear e^+e^- collider facility (LCF) at CERN would be the next best option for a Higgs factory.
496 Somewhat limited statistics at the HZ cross-section peak and a much smaller luminosity at the Z-pole are in part compensated
497 by the possibility to reach at least $\sqrt{s} = 500$ GeV, allowing a clean observation of the $e^+e^- \to \nu\nu H$ process, of the top
498 threshold, and a first determination of the Higgs-boson self coupling. Energies of $\sqrt{s} = 1$–3 TeV, as enabled by CLIC
499 technology, would significantly improve these measurements and allow detailed studies of vector-boson scattering. The
500 LCF program could be complemented by a dedicated, high-luminosity Z factory, possibly re-using existing infrastructure at
501 CERN.

502 As a last-resort fall-back, LEP3 offers an instantaneous luminosity five times less than $\mathrm{FCC_{ee}}$ and an energy range limited
503 to about $\sqrt{s} = 240$ GeV. This still matches the purpose of an electroweak, flavour and Higgs factory in line with the 2020
504 ESPP, but does not allow a complete test of the electroweak theory. LEP3 could be followed by a hadron collider, benefitting
505 of high-field magnets which would be developed at the horizon of the completion of HL-LHC, to address the missing issues
506 on a much longer timescale.

If the construction of an e^+e^- collider comparable to the $\mathrm{FCC_{ee}}$ *is firmly established outside of Europe, and ahead of the European project:*

The LCF would provide sufficient scientific complementarity only if it covers the entire energy range between the $t\bar{t}$ production threshold and the TeV scale on a reasonable timespan.

Alternatively, the strategy could shift towards the earlier development of a high-energy hh/eh program, ideally implemented in a new tunnel as in the case of FCC. Given the shorter time available for magnet development, the energy reach would likely be reduced to about $\sqrt{s} = 85$ TeV.

If a new tunnel is not feasible, a collider such as the HE-LHC could be a fallback alternative with comparable scientific breadth. Due to its limited size, the HE-LHC energy reach would be limited to O(25 TeV). However, it would serve as a natural extension of the HL-LHC, reaching similar precision as a TeV-scale LCF. Dedicated flavour and HI experiments could improve on LHC's respective legacies.

Both the $\mathrm{FCC_{hh}}$ and the HE-LHC should be complemented by an electron-hadron collider such as the LHeC to resolve the uncertainties stemming from the proton and nuclear structure in these uncharted energy regimes. The LHeC also has a rich physics program of its own, with fundamental measurements in the strong and electroweak sectors, and a non negligible potential for NP searches. It could run in the early 2040's and use improved acceleration techniques based on ERL that will help achieve the sustainability requirements and benefit to future e^+e^- colliders.

While the fall-back scenarios presented above are clearly sub-optimal compared to the FCC program, the scientific loss is in part compensated by the faster scientific return and increased complementarity offered by a program including ee, pp and ep collisions in different regions and on similar timescales.