Reunion FCC-contacts

vendredi 14 févr. 2025, 09:00 → 10:30 Europe/Paris

09:00 → 09:30 **News + FCC-contacts. Evolution vers la phase pre-TDR** 30m

Orateur: Gregorio Bernardi (APC Paris CNRS/IN2P3)

09:35 → 09:50 **Un nouveau projet** 15m

Orateurs: Ursula BASSLER (LLR - École Polytechnique - IN2P3), Mme Ursula Bassler (IN2P3)

09:50 → 10:30 **Next steps / Tour de table des EoI et des différentes contributions** 40m

Orateurs: Catherine Biscarat (L2I Toulouse, CNRS/IN2P3, UT3), 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)

News from FCC Coordination

It is planned to submit three ‘accelerator’ documents:

FCC integrated project: FCC-ee

FCC integrated project: FCC-hh

FCC ‘local implementation’ (may be renamed, to allow for more Issues to be addressed, *e.g.* future uses of tunnel beyond FCC-hh

We in PED are planning our separate submissions – see later agenda

News about National Strategy Community Meetings

Belgium
Italy
Switzerland

News from Chamonix workshop

For the first time, Chamonix had an FCC session Thurs 30/1 [protected].

Afternoon session had talks on complementary topics.

The High Field Magnet programme (20'+10')	*Dr Ezio Todesco*	
le Majestic, Chamonix		13:30 - 14:00
The Superconducting RF programme (15'+5')	*Frank Gerigk*	
le Majestic, Chamonix		14:00 - 14:20
Progress with Linear collider studies at CERN (20'+10')	*Steinar Stapnes*	
le Majestic, Chamonix		14:20 - 14:50
Options for re-using the LEP/LHC tunnel (15'+5')	*Frank Zimmermann*	
le Majestic, Chamonix		14:50 - 15:10
Leg stretch		
le Majestic, Chamonix		15:10 - 15:20
The path to a Muon Collider (20'+10')	*Daniel Schulte*	
le Majestic, Chamonix		15:20 - 15:50
The plasma wakefield acceleration landscape (15'+5')	*Edda Gschwendtner*	
le Majestic, Chamonix		15:50 - 16:10
A comparative study of future collider possibilities (20'+10')	*Gianluigi Arduini*	
le Majestic, Chamonix		16:10 - 16:40
Closing remarks	*Mike Lamont*	
le Majestic, Chamonix		16:40 - 16:50

There follow a few remarks on the LC and LEP/LHC tunnel talks.

None of the contents of the talks would surprise you, but the meeting was an opportunity to expose the status and planning to the wider (senior) CERN community.

Good discussion and well received.

The physics case for FCC (15'+5')	*Guy Wilkinson*	
le Majestic, Chamonix		08:30 - 08:50
Outcome of the Feasibilty Study (20'+10')	*Michael Benedikt*	
le Majestic, Chamonix		08:50 - 09:20
FCC territorial implementation and sustainability (20'+10')	*Johannes Gutleber*	
le Majestic, Chamonix		09:20 - 09:50
Civil engineering update for FCC (15'+5')	*Timothy Paul Watson*	
le Majestic, Chamonix		09:50 - 10:10
Coffee break		
le Majestic, Chamonix		10:10 - 10:30
Group Photo		
le Majestic, Chamonix		10:30 - 10:40
The FCC-ee injector complex (20'+10')	*Paolo Craievich*	
le Majestic, Chamonix		10:40 - 11:10
FCC-ee machine (20'+10')	*Jacqueline Keintzel*	
le Majestic, Chamonix		11:10 - 11:40
Towards the pre-TDR phase (20'+10')	*Jean-Paul Burnet*	
le Majestic, Chamonix		11:40 - 12:10

Chamonix: LC at CERN [Steinar Stapnes]

Some key points

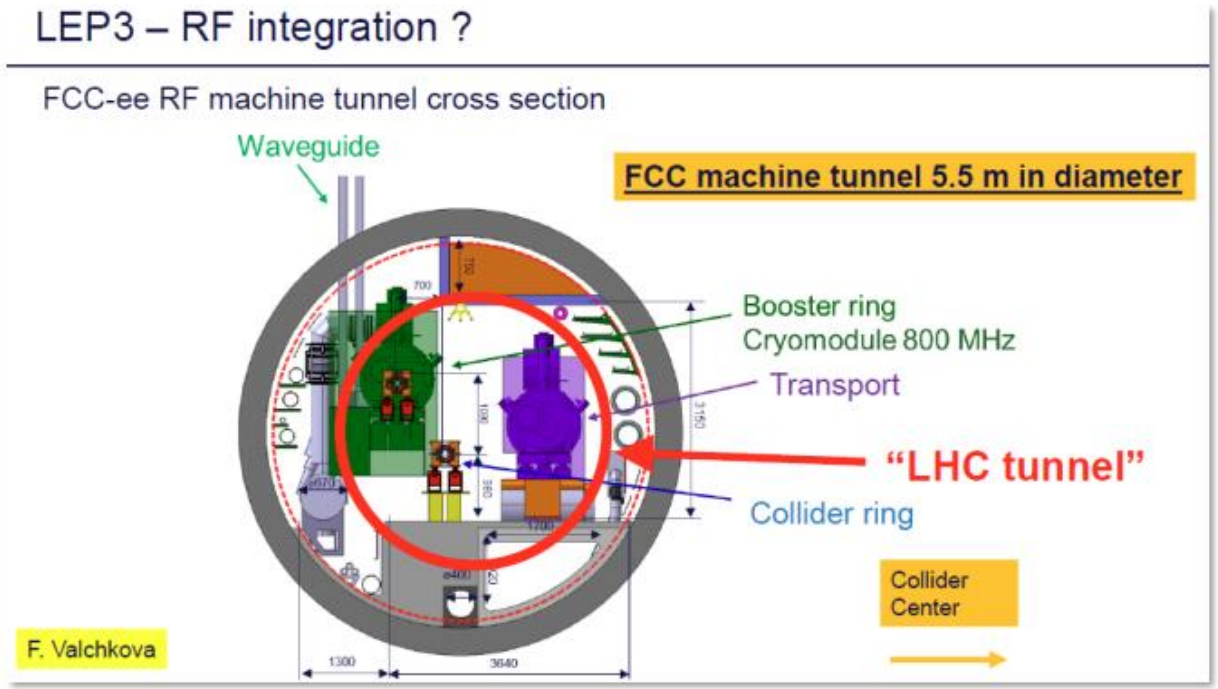
- CLIC will be proposed with several changes wrt to 2018 (X-band also an upgrade option) (Improved wrt 2018, hosted at CERN)
- A LC starting with SRF technology will be proposed for CERN, with upgrade considerations (E,L, length and technologies) (New concept considered for hosting at CERN)
- In both cases emphasis on initial "affordable" and performant Higgs factories, emphasising the additional physics reach by going to at least 550 GeV, and possibly beyond, and provide parameters for higher energy ranges.
  → Aim to demonstrate the LC "parameter space" available with "baseline" examples, and variations of these (e.g. increased luminosities, empty tunnels preparing for upgrades, …)

Thanks – most of the slides/information from:
S.Michizono, B.List, IDT and ILC colleagues, CLIC team, J.List, A.Robson, E.Nanni and the C^3 team, the HALHF team, ARUP, the Snowmass Implementation Task Force (names on page 2 of the report, chair T.Roser), F.Cardelli, N.Catalan, many more

Not to be forgotten – above plans involve very major machine upgrade midproject, which is not required for FCC programme (see discussion in arXiv:2412.13130).

Other pending issue is cost. ILC in Japan recently recosted, and shows 60+% increase w.r.t.. 2017 [link]. Waiting to learn estimated cost of ILC@CERN.

Chamonix: re-use of LEP/LHC tunnel, with focus on 'LEP3' [Frank Zimmermann]



→ LEP3 requires widening the LHC tunnel in – at least – six of the LEP/LHC straight sections, for RF installation in four straights and for two experimental IRs

CE cost for tunnel widening, bypasses (?), TL's etc ~ 1 BCHF T. Watson cost of RF system ~1-2 BCHF; arc magnets & vacuum ~0.5 BCHF; injector ~0.5 BCHF, all others ~1 BCHF
→total cost ~4-5 BCHF (very roughly)

Timeline: HL-LHC stop, LHC dismantling (2-3 years?, [LEP:15 months]), CE, LEP3 installation …
Difficult to see that LEP3 could start physics operation before ~2050

Chamonix: re-use of LEP/LHC tunnel, with focus on 'LEP3' [Frank Zimmermann]

LEP3 – ZH Higgs factory (240 GeV c.m.)

- proposed in Dec 2011 by Alain Blondel and F.Z., https://arxiv.org/abs/1112.2518
- submitted as CERN proposal to ESU 2012/13 – no traction

parameter	unit	LEP3 H	FCC-ee-H
circumference	km	26.7	90.7
number of collision points	-	2	4
beam energy	GeV	120 (115?)	120
SR power / beam	MW	50	50
beam current	mA	7.2	26.8
bunch population	10^{11}	2.7	1.69
no. bunches / beam		16	440
energy loss / turn	GeV	6.92 (5.84)	**1.86**
RF voltage	GV	8 (6.5)	2.1
arc cell length	m	28	52
hor. emittance	nm	4.2	**0.66**
vert. emittance	pm	14	**1.0**
hor. / vert. β*	mm	1000 / 2.0	240 / 1.0
luminosity *L*	10^{34} cm^{-2}s^{-1}	0.8 (x2)	7.5 (x4)

D. Shatilov, K. Oide, 2017

K. Oide, A preliminary LEP3 lattice, FCC-ee optics meeting, 15 Dec 2017

limited Q1 aperture & large $\varepsilon_x \rightarrow \beta_x^*$; long overlap region→ β_y^*

straight section length is ±270 m compared with ± 700 m for FCC-ee

~4x higher SR power per unit length, plus 10% higher E_c than FCC-ee at $t\bar{t}$

compared with FCC-ee

20x lower total *L*

Other considerations:

- At Z, ~10x lower effective L.
- Difficult to imagine operation above WW.
- Also, no RDP possible for W mass.

Not uncompetitive with linear colliders !

Very recent news on FCC-hh power budget

1.9 K operation baseline for Final Report, but discussion on 4.5 K,
which may be a working point that the project evolves to.

FCC-hh power demand and consumption, 1.9K

Parameters
- 84 TeV
- 14T magnets
- 1.9K cryogenics
- 1.2MW of synchrotron radiations per beam

- Cryogenics eco-mode at 82.7MW (shutdown)
- Cryo arc 185MW + 22.5MW for 2 HL inner triplets
- RF power 23MW during ramp-up, but 12MW during flat top

		21 TeV	42 TeV	63 TeV	84 TeV
PRF EL (MW)		17	17	17	17
Pcryo (MW)		207.5	207.5	207.5	207.5
Pcv (MW)		40	40	40	40
PEL magnet (MW)		3	11	21	33
Experiments (MW)	4 exp	24	24	24	24
Data centre (MW)	4 exp	8	8	8	8
General services (MW)		26	26	26	26
Total FCC alone (MW)		**325**	**333**	**343**	**355**
Yearly consumption TWh/y		**2.22**	**2.25**	**2.29**	**2.34**

FCC-hh power demand and consumption, 4.5K

Parameters
- 84 TeV
- 14T magnets
- 4.5K cryogenics
- 1.2MW of synchrotron radiations per beam

- Cryogenics eco-mode at 45MW (shutdown)
- Cryo arc 125MW + 12MW for 2 HL inner triplets
- RF power 23MW during ramp-up, but 12MW during flat top

		21 TeV	42 TeV	63 TeV	84 TeV
PRF EL (MW)		17	17	17	17
Pcryo (MW)		137	137	137	137
Pcv (MW)		40	40	40	40
PEL magnet (MW)		3	11	21	33
Experiments (MW)	4 exp	24	24	24	24
Data centre (MW)	4 exp	8	8	8	8
General services (MW)		26	26	26	26
Total FCC alone (MW)		**255**	**263**	**273**	**284**
Yearly consumption TWh/y		**1.7**	**1.74**	**1.78**	**1.82**

e with average annual consumption from FCC-ee `Higgs progr
1.33 TWh/y at 240 GeV and 1.77 TWh/yr at 365 GeV.

PED plans for ESPPU submission

M.L. Mangano

- **Context:**
  - 10 page doc's, to be submitted by March 31
  - Will be reviewed by the WGs of the Strategy Preparatory Group, to prepare
    - presentations at the Open Symposium (Venice)
    - briefing book of the ESPP, to be used during the strategy-setting mtg of the Strategy Group
    - for details, see: https://europeanstrategyupdate.web.cern.ch/process-0
- **FCC PED submissions,** as agreed with the ESPPU leadership (main editors, in orange chief editor):
  - 1. **Physics-Experiments-Detectors Overview** (C.Grojean, P.Janot, G. Wilkinson)
  - 2. **QCD** physics (**D. d'Enterria**, P. Monni)
  - 3. **Higgs/EW/Top** physics (P. Azzi, J. Bendavid, J. de Blas, G. Durieux, J. Eysermans, A.Freitas, E. Perez, M. Selvaggi)
  - 4. **Flavour** physics (J. F. Kamenik, A. Lusiani, S. Monteil, G. Wilkinson)
  - 5. **BSM** searches (T. You, R. Gonzalez Suarez, **M. McCullough**, P. Azzi)
  - 6. **FCC-hh specificities** (**M. Mangano**, M. Selvaggi, B. Stapf , A. Taliercio, S. Williams)

General remarks

- 1. **Physics-Experiments-Detectors Overview:**
  - introduce overall framework of PED activities, as developed during the feasibility study
  - outline of the PED ESPPU submissions (list the following 5 docs)
  - overview of the PED aspects not covered in 10-page docs (EPOL, MDI, detector concepts, SW&Comp), with references to relevant documentation (eg FSR, CDS notes, etc)
  - community building, LoI process, etc
- 6. **FCC-hh specificities (**and relation of FCC-hh projections to the other documents):
  - general references to 2016 Yellow Report and CDR, baseline detector YR
  - discussion of energy-luminosity scenarios, since CDR
  - Results of relevance to the combined FCC-ee and FCC-hh performance (eg Higgs couplings, EWSB parameters, etc):
    - include the baseline **results** (84 or 100 TeV) in the H/EW/top document
    - just the **results…** details on analysis, detector syst assumptions, etc, in the FCC-hh doc or in back-up document or in CDS/arXiv notes
  - EFT inputs from high-Q2 physics (eg high-mass tt, tttt, VV, DY, …): depends on the format
    - eg high-Q distributions can be tabulated in separate notes, made available to Prep Group for their fits
    - summary of distributions studied, in the form of a table: can go to H/EW/top document
  - Results specific to FCC-hh (eg HI's, PDFs, high-mass BSM searches, …): in the FCC-hh doc
  - BSM studies of joint interest for FCC-ee (eg ALPs, DM, …): will discuss once the BSM document draft is available

Future events

- ECR@ESPPU symposium (20/02/25, CERN and online)

- 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)

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

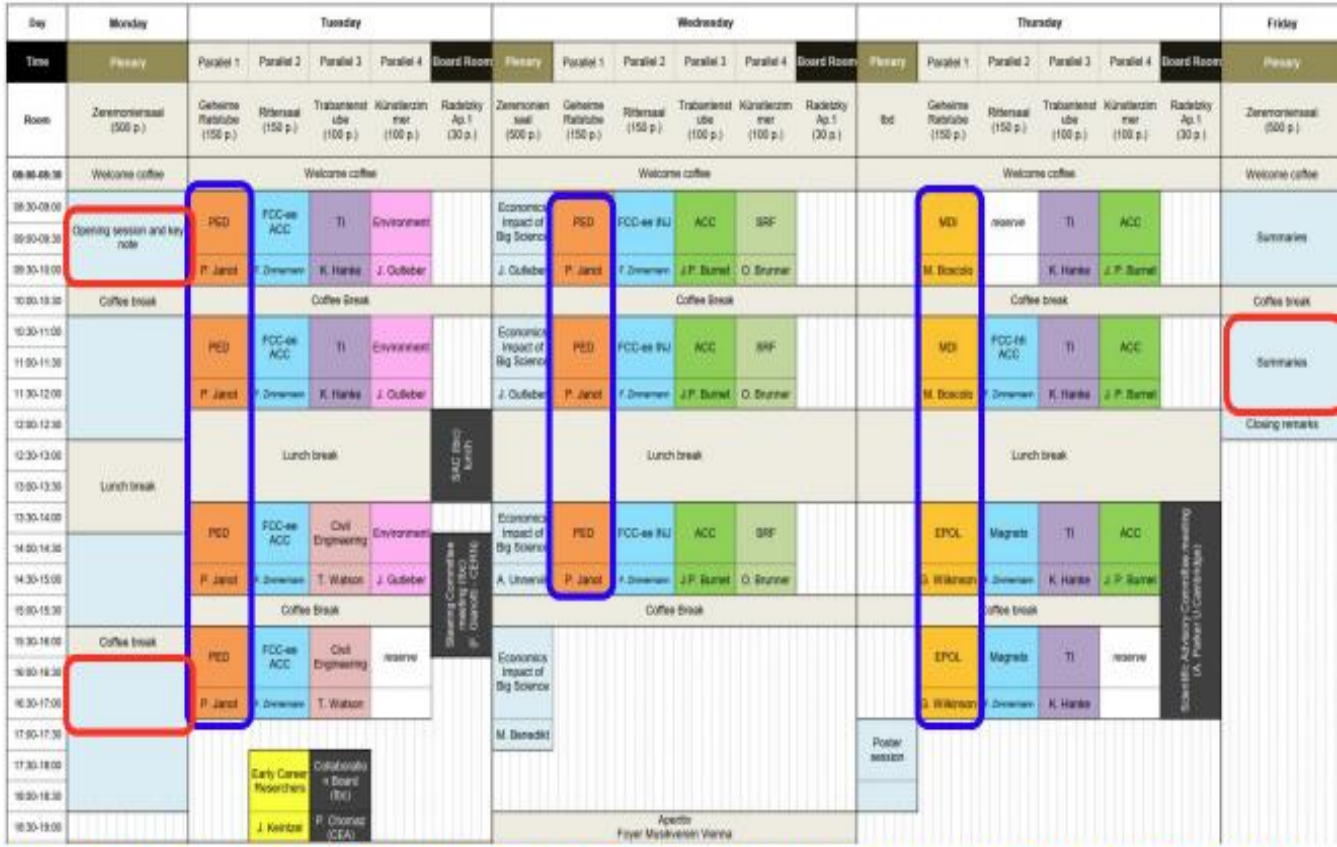
2025 FCC Week

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?

2025 FCC Week - SPC

- Alcaraz Maestre,Juan (CIEMAT)
- Allanach,Ben (Cambridge)
- Andrea,Jeremy (IPHC Strasbourg)
- Azzi, Patrizia (INFN Padova)
- Bergauer, Thomas (HEPHY)
- Bernardi, Gregorio (IN2P3)
- Boscolo, Manuela (INFN Frascati)
- Canelli, Florencia (UZH)
- Canepa, Anadi (Fermilab)
- Cepeda, Maria (CIEMAT)
- Contardo,Didier (IP2I Lyon)
- d'Enterria, David (CERN)
- Dam, Mogens (NBI)
- del Duca,Vittorio (Frascati)
- Dittmaier,Stefan (Freiburg)
- Eerola, Paula (Helsinki)
- Elvira,Daniel (FNAL)
- Eno, Sarah (UMD)
- Faltova, Jana (CUNI)
- François, Brieuc (CERN)
- Giacomelli, Paolo (U Bologna)
- Gonzalez Suarez, Rebeca (Uppsala)
- Grojean, Christophe (DESY)
- Hoang,Andre (Vienna U.)
- Huitu, Katri (Helsinki)
- Janot, Patrick (CERN)
- Kado, Marumi (MPP)
- Kamenik, Jernej (Ljubljana)
- Keintzel, Jacqueline (CERN)
- Kilminster, Ben (UZH)
- Klute, Markus (KIT)
- Laenen, Eric (Nikhef)
- Lesiak, Tadeusz (IFJ PAN Kraków)
- Maltoni,Fabio (Bologna)
- McCullough, Matthew (CERN)
- Palla, Fabrizio (INFN Pisa)
- Pandurovic, Mila (VINCA)
- Paus, Christoph (MIT)
- Piccinini,Fulvio (Pavia)
- Plaetzer, Simon (U Graz)
- Pleier, Marc-André (BNL)
- Pradler,Josef (Vienna OAW)
- Rajagopalan, Srini (BNL)
- Rojo, Juan (Amsterdam)
- Salam, Gavin (Oxford)
- Schieck, Jochen (HEPHY)
- Schwanda, Christoph (HEPHY)
- Sefkow, Felix (DESY)
- Selvaggi, Michele (CERN)
- Simon, Frank (KIT)
- Torrence, Eric (University of Oregon)
- Wilkinson, Guy (University of Oxford)
- You, Tevong (King's College)
- Zhang, Jinlong (ANL

Not accepted yet

Backup Slides

Pre-TDR phase

Detector Concepts Status

Felix, Mogens & Marc-André

Planning for “pre-TDR phase”

Need to prepare for Detector CDRs first (then TDR)!

CDR: simulation, optimisation, proof-of-principle (demonstrators), key engineering

TDR: largely complete engineering model, simulation and costing backed by scalable prototypes

Need full simulation *with realistic digitizers* to assess physics performance versus requirements at sub-detector and concept level as well as compare with prototypes and test beam data.

Need to prioritise engineering resources to address overall system integration. Need full-time “detector-oriented” physicist at CERN to coordinate across detector concepts and avoid duplication of work.

Need to develop potential installation timelines, going backwards from intended start of operations in 2045.

Progress on solenoids is needed (15 years engineering and construction time for ATLAS / CMS)

Understand TDAQ needs from full simulations (+ digitisation), including background

Develop better cost-estimates based on prototyping experience and engineering input

FUTURE CIRCULAR COLLIDER

Plans for the Pre-TDR Phase

Physics Software and Computing

FCC Coordination meeting

February 13th, 2025

Gerardo Ganis, **Brieuc François** (CERN)

Organisation Change Needed

It is **crucial to have a more structured organisation, with more official responsibilities**

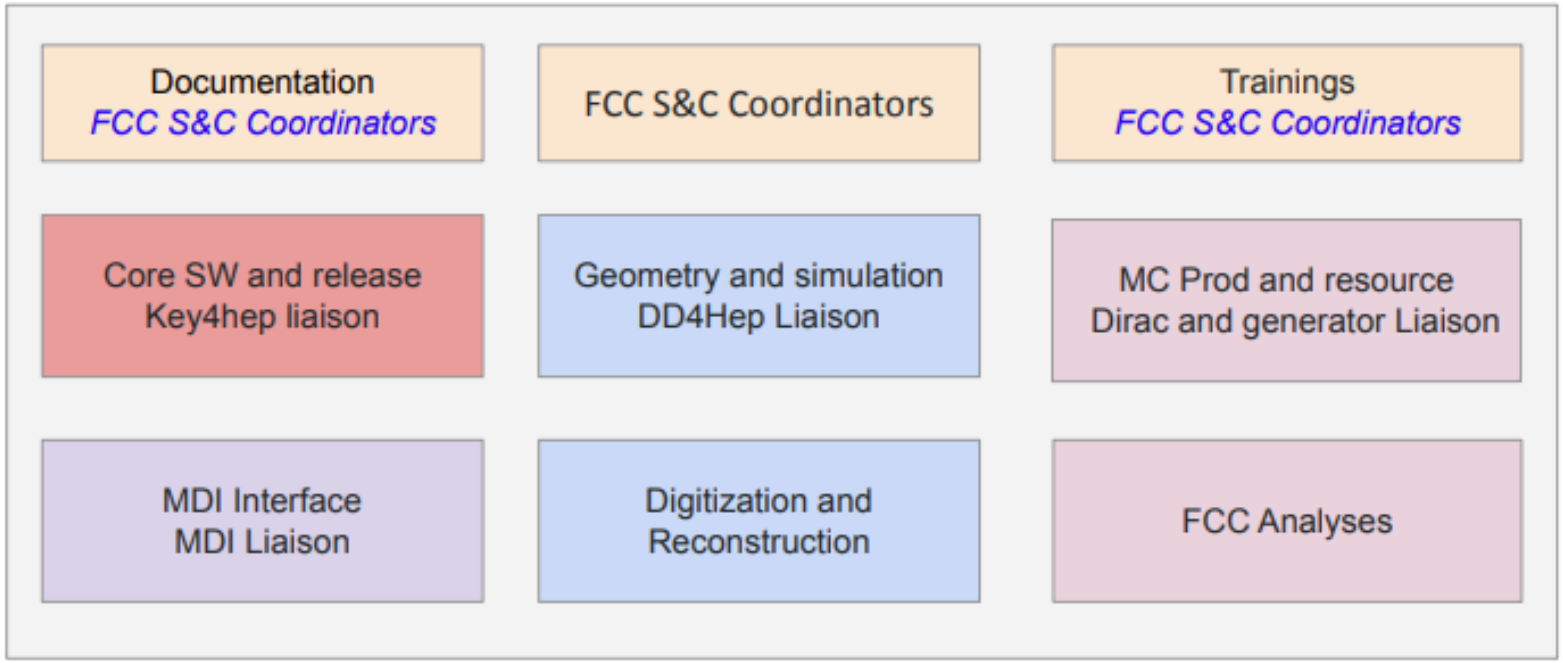
- There is a wealth of activity and too many things falls on the main coordinators
  - From 'above', from 'below' and from the 'sides'
- FCC is flying, the number of active people is increasing!
- The 'number of software tools' has increased and will continue to increase (good news, enables more physics studies)
  - This means that the **code base to maintain and debug is also growing**
- The best effort basis has reached its limit
  - **Failing at implementing a real structure will be seriously detrimental for the project**

Specific Deliverables

~~Realistic~~ → Prioritized (don't want to give false hopes, not everything depends on us)

- ❑ Detailed digitizer for the drift chamber
- ❑ A tracking solution for currently existing detectors
- ❑ Embryos of particle flow algorithms for currently existing detectors
- ❑ Centrally provide advanced particle IDs (pi0, jets, taus, …) – beyond pre-TDR
- ❑ Well-oiled MC production campaigns on the GRID (including non-CERN sites)
  - ❑ Both Parametrized and Full Simulation
- ❑ A good solution for running physics analyses on GRID produced samples
- ❑ Improved interface between centrally-produced samples and Python based analyses frameworks (possibly with 'flat n-tuple' production as the last step of the chain GEN-SIM-DIGI-RECO-TUPLE, a la CMS NanoAOD)
- ❑ Increase available computing resources (mainly storage) by a factor ~10

Another Possibility – To be thought through



Could be complemented by one “contact person” per detector concept/sub-detector/reconstruction algorithm/…

Physics Performance pre-TDR plans

Patrizia Azzi (Padova),
Emmanuel Perez (CERN),
Michele Selvaggi (CERN)

Development of reconstruction tools

- Finalize high level reconstruction in Full simulation : tracking, particle Flow, tagging
  - starting with CLD
  - adding other detectors concepts
- Trying to pursue more “detector agnostic” approach (ML) for faster application to different technologies
- In conjunction with SW group
- We propose to create a new PP sub-group (informal meetings exist):
  - **High level Reco** (conveners: D. Garcia, A. Zaborowska)
    - Tracking, Particle-Flow, Flavor Tagging (Classical and ML)

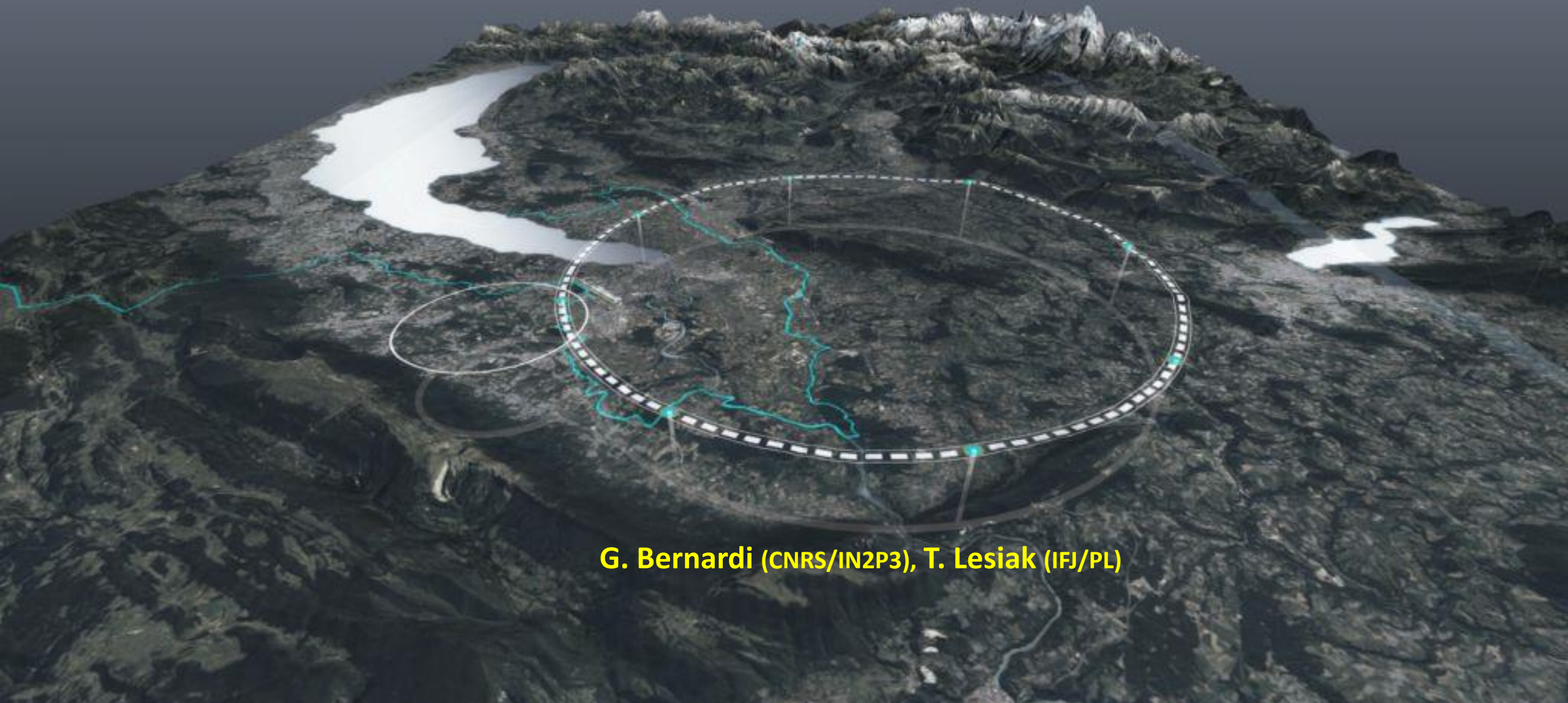
Finalize Detector requirements

- Re-assess/validate current detector requirement with Full Simulation
- Extract detector requirements for those cases where Full Simulation is necessary or never fully explored
  - tracking/calorimetry for PF (e.g. Higgs hadronic)
  - low momentum PID, muons, timing (Bs → (K)vv, HNLs ..)

Targeted analysis strategies

- Perform complete “case studies” with Full Simulation with more sophisticated evaluation of experimental systematics
  - focus at Z pole , WW (A_{FB}(qq), R_l, $alpha_{EM}$, $V_{cs,cb}$, flavor)
  - Flavour (B→K*ee/mumu, Bs→vv, B→ D*tau v)
- Design strategies for systematics mitigation (e.g. exclusive decays for R_b, R_c, etc ..)
- Design ancillary analyses for calibrations (tagger, lumi, ..)

FCC-PED Community Building
Next steps for IFNC



G. Bernardi (CNRS/IN2P3), T. Lesiak (IFJ/PL)

Recommendations of the FCC feasibility study mid-term review committee related to the FCC community development

1. to work with the scientific community, institutes, laboratories and funding agencies to ensure support and resources for **four experiments**, facilitating the exploitation of the full scientific potential offered by the large investment in the FCC-ee facility;

2. to dedicate additional human and financial resources to the project, with a resource-loaded schedule of work and clear priorities;

3. to develop the coordination and structure to enable theoretical work needed to match the anticipated experimental precision of the FCC data, both at CERN (fellows, scientific associates, visitors) and by engaging Collaborating Institutes (e.g., European networks);

4. to establish a dedicated FCC team in the CERN research sector, with specific new positions associated, and to quantify its size and makeup in terms of seniority so that the resources required can be estimated.

➔ We need to keep enlarging and organizing further our collaboration

Next Steps in FCC Collaboration building, as seen from IFNC

We have National Contacts (informally also Regional Contacts), Institute contacts in some countries but not all

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 Grey book, with a Leader (and possibly a Deputy team leader).

The goals for the IFNC in the pre-TDR phase could be to

0) Agree with the project managers that we could develop a scheme where MoU are more specific to any type of FCC contributions, while the Grey book could be more focused on the PED activities

1) Develop “FCC WORLDWIDE” in the FCC-PED-WEB.CERN.CH official web site to describe 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 active 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 (in some institutes the “boss” of the institute wants to be institute contact, i.e. TL in this new approach)

….

Current Status of FCC in the Grey book

Institute Name	Institute Parent Name	Town	Country	Team Leader & Deputy Team Leader(s)
Department of Physics	University of Zurich	Zurich	Switzerland	(TL) CANELLI, FLORENCIA MARIA (DTL) KILMINSTER, BENJAMIN JOHN (DTL) MACCHIOLO, ANNA
Department of Physics	University of Tehran	Tehran	Iran	(TL) AZIZI, KAZEM
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
Laboratori Nazionali di Frascati	INFN e Laboratori Nazionali di Frascati	Frascati	Italy	
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
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

Next Steps for IFNC during the pre-TDR phase

The goals for the IFNC in the pre-TDR phase would be to

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2) have the current PED active 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 (in some institutes the “boss” of the institute wants to be institute contact, i.e. TL in this new approach).

3) Obtain from the TL/DTL one page of the expertise of the lab, and the activities in which the institute is involved and wants to be involved. This would be stored centrally, country by country, and could be accessible to all FCC-PED members (we would obtain for each country something similar to the national notes we were discussing in the last IFNC meeting)

4) With the help of the National Contacts, contact more LHC teams (244 in ATLAS, 257 in CMS, 98 in LHCb) to ask if/when they would join FCC, starting from the countries already active in FCC. We could thus monitor the growth of the FCC-PED community.

Dotation Initiale IN2P3

Laboratoire	Origine Crédits	Montant B - Fournitures et équipements scientifiques, valorisation	Montant C - Missions, déplacements, colloques et communication	Montant D - Informatique	Montant G - Subvention	Montant total (calcul automatique)	Commentaire	Porteur du projet de l'unité
						- €		
APC	FEI		5 000,00 €			5 000,00 €	environ 33% de 2024	Gregorio Bernardi
CPPM	FEI		1 500,00 €			1 500,00 €	environ 33% de 2024	Fares Djama
IJCLab	FEI		1 500,00 €			1 500,00 €	environ 33% de 2024	Nicolas Morange
IP2I Lyon	FEI		3 000,00 €			3 000,00 €	environ 33% de 2024	Suzanne Gascon-Shotkin
IPHC	FEI		3 000,00 €			3 000,00 €	environ 33% de 2024	Ziad El Bitar
LAPP	FEI		3 000,00 €			3 000,00 €	environ 33% de 2024	Marco Delmastro
LLR	FEI		3 500,00 €			3 500,00 €	environ 33% de 2024 + 0,5k Marne-la-Vallée UB	Vincent Boudry
LPCA	FEI		1 500,00 €			1 500,00 €	environ 33% de 2024	Stéphane Monteil
LPNHE	FEI		1 500,00 €			1 500,00 €	environ 33% de 2024	Bogdan Malaescu
LPSC	FEI		1 500,00 €			1 500,00 €	environ 33% de 2024	Jean-Baptiste de Vivie de Régie

Prochains virements, date inconnue, mais ajustements possibles sur les compléments

Next FCC France ?

Where, When ?

Authorship of the ECFA report

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Next steps / Tour de table des EoI et des différentes contributions ¶

Orateurs: Catherine Biscarat (L2I Toulouse, CNRS/IN2P3, UT3), Farès Djama (CPPM), Gaelle Boudoul (IP2I/AICP (CNRS/IN2P3)), Giovanni Marchiori (AI 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, E polytechnique/IPP Paris), Ziad EL BITAR (IPHC)

- Evolution du personpower
- Demandes d'ANR

EoIs - Motivation and Status

Reminder

Purpose of the EoIs:

- show that there is a community of institutes interested in development of dedicated sub-detector systems for the FCC
  - has not been done explicitly before. - only implicitly vial technologies addressed in DRD proposals
- trigger interactions in the community on how to get (self-) organised around sub-detectors
  - not parallel to, but largely within DRDs - and PED DetCon WG
  - may set up sub-detector printed structure later

Satellite meeting

- more than 50 presentations (40 after coffee break)
- worked very well (end 13:05)
- many new groups we had not seen - invited them to DetCon meetings, to be followed up
- new possibilities for joining efforts appeared in the meeting

Next Steps: Write EOIs

Content

Joining activities and merging EOIs is an on-going process

- we may initiate a few more matches today
- can of course also happen later, at any time
- or, vice versa, joint activities can and probably will submit separate funding requests

Content, on 2-4 pages (3-6 for concepts):

- The scope of planned activties for the next 3-5 years
- The Partners (Institutes) and their expertise
- The names of one or two contact persons
- The connection with technological activities in the DRD framework
- The engineering and simulation connections with concept groups
- References to relevant more detailed documentation of the technologies

Important: no duplication
sub-detectors remain embedded in DRDs and connected to concepts

Expand communication

Ask the Symposium participants to join the FCC-Phys-All-List ?

Work with IN2P3 communication

Increase the size of the collaboration

Propose to the colleagues who got closer to FCC to do concrete work

Make another effort to fully integrate ILC colleagues

Organize further FCC-France

All our Labs can join CERN FCC group with team Leader (+deputy possibly)

Produce updated National note with reference to all contributions done to the ESPP

Can we put more coherence in our proposals ?

Next FCC France ?

Where, When ?

➔Medium Term Plan (MTP) for the period 2025-2029 / Theory effort

In June 2024, the CERN Council approved the **Medium Term Plan** (MTP) for the period 2025-2029, including the funding of a bottom-up resource request for FCC specific new positions:

→ dedicated new positions (fellows, students,scientific associates, visitors) over the next three years.

- → strong signal to the HEP community worldwide of the host lab commitment to FCC.
- → Past experience has shown that even a moderately-sized host-lab group crucial leverage on contributions from the particle-physics community at other institutes.
- → We expect that the creation of this group will be a strong incentive for CERN contract holders to reassign part of their time to the FCC project.

→ Many more engineers and detector physicists will be needed soon

The coordination and structuring of the **theoretical work** needed to match the anticipated experimental precision of the FCC data has started during the Feasibility Study.

Several successful miniworkshops were organised (Targets and Tools, Flavour Physics Programme, BSM Physics Programme, Higgs/Top/EW Physics Programme, Parton Shower, Phenomenology) with an attendance between 100 and 350 participants.

The CERN/TH FCC team currently consists of three physicists, with the occasional participation of up to eight staffs and fellows. More dedicated resources will be needed for a worldwide organization during the pre-TDR phase.

EoI's/Notes on National (or Regional) FCC Activities

Goal: give an overview of scope or activities related to future e+e- colliders in the country/region:

Can be presented as compact notes (3-6 pages) along the line:

Assuming FCC moves forward, we would continue/start to contribute in these fields:

- List of Detector/R&D scope and activities
- List of Software/Analysis scope and activities
- List of Theory scope and activities
- List of any other scope and activities within PED

with references to Feasibility study, EoI's, ECFA or other notes.
We can refer to results obtained in local workshops (and list them)
We list institutions participating, detailing in which field they contribute.

Is it a good idea to submit such notes ?

They are useful to demonstrate the number of institutes/groups working or interested to work on FCC, and in which domain.

We would need several of these national notes to have an impact.

Which kind of signature should they have (Institutions + one contact for each institution?)

Which Level of details ?

References to FCC Feasibility Study and to subdetector and detector concept EOI's

Reference to DRD

First draft of each note by 15th of February to give a chance to iterate before submission ?