FCC-contacts / DRD Status / June 16th 2023

Reunion FCC-contacts

vendredi 16 juin 2023, 13:00 → 14:30 Europe/Paris

Description

13:00 → 13:30 **News, FCC, ECFA, IN2P3** 30m

Orateur: Gregorio Bernardi (APC Paris CNRS/IN2P3)

13:30 → 14:15 **Agenda FCC-France en 2023 @ IPHC 22-24 November 2023** 45m

Orateur: Ziad El Bitar (IPHC)

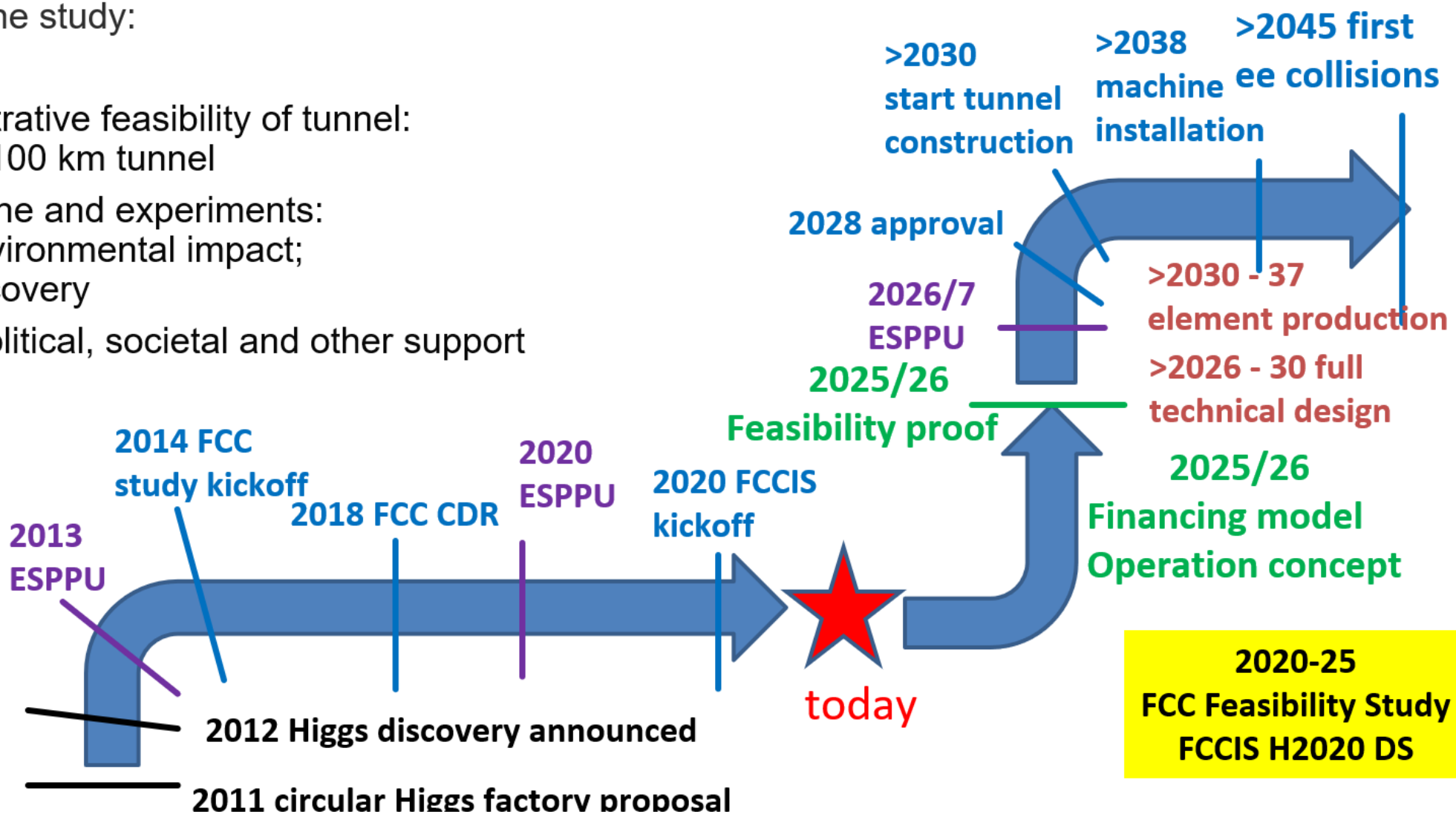
14:15 → 14:30 **Jamboree / Tour de table des activités dans les labos / Objectifs pour les prochains workshops** 15m

Orateurs: Dr Fairouz MALEK (LPSC-Grenoble, CNRS-IN2P3, UGA), Farès Djama (CPPM), Giovanni Marchiori (APC Paris), Jan Stark (L2I Toulouse, CNRS/IN2P3, UT3), Jean-Baptiste de Vivie (LAL Orsay), Luc Poggioli (LPNHE Paris), Marco Delmastro (LAPP), Nicolas Morange (IJCLab), Roberto Salerno (LLR), Stephane Monteil (Laboratoire de Physique de Clermont - UCA/IN2P3), Suzanne GASCON-SHOTKIN (IPN Lyon), Vincent BOUDRY (LLR - CNRS, École polytechnique/IPP Paris), Ziad El Bitar (IPHC), auguste besson (Institut Pluridisciplinaire Hubert Curien)

FCC Roadmap Towards First e^+e^- Collisions

Highest priority goals of the study:

- ❑ Financial feasibility
- ❑ Technical and administrative feasibility of tunnel: no show-stopper for ~100 km tunnel
- ❑ Technologies of machine and experiments: magnets; minimize environmental impact; energy efficiency & recovery
- ❑ Gathering scientific, political, societal and other support



2020-25
FCC Feasibility Study
FCCIS H2020 DS

FCC Week 2023: Luminosities

- **Luminosity / IP has decreased at all energies since the CDR**
  - The ring shrank from 100 km to 90.7 km
    - ~10% luminosity reduction
      - → e.g, from 230 to ~210 10^{34} cm^{-2} s^{-1} at the Z pole
  - The number of IPs moved from 2 to 4 in the baseline
    - Gu-estimated reduction factor of 0.85 at each IP (with respect to 2 IP)
      - → e.g, from 210 to 180 10^{34} cm^{-2} s^{-1} at the Z pole: almost 10^{13} Z and 2 10^{6} ZH with 4 IP
  - These numbers were shown by Fabiola at the BNL P5 meeting
    - We had agreed with Michael and Tor to freeze these numbers for the mid-term review report
  - Instabilities were discovered (too short lifetime), and lattice was fixed for the FCC week
    - With 2 IP and 4 IP (more severe with 4 IP)
      - → Reduction from 180 to 140 10^{34} cm^{-2} s^{-1} at the Z pole (4 IP)
      - → Reduction from 210 to 180 10^{34} cm^{-2} s^{-1} at the Z pole (2 IP)
    - These numbers were shown to the SAC, and "approved" (in spite of the previous agreement)
  - For the sake of internal consistency, we must align for PED estimates in mid-term report

FCC Week 2023: CDR Luminosities

Working point	Z, years 1-2	Z, later	WW	HZ	$t\bar{t}$	
$\sqrt{s}$ (GeV)	88, 91, 94		157, 163	240	340-350	365
Lumi/IP ($10^{34}\,cm^{-2}s^{-1}$)	115	230	28	8.5	0.95	1.55
Lumi/year (ab^{-1}, 2 IP)	24	48	6	1.7	0.2	0.34
Physics Goal (ab^{-1})	150		10	5	0.2	1.5
Run time (year)	2	2	2	3	1	4
Number of events	5×10^{12} Z		$2\,10^8$ WW	10^6 HZ + 25k WW $\rightarrow$ H	$10^6 t\bar{t}$ +200k HZ +50k WW $\rightarrow$ H	

FCC Week 2023: Luminosities for mid-term report

Working point	Z, yrs 1-2	Z, later	WW	ZH	$t\bar{t}$	
$\sqrt{s}$ (GeV)	88, 91, 94		157, 163	240	~345	365
Lumi/IP ($10^{34}\,cm^{-2}s^{-1}$, 2 IP)	90	180	19.4	7.3	0.80	1.33
Lumi/IP ($10^{34}\,cm^{-2}s^{-1}$, 4 IP)	70	140	20	5.0	0.75	1.20
Lumi/year (ab^{-1}, 2 IP)	22	44	5	1.7	0.20	0.32
Lumi/year (ab^{-1}, 4 IP)	34	68	10	2.4	0.36	0.58
Run time (year, 2 IP)	2	2	2	3	1	4
Run time (year, 4 IP)	2	2	1	3	1	5
Number of events (2 IP)	$4\,10^{12}$ Z		$1.8\,10^8$ WW	$1.05\,10^6$ HZ + 30k WW $\rightarrow$ H	$1.05\,10^6\,t\bar{t}$ +180k HZ +45k WW $\rightarrow$ H	
Number of events (4 IP)	$6\,10^{12}$ Z		$2.3\,10^8$ WW	$1.45\,10^6$ HZ + 45k WW $\rightarrow$ H	$2.3\,10^6\,t\bar{t}$ +400k HZ +100k WW $\rightarrow$ H	

FCC Week 2023: PED Coordination

- **We are happy to introduce the new Detector Concepts co-coordinator**
  - Marc-André Pleier (BNL)
    - Joining Mogens Dam and Felix Sefkow

- **Marc-André is attending this coordination meeting**
  - Thank you for joining us in this adventure & welcome!
    - We hope you'll have as much fun as we have had so far

- **We are still evaluating opportunities for**
  - Software and Computing co-coordination
  - PED co-coordination (3rd co-coordinator?)
  - Top physics group convenership

Mid-Term Report and FCC Notes

Discussion: Updated timeline

- **We now need to have all FCC Notes ready and submitted to Zenodo by end of June**
  - Instructions here
    - Today: Prepare a list of the FCC Notes that are expected to make it
- **We propose to have a first complete draft of the PED Chapter by the end of July**
  - By the end of July, in order to have time for serious internal proofreading
    - See current state here – there is still a lot to do
  - Sections to be written / completed
    - Overview (Christophe/Patrick/Michelangelo)
    - Physics Case (Matthew et al.); Theoretical Calculations (Ayres et al.)
    - Detector Requirements (Patrizia et al.); Detector Costing (Mogens et al.)
    - Outlook and next steps (Christophe/Patrick/Michelangelo)
- **And pass it over to Panos before the end of August**
  - Reminder: 16-18 Oct. 2023, SAC mid-term review meeting with all deliverables, CRP cost review meeting

List of FCC Notes and their status

- We prepared a Google Document with a preliminary list
  - Please fix it, fill it, and maintain it over summer

- Important aspects
  - Review / Certification
    - 2 weeks for comments ?
    - Referee in charge ?
  - arXiv publication ?

FCC notes

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C9 ?

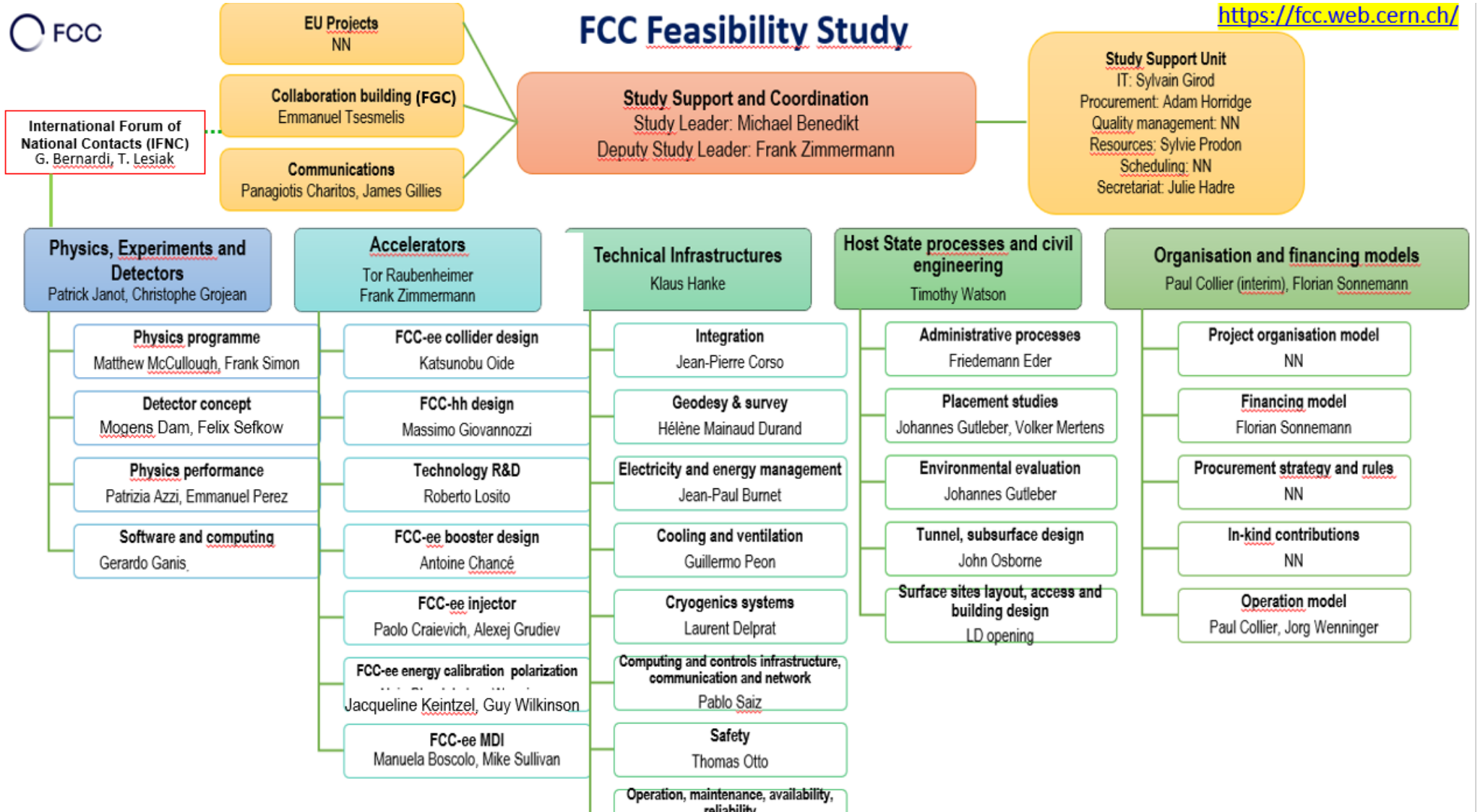
	A	B	C	D
1	**Area**	**Title**	**Author in charge**	**status (10%-33%-50%-66%-90%-100% done)**
2				
3	**General**			
4		The FCC-ee sequence	P. Janot	90%
5		FCC Sustainability: Your Questions Answered	?	0%
6		The carbon footprint of proposed Higgs factories	P. Janot	Published
7				
8	**EPOL**			
9		Accelerator and physics requirements for the calibration of the collisio	?	66%
10				
11	**Sofware and computing**			
12		The FCC Software for PED studies	G. Ganis	
13		Radiation in the cavern during FCC-ee operations	G. Ganis	
14		Computing sustainability	?	
15				
16	**MDI**			
17		Detector backgrounds		
18		Tracker integration in the MDI	F. Palla	
19		description of the vertex and outer tracker detectors and their software description for the analysis		
20		MDI layout		
21				
22	**Detector**			
23		IDEA dual-readout calorimetry		
24		Beam test results with dual-readout calorimeter prototypes		
25		Dual-readout calorimetry perfomance on single particles and jets		

Status of Global FCC Collaboration @ CDR

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

FCC Feasibility Study: Aim is to increase further the collaboration, on all aspects, in particular, on Accelerator and Particle/Experiments/Detectors (PED), to render it a **fully global project**

FGC and IFNC


FCC
FCC Feasibility Study
https://fcc.web.cern.ch/
EU Projects
NN
Collaboration building (FGC)
Emmanuel Tsesmelis
Communications
Panagiotis Charitos, James Gillies
International Forum of National Contacts (IFNC)
G. Bernardi, T. Lesiak
Study Support and Coordination
Study Leader: Michael Benedikt
Deputy Study Leader: Frank Zimmermann
Study Support Unit
IT: Sylvain Girod
Procurement: Adam Horridge
Quality management: NN
Resources: Sylvie Prodon
Scheduling: NN
Secretariat: Julie Hadre
Physics, Experiments and Detectors
Patrick Janot, Christophe Grojean
Accelerators
Tor Raubenheimer
Frank Zimmermann
Technical Infrastructures
Klaus Hanke
Host State processes and civil engineering
Timothy Watson
Organisation and financing models
Paul Collier (interim), Florian Sonnemann
Physics programme
Matthew McCullough, Frank Simon
Detector concept
Mogens Dam, Felix Sefkow
Physics performance
Patrizia Azzi, Emmanuel Perez
Software and computing
Gerardo Ganis
FCC-ee collider design
Katsunobu Oide
FCC-hh design
Massimo Giovannozzi
Technology R&D
Roberto Losito
FCC-ee booster design
Antoine Chancé
FCC-ee injector
Paolo Craievich, Alexej Grudiev
FCC-ee energy calibration polarization
Jacqueline Keintzel, Guy Wilkinson
FCC-ee MDI
Manuela Boscolo, Mike Sullivan
Integration
Jean-Pierre Corso
Geodesy & survey
Hélène Mainaud Durand
Electricity and energy management
Jean-Paul Burnet
Cooling and ventilation
Guillermo Peon
Cryogenics systems
Laurent Delprat
Computing and controls infrastructure, communication and network
Pablo Saiz
Safety
Thomas Otto
Operation, maintenance, availability,
Administrative processes
Friedemann Eder
Placement studies
Johannes Gutleber, Volker Mertens
Environmental evaluation
Johannes Gutleber
Tunnel, subsurface design
John Osborne
Surface sites layout, access and building design
LD opening
Project organisation model
NN
Financing model
Florian Sonnemann
Procurement strategy and rules
NN
In-kind contributions
NN
Operation model
Paul Collier, Jorg Wenninger

Informal structure under the National Contacts

- Currently we have a **Collaboration Board** in which all institutes who have signed an MOU are represented.

This includes all types of contributions, from all pillars of the project, which is good, and this is the body which has to be informed by the project management.

- However, institutions which have difficulties to sign the MOU (for legal reasons) or which belong to a bigger institute which has signed the MOU (like INFN or IN2P3) are not strongly represented in the Collaboration board. When a national community grows, it is also difficult to keep track who is doing what, even at an informal level, when there is only one national contact to communicate with.
- In particular, we want to extend the number of institutes working on PED, and this could be a good opportunity to attract more people. More visibility will also give them more commitments. It will be easier to find out who is doing what, and at which level of commitment.
- So it is well possible to work with the national contacts to find out who is the institute contact of the different institutes involved in a given country. It will also be easier to communicate directly in the PED domain.
- This can be also helpful in institutes or countries which have several lines of future colliders
- This is of course not a mandatory step for every country, but for those who are organised in that way, it is good that these contacts are also known at the PED management level.
- List of Institutional contacts ➔ **IFIC**

U.S. Institutional Contacts

		contact name	contact email
2	Alabama		
3	U.-mass Amherst	Stephane Willocq	Stephane.Willocq@cern.ch
4	ANL	Jinlong Zhang	zhangjl@anl.gov
5	AZ	Erich Varnes	varnes@physics.arizona.edu
6	Brandeis	Aram Apyan	aram.apyan@cern.ch
7	BNL	Marc-Andre Pleier	mpleier@bnl.gov
8	BROWN	Loukas Gouskos	Loukas.Gouskos@cern.ch
9	BU	Zeynep Demiragli	zeynep.demiragli@cern.ch
10	Caltech	Maria Spiropulu	smaria@caltech.edu
11	Carnegie Melon	John Alison	johnalison@cmu.edu
12	CO		
13	Columbia	John Parsons	parsons@nevis.columbia.edu
14	CORNELL		
15	Duke	Ashutosh Kotwal	kotwal@phy.duke.edu
16	FIT	Marcus Hohlmann	hohlmann@fit.edu
17	FLORIDA		
18	FNAL	Anadi	acanepa@fnal.gov
19	FSU		
20	Indiana	Chris Meyer	chris.meyer@cern.ch
21	Iowa	Yasar Onel	Yasar.Onel@cern.ch
22	Jefferson lab	Kondo Gnanvo	kagnanvo@jlab.org
23	JOHN HOPKINS	Andrei Gritsan	[gritsan@jhu.edu
24	LBL		
25	Maryland	Alberto Belloni	abelloni@umd.edu
26	Michigan	Jianming Qian	qianj@umich.edu
27	Michigan state	Reinhard Schwienhorst	schwier@msu.edu
28	MIT	Christoph Paus	paus@mit.edu
29	Mississippi		
30	Nebraska		
31	Northeastern	Louise Skinnari	l.skinnari@northeastern.edu
32	Notre Dame		
33	Oak Ridge	Marcel Demarteau	marcel.demarteau@cern.ch
34	Oregon		
35	Penn		
36	Pittsburg		
37	PRINCETON		
38	Purdue	Andreas Jung	anjung@purdue.edu
39	Riverside		
40	Rochester	Aran Garcia Bellido	aran@pas.rochester.edu
41	SLAC	Charlie Young	young@slac.stanford.edu
42	Stony Brook	Dmitri Tsybychev	Dmitri.Tsybychev@stonybrook.edu
43	Syracuse	Marina Artuso	martuso@syr.edu
44	Texas Arlington		
45	Texas Tech		
46	Texas austin	Tim Andeen	tandeen@utexas.edu
47	tufts	Hugo Beauchemin	hugo.beauchemin@tufts.edu
48	UCLA		
49	UCSB		
50	UCSC	Mike Hance	mhance@ucsc.edu
51	UCSD		
52	UC Davis		
53	UC Irvine	Anyes Taffard	
54	UNM	Sally Seidel	seidel@unm.edu
55	U Washington		
56	VIRGINIA	Bob Hirosky	hirosky@virginia.edu
57	WISCONSIN		

European Institutional Contacts (1)

	France	
23	IRFU-Saclay	Roy Aleksan
24	IN2P3	Gregorio Bernardi
25	APC Paris	Giovanni Marchiori
26	CPPM Marseille	Farés Djama
27	IJC Lab Orsay	Nicolas Morange
28	IPHC Strasbourg	Ziad El Bitar
29	IP2I Lyon	Suzanne Gascon
30	LAPP Annecy	Marco Delmastro
31	LLR Palaiseau	Roberto Salerno
32	LPC Clermont	Stéphane Monteil
33	LPNHE Paris	Luc Poggioli
34	LPSC Grenoble	Fairouz Malek
35	L2IT Toulouse	Jan Stark
	DRD roadmap panel	Didier Contardo
	contact for microvtxing	Auguste Besson
	contact Calice-type calo	Vincent Boudry
	Czeck Republik	
36	CUNI	Jana Faltova
37	FZU	Alexander Kupco
	Romania	
38	IFIN-HH	Calin Alexa
39	University of Bucharest	Roxana Zus
40	U.Politehnica of Bucharest	Calin Bira
	Denmark	
41	Niels Bohr Institute	Mogens Dam
	Portugal	
42	LIP	Ricardo Goncalo

Italy	
INFN - Bari	Nicola De Filippis
INFN - Bologna	Paolo Giacomelli
INFN - Catania	Sebastiano Albergo
INFN - Ferrara	Gianluigi Cibinetto
INFN - Firenze	Giacomo Sguazzoni
INFN - Genova	Enrico Robutti
INFN - Lecce	Margherita Primavera
INFN - Laboratori Naz. Frascati	Manuela Boscolo
INFN - Laboratori Naz. di Legnaro	Cristian Pira
INFN - Milano	Romualdo Santoro
INFN - Milano Bicocca	Marco Toliman Lucchini
INFN - Napoli	Pierluigi Paolucci
INFN - Padova	Patrizia Azzi
INFN - Pisa	Paolo Azzurri (Fabrizio Palla)
INFN - Pavia	Alessandro Braghieri
INFN - Roma1	Stefano Giagu
INFN - Roma3	Biagio Di Micco
INFN - Torino	Marco Maggiora
INFN - Udine	Giancarlo Panizzo
Silicon/Vertex detectors	Massimo Caccia INFN-Milano
Silicon/Vertex detectors	Attilio Andreazza INFN-Milano
Drift chamber	Franco Grancagnolo INFN-Le
Dual readout calorimetry	Roberto Ferrari INFN-Pavia

European Institutional Contacts (2, and still growing)

UK	
Birmingham	Dave Charlton
Bristol	Joel Goldstein
Cambridge	Sarah Williams
Cockcroft Institute	Peter Ratoff
Daresbury	Roy Lemmon
Durham	Michael Spannowsky
Edinburgh	Christos Leonidopolous
Imperial	Gavin Davies
John Adams Institute	Phil Burrows
Kings College	John Ellis
Lancaster	Harold Fox
Liverpool	Joost Vossebeld
Manchester	Andrew Pilkington
RAL/PPD	Jens Dopke
RHUL	Veronique Boisvert
Oxford	Guy Wilkinson
Queens College London	Seth Zenz
Sheffield	Trevor Vickey
Southampton	Stefano Moretti
Sussex	Iacopo Vivarelli
UCL	Jon Butterworth
Warwick	Bill Murray

Update since last P5 status

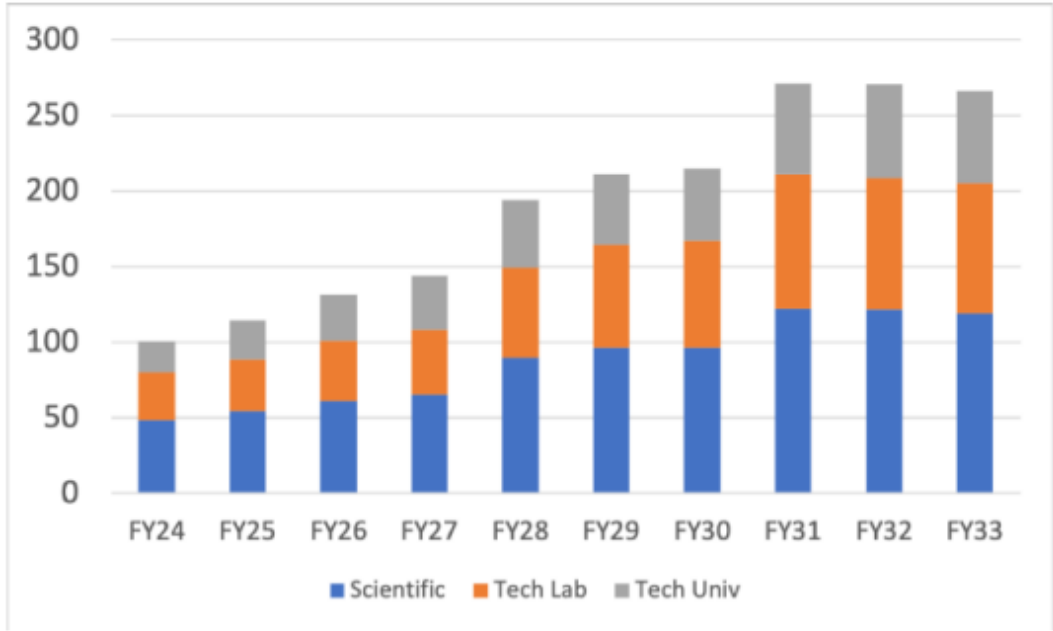
- One more virtual townhall occurred 5 June https://indico.cern.ch/event/1288661/
  - 3 FCCee abstracts out of 11 total
  - GPU acelerations in Geant4 simulations by Hayden Hallenbeck UVA
  - An inclusive timeline for future HEP collider projects by Julia Gonski SLAC
  - FCC-ee: synergies between Tera-Z and Higgs Physics by Saptaparna Bhattacharya Northeaster
  - Comments from chat with attendees: nothing interested occurred. People have run out of new ideas to present…

- One P5 virtual town hall more to go on 27 June https://indico.phys.vt.edu/event/64/
  - Plan to submit 3 FCCee abstracts
  - Synergies between lab and University FCCee detector design – Chris Palmer UMD
  - Low mass support structures for FCCee – Andreas Jung Purdue
  - Lar calorimetery for FCCee – Elizabeth Brost BNL

P5 Update

- Major submission on proposed US Higgs factories R&D budget, lead by Srini Rajagopalan of BNL, submitted to P5. Submitted joint with linear collider detector community
  - Detailed list of US groups interest in detector design participation Argonne Arizonia Berkeley BNL Boston California Davis California Irvine Caltech Chicago Coe Columbia Duke Fairfield FIT Florida Florida State FNAL Illinois Chicago Iowa Jefferson lab JPL Kansas LBNL Los Alamos Maryland Mass Amherst Michigan Michigan State Minnesota Mississippi MIT NIST Northeastern Northern Illinois Notre Dame Oak Ridge Ohio State Oregon PNNL Princeton Purdue Rice Santa Cruz SLAC Stony Brook Syracuse Texas Arlington Texas Tech Tufts Virginia Washington Wisconsin

- Find submitted doc at https://www.dropbox.com/s/0l5gax40u2dbj20/srini_final_ee_detectors_whitepaper.pdf?dl=0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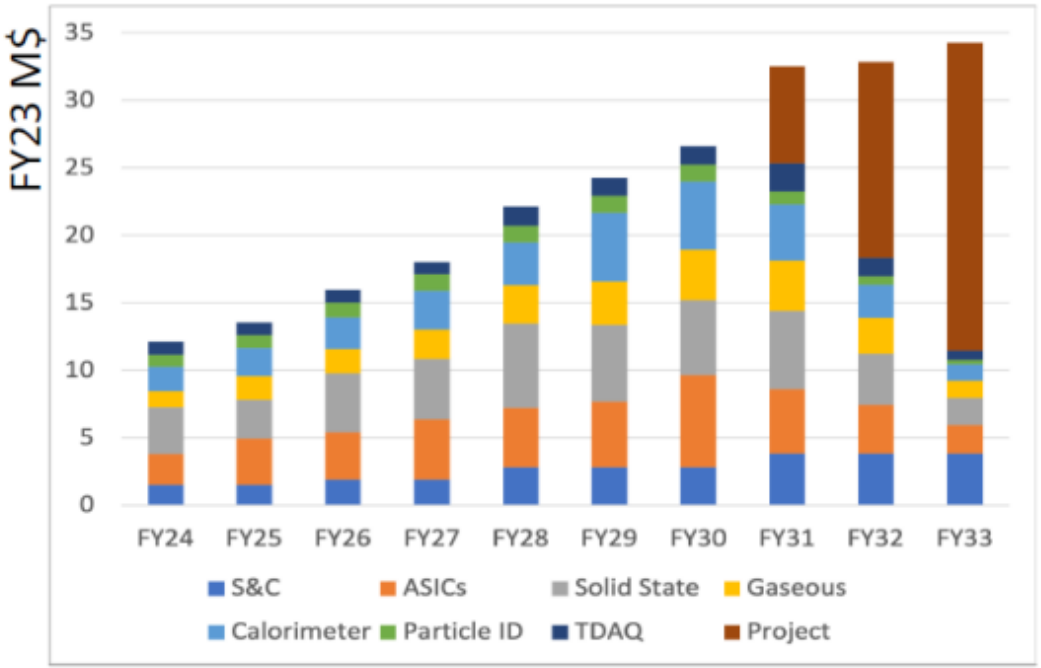
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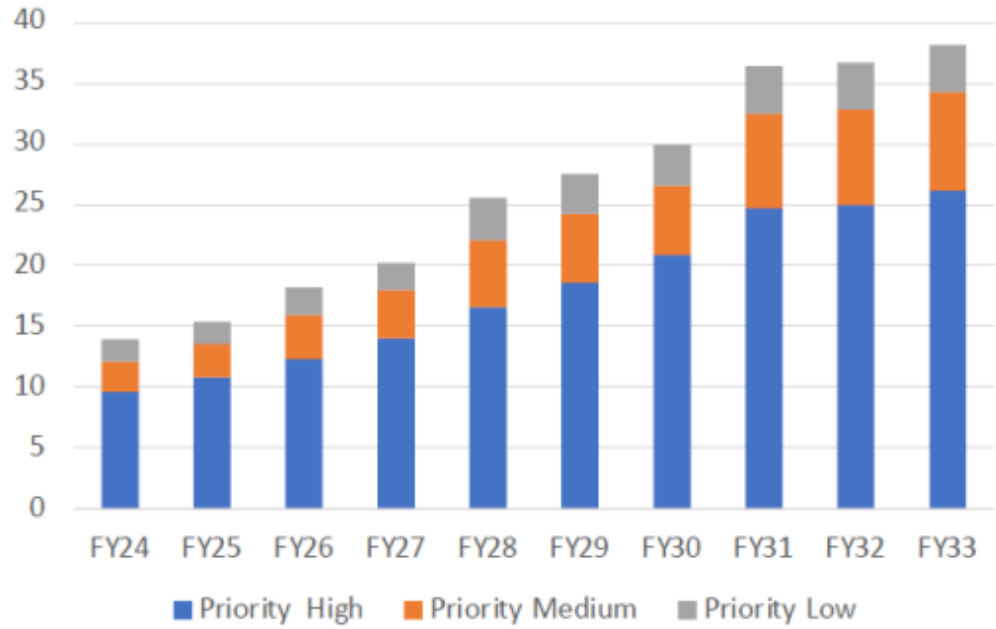
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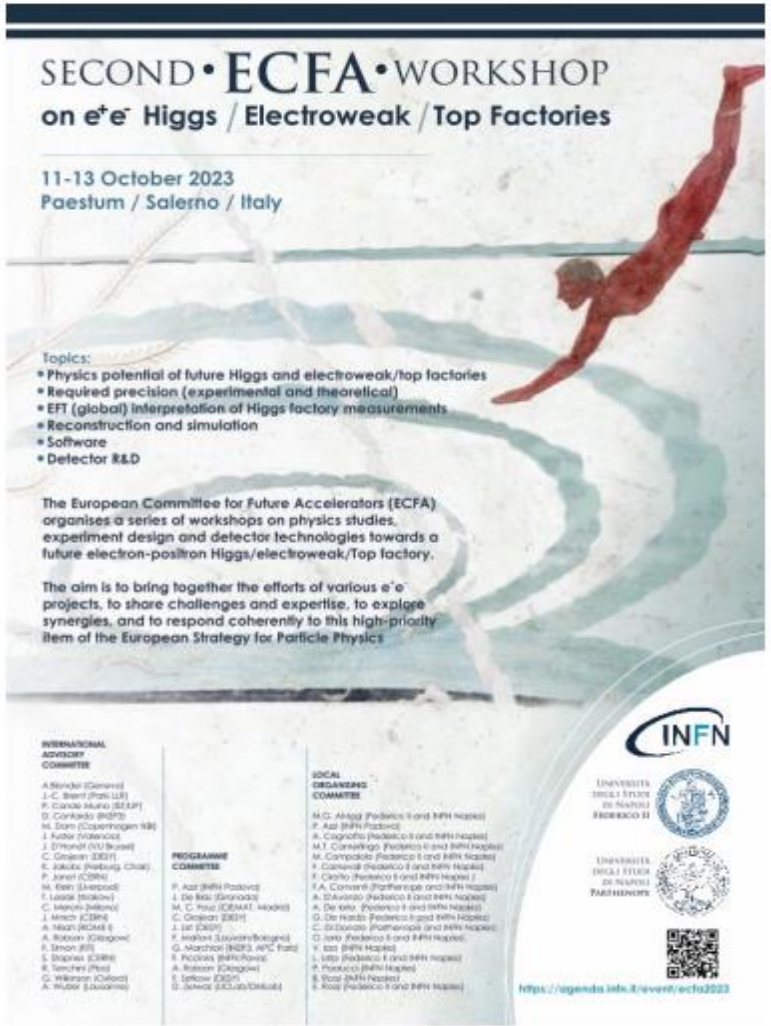
Priority High
Priority Medium
Priority Low

News from ECFA I

- **Second Higgs/EW/Top Factory ECFA Workshop,**
  - 11 (wed)-13(fri) October 2023, Capaccio-Paestum
  - Webpage: https://agenda.infn.it/event/34841/
  - Registration open till Oct. 4 (Sept. 13 if you want to have a seat on the bus from/to Naples airport)
  - Fees: 460 EUR will full board at the conference hotel



- **Upcoming meetings**
  - June 21-22, Brussels: 2nd Topical Meeting on Generators – link
  - Wed. June29, 2pm: ECFA WG1 FLAV 1st meeting (zoom) – link

7th FCC PED/Physics Workshop

- **Host: LAPP, Annecy.**
  - **see the presentation by G. Lamana at the last PED coordination meeting**
- **Dates: Jan. 29-Feb. 2, 2024**
  - Rooms booked for us:
    - Auditorium (211);
    - Amphitheatre (54);
    - One room (16);
    - One room (34);
- **Local Organization**
  - Local organizers: G. Lamana + TBA

- (IAS Hong Kong HEP programme: Jan. 8-26)
- Chamonix week?

News from ECFA II

- EPS conference, Hamburg, August 21-25 : there will be the traditional ECFA-EPS session to discuss about the future of the field with the following agenda defined by RECFA

1. Introduction	ECFA Chair	5 min
2. FCC Feasibility Study	NN, CERN	25 + 5 min (input from CERN)
3. Status of e+e- Higgs factory projects	NN	25 +5 min (input from RECFA)
4. ECFA study on e+e- Higgs factories	NN	20 + 5 min (input from IAC)
5. The ECFA Early Career Researcher Panel	NN	10 + 5 min (input from ECR Panel)
6. ECFA Detector R&D Roadmap (overview on implementation status, and proposals)	NN	25 + 5min (input from RECFA)

- Speaker nominations:
  - #3 → Jenny **List** (suggested by RECFA).
  - #4→ Giovanni **Marchiori**
  - #2 → Michael **Benedikt**
  - #6 → Didier **Contardo**
- As well as two plenary talks:
  - Overview on Detector R&D highlights / recent achievements (Erika **Garutti**, Hamburg)
  - Overview on Accelerator R&D highlights / recent achievements (Steinar **Stapnes**, CERN)

News from ECFA

- Karl's mandate as head of ECFA is finishing this year
- Election of new chair: Sept. 16, Lisbon
  - 12 nominations
  - 7 nominees accepted to run for election
    - Daniela Bortoletto UK
    - Paris Sphicas Greece
    - Gregorio Bernardi France
    - Juan Fuster Spain
    - Matthew Wing UK
    - Aleandro Nisati Italy
    - Nadia Pastrone Italy

Preferential vote, one ranked list per European country, ECFA member or associate (29 countries voting)