



Welcome to the 7th
FCC-ee physics workshop

The 7th FCC-ee Physics Workshop

A 100 km Tunnel for Luminosity, Energy and Precision

19 - 21 June 2014

TH Auditorium (CERN)

Register at
indico.cern.ch/event/313708/

Organizing committee
Alain Blondel - U. Geneva
John Ellis - U. College London
Christophe Grojean - ICREA
Patrick Janot - CERN

Designer:
Cristina Martin Pérez

FCC
Future Circular Collider

European Organization
for Nuclear Research

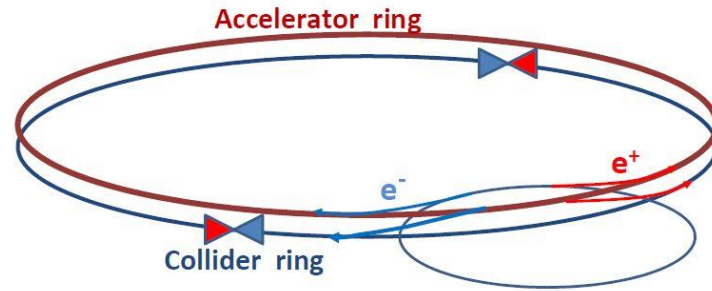
CERN
1954-2014



Poster by Cristina
1



From



to





possible long-term strategy



FCC-hh
(pp , up to
100 TeV c.m.)

Ultimate goal

& e^\pm (120 GeV)– p (7, 16 & 50 TeV) collisions FCC-eh)

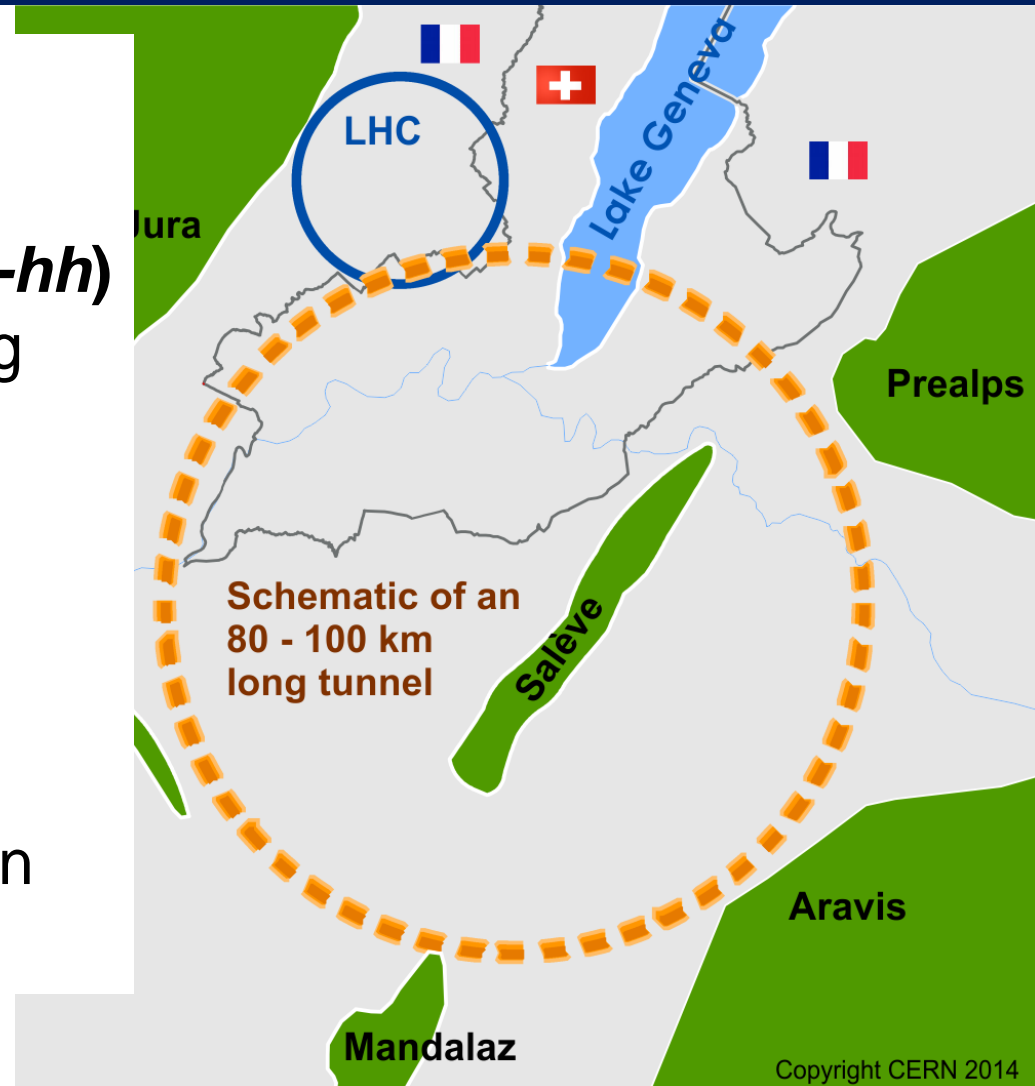
≥ 50 years of e^+e^- , pp , ep/A physics at highest energies

Future Circular Collider Study - SCOPE

CDR and cost review for the next ESU (2018)

Forming an **international collaboration** to study:

- **100 TeV pp-collider (FCC-hh)** as long term goal, defining infrastructure requirements
- **e^+e^- collider (FCC-ee)** as potential intermediate step
- **$p-e$ (FCC-he)** option
- **80-100 km infrastructure** in Geneva area





FCC Kick-off Meeting



Kick-off Meeting of the Future Circular Colliders Design Study

12 - 15 February 2014, University of Geneva / Switzerland

341 registered participants



FCC Kick-off participants

341 registered participants - geographical distribution

Americas (37)

Canada: 1

Mexico: 2

US: 34

Asia (19)

China: 9

Japan: 9

Republic of Korea: 1

Africa (1)

South Africa: 1

Europe (284)

Austria: 1

CERN: 140

Czech Republic: 2

Denmark: 1

France: 30

Germany: 14

Greece: 1

Hungary: 2

Italy: 20

Poland: 6

Portugal: 2

Russia: 8

Serbia: 1

Spain: 11

Sweden: 1

Switzerland: 19

(w/o CERN)

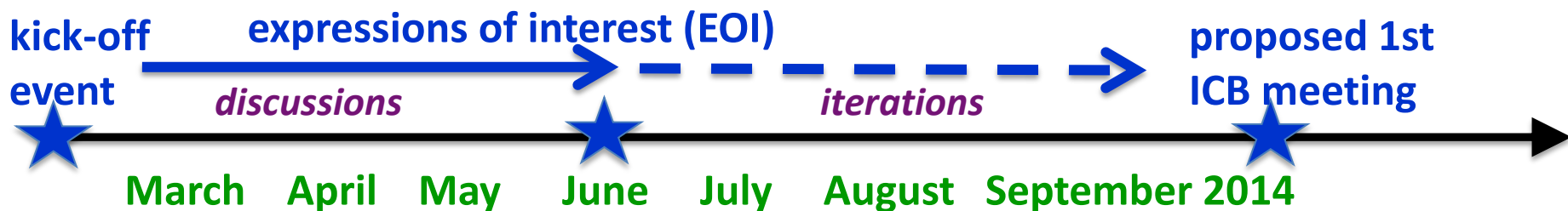
UK: 25

Well-balanced world-wide attendance



Establish an international collaboration

- **Invitation to institutes to join collaboration**
- Aiming at **expressions of interest by end May 2014** to form nucleus of collaboration by September 2014
- Enlargement of the study preparation team
- **First international collaboration board meeting:**
9-10 September at CERN





Collaboration based on general MoU and specific addenda:

Draft 23 May 2014 11:30

Memorandum of Understanding for the Future Circular Collider (FCC) Study hosted by CERN

THE INSTITUTES, LABORATORIES, UNIVERSITIES AND THEIR FUNDING AGENCIES AND OTHER SIGNATORIES OF THIS MEMORANDUM OF UNDERSTANDING AND CERN AS THE HOST LABORATORY (“the Participants”)

Whereas

At a dedicated session of the CERN Council held on 30 May 2013, the Council adopted the Update of the European Strategy for Particle Physics which included *inter alia* the following statement:

“...Europe needs to be in a position to propose an ambitious post-LHC accelerator project at CERN by the time of the next Strategy update, when physics results from the LHC running at 14TeV will be available. CERN should undertake design studies for accelerator projects in a global context, with emphasis on proton-proton and electron-positron high-energy frontier machines. These design studies should be coupled to a vigorous accelerator R&D programme, including high-field magnets and high-gradient accelerating structures, in collaboration with national institutes, laboratories and universities worldwide.”

The conceptual design study (the “FCC Study”) must be available in time for the next update of the European Strategy for Particle Physics for the Council to take

DOCUMENT ID / Doc. Mgmt. Sys. ID VERSION DATE

ADDENDUM {IDENTIFIER}

{Name of Participant} (“Participant”)	
This Addendum defines a contribution by one or more Participants under Article 6 of the Memorandum of Understanding for the FCC Study {MoU Identifier and date}	
SCOPE OF WORK	
{General description of scope of work}	
PROJECT CONTACTS	
The following contacts may, on behalf of the Participant and of CERN as the Host Organization, update the contents of this Addendum by issuing a revised Addendum that will cancel and replace all previous versions.	
Participant Project Contact:	{FIRST NAME} {LAST NAME} {e-mail} {phone}
CERN Project Contact:	{FIRST NAME} {LAST NAME} {e-mail} {phone}

DETAILED WORK DESCRIPTION

Note: The following table is repeated for each individual Work Unit constituting the Scope of Work (i.e. each deliverable, identifier, title, description and planned delivery date). The identifier should have the form {3-letter institute letter code}-{work unit code}-{deliverable code}.

WORK UNIT	
Title:	{Name of the unit of work to be carried out}
Identifier:	{Identifier used in communication between Participant and CERN}
Reference:	{Associated FCC Work Breakdown Structure items}
Objectives:	{Description of objectives}



Forming the collaboration:

This goes further than a mailing list!

We have mission from the FCC study director to collect expressions of interest, agree on FCC-ee workpackage of interest and prepare MOUs

WHY? This allows

1. to structure the study and help cover the whole **WBS structure**.
2. to have access to CERN, access card, computing resources etc. etc.
like any member of a **CERN approved experiment**
3. to **prepare funding requests** for
 - PhD students, post-docs etc..
 - travel
 - others such as detector prototype project etc...within an official CERN approved activity and with CERN support!
4. to be represented in the **Institutional Board**

Small and large institutes are welcome. Who signs is country-dependent

2.3	Lepton collider physics
2.3.1	Model building and new physics <i>To be completed</i>
2.3.2	Precision EW calculations <i>To be completed</i>
2.3.3	Flavour (b,c, τ, ν) physics and rare decays <i>To be completed</i>
2.3.4	QCD and $\gamma\gamma$ physics <i>To be completed</i>
2.3.5	Combination and complementarity <i>To be completed</i>
2.4	Lepton collider experiments
2.4.1	EW physics at Z pole <i>To be completed</i>
2.4.2	WW, ZZ, Zγ physics <i>To be completed</i>
2.4.3	H(126) properties <i>To be completed</i>
2.4.4	Top quark physics <i>To be completed</i>
2.4.5	Flavour (b,c, τ, ν) physics and rare decays <i>To be completed</i>
2.4.6	QCD and $\gamma\gamma$ physics <i>To be completed</i>
2.4.7	Experimental signatures of new physics <i>To be completed</i>
2.4.8	Experimental environment <i>To be completed</i>
2.4.9	Detector designs <i>To be completed</i>
2.4.10	On-line software <i>To be completed</i>
2.4.11	Off-line software <i>To be completed</i>

«To be completed»
is now complete

see Patrick's talk.

Substructure is OK
as necessary



Meanwhile ...

CERN's MTP as discussed by SPC on Monday 16 June 2014 contains FCC in good place including crucial R&D (CW SC RF and High Field magnets) at high level.

FTEs are «to be found»

Collaborating institutes expected to contribute manpower (or to commit to request it)

CERN budget codes have been open for study. (Fabiola, Patrick for the physics study)

On the accelerator side, large MOUs have/are being/ signed with various institutes in EU, Russia, Japan, US etc... and some small institutes too.



Conferences, workshops and seminars

FCC-ee 4 parallel session talks and 2 posters at ICHEP2014

title	session	speaker
Higgs Physics at the FCC-ee ,	Higgs Physics	Manqi Ruan (CERN/IHEP BEijing)
Precision Electroweak measurements at FCC-ee,	EW and top physics	Roberto Tenchini (Pisa)
Search for rare phenomena at FCC-ee	BSM Searchs	Maurizio Pierini (CERN)
Heavy neutrino hunting in Higgs- and Z decays	Neutrino	Alain Blondel (Geneva)
Strong coupling constant measurements at the FCC-ee	QCD → Future colliders	Poster
FCC-ee accelerator performance and limitations	Future colliders	Poster

and some more at various conferences

Please help us by signaling conferences where FCC-ee could contribute

We have good stories to tell!

→ Mike Koratzinos



Next FCC-ee Physics Workshop

27-29 October 2014 in Paris

Roy Aleksan and Sandrine Laplace, organizers.

