

# Introduction & News

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Filip Moortgat (CERN) and Heather Gray (LBNL)



# CDR Outline

## 1.1 Introduction

(Heather Gray, Filip Moortgat)

Discussion on physics motivation of the benchmark channels.

## 1.2 Higgs and Electroweak Symmetry Breaking

### 1.2.1 Higgs Properties

Responsible: Michele Selvaggi

#### 1.2.1.1 $H \rightarrow ZZ$

#### 1.2.1.2 $H \rightarrow \gamma\gamma$

#### 1.2.1.3 $H \rightarrow Z\gamma$

#### 1.2.1.4 $H \rightarrow \mu\mu$

### 1.2.2 ttH Production

Responsible: Michele Selvaggi, Valentin Volk, Clement Helsen

#### 1.2.2.1 $t\bar{t}H, H \rightarrow \gamma\gamma$

#### 1.2.2.2 $t\bar{t}H, H \rightarrow \text{multileptons}$

#### 1.2.2.3 $t\bar{t}H, H \rightarrow bb$ (boosted) ?

### 1.2.3 Measurement of di-Higgs production

Responsible: Michele Selvaggi, Sylvie Braibant, Giacomo Ortona, Biagio Di Micco, Nicola De Filippis, *et al.*

#### 1.2.3.1 $HH \rightarrow bb\gamma\gamma$

#### 1.2.3.2 $HH \rightarrow bbWW / bbZZ$

#### 1.2.3.3 $HH \rightarrow bb\tau\tau$

#### 1.2.3.4 $HH \rightarrow bbbb$ (boosted)

### 1.2.4 Measurement of Vector Boson Scattering

(Andre Sznajder, *et al.*)

## 1.3 Searches for new physics

### 1.3.1 Resonances: $ee, \mu\mu, jj$

Responsible: Clement Helsen, Michele Selvaggi

### 1.3.2 Resonances: $WW, t\bar{t}$

Responsible: Clement Helsen, Michele Selvaggi

### 1.3.3 Supersymmetry: stop search

Responsible: Loukas Gouskos

### 1.3.4 Dark Matter: monojet + DM, $t\bar{t}$ + DM, VBF + DM

Responsible: Phil Harris

### 1.3.5 Dark Matter: disappearing tracks

Responsible: Ryu Sawada, Koji Terashi, Masahiko Saito

Goal: First full draft by FCC week  
**Individual contribution deadline: 26  
 March**

Each individual contribution should be 2-4  
 pages including figures

Access coming soon: [https://  
 www.overleaf.com/](https://www.overleaf.com/)

[13542649sbdcjnsnmwgp#/52315115/](https://www.overleaf.com/13542649sbdcjnsnmwgp#/52315115/)

Please feel free to start using a .tex file in  
 the mean time

# FCC week Amsterdam, Draft Agenda

Time	Sunday (8 APRIL)	Monday (9 APRIL)	Tuesday (10 APRIL)				Wednesday (11 APRIL)					Thursday (12 APRIL)					Friday (13 APRIL)	Time			
	P1	Plenary	P1	P2	P3	P4	P1	P2	P3	P4	P5	P1	P2	P3	P4	P5	Plenary				
08:30-09:00	Registration (Place)	WELCOME (Name, Organisation)	FCC-hh ACC	Conductor Nb3Sn : State of the art & characterization	FCC-ee Phys/Exp	SRF	FCC-ee ACC	EuroCirCol 16 T Other tasks	FCC-physics	I&O CE, geodesy, alignment, transport, logistics	STP	FCC-hh Phys/Exp	FCC-ee INJ	STP	HE LHC Parameters and optics	I&O	Summaries Machines and Technologies	Summary FCC-hh machine design	08:30-09:00		
09:00-09:30		Opening, study status and physics perspectives	Physics at FCC J. Rudermann (CCPP, NYU)																Summary FCC-ee machine design	09:00-09:30	
09:30-10:00		CHAIR (ORG)		Schulte	C. Senatore (UNIGE)	Janot	Brunner	Olde	P. Fabricatore	Mangano	Mertens	Jimenez	Riegler	Papaphilippou	Jimenez	A. Seryi		Mertens	I&O/Technologies J.	09:30-10:00	
10:00-10:30		CHAIR (ORG)	Study status & further plans	Coffee Break (Place)				Coffee Break (Place)					Coffee Break (Place)					CHAIR (ORG)	Summary Magnets / RF	10:00-10:30	
10:30-11:00			Coffee Break (Place)	FCC-hh ACC	Conductor: Development for FCC	FCC-ee Phys/Exp	SRF	FCC-ee ACC	16 T R&D Magnets and models	FCC-physics	I&O Cryogenics	RESERVE	FCC-hh Phys/Exp	FCC-ee INJ	STP	HE LHC Colimation and beam dynamics	EASITrain (ESRs 1-6-8-9-10-14)	Coffee Break		10:30-11:00	
11:00-11:30		Status Machines	FCC-hh machine design overview	Schulte	A. Ballarino (CERN)	Janot	Brunner	Olde	F. Toral (CIEMAT)	Mangano	Mertens	Benedikt	Riegler	Papaphilippou	Jimenez	Y. Cai	Gutleber	Summaries Physics and Experiments	Summary FCC-he	11:00-11:30	
11:30-12:00			FCC-ee machine design overview																Summary FCC-hh experiments	11:30-12:00	
12:00-12:30		CHAIR (ORG)	HE-LHC and FCC-he overviews	Lunch (PLACE)				Lunch (PLACE)					IAC (closed session)	Lunch (PLACE)					CHAIR (ORG)	Summary FCC-ee experiments	12:00-12:30
12:30-13:00			Lunch (PLACE)	Lunch (PLACE)				Lunch (PLACE)					Lunch (PLACE)						losing remarks	12:30-13:00	
13:00-13:30			Lunch (PLACE)	Lunch (PLACE)				Lunch (PLACE)					Lunch (PLACE)							13:00-13:30	
13:30-14:00		Lunch (PLACE)	Lunch (PLACE)				Lunch (PLACE)					Lunch (PLACE)						Free lunch break	13:30-14:00		
14:00-14:30	Status Technologies and Infrastructure	Civil Engineering, I&O overview V. Mertens	FCC-hh ACC	Conductor: Other superconductors	FCC-ee Phys/Exp	SRF	FCC-ee ACC	Other programs	FCC-hh Phys/Exp	I&O CV, EL, power management	EASITrain coordination Committee (closed session)	Common Det Technology	FCC-eh Technical design	STP	FCC-hh ACC	EASITrain (ESRs 2-7-12-13)			14:00-14:30		
14:30-15:00		Special Technologies R&D overview	Schulte	E. Barzi (FNAL)	Janot	Brunner	Olde	G. Apollinari (FNAL)	Riegler	Mertens	Gutleber	Riegler	tbd	Jimenez	Schulte	Gutleber			14:30-15:00		
15:00-15:30	CHAIR (ORG)	16 T Magnet R&D overview SRF R&D overview	Coffee Break (Place)				Coffee Break (Place)					Coffee Break (Place)							15:00-15:30		
15:30-16:00		Coffee Break (Place)	Poster Session				RESERVE	FCC-ee ACC	Other magnets for FCC	FCC-hh Phys/Exp	I&O Safety, operation, reliability	FCC-hh INJ	Common Det Software	FCC-eh Physics overview	STP	FCC-hh ACC	EASITrain (ESRs 3-4-5-11-15)			15:30-16:00	
16:00-16:30	Status Experiments and Detectors	FCC-hh experiments and detector overview																	16:00-16:30		
16:30-17:00		FCC-ee experiments and detector overview	FCC-hh INJ	EuroCirCol 16 T Designs for the FCC CDR	FCC-ee Phys/Exp	SRF	Olde	P. Vedrine (CEA)	Riegler	Mertens	Goddard	Riegler	tbd	Jimenez	Schulte	Gutleber			16:30-17:00		
17:00-17:30	CHAIR (ORG)	HE-LHC and FCC-he overviews	Cold refreshments Place				Cold refreshments Place					Cold refreshments Place							17:00-17:30		
17:30-18:00		Cold refreshments Place	Goddard	S. Prestemon	Janot	Brunner	Netherlands specific session					TITLE (Name, Org)							17:30-18:00		
18:00-18:30	Strategy Roadmaps Plenary Session	American activities on future colliders HEPAP view	Cold refreshments Place				TITLE (Name, Org)					FCC & EuroCirCol Collaboration Boards, EASITrain SSB (closed session)							18:00-18:30		
18:30-19:00		Asian activities on future colliders ACFA view	ISC (closed session)	Cold refreshments Place				TITLE (Name, Org)					L. Rivkin (PSI) / R. Aleksan (CEA)							18:30-19:00	
19:00-19:30	CHAIR (ORG)	European activities on future colliders ECFA view	Cold refreshments Place				TITLE (Name, Org)					L. Rivkin (PSI) / R. Aleksan (CEA)							19:00-19:30		

FCC-hh experiment and detector overview (30')

4x FCC-hh/Phys&Exp 90'

Common Technologies (90')  
Common Software (90')

Summary FCC-hh

# Preliminary Program for FCC week

- **Session 1 : Higgs & EWSB (90')**

- Introduction to FCC-hh physics analysis studies (20' - Filip/Heather)
- Higgs & EWSB studies (i.e. Higgs properties + VBS) (40' - Michele)
- Di-Higgs studies (30' - Sylvie Braibant)

- **Session 2: BSM (90')**

- Resonances (30' - Clement)
- Supersymmetric top (20' - Loukas)
- Dark Matter: mono-X, tt+X, VBF+X (20' - Kristian?)
- Dark Matter: disappearing tracks (20' - Ryu or Koji)


# Upcoming FCC-hh Analysis Meetings


- March 2nd at 14:00
- March 15th at 16:00
- April 5th at 14:00 (focussed on review of talks/material for FCC week)





Please get in contact with us if you'd like to present something

# Today's agenda



## FCC-hh physics analysis meeting

 Wednesday 14 Feb 2018, 16:00 → 18:00 Europe/Zurich

 4-3-006 - TH Conference Room (CERN)

Videoconference Rooms  FCC-hh\_physics\_analysis\_meeting [Join](#)   TH Conference Room 

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<b>16:00</b>	→ 16:10	<b>Introduction</b>	🕒 10m	
Speakers: Filip Moortgat (CERN), Heather Gray (LBNL)				
<b>16:20</b>	→ 16:35	<b>Z'→tt and RSG→WW</b>	🕒 15m	
Speaker: David Olivier Jamin (Oklahoma State University (US))				