News - Physics Performance, May 22, 2023

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Reminder: timelines

A very tight schedule!

- First draft is expected by June – around the FCC Week 2023
  - To allow for internal review and corrections over summer
    - This is exactly four months away

X **< 1 month !**

- Our mid-term deliverable will be covered in a ~60-page report (with flexibility)

8. Physics & Experiments	C. Grojean, P. Janot, M. Mangano	8.1 Overview
		8.2. Documentation of the specificities of the FCC-ee and FCC-hh physics cases.
		8.3 Strategic plans for the improved theoretical calculations.
		8.4 FCC-ee Detector Requirements.

+ Preliminary detector costing (tbc)

  - The report will address the key question in a concise, albeit comprehensive way
    - It will include links to supplementary material
      - Several FCC Notes to be written ahead of the report itself
      - Your plans towards these FCC notes is very much welcome (starting today)

P. Janot, C. Grojean — FCC PED Coordination meeting, 9 Feb 2023 — X

Next:

- All deliverables available in **final form** to the SAC by end of Sep
- SAC report available to the SPC end of Oct

- Early drafts of the analysis notes expected by end of April.
  - Thanks a lot to those who have provided already a draft !
- Will be reviewed / approved, and ultimately submitted to arXiv or to a journal

FCC week 2023

- **June 2023 FCC week: June 5-9, 2023, London**
  - **fccweek2023.web.cern.ch**

Register by May 31st !

Poster session: deadline for proposing a poster is June 3rd

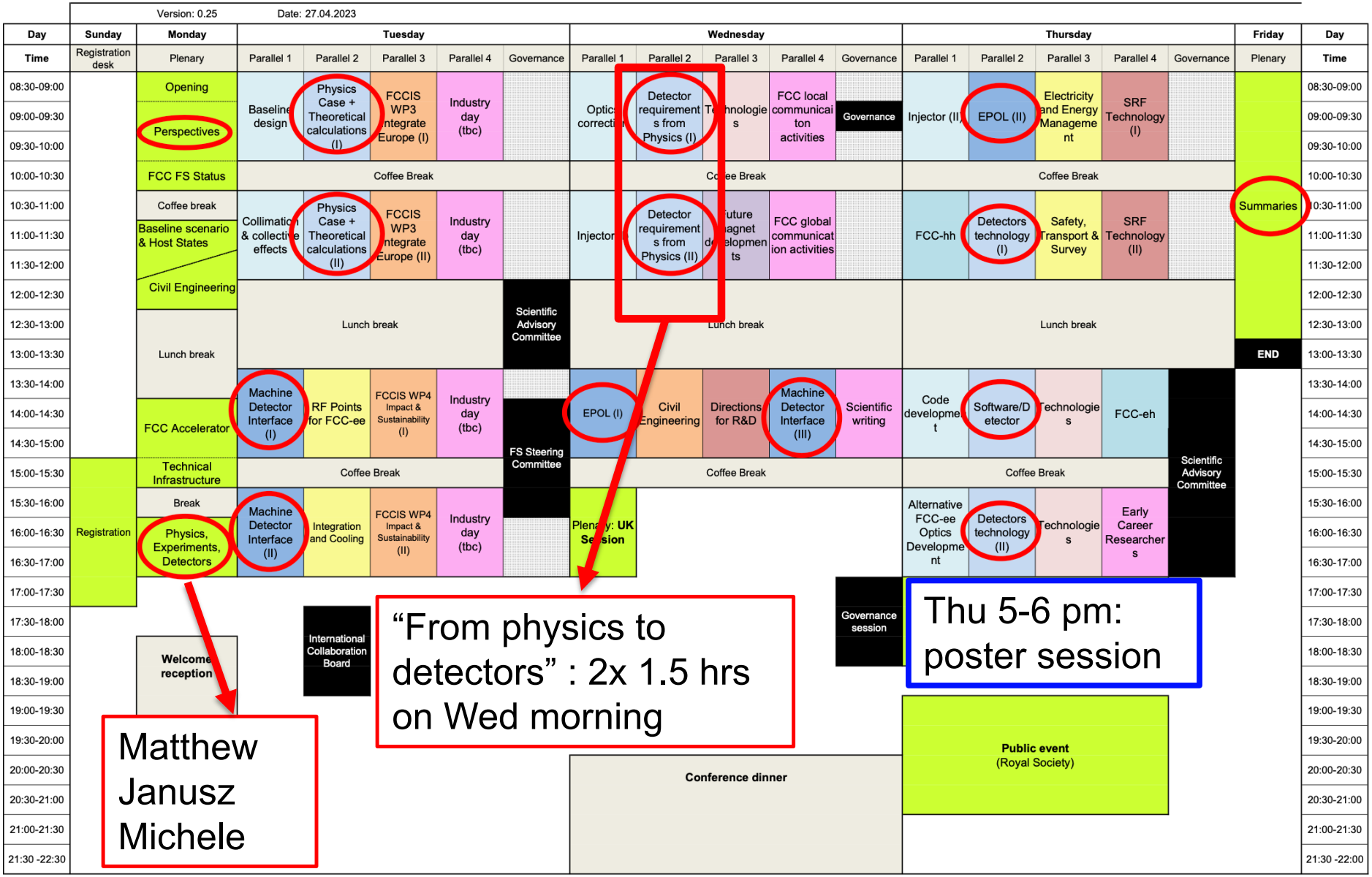
PED Sessions

- **Plenary Speakers:**
  - G. Salam "Physics Motivations"
  - Mid-term milestones: M. McCullough, J. Gluza, M. Selvaggi
  - G. Wilkinson, PED summary
- **11 PED parallel sessions:**
  - See next slides and gdoc.
- **Poster session: abstract submission deadline June 3rd (?!)**
  - Thursday 5pm-6pm with wine&cheese
  - Encourage people to propose a poster
  - Best-poster award
- **ECR/Young researchers session (Thursday 3:30-5:00 pm)**
- **Public event at the Royal Society with Robin Ince and panel of physicists**
  - Thursday evening, 76:30-8:30pm
- **Conference dinner on Wednesday at the National Gallery**

"Detector requirements from physics"

Opening session.

FCC week, program overview



Parallel session: from Physics to detectors

General Higgs Performance overview

Speaker: Jan Eysermans (Massachusetts Inst. of Technology (US))

Higgs mass, sigma(ZH) and self-coupling ¶

Speaker: Louis Portales (CNRS/IN2P3 - LLR, École Polytechnique)

Higgs hadronic couplings and Higgs to invisible

Speaker: Loukas Gouskos (CERN)

In-situ determination of acceptances

Speaker: Patrick Janot (CERN)

Heavy quark electroweak measurements

Speaker: Lars Rohrig (Technische Universitaet Dortmund (DE))

Detector requirements from B to K* tau tau

Speaker: Tristan Miralles (Université Clermont Auvergne (FR))

Prospects for b to snunu and requirements on the detector

Speaker: Matthew William Kenzie (University of Warwick (GB))

Detector requirements from Tau physics

Speaker: Alberto Lusiani (Scuola Normale Superiore and INFN, sezione di Pisa)

Detector requirements from BSM: long-lived signatures

Speaker: Sarah Louise Williams (University of Cambridge (GB))

Detector requirements from BSM: prompt signatures

Speaker: Nicolo Valle (INFN Sezione di Pavia (IT))

- Agenda: Priority to the analyses that were not already presented to a FCC week / physics workshop, and / or that are expected to come with a quantified requirement on the detector performance.

- New results: still O(10) days, review with the WG conveners, preview needed such that they can be used for Michele's talk in the opening session !

New baseline: 4 interaction points !

The new baseline numbers should correspond to the new baseline design:

- 4 IPs, 4 detectors
- hence total integrated luminosity x O(2)

Please rescale your projections to these rounded numbers:

- 2 M of Higgs bosons produced at 240 GeV (instead of 1M)
- 8 10^{12} Z's produced at and around the Z peak

(in case you have no time to update your plots for London, state that this is still for the old baseline)

Computing resources (CERN EOS)

In addition to the 500 TB that we have for MC samples, 200 TB have been secured for analysis files.

These 200 TB will be allocated according to quotas, basically per physics groups. The sharing of each group space will be under the responsibility of the conveners.

Current plan: allocate part of the 200 TB for the while, gradually increase when necessary:

20 TB	Higgs + Top
20 TB	BSM
10 TB	Flavours
10 TB	EW + QCD

Folder are in /eos/experiment/fcc/ee/analyses_storage

We will grant write access according to the conveners' requests.

Next meetings and (some) events of interest

- Next Higgs performance meeting during the week before London
  - Approx May 30th – June 1st

- ECFA (WG3) workshop on tracking & vertexing, May 30-31
  - https://indico.cern.ch/event/1264807/

- ECFA (WG2) 2nd Topical Meeting on Generators, June 21-22, Brussels
  - https://indico.cern.ch/event/1266492/

- WG2 ECFA Reconstruction Workshop 11-12 July , at CERN

- 2nd Higgs/EW/Top factory ECFA workshop, October 11-13, Paestum (Italy)
  - https://agenda.infn.it/event/34841/

- ECFA seminars / workshops of interest :
  - List collected here https://indico.cern.ch/category/14055/

Today's agenda and next meetings

15:30 → 15:40 **News**

Speakers: Emmanuel Francois Perez (CERN), Patrizia Azzi (INFN Padova (IT))

15:40 → 16:05 **Sensitivity to HNLs decaying into a muon and two jets**

Speakers: Giacomo Polesello (INFN, Sezione di Pavia (IT)), Nicolo Valle (INFN Sezione di Pavia (IT))

16:05 → 16:20 **Resolution studies in Higgs to invisible**

Speakers: Andrew Mehta (University of Liverpool (GB)), Nikolaos Rompotis (University of Liverpool (UK))

~~**16:20** → 16:40 **Update on Tau reconstruction (t.b.c.)**~~

Speaker: Maria Cepeda (CIEMAT)

16:40 → 16:55 **Tagger on Z -> qq events at 91 GeV**

Speaker: Emmanuel Francois Perez (CERN)

Next Physics Performance meetings :

- May 29 if need be
- June 19, 15:00
- July 17 (t.b.c.)

Still lots of work after London to get the results that will be used for the mid-term report !

Strongly encourage ALL physics groups to have regular working meetings where ongoing analyses should be discussed / reviewed !