

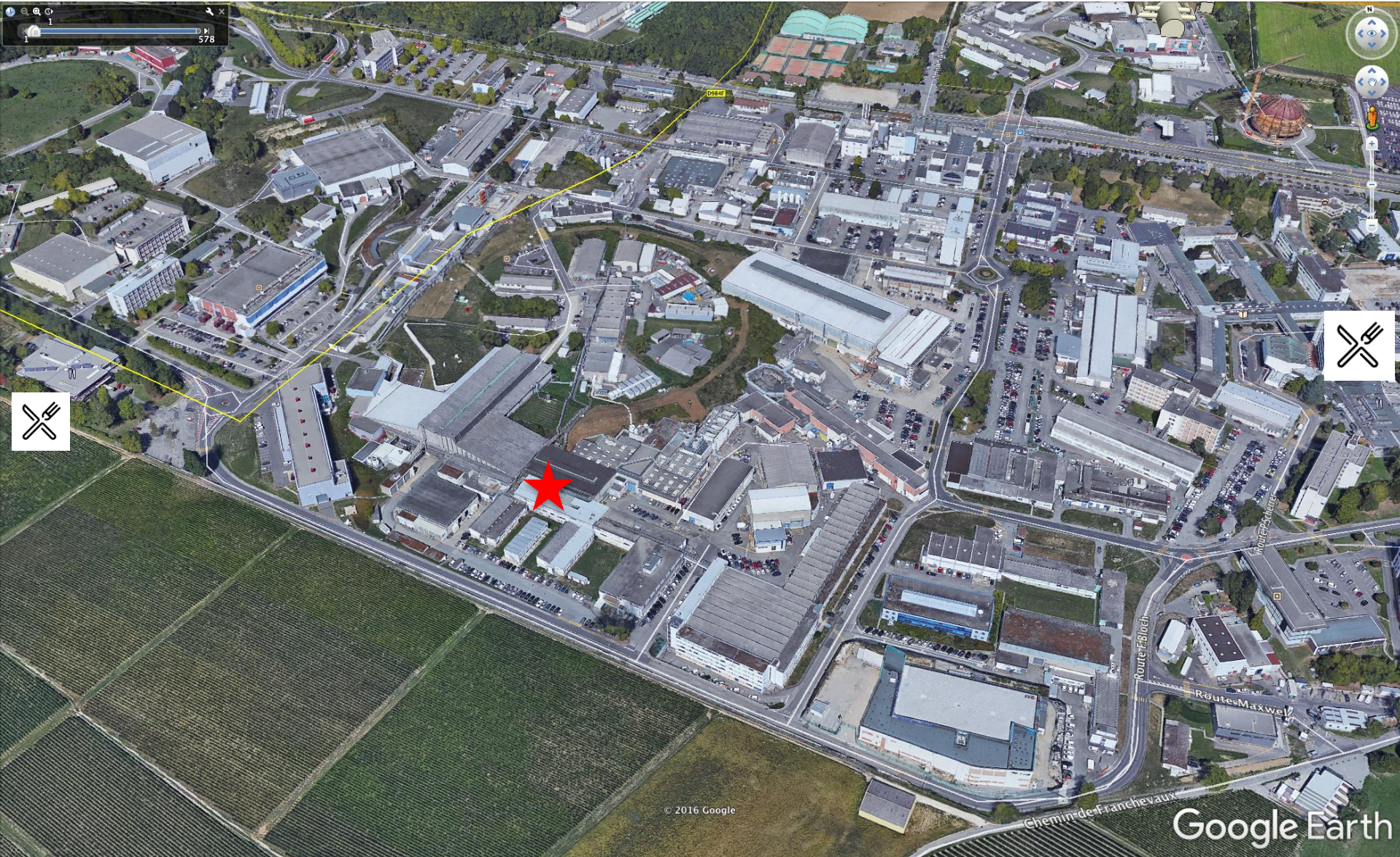
EDM kick-off meeting

Introduction

Mike Lamont, Joerg Jaeckel, Claude Vallée
13th March 2017

Acknowledgements: Hans Stroeher (JEDI) and Yannis Semertzidis (srEDM)

Welcome to CERN!



CERN's 3 main scientific pillars

Fabiola Gianotti SPC May 2016

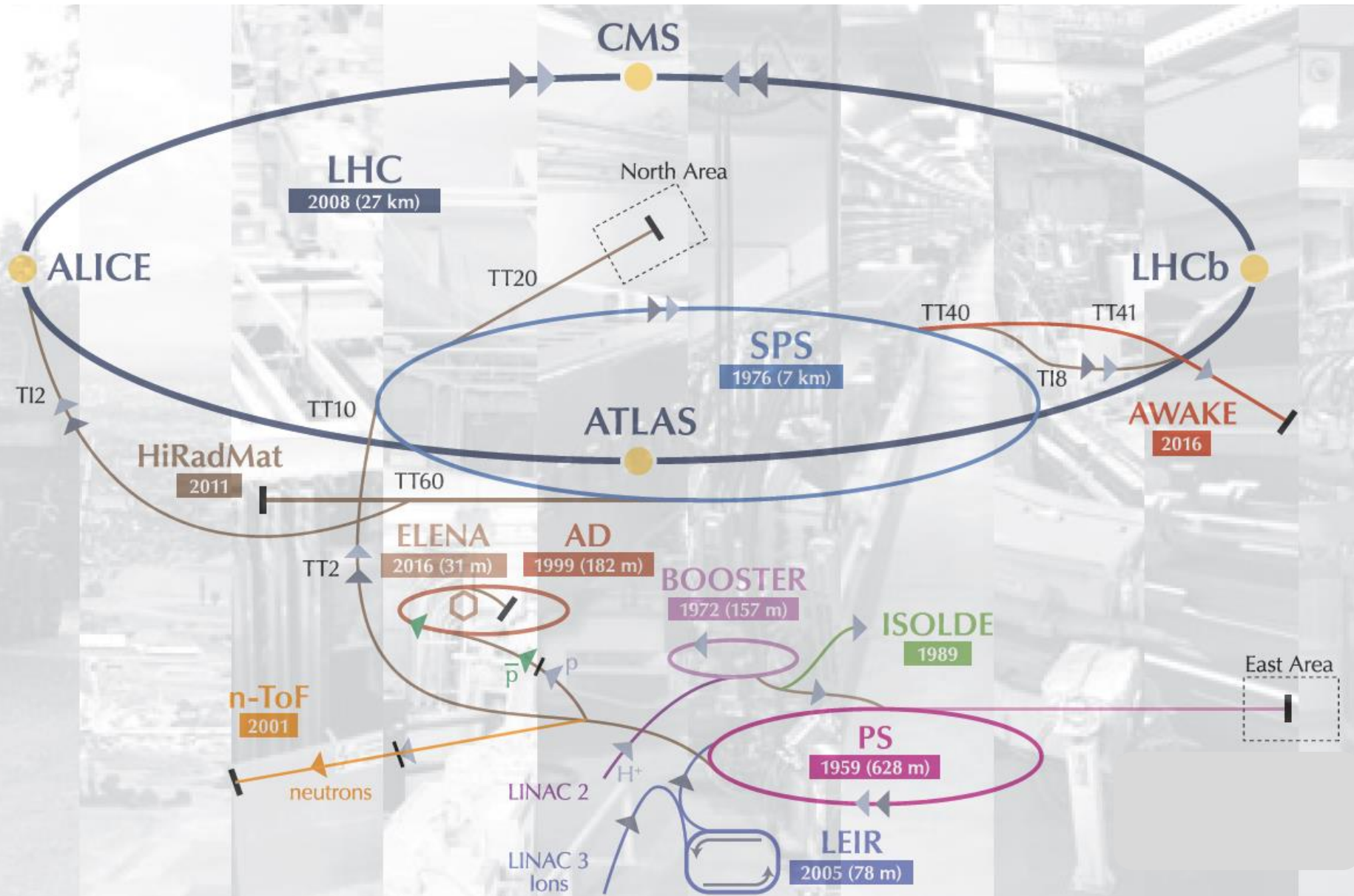
- Full exploitation of the LHC
- Scientific diversity program
 - Ongoing experiments and facilities
 - Participation in accelerator based neutrino projects outside Europe
- Preparation for future
 - R&D (superconducting magnets, AWAKE etc.)
 - Design studies for future accelerators: CLIC, FCC
 - **Future opportunities of diversity program (new):**
“Physics Beyond Colliders study group”

Important milestone: update of the European Strategy for Particle Physics (ESPP): ~ 2019-2020
→ 10-year view has uncertainties beyond 2020 for part of programme other than LHC upgrade

PBC - scientific goal

- Explore the opportunities offered by the CERN accelerator complex to address some of today's outstanding questions in particle physics
- These experiments would typically:
 - enrich and diversify the CERN scientific program,
 - exploit the unique opportunities offered by CERN's accelerator complex and scientific infrastructure,
 - complement the laboratory's collider programme
- Examples of physics objectives include searches for rare processes and very-weakly interacting particles, measurements of electric dipole moments, etc.

This study should provide input for the future of CERN's scientific diversity programme, which today consists of several facilities and experiments at the Booster, PS and SPS, **over the period until ~2040.**



What's not in!

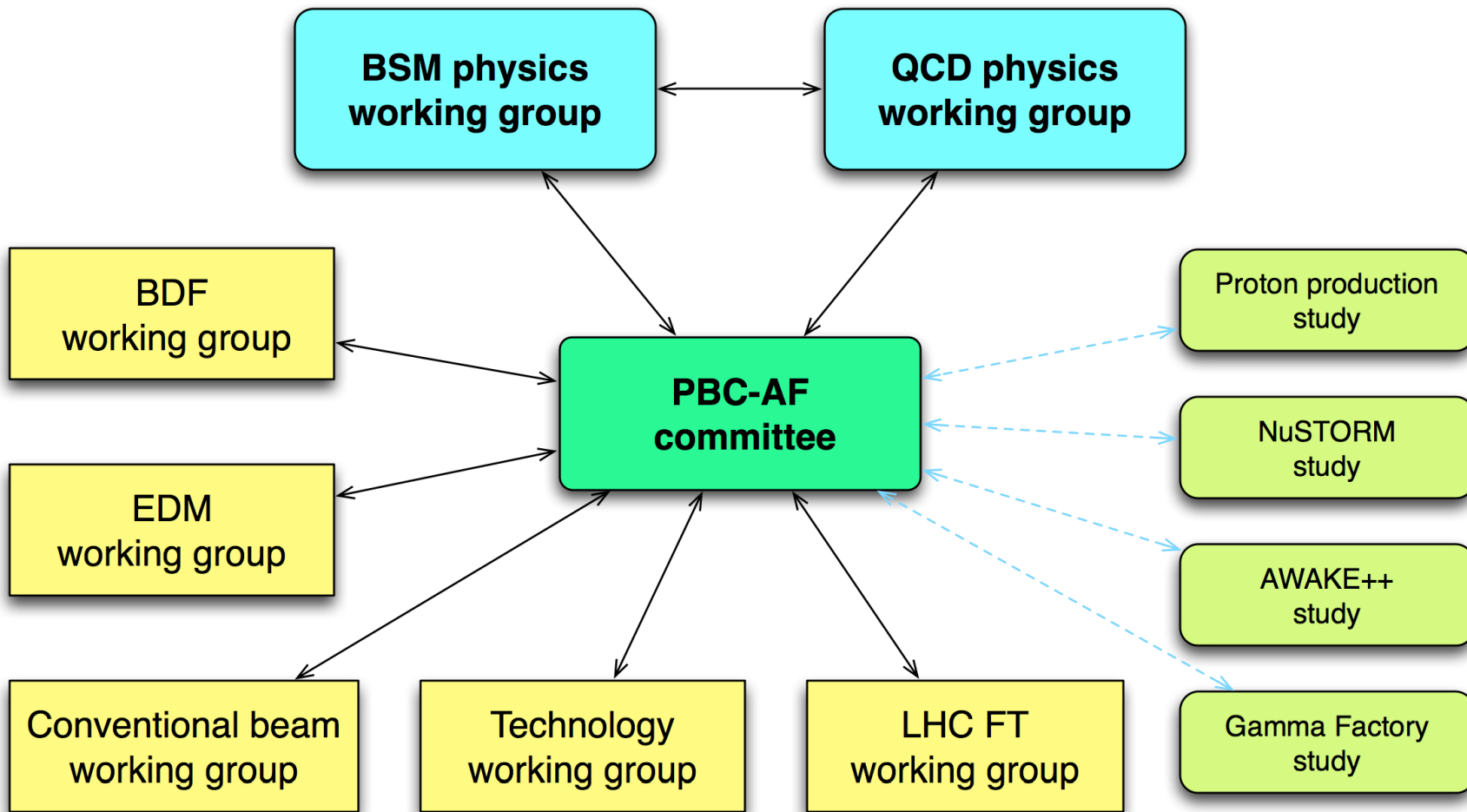
Medical applications
Beta beams
ADSR
Short baseline neutrino
Long baseline neutrino
g-2
Mu2e
AWAKE (as a project)
Neutrino platform
FCC era variations

Working groups

Collected input from the community mainly via the kick-off workshop

- Working Groups have been set up to address:
 - the physics case of the proposed projects in the worldwide landscape
 - their feasibility and possible implementation at CERN (or elsewhere)
 - With deliverables being tuned to the level of maturity of the projects
- First general working group meeting 1-2 March
 - Present plans, deliverables, timeline, resources
- Follow-up PBC workshop foreseen in autumn 2017.

Organization



Conveners have been nominated for each group – see [//cern.ch/psc](https://cern.ch/psc) for details

Physics sub-working groups

- **BSM subgroup:**

- current projects: SHIP; NA64++; NA62++; KLEVER; IAXO; LSW; EDM

- **QCD subgroup:**

- current projects: COMPASS++; μ -e; LHC FT (gas target+crystal extraction); DIRAC++; NA60++; NA61++

The subgroup core members include theory and experimental experts of the corresponding domains as well as representatives of the projects.

Physics domain - deliverables

- For each proposed project deliverables will include:
 - evaluation of the **physics case** in the worldwide context;
 - possible further detector optimization;
 - and, for new projects, investigation of the **uniqueness of the CERN accelerator complex for their realization.**

Accelerator domain - deliverables

COMPLEX	Fully developed proton performance plan – post LIU era
BDF	<ul style="list-style-type: none">• Complete technical feasibility studies• Preliminary Comprehensive design report
EDM	Fully developed proposal including preliminary costing
CONV. BEAMS	Establish requirements, initiate feasibility studies
LHC FT	Preliminary conceptual design report(s)
GAMMA	Exploratory study, initiate initial tests
nuSTORM	<ul style="list-style-type: none">• Exploratory study of implementation at CERN• Review potential scientific impact
AWAKE+	Exploratory study for potential application of AWAKE concept
Technology	<ul style="list-style-type: none">• Explore possible technological contributions by CERN to externally hosted facilities• Facilitate potential use of CERN infrastructure• Study physics case and technical requirements as input to ESU

We'll hear from most of these this morning...

Deliverables

- Final deliverable due end 2018:
 - Summary document as input to the European Strategy Update process (2019-20)
 - Foresee executive summaries from each group
- Will gather and summarize the status and potential of the projects to help facilitate the update of the ESPP by the ESG group.

The remit of the ESG is to establish a proposal for an Update of the medium and long-term European Strategy for Particle Physics, for approval by the Council.

PBC EDM executive meeting

January 2017

- Participants:
 - T. Bowcock, C. Carli , G. Guidoboni, M. Lamont, J. Pretz, Y. Semertzidis, A. Stahl, E. Stephenson, H. Ströher, C. Vallée.

- Reviewed activities of JEDI and srEDM
- Reviewed development of construction of small ring (ELENA) at CERN
- Discussed objectives and scope
- Produced preliminary work-package breakdown and initial assignments
- Laid foundations for this meeting... subsequent agenda courtesy Hans and Yannis

Initial conclusions

- The EDM community would highly appreciate CERN involvement. The expertise at CERN could be very helpful for the development of the experiment.
- It looks possible to build an EDM ring at CERN without interfering with other projects if the necessary resources are available.
- The deadline to present a document on the EDM project is the end of 2018, before the next European strategy update process (2019-2020).
- The proposal should describe the different possibilities for the EDM experiments: proton, deuteron and helium-3.
 - At this stage, there is no need to take a decision on the strategy – a program should be presented: each particle could be optimized in a different ring, or a combined function ring considered.

To be thoroughly revisited by the community
in the EDM kick-off meeting

Conclusions

- Physics Beyond Colliders study group to look at CERN's non-collider options out to 2040
- Wide range of physics and accelerator domain groups have been set up...
- Clearly a lot of support for an EDM initiative out there!

But please bear in mind the competition for resources

Workshop organization

- Coffee will be served at each session outside the cafeteria downstairs
- Lunch is up to you – the nearest restaurant is just up the road
 - sandwiches on the ground floor, full meals upstairs
- Dinner 19:30 tonight...

Café de l'Aviation

- TRAM 19h **03** 14 29 42 50 57 from CERN
- 10' on the tram to Blandonnet
- Billet Tout Genève validité 60' 3.00 CHF

