

Minutes of the Plenary meeting 2020 27 August 2020 10h30

CHIPP Roadmap Workshop

Place of the meeting: Hotel Belle Epoque Victoria, Kandersteg

Time of the meeting: Thursday, 27 August 2020, 10:30 – 12:30 15h15 - 16h30

Indico link: <https://indico.cern.ch/event/897920/timetable/#20200827.detailed>

Welcome

In his opening presentation¹, the CHIPP Chair, Rainer Wallny, welcomes everybody to the CHIPP Roadmap Workshop. He starts by recalling the main purpose of the Roadmap as the information source for stakeholders (SERI, SNF and the Parliament etc.) to secure funding for the next period (2025-2028). Due to the long-term nature of our field, but also thanks to the approval of the European Strategy (EPPSU) in June 2020 CHIPP has a longer timespan to cover; the Roadmap will inform the general audience and the Swiss state politicians about the future infrastructure projects and the scientific priorities for Particle Physics and Astronomy. SERI will have all the instruments to devote special funding to projects that benefit from the high priority status for the scientific community. The Swiss scientific community has the opportunity to find an agreement built on a bottom-up process. In case we do not find an agreement, the prioritisation will be done based on other criteria than science.

Two members of the community passed away this year: Prof. Peter Truöl from the University of Zurich and Prof. Philippe Mermod from the University of Geneva. They are dearly missed. Katharina Müller and Federico Sanchez say a few words about their work and lives. A minute of silence is dedicated to their remembrance.

The chairman informs the participants of the hygienic measures we need to follow in order to be protected as best we can during the Workshop. He presents the agenda for the next few days and the rooms available for the meetings. ZOOM sessions will be available during the whole Workshop.

Rainer explains what deliverables are expected from the Workshop, but before starting to write and changing the text we need to find consensus on the final message to deliver to the funding agencies within the Pillars and among the whole community. For the next two days we need to:

- Identify all/check for the necessary pieces
- Find the relative weight and balance of those pieces
- Make a concise document that fulfils the requirements

Before starting the writing and changing the text we need to find consensus. The aim is not to have an “encyclopedic” document focusing on the past; a “laundry list” of accomplishments should be avoided, with the main emphasis being on the future vision. Equilibrium between institutions should eventually be achieved balancing the examples of successful projects from different institutes.

The first deadline is set by the SCNAT to have a rough page size, boxes, and images by the end of September. Then by the end of November, a “close” to final version is requested. By the 31st of December, a version to be presented to the Swiss Universities and ETH Board is needed. Then the final version should be available on the 31st of March 2021. If we need extra flexibility on the timetable, we could ask PSI to be responsible for the printing and the layout of the document. But the strict deadline is still the end of December 2020, when the text will be used by the Swiss University and ETH.

¹ <https://indico.cern.ch/event/897920/contributions/3978980/attachments/2091442/3515798/Kandersteg2020WelcomeV3.pdf>

ESPP and intensity frontier of particle physics – presentation of Mikhail Shaposhnikov

Shaposhnikov in his presentation² shares his view on the outcome of the ESPP and the decision taken on the intensity frontier of particle physics in its frame. He starts by introducing the triumph of the Standard Model, a self-consistent and complete theory in particle physics. No significant deviations have been observed yet; however several phenomena are not described by it. Unfortunately, no clear indications have pointed toward the scale energy of New Physics. Several frontiers are being explored: high energy, high intensity and precision measurements. In particular, the intensity frontier deals with the search for hidden particles whose production and decay are highly suppressed. Several experiments have been proposed worldwide and many papers have been written on the search for hidden particles like FIPS (feebly interacting hidden particles). A measure of evidence that the intensity frontier is a mature direction of research, very well supported by the physics community, is the number of citations in papers. He muses that the SHiP experiment now attracts much more attention than CMS, LHCb and ATLAS did altogether at the same stage of preparation. Another very important measure is its strong physics case. Several Swiss institutes are involved in the development of the SHiP project and the Swiss interest has been openly reflected in the Swiss input to the ESPPU. Surprisingly, despite the outcomes of the HEP community, the Granada symposium and the Swiss input and the EPPSU, the deliberation document gave a non-favorable support to the project due to budget limitation. No explanation for why intensity frontier was not supported was provided. The community had no chance or time to react. Shaposhnikov is proposing to modify the deliberation and the main EPPS document stating that the Beam Dump Facility at the SPS should be a priority. He is also proposing to the ESPP to modify the procedure for the next strategy update, making the draft strategy document public and allowing the physics community to provide feedback.

The Swiss representatives to the ESPPU process stress that the planned procedure was followed in a democratic way following the bottom-up consensus and that there will be no possibility to change the deliberation document.

The idea to investigate other laboratory facilities has been considered, but it turns out that they are not realistic. The CHIPP community shares the disappointment for this EPSSU decision and will express its support for the SHiP project, including it in the Swiss Roadmap. A procedure that allows for more feedback on the final version of the next edition of the EPPSU document is wished for by some of the CHIPP members.

FCC project – presentation of Alain Blondel

Blondel in his presentation³ reports on the latest news about the FCC project. The EPPSU stated that Europe and the international community should investigate the technical and financial feasibility of a future collider at CERN with an energy of at least 100 TeV. This is a huge challenge and it should be established as a global endeavor. The feasibility study should be delivered by the end of 2025 as input for the next Strategy update for 2026/27. Several points in the implementation sequence of FCC have been presented. The similarity of the FCC timeline with LHC is shown with particular emphasis on avoiding too long a gap between active projects. In Switzerland, the CHART collaboration frames several activities for the development of the High field magnet, the FCC-ee injector study, the geological study and the beam dynamics for both FCC-ee and FCC-hh with the support of SERI, ETH, PSI, UniGe and CERN. The greatest remaining challenge is the creation of a worldwide consortium of scientific contributors who will reliably commit resources to the development and preparation of the FCC-ee science project from 2020 onwards. This is a call to the full CHIPP community. Patrizia Azzi and Emmanuel Perez have agreed to serve as coordinators. A first selection of Benchmark studies (mostly experimental, some theory) has already been prepared. A list of abstracts⁴ will be regularly updated. This was also submitted to the [SNOWMASS](https://indico.cern.ch/event/897920/contributions/3978978/attachments/2092283/3516843/ESPP_Intensity.pdf) process as LOI. This is a call to the full CHIPP community to participate. FCC is organizing a kick-off [meeting](#) and 4th Physics workshop from the 10th to the 13th of November. Rainer Wallny, as CHIPP Chair, is a member of the advisory committee of this FCC workshop. Please contact him and Alain for details on how to submit contributions and suggestions.

The funding of FCC is very substantial and it's difficult to respond to the concern of society, which needs to invest in measures to contain the climate change impact. Blondel insists that while everybody is asked to participate in reducing the impact on the environment with all the measures that are possible for an individual,

² https://indico.cern.ch/event/897920/contributions/3978978/attachments/2092283/3516843/ESPP_Intensity.pdf

³ <https://indico.cern.ch/event/897920/contributions/3978979/attachments/2092347/3515962/ABlondel-News-FCC-CHIPP-2020-08-27.pdf>

⁴ <https://www.overleaf.com/project/5ed4cade518db90001ec810d>

the big decisions and unfortunately the big impact on climate is in the hands of the politicians. Particle physics experiments have to include concerns about the environment and, with the technology available, find solutions to help society.

PLENARY: VISION OF YOUNG PEOPLE

Working group: *Admir Greljo, Alessandro Calandri, Anna Soter, Armin Fehr, Federico Leo Redi, Francesco Lucarelli, Giulia Cusin, Michelle Galloway, Stefania Bordoni, Tatiana Pieloni, Xuan Chen*

The working group prepared several presentations and reports of their work^{5,6,7}.

Greljo, Cusin and Chen prepared the part of the presentation on the young group vision on Theory. They organized a survey among young theorists in Switzerland. The results are shown; the main outcomes are as follows:

- More than 80% think that Switzerland is at the forefront of their working field.
- 78% of them would like to have more outreach opportunities to meet.
- 40% of them do not perceive their research as having a positive impact on society.

They also express overwhelming support for a strong experimental program and envisage exploration in many diverse directions.

Calandri, Fehr, Redi, Soter and Pieloni prepared a summary of their vision of Pillar1. They report the results from the 24 answers obtained in their survey.

- 87% think they are at the forefront of their respective fields
- 62% of them consider FCC-ee a priority

The statistics are low, but from the answers, it appears obvious that the young community wishes to participate more actively in outreach activities that would give them the opportunity to meet the other groups involved in Particle Physics in Switzerland and to hear about their work. The organization of outreach events could also respond to the perception that their working research has no positive impact on society (41%). The survey also highlights the worry about not having new high-energy experiments for many years in the future.

Bordoni, Galloway and Lucarelli present their summary for Pillar2 and 3. Instead of sending a survey they choose to perform interviews with the 33 available young researchers. The results are comparable with the Pillar1 and Theory surveys:

- they feel they are at the forefront of their respective fields, but the young people are not convinced that their research has a positive impact on the society or is not seeing the big picture
- they say that there is too little connection between different fields in Switzerland and no knowledge about other projects. They ask CHIPP for social networking events to boost innovation, enhance interdisciplinary projects, startup companies...? (Poster + Pizza events)
- they would like to have training possibilities in different fields / towards industry? Many PhD students/young postdocs are specialized in narrow fields.

Pieloni and Schenk report on the young vision in the Accelerator development group. They sent open questions to young scientists in this field and got 18 answers. The results are summarized as follows:

- PSI and CERN are highly valuable and give access to infrastructures at the forefront of accelerator physics and technology. They appreciate the variety of opportunities there.
- The Swiss institutes are leaders in their research areas.
- They wish to have a stronger Swiss network.
- They would like to see modern and automatized solutions in the accelerator physics operation and design, and they would like the Swiss community to undertake the muon collider project, the plasma acceleration studies and the HTS.
- They strongly wish to involve accelerator field much more deeply in computer science.
- They think that sustainability is an important must for young generations.

written by Angela Benelli
approved by the CHIPP EB

⁵ https://indico.cern.ch/event/897920/sessions/344178/attachments/2091985/3516431/CHIPP_Roadmap_2020_-_Young_People_Vision_.pdf

⁶ <https://indico.cern.ch/event/897920/sessions/344178/attachments/2091985/3516107/TheoryCHIPP20.pdf>

⁷ https://indico.cern.ch/event/897920/sessions/344178/attachments/2091985/3516429/Presentation_Accelerators.pdf