Welcome to the

European Neutrino "Town" meeting and ESPP 2019 discussion

22-24 October 2018
CERN
Europe/Zurich timezone

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Contact

antonella.vignes-magno...

Dear colleagues,

The European Strategy Discussions will take place in 2019, and to inform this process, a call was made to the particle-physics community across universities, laboratories and national institutes to submit written input by 18 December 2018.

The aims of this meeting are as follows:

1. The first aim is to prepare a document expressing the views of the European community, in a context where there is no longer an accelerator neutrino beam in Europe and the community has invested in

131 participants
at 10:00 on monday

https://indico.cern.ch/event/740296/

The European Strategy Discussions will take place in 2019,

(see next pages for more info, links etc…)

-- deadline for written contributions (10 pages) 18 December 2018
-- open Scientific Open Symposium in Granada, Spain, 13 to 16 May 2019,
-- final writing (by strategy group) : Bad Honnef, Germany, 20 to 24 January 2020.

to inform this process, a call was made to the particle-physics community across universities, laboratories and national institutes to submit written input by 18 December 2018.

"The Strategy process is about reviewing the state of particle physics by bringing together the whole community to discuss what Europe's long-term vision should be. It is about shaping the field for the next decade and beyond. We have to start discussing what we would like the landscape of particle physics research to look like in the post-LHC era," said the Chair of the European Strategy Group, Professor Halina Abramowicz.

We propose to organize a contribution by the European Neutrino community,

"town" meeting 22-24 October 2018 at CERN
-- open to the European neutrino community
-- and others, especially if they carry out experiments at CERN.

The European particle physics community gears up for a new shared vision for the future

Geneva, 11 October 2018. During its hundred-and-ninetieth session, the CERN Council formally launched the update of the European Strategy for Particle Physics, a two-year process involving the whole community and aiming at developing a common vision for the future of particle physics in Europe. The process is expected to be concluded in May 2020, with the approval of the updated strategy by CERN's Council.

"The Standard Model, our theory that best describes the known forces and particles, is unbelievably successful and was crowned by the discovery of the Higgs boson in 2012. But there is much evidence that it is not complete," said the President of the CERN Council, Sijbrand de Jong. *"There must be something beyond the Higgs and beyond the Standard Model, and it is a good time to reflect on where we are and where we should go next."*

The discovery of the Higgs boson at the Large Hadron Collider (LHC) has opened a completely new path of investigation. Increased understanding of the properties of this new, very special particle remains a key focus of analysis at the LHC and future colliders, as do precision measurements of other Standard Model parameters and searches for new physics phenomena. Why is there far more matter than antimatter in the universe? What is the dark matter making up most of the universe? Such mysteries remain among the most important outstanding questions of modern physics.

"The Strategy process is about reviewing the state of particle physics by bringing together the whole community to discuss what Europe's long-term vision should be. It is about shaping the field for the next decade and beyond. We have to start discussing what we would like the landscape of particle physics research to look like in the post-LHC era," said the Chair of the European Strategy Group, Professor Halina Abramowicz.

A Physics Beyond Colliders programme has also been established by CERN to explore projects complementary to high-energy colliders, thereby expanding the scientific diversity of CERN's projects.

"With the High-Luminosity LHC now being under way, CERN will be able to exploit the Large Hadron Collider to its full potential until the end of the 2030s, profoundly improving our understanding of fundamental physics and keeping Europe at the forefront of physics and technology. This was the most important recommendation of the previous Strategy update in 2013. We now have to pave the way for the future. A diverse scientific programme will be crucial in order to answer the outstanding questions," said CERN Director-General Fabiola Gianotti.

To inform this vital process, the particle-physics community across universities, laboratories and national institutes have been invited to submit written input by 18 December 2018. This exercise will be followed by a Scientific Open Symposium to be held in Granada, Spain, from 13 to 16 May 2019, where the community is invited to debate the future orientation of European particle physics. This event will lead to the writing of a "briefing book" and to a Strategy Drafting Session that will take place in Bad Honnef, Germany, from 20 to 24 January 2020.

In Bad Honnef, the European Strategy Group, which brings together representatives of CERN's Member States and of the major European laboratories active in the field, as well as representatives of particle physics communities from outside Europe, will draft the final Strategy update, which will be submitted for adoption by the CERN Council in a special session in May 2020.
"The European Strategy process is essential to maintain Europe's unique leading position in the worldwide advancement of high-energy physics throughout the century," added the President of the CERN Council, Sijbrand de Jong.

Strategic planning in European particle physics is an open, inclusive and evidence-driven process and takes into account the worldwide particle physics landscape and developments in related fields. It was initiated by the CERN Council to coordinate activities across a large, international and fast-moving community, with the aim of maximising scientific returns. The European Strategy process was first initiated by the CERN Council in 2005, resulting in a document being adopted by the Council in 2006 and updated in 2013.

https://europeanstrategy.cern

Goals of the meeting

The aims are as follows:

1. The first aim is to prepare a document expressing the views of the European community, in a context where there is no longer an accelerator neutrino beam in Europe and the community has invested in projects in China, Japan and the USA.

2013 Strategy:

f) Rapid progress in neutrino oscillation physics, with significant European involvement, has established a strong scientific case for a long-baseline neutrino programme exploring CP violation and the mass hierarchy in the neutrino sector. *CERN should develop a neutrino programme to pave the way for a substantial European role in future long-baseline experiments. Europe should explore the possibility of major participation in leading long-baseline neutrino projects in the US and Japan.*

2. The document should take stock of the properties of the "present" LBL program (T2K+SK+NOvA, JUNO, T2K upgrade, HyperK and DUNE) in physics terms, identifying and quantifying who measures what and how well, and what is the **complementarity in quantitative and qualitative terms** and under which time scale.

3. It should also **address** the status and possible future of the **short baseline neutrino experiments in search for 'sterile neutrinos' and 'anomalies'.**

4. Address possible contributions or support of CERN to this program and discuss the best possible investment based the above physics considerations.

5. address the question of the future of the field

-- with neutrinos beams to complete the present LBL program

-- includes HP-TPC, nustorm, moment, P2O and R&D on supplementary detector methods

-- searches for 'sterile/Right-handed neutrinos' with the existing or foreseen neutrino near detectors as well as with beam dump experiments such as SHIP, and at high energy (LHC, Future Colliders)

-- neutrinoless double beta decay experiments

to this effect

1. we have invited a number of speakers to cover the issues

2. we have created preparatory panels:

‘Hot’ events:

-- 10 minute ‘hot news’ Monday 17:50
on activities of CERN’s neutrino platform
(we must walk to CERN main building before 19:00)

-- 10 minute ‘hot news’ on Tuesday 12:30
Hiroaki Aihara: 2020 start of construction of HyperK

ideally one would want many others, but this small number is requested by Freddy for good discussion

Round table discussion

Tuesday 17:15-18:45

participants:

Masayuki Nakahata
(Nigel Lockyer, remote),
Marzio Nessi,
Peter Shanahan,
Dave Wark,
Christian Weinheimer

Main purpose of this round table is to provoke questions from the participants and ask them questions in view of the final discussion, that takes place the next day.

Panel 1. Standard active oscillations

Patrick Huber (chair), pahuber@vt.edu
Serguei Petcov petcov@sissa.it
Ryan Patterson rbpatter@caltech.edu
Mark Hartz mark.hartz@ipmu.jp
Ewa Rondio Ewa.Rondio@cern.ch
Marcos Dracos marcos.dracos@in2p3.fr

The panel should take stock of the properties of the "present" LBL program (T2K+SK+NOvA, JUNO, T2K upgrade, HyperK and DUNE, atmospheric experiments). Questions to address are for instance:

- What are the relevant physics questions to be addressed by the LBL program?
- In physics terms, identifying and quantify who measures what and how well?
- What is the complementarity in quantitative and qualitative terms and under which time scale?
- What risks are involved (technological and physics-related)?
- What is needed from the theory community? What can we learn with increasing precision on the measurements?
- What would be a continuation of that program in the long term what are big issues that could require a parallel experimental program. (Complementarity and possible synergies)

First draft was delivered – many comments and questions

Panel 2. Beyond PMNS (Majorana and/or Dirac mass term, Heavy Neutral lepton searches from meV to ZeV, NSI, etc…)

Oliver Fischer and Stefan Schoenert(Chairs) *oliver.fischer@kit.edu , schoenert@ph.tum.de*
Antonin Vacheret *antonin.vacheret@imperial.ac.uk*
Jacobo Lopez Pavaon *jacobo.lopez.pavon@cern.ch*
Cristiano Galbati *galbiati@Princeton.EDU*
Maura Pavan *Maura.Pavan@mib.infn.it*

Questions to address are for instance:

- Which extensions of the SM can we probe (Majorana masses, light and heavy sterile neutrinos, neutrinos as dark matter)
- What are the relevant experiments (0nu2beta, SBL oscillations, SHiP and other fixed-target experiments, LHC and future colliders)
- What is needed from the theory community?
- What risks are involved (technological and physics-related)?
  How do you see this field develop?

First draft was delivered – a few comments and questions

Panel 3. Neutrinos and the Universe (Nv, mv, BAU, etc..)

Mikhail Shaposhnikov (chair) ***Mikhail.Shaposhnikov@epfl.ch***
Steen Hannestad ***steen@phys.au.dk***
Luis Labarga ***luis.labarga@uam.es***
Susanne Mertens ***mertens@mpp.mpg.de***
Marek Kowalski ***marek.kowalski@desy.de***

Questions to address are for instance:

- What are the relevant questions (neutrino masses, number of neutrino species, leptogenesis/baryogenesis, origin of UHE neutrinos, …)
- What are the relevant experiments, measurements, and observations now and in the future (CMB, BBN, Neutrino Telescopes, KATRIN, Project 8, …)
- What is needed from the theory community?
- What is the complementarity between different approaches?
- What risks are involved (technological and physics-related)?

First draft was delivered – minor comments and suggestions

Panel 4. Ancillary measurements (cross-sections, Nustorm, NA61, etc.)

Federico Sanchez (chair) ***Federico.SanchezNieto@unige.ch***
Boris Popov ***popovb@mail.cern.ch***
Morgan Wascko ***m.wascko@imperial.ac.uk***
Natalie Jachowicz ***Natalie.Jachowicz@UGent.be***
Francesco Terranova ***francesco.terranova@cern.ch***

Questions to address are for instance:

- What are the requirements and opportunities raised by the LBL, SBL, and other neutrino programs neutrino fluxes and neutrino cross sections, energy response function and calibration, for ($\nu e/\nu\mu/\nu\tau$)? …
- What is their relevance to other neutrino experiments (e.g. LBL)?
- What are the relevant experiments (NA61 and other hadroproduction, near detectors, NUPRISM, HPTPC, NuSTORM, …)?
- What is needed from the theory community?
- What is the complementarity between different approaches?
- What risks are involved (technological and physics-related)?

Panel report being completed

Presentation of panel reports

Wednesday 24 October afternoon + discusssion

preparation of ESPP contribution:

Albert de Roeck, Joachim Kopp and AB
+ 1 member of each panel
will edit the final 10 pages document and distribute soon after meeting.
(goal is first week of November) to all meeting participants
(who can distribute draft more widely)
for comments two weeks later.

Practical informations

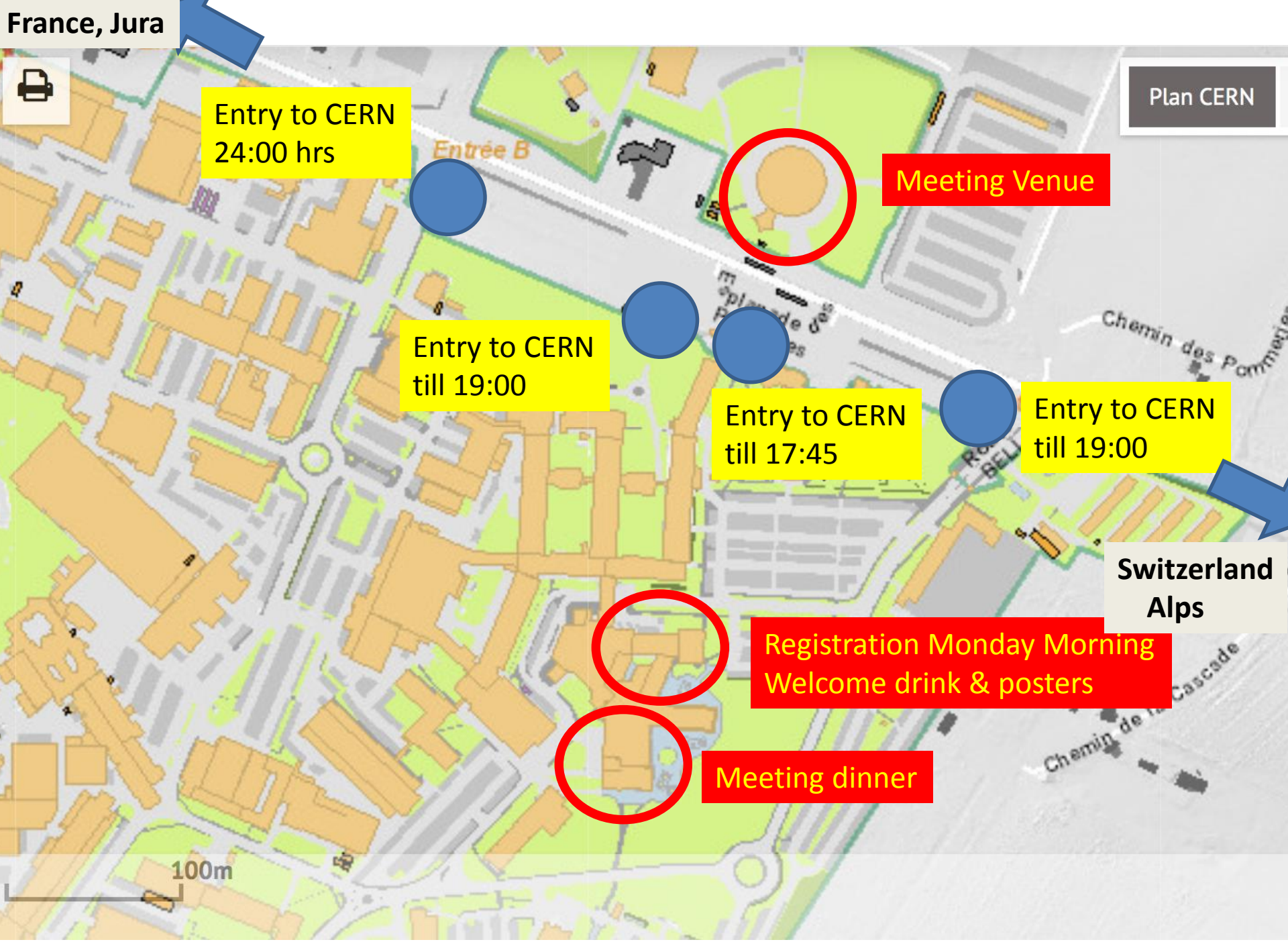
welcome drink + poster session : tonight Monday at 19:00 in CERN pas perdus
(same place as registration this morning)

Group photo **tomorrow after lunch** (make yourselves beautiful ☺)

Meeting Dinner **Tomorrow night starting at 19:00**
for those that have purchased a ticket. They need to bring the ticket with them

WARNING: Easy access gates to CERN close at 19:00
➔ everybody should move over to CERN before that time (session chairs be aware!)

otherwise only entrance B wil be open for those that do not have an electronic access card (➔ more difficult, lines etc…)


France, Jura
Entry to CERN
24:00 hrs
Entrée B
Meeting Venue
Plan CERN
Entry to CERN
till 19:00
Entry to CERN
till 17:45
Entry to CERN
till 19:00
Switzerland
Alps
Registration Monday Morning
Welcome drink & posters
Meeting dinner
Chemin des Pommeret
Chemin de la Cascade
100m