

European Strategy Update Input from IPPOG

Pedro Abreu, Darren Price, Farid Ould-Saada, Michael Kobel, Thomas Naumann,
Yiota Foka, Steve Goldfarb, Barbora Gulejova, HPB,

and Charles Timmermans, Pasquale Di Nezza, Uta Bilow on Friday 5 October WG

The European Strategy for Particle Physics Update 2013

Preamble

Since the adoption of the European Strategy for Particle Physics in 2006, the field has made impressive progress in the pursuit of its core mission, elucidating the laws of nature at the most fundamental level. A giant leap, the discovery of the Higgs boson, has been accompanied by many experimental results confirming the Standard Model beyond the previously explored energy scales. These results raise further questions on the origin of elementary particle masses and on the role of the Higgs boson in the more fundamental theory underlying the Standard Model, which may involve additional particles to be discovered around the TeV scale. Significant progress is being made towards solving long-standing puzzles such as the matter-antimatter asymmetry of the Universe and the nature of the mysterious dark matter. The observation of a new type of neutrino oscillation has opened the way for future investigations of matter-antimatter asymmetry in the neutrino sector. Intriguing prospects are emerging for experiments at the overlap with astroparticle physics and cosmology. Against the backdrop of dramatic developments in our understanding of the science landscape, Europe is updating its Strategy for Particle Physics in order to define the community's direction for the coming years and to prepare for the long-term future of the field.

General issues

a) The success of the LHC is proof of the effectiveness of the European organisational model for particle physics, founded on the sustained long-term commitment of the CERN Member States and of the national institutes, laboratories and universities closely collaborating with CERN. *Europe should preserve this model in order to keep its leading role, sustaining the success of particle physics and the benefits it brings to the wider society.*

b) The scale of the facilities required by particle physics is resulting in the globalisation of the field. *The European Strategy takes into account the worldwide particle physics landscape and developments in related fields and should continue to do so.*

High-priority large-scale scientific activities

After careful analysis of many possible large-scale scientific activities requiring significant resources, sizeable collaborations and sustained commitment, the following four activities have been identified as carrying the highest priority.

c) The discovery of the Higgs boson is the start of a major programme of work to measure this particle's properties with the highest possible precision for testing the validity of the Standard Model and to search for further new physics at the energy frontier. The LHC is in a unique position to pursue this programme. *Europe's top priority should be the exploitation of the full potential of the LHC, including the high-luminosity upgrade of the machine and detectors with a view to collecting ten times more data than in the initial design, by around 2030. This upgrade programme will also provide further exciting opportunities for the study of flavour physics and the quark-gluon plasma.*

d) To stay at the forefront of particle physics, Europe needs to be in a position to propose an ambitious post-LHC accelerator project at CERN by the time of the next Strategy update, when physics results from the LHC running at 14 TeV will be available. *CERN should undertake design*

Section Layout for the 2013 version

Preamble

General Issues

High-priority large-scale scientific activities

Other scientific activities essential to the particle physics programme

- Theory

- Experiments in Europe with unique reach

- Detector R&D

- non-accelerator experiments

- research at the boundary between particle and nuclear physics

Organisational issues

Wider impact of particle physics

- Outreach and communication

- Knowledge and technology transfer

- Education and training in key technologies

Concluding recommendations

Open call to all members of the particle physics community

The [CERN Council](#) has set itself the objective of updating the European Strategy for Particle Physics by May 2020. To achieve this, it has established a Strategy Secretariat to which it has assigned the task of organising the update process.

The Strategy update process will include two major events: an “Open Symposium” and a “Strategy Drafting Session”.

At the Open Symposium, to be held in the second half of May 2019, the community will be invited to debate the scientific input into the Strategy update, which will take the form of a “Briefing Book”. This will be prepared over the summer of 2019 by a Physics Preparatory Group (PPG) and submitted to the European Strategy Group (ESG) for consideration before and during its Strategy Drafting Session to be held in the second half of January 2020.

To prepare the Open Symposium, the Strategy Secretariat hereby calls upon the particle physics community in universities, laboratories, national institutes and institutions to submit written input following the enclosed guidelines.

The deadline for input is **18 December 2018**.

Input should be submitted via a portal that will be created on the Strategy update website, which will be available from the beginning of October 2018, once the Strategy update has been formally launched by the CERN Council. The link to this website will appear on the CERN Council’s web pages - <https://council.web.cern.ch/en> - and be widely communicated through the appropriate channels.

The Strategy Secretariat
Update of the European Strategy for Particle Physics
EPPSU-Strategy-Secretariat@cern.ch

With help from Thomas, Pedro, Darren, Yiota, Enrico, Uta, Michael, Farid, Charles, and Barbora, Steve and HPB could write a, as I call it, excellent and strategic paper in time for the open call. https://indico.cern.ch/event/767060/contributions/3367861/attachments/1850630/3037924/EPPSU_IPPOG_final.pdf

Future Challenges in Particle Physics Education and Outreach

IPPOG Collaboration

IPPOG, the International Particle Physics Outreach Group, is a collaboration comprising 27 signing member-organizations (countries, laboratories, experiments) whose goal is to maximize the impact of education and outreach efforts related to particle physics.

IPPOG members from:

Australia, Austria, Belgium, Brazil, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden, Switzerland, USA; and CERN, ALICE, ATLAS, Belle II, LHCb

Contact: Hans Peter Beck and Steve Goldfarb

E-mail: ippog-chairs@cern.ch

Submitted: 18 December 2018

Abstract

This document is meant to serve as input from the IPPOG Collaboration for the open call for the European Particle Physics Strategy Update 2020. It emphasises the strategic relevance of concerted, global outreach activities in particle physics today and beyond when envisaging new large-scale projects.

- 1 Introduction
- 2 Outreach and Communication
- 3 Large-Scale Global Science
- 4 Outreach Today in Particle Physics
- 5 IPPOG as a Strategic Pillar for Particle Physics
- 6 Future challenges
- 7 Conclusions

In total, 9 pages with a clear message.

Also forwarded the paper to: Charlotte, Ana, Ursula, Sijbrand, ...

Message written in the conclusions

The European Particle Physics Strategy Update 2013 provided important recommendations concerning the support of education, outreach, and communication for particle physics. The document explicitly mentioned both IPPOG and EPPCN as relevant groups for public engagement, stating that “Outreach and communication in particle physics should receive adequate funding and be recognised as a central component of the scientific activity”. These recommendations and follow-up to the document led IPPOG to pursue the writing of our memorandum of understanding and to evolve into a global scientific collaboration with a modest, but very-much appreciated budget.

We propose the European Particle Physics Strategy Update 2020 build upon this important foundation with the following recommendations:

- 1. The relevant roles of particle physics outreach and communication shall be considered in all discussions leading to the development of the EPPSU 2020.**
- 2. Particle physics outreach and communication shall be explicitly recognised as strategic pillars in the EPPSU 2020 document.**

Concerted and global efforts in education, outreach, and communication are indeed essential strategic components of any roadmap to be laid out defining the future of particle physics in Europe and world-wide. Securing and increasing the available funds to IPPOG further means strengthening particle physics globally, which also sends a clear signal to our learning institutions, experiments, and laboratories to hire and provide support for researchers who spend significant effort on outreach activities.

Subject: [Indico] Abstract Acceptance notification (#104)
Date: **Fri, 25 Jan 2019** 09:58:53 +0000
From: noreply-indico-team@cern.ch
Reply-To: halina.abramowicz@cern.ch
To: steven.goldfarb@cern.ch, hans.peter.beck@cern.ch
CC: eppsु.input.submission@cern.ch

Dear Hans Peter Beck,

We thank you for your valuable input "Future Challenges in Particle Physics Education and Outreach" with ID #104.

It was reviewed by the Physics Preparatory Group and will be included in the deliberations of the Strategy Update. For your information, the debates in Granada will be organised around parallel sessions convened by the members of the Physics Preparatory Group, along subjects defined by the physics submission tracks.

Please follow the link to the Granada Symposium (<https://cafpe.ugr.es/eppsु2019/>) where you will find details about the organisation of the sessions under Organisation of the Symposium and further updates as the preparations develop, expected in the next few weeks.

We are looking forward to your active participation in the Symposium. Please do not forget to register.

Kind regards,
The Strategy Secretariat

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Indico :: Call for Abstracts
<https://indico.cern.ch/event/765096/>

An accepted abstract at the EPPSU Granada meeting does not imply getting a slot in the agenda.

It only means the abstract is an element for discussion and publicly available.

Halina Abramowicz allowed for one slot on ECO in the Granada meeting. Perrine Royole-Degieux, co-chair of EPPCN, was invited by Halina.

Upon discussion with Halina, I was proposed to get in contact with Perrine.

Video meeting with Perrine & Arnaud from EPPCN and Steve & I on 5 May 2019.

- Agreed that EPPCN and IPPOG have common goals and complementary strengths
- Agreed to see draft slides and contribute to them

Received draft slides on 9 May, but Steve and I could not see a way how to fit in IPPOGs message.

Received draft slides on 9 May, but Steve and I could not see a way how to fit in IPPOGs message:

Dear Perrine

Thank you for sharing your slides with us.

Steve and I had a look at them, but couldn't find any relevant statements regarding strategic impact or educational relevance. We don't think we can help much with your talk on which we would propose that you focus on communication aspects but without covering education.

Looking forward to meeting you soon in Granada.

Have a safe trip
Hans Peter and Steve

Obviously, this triggered further discussions within EPPCN and with IPPOG
○ I consider this, in the end, as very helpful.

Perrine presented her talk in Granada

<https://indico.cern.ch/event/808335/contributions/3365154/attachments/1844755>

on behalf of EPPCN, discussing mainly Communication.

After Perrine's talk, during the Q&A, HPB addressed to the participants at the Granada meeting that communication, education and outreach are all extremely relevant, but that physicists can not outsource the task to professional communicators. Stating the role physicists have in particular in E&O.

Fabiola gave a welcome talk on what has happened since the previous EPPSU:

- Implementation of the 2013 European Strategy Update

Fabiola directly interacted with me for the preparation of the one slide she showed on ECO, which I appreciated a lot



Wider impact on society (1)

n) *Outreach and communication* in particle physics should receive adequate funding and be recognised as a central component of the scientific activity. *EPPCN and IPPOG* should both report regularly to the Council.

EPPCN (European Particle Physics Communications Network) brings together professional communication officers from CERN Member States to coordinate and strengthen outreach and communications activities, and develop common strategies in support of particle physics. Over past years, increasing efforts to use CERN's public visibility to support outreach and communications activities in the Member States, with initiatives targeting the needs of the various countries.

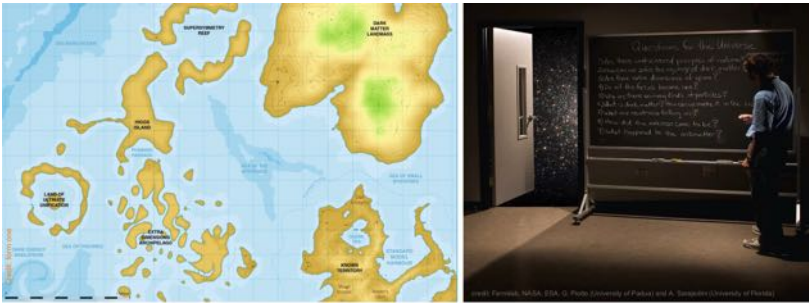
IPPOG (International Particle Physics Outreach Group) brings together physicists, educators and communication specialists active in education and outreach for particle physics. Flagship programme is International Particle Physics Masterclasses. Since last ESPP: formal collaboration established (23 countries, 5 experiments and CERN). Annual budget: 70 kCHF + in-kind support.

EPPCN and IPPOG report to Council in September each year

→ See talk by Perrine Royole-Degieux

Note: importance of recognizing people devoting fraction of their time to education and outreach
Dedicated WG established by ESG to review existing structures and level of support, as well as synergies with other fields

Same goals, complementary strengths



New narrative needed



How to facilitate better collaboration between scientists, outreachers and communicators ?²

Perrine Royole-Degieux
EPPCN co-chair and CNRS/IN2P3
15 May 2019, Granada, Spain



Let's be ambitious

We're aiming at a new scale
in fundamental physics.

In view of realising this ambitious plan, **education, communication and outreach** are key strategic pillars for our field.

Perrine Royole-Degieux
EPPCN co-chair and CNRS/IN2P3
15 May 2019, Granada, Spain

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- slides from Perrine's talk:
- same goals
- need to facilitate collaboration
- thanks for input



Thanks to EPPCN, IPPOG and interactions members and CERN communication team for their input.

Perrine Royole-Degieux
EPPCN co-chair and CNRS/IN2P3
15 May 2019, Granada, Spain

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Between now and the Bad Honnef meeting, 20-24 January, 2020:

- The Granada meeting was to collect input from the community, not to define the strategy for PP
- Various WGs will now condensate these inputs and formulate recommendations for the next step, the drafting session at Bad Honnef, early next year
- WG5 is chaired by Sijbrand de Jong and discusses ECO
- HPB is in directed contact t with Sijbrand and is invited to the next WG5 meeting at CERN on 17 June

Obvious goal

- 1. The relevant roles of particle physics outreach and communication shall be considered in all discussions leading to the development of the EPPSU 2020.**
- 2. Particle physics outreach and communication shall be explicitly recognised as strategic pillars in the EPPSU 2020 document.**

For an Open Dialogue with Society

As we entered the so-called “**post-factual world**” emerging from political ideologies in a growing number of modern democracies, it is **more important than ever for science and society to maintain an open and transparent dialogue.**

It has also become evident that the tools and methods currently used to support such a dialogue have not been as successful as we would have hoped.

Indeed, many excellent outreach activities at research centres, universities and museums often attract only those people who are already interested and appreciative of the basic and fundamental relevance of science.

Without compromising established methods, we must explore new paths to engage citizens – especially the young.

While only a fraction of young students will become scientists, and fewer still will become particle physicists, all will become ambassadors for the scientific method and evidence-based decision-making.

— HP Beck
CERN Courier (March 2017)