

# 18<sup>th</sup> IPPOG MEETING - CERN

Nov 28-30, 2019

## IPPOG Open Session

[List of participants](#)

[Link to agenda](#)

- Welcome from Ana Godinho, head of communications at CERN and the new CERN representative to IPPOG
- News from Steven Goldfarb on behalf of the IPPOG core team highlighting the new country members of IPPOG, Montenegro and Spain, which brings the IPPOG collaboration to a total of 32 members.
- Katrin Link presented [APPEC](#) – the AstroParticle Physics European Consortium. APPEC has 19 partners and 6 observers (that includes CERN, ESO, ECFA and NuPECC) and a budget of 70k€/year. Its main goal is to coordinate the efforts of the European Astroparticle Physics community in Europe bridging researchers with funding agencies and providing them visibility at the Ministry level.
  - Follow up: Question posed: Should APPEC create its own outreach network or join other existing collaborations such as IPPOG?
- Sissy Koerner presented [NuPECC](#), the Nuclear Physics European Collaboration Committee composed of 33 members from 21 countries and 5 institutions (ECT\*, FAIR, SPIRAL2, JINR, MYRRHA). NuPECC produces reports, and maintains a newsletter and a website that highlights activities of its members. It also produces material aimed at the public: [www.nupex.eu](http://www.nupex.eu).
  - Follow up: NuPECC also expressed interest to further collaborate with IPPOG
- Nicolas Arnaud presented the new IGRAV (International Gravitational-wave Outreach Group). IGRAV does not exist yet. The goal is to make it real by July 2020, during the F2F meeting in Glasgow. There has been some progress since the initial trigger at the GR/Amaldi meeting in Valencia, July 2019. The structure is taking shape with a dedicate name, acronym, mission statement, mailing lists and soon a website.
  - Follow up: How can IGRAV collaborate with IPPOG and other outreach groups?
- Uta Bilow and Ken Cecire gave an update to the international Masterclasses program. The scope and format is expanding from traditional LHC masterclass offers to include updated data from Minerva, Belle II and Particle Therapy. Masterclasses are attracting interest from other fields as well, such as Darkside, PANDA, Nuclear Astrophysics, and Quantum Computing. IDWGS and W2D2 is also growing.
  - Follow-up: the pilot masterclasses for IPPOG and CERN members hosted before the IPPOG meeting on Nov 28 at CERN had 13 attendees; shall we organize it every other year?

## Inspiring Success Stories

- Hans Peter Beck presented the [Hot Air Balloons Exhibition at Château-d'Oex](#). A narrative with local relevance describing the story of balloon flights since 1909 allowed the visitors to get exposure to particle physics and the modern understanding of the universe. While the content explained the physics, the art helped the visitors to engage with it emotionally. The museum attracted more visitors than usual, showing how the general public is attracted to particle physics and particle physics related stories.
- [ColliderScope](#) is an activity developed by Lawrence Lee, an ATLAS researcher, to reach a diverse audience through electronic music. The idea is to use oscilloscopes to make stereo sounds whose waveforms draw images. Audio waveforms encode the visual show. In the images, shape represents timbre and speed represents pitch. It makes an easy/cheap outreach display. ColliderScope is opening electronic music festivals around the world and is now being offered its own stage!
- [Quantica](#) is an art exhibit in Barcelona curated by the Arts at CERN program in collaboration with IFAE. Sebastián Grinschpun said that the main challenge to the IFAE researchers was to bridge the traditional outreach, which focuses on students' material, to the world of the arts. The artist adapted the existing decay process visualisation that IFAE researchers had created on C++ and a game of particles they had used with kids into an engaging piece that attracted a much larger audience. This experience made researchers rethink their approach to particle physics outreach and how to deliver a better experience to the audience by incorporating best practices from other disciplines.

## Countries, Labs and Experiments Highlights

- Ana Godinho gave an overview of the [Open Days at CERN](#) that received more than 75,000 visitors over two days, 14-15 September 2019, offering more than 155 activities. The goals of the event were to engage the audience to CERN sharing the value of openness, diversity and peaceful collaboration. Most of the visitors were from Europe, had higher education and were visiting CERN for the first time.
- Pedro Abreu gave a glimpse on the positive impact of the outreach activities in Portugal towards increasing the number of students joining physics and engineering physics programs at the university level. In summary, 15 years of engagement of teachers programs and other outreach activities has helped physics and engineering physics to achieve the highest marks in their universities overcoming eventually even medicine that used to hold the highest marks. The key message is that it does pay off to open the lab and go to schools to reach out for young and high-school students!
- Marcelo Munhoz gave a brief update of the outreach activities of the Brazilian community. A working group of particle physicists and science education experts was organized during the process of the Brazilian association to IPPOG in 2017. Currently, a few common projects are already taking place. However, they still need to expand the number of active people/institutions in the group as well as the number/scope of the projects. Couple of ideas on how to continue the work

are: to create a meeting point in the web for particle physicists interested in outreach and the public as well as to increase the network with school teachers.

- Follow up – Will IPPOG provide an entry point in the database in specific languages?
- Sebastian Fabianski showcase the Interactive Bubble Chamber Education Material for [GEOGebra developed by Netzwerk Teilchenwelt in Dresden](#) that has been translated to English and is available for the collaboration to use.
- Dezső Horváth presented the wire chamber construction by Hungarian teachers at CERN and by HS students in Budapest. These exercises are good for both teachers and students, allowing them to develop manual skills, providing team building and promoting cooperation among schools and with universities.
- Ken Cecire highlighted the [Notre Dame QuarkNet Centre](#) as a unique PP Learning Community. Since the early 2000's a group of about 10 high school physics and chemistry teachers have met weekly at the centre. About once every 3 months they plan particle physics activities for local science exhibitions. In the spring they focus on planning our summer research efforts.
- Marina Trimarchi presented initiatives of [Centro Fermi](#). [The Cosmic Box contest](#) consists of a school competition where the best research project wins a cosmic box. There were 3 winners with projects taking real data. [The PolarquEEEst](#) has 3 permanent detectors installed at Dirigibile Italia CNR Arctic Station. [EEE@International Cosmic Day 2019](#) had 39 High Schools, 14 researchers, 46 Teachers, 430 Students. Additionally, there is an opportunity of collaboration with INFN OCRA Experiment and EEE data analyzed with Root.
- Vojtech Pleskot gave a report on the particle physics outreach activities at [Colours of Ostrava](#). The Big Bang Stage during the festival received more than 4,000 visitors over 28 hours of programming that included VR headsets, music, hands on show, workshops on cloud chamber and more than 16 talks.
- Ivan Melo reported about the physics pavilion in [Pohoda music festival](#) in Slovakia, which is the largest art/music festival in Slovakia – limited capacity of 30 000 visitors. More than 5 000 visitors in the Magical science tent during two mornings at Pohoda featuring simple experiments, cloud chamber workshop, the physics of beer workshop and talks.
- Steven Goldfarb talked about the [Universal Science](#) event in Adelaide, Australia, that consisted of short talks from people of a diverse science background. It had the aim to trigger interactions with the local public but to also introduce the public and our colleagues to IPPOG. There were about 250 people in the audience.

## IPPOG Session 02 – Working Groups

- Steve Goldfarb gave a report on the **Exhibits and Exhibitions WG**. The common themes of ORIGIN / CERN Traveling Exhibitions are the support it provides to local engagement and the creation of points of contact to local networks. There were many key take away points. First, global support for science needs to be fostered and supported. Secondly, Post-LHC projects will require major public support. Thirdly, IPPOG serves as a means to foster and optimize local involvement with global strategies. Efforts like ORIGIN and CERN traveling exhibit are directly in line with these points, creating and supporting local networks of artists, scientists, educators, stakeholders and promoting

science through excitement of current research, while embracing local culture. There is much room for IPPOG to become involved.

- **Follow up: How do we better collaborate between IPPOG external activities, ORIGIN activities, and the CERN traveling exhibit?**
- Dirk D E Ryckbosch reported on the **Particle Physics for lay audience WG**. The group diverged from the title but converged into ideas for the public and decision makers on the need of new accelerators. WG5 is working on the outreach recommendation that will go to the strategy group. The discussion of the strategy, illustrated differing visions for future and how to convince the public of the need for a new accelerator in 20 years time. Document by WG5 on public engagement, education and communication stresses the need for cooperation with other fields (APPEC) as well as the need to include SM in standard educational curriculum. IPPOG could/should reiterate the importance of Outreach and its inclusion in recommendations of the final Strategy document, and the support of IPPOG and Outreach in general and to reach out to other fields in Fundamental Physics.
  - **Follow up: Write an email to the secretary of the Strategy asking to iterate what we suggested last year. “ Particle physics outreach and communication shall be explicitly recognized as strategic pillars in the EPPSU 2020 document”.**
- Kenneth William Cecire and Uta Bilow reported on **Expanding Masterclasses WG**. The strategy is based on collaborations and opportunities. New Ideas are expand thematically such as astrophysics Masterclasses and geographically such as Africa. An important point is to take opportunities such as the African Conference of Physics, Marrakesh to expand in Africa. Additionally it was discussed that one event only is not enough to trigger Masterclasses in a new region but the follow up is also important.
- Yiota Foka presented the summary of the **Outreach of Applications for Society WG** that featured 5 talks: Marina Trimarchi on GPS measurements on EEE experiment, Despina Hatzifotiadou on PET and Cultural heritage (muon tomography), Manuela Cirrili on JENAS 2019 report, Yiota Foka on Particle Therapy and Accelerators for society and Djurdjina Bulatovic on Open Science Days Montenegro.

## IPPOG Session 03

- CAEN produces modular Educational Kits, mainly based on Silicon Photomultipliers (SiPM) state-of-the-art sensor of light. The Educational Kits, have a dedicated Control Software, are modern and flexible platforms for teaching the fundamentals of Statistics, Particles Detection and Nuclear Imaging. Moreover, CAEN developed a series of experiments with different difficulty level, from basic experiments to more complex applications. The idea is to target the experiment depending on the student educational level. With this approach, the experiments proposed can be performed at high school level (grade 11, 12) science classes up to undergraduate physics laboratory and PhD courses.
  - **Follow up: CAEN proposal to collaborate with IPPOG**
- In the beginning of 2019 the Faculty of Physics of the Warsaw University of Technology (WUT) received an educational grant of ~1.5 million EUR from the European Union funds within the Horizon 2020 scheme. The ALICE Masterclass

is included as one of the tasks of this big project. The Masterclass part foresees funding of a computer scientist (programmer) for ~2 years as well financial support for organization of the Masterclass sessions in Warsaw (including invitations of external scientists) in 2020. The ALICE Masterclass main measurements are Strangeness enhancement, Jet quenching nuclear  $\rightarrow$  nuclear modification factor (RAA) and  $J/\psi$  suppression and it was presented by Lukasz Graczykowski.

- Charlotte Warakaulle, the director for International Relations at CERN presented the group trends and priorities. In sum, there is continued interest in the field, particular in Asia and to a lesser extent in Latin America. There are also regional opportunities for intra-regional support. The Global Goals agenda provides an important framework within which to place capacity building for the field. For the future, the focus of CERN will be on the implementation of the European Strategy for Particle Physics Update, emphasizing international engagement and outreach that will support a next big project. Additionally, we will focus on capacity building for the field supporting the momentum that has already been built in different regions, with especial effort to nurture communities in Africa. When asked how IPPOG contributes to CERN's mission, Charlotte answered "...as presented, CERN is collaborating to the SDG's in 5 initiatives and IPPOG is part of the engagement towards International Cooperation. Additionally the two entities can provide valuable contributions to the update to the European Strategy, a key development for the field".
- Emma Sanders the head of the Exhibits at CERN presented the Science Gateway project. The Science Gateway will be a new hub for visitors, designed by the world-renowned architect Renzo Piano. The building will host a large auditorium, labs for children, 1500m<sup>2</sup> of new exhibitions and a restaurant. The project will be situated next to the Globe and is due to open at the end of 2022. Additionally, CERN will continue to maintain a menu for itinerary traveling exhibits and will be more active in organizing panels around the world.

## **Panel Discussion – Expanding Borders**

Every meeting, IPPOG hosts a panel discussion with input from external participants to expand our knowledge on a particular topic. This edition's theme was "Expanding Borders". The panel was composed of Emmanuel Tsesmelis (CERN), Gabriele-Elisabeth Körner (NuPECC), Nicolas Arnaud (LAL (CNRS/IN2P3 and Université Paris-Sud)), Teresa Montaruli (APPEC) and moderated by the IPPOG chairs. The panelists addressed the following questions:

- What are the common interests of these three groups? "Public engagement with policy makers and decision makers need to be linked to what we are doing and aiming for long-term support, which it is common, dominant topic across the groups" said Sissy from NuPECC.
- What are the benefits of us joining forces? "The diversity in content such as in masterclasses that cover both particle physics and astrophysics would give a much broader understanding to the public" said Teresa from APPEC. "Bringing forces from both sides help to give a complete picture that is beneficial to the public and to decision makers and funders" agreed Emmanuelle from CERN. "The message is much more powerful. There is benefit to get the exposure of one community to another", complemented Sissy from NuPECC.

- How do we do that? “We should avoid creating a structure that is too big. It is important to also maintain each group’s identity, but we should collaborate in activities and information gathering and dissemination”, said Nicolas from iGRAV. Ideas on common activities that the different groups could engage included masterclasses, arts and science and the database website to collect different initiatives around the world on materials and exhibits.
- What should be our priorities in targeting new countries for expansion? “IPPOG could consider enlarging its community among some of the country members of CERN that are not yet members of IPPOG. Also, there are other countries that are not members yet of CERN but have an active community, especially in Asia” said Emmanuel from CERN. “It would be great to have support from CERN in strengthening the links between IPPOG and new members and candidate members” added Steven from IPPOG. “IPPOG might also be a good door for non-CERN members to get used to the community and strength the internal links,” added Hans Peter from IPPOG. “IPPOG can also focus on providing capacity building within small countries in which this is a key point of interest”, added Emmanuel from CERN.

## IPPOG Session 04

### Collaboration Matters

- Pedro Abreu gave a report on the activities of the IPPOG Speakers Committee. The committee is composed by the same members of 7 years ago and that needs to change soon! We need a process to get people into the committee, to get people to propose content and even produce notes that eventually could end up being a paper for publication. There was also an idea to create support material to be present at conferences even if we are not giving a talk.
  - Follow up: new members for the committee
  - Follow up: new process to get member to participate in the conferences
  - Follow up: suggestion for potential paper material
- There were three offers of members for location for the IPPOG spring meeting 2020. The first option was the Hungary Academy of Science in Budapest during the CERN strategy meeting that will be host in the same building. The second option was Ljubjana in Slovenia that is about to become a CERN member. The third option was for the meeting to be host in Montenegro by its ministry of science.
- Charles Timmermans presented the process to search for candidates for the IPPOG chair position on behalf of the search committee composed of Catia Peduto, Farid Ould-Saada, Jonas Strandberg and Charles Timmermans. Charles explained that the committee discussed each and every nomination at length. Then it created a short list based upon the profile. After checking the availability of potential candidates, it informed CB of the short list of 4 candidates: Despina Hatzifotiadou (Universita e INFN, Bologna (IT)), Nicolas Arnaud (LAL (CNRS/IN2P3 and Université Paris-Sud)), Pedro Abreu (LIP Laboratorio de Instrumentacao e Fisica Experimental de Partículas and Instituto Superior

Técnico, Lisboa) and Steven Goldfarb (University of Melbourne (AU)). Finally Charles explained that the CB would have to first vote for one or two chairs then vote for all names or a combination of names. Charles finalized saying that a 2/3rds majority would be required for election.