



REPORT

15th IPPOG meeting

Pisa and Cascina, 19-21 April 2018

(Prepared by Claudia Marcelloni and Barbora Bruant Gulejova)

PARTICIPANTS

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MEMBERS REPRESENTATIVES:

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ASSOCIATES:

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GUESTS:

Victoria Tokareva (Joint Institute for Nuclear Research, Russia)

WEBPAGE

<https://indico.cern.ch/event/703335/>

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1 GENERAL IPPOG ISSUES

1.1 WORD from LOCAL HOSTS

Director of Physics department of University of Pisa, Professor Ettore Vicari welcomed IPPOG at the University of Pisa outlining the importance of the collaboration work in spreading the message of particle physics and especially attaining the next generation of scientists.

1.2 IPPOG NEWS

Presented by Steven Goldfarb

IPPOG coordination team:

- Barbora Bruant Gulejova is now the Development Lead. Claudia Marcelloni joined the IPPOG Coordination Team as the Community Lead, supporting chairs Hans Peter Beck and Steven Goldfarb.

IPPOG membership

- **IPPOG new Members:** ATLAS Experiment, Belle II, Czech Republic, Slovenia and Brazil (who signed the MoU at CERN one week following this meeting). Austria, Greece and ALICE collaboration are imminent to become members. Georgia has also shown an expression of interest.
- **IPPOG Candidate Members:** IPPOG members of the pre-collaboration phase that have not yet signed the MoU became automatically Candidate Members until **18 December 2018**. These are: Bulgaria, Denmark, Ireland, Israel, Spain, South Africa, UK, CMS, LHCb, TOTEM, DESY (as representing itself as a lab). After this date, Candidate Members that have not become Members will lose the right to vote and must go through the accession procedure to MoU to become Member again.

IPPOG Representatives

- New IPPOG representatives are: Zdenek Dolezal (Belle II), Sascha Mehlhase (ATLAS), Katharina Mueller (Switzerland), Marcello Munhoz (Brazil), Spencer Pasero (USA), Vojtech Pleskot (Czech Republic). The IPPOG representatives who, have being an instrumental part of the collaboration and are now retiring: Jiri Rames (Czech Republic) and Marge Bardeen (USA); on behalf of the IPPOG collaboration we thank both for the excellent collaboration through the years.

Particles 4U Competition

- The project received 89 applications from 15 countries. Teams from Greece and Bulgaria were the winners for the primary school prize and from Slovakia and Austria for the secondary school prize. Each classroom received a visit from particle physics scientists and a certificate as a prize. The secondary schools each received a cosmic pi detector, as well.

Discussions and TODO:

- There was discussion concerning new ippog e-groups. The group ippog-friends@cern.ch is for informing teachers and other “friends” about upcoming IPPOG activities, while the group ippog-forum@cern.ch is for members, candidates and associates. Use this list for lively discussions on all aspects related to IPPOG matters.

1.3 IPPOG PARTICIPATION to EPPSU

The European Strategy for Particle Physics (ESPP) 2013 document was a trigger for the IPPOG group to become an official collaboration on its own with independent funding. Working Group 5 of the ESPP prepared a document on Communication and Outreach in Particle Physics, where IPPOG, EPPCN and the importance of funding of education, outreach and communication in PP were stated (see paragraphs p and n in the [Strategy Report](#), which were crucial for IPPOG Collaboration to become to its existence).

A new update of the European Strategy for Particle Physics is being prepared now and the official call for input has been made to the PP community with deadline of 18th of December 2018. The guidelines for providing input are available in the [link here](#). All relevant documents are uploaded at the 4th IPPOG CB meeting website [here](#).

Discussions at IPPOG CB resulted in 2 proposals:

PROPOSAL 1: It is important that IPPOG as a body writes input (half page) which would be sent by IPPOG Chair(s) to the ESPP 2018 Secretary. For this reason the IPPOG CB decided to create a working group to provide guidance to the IPPOG Chairs on what key points need to be carried to the European Strategy Update Secretary. Volunteer members of the working group are Darren Price, Farid Ould-Saada, Hans Peter Beck, Michael Kobel, Pedro Abreu, Steve Goldfarb, Thomas Naumann and Yiota Foka. **VOTE:** CB endorsed unanimously the IPPOG working group for the Open Call for European Strategy Update. The group will be convened by the IPPOG Chairs early for discussion and once the draft is available (best for next IPPOG meeting), all IPPOG Forum members will be able to give comments / feedback.

PROPOSAL 2: Propose to ESPPU Secretary, that IPPOG is such important body that there should be a representative of IPPOG involved in drafting the part of EPPSU document about communication, education and outreach.

1.4 SIGNATURE CEREMONIES

Two countries, signed the MoU during IPPOG meeting in Italy and a third one a few days later at CERN.

- Slovenia became an official member of IPPOG on 19 April 2018. The MOU was signed by the head of Particle Physics Department at Jožef Stefan Institute representing Slovenia participation at IPPOG. Andrej Gorišek, country representative for Slovenia in IPPOG, brought the document to the meeting in Italy where the IPPOG chairs signed it, confirming Slovenian membership to the collaboration. [PHOTOS](#).
- Czech Republic became an official IPPOG member on April 21 2018. The MoU between Czech Republic and IPPOG was previously signed by the director of the Institute of Physics of the Academy of Sciences of the Czech Republic. IPPOG chairs confirmed the agreement by signing the MoU during the meeting in Pisa in presence of IPPOG representative for Czech Republic, Vojtech Pleskot from the Faculty of Mathematics and Physics, Charles University in Prague. Vojtech Pleskot replaces Jiri Rames who did an excellent job during his long tenure as a member of EPOG and IPPOG. [PHOTOS](#).
- Brazil became an official IPPOG member on April 26 2018. Ignacio de Bediaga Hickman from the Rede Nacional de Física de Altas Energias (RENAFAE) signed the IPPOG MoU on behalf of the Brazilian Particle physics outreach community. Marcelo Munhoz from University of Sao Paulo will be the official representative of Brazil in IPPOG. [PHOTOS](#). Brazil signing the IPPOG Mou was featured in an article at the CERN Courier <https://cerncourier.com/faces-and-places-138/>.

2 IPPOG STORIES and IMPACT

2.1 INSIDE VIEW

2.1.1 Committee for Cooperation in the Czech Republic

Presented by Vojtech Pleskot

- IPPOG membership has helped to formalise a local outreach group IPPOG Czech Republic including 6 institutes.
- Main activities consists of Masterclasses, participation on the CERN High School Internship Program and at an important music festival called “Colours of Ostrava” during which a bistro was converted into a “Science Bistro” hosting discussions.
- Main challenge is to set-up an internal communication channel and strategy for the group.

2.1.2 CERN and IPPOG

Presented by Rolf Landua

IPPOG is part of CERN’s strategy to support its member states activities, which CERN does not have capacity to do. IPPOG is for CERN a link to member states with inside view and knowledge of national HEP and education landscape. IPPOGers are CERN ambassadors who bring CERN activities to member states and outside of member states.

That said, CERN is happy to support IPPOG in the following format:

- Two half FTE
- Website, administrative and secretarial support
- 5k€

CERN can also provide different resources and content for exhibitions, traveling exhibitions and special exhibitions for IPPOG members such as:

- ‘Accelerating Science’ exhibit with is big 270m² (the exhibition is free for the charge but the cost of the transportation logistics is around of 25k€)
- A smaller and cheaper version of the ‘LHC interactive Tunnel’ among other materials, among others.
- Exhibition material such virtual reality pieces and animations and

Discussions and TO DO

- IPPOG members appreciate that CERN considers IPPOG the link with member states, with a special thanks for the support on the national teacher programs.
- CERN and IPPOG shall sign a MoU lasting until the end of the term of CERN’s current management.

2.2 INSPIRING SUCCESS STORIES

2.2.1 2017 French HSSIP

Presented by Nicolas Arnaud

- The High school students internship programmes (HSSIP) is a new CERN programme for high school students.
- The programme consists of a two-week internship for 24 high school students at CERN funded by the lab 5 times/year.
- France's goal was to shape a group of students representing the diversity of its society.
- Long application process, including video and letter of interest were used as a screen to select motivated students.
- 141 valid applications were received and 24 selected (with 3 outside mainland France). Students watched talks, visited sites, shadowed physicists and even met with CERN DG.

Discussion and TO DO:

- Good idea to send the applicants that didn't get selected a copy of the "Passeport pour les deux infinis" book.
- Get in touch with the national representatives in "Teachers and Students Forum of CERN", who are heavily involved in the organisation of HSSIP and other official CERN programmes.

2.2.2 Science to go - Czech Republic

Presented by Vojtech Pleskot

- In total the group has organized 30 events in libraries, reaching out to small communities with short lectures on physics and life sciences.
- There are many other ideas such as creating a large database of scientists active in outreach, but the main focus is to get more people involved.

2.2.3 QM and Masterclasses demos and CURIEosity Team visit to CERN

Presented by Yiota Foka

- QM and Masterclass Demos - Proposal to organize QM and Masterclass demo during coffee or lunch breaks at a stand at the Poster's area at the Venice event mid-May.
- CURIEosity Team composed of teenagers from Crete have been really active. Born from a Masterclass, they have visited CERN, participated on Particles4U, NASA competitions and now are organizing activities at hotels and other schools and are creating a virtual portal community.

2.3 COUNTRIES, EXPERIMENTS AND LABS HIGHLIGHTS

2.3.1 Update on the education and outreach program at Fermilab

Presented by Spencer Pasero

- Updating the vision for Fermilab outreach through an in-depth inventory, independent committee and a new strategic communication plan.
- Inventory included 69 programs that reached almost 100'000 people in 2016. Discussions involved defining "public outreach" and what should or should not be included. Activities were divided into: formal and informal education programs, internship and fellowships, community relations and online communication products.

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- The inventory took about 2 months to be done and it shows the importance of Outreach to Fermilab. It also provided a great opportunity for employee and user involvement.

2.3.2 Report on IPPOG related activities in Slovenia

Presented by Andrej Gorisek

- Slovenia became a member of CERN on July 4th generating national media interest.
- Activities include 3rd year participation on Masterclasses with 60 students and presence at a Science Festival with a LIP Spark Chamber.
- Proposal to develop a Belle II based IMC Masterclass, similar to other Masterclasses where the students have to identify different particles and decays. The goal is to combine the exercise with a VR walk through the experiment experience.

2.3.3 INFN initiatives with and for Italian High Schools

Presented by Giorgio Chiarelli

- INFN has 4 Labs, 21 local units embedded/strongly linked to Physics Departments.
- Communication Office is the link between students, media and researchers. Its main activities include exhibitions, special events and Masterclasses among others.
- Creation of central group to coordinate 'Third Mission' activities with large national/multiregional impact such as RadioLab and Art&Science across Italy.

Discussion

- INFN wants to bring many students close to science, independent if they will become a scientist or not.
- Need to improve measurement of impact and also selection of national students for the programs.

2.3.4 Centro Fermi and EEE

Presented by Rosario Nania

- A Research Institute funded in 2001 by the Italian Ministero per Istruzione Università e Ricerca dedicated to frontier research in physics and its wide applications for the benefit of humankind (Education and Outreach), in the spirit of E. Fermi legacy.
- Three main focus points: Grants for Junior/Senior researchers, Interdisciplinary Research Projects and Dissemination of Scientific Culture and Historic Memory.
- The Extreme Energy Events (EEE) is a real experiment on Cosmic Rays, with the largest area coverage, with a direct participation of students and teachers in all aspects of the experiment, reaching around 2000 students/year. More than 10'000 students have participated to date.
- The EEE project is international, has a specific and independent role in Italy that complements the one of INFN inside IPPOG and it will benefit from the collaboration's international connection.

Discussion and TO DO

- Need to apply IPPOG's policy regarding institutions and labs becoming member.

2.3.5 Updates on the Shower of knowledge project – JINR/Russia

Presented by Victoria Tokareva

- Joint Institute for Nuclear Research (JINR), Russia has 11 stations. The main challenge is in the coordination of internal stakeholders active in outreach activities such as the science museum, the library, the lab, the PR department, etc.
- Main activities are science festivals (Nauka O+, JINR Physics days), scientific camps, public lectures and videoconferences for schools.

3 WORKING GROUPS

3.1 BRINGING MC to NEW COUNTRIES

Presented by Ken Cecire and Uta Bilow

- The main approach to bring Masterclasses to new countries and institutions has been focused on going where masterclasses have not gone before.
- What has been done so far: Follow-up with teachers with whom we have worked; Reach groups and countries under-represented in HEP; Use existing connections; Follow opportunities; Target countries that have growth potential, e.g. India
- What the program will seek to implement: Connection with someone who can carry Masterclasses forward with sufficient infrastructure; Foster international collaboration and use it to attract students to STEM; more active dissemination in professional meetings, e.g. EPS, APS, etc; work with colleagues in and out of HEP.

TO DO

- Promote Belle II Masterclass.
- Organically add ATLAS, other measurements.
- Moderators at KEK; English, Japanese.

3.2 EXPLAINING PP HOT TOPICS to LAY AUDIENCE

Presented by Thomas Naumann

- Do not reinvent the wheel and evaluate what is already available in the CERN and ATLAS backgrounders.
- What if only one Higgs? The message should be “There is no experiment/facility, proposed or conceivable, in the lab or in space, accelerator or non-accelerator driven, which can guarantee discoveries beyond the SM”.
- European Strategy: Why is it important to precisely measure the SM?; Gravitational waves (EGO) has opened a new Astronomy; After 500 years of vector force fields, Higgs opens new Scalar Era (gravity: tensor); Explanation need for: Higgs ee factory and HE pp machine.

TO DO

- IPPOG web site: link to related background information
- IPPOG advisory group: HP, Dirk, Thomas
- Ivan Melo Higgs potential and fundamental physics
- HP offers cooperation to European Strategy Group depending on reply define small Strategy task force

3.3 EXHIBITS

Presented by Catia Peduto and Emma Sanders

- The mix of diverse backgrounds and enthusiasm for exhibits will surely lead to some creative new ideas. Now we need to set the framework that allows it to happen.

TO DO

- Develop a platform for sharing exhibits such as at the IPPOG resources database.
- Facilitate access to raw material for particle physics exhibitions for both the IPPOG community and beyond, including museums and science centres.
- Write mission statement for the future work of this group, the criteria for inclusion in the database, who is target, how to define best practice, the kind of tags that are needed.
- Up for discussion: Evolve to a steering group; Enlarge group to include others working on exhibits? Theme of future meetings and feedback on database content.

4 PANEL DISCUSSIONS

4.1 BROADENING PHYSICS SCOPE of MC

Presented by Ken Cecire and Uta Bilow

- Great ideas emerged to expand the content.
- The challenge is to understand what is possible and how to explore the concept further.
- LIGO and VIRGO are excited to get together and build something new.
- Other ideas were Heavy Ion Masterclasses and Masterclasses using data from Belle II.
- SESAME – maybe interesting to have a Masterclasses focus on the operations instead of analyses.
- PATHWAYS – create a network more than a new Masterclass.

TO DO

Investigate:

- Heavy Ion Masterclasses
- Masterclasses using data from Belle II
- Masterclasses focusing on the operations instead of analyses from SESAME
- Network with PATHWAYS

4.2 COMMUNICATION PLATFORMS and STRATEGY

Presented by Steven Goldfarb

- Webpage upgrade: Will be built on next CERN theme (or in accordance with that theme). Barbora and Steve working on specifications for call to tender and Barbora will be chief developer
- Leadership: We are seeking a Social Media person
- Communication Strategy:
 - Primary goals are to highlight IPPOG Activities and promote best practices in world wide particle physics outreach
 - Identified target audiences as teachers (and inquisitive students) - primarily high school, but not only and also consider Particle Physics outreachers
 - Types of content should include descriptions of IPPOG activities, educational content and links to other curated resources
 - Confirmed need for visual identity
 - Concerning Networks: Internal networks need to be developed locally and run by reps and a listing like ippog-friends will be publicly joinable, but one-way for announcements
 - Translations are most expected to be done through in-kind contributions. Translation from original language to English is a priority, if there is a resource useful for everyone.

TO DO

- Barbora and Steve working on specifications for call to tender
- Develop visual identity for site
- Find a Social Media person

4.3 DIVERSITY in SCIENCE and TECHNOLOGY

Presented by Alberto Ruiz Jimeno

Reasons for lack of diversity in science and technology, which are higher at university and academic levels, are many, among them:

- Cultural traditions and stereotypes is a source of problem. The [ASPIRES Project from UK](#) investigates this issue.
- Few studies suggest an important impact on the familiar conciliation. A good education from the start, promote STEM for all, campaigns of sensitisation to the society, programs favouring the familiar conciliation few things that could help. Communicators, scientists, educators can provide specific programmes oriented to primary school, but also to the general public.

IPPOG might want to consider:

- Developing a program specifically for primary schools, taking into account the role models projected, as this is such a pivotal point for stereotypes to set in.
- It's not good to do events dedicated to promote the gender equality in which only women participate.
- Promoting the gender and diversity perspective should be done on a continual basis, not just a day dedicated each year.

Discussion and TO DO

- We should have a working group on the topic
- We should consider writing beyond minutes and into publications

5 ACTIVITIES REPORTS

5.1 REPORT MASTERCLASSES

Presented by Uta Bilow and Ken Cecire

- New participants: Sofia, Vilnius, Doha, Mostar, Lima and Trujillo, Tehran, Indore and Montevideo
- Statistics: 52 countries, 225 Institutes, 37 master classes, 14k students through 82 videoconferences
- [Int. Day of Women and Girls in Science](#) Feb 12: 250 students participate in 2 videoconferences
- [World Wide Data Day](#): 24 hours shift of world conferences, 445 students participated on 14 Nov 2017

Discussion and TO DO:

- Length of video conference at the end of the day: there was no agreement if should be shorter or longer, but importance was given on the moderator.
- How to recruit more conveners: need to draft a clear message on what the engagement to become a convener entails, ask for support from CERN and Experiments to promote a call for moderators and recognize the work of those who participate through a more formal thank you note or event.
- New content: potential participation of Belle II into Masterclasses should be looked into
- Survey: suggestion was made to develop a follow up survey with teachers on the content, format and extra support they might need to continue the work after the Masterclass event.

5.2 REPORT COSMIC RAY STEERING GROUP COMMITTEE

Presented by Marge Bardeen and Carolin Schwedt

- Committee participants are: Krzysztof Wozniak(CREDO); Carolin Schwerdt (ICD & Teilchenwelt); Marcello Abbrescia & Rosario Nania (EEE); Sabine Hemmer (INFN Padua); Charles Timmermans (HISPARC); Mark Adams & Marge Bardeen (QuarkNet & IMW)
- Full report on the discussions and presentations of all projects:
<https://indico.cern.ch/event/703335/sessions/266899/note/>

Discussions and TO DO:

- The group plan to have two videoconference/year to prepare for annual events and follow up with the projects between the IPPOG meetings.

6 IPPOG and GRAVITATIONAL WAVES (EGO/VIRGO/LIGO)

6.1.1 Welcome from the EGO director and Virgo Spokesperson

Presented by EGO director Stavros Katsanevas

- These are exciting times! Our message is that our research links the universe, society and the Earth that we live in. There is societal impact with many things we are doing here.
- We have a lot of data to analyse but we also need to manage the public interest in the topic.
- Outreach activities include citizen science and senior citizen science initiatives, MOOCs, International hang-outs and visits.

Presented by Virgo spokesperson Jo van den Brand

- EGO is the home of Virgo in the same way that Caltech is the home of our partner LIGO in USA. It is great to work together and be collaborators because it creates a better science.
- Great time last year with a bigger outreach activity that involved LIGO, MIT, Caltech and also NASA, ESA and others. We produced great material but it was an intense experience.
- Expecting 'big outreach global' events like this in the future, especially since an entire community of scientists, astronomers, cosmologist, particle physicist, got interested in us.
- Scientifically it is a new field. We are writing now the book of the cosmos.
- There is a need to create observatories to look at the whole universe. The [Einstein Telescope](#) project aims to the realization of a crucial research infrastructure in Europe: [a third generation Gravitational Wave observatory](#).

6.1.2 Outreach at Virgo

Presented by Severine Perus

- Virgo's Outreach group main goal is to raise public awareness about gravitational waves through school visits and events, exhibits, seminars and public talks.
- There is an interest to explore arts & science with music and dance events.
- The demand of visits has increased from 1000/year 2016 to 4000/year in 2017. We are trying to develop new tools such as virtual visits to the site to accommodate the demand.
- The group is facing challenges with budget allocation for such activities and also to get more people volunteers involved.

6.1.3 Outreach at LIGO

Presented by Amber Henry (LIGO lab @Hanford), Cathy Holt (LIGO lab@Livingston), Martin Hendry (LIGO)

- LIGO is a lab (Caltech, MIT, Hanford and Livingston Observatory) and a collaboration made of 1200 scientists from 108 institutions.
- LIGO lab outreach activities are divided into:
 - Offsite (participation on classroom visits, virtual visits, science nights, talks, conferences) and
 - Onsite activities (field trips, tours, open days, special events and teacher professional development).
- LIGO Scientific Collaboration (LSC) activities are divided into:
 - "LIGO Formal education" (teacher professional development, partnerships with classroom networks and Masterclasses),

- “LIGO Informal education” (web, social media, citizen science projects, exhibits, public lectures, etc)
- Higher education (on-line teacher, talks and lectures and summer research programs) and Professional outreach (other scientists, funding agencies and government).
- Examples of projects: Website with content with a layman summary, Social Media with the Nobels, Citizen Science (Einstein@home: distributing computing and analyzing data; GravitySpy.org: looking for glitches into the detector; LIGO Open Science Center – 100 users/day to become a MOOC), LIGO [Exhibits](#) and the Spiral TOAST!!!

6.1.4 Open Discussion on potential collaboration

EGO Director [Stavros Katsanevas](#) reiterate in collaborating and the following ideas emerged:

- Develop and organize hang-outs together; for example a MOOC on Gravity done by a Nobel prize winner was followed by 1000/people. Another popular initiative was the project [‘Sense & Sensibility and Science’](#)
- Discussion on societal impact took place. It was stated that one can’t promise societal impact because we can’t guarantee it and we need to be careful. Also what has impact today was originated from ideas and discoveries done long ago; it is important to clarify that it takes time for discovery to impact society.
- Discussion on the recognition of those doing outreach. There has been a shift on thinking and many younger researchers assume they need to participate in the communication of what they do, but it is still a tough idea to sell.
- Suggestion to develop more Masterclass content with cosmic rays. Technical people will need to develop the framework using gravitation waves like the event display will be needed. IPPOG and LIGO agree on developing a small group to investigate the idea of developing a Masterclasses on gravitational waves together; Martin Hendry offered to facilitate.
- A discussion if IPPOG should enlarge its scope and send a direct invitation to VIRGO and LIGO to become an IPPOG member took place. It was added that these two groups are already collaborating informally through virtual reality and other activities and a more formal collaboration would be useful.

TO DO

- Martin Hendry will facilitate a small group to investigate the idea of developing Masterclasses on gravitational waves together
- EGO director and IPPOG chairs will further investigate the possibility of a formal collaboration.