A word from the coordination team

Dear IPPOGers!

We are very happy to share with you this first issue of the IPPOG newsletter, which will be published twice a year between IPPOG meetings. The aim of this new tradition is to keep the IPPOG spirit alive between meetings, to keep you informed about the most important happenings in our community, and thus to facilitate the even closer collaboration of our team. It will also allow us to show interested non-members what IPPOG is and does.

After a very interactive and productive spring meeting in Paris (https://indico.cern.ch/event/354555/), IPPOG is now ready to take several new actions and to continue to fulfil its mission at full strength and with new resources! The future of IPPOG looks very promising and new initiatives are in the pipeline!

We hope you enjoy this first issue of the IPPOG newsletter and we look forward to seeing you at the next meeting at CERN this autumn.

Hans Peter, Marge and Barbora

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‘Universe of Particles: Explore, Discover, Understand, be Inspired!’

An international network of scientists, science educators and explainers engaged in informal science education and outreach for particle physics across the globe.

**Vision for the future:**

Promote understanding of and enthusiastic support for particle physics and related sciences from all audiences.

IPPOG’s current members come from CERN’s 21 Member States, plus Ireland, Romania, South Africa and the USA, prominent laboratories and institutions in Europe and the USA and the 5 main LHC experiments.

Since 2013 the co-chairs of IPPOG have been Marge Bardeen and Hans Peter Beck.

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“The discovery of the Higgs boson is not the end of the story... it is just the beginning of a new era... The scalar era.”

- IPPOG on LHC as a discovery machine

“Higgs-what now?”

IPPOG recognizes the need for LHC Run 2 communication strategy, especially in the context of the future of fundamental research in particle physics and with a view to gaining the support of a non-scientific audience.

“How to prepare/approach the discoveries beyond the Standard Model?”

“...The nature of dark matter cannot be explained without the LHC upgrade...”

- IPPOG on LHC as a discovery machine
**EPS outreach prize**

We are proud to announce, that the IPPOG delegate from ATLAS, Kate Shaw, has been awarded the EPS outreach prize in 2015 for her contribution to the International Masterclasses and for her pioneering role in bringing them to countries with no strong tradition in particle physics. Kate received the award during the EPS conference in Vienna in July this year.

Congratulations, Kate!

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**IPPOG on the way to official collaboration**

A vision to become a proactive leader in the field of outreach for particle physics and related fields worldwide

Following the successful transition from EPPOG to IPPOG and the recommendation of the European Strategy for Particle Physics that “outreach and communication in particle physics should receive adequate funding and be recognised as a central component of the scientific activity”, the next logical step for IPPOG is its transformation into a collaboration in its own right. The IPPOG coordination team is working on an MoU document to this end. During the 2014 RECFA meeting at CERN, the IPPOG co-chairman, Hans Peter Beck, stressed the importance of a sustainable structure for IPPOG, adequate funding and professionalism. His message was well received by the CERN DG and by RECFA.

Memorandum of Understanding in preparation

We are distributing a questionnaire to the IPPOG delegates and we look forward to your replies, which will be of considerable help to us in defining the appropriate contents of the MoU.

Several advantages…

- IPPOG collaboration account - securing funding for IPPOG infrastructure and activities
- Formalising, developing and strengthening the existing network
- Encouraging professionalism, better visibility and recognition
- Official relations with other bodies

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**IPPOG education and outreach session at EPS-HEP**

The EPS - HEP 2015 conference in Vienna (22. – 29.7.2015) included, for the first time ever, a dedicated Education and Outreach (E&O) parallel session, chaired by Uta Bilow and Dave Barney. Building on the experience from similar sessions at ICHEP 2012 and 2014, Uta and Dave focused on the conference attendees with the presentations that encouraged them to develop their own E&O activities.

A deliberate attempt was made to have topic-based rather than experiment-based presentations. In addition to the “traditional” submitted talks (9 of them), a variety of other activities was organised, including an invited talk (from David Kaplan: producer and star of “Particle Fever”), a panel discussion on E&O resources (six 3-minute presentations followed by an hour of audience engagement) and a “business lunch” offering the audience the opportunity to continue the discussions with the presenters and each other.

Practice interviews with journalists were held, including one in front of the audience! The audience comprised around sixty people, including the chair of EPS-HEP, the main conference organiser and a variety of interested and engaged physicists. This was more than a majority of the parallel sessions at the conference!

A printed flyer advertising the session was distributed to the conference participants during the coffee breaks.

The final activity was a “Physics Slam”. Poster presenters were offered the opportunity to present their work in a three-minute oral presentation at a dedicated evening session. Twelve (mainly young) physicists accepted the challenge and were given help to focus on their key messages, be entertaining, etc. An 80-strong audience voted for their favourite (a talk on AMS the experiment) and, judging by the favourable comments from speakers and audience alike, the activity was appreciated as a fun experience. The speakers all commented that it had been very useful and that they would take some lessons away for their “normal” physics presentations. Again, a flyer was used to advertise this session.

“I improvements can definitely be made for future parallel sessions at major HEP conferences “, concluded the conveners, “but this first EPS session was widely hailed as a success by both the organisers and the audience and similar events will certainly take place at EPS-HEP conferences.” A full debrief will be given at the November IPPOG meeting.

https://indico.cern.ch/event/356420/session/7/?

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**“...outreach and communication in particle physics should receive adequate funding and be recognised as a central component of the scientific activity...”**

- European Strategy for Particle Physics, update 2013
New support for IPPOG coordination team

In 2015 the IPPOG family welcomed a new member, Barbora Gulejova, a fellow from CERN's Education and Outreach group. She joined the IPPOG coordination team in spring 2015 with the goal of helping IPPOG to become more professional and better known and keeping it alive also between the official meetings.

Welcome, Barbora!

Cosmic rays becoming global

We propose to establish a 'universal' portal through which successful cosmic ray studies programmes can reach out to teachers and students around the world. This common webpage on cosmic rays would contain all the resources available today, including background information, data, analysis tools, an educational framework for students' investigations, a place to post results, and more. Teachers and students will learn how to build, borrow or purchase a detector for use in the classroom and the translations are also envisaged.

Possible new IPPOG activity...

Educational/outreach programmes present an excellent opportunity for IPPOG to set up an umbrella structure. Many such programmes exist in a number of countries, so there is no need to re-invent the wheel, but this is an opportunity to take advantage of being a network to bring the existing programmes together with a view to exchanging ideas and experience. The aim would be to allow teachers /schools across the globe to participate and engage in cosmic ray educational programmes.

Partnership with APPEC in the pipeline

Following the ASPERA meeting on cosmic ray detectors for education held at CERN in 2010, several high school cosmic ray project representatives expressed an interest in working together to develop a common website and data format so that teachers and students worldwide, with or without a detector, could design and conduct studies using data from one or more projects. At the April 2015 IPPOG meeting, a panel representing five of the original cosmic ray projects (COSMIX, Extreme Energy Events, HISPARC, QuarkNet and Teilchenwelt Netzwerk) presented a brief overview of their projects and discussed renewing collaboration talks. IPPOG members made a number of suggestions and expressed an interest in participating if the initiative goes forward.

In the meantime, Hans Peter Beck and Marge Bardeen have discussed a possible partnership between IPPOG and APPEC with APPEC representatives, who expressed an interest and raised the possibility of releasing funds for the joint project. IPPOG hopes that official collaboration will prove possible, and the discussions are continuing.

Article about IPPOG in the CERN Courier

Inspired by the IPPOG meeting in Paris in April 2015, Catarina Espírito Santo wrote a nice article about IPPOG, which was published in the June edition of CERN Courier.

http://cerncourier.com/cws/download/Jun15

Well done, Catarina!

Masterclasses: Participation record achieved again!

The world-famous International Masterclasses, flagship activity of IPPOG, have set a new record for participation again in 2015. International Masterclass coordinators Uta Bilow and Ken Cecire reported an 8% increase in the number of Masterclasses with 14 new Masterclass Institutes.

The International Masterclasses took place this year over 32 days (26.2 to 2.4.2015) in 42 countries. Some 255 Masterclasses were held at 193 Masterclass Institutes. Thanks to the joint efforts of both CERN and Fermilab, all Masterclasses finished with a video conference, establishing a contact between participants in the remote institutes and scientists at CERN and Fermilab. An estimated 10500 high-school students participated (1040 at Fermilab Videoconferences). The 69 slots offered for videoconferences were fully booked, each one by up to 5 institutes, and the demand was even higher.

New developments continued briskly in 2015. The CMS collaboration successfully tested a Virtual Masterclasses with a school in yet another country. The full integration of all experiments is getting closer: ALICE, ATLAS W, ATLAS Z, CMS, and LHCb all offered Masterclasses this past year and TOTEM is on the horizon. There is great progress in adopting the Masterclass concept by astroparticle physics experiments such as Fermi Satellite, the Pierre Auger Observatory, and IceCube. The Australian state of New South Wales is proceeding along with the ARC Centre of Excellence in Particle Physics with plans to establish particle physics Masterclasses that link with the high school curriculum. Paper/PDF tutorial „Masterclasses in a box“ are being prepared for settings with IT challenges or looking for a smaller-footprint version.

The preparation of new edition is in full swing! Watch International Masterclasses circulars for the dates, coming soon!
This year has been rich in terms of IPPOG representation at conferences worldwide:

**XXXV Reunión Bienal de la Real Sociedad Española de Física**, 13-17 July 2015, Gijón, Spain

Education and Outreach Session Conveners: Dave Barney (CERN) and Uta Blow (TU Dresden, Germany)
IPPOG Representative at panel discussion: Michael Kobel (TU Dresden, Germany): “IPPOG: Experts in bringing new discoveries to the public”
Oral Presentation: Fedid Ould Saada (University Oslo, Norway): “LHC discoveries and particle physics concepts for education”

**Meeting of the Division of Particles and Fields of the American Physical Society, DPF 2015**, 4-8 August 2015, Ann Arbor, MI, USA
Marjorie Bardeen (Fermilab): “The International Particle Physics Outreach Group”

**XXVII International Symposium on Lepton-Photon interactions at high energies, LP2015**, 17-22 August 2015, Ljubljana, Slovenia
Kate Shaw (INFN Gruppo Collegato di Udine and ICTP Trieste): “Education and Outreach”

**4th International Conference on New Frontiers in Physics, ICNFP2015**, 24-30 August, Rethymno, Crete, Greece
Hans Peter Beck (Universitaet Bern, Switzerland): “Particle Physics Outreach in the LHC era: Higgs - what’s next?”