



International Particle
Physics Outreach Group

News from IPPOG, November 5th 2015

Hans Peter Beck: IPPOG Co-chair, Bern University

Marjorie Bardeen: IPPOG Co-chair, Fermilab

IPPOG – an International Network

34 members representing 26 countries + CERN, DESY, FNAL and 5 experiments

<http://ippog.web.cern.ch>

International network of (mainly) **physicists** who commit a fraction of their time in **education** and **outreach**.

These are your **local contacts** in your **country, laboratory,** and **experiment** when you need, **advice, help, support,** in your education and outreach activities.

IPPOG meets twice a year in Spring and Autumn to discuss and exchange **thoughts** and **success stories**, get **inspirational ideas**, and getting **organized world-wide**.



IPPOG Spring Meeting 2015 – Paris, Orsay LAL

IPPOG New members - Australia

- **Australia** voted in as 26th country in IPPOG.
Australia aims to introduce the IPPOG Masterclasses programme as part of their formal science education in high-schools in New South Wales.

Paul Jackson
Australian delegate to IPPOG
paul.douglas.jackson@cern.ch

<http://ippog.web.cern.ch/members/australia>



New people in IPPOG in 2015

New countries, laboratories, experiments engaged in all fields of particle physics are welcome to strengthen IPPOG further.

http://ippog.web.cern.ch/ippog_membership

Formal interest of **China** expressed to join IPPOG.

Zhi-zhong Xing, IHEP Beijing, is participating as guest/observer

Formal interest of **Slovenia** expressed to join IPPOG.

Andrej Gorisek, J. Stefan Institute Ljubljana, is participating as guest/observer

New IPPOG Associates

Eirik Gramstad is succeeding **Maiken Pedersen** as IPPOG associate member, and will continue developing ATLAS Z Path from Oslo, Norway.

Iva Maksimova Raynova ALICE science writer,

Katarina Anthony-Kittelsen ATLAS science writer

Panagiotis Charitos FCC communication

IPPOG an umbrella for making outreach global

CERN Courier June 2014

Education



High-school students from all geographical regions master real event-display programmes, software tools and analysis methods. Having been introduced to the problem, they identify electrons, muons, photons and jets by exploiting their characteristic signals in various detector elements, perform event selection and categorization, and achieve the final analysis goals. (Image credits, left to right: Caroline Hamilton/CoEPP/University of Melbourne, Jayne Ion/ION creative, Franziska Viebach/TU Dresden.)

International Masterclasses in the LHC era

Each year in spring, the International Particle Physics Outreach Group organizes the International Masterclasses, which give students the opportunity to analyse data from the LHC.

The International Masterclasses (IMCs) began in 2005 as an ini-

ATLAS "discovery" data are available for students to Higgs boson, CMS approved 13 Higgs candidates in th of interest, which are mixed with a more abundant san Z events, for "treasure hunt" activities; ALICE data a to study the relative production of strange particles, w a tell-tale signal of quark-gluon plasma production; L students how to measure the lifetime of the D meson; containing b and c quarks are studied extensively to slu mystery of antimatter in the universe.

Students quickly master real event-display progra

IPPOG

Reaching out with particle physics

How do we communicate about the LHC as a discovery machine, following the Higgs boson of 2012? How do we take the particle-physics masterclasses to new countries, age groups and settings? What makes a good educational game? How do we join in the existing national cosmic-ray-detector programmes, to take them further? These were some of the questions addressed at the 9th meeting of the International Particle Physics Outreach Group (IPPOG), which took place in Paris on 16–18 April.

common project or for an activity going on in only one country. Between the meetings, work continues and ideas are tested: do they work, for example, with real students and teachers? Other topics on the agenda of the recent meeting included discussions on how to boost the educational use of CERN open-access data, and how to bring science education and outreach to particle-physics conferences in a more effective way. There was also news on web resources, exhibits and programmes for teachers and students in the

the communication between researchers, teachers and participants goes on across a longer timescale, may become particularly important. At the other end of the spectrum are the "masterclasses in a box", which are based on printed images and foreseen for settings where no computers are available.

There were also presentations on activities such as the most recent edition of the International Cosmic Day and the International Muon Week. These are crucial when the goal is to have more modern and

International Masterclasses, the flagship activity of IPPOG trained over **10'000 students in Spring every year !**

Over 200 institutions in over 46 countries participating.

CERN Courier June 2015

Faces & Places



IPPOG's participants in Paris. (Image credit: Dominique Longieras/LAL-Orsay.)

CERN Courier
June 2014 edition
&
June 2015 edition

IPPOG is recognized internationally

Education & Outreach becoming an integral part in international HEP conferences

❑ **EPS HEP 2015 – Vienna**

- ❑ Parallel sessions on education and outreach
 - sessions chairs are IPPOG members
- ❑ Panel discussion *"IPPOG: Experts in bringing new discoveries to the public"* (Michael Kobel –IPPOG Germany)
- ❑ EPS-HEP Outreach Prize (see next slide)

❑ **Lepton Photon 2015 – Ljubljana**

- ❑ plenary talk *"education & outreach"* (Kate Shaw – IPPOG ATLAS)

❑ **ICNFP 2015 – Crete**

- ❑ Invited plenary talk on *"Particle Physics Outreach in the LHC Era: Higgs – What's next?"* (HPB)

❑ **CERN Council congratulates IPPOG in its 177th meeting in the RESTRICTED SESSION - EUROPEAN STRATEGY MATTERS**

- ❑ REPORT FROM IPPOG (Item 11 of the Agenda) The Council took note of the report by the IPPOG Co-Chair, Dr H. Beck, and congratulated the group on the continuing success and rapid growth of its Masterclass programme.

❑ ...

EPS-HEP 2015 Outreach Prize

Physics without Frontier



2015 Kate Shaw

IPPOG Delegate and ATLAS Outreach Coordinator

*For her contributions to **the International Masterclasses** and for her pioneering role in bringing them to countries with no strong tradition in particle physics.*





A word from the coordination team



IPPOG meeting, 16-18 April 2015, Paris

Dear IPPOGers!

We are very happy to share with you this first issue of the IPPOG newsletter, which will appear twice a year between IPPOG meetings. The aim of this new tradition is to keep IPPOG spirit alive also in between the meetings and maintain you informed about the most important happenings in our community, and thus to facilitate even closer collaboration of our team. This little periodical would also allow us to show to the interested external eyes 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 continue its mission with full power and new resources! The future of IPPOG is very promising and a lot of upcoming initiatives are in the pipeline!

We hope you enjoy this first number of IPPOG newsletter and looking forward to see you at the next meeting in autumn at CERN.

Hans Peter, Marge and Barbora



'Universe of Particles : Explore, Discover, Understand, be Inspired!'

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

Vision for the future:

Understanding and enthusiastic support of 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 USA, prominent laboratories and institutions in Europe and USA and 6 major experiments of LHC. Since 2013 the co-chairs of IPPOG are Marge Barbora and Hans Peter Dier.

"The discovery of 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 feels the need for LHC Run 2 communication strategy especially in the context of the future of fundamental research in particle physics and non-scientific audience acceptance.

"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

IN THIS ISSUE

★ IPPOG

worldwide

- EPS outreach prize
- Article about IPPOG in CERN Courier
- IPPOG at conferences
- IPPOG outreach session at EPS

IPPOG internas

- IPPOG on the way towards official collaboration
- New support in IPPOG coordination team
- 10th IPPOG meeting at CERN

IPPOG activities

- Masterclasses 2015 and 2016
- Cosmic rays becoming global

Professionalizing IPPOG

Newsletter twice a year in-between IPPOG meeting.

Memorandum of Understanding between IPPOG members in an much advanced state.

Well defined IPPOG structure and tasks.

IPPOG Working groups, with action items.

All these advances would be un-thinkable without the help from Barbora !

Effort, Needs & Support

Support (FTEs, use of infrastructure, in-kind, ad-hoc,...) from

CERN,

Fermilab,

EPS HEPP High-Energy and Particle Physics Division of the European Physical Society,

TU Dresden,

US National Science Foundation and the US Department of Energy.

And the many institutes contributing to the development of Masterclass exercises

Manpower

Uta Bilow (Dresden) funded by CERN 2013-2015, and new 2016-2018

before: Helmholtz Alliance: Physics at the Terascale 2008-2012

Ken Cecire (Notre Dame) funded by Quarknet for US based Masterclasses

Barbora Gulejova (CERN) IPPOG Scientific Secretary

And lots of voluntary effort

provided by IPPOG members, and local teams at universities,...

Thanks to all who are helping !!

Panel Discussions

Explaining new physics

Andrej Gorisek, Farid Ould-Saada, Jiri Rames, Jonas Strandberg, Nick Tracas, Peter Watkins, Thomas Naumann, Zhi-zhong Xing

CERN Backgrounders

Hans Peter Beck, Ivan Melo

Cosmic rays going global

Barbora Gulejova, Dirk Ryckbosch, Kenneth Cecire, Marjorie Bardeen, Nicolas Arnaud, Uta Bilow

Open data and their use

Achintya Rao, Christine Kourkoumelis, Claire Adam Bourdarios, Daniel Lellouch, David Barney, Eirik Gramstad, Pedro Abreu, Thomas McCauley

Exhibitions

Catarina Espirito Santo, Natascha Hörmann, Panagiotis Charitos

Panel Discussions

During the panel preparations

an intense exchange of ideas and experiences made can be made among those active/interested in a given topic.

At the panel presentation

An overview of activities/items/topics can be given to the IPPOG plenary, and conclusions/recommendations/suggestions coming out of the panel preparation can be disseminated.

Working Groups

❑ **Broadening of the scope of Masterclasses**

Achintya Rao, Catarina Espirito Santo, Christine Kourkoumelis, Despina Hatzifotiadou, Dirk Ryckbosch, Eirik Gramstad, Kenneth Cecire, Krzysztof Wieslaw Wozniak, Natascha Hörmann, Nicolas Arnaud, Thomas McCauley, Uta Bilow

❑ **Conferences and publications WG**

Claire Adam Bourdarios, Farid Ould-Saada, Hans Peter Beck, Ivan Melo, Pedro Abreu, Peter Watkins, Zhi-zhong Xing

❑ **How to assess impact of teachers & students programs**

Andrej Gorisek, Barbora Gulejova, Daniel Lellouch, David Barney, Jiri Rames, Jonas Strandberg, Jean Young, Marjorie Bardeen, Nick Tracas, Rasmus Mackeprang, Riitta Rinta-Filppula, Rossana Centioni

Thursday, 5 November 2015

11:00 - 13:00	Closed session Masterclasses Steering Group http://indico.cern.ch/event/459012/	
	Conveners: Uta Bilow (Technische Universitaet Dresden (DE)), Kenneth Cecire (University of Notre Dame)	
13:00 - 14:00	Lunch (Restaurant R1)	
14:00 - 15:00	Closed session Masterclasses Steering Group http://indico.cern.ch/event/459012/	
	Conveners: Uta Bilow (Technische Universitaet Dresden (DE)), Kenneth Cecire (University of Notre Dame)	
15:00 - 17:15	IPPOG open session	
15:00	IPPOG Open Session Welcome 5' Speaker: Hans Peter Beck (Universitaet Bern (CH))	
15:05	Welcome by CERN's Head of Education 15' Speaker: Rolf Landua (CERN)	
15:20	Introduction / review of IPPOG news 15' Speakers: Hans Peter Beck (Universitaet Bern (CH)), Marjorie Bardeen (Fermilab)	
15:35	Masterclasses 25' Speakers: Uta Bilow (Technische Universitaet Dresden (DE)), Kenneth Cecire (University of Notre Dame)	
16:00	An inside view from IPPOG 20' <i>Benefits from membership in IPPOG</i> <i>2 x 10 minutes</i>	
	An inside view from Slovakia 10' Speaker: Ivan Melo (University of Zilina (SK))	
	An inside view from ATLAS 10' Speaker: Claire Adam Bourdarios (Laboratoire de l'Accelérateur Lineaire (FR))	
16:20	Physics for everyone - Higgs in the sky 15' <i>Vidyo</i>	
	Speaker: Michael Kobel (Technische Universitaet Dresden (DE))	
16:35	Inspiring success stories 40' <i>Four topical reports (4x10 minutes) with inspiring examples and success stories to be shared within IPPOG.</i>	
	TEDxYouth-Zurich 10' Speaker: David Barney (CERN)	
	Cascade competition 10' Speaker: Peter Watkins (University of Birmingham (GB))	
	Quark clash 10' Speaker: Nicolas Arnaud (LAL (CNRS-IN2P3))	
	A science fair in Chanla, Crete, to inspire science for all ages 10' Speaker: Christine Kourkoumelis (National and Kapodistrian University of Athens (GR))	
17:15 - 18:45	Working groups discussions	
	1.) How to assess teachers and students programs? Can we measure impact?	
	2.) Broadening of the scope of Masterclasses (https://indico.cern.ch/event/459038/)	
	3.) Conferences and publications WG	

Friday, 6 November 2015

09:00 - 10:30	IPPOG and EPPCN joint session	
09:00	IPPOG+EPPCN joint session welcome 5' Speakers: Hans Peter Beck (Universitaet Bern (CH)), Arnaud Marsollier (CERN)	
09:05	A word of welcome from the DG designate 15' Speaker: Fabiola Gianotti (CERN)	
09:20	Beamline for schools report 15' Speaker: Markus Joos (CERN)	
09:35	Joint working groups discussions 55' <i>Topical discussion groups.</i> <i>Please sign up here: http://doodle.com/poll/5azxtuk8s4aq5y9t</i>	
	1.) High-lumi LHC	
	2.) FCC, ILC, CLIC and other future machines	
	3.) Physics at future machines	
	4.) Communication and outreach at big conferences like e.g. ICHEP 2016, August 3-10, Chicago	
	5.) How to handle apocalyptic prophecies when they are proclaimed in media	
10:30 - 11:00	Coffee break	
11:00 - 12:00	IPPOG and EPPCN joint session	
11:00	Working groups wrap-ups 1h0' <i>10 minutes per WG</i>	
12:00 - 13:30	Lunch <i>With groups to talk about topics from 'Inspiring success stories'</i>	
13:30 - 16:10	IPPOG session	
13:30	Report from the EPS-HEP 2015 Outreach Session 20' Speaker: David Barney (CERN)	
13:50	Report from the APS DPF 2015 Outreach Session 20' Speaker: Marjorie Bardeen (Fermilab)	
14:10	Teacher and student programs – how to assess impact? 20' Speaker: Jean Young (Fermilab)	
14:30	Education and Outreach Resource - Book presentation 10' <i>From Here to Big Bang</i> Speaker: Barbara Sciascia (INFN (IT))	
14:40	Panels preparation 1h30' 1.) Explaining new physics 2.) CERN backgrunders 3.) Cosmic rays going global 4.) Open data and their use (like new competition Higgs challenge...) 5.) Exhibitions	
16:10 - 16:40	Coffee break	
16:40 - 18:10	IPPOG session	
16:40	Report from working groups 1h30' <i>3 x 30 minutes</i>	
18:10 - 20:00	Portrait session <i>Photo shooting of IPPOG delegates and associates for the new IPPOG webpage</i> Location: Photo studio	

Agenda

Saturday, 7 November 2015

08:30 - 10:00	IPPOG session	Q-
08:30	Panel reports 1h30' <i>3 x 30 minutes</i>	Q-
10:00 - 10:30	Coffee break	
10:30 - 12:30	IPPOG session	Q-
10:30	Panel reports 1h0' <i>2 x 30 minutes</i>	Q-
11:30	Evolving IPPOG 30'	Q-
12:00	Closing remarks 30'	Q-

IPPOG+EPPCN joint dinner tonight



<http://www.chaletswiss.ch>



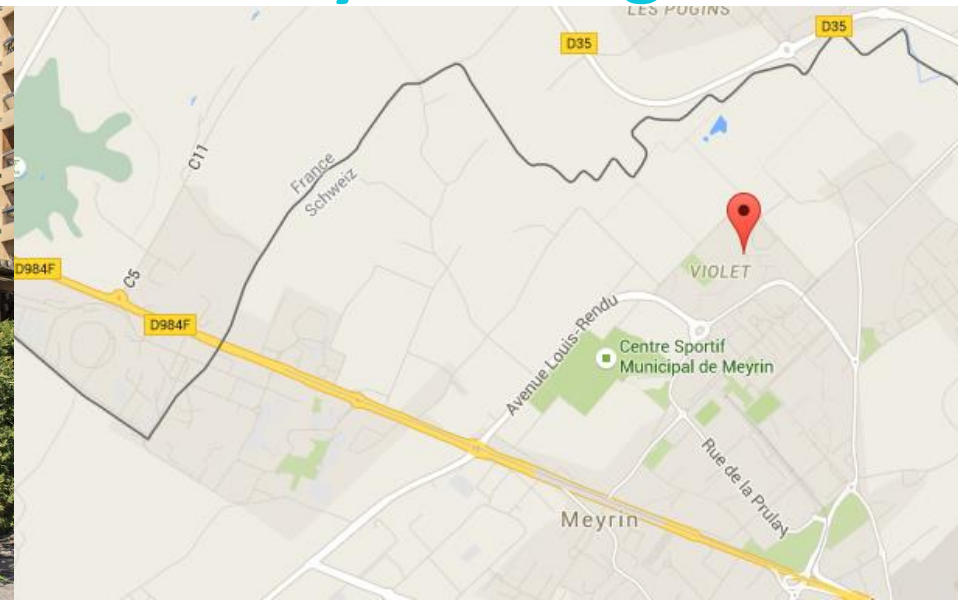
Bus at 19:00

in front of the **Hostel, bldg 39**

**You can also take tram 18 from
CERN and exit at Plainpalais
It's a 30' trip**



IPPOG informal dinner Friday evening



Pizzeria Da Ettore,
13, promenade des Champs-Frechets,
1217 Geneva,

Those who have cars and will drive:
Please inform Barbora and me, we will then
arrange further.

Transport:

Tram 18 to Meyrin Village and Bus 57 to Champs-Frechets 4' + 4'

or

Tram 18 to Jardin-Alpin Vivarium and Tram 14 to Meyrin-Gravière 7' + 5'

Check <http://www.tpg.ch> for timetables