



IPPOG report to EPPCN, 17 November 2016

Hans Peter Beck: IPPOG Chair, Bern University

IPPOG

International Particle Physics Outreach Group

an example for concerted and systematic effort for outreach

Enabling Outreach Globally

as a Collaboration in a collaborative effort

Strengthening the sustainability, reproduction and growth of outreach activities in particle physics

through the provision of reliable and regular discussion forums and information exchange for science institutions and laboratories as well as for individual scientists engaged in science outreach and informal science education world-wide

Raising standards

for outreach and informal science education initiatives by proposing and implementing strategies designed to share lessons learned and best practices for outreach in particle physics and related fields

Providing explanatory materials

for helping disseminate results from particle physics and related subjects.

– an International Network

Current members come from the 22 member states of CERN, Australia, Ireland, Slovenia, South Africa, the USA, and from DESY, CERN and five of the major experiments at the Large Hadron Collider (LHC).

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 Fall meeting
2015 – CERN
Incl. half-day session
with EPPCN

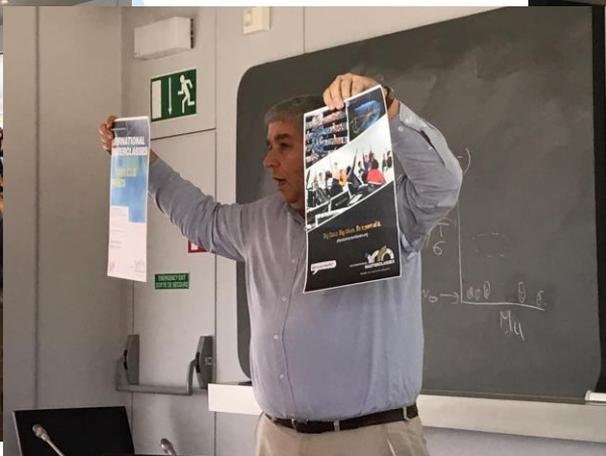
IPPOG meets twice a year in Spring and Autumn to discuss and exchange **thoughts** and **success stories**, get **inspirational ideas**, and getting **organized world-wide**.



IPPOG Spring meeting 2016 – Krakow, IFJ PAN

IPPOG Meeting Nov 10-12, 2016

Intense 2½ days



Explaining PP hot topics to lay audience

Organising E&O sessions for LHCP and ICHEP

Table top experiments

Beamline for schools 2016 and call for 2017

Masterclasses in New Countries

Broadening the physics scope of Masterclasses

Inspiring success stories

Special events and exhibitions

Masterclasses 2016

IPPOG website

MoU discussion

Country highlights

An inside view from IPPOG

Impact and usage of worldwide open data

Ethics in particle physics

Physics for everyone - The Higgs particle

Election of new chairs

IPPOG's Flagship: International Masterclasses

High school students (15 – 19) are
„scientists for one day“

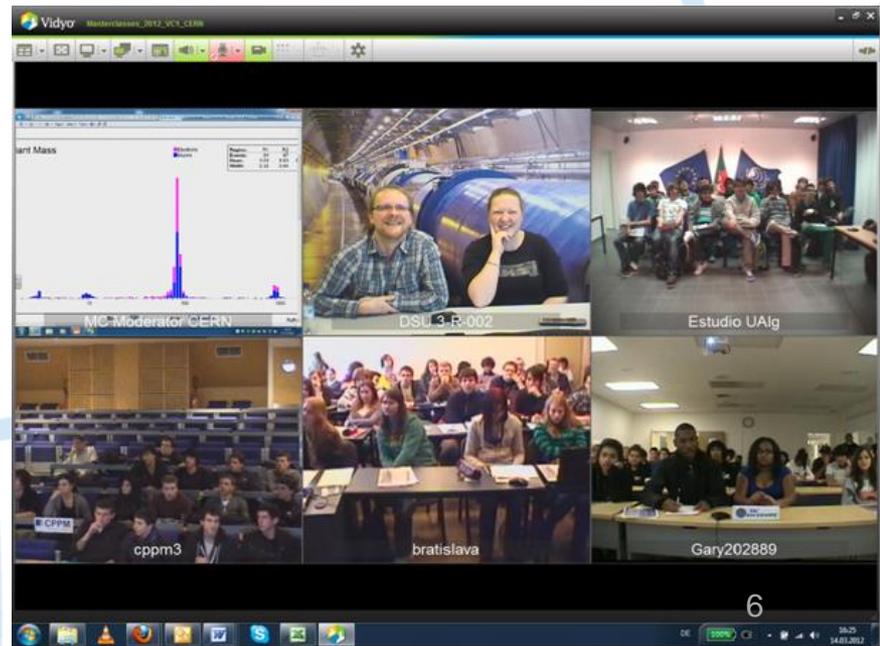
Get invited to a research institute or
university

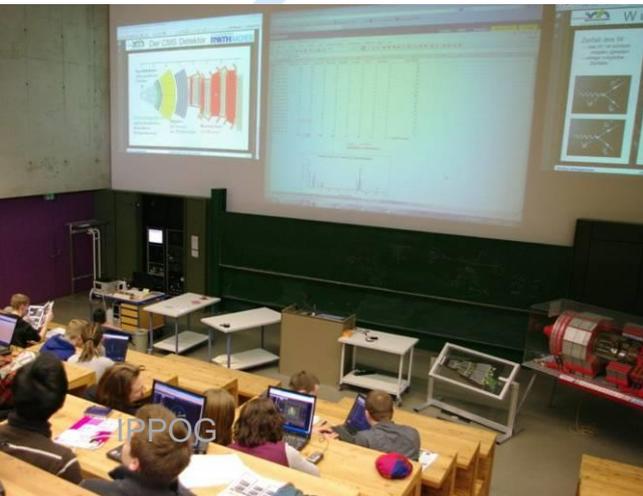
Introductory talks (standard model,
detectors, accelerators)

2 h measurement with LHC data

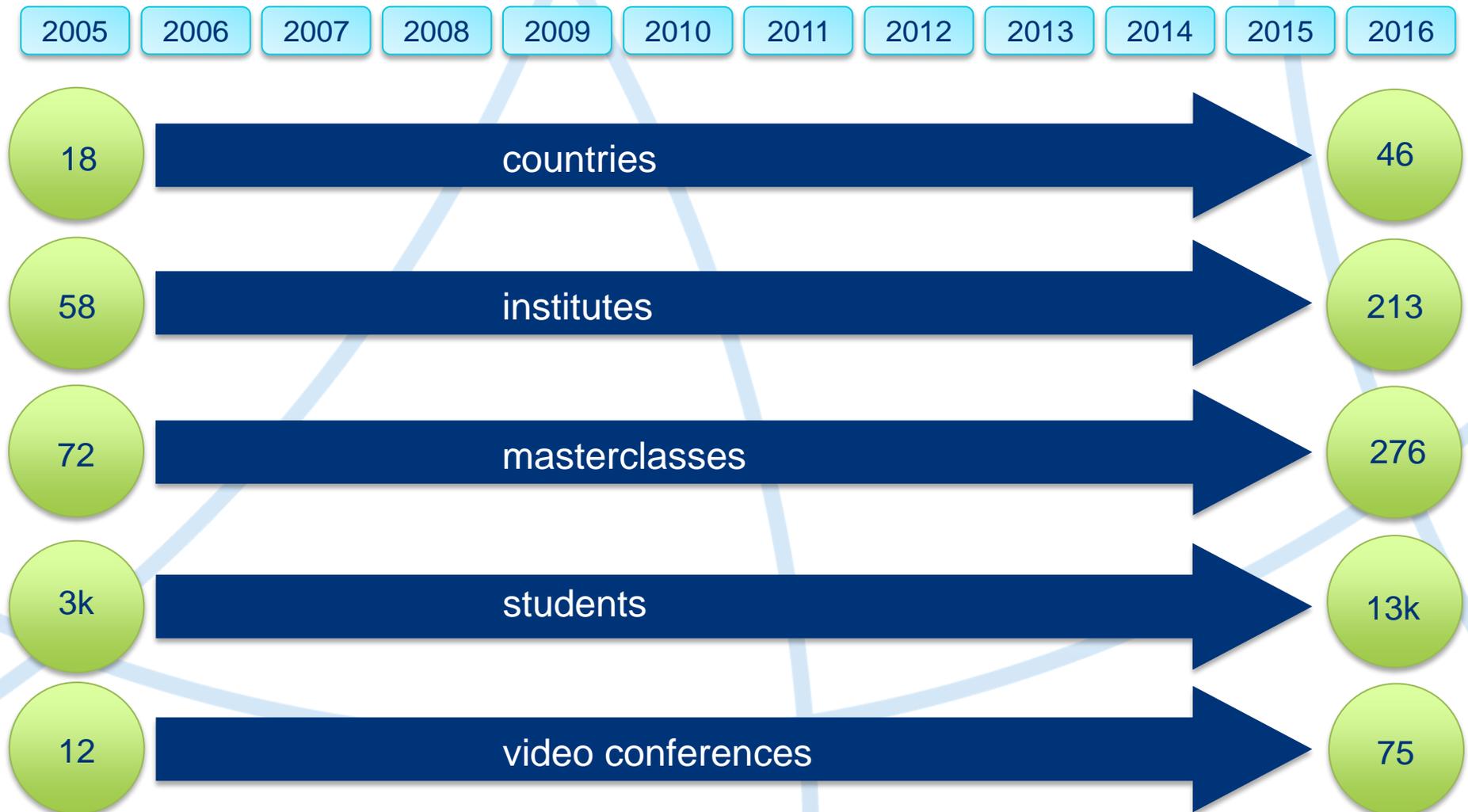
New also with Icecube data

International video conference (2 – 5
inst. + CERN/Fermilab)





Evolution of Masterclass participation



International Masterclasses



11 February – 23 March 2016

46 countries – 213 institutes – 13'000 high-school students – 1'100 teachers

Expanding to Astroparticle physics – discussions and pilot tests

IceCube Masterclass

<http://icecube.wisc.edu/masterclass/home>

International Muon Week

Quarknet

<http://Internationalmuonweek.org>

International Cosmic Day

<http://icd.desy.de>

IPPOG is embracing all particle physics activities.

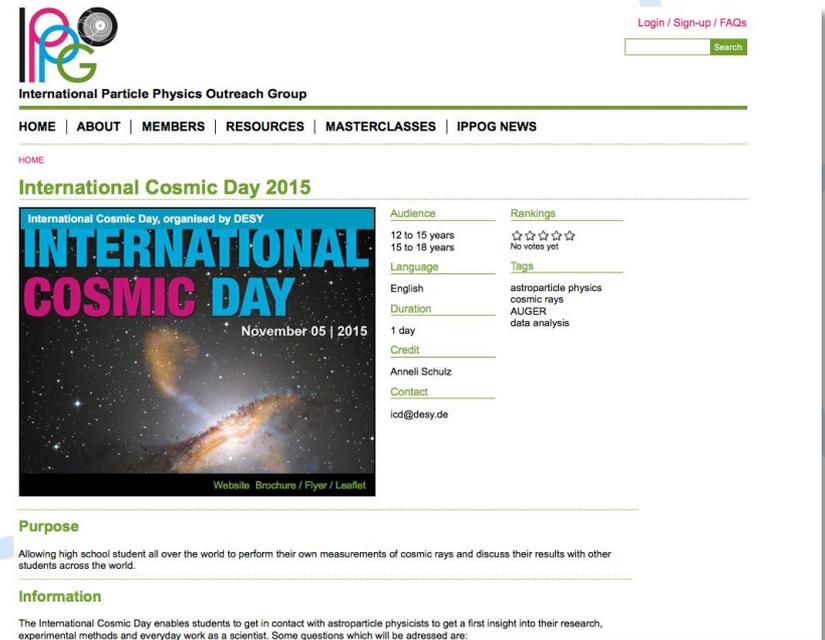
Although, historically, there is a strong bias towards LHC physics.

This bias is lingering with a broader base.

Auger Masterclass

<http://auger.colostate.edu/ED/>

- Pilot tests in German Netzwerk Teilchenwelt



The screenshot shows the website for International Cosmic Day 2015, organized by DESY. The main banner features the text "INTERNATIONAL COSMIC DAY" and "November 05 | 2015" over a background image of a galaxy. Below the banner, there are sections for "Audience" (12 to 15 years, 15 to 18 years), "Duration" (1 day), "Credit" (Anneli Schulz), and "Contact" (icd@desy.de). There are also "Rankings" (No votes yet) and "Tags" (astroparticle physics, cosmic rays, AUGER, data analysis). A "Purpose" section states: "Allowing high school student all over the world to perform their own measurements of cosmic rays and discuss their results with other students across the world." An "Information" section states: "The International Cosmic Day enables students to get in contact with astroparticle physicists to get a first insight into their research, experimental methods and everyday work as a scientist. Some questions which will be addressed are:"

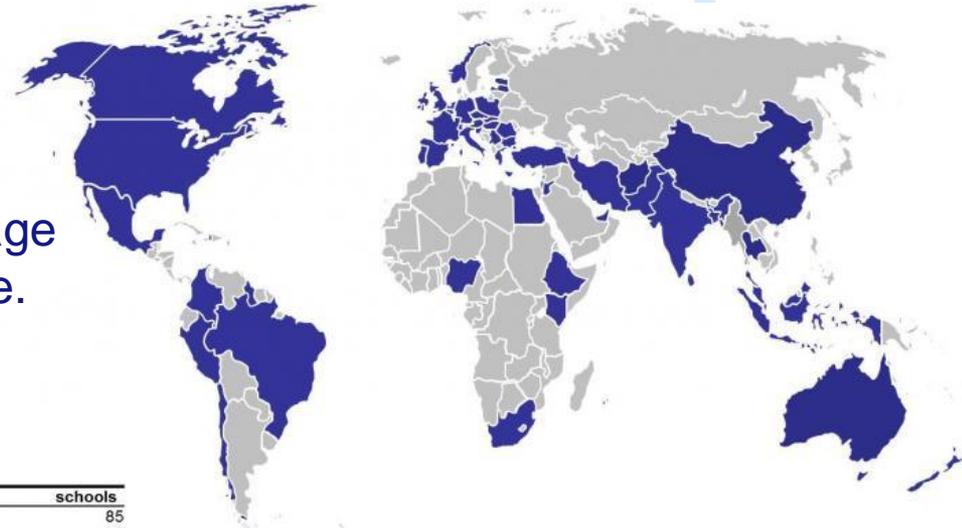


<http://www.un.org/en/events/women-and-girls-in-science-day/index.shtml>

- encourage girls to pursue a career in science
 - encouraging the development of science education policies and programming
 - recognize the achievements of women in science
- IPPOG: MasterClasses for girls only on Feb 11
 - will be advertised to all MC institutes, see how many are interested
 - MCs for girls only
 - female tutors and moderators, as much as possible
- IPPOG – adapt focus of the video conference

Competition: a beam line for schools

IPPOG acts as local contacts to schools in many countries. IPPOG members take responsibilities for multiple countries to ensure that language barriers will not be an insurmountable hurdle.



Enter CERN's Beamline for Schools 2016 competition now



| Country | schools |
|----------------|----------|
| Italy | 85 |
| Spain | 66 |
| United States | 45 |
| United Kingdom | 43 |
| India | 28 |
| Greece | 19 |
| Germany | 17 |
| Canada | 13 |
| Poland | 10 |
| Switzerland | 8 |
| France | 7 |
| Portugal | 7 |
| Romania | 6 |
| Turkey | 6 |
| Netherlands | 6 |
| Singapore | 5 |
| South Africa | 5 |
| Indonesia | 4 |
| Hungary | 4 |
| Austria | 4 |
| Mexico | 4 |
| Ireland | 4 |
| Iran | 3 |
| Colombia | 3 |
| Estonia | 3 |
| Thailand | 3 |
| Slovakia | 3 |
| New Zealand | 2 |
| Czech Republic | 2 |
| Brazil | 2 |
| Norway | 2 |
| Serbia | 2 |
| Slovenia | 2 |
| Bulgaria | 2 |
| Australia | 2 |
| Afghanistan | 2 |
| Peru | 2 |
| Egypt | 3 |
| Jordan | 1 |
| Mauritius | 1 |
| China | 1 |
| Kuwait | 1 |
| Nigeria | 1 |
| Malaysia | 1 |
| Ethiopia | 1 |
| Haiti | 1 |
| Pakistan | 1 |
| Guyana | 1 |
| Kenya | 1 |
| Latvia | 1 |
| Belgium | 1 |
| Sri Lanka | 1 |
| Cyprus | 1 |
| Malta | 1 |
| Qatar | 1 |
| UAE | 1 |
| Israel | 1 |
| Chile | 1 |
| Bangladesh | 1 |
| Kenya | 1 |
| Total | 1 |

GENERATION OF SCIENTISTS AND INNOVATORS

17 Nov 2015 — Alcoa Foundation and the CERN & Society Four forces for the third annual for Schools Competition

Search this site

Competition for 2016 Winner teams arrived at CERN this week

Competition 2017 call on 14 July <http://beamline-for-schools.web.cern.ch>

IPPOG at Conferences

Education & Outreach becoming an integral part in international HEP conferences, where IPPOG is an active player and driver

❑ **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)

❑ **Lepton Photon 2015 – Ljubljana**

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

❑ **LHCP 2016 – Lund**

- ❑ Parallel sessions on education and outreach ← this session here !

❑ **ICHEP 2016 – Chicago**

- ❑ Parallel sessions on education and outreach (IPPOG engaged and invited)

❑ **Physics, Technology, Ethics – Žilina**

- ❑ Invited contribution on *Some Ethical Questions related to Particle Physics* (Ivan Melo – IPPOG Slovakia; Thomas Naumann – IPPOG DESY; HPB)

❑ **WCPE 2016 – Sao Paulo**

- ❑ *CERN Masterclass courses and the impact on school physics* (Uta Bilow – IPPOG Masterclasses)

IPPOG NEWSLETTER



SEPTEMBER 2015

Number 1

A word from the coordinati

LABORATOIRE DE L'ACCELERATEUR LINEAIRE



IPPOG meeting, 18-19 April 2016, Paris

After a very interactive and productive spring meeting in Paris, the IPPOG is now ready to take several new actions and continue its sources! The future of IPPOG is very promising and a lot of options

We hope you enjoy this first number of IPPOG newsletter and our next meeting in autumn at CERN.

Hans Peter, Marg



"University of Particles : Explore, Discover, International network of scientists, science educators a science and education and outreach for particle physics. Vision for the future: Understanding and enthusiastic support of particle physics and re

IPPOG's current members come from CERN's 21 member states, plus Ireland, Romania, Slovakia, Poland, Czech Republic, Hungary, Greece, Italy, Spain, Portugal, France, Germany, Belgium, Netherlands, United Kingdom, USA and 5 major experiments at LHC. Since 2013 the co-ordinators

"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 strategy especially in the context of fundamental research in particle physics: scientific audience acceptance.

"How to prepare/approach the discover the Standard Model?"

IPPOG NEWSLETTER



FEBRUARY 2016

A word from the coordinati



IPPOG meeting, 6-7 November at CERN, IPPOG & EPPCN family

Our membership is growing worldwide and IPPOG is becoming truly international. Several new members and several others intend to become members this year. In terms of conference education and outreach contributions on behalf of

The last IPPOG meeting in November 2015 at CERN (<https://indico.cern.ch/event/411111>) was fruitful. Tradition from 2014 continued, and EPPCN colleagues joined it was opened by the new CERN DG, Fabiola Gianotti, who stressed the EPPCN. The former Head of the Education and Outreach Group of Landau, also highlighted the importance of IPPOG and the willingness future. The program of the meeting was very rich and diverse and we about the highlights in this second edition of the IPPOG Newsletter.

Wishing you a great and successful 2016. We look forward to see you 19-21 May in Cracow.

Hans Peter, Marg

IPPOG growing truly inter



Last year Australia has been voted in as the 26th IPPOG! Australia aims to be the IPPOG Masterclasses as part of their formal science in high schools in Wales. We are glad to have such a proactive partner, as come Paul Jackson, the Aus

expressed interest for membership and potential candidacy for members in the pipeline!

Page 1

IPPOG NEWSLETTER



International Particle
Physics Outreach Group

NOVEMBER 2016

Number 3

A word from the coordination team

Dear IPPOGers,



IPPOG meeting, 19-21 May 2016, Krakow

This third edition of our newsletter, which is much inspired by the Spring IPPOG meeting in Krakow, comes out just before our next meeting at CERN (10-12 November 2016) - at a time when IPPOG has never been so close to becoming an official collaboration which allows us to professionalise the personal investments we all make in IPPOG. In this way we can steadily increase the impact we are able to have. Even though setting up the IPPOG Collaboration turned out to be much more complex and a much longer process than originally imagined, now the final MoU document is circulating and signatures are indeed coming in.

IPPOG is an international body open for new member countries, laboratories and experiments to join. With Australia, Ireland, South Africa, United States of America and more recently Slovenia, we are clearly stepping into the global realm of collaboration. With the burden of the MoU writing and collaboration building (almost) behind us, IPPOG can now concentrate on growing its activities. We will be discussing adding a neutrino program and cosmic rays going global" to IPPOG's core activities. Broadening the scope of masterclasses, the flagship activity of IPPOG, geographically and in physics content will be key for continued success. The efforts to improve the IPPOG web-presence will soon materialise.

We wish you fun reading this newsletter, great meeting at CERN and wonderful end of 2016!

Hans Peter, Marg and Barbara



DOWNLOAD the electronic form of this newsletter with clickable hyperlinks at: http://ipog.web.cern.ch/sites/ipog.web.cern.ch/files/IPPOG_newsletter_November_2016.pdf



IPPOG pilots World Wide Data Day

Imagine a 24 hour span of masterclass-like videoconferences for students and teachers in the schools. To cover that, we'd need world-wide collaboration. And the students would need simple measurements that their teachers can readily explain. Well, we are getting there with the pilot of World Wide Data Day (WDD) on 2 December this year. Students will measure theta and phi of muon tracks in dimuon events from online ATLAS and CMS displays and try to understand their distributions. Physicists at TRIUMF, CERN, Fermilab and even in Australia will be on hand to help them see the big picture when they connect on Vidyo.

Contact Ken Cecire (kcecare@nd.edu) to discuss how you, a colleague or a good physics teacher you know might be involved.



Page 1

IN THIS ISSUE

★ IPPOG worldwide

- IPPOG's growing membership
- Worldwide spotlights
- Popular E&O sessions at conferences
- IPPOG - key partner of CERN
- IPPOG article on ethical issues in PP
- Exhibitions worldwide
- RECFA supports IPPOG Collaboration

IPPOG internal affairs

- IPPOG Collaboration MoU signatures being collected
- 12th IPPOG meeting at CERN

IPPOG activities

- IPPOG pilots World Wide Data Day
- IPPOG discusses theory in science and everyday language
- Masterclasses 2017

IPPOG MoU



INTERNATIONAL PARTICLE PHYSICS OUTREACH
GROUP

MEMORANDUM OF UNDERSTANDING

Establishing

The International Particle Physics Outreach Group (IPPOG) Collaboration

PREAMBLE

IPPOG is a network of scientists, researchers, science educators, explainers and communication specialists active across the globe in outreach for particle physics;

IPPOG's mission is to maximise the impact of education and outreach efforts related to particle physics;

The European Strategy for Particle Physics, as adopted and updated regularly by the CERN Council, acknowledges the important role played by IPPOG in the promotion of particle physics;

The IPPOG stakeholders recognise the need to create a formal legal structure permitting IPPOG to increase the scope and quality of its work;

This Memorandum of Understanding (the "MoU") creates the IPPOG Collaboration and sets out its governance and the rights and obligations of participants.

ARTICLE 1 PURPOSE OF THIS MOU

- 1.1 This MoU creates the IPPOG Collaboration and sets out its governance and the rights and obligations of participants.
- 1.2 This MoU is not legally binding, but its signatories recognise that the long-term success of the IPPOG Collaboration depends on their adherence to the provisions of this MoU.

- Collaboration will be considered starting when **10 Member** have signed.
- Today **signed**, or clear commitment to sign:

CH, D, I, F, FIN, N, NL, P, RO, S, SK

- Will be achieved in few weeks form now!



IPPOG Looking forward

