16th IPPOG Meeting – CERN

News from the Coordination

H.P. Beck, *Universität Bern*

S. Goldfarb, *University of Melbourne*

4 Oct 2018

15th IPPOG Meeting in Pisa & Cascina

International Particle Physics Outreach Group

15th IPPOG Meeting in Pisa & Cascina

Working Groups

- Global Cosmics (Charles, Marge)
- Explaining Hot Physics Topics (Dirk, Thomas)
- Masterclasses to New Countries (Uta, Ken)

Panel Discussions

- Special Events & Exhibitions
- Beauty & Physics
- Broadening the Scope of Mast
- IPPOG & Gravitational Wa

Full Agenda
https://indico.cern.ch/event/674777

Inside Views of IPPOG

- Australia (Paul), Sweden (Jonas)

Inspiring Success Stories

- Non-Science Festivals (Connie), ScienzaPerTutti (Pasquale), Eclipse Cosmic Adventure (Marge)

International Particle Physics Outreach Group

IPPOG In The Media

CERNCOURIER | International journal of high-energy physics

Brazil signs up to IPPOG collaboration

Brazil joins IPPOG

The International Particle Physics Outreach Group (IPPOG) has welcomed Brazil as a new member, boosting efforts to expand the group's international impact on scientific outreach. Established 20 years ago as a European network, IPPOG has grown to a global network that involves countries, laboratories and scientific collaborations active in particle physics. It is best known for its international masterclasses programme, which evolved in the late 1990s from national outreach efforts. Following the model of collaboration in experimental particle physics, IPPOG became a formal scientific collaboration based on a memorandum of understanding (MoU) in 2017 (***CERN Courier*** March 2017 p5).

Brazil, which will be officially represented in IPPOG by Marcelo Munhoz of the Universi[illegible] of São Paulo, is one of several countries to formally join the collaboration in recent months. In April, at [illegible]POG collaboration meeting in Pisa, two further countries – Slovenia and the Czech Republic – confir[illegible]ship, while Greece and Austria are finalising the process to sign IPPOG's MoU. That will bri[illegible] number of members to 26 – including the Belle II experiment, which has just started op[illegible]apan (see SuperKEKB steps out at the intensity frontier).

Faces & Places, 1 June 2018

OUTREACH

Packed house for CHEP public event

A large and enthusiastic crowd attended "Universal Science," a public event preceding the International Conference on Computing for High Energy and Nuclear Physics (CHEP), in Sofia, Bulgaria, on 8 July. With the three-part theme of research, computing and diversity, tickets for the event sold out well before deadline, and overflow had to be accommodated through online participation.

Such an outreach event is not typical for CHEP, a conference that focuses on specialised topics such as distributed computing, event reconstruction, data handling and virtualisation. This year's organising committee, however, saw it as an opportunity to reach out to the local public and to foster open discussion on the impact of particle-physics research on society. Similar events have grown in popularity at other major conferences, such as ICHEP, EPS and LHCP, and the particle-physics-[illegible] community has become incr[illegible]

Audience Q&A with the scientific panel (from left): Steven Goldfarb, Andreas Salzburger, Lee Bitsoi, and Hannah Short.

Kasperowski

engaged in public outreach.

Hands-on exhibits, including interactive virtual-reality displays, entertained and informed the audience. Andreas Salzburger, a CERN physicist on the ATLAS experiment, kicked off the evening with a short talk on the motivation for and history of particle physics. This was followed by talks on diversity by Lee Bitsoi of Stony Brook University and on the growth of distributed computing by CERN computer engineer Hannah Short. Talks were followed by a panel discussion generating a barrage of questions from both the local audience and those connecting via Facebook Live. The event was organised and sponsored by CERN, Brookhaven National Laboratory, a local popular-science platform called RATIO, IPPOG and Belle II.

● *Steven Goldfarb, CERN.*

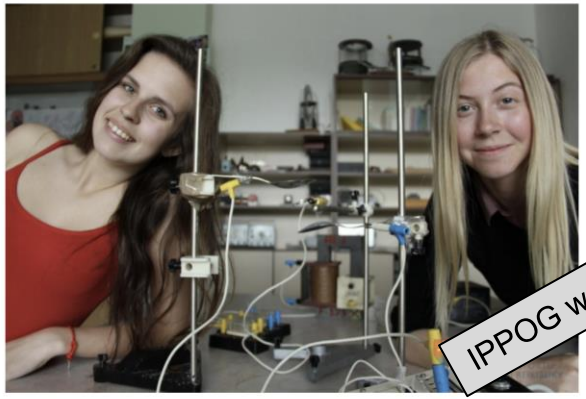
Coming Next Month

International Particle Physics Outreach Group

IPPOG In The Media

Slovenské gymnazistky zvíťazili v medzinárodnej fyzikálnej súťaži Particles4U

Jednoduchý a lacný lapač iónov priniesol dvom žiačkam Gymnázia Ľudovíta Štúra vo Zvolene víťazstvo v prvom ročníku medzinárodnej súťaže Particles4U (Častice pre teba)



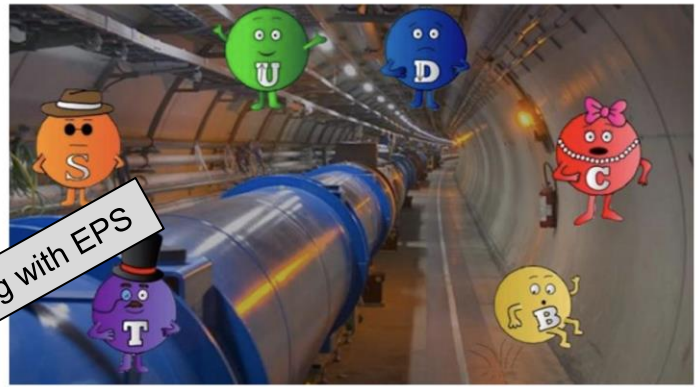
Andrea Škvareninová a Radka Veselá pod vedením svojho učiteľa fyziky **Mareka Balážoviča** uspeli v konkurencii rovesníkov z 15 krajín.

Súťaž organizovala kolaborácia **International Particle Physics Outreach Group** s podporou **Európskej fyzikálnej spoločnosti**.

IPPOG working with EPS

Σε Έλληνες μαθητές το 1ο Βραβείο Διεθνούς Διαγωνισμού για το βίντεο «The Quark show»!

Μαθητές του 2ου και 6ου Δημοτικού Σχολείου Αρτέμιδος, με την καθοδήγηση ειδικών, δημιούργησαν ένα εκπαιδευτικό βίντεο, συνδύασαν το χιούμορ με τα στοιχειώδη σωματίδια και φαντάστηκαν έναν διάλογο μεταξύ των σωματιδίων που εξηγεί, ουσιαστικά, γιατί δεν είναι τίποτα τυχαίο στη φύση.



07.03.2018 | upd: 09.03.2018 Δημιουργικότητα Εκπαίδευση Επιστήμη

Πώς θα ήταν άραγε ένας διάλογος μεταξύ...σωματιδίων; Οι μαθητές του 2ου και 6ου Δημοτικού Σχολείου Αρτέμιδος όχι μόνο κατάφεραν να απαντήσουν σε αυτό το ερώτημα δημιουργώντας ένα πρωτότυπο video με τίτλο «Η παράσταση των κουάρκ» ("The Quark Show"), στο πλαίσιο του εκπαιδευτικού προγράμματος «Παίζοντας με τα πρωτόνια» (Playing with Protons), αλλά και να κερδίσουν το Πρώτο Βραβείο του Διεθνούς Διαγωνισμού Particles4U του International Particle Physics Outreach Group (IPPOG), στην κατηγορία των Δημοτικών Σχολείων.

International Particle Physics Outreach Group

IPPOG In The Media

Jornal da USP

CIÊNCIAS | TECNOLOGIA | EDUCAÇÃO | CULTURA | ATUALIDADES | UNIVERSIDADE | INSTITUCIONAL

Home > Universidade > Na USP, jovens descobrem como é trabalhar com física de partículas

Universidade - 26/03/2018

Na USP, jovens descobrem como é trabalhar com física de partículas

No Instituto de Física, alunos do ensino médio vão interagir com participantes de outros países e com os pesquisadores do Cern

Por Redação - Editorias: Universidade - URL Curta: jornal.usp.br/?p=155888

Masterclasses in Brazil

Alunos durante a Masterclasses de 2017, realizada no Instituto de Física da USP – Foto: Divulgação/IF

O Instituto de Física (IF) da USP é uma das sedes brasileiras da *International Masterclasses Hands on Particles Physics*, iniciativa que aproxima alunos do ensino médio do cotidiano dos cientistas do Cern, o maior laboratório de física de partículas do mundo.

attain

Announcements | Community | Academic | The Arts | Sport | Activities | Speakers & Visitors

Cosmic-ray Detector Awarded for Contribution to International Competition

University College School | 2 Jul 2017

EMAIL TO A FRIEND | TWEET THIS STORY | SHARE ON FACEBOOK

Eleven students from UCS Hampstead have won a cosmic-ray detector after reaching the top 30 entries in the Beamline for School's Competition 2017 (BL4S) established by CERN.

Working with CERN on BL4S

The "Absolute Uncertainty" team (all 15 to 17 years old) included Michael [illegible] Grodzinski, Chris Harley, Geno Racklin Asher, Ava Pettit, Kieran Ros[illegible] Hampstead, which successfully made it to the final round of th[illegible] from around the world.

One of the team, Michael Aarons (17 years) exp[illegible] aged to take part in the competition by their school's Physics dep[illegible] enthusiasts, and were excited by the opportunity to run our own exp[illegible] opportunities to enter competitions and work in such large teams, and [illegible] The team entered with a proposal to study the consequences of Van Allen B[illegible] efficiency of satellite mounted solar cells, for which they were shortlisted. Michael is k[illegible] other physics enthusiasts to enter next year, and has the following advice for future teams[illegible] with your gut and don't look at what everyone else is doing. Don't be afraid to be innovative!"

The BL4S physics competition tasked entrants with designing a proposal to utilise a particle accelerator in an innovative fashion. Now entering its fourth year, CERN works with the International Particle Physics Outreach Group (IPPOG) to test the innovation, problem-solving and collaboration skills of teams, with the winners getting the opportunity to conduct an experiment for 10 days on-site at CERN in Geneva, Switzerland.

Related stories

Back in the classroom to look back in time

International fiction writing competition win

IPPOG In Conferences

APS March 2018 – Los Angeles, CA, USA
- Outreach Parallel Session

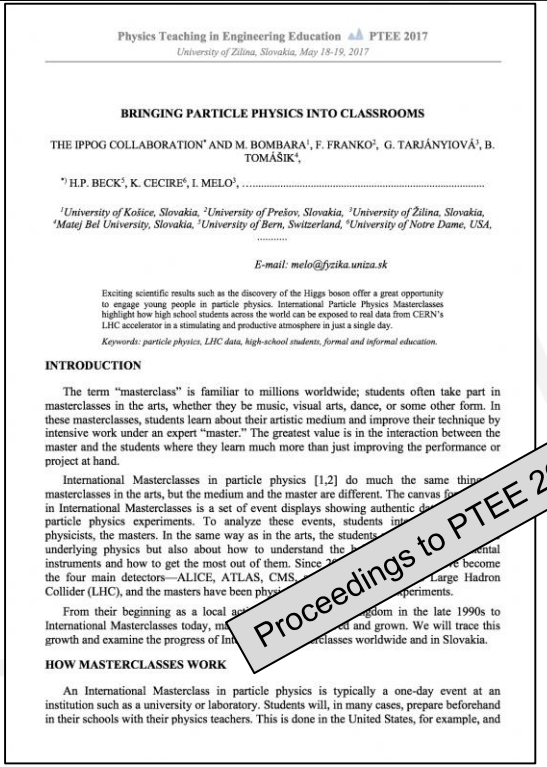
LHCP 2018 – Bologna, Italy
- Outreach Parallel Session
- Plenary Presentation by IPPOG Chair

ICHEP 2018 – Seoul, Korea
- Education & Outreach Parallel Sessions
- Public Presentations

CHEP 2018 – Sofia, Bulgaria
- Public Forum on Physics, Computing and Diversity, Organised and Sponsored by IPPOG, et al.

ICNFP 2018 – Crete, Greece
- Outreach Masterclass

Interchange 2018 – Vienna, Austria
- Presentation to High School students



Physics Teaching in Engineering Education PTEE 2017
University of Žilina, Slovakia, May 18-19, 2017

BRINGING PARTICLE PHYSICS INTO CLASSROOMS

THE IPPOG COLLABORATION* AND M. BOMBARA[1], F. FRANKO[2], G. TARJÁNYIOVÁ[3], B. TOMÁŠIK[4],

*) H.P. BECK[5], K. CECIRE[6], I. MELO[3], ...

[1]University of Košice, Slovakia, [2]University of Prešov, Slovakia, [3]University of Žilina, Slovakia, [4]Matej Bel University, Slovakia, [5]University of Bern, Switzerland, [6]University of Notre Dame, USA,

E-mail: melo@fyzika.uniza.sk

Exciting scientific results such as the discovery of the Higgs boson offer a great opportunity to engage young people in particle physics. International Particle Physics Masterclasses highlight how high school students across the world can be exposed to real data from CERN's LHC accelerator in a stimulating and productive atmosphere in just a single day.

Keywords: particle physics, LHC data, high-school students, formal and informal education.

INTRODUCTION

The term "masterclass" is familiar to millions worldwide; students often take part in masterclasses in the arts, whether they be music, visual arts, dance, or some other form. In these masterclasses, students learn about their artistic medium and improve their technique by intensive work under an expert "master." The greatest value is in the interaction between the master and the students where they learn much more than just improving the performance or project at hand.

International Masterclasses in particle physics [1,2] do much the same thing masterclasses in the arts, but the medium and the master are different. The canvas fo in International Masterclasses is a set of event displays showing authentic da particle physics experiments. To analyze these events, students int physicists, the masters. In the same way as in the arts, the students underlying physics but also about how to understand the h instruments and how to get the most out of them. Since 2 e become the four main detectors—ALICE, ATLAS, CMS, Large Hadron Collider (LHC), and the masters have been physi periments.

From their beginning as a local act gdom in the late 1990s to International Masterclasses today, ma ed and grown. We will trace this growth and examine the progress of Int rclasses worldwide and in Slovakia.

HOW MASTERCLASSES WORK

An International Masterclass in particle physics is typically a one-day event at an institution such as a university or laboratory. Students will, in many cases, prepare beforehand in their schools with their physics teachers. This is done in the United States, for example, and

Proceedings to PTEE 2017

International Particle Physics Outreach Group

IPPOG Members

	Signator	Country/Lab/Experiment	Date Signed
1	NIKHEF	The Netherlands	22 Sep 2016
2	DESY for KET	Germany	23 Sep 2016
3	Physics Department of University of Oslo	Norway	21 Oct 2016
4	LIP	Portugal	1 Nov 2016
5	The Section for Elementary Particle and Astroparticle Physics of the Swedish Physical Society through the Swedish LHC Consortium	Sweden	1 Nov 2016
6	CHIPP	Switzerland	4 Nov 2016
7	Ministry of Education, Science, Research and Sport	Slovak Republic	15 Nov 2016
8	Institute of Atomic Physics	Romania	17 Nov 2016
9	Helsinki Institute of Physics	Finland	29 Nov 2016
10	FWO + F.R.S.-FNRS	Belgium	30 Nov 2016
11	CERN	CERN	19 Dec 2016
12	INFN	Italy	21 Dec 2016
13	CNRS/IN2P3	France	23 Dec 2016
14	The Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences	Poland	29 Dec 2016

International Particle Physics Outreach Group

IPPOG Members

	Signator	Country/Lab/Experiment	Date Signed
15	CoEPP	Australia	14 Feb 2017
16	The University of Notre Dame on behalf of QuarkNet	USA	14 Mar 2017
17	ATLAS Spokesperson	ATLAS	1 Nov 2017
18	BELLE II Spokesperson	BELLE II	19 Feb 2018
19	Jôsef Stefan Institute, Ljubljana, Slovenia	Slovenia	19 Apr 2018
20	**Institute of Physics of the Czech Academy of Sciences**	**Czech Republic**	**21 Apr 2018**
21	**Rede Nacional de Física de Altas Energias (RENAFAE)**	**Brazil**	**26 Apr 2018**
22	**Ministry for Education, Research, and Religious Affairs**	**Greece**	**19 Jun 2018**
23	**HEPHY, ÖAW, ÖPG**	**Austria**	**Ready to Sign**
24	**Danish CERN Instrumentation Centre, NICE**	**Denmark**	**Ready to Sign**
25	**LHCb Spokesperson**	**LHCb**	**Ready to Sign**
26	**ALICE Spokesperson**	**ALICE**	**Ready to Sign**
27	**CMS Spokesperson**	**CMS**	**In Process**

International Particle Physics Outreach Group

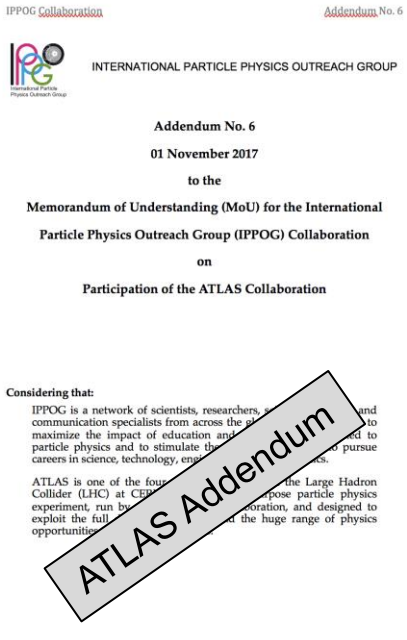
IPPOG Members

Status

- **Members**: 19 (+2) Countries, 2 (+3) Experiments, 1 Lab
- **Candidates**: Bulgaria, Hungary, Ireland, Israel, South Africa, Spain, United Kingdom
- **Expression of Interest**: Georgia

International Particle Physics Outreach Group

Experiment Agreements



IPPOG Collaboration Addendum No. 6

INTERNATIONAL PARTICLE PHYSICS OUTREACH GROUP

Addendum No. 6

01 November 2017

to the

Memorandum of Understanding (MoU) for the International Particle Physics Outreach Group (IPPOG) Collaboration

on

Participation of the ATLAS Collaboration

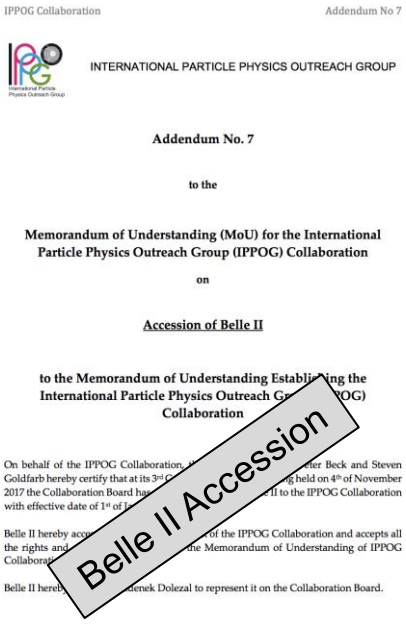
Considering that:

IPPOG is a network of scientists, researchers, s… and communication specialists from across the gl… to maximize the impact of education and… ed to particle physics and to stimulate the… o pursue careers in science, technology, engi… cs.

ATLAS is one of the four… the Large Hadron Collider (LHC) at CER… pose particle physics experiment, run by a… boration, and designed to exploit the full… d the huge range of physics opportunities…

ATLAS Addendum

01 November 2017 Page 1/4



IPPOG Collaboration Addendum No 7

INTERNATIONAL PARTICLE PHYSICS OUTREACH GROUP

Addendum No. 7

to the

Memorandum of Understanding (MoU) for the International Particle Physics Outreach Group (IPPOG) Collaboration

on

Accession of Belle II

to the Memorandum of Understanding Establi…ng the International Particle Physics Outreach Gr… POG) Collaboration

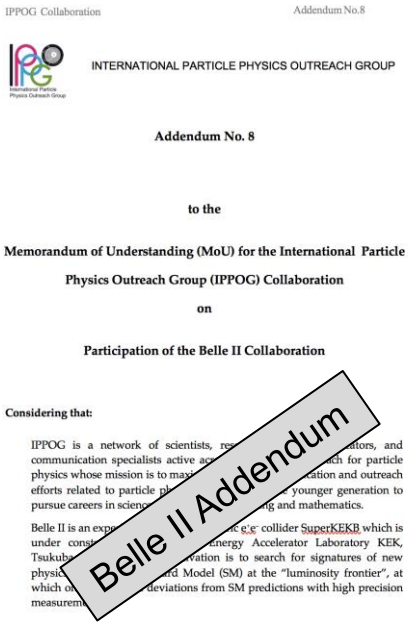
On behalf of the IPPOG Collaboration, M… ber Beck and Steven Goldfarb hereby certify that at its 3rd G… g held on 4th of November 2017 the Collaboration Board has… II to the IPPOG Collaboration with effective date of 1st of J…

Belle II hereby acce… of the IPPOG Collaboration and accepts all the rights and… the Memorandum of Understanding of IPPOG Collaborat…

Belle II hereby… denek Dolezal to represent it on the Collaboration Board.

Belle II Accession

Page 1/2



IPPOG Collaboration Addendum No.8

INTERNATIONAL PARTICLE PHYSICS OUTREACH GROUP

Addendum No. 8

to the

Memorandum of Understanding (MoU) for the International Particle Physics Outreach Group (IPPOG) Collaboration

on

Participation of the Belle II Collaboration

Considering that:

IPPOG is a network of scientists, re… ators, and communication specialists active ac… ach for particle physics whose mission is to maxi… ation and outreach efforts related to particle ph… younger generation to pursue careers in scienc… g and mathematics.

Belle II is an expe… e⁺e⁻ collider SuperKEKB which is under const… Energy Accelerator Laboratory KEK, Tsukuba… vation is to search for signatures of new physic… d Model (SM) at the "luminosity frontier", at which o… deviations from SM predictions with high precision measurem…

Belle II Addendum

Page 1/4

International Particle Physics Outreach Group

Experiment Agreements

Experiment Commits to:

- Recognise Outreach as Important Part of Research Programme
- Recognise Efforts of Collaboration Members Who Do Outreach
- In-Kind Contributions
  - Access to agreed-upon data sets for education
  - Access to analysis tools and documentation for using the data sets
  - Support for conducting Masterclasses
  - Educational material, communication support, physics expertise

IPPOG Commits to:

- Organise and Execute Particle Physics Masterclasses
- Widen Global Scope of Experiment's Outreach & Education Efforts
- Provide Stimulating Environment for Exchange of Ideas, Best Practices
- Provide Coordinated Efforts for Increased Visibility

Country & Lab Commitments

Signing of MoU

- Identification of National Body Responsible for Particle Physics Outreach
- Identification of Representative

Annual Membership Fee

- Countries ranked on GDP, Particle Physics Community Size
  - 3 Country Rankings: 1 kEUR, 3 kEUR, 5 kEUR
- Labs treated case-by-case
  - CERN contributes 5 kEUR + Masterclass Coordinator + Scientific Secretary + Infrastructure for Web, Finance, Legal Support

In 2018

- Total revenues of 58 kEUR + 2 x ½ FTE + In-Kind Support
- → Core Infrastructure to Support Global Outreach Efforts (*Hired Expertise*)
  - Web and Communication Content Development (1/2 FTE)
  - Support for Expansion of Global Reach

Agenda

https://indico.cern.ch/e/IPPOG16

- Thursday
  - Preliminary WG Meetings
  - Open Session
  - Portraits
  - Dinner at Smash
- Friday
  - Session 1 (WG Reports)
  - European Strategy Open Discussion
  - Session 2 (CERN Activities)
  - Group Picture
  - Panel Preparation
  - Session 3 (IPPOG & Other Activities)
  - Dinner art Café Papon
- Saturday
  - Session 4 (Panel Presentations, etc.)
  - Collaboration Board

Working Groups

Bringing Masterclasses to New Countries

- Conveners: **Uta Bilow, Ken Cecire**

Explaining Particle Physics Hot Topics to a Lay Audience

- Convener: **Deszo Horvath**

Exhibits

- Conveners: **Emma Sanders**

European Strategy Update

- Convener: **Hans Peter Beck**
- Open Discussion on Friday morning
- Wrap-Up on Saturday morning

Discussion Panels

Is beauty leading physics astray?

- Convener: **Ivan Melo**

Outreach applications of particle physics for society

- Medical Convener: **Manuela Cirilli**
- Non-Medical Convener: **Barbora Gulejova**

International Particle Physics Outreach Group

CB Discussions & Votes

Points for Discussion during Saturday Collaboration Board

- European Strategy Update (Endorsement)
- Expression of Interest by Georgia
- Observer Status for National Organizations
- Candidate Member Expiration (Possible Votes)
- Project Support Guidelines
- IPPOG Human Resources
- Budget 2019 (Endorsement)
- Next Meeting Venue (Vote)

Housekeeping

Notes from Claudia:

- Register if you haven't
- Visits to ALICE and SM18 cancelled
- If you are interested in visiting ALICE please contact Despina directly.
- Dinner - tonight is at SMASH across the street from CERN and cost is on your own!
- Dinner - tomorrow is at Café Papon (Downtown Geneva) and offered by CERN.
- Color code means your choice of menu, front for dinner tonight and back for dinner tomorrow
  - Green - Vegetarian
  - Blue - Fish
  - Red - Chicken
- If you are missing a sticker or are no longer coming to dinner, please tell Claudia asap, so she can coordinate with restaurants