



Report to ECFA, November 22<sup>nd</sup> 2012

**Dave Barney**, Michael Kobel: IPPOG Co-chairs

# IPPOG 2012 - Overview



- IPPOG Membership
- International Masterclasses
  - Driving the public use of LHC data!
- Education & Outreach Collection
- IPPOG @ International Conferences
- IPPOG chairs 2013-2016
- Summary/Resources.....



***Discovering Particle Physics Together***

# IPPOG Membership (1)



International Particle Physics Outreach Group

HOME | ABOUT | MEMBERS | RESOURCES | MASTERCLASSES

IPPOG Members

ALICE COLLABORATION ATLAS COLLABORATION ATLAS COLLABORATION AUSTRIA

ITALY NORWAY POLAND PORTUGAL

ROMANIA SLOVAKIA SPAIN SWEDEN

BELGIUM BULGARIA CMS COLLABORATION CZECH REPUBLIC

DENMARK DESY FINLAND FRANCE

GERMANY GREECE HUNGARY IRELAND

UNITED STATES OF AMERICA

Switzerland THE NETHERLANDS TOTEM Collaboration UNITED KINGDOM

New IPPOG Website includes members page with profiles

## UNITED KINGDOM



**Peter Watkins**  
 Physicist, Honorary Professor  
 Particle Physics Group, School of Physics and Astronomy, University of  
 Birmingham, Birmingham B15 2TT, UK  
[ptw@pho.ph.bham.ac.uk](mailto:ptw@pho.ph.bham.ac.uk)

Pete first got interested in fundamental physics after reading George Gamow's book 'Matter, Earth and Sky' at school. He studied Physics at the University of Birmingham and obtained his PhD in Particle Physics after working on bubble chamber experiments at CERN. These experiments discovered many short lived hadrons which we now know contain quarks. These collision energies were around one thousand times smaller than he now studies in the ATLAS experiment at the Large Hadron Collider(LHC).




He worked on the first experiment to publish results from the CERN Super Proton Synchrotron and when this accelerator was converted into a proton antiproton collider he worked on the Nobel prize winning LIA1 experiment. This discovered the W and Z bosons and he wrote a book 'Story of the W and Z' aimed at a general audience. He wrote much of the software with a few colleagues to visualise the matter-antimatter collisions that aided the first identification of the massive bosons. Detailed measurements of the W and Z bosons were made by later experiments at the Large Electron Positron Collider(LEP) where he worked on the OPAL experiment. Here the Birmingham team constructed the 12m by 12m muon detectors and electronics that selected (or triggered) the recording of the most interesting collisions. For the past decade he has been working on the calorimeter trigger, event visualisation and physics analysis for the ATLAS experiment. Most recently contributing to the publication of the chib3p observation which is the first new particle discovered at the LHC.

Peter was the head of the Birmingham Particle Physics group for many years and is the ATLAS UK Outreach representative. He has initiated many different Outreach activities and competitions throughout his career and gives many talks each year on Particle Physics and the LHC aimed at a non-specialist audience. 'I have been very lucky to have worked with colleagues around the world on so many interesting projects at CERN. It is great fun to pass on the excitement and challenges of this work to schools and the general public in lectures and other outreach work.'

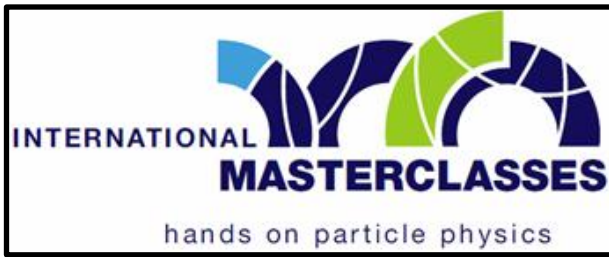
Peter has been the UK representative to IPPOG since 2007.

# IPPOG Membership (2)



- In 2012 we have invited TOTEM, Romania, Ireland, Israel, India
  - TOTEM: Beatrice Bressan 
  - Romania: Gabriel Stoicea 
  - Ireland: Jonivar Skullerud 
  - Both Israel and India seeking appropriate member

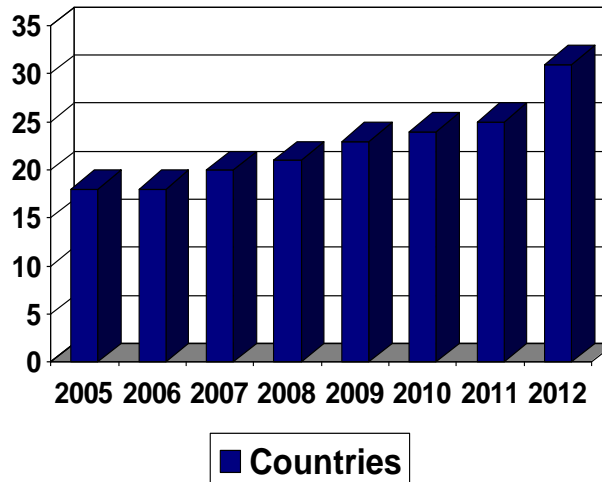
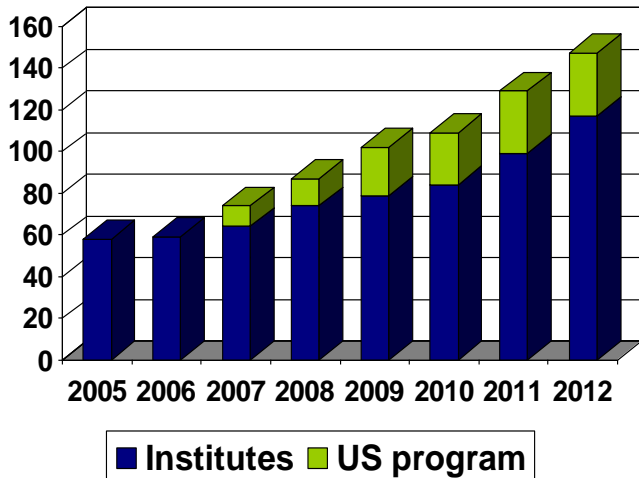
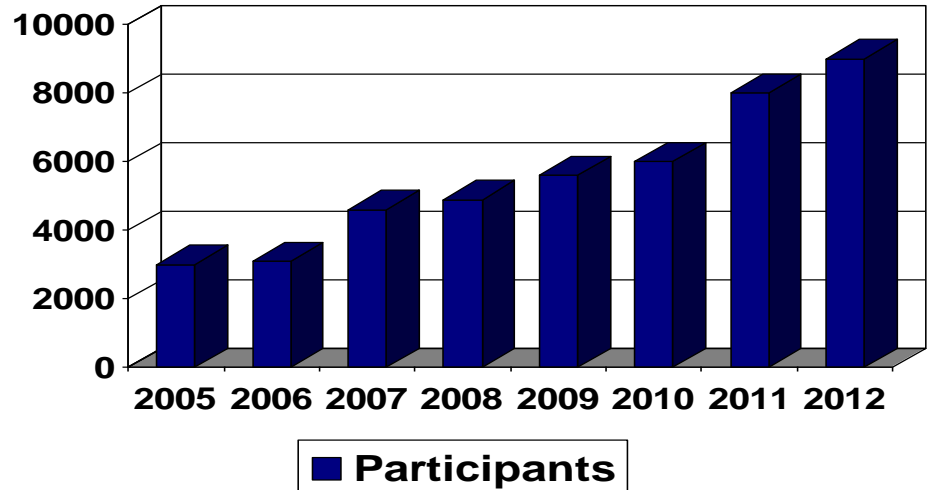




# International Masterclasses (1)



- High school students become “scientists for a day” at a local University/Institute
- “enquiry-based learning exercise” on real data from LHC
- Discussion of results via video conference with other participants & CERN – just like we do!



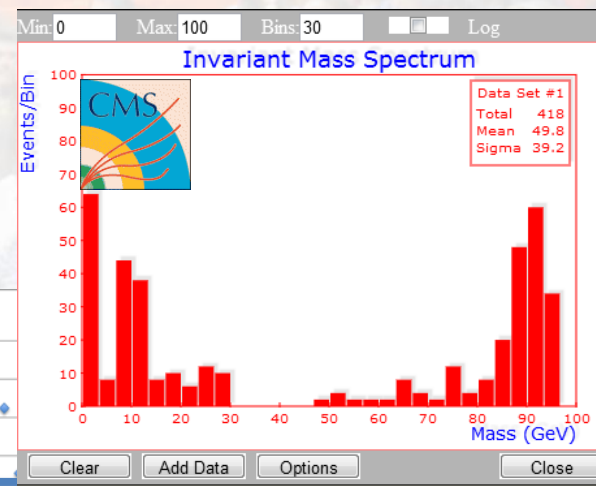
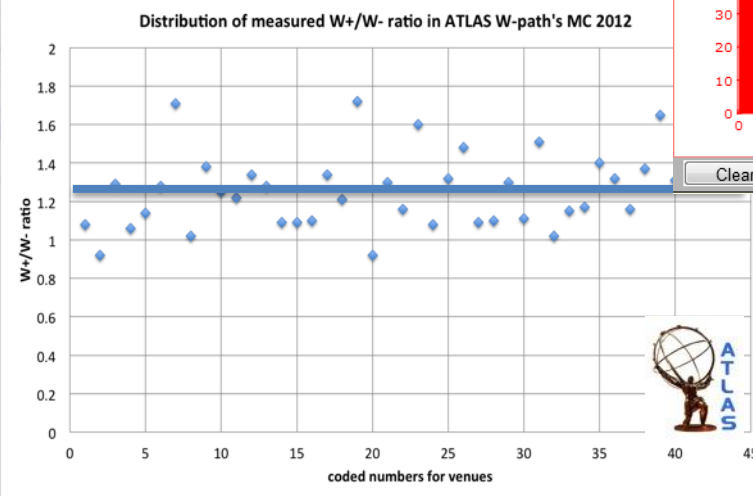
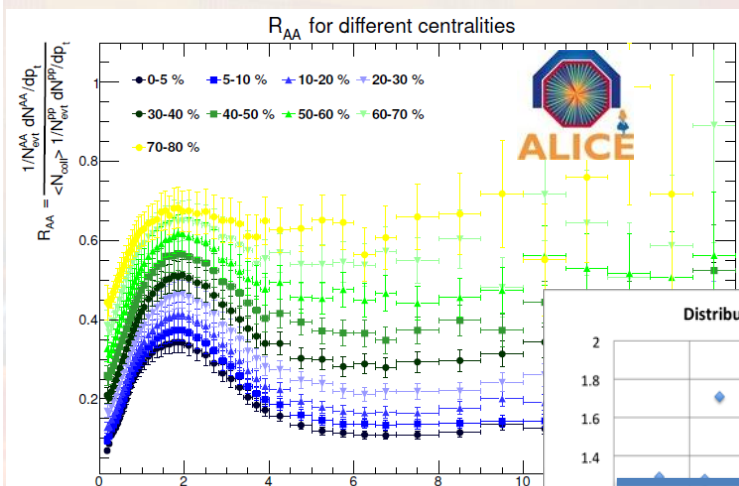
## Interest expressed for 2013:

- India
- China
- Australia
- Georgia
- Romania
- Cyprus
- Palestine
- Turkey

# International Masterclasses (2)



- Real LHC data from ALICE, ATLAS, CMS:



– In 2013 we will also have real Higgs events!

# IPPOG E&O Resource Collection



International Particle Physics Outreach Group

HOME | ABOUT | MEMBERS | **RESOURCES** | MASTERCLASSES

HOME > RESOURCES

## Resources

- Activities
  - Cart Demonstration
  - Display
  - Classroom Activity
  - Facilitated Activity
  - Presentation
  - Game
- Programs & Events
- Media
- Professional Development & Coaching
- Exhibits
- Souvenir / Novelty Item

FAQs

### Welcome !

What is this?

Who is this for?

Want to share items, leave comments and rate stuff too? [Learn more](#) about joining the collection's user group.

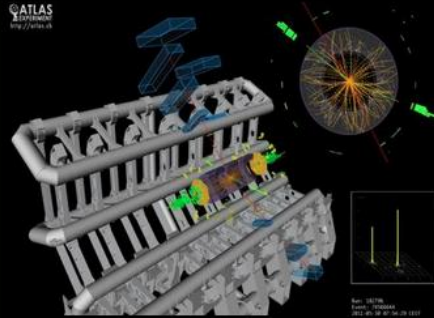
### Learning Topics



- ▶ Physics
- ▶ Technology
- ▶ International Collaboration
- ▶ Broader Impacts

LATEST

FEATURED



©ATLAS  
IPPOG

**The Large Hadron Collider at CERN: Exploring the frontiers of our universe (Part 1 of 2)**

Inform the general public of the importance and necessity of fundamental research, describe the LHC, its experiments, collaborations, and recent achievements.

Presentation

Login / Sign-up / FAQs

Search

### Search by

#### Learning Topic

- Any -

#### Audience

- Any -

#### Item Type

- Any -

#### Availability

- Any -

#### Duration

- Any -

#### Language

- Any -

#### Key Words

GO

### Resources in your language

English French German  
Italian Portuguese Spanish

[more](#)

### Filter by audience

- 6 to 9 years
- 9 to 12 years
- 12 to 15 years
- 15 to 18 years
- 18 to 25 years
- 25 years+

Science Educator / Science Explainer

- First-ever global collection of materials for particle physics E&O
  - Provides materials and ideas for public talks, exhibitions and informal education activities
  - Hundreds of items
  - Videos, photos, presentations, descriptions of physics goals of LHC etc., ideas for educational activities
  - Multiple languages
  - All items carefully tagged to facilitate finding the “right stuff”
  - Growing number of external contributors
  - ***Does require maintenance***

# IPPOG @ Conferences (1)



- Reminder from IPPOG presentation to ECFA 2011

*Proposal* to get increased visibility of IPPOG (and E&O in general) at other International Conferences, such as ICHEP 2012 (Melbourne, Australia, July 2012) and 1<sup>st</sup> World Conference on Physics Education (Istanbul, Turkey, July 2012)

## **Achieved:**

- ICHEP: IPPOG-organized parallel session, masterclass, museum exhibit, TV/radio...
- WCPE: Oral presentation on masterclasses + hands-on workshop
- ESOF: 90-minute IPPOG session



# IPPOG @ ICHEP (Melbourne)



09:00	<b>The importance of Science Communication Now</b> <i>Room 217, Melbourne Convention and Exhibition Centre</i>	<i>Rolf HEUER</i> 09:00 - 09:30
	<b>Opportunities to Learn Scientific Literacy</b> <i>Room 217, Melbourne Convention and Exhibition Centre</i>	<i>Ms. Marjorie BARDEEN</i> 09:30 - 09:50
10:00	<b>European and global networks for high-energy physics communications and outreach</b> <i>Room 217, Melbourne Convention and Exhibition Centre</i>	<i>Mr. Arnaud MARSOLLIER</i> 09:50 - 10:10
	<b>International Particle Physics Masterclasses - Bringing LHC data into the classroom</b> <i>Room 217, Melbourne Convention and Exhibition Centre</i>	<i>Prof. Farid OULD-SAADA</i> 10:10 - 10:30
	<b>Refreshment Break</b> <i>Room 217, Melbourne Convention and Exhibition Centre</i>	10:30 - 11:00
11:00	<b>Social Media in Science Communication</b> <i>Room 217, Melbourne Convention and Exhibition Centre</i>	<i>Mrs. Claudia MARCELLONI DE OLIVEIRA</i> 11:00 - 11:30
	<b>Great Moments in Science</b> <i>Room 217, Melbourne Convention and Exhibition Centre</i>	<i>Dr. Karl KRUSZELNICKI</i> 11:30 - 12:00
12:00	<b>Q&amp;A to the Public</b> <i>Room 217, Melbourne Convention and Exhibition Centre</i>	12:00 - 13:00

All-Star Cast!!!

4-hour parallel session

About 30 attendees (in parallel to Higgs!)

“Hangout on air” video conference with the public very well attended - included audience participation

(“Hangouts on air” now held every week from CERN to worldwide audience)

# IPPOG @ ICHEP (cont.)



**ATLAS Experiment** Jul 8, 2012 - Public

Physicists answering questions through Google hangout on 7th of July from Melbourne, Australia:

<https://plus.google.com/106123073424280939934/posts/LA5qTXD8NYe>



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**ATLAS Experiment** Jul 9, 2012 Edit

Recording of the Hangout: <https://plus.google.com/106123073424280939934/posts/LA5qTXD8NYe>

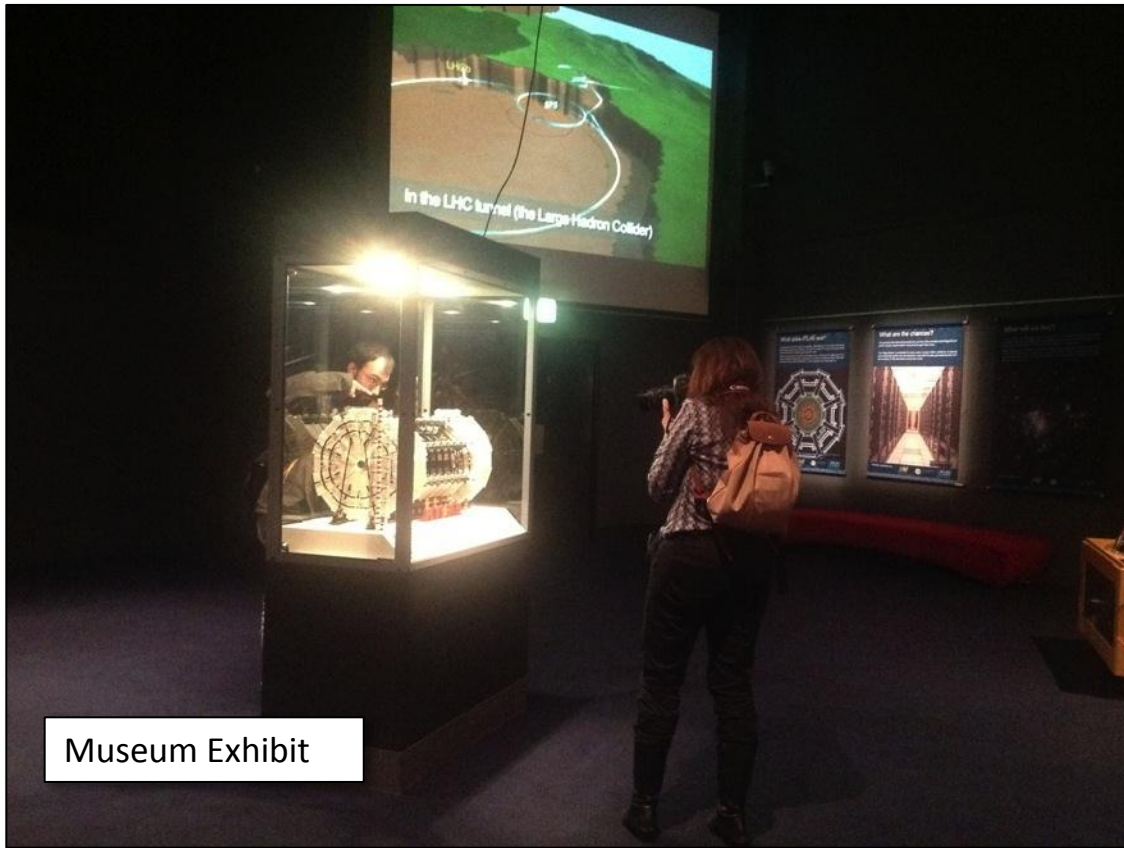


Masterclass



Panel Discussion

# IPPOG @ ICHEP (cont.)



Museum Exhibit



Radio



Press Room



# IPPOG @ WCPE (Istanbul)



## **Theme: The Role of Context, Culture and Representation in Physics Teaching and Learning**

500 physics educators, teachers, researchers, policy makers

**IPPOG Workshop** (Experiencing data analysis from the world's largest science experiment):

- ATLAS W-path measurement (90 min)
- Attendees from India, Iran, Czech Republic, China, Japan, Turkey, Portugal

### **Reception:**

- Fascinated by the idea of LHC data analysis in the classroom or at home
- Website seen as a pleasant (and useful) environment



# IPPOG @ ESOF (Dublin)



- Europe's largest general science meeting (5000 attendees)
- IPPOG 90min panel discussion:
  - **Best practice in sharing the research process with the public**
    - Paul Hix, German Museum Munich: established Open Research Laboratory on Nanoscience in the museum
    - Marianne Fokkens, Dutch National Natural History Museum: Museum opened up more of its collection and research to the public, interactive exhibitions and activities, e.g. crowdsourcing
    - Tom McCauley, QuarkNet / I2U2 / CMS
    - Michael Kobel, IPPOG
  - 100 participants, lively discussion

# IPPOG @ ESOF (cont.)



# IPPOG @ Conferences

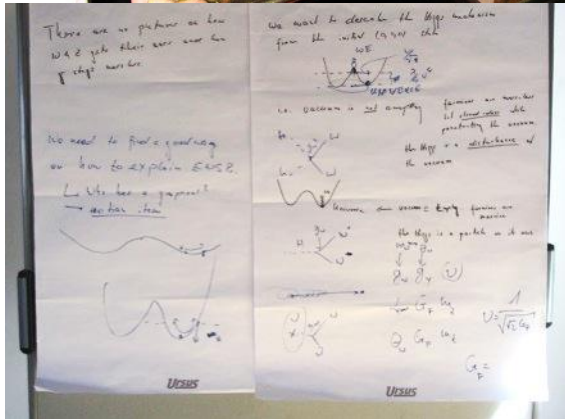


- International conferences are receptive to E&O sessions
  - Plenary talks very well attended
  - Parallel talks less well attended – especially when in parallel to sessions on new Higgs results!
- Perhaps try for EPS or Lepton/Photon in 2013...

# IPPOG Meeting @ Innsbruck



- Spring Meeting in Innsbruck, Austria, including visit to Hess' lab.



ECFA Plenary, November 22nd

IPPOG Report 2012, Dave Barney



# IPPOG Co-chairs



- Michael Kobel & Dave Barney reach the end of their 3-year mandate at the end of 2012
- Two co-chairs, rather than 1 chair, deemed most efficient, with increased IPPOG activities
- 3 candidates for next co-chairs:
  - Marge Bardeen (USA)
  - Hans Peter Beck (Switzerland)
  - Steven Goldfarb (ATLAS)
- Election to take place at IPPOG meeting 30<sup>th</sup> Nov.

# IPPOG: Summary (1)



- Much progress and additional activities in 2012
- Working Groups active between meetings
  - Especially group to develop simple – but correct – Higgs mechanism/boson explanations
- Expansion underway, with much interest
- Plans for 2013:
  - Continued **expansion** of IPPOG
  - Organization of International **Masterclasses** & help with spin-off programmes
  - Continued participation in **International Conferences** (already invited to MRS conference in San Francisco, spring 2013)
  - Further development of **web-site** and **database** to “package” materials for teaching purposes – but ***manpower needed***

# IPPOG: Summary (2)



- **Funding** (at a relatively modest level) is invaluable for many of our activities. Currently we are extremely thankful to:
  - **Helmholz Alliance (“Physics at the Terascale”), TU Dresden, EPS-HEPP, QuarkNet, I2U2, FNAL** for Masterclasses
    - funding from Germany ends at the end of 2012
      - Lost 80% funding of the DVDs distributed to all Masterclass participants (about 10k CHF)
    - CERN DG has agreed to take over funding of Masterclass central coordinator Uta Bilow (50% FTE) from January 2013 – ***thank you!***
  - 60% FTE @ CERN for database, organization: **CERN DG** (funding assured until end 2012)
    - **But Lisa McCarthy has now left; need to find a replacement for 2013-**