

IPPOG – EXPERTS IN BRINGING NEW DISCOVERIES TO THE PUBLIC

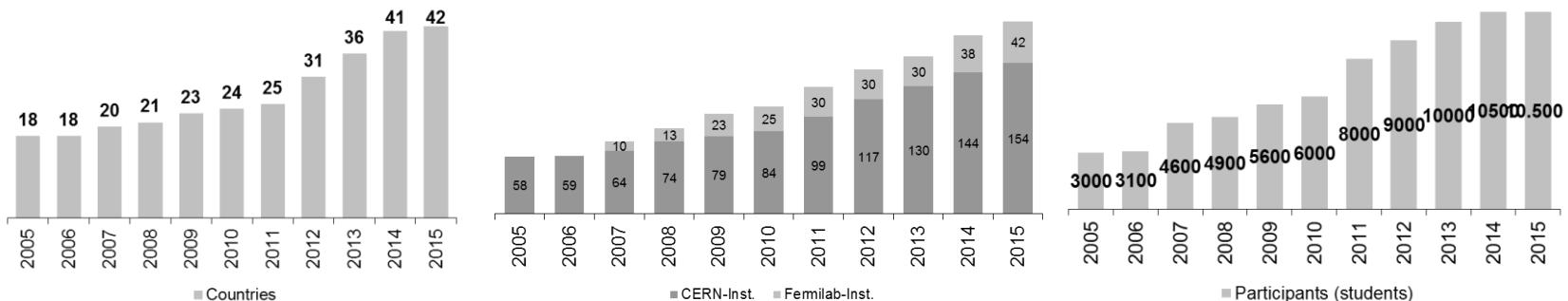
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International Particle Physics Outreach Group

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International Particle Physics Outreach Group

- IPPOG = unique mix of people (<http://ip pog.web.cern.ch>)
 - scientists, formal and informal science educators and explainers
 - from > 20 countries and prominent labs engaged in particle physics.
 - links to several national level science networks
- Flagship project: international masterclasses (www.physicsmasterclasses.org)



- Fostering other authentic international formats e.g. international cosmic day (<http://icd.desy.de>)



Open Science = Authentic Science

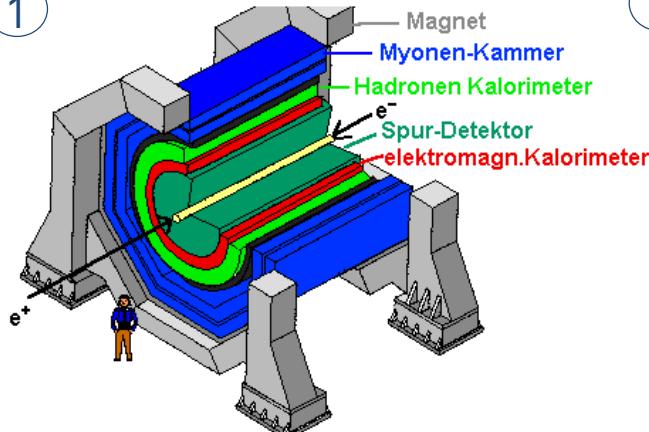
- ❖ Make public into scientists for a day
 - Active „hands-on“ involvement
 - hear = forget, see = remember, do = understand
 - boil down to essentials for enabling own measurements
 - As close as possible to current research
 - follow up what scientists have recently done
- ❖ Get insight into research process
 - use original methods and tools
 - compare the results to theories
- ❖ Authentic experience
 - Analyse real scientific data
 - Meet and discuss with active scientists



Example: ATLAS W path

<http://atlas.physicsmasterclasses.org/en/wpath.htm>

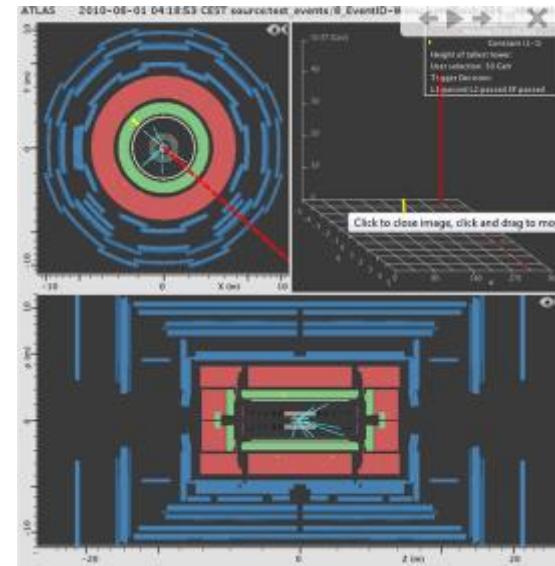
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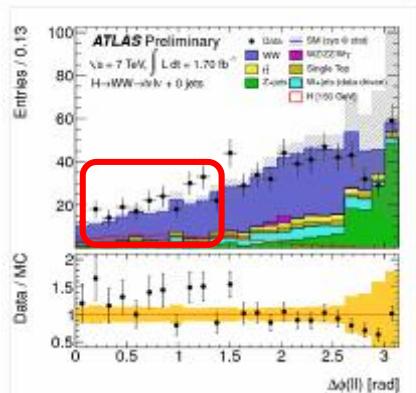
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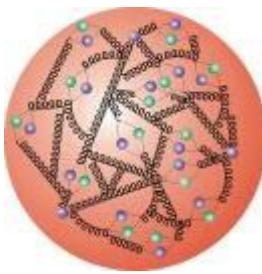
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6



5



4

group	N	bin 1	bin 2	bin 3	bin 4	bin 5	bin 6	bin 7	bin 8	bin 9	bin 10	Data		MC	
												W	WW	WW	WW
group A	3	0	1	2	3	4	5	6	7	8	9	12	13	14	15
group B	25	3.6	3.0	2.9	5.3	5.0	7	6	9	9.9	9.1	12	13	14	15
group C	95	2.4	8.4	2.9	2.7	17.9	16.4	4.1	2.9	1.9	1.8	12	13	14	15
group D	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group E	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group F	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group G	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group H	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group I	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group J	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group K	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group L	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group M	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group N	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group O	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group P	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group Q	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group R	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group S	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
group T	1	1.0	1.0	1.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0	12	13	14	15
Total	41	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	12	13	14	15
Ratio	ATLAS MC / W	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	12	13	14	15

Higgs signal accumulates at small angles

decay of W bosons → structure of the proton

1-day formats need sustainable support

- resource collections (all target groups)
 - IPPOG database (<https://ip pog.web.cern.ch/resources>)
 - CERN Open Data Portal (www.OpenData.cern.ch)
 - DESY Cosmic Muon web Interface (online autumn 2015)
- scientists + teacher/student networks
 - US QuarkNet
 - teachers join the research community at 52 centers nationwide
 - German Netzwerk Teilchenwelt www.teilchenwelt.de
 - 4 levels from masterclasses to research
 - Basic level: 24 institutes send Ph.D. students to schools (> 100 / year)
 - Interactions in Understanding the Universe I2U2 (FNAL et al.)
 - CMS e-lab: www.i2u2.org/elab/cms
 - student-led, teacher-guided online project in the class-room
- material tailored for school and university
 - Teilchenwelt material www.teilchenwelt.de/material + more to come
 - LEIFI web site www.leifiphysik.de/themenbereiche/teilchenphysik
 - Lab courses for university education

The screenshot shows a search interface for the IPPOG database. It includes a sidebar with filters for Learning Topics (Physics, Techniques, International Collaboration, Broader Impacts), Audience (Any), Resource Type (Any), Availability (Any), Duration (Any), Language (English, French, German, Spanish), and Key Words. Below the filters is a thumbnail image of a person working at a computer in a lab setting.



DISCUSSION

