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UNIVERSITY of
WASHINGTON



IPPOG International Masterclasses 2024 The Video Conference

IMC Moderators training

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12th February 2024

Moderators

Video Conference

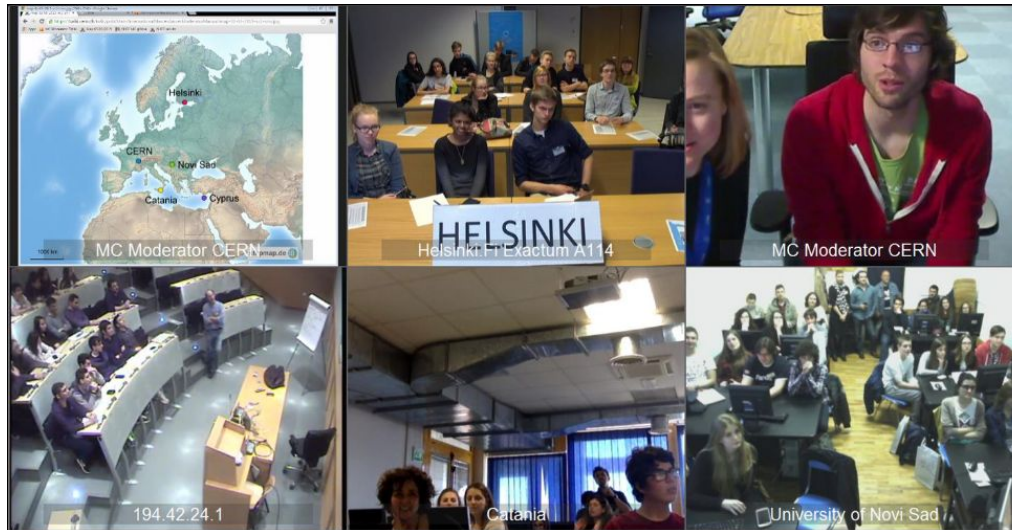
- You are going to be the face of CERN to hundreds of students around the world!
- In pairs you will hold a video conference via Zoom to a group of institutes who have all done the same masterclass exercise during their day.
- The video conference (VC) allows the students to come together to combine and discuss their results under your guidance in a light hearted and fun way.



Aims

Video Conference

- Convey the internationality of the event.
- Demonstrate how physicists work together internationally.
- Encourage students to exchange experiences between masterclasses.
- Demonstrate improvement in accuracy by combination of different data sets.
- Be a FUN end to a long day!



3-5 institutes
participating in
each session

General information

Video Conference

- [Moderators Manual](#) – has all the information you need for the VC!
- [Manual](#) has quick links and information
 - Bookmarked on the 'favourites' bar of the browser in the VC room

Preparation for the video conference

Prepare/upload all the material you will have to share, including:

- [intro slide](#)
- [masterclass map](#)
- [table/website](#) for combination of results
- [link](#) to quiz on Kahoot!

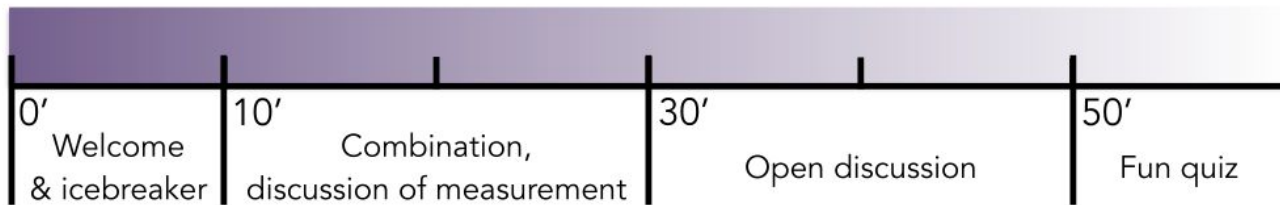
- Use Zoom to setup the video conference.
 - Moderators will have alternative host permissions, if they have a CERN Zoom account.
 - Step by step instructions are in the Twiki.
 - Make sure you know how to use the shared desktop.
 - Mute any noisy participants if necessary!

Timeline

Video Conference

Check the one-pager for moderators here:

https://twiki.cern.ch/twiki/pub/Main/InternationalMasterclassesModeratorManual/One_pager_for_moderators-2024.pdf



- One hour video conference (16h – 17h sharp) with 3-5 institutes.
- **If both moderators are at CERN:** Arrive at the correct room at 15:30 to get everything setup and prepared.
- **Otherwise (1 at CERN + 1 remotely or 2 remotely) :** connect to the correct Zoom meeting room 30 minutes in advance (i.e. by 15:30) to meet your co-moderator and get everything setup and prepared.
- **One location for the VC:** 4/S-020 except March 4-9 (31/2-028 during that week)
- Agree with your co-moderator which chat function you want to use to in case you need to communicate with each other during the video conference.
 - Option in Zoom to message the co-host.
 - Skype, Mattermost or other platform also fine if you prefer.

Welcome & Icebreaker Video Conference



The welcome has to be on schedule, clear and interactive!

- Students should immediately feel that this is a two-way conversation and they should actively take part in the VC.
- Introduce yourself, say a little about your research and explain where you are.
 - *"Hello! My name's Katharine and I work on the ATLAS detector. My research focuses on searching for new particles that can decay to two Higgs bosons."*
 - *"Right now we are sitting at CERN. CERN is the largest centre for particle physics research in the world and the place to be for a particle physicist"*
- Go through the VC timeline and explain what will be happening in the next hour.
 - Share the provided intro slide.

Welcome & Icebreaker Video Conference

- Share a map showing all the connected sites.
 - Use to explain to the institutes in which order they will be addressed (e.g. north to south).
- Ask one short, friendly question to each institute (sometimes suggested by the local organisers).
 - "Barcelona, how did you find the exercises today?"
 - "Vienna, have you seen the VERA accelerator?"
 - More ideas for questions available from the TWiki



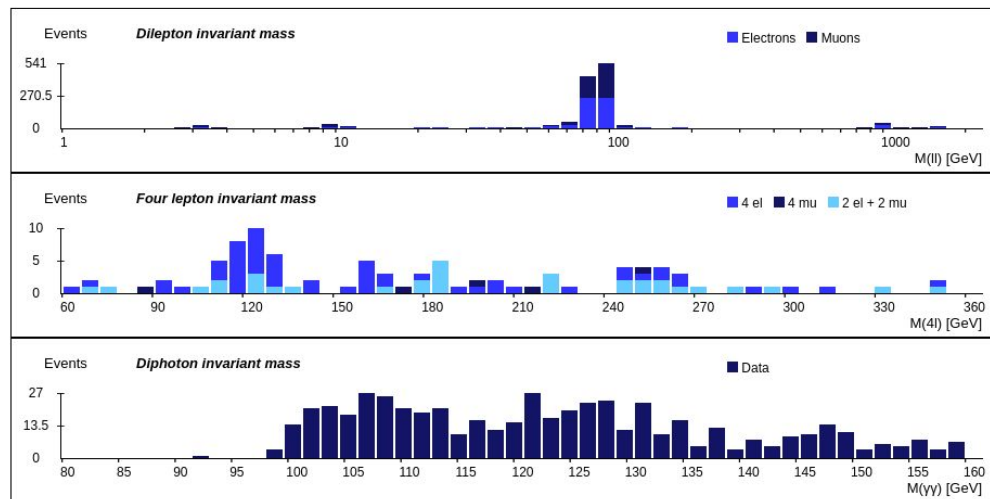
Discussion of measurements & Combination

Video Conference

- Share the combination results on Zoom.
- Summarise and comment on the combination.
 - Note that all groups in the VC have done the same measurement, but using different datasets.
 - Don't comment on results from individual institutes.
- Compare to the theory/experimental results.
- Stress why using different data from different sources is beneficial (stats and reduces bias).

OPLOT – MasterClass – Combination for all institutes on 2022-03-12

Start Student Moderator Tutor Administrator



Discussion of measurements & Combination

Video Conference

- Ask each group questions about their measurement.
- Questions have been pre-agreed by the authors of each measurement.
 - **Follow the individual training for the measurement you are doing!**
- Examples include:
 - Where are the peaks in the mass histogram? What do they represent?
 - How would you interpret the blue and green areas? What do they mean?
- See the TWiki for list of questions for each measurement.



Discussion of measurements & Combination

Video Conference

Example from ATLAS Z-path:

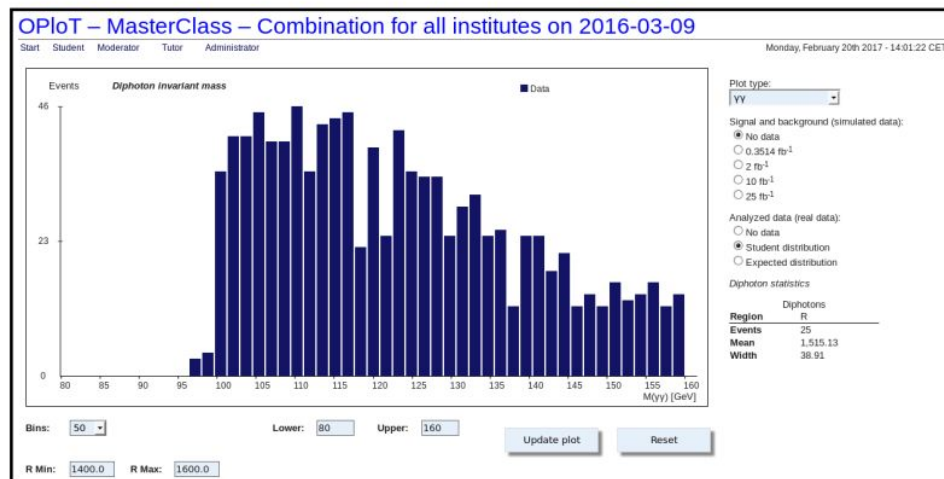
Moderators show the diphoton invariant mass distribution

Possible question:

Do you see a peak corresponding to the Higgs boson?

Moderator discussion:

Explain about statistical limitations of the measurements and that $H \rightarrow \gamma\gamma$ is a very rare process.



Open discussion

Video Conference

- Discussion expands to more open and general questions. They can be on anything from...
 - Life at CERN.
 - LHC size/magnets/cost/power consumption.
 - The Big Bang, dark matter, black holes, time travel...
 - How to become a particle physicist.
- Repeat/rephrase the question to:
 - Make sure you understood correctly.
 - Help other groups understand.
- Ask the institutes to come up with more general questions. 1 question per institute per round.

Give concise, interesting answers!



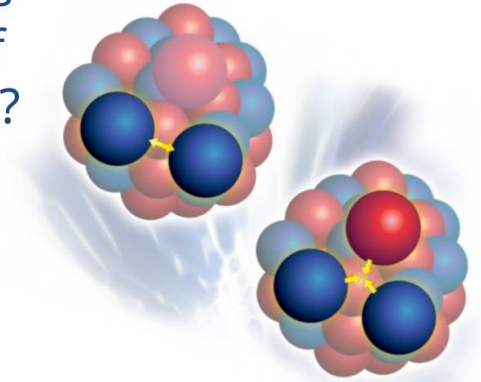
Quiz

Video Conference

“Who Wants To Be A Millionaire” style quiz

- Seven multiple-choice questions.
- Correct answer revealed after each question.
- Each student plays alone and can share their answer with the colleagues.
- No comparisons, no prizes!

Which particle is the mediator of the strong force?



1

A. Neutralino

B. Z boson

C. Gluon

D. Quark

Quiz

Video Conference

1. Read out question
2. Start timer
3. Reveal correct answer and answer choices

1

A. Neutralino

B. Z boson

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D. Quark

Goodbye Video Conference

There must be a clear and common end to the VC after one hour.

- Say goodbye to everyone and thank them for taking part.
- Do not keep discussion going even if the students are still asking questions.
 - If they and you want some discussion can continue after the goodbye on a voluntary basis.



Summary

Video Conference

- Arrive 30 minutes before the start of the VC.
- Set up the Zoom conference following the step by step instructions on the TWiki (instructions also in the manual).
- Have the “one pager for moderators” document to hand.
- Download the map - this must be done each time (also available in the Twiki).
- Have the link to the tables for the combination already open.
- Agree with your co-moderator in advance who will do each step.
- Follow the suggested timeline where possible, but use some common sense too.
 - e.g. if there are few institutes joining and the students do not have lots of questions then you may finish a bit early - that’s fine!

All the info you need is on the TWiki and in the manual:

- <https://twiki.cern.ch/twiki/bin/view/Main/InternationalMasterclassesModeratorManual>

Things it should not do

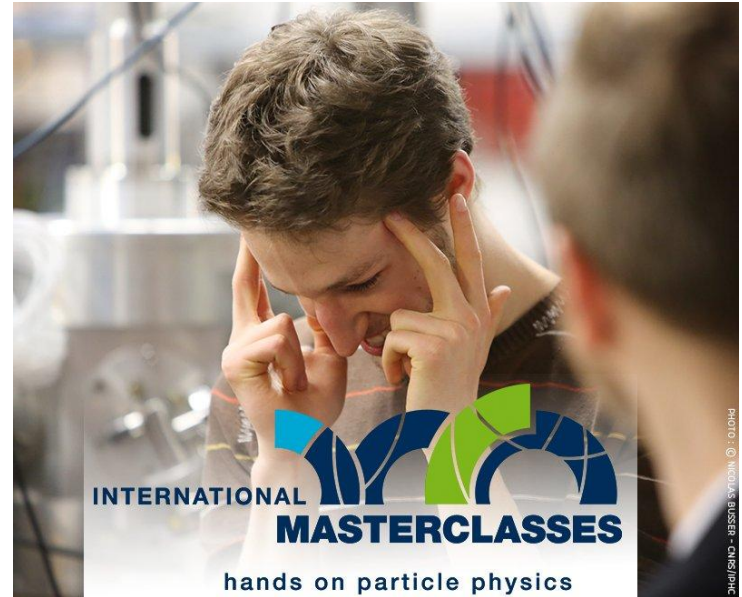
Video Conference

Things it should not do:

- Provide a deeper understanding of the physics.
- Teach English to the students.
- Contain a basic discussion of the measurement.
- Create a competition between the institutes.

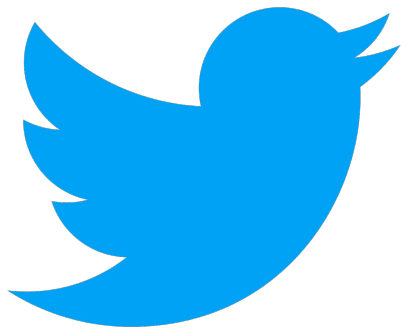
Before your first moderation:

- Feel free to observe one of the other video conferences before moderating your first session - ask in the Mattermost for the Zoom link.
- Join the Mattermost channel for moderators - join [here](#)
 - Ask questions to organisers or other moderators.
 - Provide fast informal feedback to us about what's working well and what isn't.



Social Media Video Conference

- Feel free to post on Twitter!
 - Interesting questions you were asked.
 - Anything unusual or interesting with the combination.
 - Links you wish to share.



#LHCIMC
[@physicsIMC](https://twitter.com/physicsIMC)



physicsIMC

@physicsIMC Follows you

International Masterclasses is where high-school students become particle physicists for one day: [#physicsIMC](https://twitter.com/physicsIMC)

📍 everywhere 🌐 physicsmasterclasses.org 📅 Joined November 2015

274 Following 1,575 Followers

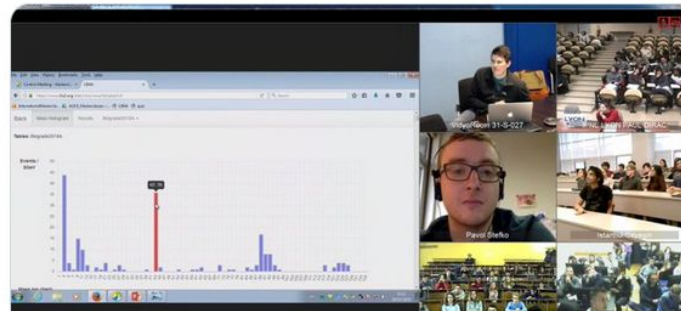


physicsIMC

@physicsIMC

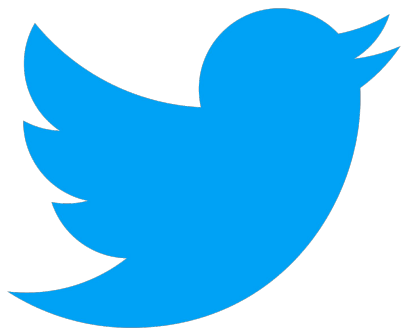


Discovery? Moderators at [@CERN](https://twitter.com/CERN) are discussing a peak in students' histogram with [@CMSexperiment](https://twitter.com/CMSexperiment) data.



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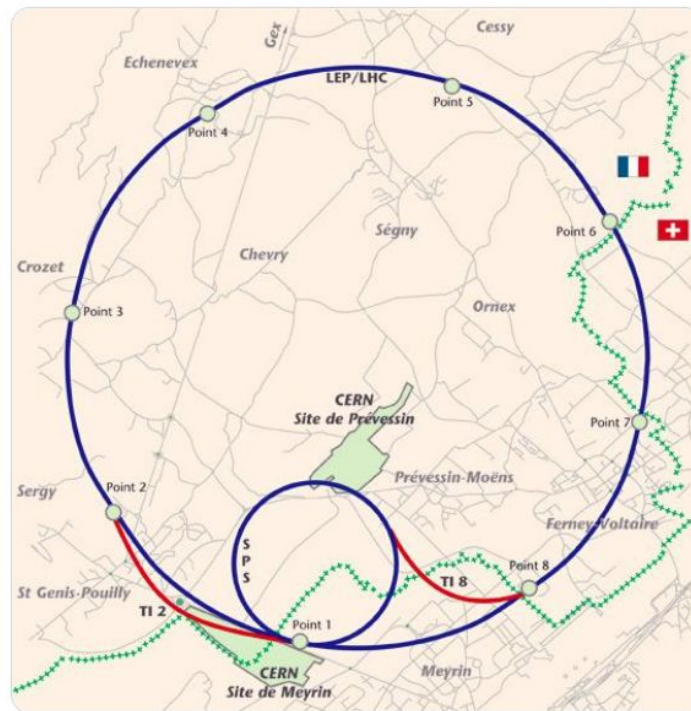
#LHCIMC
[@physicsIMC](https://twitter.com/physicsIMC)



Dr. Ina Carli
@Ina_Carli

Replying to @physicsIMC @uniwue and 2 others

#ICYI Answer to a question from yesterday's #LHCIMC18 I was not sure about: about 2 out of 8 sectors = 1/4 of LHC are under Switzerland, have a look on map here or on natronics.github.io/science-hack-d...



And finally!

Video Conference



Join us for the moderators coffee time:
every Tuesday from 10:30 - 11:00 in this [link](#)
Mattermost channel: [here](#)

Smile, initiate two-way conversations with the students, meet your colleagues and have FUN!



Thanks!