

INTERNATIONAL MASTERCLASSES HANDS ON PARTICLE PHYSICS

IMC SG meeting
18.05.2021, Zoom





Hands on Particle Physics Masterclasses

SCHEDULE 2021

At the end of each Masterclass day a videoconference between the institutes and with moderators at CERN, at Fermilab, TRIUMF, KEK, or GSI is established. Choose your moderation center to see the schedule for 2021!



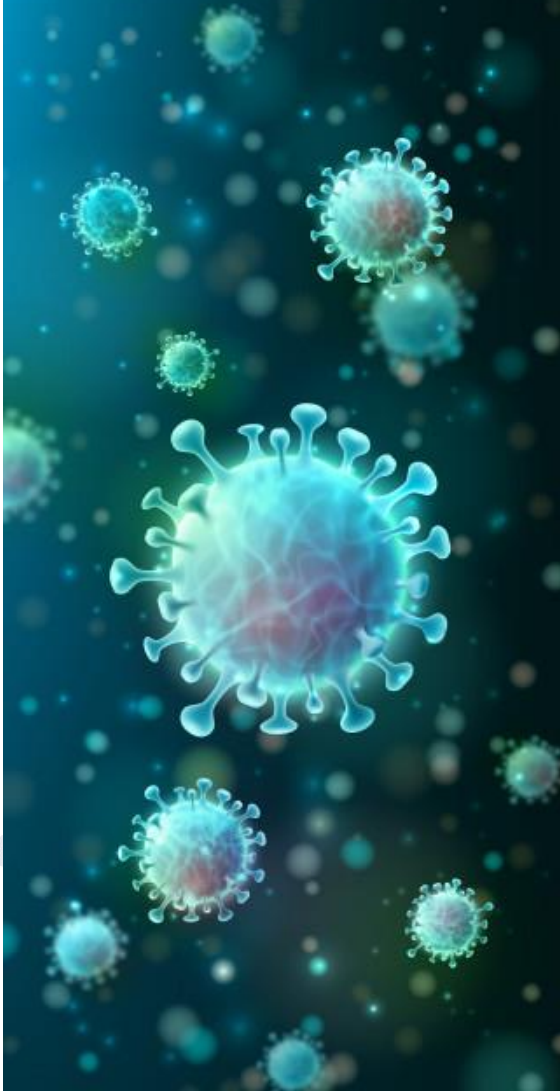
© CERN



© Fermilab



Results and statistics from IMC21



- Pandemic forced us to go completely virtual
- Nearly all Masterclasses given online
- Institutes adapted very quickly, although a considerable number withdrew their registrations, often on short notice (for CERN: 24 %)
- Increased support effort, for all groups involved
 - Recommendations for institutes
 - Question times for tutors
 - Instructional sceencasts for students
 - Moderators' orientation with prerecorded videos, office hours, weekly coffee breaks
 - and of course a huge amount of extra work from all institutes and tutors

Great help from Ina Carli, Katharine Leney

Statistics for IMC21

LHC Masterclasses

136 MCs with CERN VC (275)

- 57 ATLAS (128)
- 35 CMS (66)
- 22 LHCb (43)
- 22 ALICE (38)

38 MCs with Fermilab VC (50)

- 23 CMS (35)
- 5 ATLAS (15)

5 MCs with TRIUMF VC (3)

MINERvA Masterclasses

11 MCs (18),
7 VCs (7)

Belle II Masterclasses

10 MCs (14),
3 VCs (3)

Hadron Therapy Masterclasses

33 MCs (24),
6 VCs (5)

5192 unique viewers
(from Zoom reports)

240
students

(xx) = numbers from 2020

Introduction to Masterclasses for Physicists, APS April Meeting 2021



Submitted by kcecire on Fri, 03/19/2021 - 10:40

LHC Masterclass Library 2021

Friday 16 April 2021, 11:00 am to 1:00 pm U.S. Eastern Time

Small URL for this page: <http://tiny.cc/imc-aps-apr21>.

Interested? Register to reserve your place!

Agenda

Time (ET)	Activity	Comments
11:00	Greetings and Introduction to International Masterclasses (Bilow, Cecire)(slides)	
11:20	Session 1: Introduction to and try-out of a masterclass measurement	Breakout rooms (slides and resources, if any, below)
12:05	Transition and brief comments	
12:15	Session 2: Introduction to and try-out of a masterclass measurement	Breakout rooms (slides and resources, if any, below)
13:00	End of formal program	may remain for discussion

Masterclass measurements to be offered

1. ALICE Strange Particles (measurement: CERN server, Warsaw server, Trieste server) (results)
2. Belle II (slides)
3. CMS WZH (iSpy) (CIMA)
4. Dark Side
5. LHCb
6. MINERvA Neutrino (slides)
7. Particle Therapy (slides)

<https://tiny.cc/imc-aps-apr21>

IMC@conferences and @schools

- Heavy Ion Therapy Masterclass School, virtual, 17.-22.5.2021
<https://indico.cern.ch/event/1024183/>
- EPS-HEP conference, virtual, 26.-30.7.2021
<https://indico.desy.de/event/28202/overview>
- vCONF2021 (Quark Confinement and the Hadron Spectrum conference, virtual), 2.-6.8.2021 <https://indico.uis.no/event/2/>
- ?JENNIFER2 summer school, 19.-27.7.2021
<https://indico.belle2.org/event/4071/> ?
- ?...

Presentation on
International
Masterclasses

Contribution on
International
Masterclasses

Introduction to
Masterclasses for
physicists

2 ideas worth to be pursued

- "Which book(s) would you recommend to someone who wants to learn about particle physics?" There is probably no universal answer for this (language/availability of translations also matter), but it could be good to think about which divulgative titles are useful to interested high-schoolers.
- Has the IMC ever been run for groups other than high-school students? It could be an interesting experiment to try running an IMC-inspired event for interested laypeople, perhaps with a relaxed timetable, e.g. introduction videoconference on Monday, data analysis through the week coordinated via a Slack channel or similar, then the closing webinar on Friday. I think that the online format would be perfect for this sort of extension to the usual masterclass audience.

In Memoriam: Salvador Carrillo



Salvador Carrillo
Universidad
Iberoamericana, Mexico

Backup slides for report Masterclass Steering Group on Wednesday

Moderators



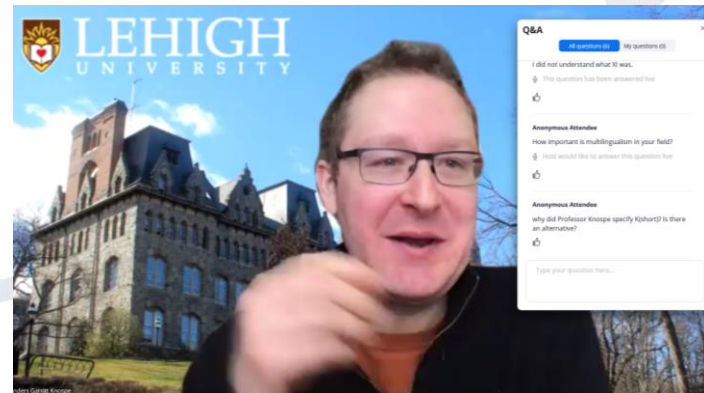
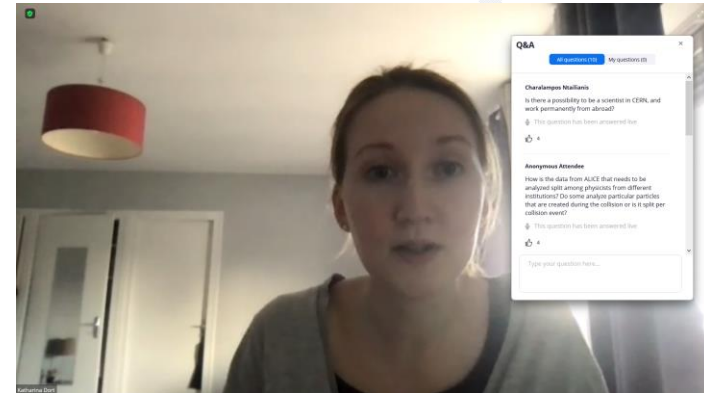
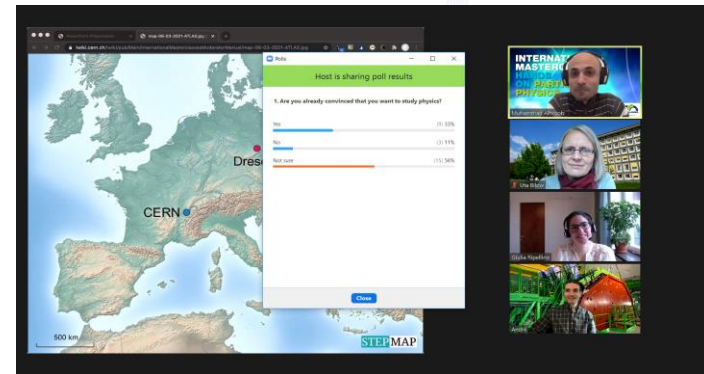
“

I did this masterclass in 2012 when in high school and that's why I decided to study physics so I would love to encourage people to join our community.

”

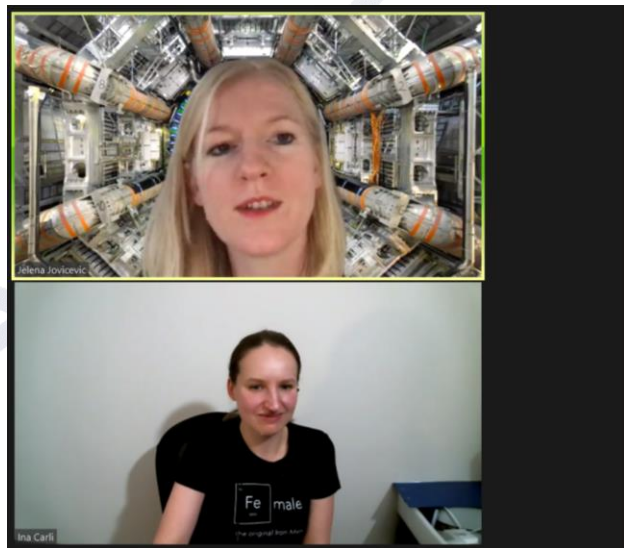
CERN Videoconferences

- Zoom webinars
- Icebreaker polls
- Q&A function
- Quiz via kahoot
- 3 moderators, incl. 1 technical moderator
- Very positive feedback from tutors and moderators
- Zoom works very stable
- All students involved via polls
- Lively discussion via Q&A function, many questions
- Trouble-free process
- but: Webinar style lacks personalization



Int. Day of Women and Girls in Science

- On Feb 11th
- MCs for girls http://physicsmasterclasses.org/index.php?cat=women_in_science
- 7 groups participating (17)
- 290 students/unique viewers (600)
- Female lecturers and tutors (as much as possible)
- 3 videoconferences at CERN (4)
- 6 female moderators



Anonymous Attendee 04:36 PM
 What has been your academic background?
 This question has been answered live

Júlia Cedra 04:37 PM
 Hello, thank you so much for inspiring all of us! I would like to ask you if your work as experimentalists mostly include proving a preconceived theory or developing new ideas as you receive strange yet fascinating results?
 Ina Carli would like to answer this question live.

carola fiorini 04:38 PM
 Sorry for the question, but how old are you?
 This question has been answered live

Mallu Seltis - São Paulo 04:38 PM
 What is the most exciting thing about physics for you personally?
 Type your question here...

First International Masterclasses of ALICE held in JU

STATE TIMES NEWS
JAMMU: On the occasion of International Day of Women and Girls in Science (IDWGIS), a one-day online event 'Hands-on Particle Physics Masterclasses @JU' was organised by the High Energy Physics (HEP) group of the Department of Physics, University of Jammu for high school/college/university girl students. It was the first time that International Masterclasses in Particle Physics was organised in India.

The International Masterclasses programme is organised by Institute of Nuclear and Particle Physics (INPP) Dresden and QuarkNet Collaboration. The inaugural session was attended and addressed by the chairperson of ALICE-India Collaboration Dr Zubayer Ahammed from VECC, Kolkata, spokesperson of ALICE-India Collaboration Prof. Indragu Bhattacharya from NISER, Odisha, Dr Deepina-Hatzifotiadou outreach coordinator of Council for Nuclear Research, TU Dresden, US National Science Foundation and the US Department of Energy.

The High Energy Physics (HEP) group at University of Jammu as part ALICE experiment at LHC, organised International Masterclasses for girls students in which 40 girl students registered to become part of learning experience of its kind. The event started with an inaugural session where the coordinator of the event Dr Hasmni Gupta, Associate Professor of Physics in the department of Physics. The inaugural session was attended and addressed by the chairperson of ALICE-India Collaboration Dr Zubayer Ahammed from VECC, Kolkata, spokesperson of ALICE-India Collaboration Prof. Indragu Bhattacharya from NISER, Odisha, Dr Deepina-Hatzifotiadou outreach coordinator of Council for Nuclear Research, TU Dresden, US National Science Foundation and the US Department of Energy.

The High Energy Physics (HEP) group at University of Jammu as part ALICE experiment at LHC, organised International Masterclasses for girls students in which 40 girl students registered to become part of learning experience of its kind. The event started with an inaugural session where the coordinator of the event Dr Hasmni Gupta, Associate Professor of Physics in the department of Physics. The inaugural session was attended and addressed by the chairperson of ALICE-India Collaboration Dr Zubayer Ahammed from VECC, Kolkata, spokesperson of ALICE-India Collaboration Prof. Indragu Bhattacharya from NISER, Odisha, Dr Deepina-Hatzifotiadou outreach coordinator of Council for Nuclear Research, TU Dresden, US National Science Foundation and the US Department of Energy.

Dignitaries participating in a webinar

ALICE experiment, Prof. of ALICE-India Collaboration, participants, family, and scholars of the Department of Physics, also attended by members University of Jammu. The

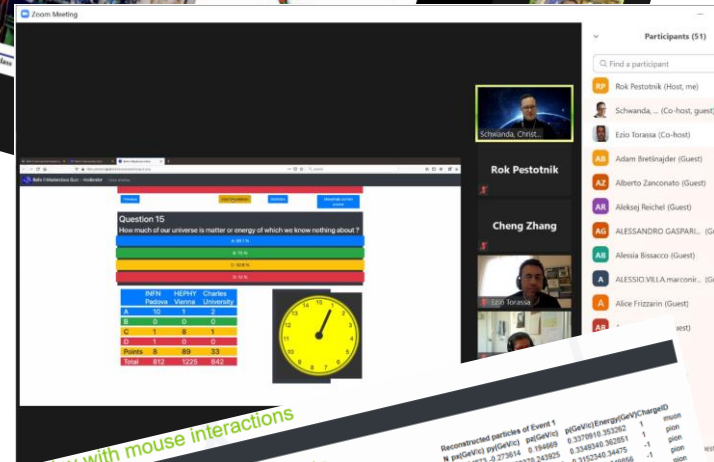
resource persons for first session (Talks Discussion) of the were Dr. Deepina Hatzifotiadou, Prof. A. Bhassin, Prof. Rami G. Associate Professor, Meenakshi Sharma, P. Student of IIT Guwahati, University of Jammu.

A hands-on session conducted by team of P. students of HEP group University of Jammu. Later in evening, participants connected to video-conference with moderators from the CERN shared and compared results of the exercises those obtained by other institutes (CTU, Prof. and Theodoros, Greece) who also had organised ALICE Masterclasses. Participants of the event interacted with the moderators and asked various questions related to ALICE, and life of women in particle Physics.

BELLE II IMC in 2021

SARS-CoV-2 affected -> all events online

- ❖ The events announced through IMC and Belle II collaboration channels
 - ❖ **No interest from Asia and USA for events at different timezones**
 - ❖ **Europe** - 3 events with a video conference at 16:00 CET



	Institutes	Participants
Mar. 4 2021	4	127
Mar. 11 2021	3	63
Mar. 18 2021	3	50

- ❖ Intro for tutors:
 - ❖ Belle II General Meeting, Feb. 5, 2020, Belle II **Masterclasses tutorial**
 - ❖ **Question time**, Feb 24, 14:00-15:00 CET
- ❖ Belle II MC Website upgraded - 64 CPUs, 32GB RAM
- ❖ <https://belle2.ijs.si/masterclass/>
 - ❖ able to handle data processing of more than 250 parallel users
 - ❖ Event display added (not used before)
 - ❖ Online quiz



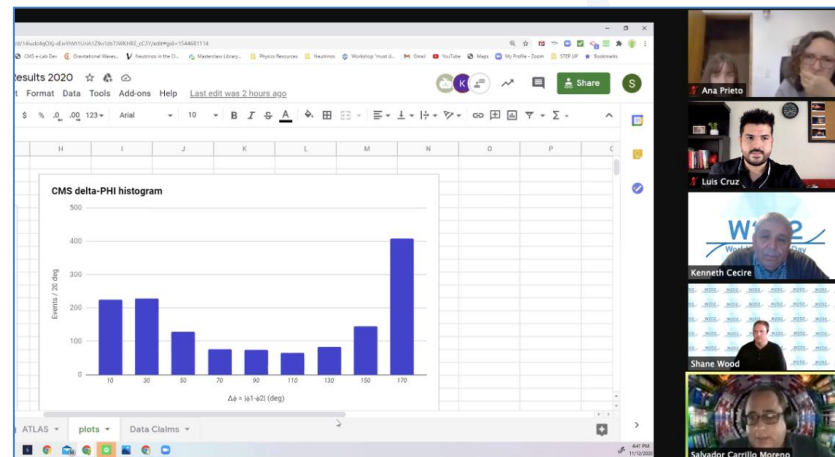
QuarkNet and Fermilab

- CMS
 - New 1-, 2-, and 4-lepton measurement
 - Introduced in IMC 2020, cut short
 - Re-introduced in IMC 2021 with success
 - CIMA glitches remain
- Neutrino Masterclasses
 - MINERvA again successful
 - Currently changing servers
 - Working on new masterclasses: ProtoDUNE and NOvA in the pipeline



Satellite Masterclasses

- World Wide Data Day
 - 12 November 2020
 - ATLAS phi and theta, 25 schools
 - CMS phi and delta-phi, 16 schools
 - Great moderators!



- Big Analysis of Muons
 - Next week! 36 registrations!
 - ATLAS 2- and 4-muon masses
 - CMS 2- and 4-muon masses, W+/W-
 - Need moderators!

- Off-shell
 - Local institutes
 - Anytime
 - South America ATLAS – español – summer 2021