

INTERNATIONAL MASTERCLASSES HANDS ON PARTICLE PHYSICS

General introduction to IMC

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Concept of Masterclass

High school students (16-19y)

- are made „scientists for one day“
 - usually at research lab
 - during pandemic also online
- are informed about central findings in HEP research and open questions
- get insight into methods and organisation of HEP research (international collaborations)
- learn to identify different particles, categorize events, do a measurement of a physics variable, combine results to improve results, understand pre-conditions for claiming a discovery



Sample Agenda (non-COVID)

8:30 - 9:00

registration & welcome

9:00 - 10:00

introduction to Particle Physics
(standard model, detectors,
accelerators)

10:30 - 11:30

second talk or tour

12:00 - 13:00

lunch

13:00 - 15:00

data analysis: measurement
with LHC data (ALICE, ATLAS,
CMS, LHCb)

15:00 - 16:00

local combination + discussion

16:00 - 17:00

Zoom videoconference
(webinar) with CERN



International Masterclasses

- Worldwide effort, key activity of IPPOG (International Particle Physics Outreach Group)
- coordinated by TU Dresden and Ken Cecire, QuarkNet/U. Notre Dame
- 2022: 25.02. – 05.04.
- ~ 58 VCs at CERN, ~ 20 at Fermilab



CERN videoconference schedule

- Always from 16-17 CET
 - single exception on March 5 (13-14 CET)
- Virtual international collaboration
- 2 or 3 moderators in each VC
- See example from 2021:

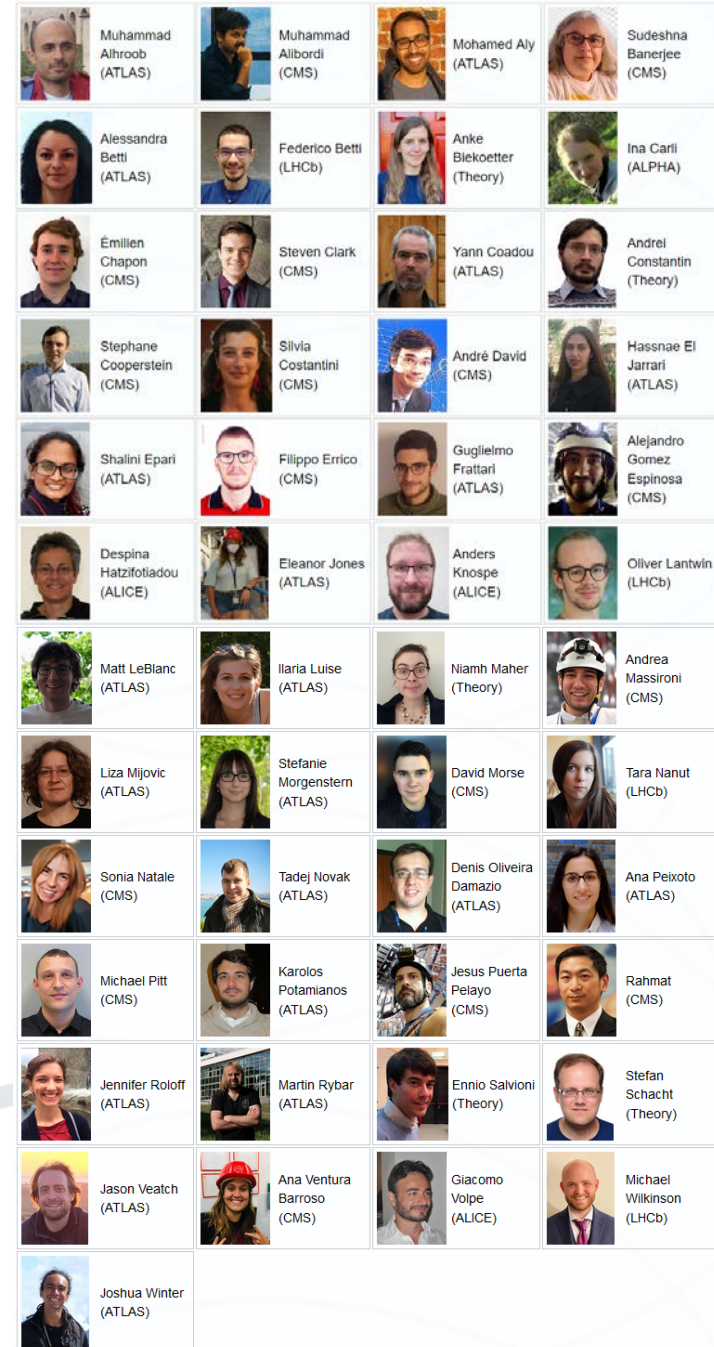
15.03. - 20.03.2021

	Mon, Mar 15	Tue, Mar 16	Wed, Mar 17	Thu, Mar 18	Fri, Mar 19	Sat, Mar 20
topic	VC 1: ATLAS Z	VC 1: ATLAS Z	VC 1: ATLAS W	VC 1: ATLAS Z	VC 1: ATLAS W	VC 1: ATLAS Z
moderators	Jennifer	Meirin	Denis	Christos	Martin	Ana P.
moderators	Tadej	Shalini	Martin	Denis	Meirin	Jelena
moderators		Vasiliki	Stefanie	Jelena	Stefanie	Michael P.
	Afula 	Amsterdam 	Madrid IFT 	Oxford 	Prague CTU 	Novi Sad
		Afula 	Swansea 	Saclay 	Bologna 	Lisbon IST
		Oxford 	Regensburg 	Bergen 	Orsay 	Coimbra
		Saclay 	Parma 	Nis 	Krakow AGH 	São Tomé and Príncipe
			Edinburgh 	Sharjah 	Copenhagen 	Porto
topic	VC 2: CMS	VC 2: LHCb	VC 1: ALICE	VC 2: LHCb	VC 2: CMS	
moderators	Jónatan	Carla	Anders	Alex	Émilien	
moderators	Kathryn	Lakshan	Stefania	Carla	Jesus	
moderators	Steven	Mick		Tara	Stephane	
	Turin 	Ferrara 	Bologna 	Cincinnati Anderson 	Padova 	
	Zagreb 	Bari 	EKFE Kantrou 	Rio de Janeiro UFRJ 	Tbilisi GTU 	
	Santo André UFABC 		Salerno 	Birmingham 	Bari 	
	Palaiseau 		EKFE Khanion 	Bologna 	Istanbul, Ozyegin 	
	Perugia 		Trieste 	Syracuso 	Athens Democritos 	
			Mexico UNAM 			

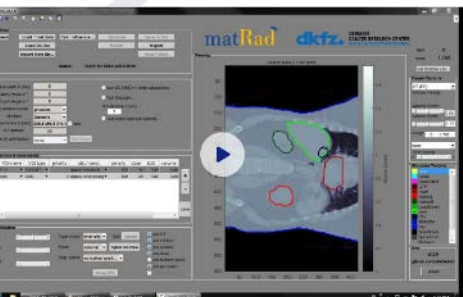
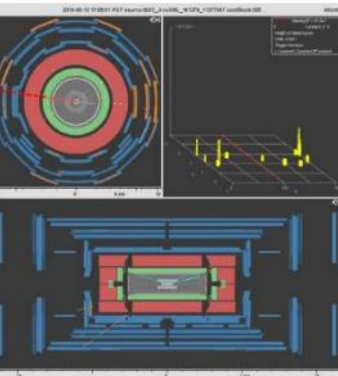
https://physicsmasterclasses.org/index.php?cat=schedule&page=schedule_2022

Moderators

- > 50 physicists
- Gallery at https://physicsmasterclasses.org/index.php?cat=schedule&page=schedule_2022#moderators
- e-group: ippog-masterclass-moderators@cern.ch



Brief History of IMC

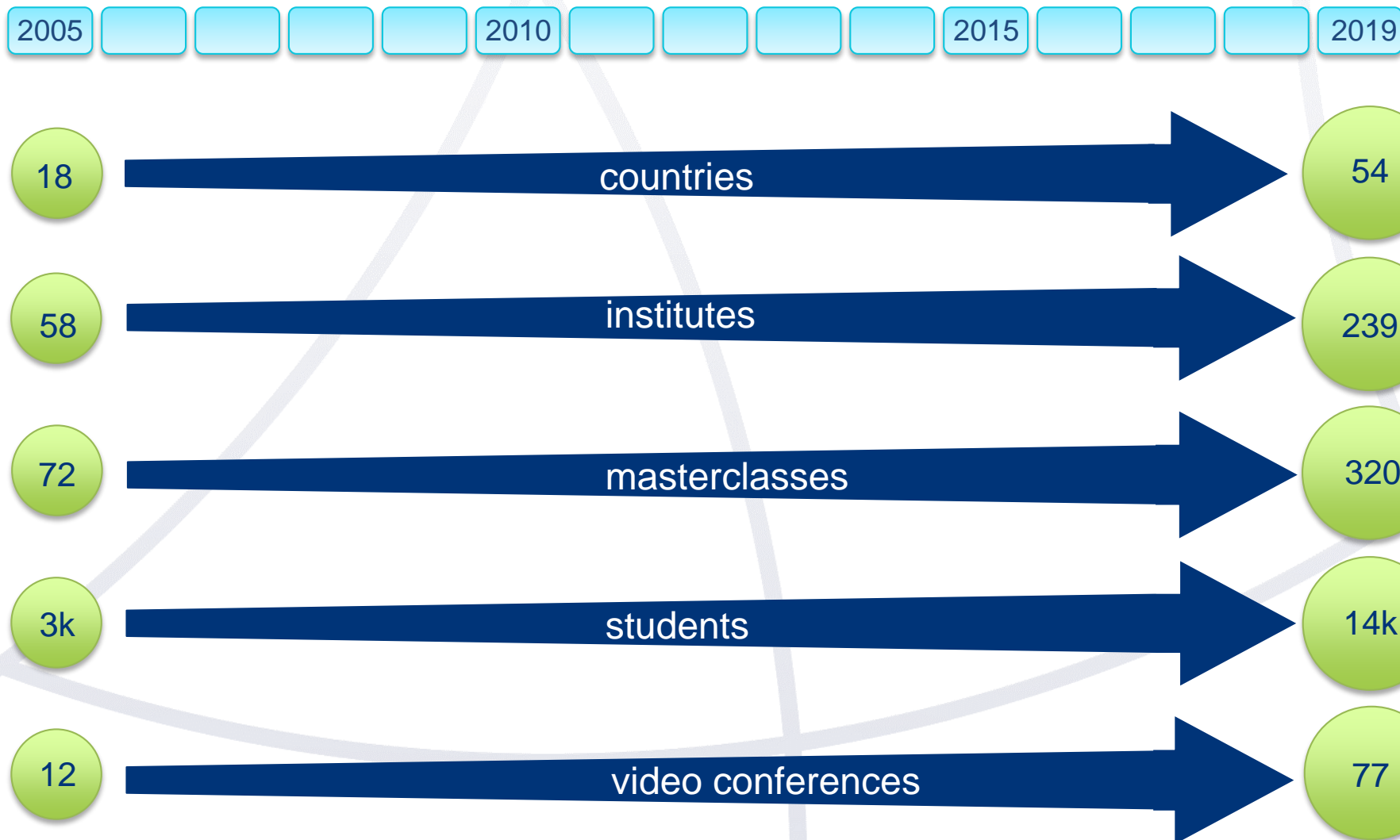


- Idea from UK, 1996 (R. Barlow et al.)
- 1997: 1. Masterclass with 7 institutes (LEP data)
- 1998 nationwide uptake
- 2005: Adopted by (E)IPPOG for all Europe
- 2006: U.S. joined program (QuarkNet)
- 2011: LHC-based Masterclasses
- 2014: all 4 LHC experiments involved
- 2019: MINERvA Neutrino Masterclass
- 2020: Belle II Masterclass (KEK videocon) and Particle Therapy Masterclass (GSI videocon)

<https://cerncourier.com/cws/article/cern/55890> (How it all begun)

<https://cerncourier.com/cws/article/cern/57305> (MC in the LHC era)

Statistics International Masterclasses



Thank you for being part of IMC22!



Enjoy your sessions!