

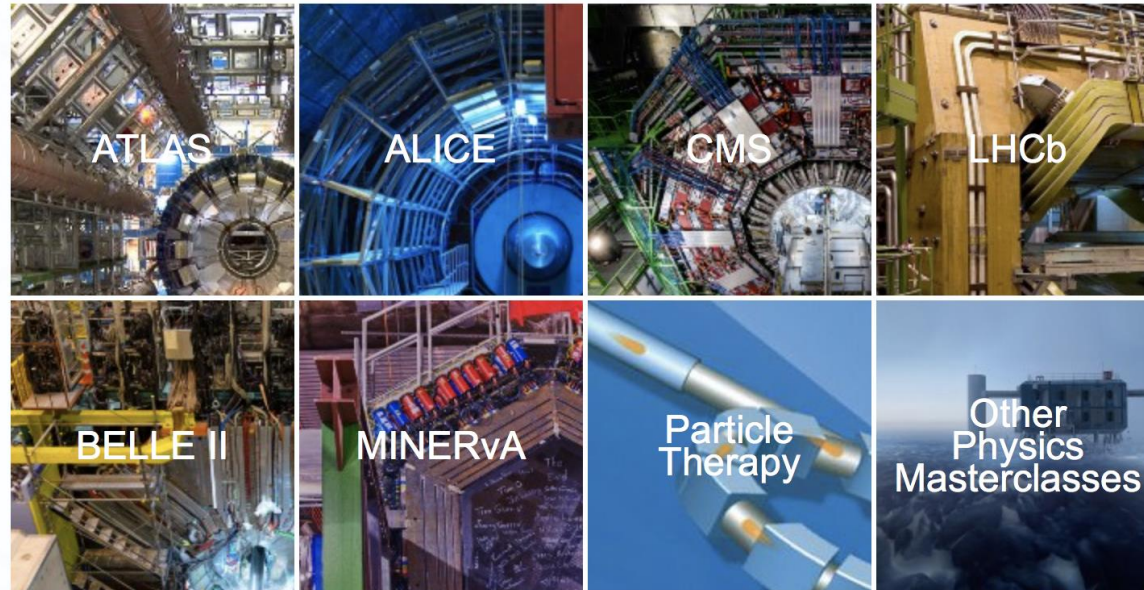
INTERNATIONAL MASTERCLASSES



International Masterclasses

18th International Masterclasses 2022

<https://physicsmasterclasses.org/>



Yiota Foka (GSI/CERN)

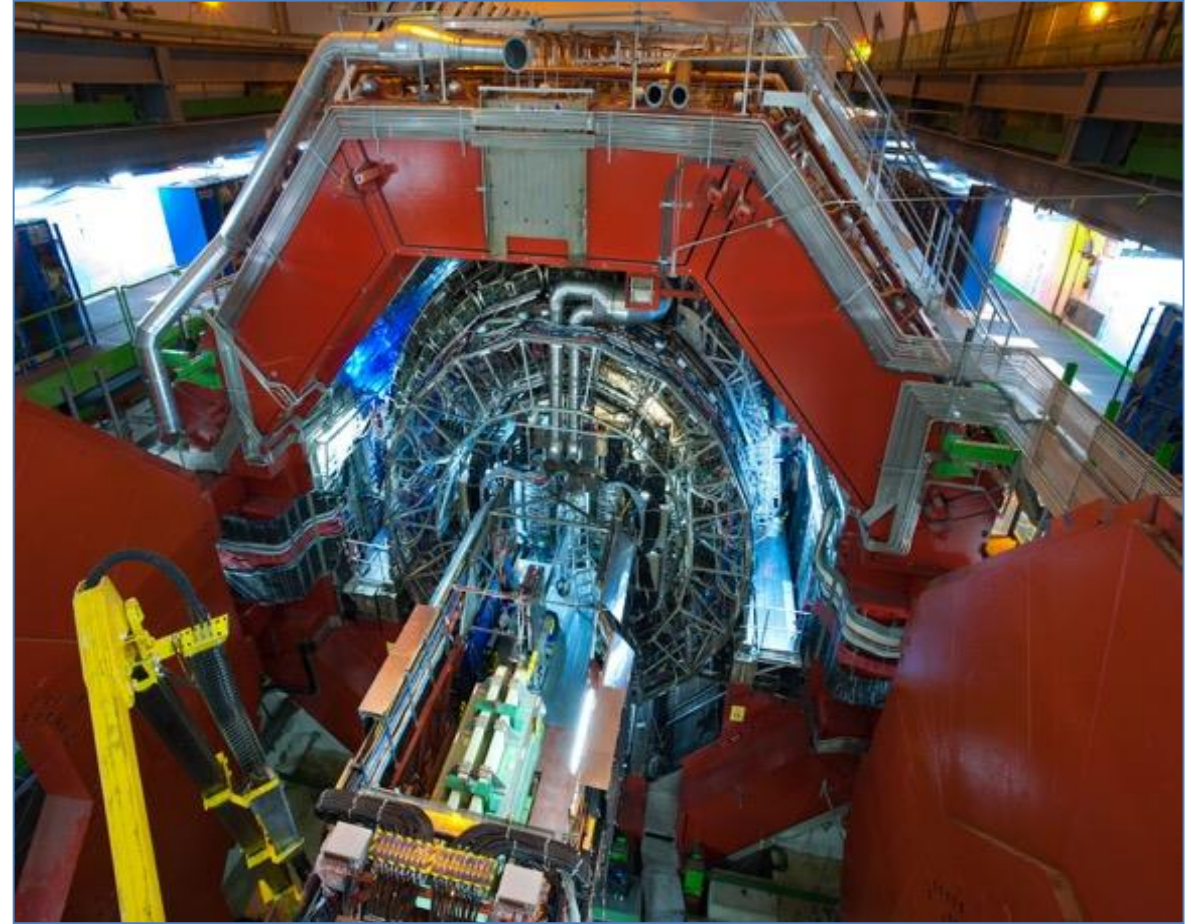
on behalf of

IPPOG and IMC Steering Group



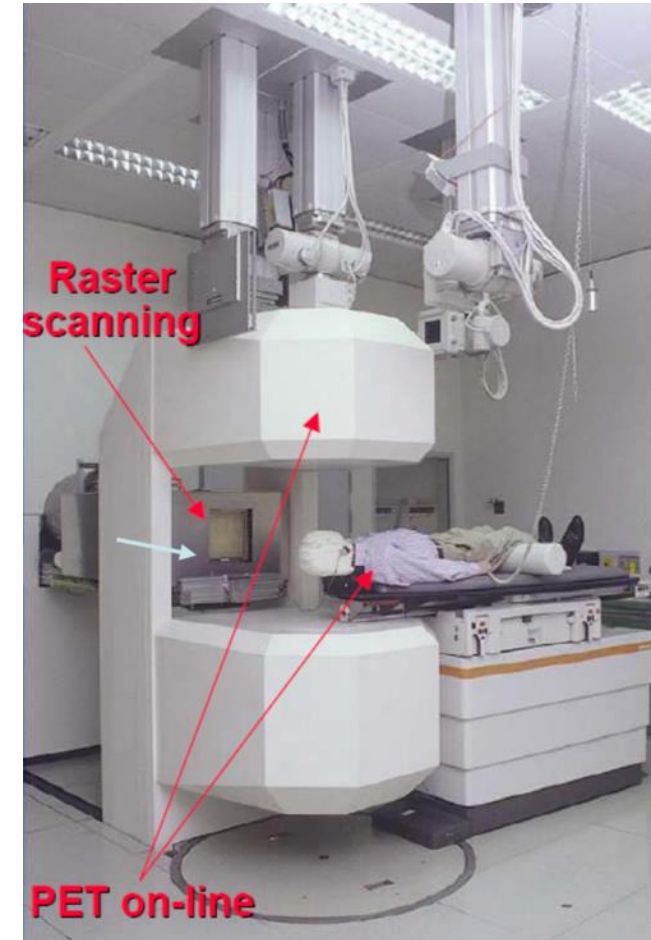
Heavy-ion research and heavy-ion therapy

Heavy-ion Physicist, involved with medical applications of heavy-ions for cancer therapy



Virtual visit: ALICE heavy-ion experiment at CERN.

Heavy-ion research and heavy-ion therapy at GSI



Pioneered heavy-ion (carbon) therapy for cancer tumours in Europe (90s).

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 **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. The schedules for 2021 will be created early in 2021.



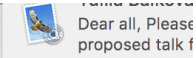
<https://indico.cern.ch/event/840212/>



PTMC IMC Schedule

07.03. - 12.03.2022

Online week for remote Masterclasses! Students connect individually to the videoconference



	Mon, Mar 07	Tue, Mar 08	Wed, Mar 09	Thu, Mar 10	Fri, Mar 11	Sat, Mar 12
topic	VC 1: ATLAS Z	VC 1: ATLAS Z	VC 1: ATLAS W	VC 1: ATLAS Z	VC 1: ATLAS Z	VC 1: ATLAS Z
moderators	Alessandra	Eleanor	Andrei	Martin	Joshua	André
moderators	Denis	Guglielmo	Émilien	Shalini	Mohamed	Mohamed
moderators	Stefanie	Mohamed	Tadej	Ennio	Shalini	Joshua
	Napoli 	Napoli 	Rome, Tre 	Pisa 	Strasbourg 	Covilhã
	Krakow 		Oujda 		Lecce 	Coimbra
			Erlangen 			Novi Sad
						Évora
						Beja
topic	VC 2: CMS	VC 2: ALICE	VC 2: CMS	VC 2: LHCb	VC 2: ALICE	
moderators	Alejandro	Anders	Jesus	David F.	Despina	
moderators	Muhammad Alib.	Stefania	Michael	Maria	Giacomo	
moderators			Stephane	Michael	Stefania	
	Trieste 	Tehran, TIS 	Split 	Bonn 	Mexico, UNAM 	
	Benha 		Torin 	Bari 	Chania, EKFE 	
	Athens, Demokritos 		Florence 	Frascati 	Jammu 	
			Tehran IPM 	Birmingham 	Thessaloniki, EKFE 	
				Ferrara 	Sarajevo 	

IMC Statistics 2019

Motivate the next generations of scientists !



54 countries
255 institutes
15 000 students
5 weeks in 2019

IMC 2021 :
11.2.2021 – 27.3.2021



Brings scientific methods and real data to schools!

Coordination QuarkNet / TU Dresden

- 51 institutes (48)
- 54 LHC Masterclasses (50)
 - 22 ATLAS (19)
 - 32 CMS (31)
(Incl. TRIUMF program)
- 12 MINERvA Masterclasses

- 188 institutes (177)
- 266 LHC Masterclasses (257)
 - 30 ATLAS W (35)
 - 101 ATLAS Z (104)
 - 64 CMS (58)
 - 41 LHCb (39)
 - 27 ALICE SP (18)
 - 3 ALICE R_AA (3)

Flagship project of IPPOG, the International Particle Physics Outreach Group

Concept and programme of an IMC day

Every year, during the months of February-March school-children (15-19 year old) are invited to an institute of their area.

Scientists for a day !!



2-5 institutes per day performing the same programme

LOCAL TIME: ACTIVITY

8:30 - 9:00	Registration and Welcome
9:00 - 10:00	Introductory lectures
10:30 - 11:30	Visit of a lab or experiment
12:00 - 13:00	Lunch
13:00 - 15:00	Hands-on session
15:00 - 16:00	Discuss results locally
16:00 - 17:00	Video conference



The aim is to get insight into topics and methods of research

From first ALICE MC in Sarajevo in 2019 to hundreds of students !!



New PTMC and Treatment Planning

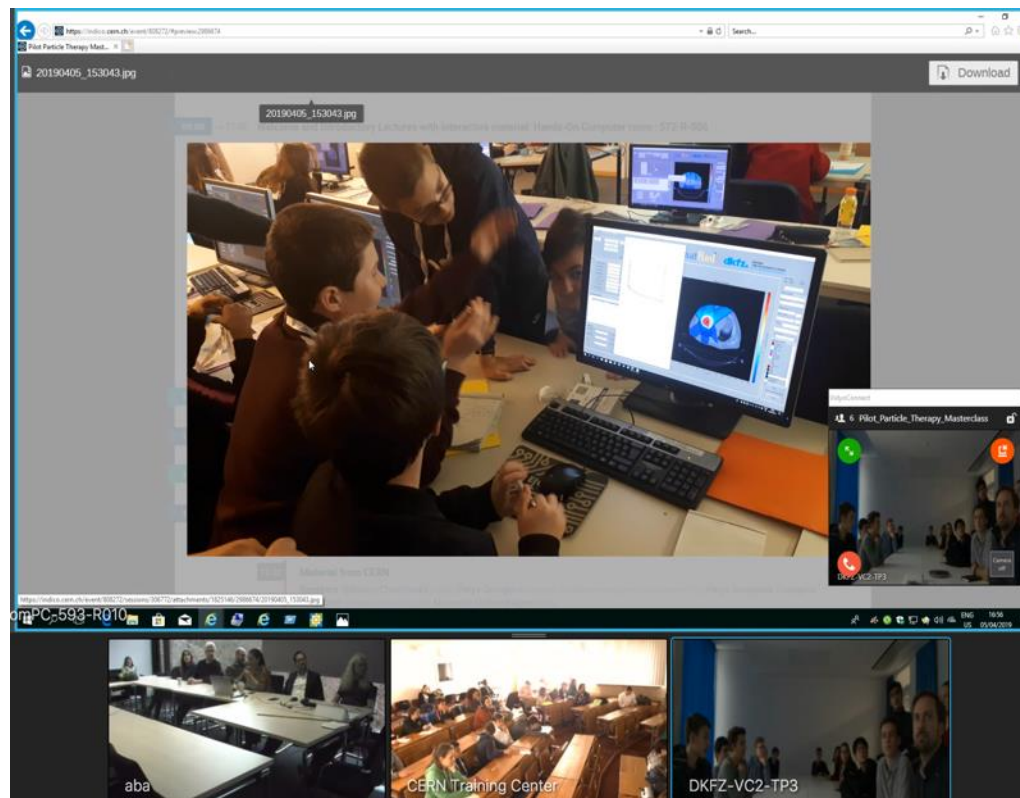
First Local Test: GSI Feb 2019



Web page: UNSA students
at CERN, Aug 2019



International Pilot: CERN, GSI, DKFZ April 2019



- First local test: GSI Feb 2019
- First International Pilot: GSI, Heidelberg DKFZ, CERN Apr 2019
- IMC Steering Group Approval: GSI May 2019
- **Web pages: Sarajevo Uni students Aug 2019 at CERN**
- **CERN Open days: Sarajevo Uni students Sep 2019**

New PTMC 2022 BiH Schedule

Friday 18 March 2022, Video Conference:		https://indico.cern.ch/event/1122782	
UNIMI – INFN, Milano, Italy	Flavia Groppi	Yiota Foka (GSI), Aris Mamaras (AUTH) Albana Topi (GSI)	Damir Skrijelj (UNSA), Deianira Fejzaj (Uni. Brescia), Aris Mamaras (AUTH)
UNICAL - INFN, Cosenza, Italy	Marcella Capua		
University of Tuzla, BiH	Hedim Osmanovic		
UNSA, Sarajevo, BiH	Azra Gazibegovic		
GSI, Darmstadt, Germany	C. Graeff		

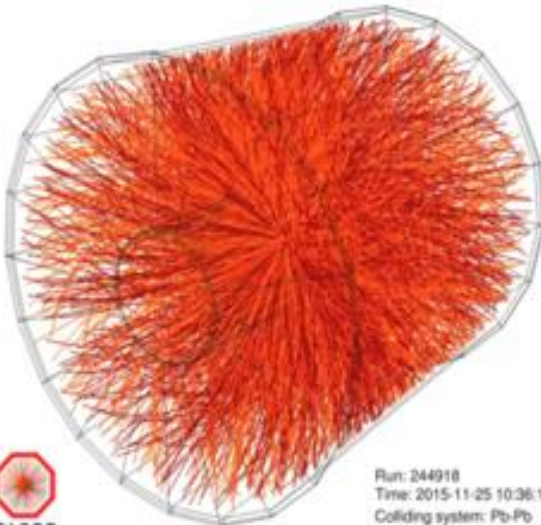
Heavy-ion research and heavy-ion therapy

Pb-Pb at 5.5 TeV
pp at 14 TeV

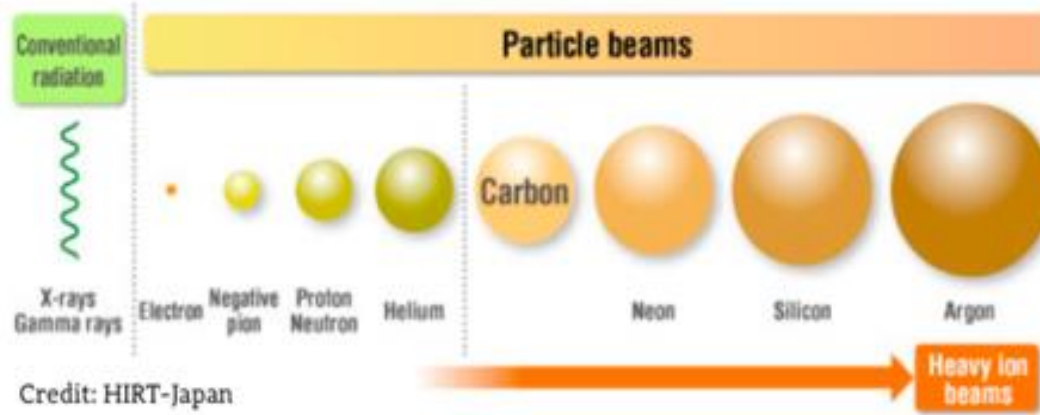
fundamental science
QGP studies



Credit: CERN



Run: 244918
Time: 2015-11-25 10:36:18
Colliding system: Pb-Pb
Collision energy: 5.02 TeV



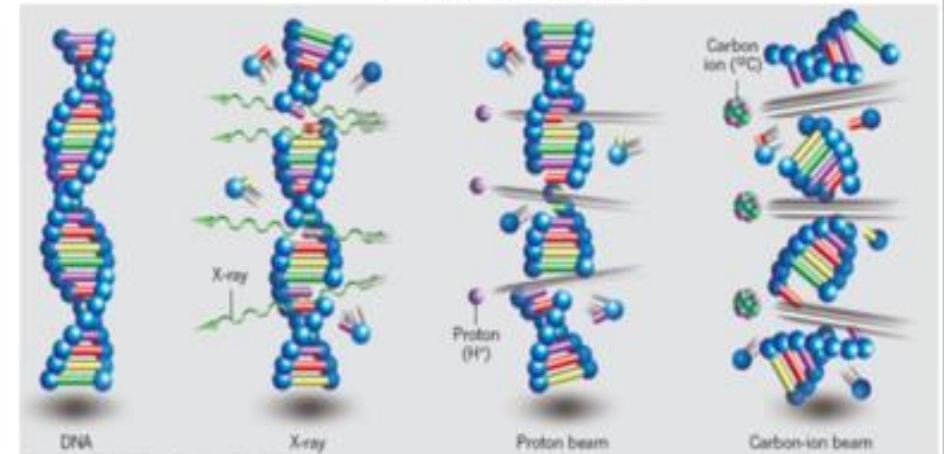
Credit: HIRT-Japan

88-430 MeV/u carbon
50-221 MeV/u protons

applied science
medicine



Credit: HIT Heidelberg



Credit: T. Nomiya, NIRS Japan