

Heavy Ion Therapy MasterClass School

17-21 May 2021

YIOTA FOKA (GSI)

FOR THE ORGANISERS



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008548



HITRIplus Project

Organised in the Framework of the HITRIplus EU-funded project

Large consortium where also all existing European heavy-ion therapy centres participate, plus CERN and GSI research centres, and the future SEEIST research infrastructure, among many others.

Heavy Ion Therapy Masterclass School included in “Education and Training” Work Package addressing university students and up to early stage researchers and practitioners

First event of HITRIplus Project



Executive Summary

Uploaded in indico a summary report/article: <https://indico.cern.ch/event/840212/page/18001-articles>

- Accelerating News
- GSI News
- ENLIGHT
- CERN Courier

Very well received, had a big impact, but also a big challenge
Despite the online mode, and huge numbers, it run smoothly and was quite interactive
but required big efforts and a well-trained, enthusiastic team of friends

Some comments of participants:

- It's approach, regarding the content but also its format was "holistic, multi-disciplinary, original"
- Speakers, top experts in their fields, started from basic principles, so beginners and participants from different fields could follow, and then progressed to deeper details, not taking shortcuts.
- It gave the opportunity to have an overview of heavy-ion therapy but also included cutting-edge developments.



Format of School

“Original” Format: commented, liked by participants

- Long lectures in the morning
- Hands-on in the afternoon
- Students’ presentations in the presence of experts
- Virtual visits to existing therapy centres guided by the local experts, supported by web-cam or videos
- Every day started with videos while participants were connecting to give them a visual impression and help them relate what they would listen
- Every day ended with social events, to provide opportunities for networking and entertainment
- Last day dedicated to “future developments” just before the “Careers Fair” in the evening

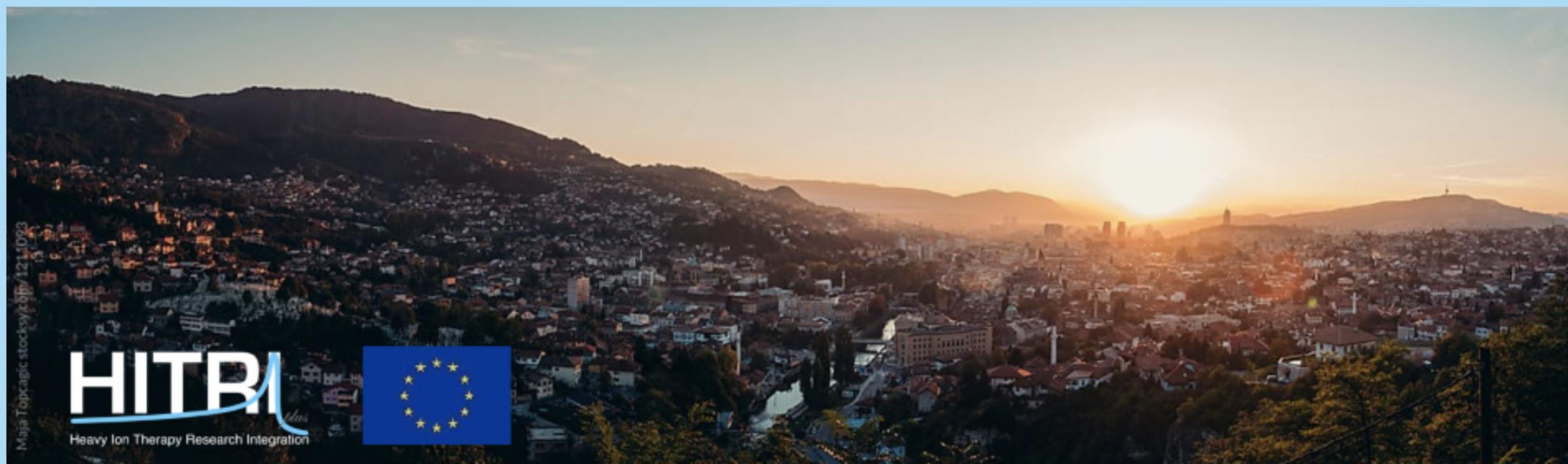


Location and Time

Why Sarajevo
Why this year

**Ongoing collaboration with the University of Sarajevo,
supported by private sponsor Eddy Offermann through his foundation
“The three physicists”**

**Organise it already before the end of this semester to support all students finishing
this year and provide them with some directions and options for their future studies**



Heavy Ion Therapy Masterclass School

17-22 May 2021
Sarajevo-Online
Europe/Sarajevo timezone

<https://indico.cern.ch/e/HeavyIonTherapyMasterClass>

Home

Organizers and Sponsors

Objectives and Scientific
Programme

Poster School

Participant List

798 participants

Registration Form

965+100
from Egypt
via a single
connections

Number of participants: 965

- 36 lecturers
- 222 young researchers
- 234 PhD students
- 197 Master students
- 276 Undergraduate students



Opening Session

Uni of Benha, Egypt: Integrate the school into the Uni curriculum, presence of rector

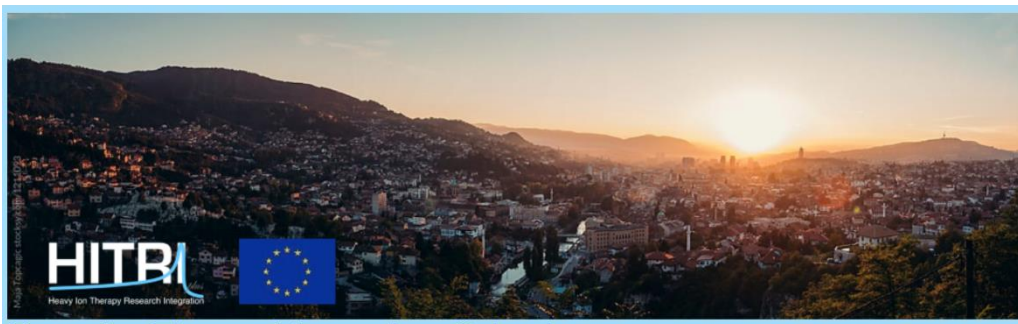




Opening Session

First day: only speakers on zoom and webcasting (any number of participants, but no communication)





Heavy Ion Therapy Masterclass School

Connection Instructions

<https://indico.cern.ch/e/HeavyIonTherapyMasterClass>

Home
Organizers and Sponsors
Objectives and Scientific Programme
Poster School
Poster Social Events
Agenda
... Timetable
Registration Fees and Instructions
Registration Form
Participant List
Presentations Instructions
MatRad Instructions
Zoom Instructions
Photos Gallery
Connection Instructions
Contact
✉ hitm.adm@cern.ch

webcasting with support of CERN IT:

<https://webcast.web.cern.ch/event/i1024183>

Webcast link

Participants should join the webcast through the link: <https://webcast.web.cern.ch/event/i1024183>

Participant that will join hands-on and students afternoon sessions, they will be provided a zoom link also through webcast.

Shared document to submit questions

Participants can ask experts questions through this shared document:

<https://docs.google.com/document/d/1QXEi7wai8QtvNIWEcr1mcy7GgTuqGfUfY4nCADrc2v0/edit>

Evaluation form

Please use the evaluation form to give us your opinion, comments about the school:

https://docs.google.com/forms/d/1rF1A5U7rBTSPjQ42Zb_Q9Fj7oG3cE6Q8ZdZYvlf_yg/edit

Social Events:

SIGNup Social Events Mon: ENLIGHT Networking

<https://forms.gle/4P2Db1LS5YG5fNEw9>

every day zoom links
and updates

For better interaction use of the

- **shared doc to insert questions**
- **Zoom chat**
- **evaluation form**
- **polls**

Recordings available in the timetable
for the ones at different time zones

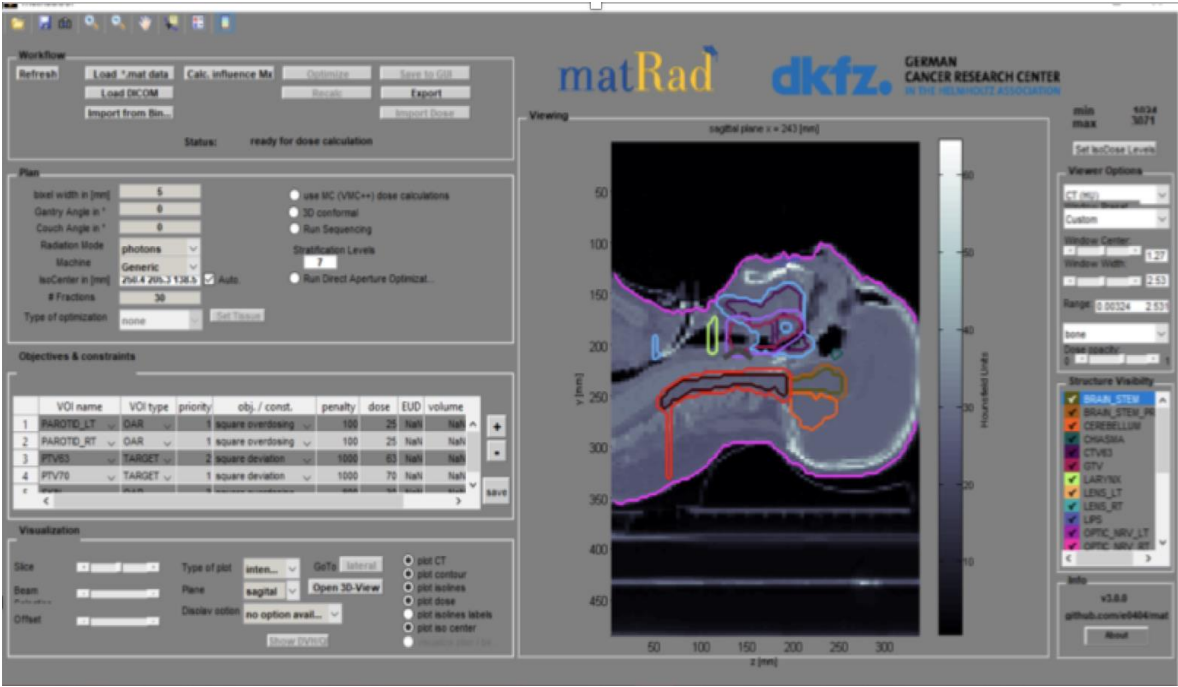
Info on certificate of attendance
via the web page and special email.

Treatment Planning



Virtual Therapy Centre

Focus: Treatment Planning and all it entails to deliver the beam to the target





Heavy Ion Therapy Masterclass School

School Lectures

Timetable: <https://indico.cern.ch/event/1024183/>

- Home
- Organizers and Sponsors
- Objectives and Scientific Programme
- Poster School
- Poster Social Events
- Agenda
 - Timetable**
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Contact

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Timetable Heavy Ion Therapy MasterClass School 17 May 2021

17 May 2021, 08:23 → 22 May 2021, 19:00 Europe/Zurich

Webcast

There is a live webcast for this event

Watch

Main Topics:

- Heavy ion therapy
- Treatment planning
- Medical accelerators and accelerator physics including:
 - Ion sources
 - Beam optics
 - Beam delivery systems
 - Controls
- Linear accelerators for isotope production
- Radiation protection and safety
- Imaging for particle therapy and diagnostics
- Biophysics
- Machine learning applications for particle therapy
- European heavy ion therapy centres:
 - Current activities
 - Future upgrades

Manjit and Mimoza

Maurizio, Mariusz, Giovanni, Elena, Rebecca

multidisciplinary facets of heavy- ion therapy
many different interesting career paths in many different fields
where there is lack of specialised personnel



School Lectures

Timetable: <https://indico.cern.ch/event/1024183/>

Friday afternoon Sessions: Future Plans

dedicated to future projects
and upgrades

based on the current experiences of existing
heavy-ion therapy centres
and needs for further research

“next generation of specialised scientists
in heavy-ion therapy” needed
to build and run the “next generation facilities”

Experiences of existing heavy ion therapy and research infrastructures, Future Plans, Upgrades

Input from HIT, MIT, MedAustron, CNAO, GSI, CERN, SEEIIST

13:15

Clinical experience on benefits of heavy-ion therapy

Speaker: Ester Orlandi (CNAO)

13:30

MedAustron experience with heavy ion therapy

Speaker: Piero Fossati (MedAustron)

13:40

Particle therapy approach exploring the synergies between carbon ion and immune response

Speaker: Slavisa Tubin (MedAustron)

13:50

From pioneering heavy ion therapy at GSI to the HIT and MIT hospitals

Speaker: Christian Graeff (GSI)

14:10

From fundamental research to medical applications

Speaker: Manuela Cirilli (CERN)

14:30

CNAO Accelerator complex and upgrade plans

Speaker: Marco Pullia (CNAO)

14:45

Accelerator complex for next generation heavy ion therapy and research facilities

Speaker: Mariusz Sapinski (SEEIIST)



School Format

Timetable: <https://indico.cern.ch/event/1024183/>

Afternoon Sessions: “Interactive Experiences”

- Hands-on sessions, “do it yourself” guided by experts, with real data and professional tools and methods
- Presentations by students of hands-on results or projects
- Discussions with experts from different Labs
- Visits of Labs

Hands-on results presented everyday by students of Benha Uni, Egypt and some other volunteers

14:00	→ 16:00	Hands-On Treatment Planning Basics Conveners: Hans-Peter Wieser (LMU Munich) , Niklas Wahl (Deutsches Krebsforschungszentrum)
		Agenda
16:00	→ 16:15	Complete the evaluation form
		Evaluation Form
16:15	→ 16:30	Coffee Break
16:30	→ 18:00	Interaction with Experts, Students Presentations, Virtual Visits Virtual Visit to therapy centers or labs; discussion of results with experts from therapy center Conveners: Yiota Foka (GSI - Helmholtzzentrum für Schwerionenforschung GmbH (DE)) , Arist Graeff (GSI) , Marco Pullia (CNAO) , Angelica Facoetti (CNAO)
		Agenda
18:00	→ 19:00	SOCIAL EVENT: Language & Culture Cafe



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Timetable: <https://indico.cern.ch/event/1024183/>

Hands-on results and students presentations

Participants could drop results of hands-on session:

<https://docs.google.com/document/d/1K5wGM9sZJNQauvaS6P5jfm30mUNzPPdChCFQ0o7KDKM/edit>

to discuss them during the students session with the experts

But also as requirement to obtain “certificate of attendance”

Some student’s presentations were scheduled already:

mostly master’s and/or CERN summer students supported by private sponsor wishing to strengthen this kind of research and support young researchers in this field

Masters: Aris, Damir, Denjamin, Fehima
Sum Stud: Maja, Adrijana, Stipe....



School Format

Interaction with Experts, Students Presentations, Virtual Visits

Virtual Tour to therapy centers or labs; discussion of results with experts from therapy centers/research labs

Conveners: Angelica Facchetti (CNAO), Aristeidis Mamaras (Aristotle University of Thessaloniki (GR)), I Foka (GSI - Helmholtzzentrum für Schwerionenforschung GmbH (DE))

[Video Visit to CNAO](#)

16:30

Connection to GSI, Video/Visit

Speaker: Christian Graeff (GSI)

16:40

Connection to CNAO, Video/Visit

Speaker: Marco Pullia (CNAO)

17:00

Connection to CNAO, Video/Visit

Speaker: Angelica Facchetti (CNAO)

17:20

Simulations of Low Energy Beam Transport

Speaker: Benjamin Dedic (University of Sarajevo (BA))

17:30

Hands-on TP Results and Radiation Therapy for Cancer Treatment

Speaker: Maja Kuzmanovic

17:35

Hands-on TP Results and Cancer Data Platform

Speaker: Andrijana Gjoreska (Ss. Cyril and Methodius University)

17:40

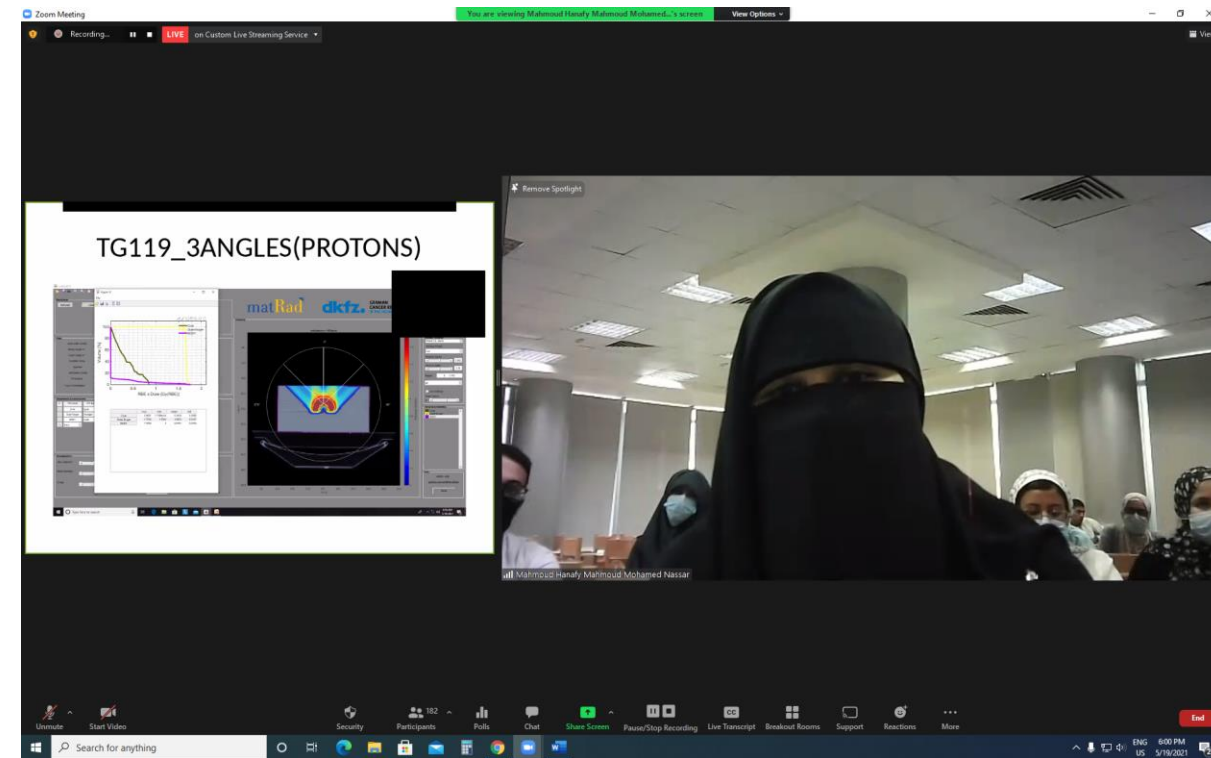
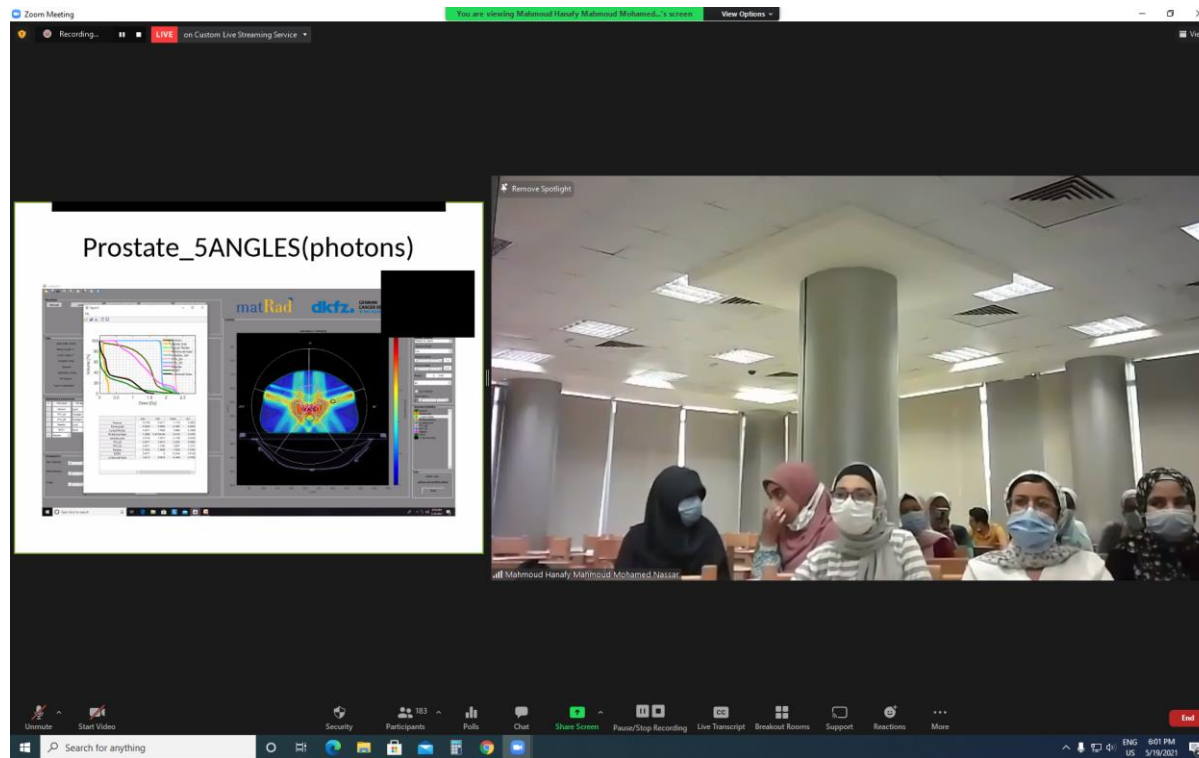
Q&A with experts

Speakers: Marko Pullia (CNAO), Christian Graeff (GSI), Angelica Facchetti (CNAO)

Horizon 2020
101008548



Diversity and sharing know-how





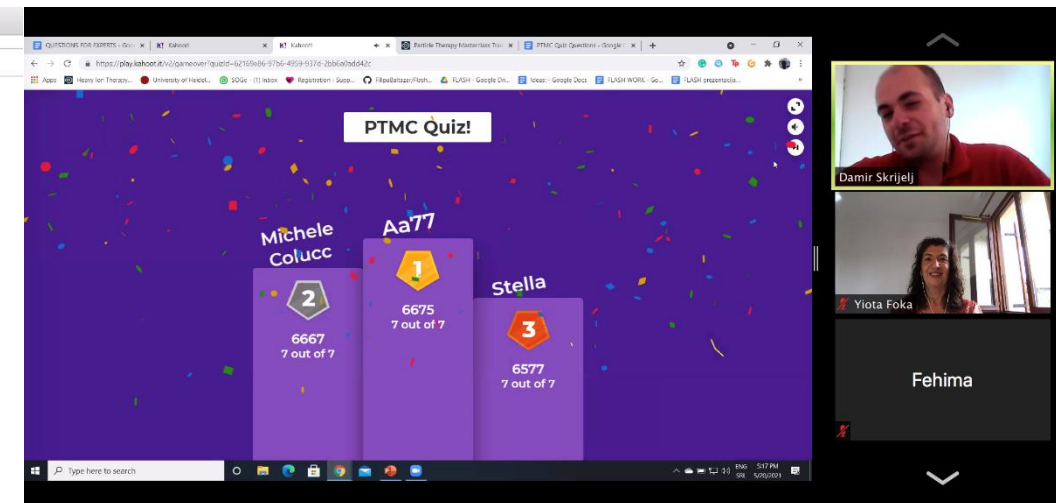
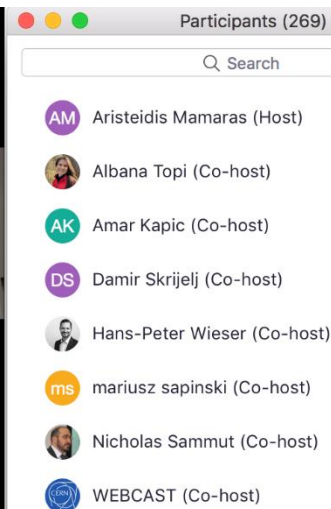
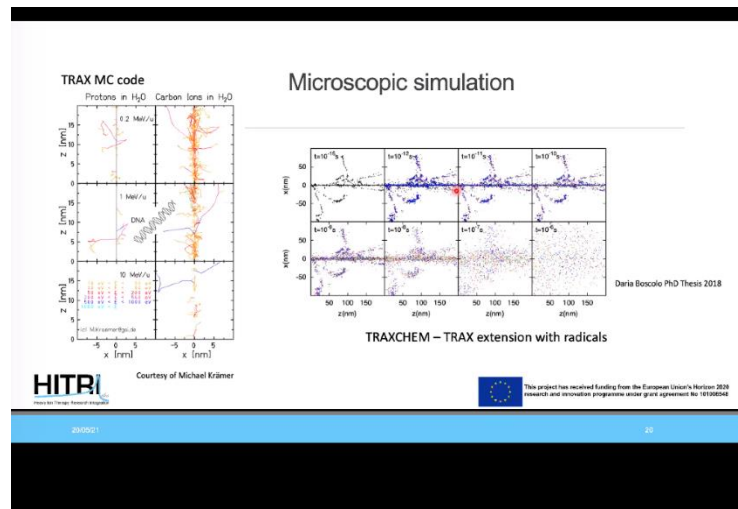
Gender equality and students presentations

Statistics

Out of a total of 36 speakers, 18 female

Plus 23 students' presentations plus the students from uni Benha (Egypt)

Timetable: <https://indico.cern.ch/event/1024183/>





Themes of students sessions

- **Tuesday:**
connected to GSI, the research institute where heavy-ion therapy was pioneered (C. Graeff)
and CNAO, the running heavy-ion therapy centre (M. Pullia et al)
- **Wednesday:**
dedicated to treatment planning
expert from CNAO presented the real TP tools used in CNAO and explained real cases, discussed and contrasted to the matRad TP tool for training and research
- **Friday: focusing on future facilities and plans**

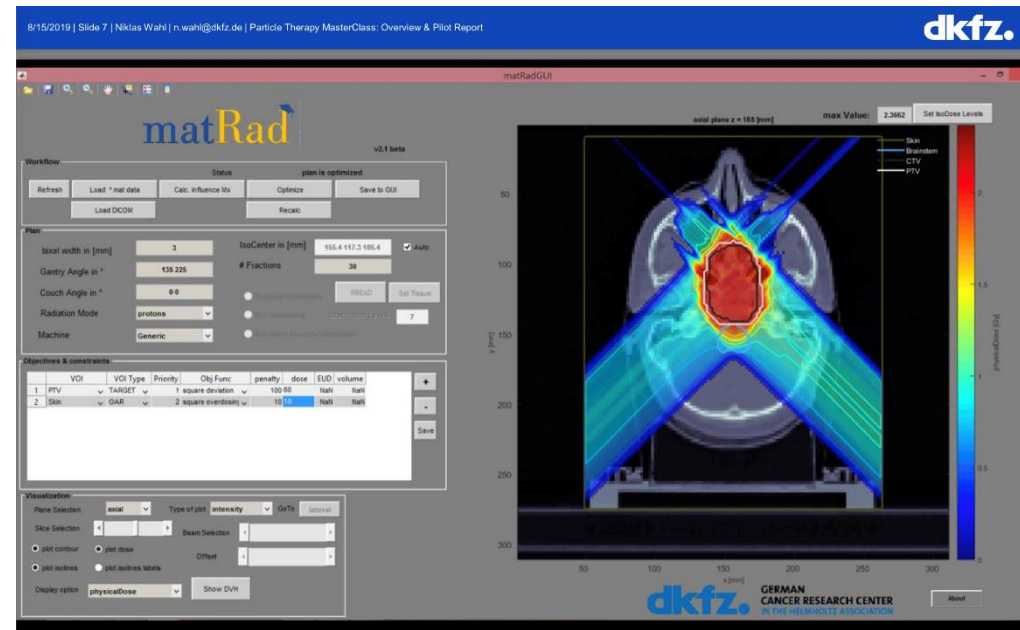
- **Thursday:**
focus on International MasterClasses programme of IPPOG
presentations of the coordinators Uta Billow and Ken Cecire
complemented by presentation from Sarajevo MCs
by Fehima on pedagogical value of MCs based on analysis of surveys and
by Melika on the PTMC experiences



matRad Treatment Planning toolkit

Hands-on: based on professional open source treatment planning toolkit matRad, developed by Heidelberg DKFZ www.matrad.org

- Home
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14:00 → 15:30 Cancer Radiotherapy Introduction

Speaker: Joao Seco (DKFZ)

15:30 → 16:00 MatRad General Introduction

Speakers: Hans-Peter Wieser (LMU Munich), Niklas Wahl (DKFZ)

16:00 → 16:15 Complete the evaluation form

[Evaluation Form](#)

16:15 → 16:30

16:30 → 18:00 MatRad Installation & Data

Conveners: Hans-Peter Wieser (LMU Munich), Niklas Wahl (DKFZ)



Heavy Ion Therapy Research Integration

Contact

hitm.adm@cern.ch

matRad - an open-source toolkit for dose calculation and optimization



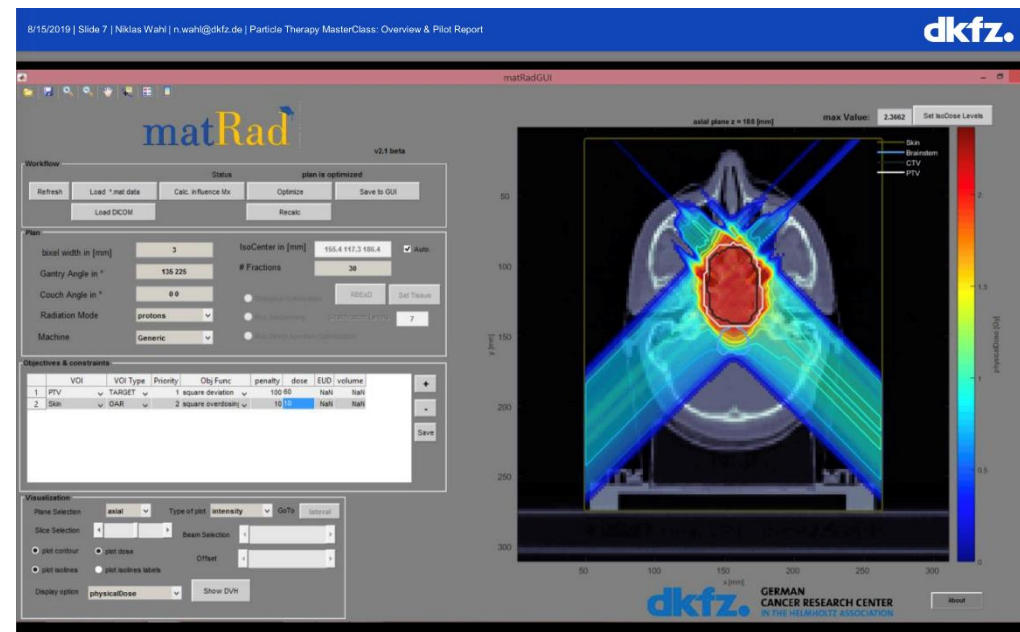
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matRad Treatment Planning toolkit

Thanks to: Niklas Wahl and Hans-Peter Wieser
matRad, developed by Heidelberg DKFZ www.matrad.org

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180 participants delivered matRad hands-on results

Out of 238 certificate requests, 158 eligible having delivered hands-on and sufficient attendance



Heavy Ion Therapy Research Integration

matRad - an open-source toolkit for dose calculation and optimization



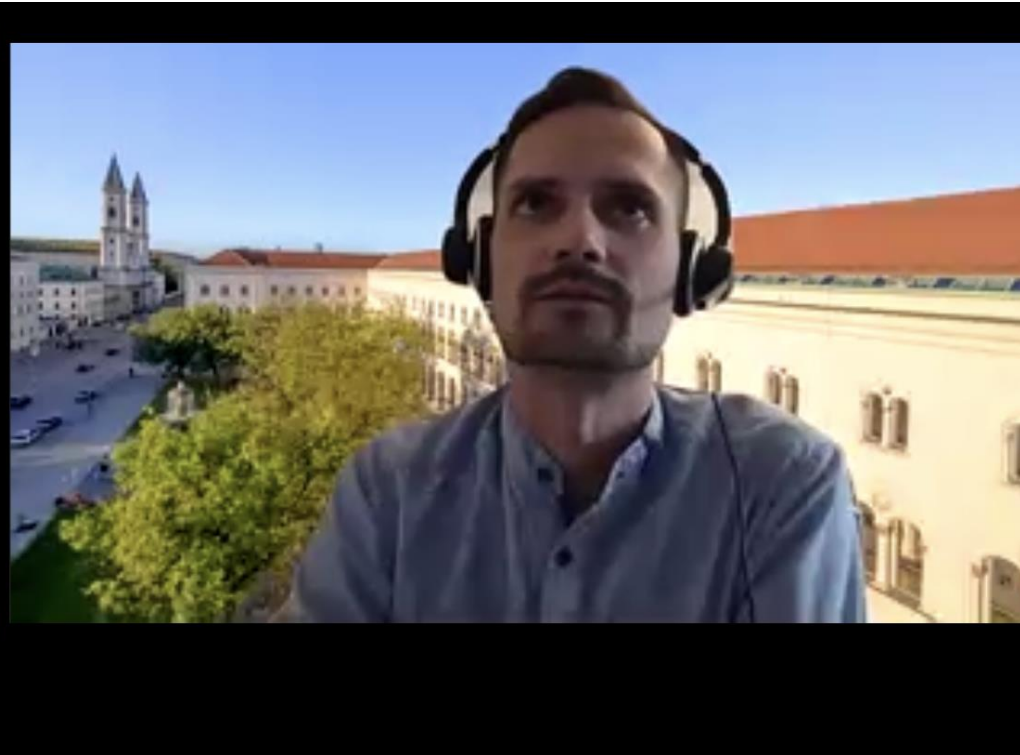
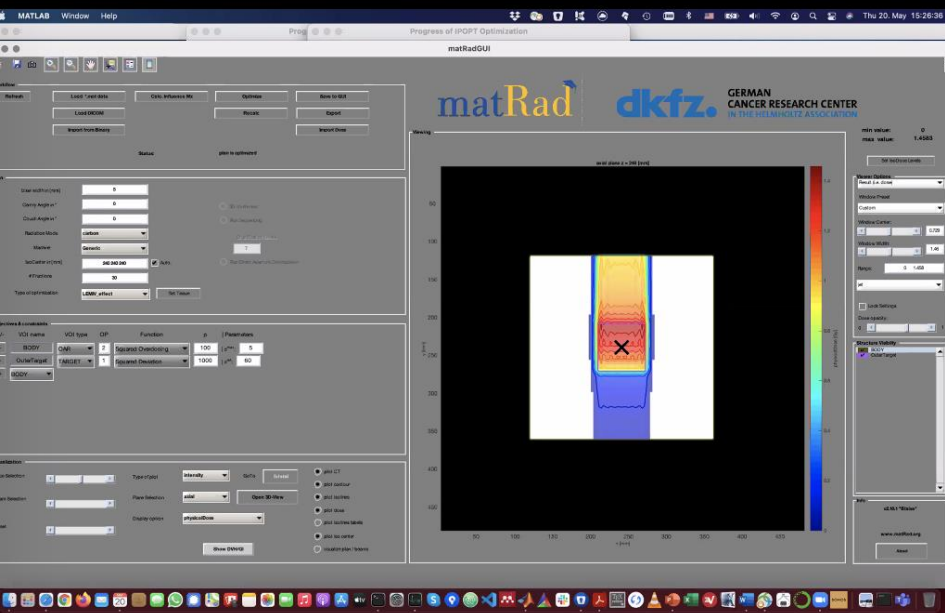
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matRad Treatment Planning toolkit

....hats off to both of you....

Thanks to: Niklas Wahl and Hans-Peter Wieser



computational load

From Dr Sonali Bhatnagar to Everyone:

the doc file is very helpful

From Besa Sadiku to Everyone:

Me to like Dr. Sonali, I miss any step, and my results are not the same that you're explaining us,

From Adin Alić to Everyone:

Computations are now really slow.

From Dr Sonali Bhatnagar to Everyone:

but hats off to you both for keeping patience with us. we are all working hard and trying to learn so the goal is achieved... To work after your class, makes me miss on the social interactions sessions as earning matrad is important learning



matRad Treatment Planning toolkit

....hats off to both of you....

Thanks to: Niklas Wahl and Hans-Peter Wieser
matRad, developed by Heidelberg DKFZ www.matrad.org

Biological Treatment planning

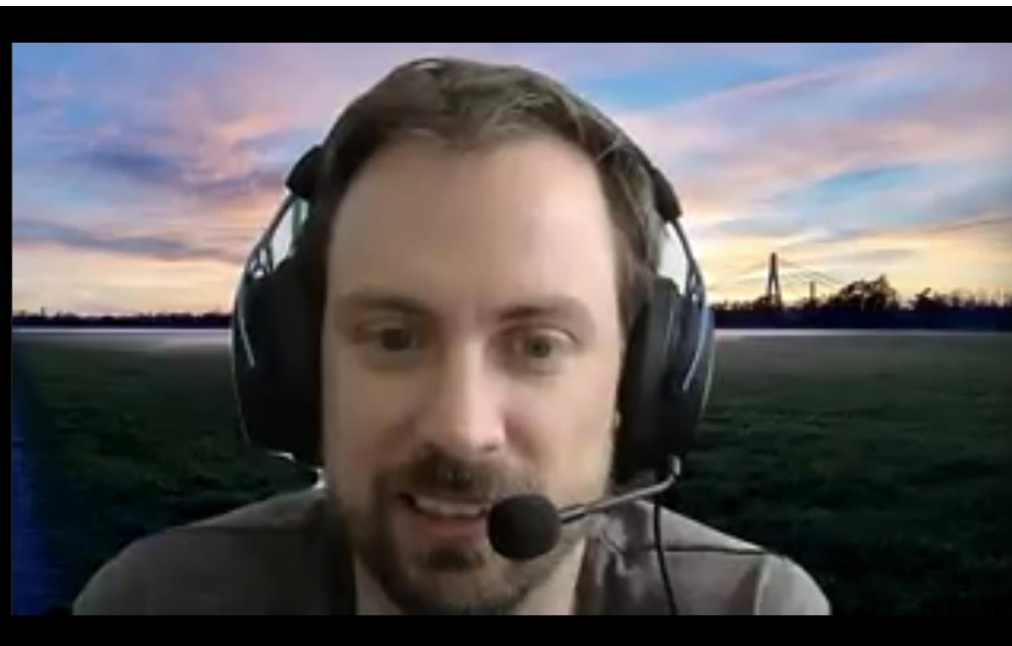
For **each** tabulated carbon ion energy E_0 and for **each** cell type: \rightarrow triplet of curves $d(E_0, z)$, $\alpha_c(E_0, z, T)$, $\beta_c(E_0, z, T)$

$RBE = \frac{d_x}{d_I} \Big|_{iso-effective}$ **biological effect**

$$RBE \times d = \sqrt{\frac{\epsilon}{\beta_x} + \gamma^2} - \gamma = \sqrt{\frac{\alpha_c d + \beta_c d^2}{\beta_x} + \left(\frac{\alpha_x}{2\beta_x}\right)^2} - \frac{\alpha_x}{2\beta_x}$$

adapt dose influence concept to radio-sensitivity parameters for fast evaluation of ϵ_i for different intensities w during optimization.

277 MeV carbon ions



From NIKLAS Wahl to Everyone:

the blue area is bigger for carbon ions due to the fragmentation tail

Polls

Question: in Progress

Attendees are now viewing questions 147 of 229 (6)

1. Do you have MATLAB licenses?

Yes ☐

No ☐



Heavy Ion Therapy Masterclass School

School Lectures

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Timetable Heavy Ion Therapy MasterClass School 17 May 2021

17 May 2021, 08:23 → 22 May 2021, 19:00 Europe/Zurich

Webcast

There is a live webcast for this event

Watch

Statistics

Total: 35.5 h

- **Lectures: 18 h**
- **Hands-on 7.5 h**
- **Students sessions: 5 h**
- **Social Events: 5 h**

Recordings and presentations
available in the timetable
for the ones at different time zones
Immediately at lunch break and evening

Overall: much-too-much...
but still participation to social events !!



Social Events Networking

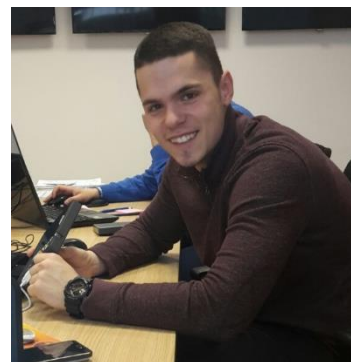
The Platform SpatialChat : 40-50 participants, 60 on Fri till 21:30

Link: <https://spatial.chat/s/IonTherapyMasterclass>

MON	Introductory Drinks <i>Meeting the other attendees with drinks!</i> Speaker: Manjit discussing the ENLIGHT network Dress Code: Smart Casual
TUE	Language Cafe <i>Learn other languages & cultures!</i> Speaker: Mimosa - ion treatment for beginners Dress Code: Traditional
WED	Student Q&A <i>Ask advice & chat to current students</i> Speaker: CERN Knowledge Transfer Dress Code: Pyjama Party
THU	Tours, Games & Disco <i>Share music tastes & play games & quizzes</i> Dress Code: Impress Us.
FRI	Career Fair <i>Discussion with experts on career paths</i> Speakers: CERN, GSI, CNAO, DKFZ & Cosylab Dress Code: Formal Attire



The Hosting team @ Social Events:



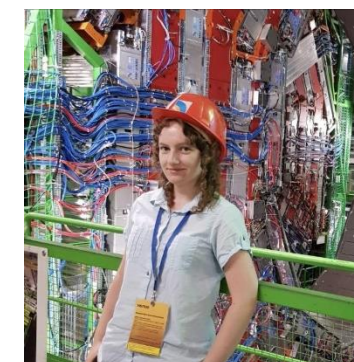
Amar Kapić
PhD student
EPFL/CERN



Aristeidis Mamaras
MSc student
AUTH/CERN



Damir Škrijelj
MSc student
UNSA/DKFZ



Rebecca Taylor
PhD student
ICL/CERN

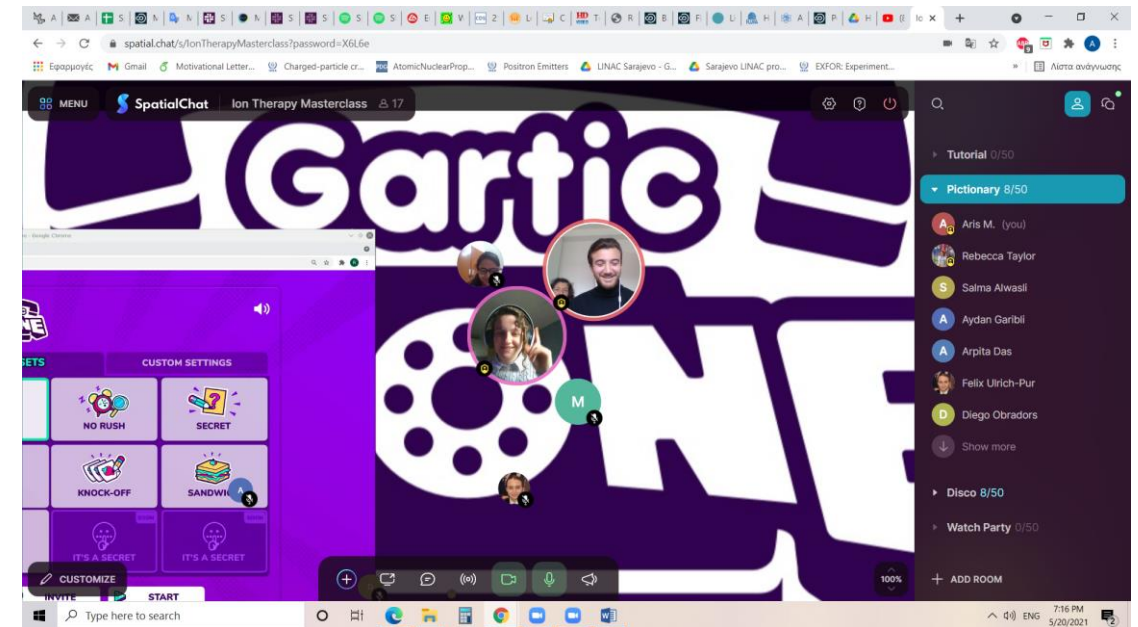
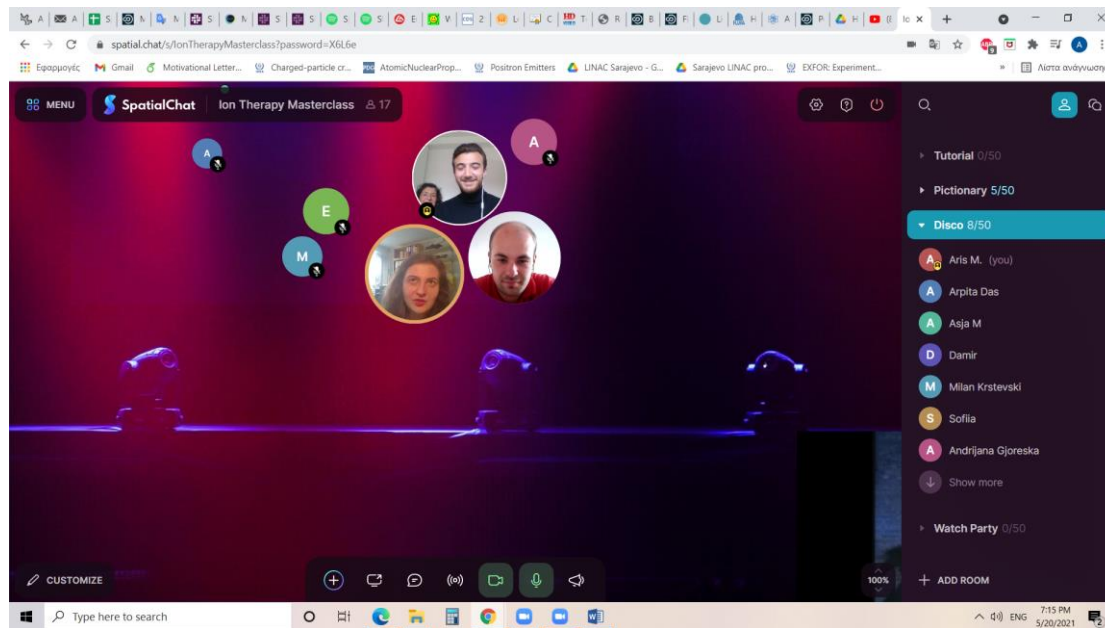
Every evening 18:00-19:00 CET **8 speakers on various topics**



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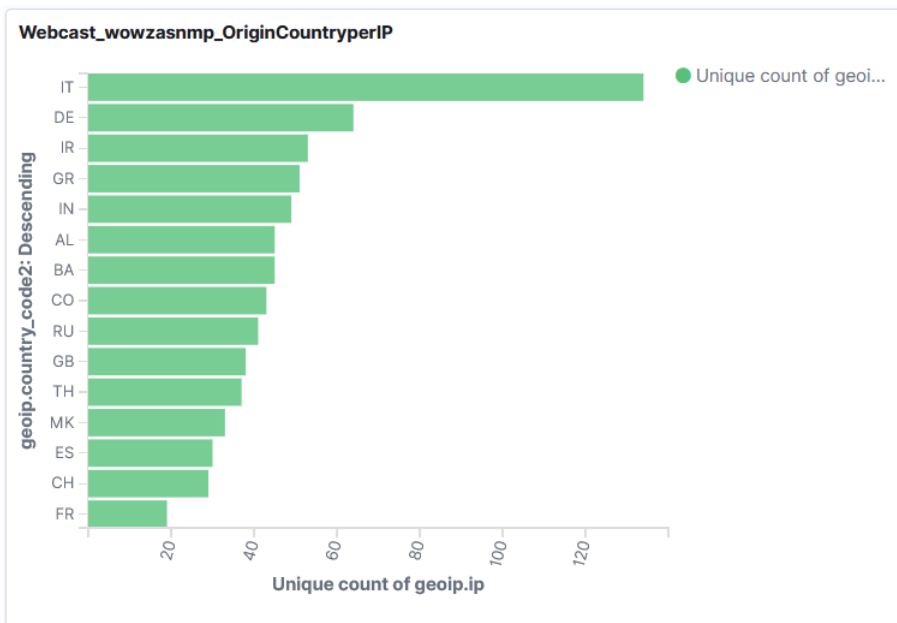
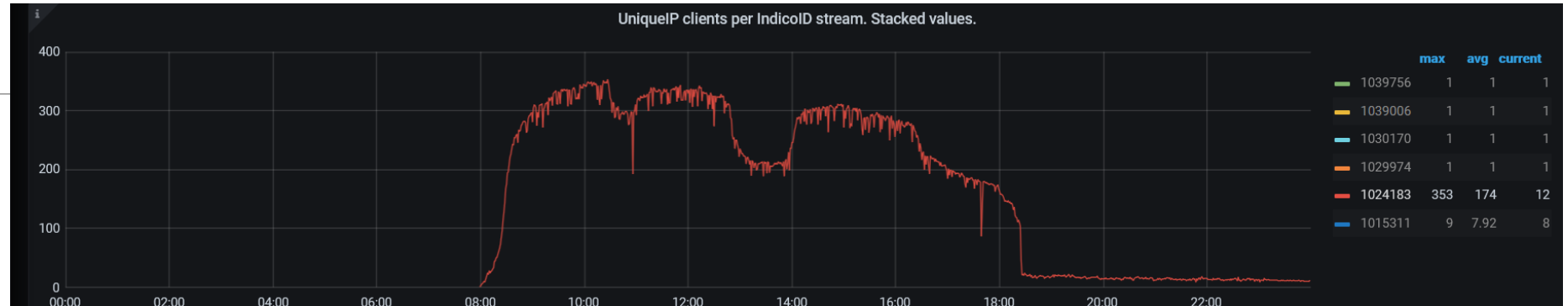
The disco and fun !



Participants via zoom and webcast

1st Day webcast: following via webcast in the afternoon too in addition to zoom connection

A single person
Could connect
Via different devices



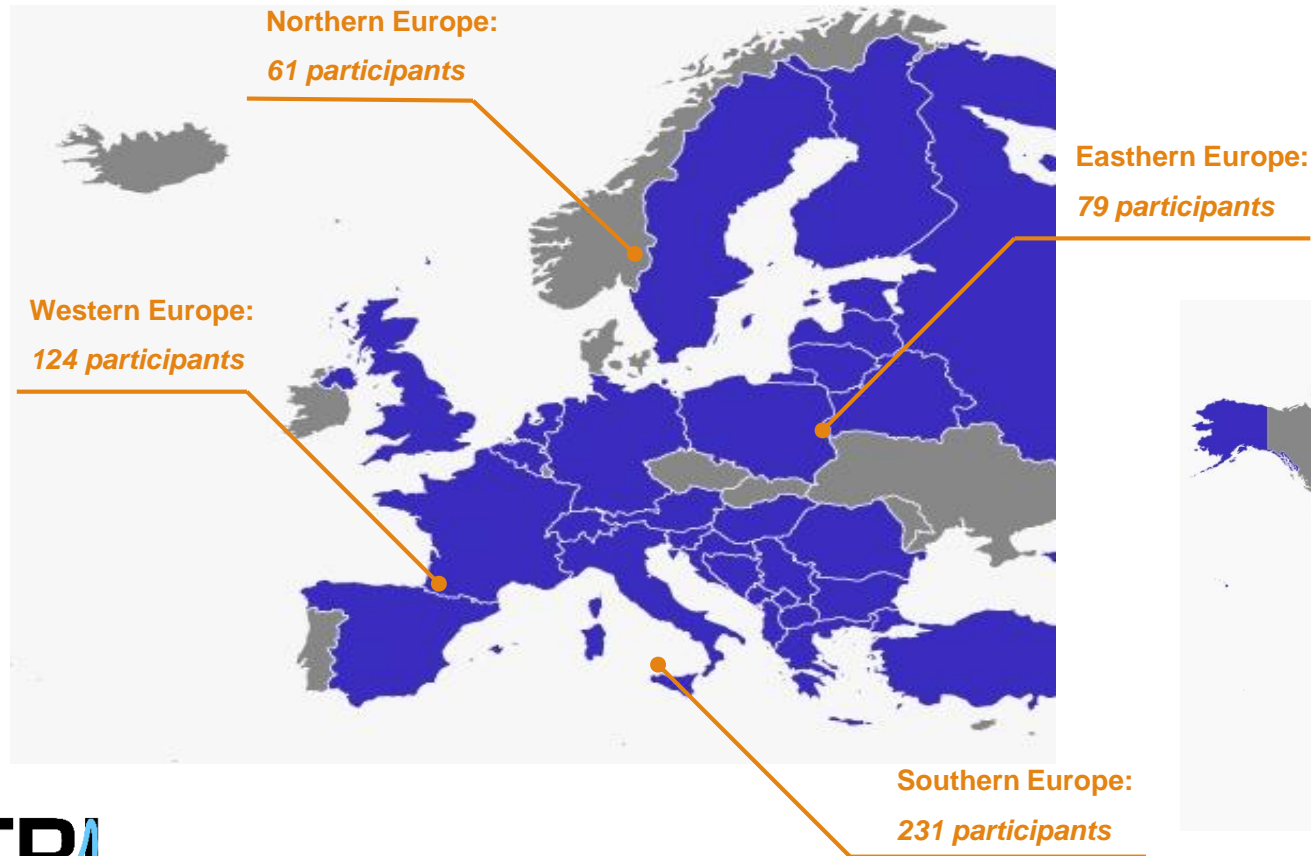
Unique zoom IDs plus webcast by day
plus Egypt (80-100?) via one single zoom connection

- 17.5: 163 zoom + 353 webcast max +
- 18.5: 601 zoom + 51 webcast max +
- 19.5: 469 zoom + 78 webcast max +
- 20.5: 450 zoom + 32 webcast max +
- 21.5: 403 zoom + 21 webcast max +

TOTAL= 730 zoomIDs + 182 webcast (+ 353 for Mon) + Egypt = 1265 + Egypt



Expanding in Europe and beyond

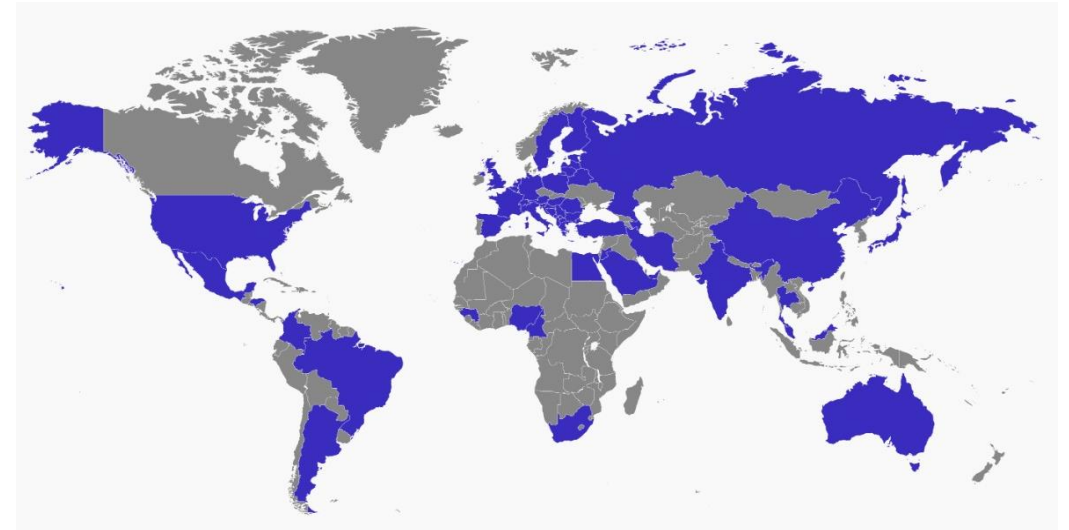


European countries:

➤ 495 participants

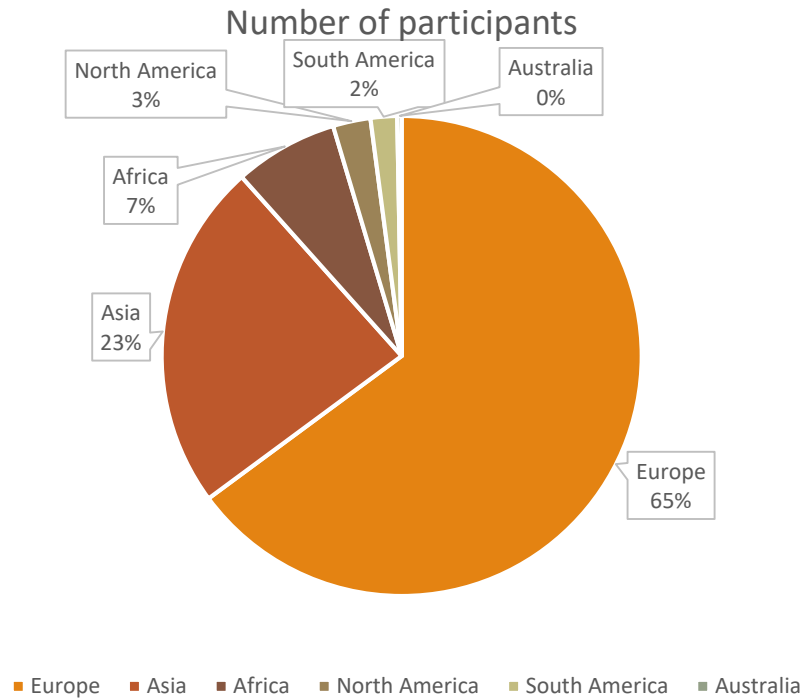
Non-European countries:

➤ 470 participants





Expanding in Europe and beyond



	Europe	Asia	Africa	North America	South America	Australia
Number of participants	436	158	47	17	12	2

India, Egypt, Australia
 Cameroon, Thailand, Iran, USA, Jordan, Nigeria, Ghana
 Azerbaijan, Singapore, South Africa, Malaysia,
 Colombia, Mexico



Questions and Discussions

QUESTIONS FOR EXPERTS - Ey...

docs.google.com/document/d/1QX6i7wai8QbNlWecr1mcY7GgTuqGfUfY4nCADrc2v0/edit#

Epapayotic Gmail Motivational Letter... Charged-particle cr... AtomicNuclearProp... Positron Emitters LINAC Sarajevo - G... Sarajevo LINAC pro... EXFOR: Experiment...

1. is it possible to measure proton beam shape using a camera?
2. How do you measure fwhm/sigma
3. Reliability of indirect beam current measurement using a beam profile monitor signal?
4. Do you know what size and emittance they have beams from the SEEIIST accelerator at fast mode ?
5. What about measure resonances and Beam stability?
6. Normally how much of the beam will be lost in a ion-therapy session?
7. Doesn't the measurement by induction change the beam itself?
Can kindly tell me again the definition of " tune " ?
Your e-mail please ?
8. I think we can put a second camera on a lot of places to measure beam. Is it right?
9. Is the emittance of a synchrotron similar to a synchrotron?
10. Can we use cyclotron for carbon ion acceleration ?
11. Any specific diagnostic challenges for FLASH?



N. of Questions:

- 343 on questions doc
- zoom chat

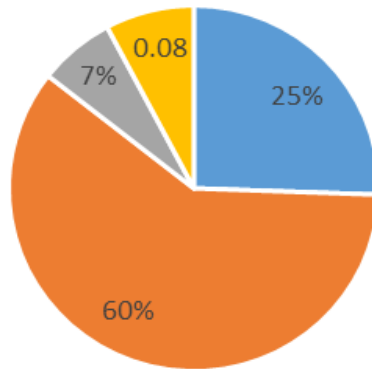
- more than 100 questions during social events



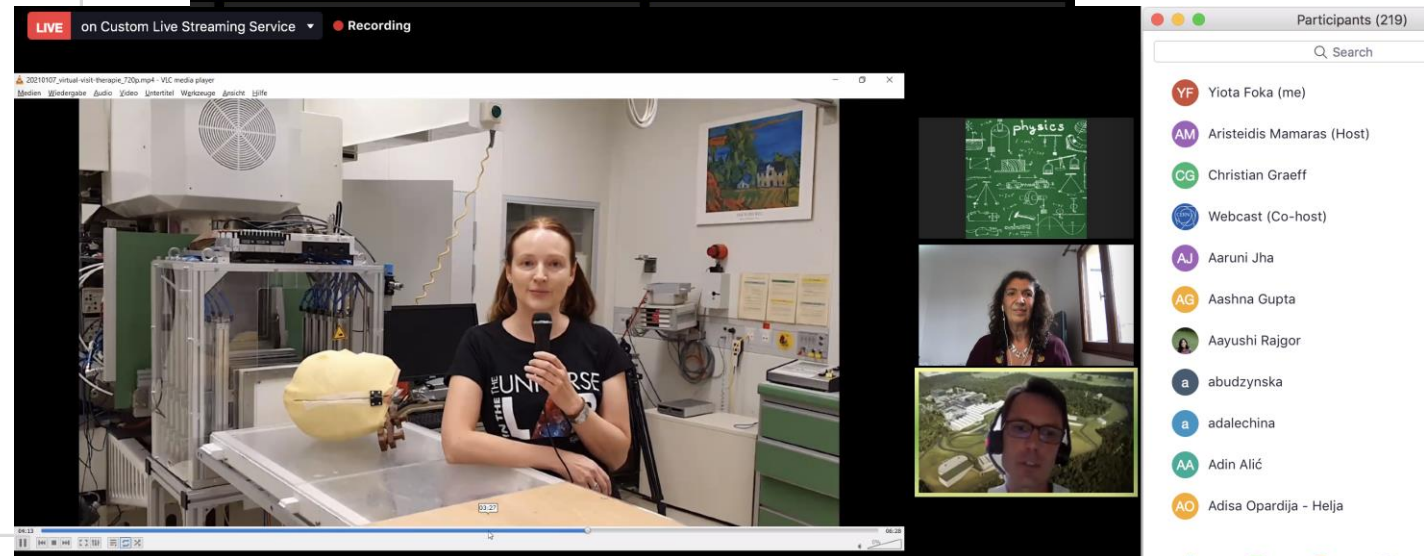
Zoom Polls

90 answers

What do you like better in the students session?



- All of the above
- Virtual visits to therapy center
- Students presentations
- Discussions of matRad results



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Heavy Ion Therapy Masterclass School

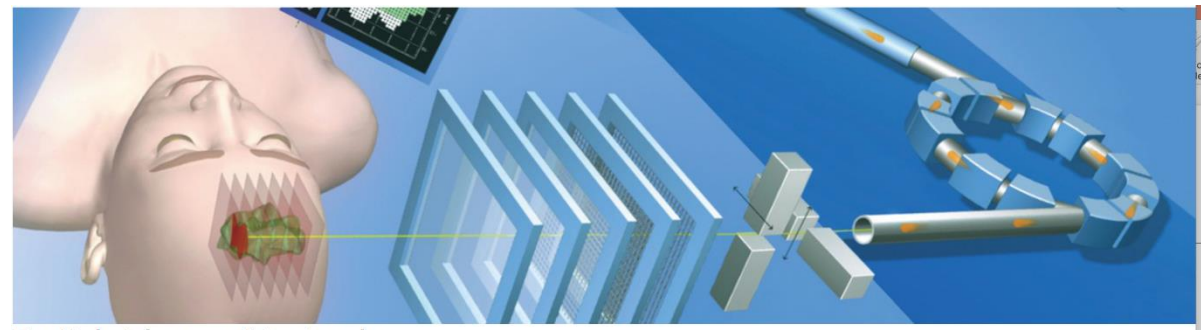
<https://indico.cern.ch/e/HeavyIonTherapyMasterClass>

Full week course

The HITRIplus HITM school is **aimed at university students, and up to early stage researchers.**

First of a series of schools and actions within HITRIplus to support the ones that *show strong promise and interest in becoming part of the heavy ion research community and who may then exploit and access Europe's heavy ion therapy research infrastructures.*

Details on internships and 2 future schools focusing on medical physics and clinical aspects by the WorkPackage coordinator Prof Nicholas Sammut



Particle Therapy Masterclass

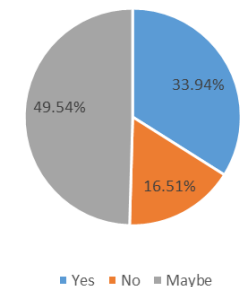
<https://indico.cern.ch/event/840212/>

One day activity

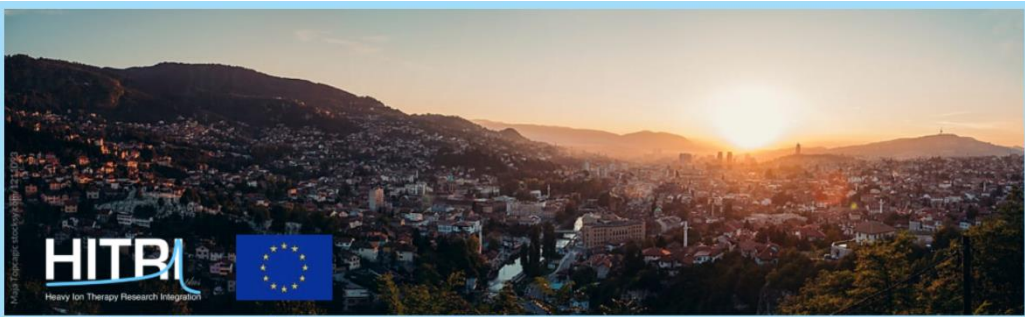
The Particle Therapy MasterClass, is **aimed at high-school students (16-18),** to motivate them to choose related university studies.

Future Tutors

Would you consider becoming tutor at your institute for high-school students as part of IMC/PTMC?



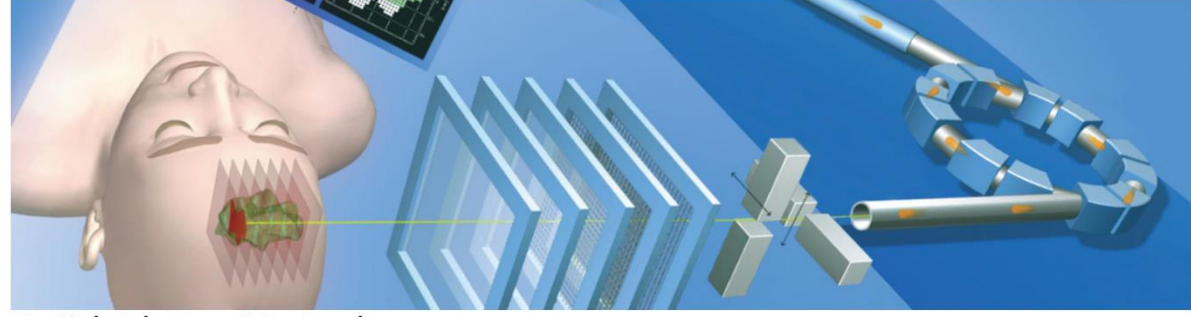
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101008548



Heavy Ion Therapy Masterclass School
<https://indico.cern.ch/e/HeavyIonTherapyMasterClass>

Full week course

The HITRIplus HITM school will continue **supporting a growing community**





Particle Therapy Masterclass
<https://indico.cern.ch/event/840212/>

One day activity

The Particle Therapy MasterClass, is aimed at high-school students (16-18), to motivate them to choose related university studies.

Particle Therapy Masterclass in Sarajevo and Tuzla

- A Particle Therapy Masterclass was held in Sarajevo, and then in Tuzla, organized by the Department of Physics of the Faculty of Science. It is a global project of the world's top laboratories to popularize science, in which students are given the opportunity to be scientists for one day. The masterclass is a full-day activity for high school students and consists of introductory lectures given by renowned scientists, university staff and researchers from CERN.
- The interest was much greater than could objectively be accepted. In Tuzla, the masterclass was held in two schools, while the Sarajevo masterclass was held entirely online. Students had the opportunity to get acquainted with the principles and work of the masterclass program, but also to work independently and interpret the optimization of radiotherapy treatment.



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Thanks for the video Prof

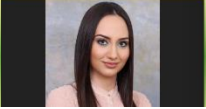


Participants (158)

Q Search

- YF Yiota Foka (Co-host, me)
- AM Aristeidis Mamaras (Host)
- Melika Damadzic (Co-host)
- DS Damir Skrijelj (Co-host)
- F Fehima (Co-host)
- MH Mahmoud Hanafy Mahmoud... (Co-h...
- WEBCAST (Co-host)
- AJ Aaruni Jha

yes no go slower go faster more

Damir Skrijelj

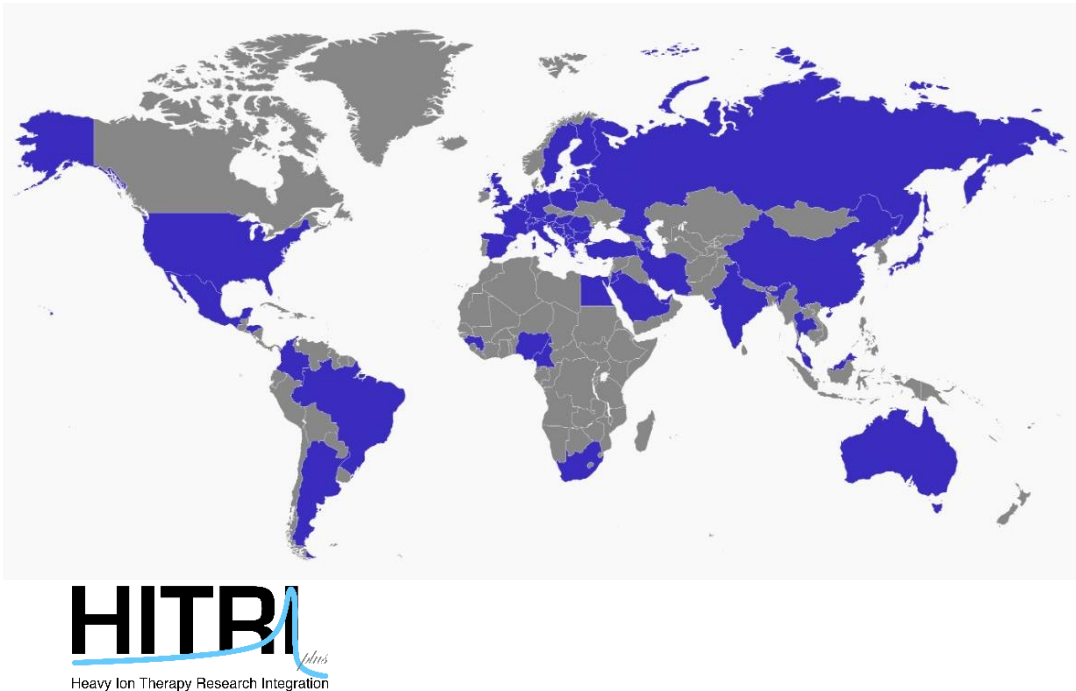


Sustainability



World-wide reach motivating next generation of scientists

HITRIplus full week heavy-ion therapy masterclass school



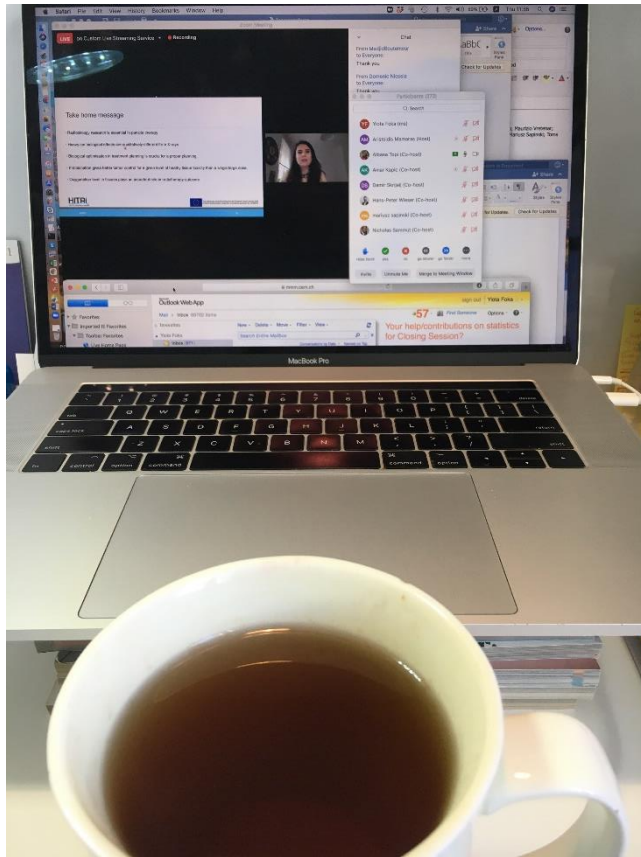
International MasterClasses one day activity



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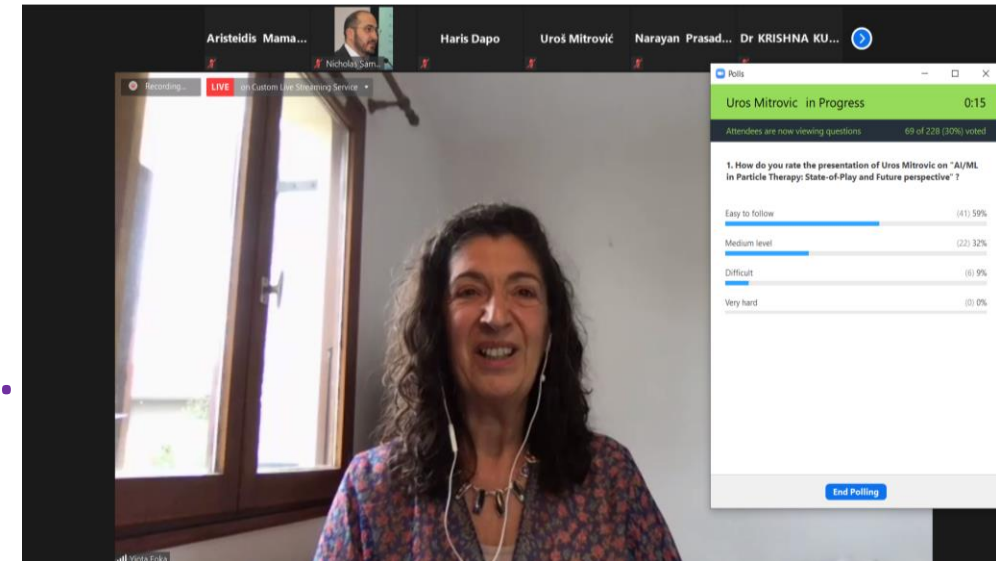
On the stage !



Heavy Ion Therapy Research Integration

Statistics

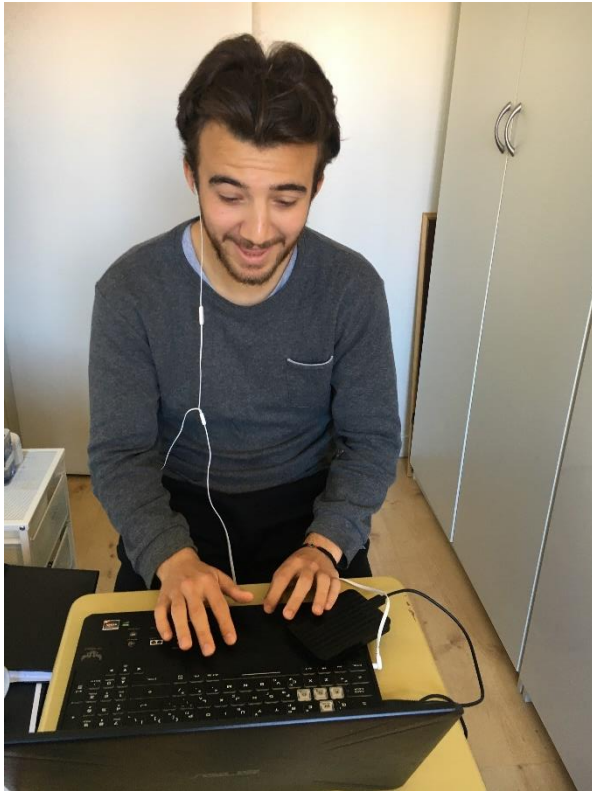
- N. of litres of coffee
- N. of Kg of chocolate
- N. of emails answered
- N. of hours of sleep deficit...



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Behind the scenes !



Big Thanks!



Heavy Ion Therapy Masterclass School

Thanks to all lecturers, speakers, moderators...

Speakers and Lecturers:

1. Amer Ajanović
2. Elena Benedetto
3. Uta Bilow
4. Giovanni Bisoffi
5. Manuella Cirili
6. Haris Dapo
7. Mirza Dautbasic
8. Manjit Dosanjh
9. Ana Đorđević
10. Angelica Facoetti
11. Yiota Foka
12. Piero Fossati
13. Nadia Gambino
14. Christian Graeff
15. Milkos Jaksic
16. Silvia Meneghello
17. Uros Mitrović
18. Silvia Molinelli
19. Monica Necchi

Institutes:

- ICL
- SEEIIST
- TU Dresden
- INFN
- CERN
- ANKARA Univ./TARLA
- UNSA
- ENLIGHT/SEEIIST/CERN
- CERN
- CNAO
- GSI/EMMI
- MedAustron
- MedAustron
- GSI
- IRB
- CNAO
- Cosylab JSC
- CNAO
- CNAO

20. Ester Orlandi
21. Matej Polzelnik
22. Marco Pullia
23. Ash Ravikumar
24. Mimoza Ristova
25. Mariusz Sapinski
26. Joao Seco
27. Rebecca Taylor
28. Markus Stock
29. Dasa Stupica
30. Albana Topi
31. Slavisa Tubin
32. Viviana Vitolo
33. Vasilis Vlachoudis
34. Maurizio Vretenar
35. Niklas Wahl
36. Hans Peter Wieser

- CNAO
- Cosylab JSC
- CNAO
- CERN
- UKIM
- SEEIIST
- DKFZ
- ICL
- MedAustron
- Cosylab JSC
- GSI
- MedAustron
- CNAO
- CERN
- CERN
- DKFZ
- LMU



Thanks to all supporting institutes



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Thanks for your attention and comments !


MENU


SpatialChat

Ion Therapy Masterclass

60

DKFZ is the largest biomedical research institute in Germany. They are developing novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful.







Centro Nazionale di Adroterapia Oncologica

CNAO is an innovative and technologically advanced oncological center providing carbon ions and protons radiation therapy treatments for radio-resistant or inoperable tumors.


GSI in Darmstadt, Germany operates a worldwide leading accelerator facility for research purposes. Currently the international accelerator facility FAIR, one of the largest research projects worldwide, is being built there.






Cosylab is a global technology company that develops and integrates state-of-the-art software and hardware for many of the most demanding and advanced radiotherapy and big-science systems in the world.

CERN, the European Organization for Nuclear Research, is one of the world's largest and most respected centres for scientific research. Its business is fundamental physics, finding out what the Universe is made of and how it works.







MedAustron, the center for cancer treatment and research, is unique in Austria. We can bring hope to patients and inspire new impulses in science.

Welcome to the Heavy Ion Therapy Masterclass

Career's Fair

Please fill in the Evaluation Form for the social events:
<https://forms.gle/TG39tSFeZtZNPamBA>



Rebecca Taylor (you)

Nicholas Sammut

Amer Ajanovic

Cosylab 3/50

GSI/FAIR 17/50

CERN 11/50

DKFZ 12/50

CNAO 14/50

MedAustron 0/50

Tutorial 0/50

Presentation Room 0/1000

CERN Knowledge Transfer 0/50

ENLIGHT 0/50

CUSTOMIZE

52%

ADD ROOM

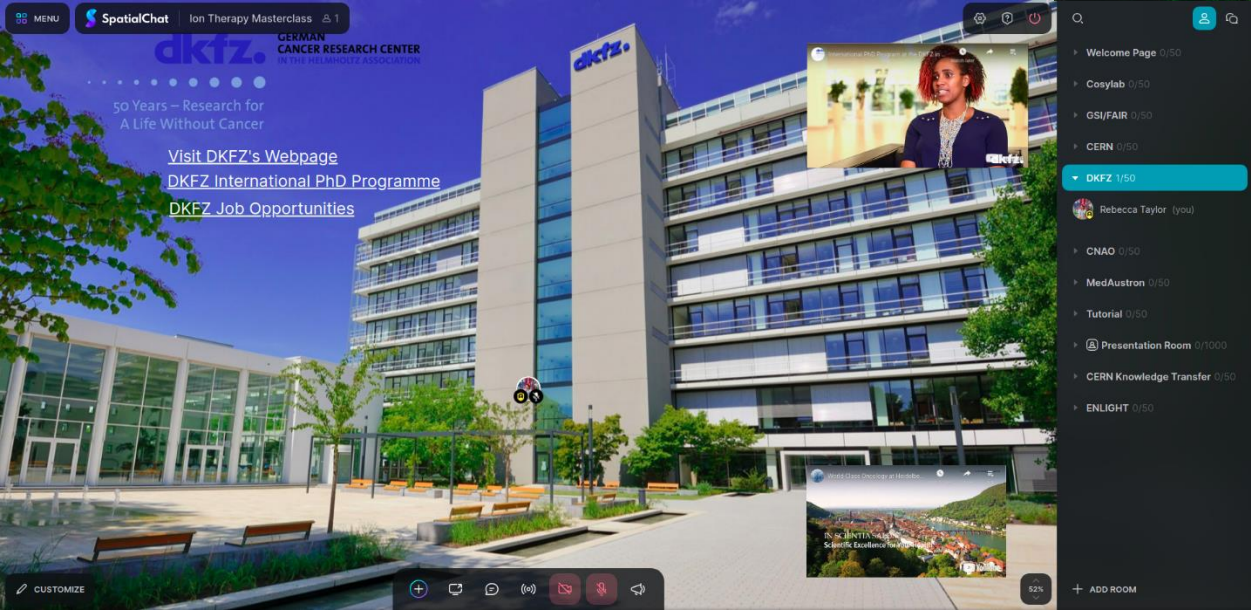
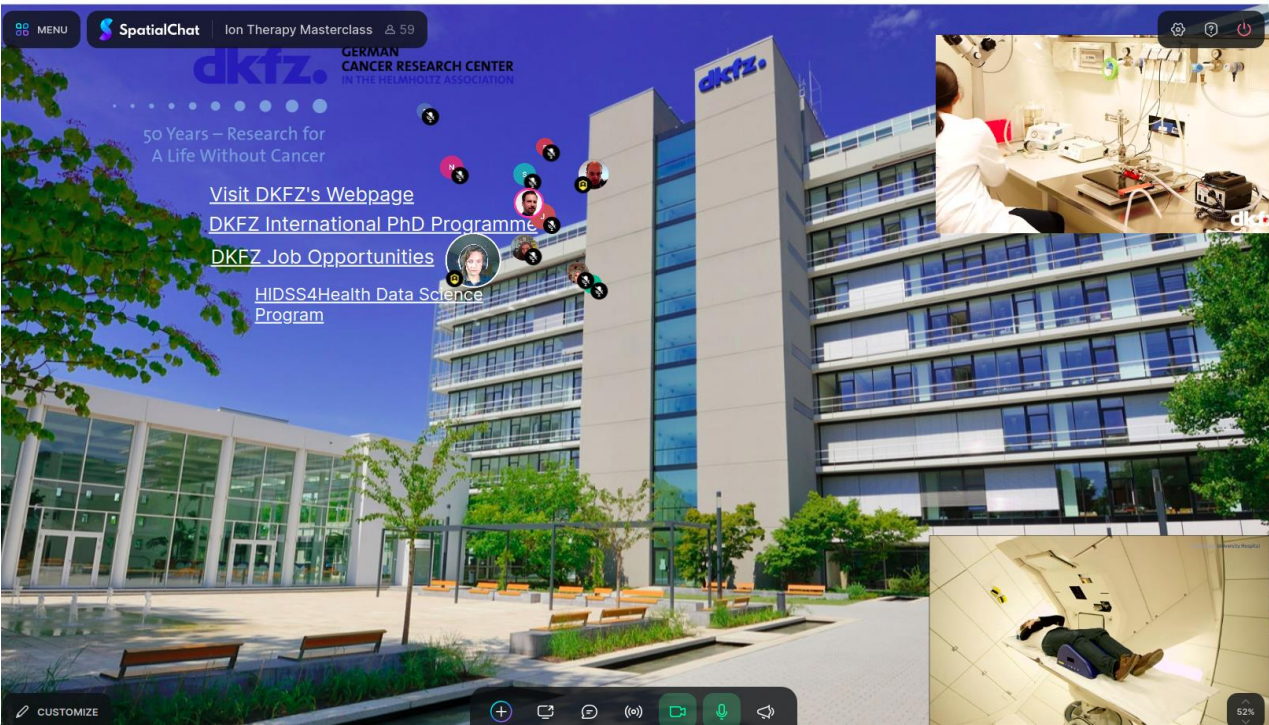
Horizon 2020
101008548

15/11/2021

37

Social Events: Career's Fair

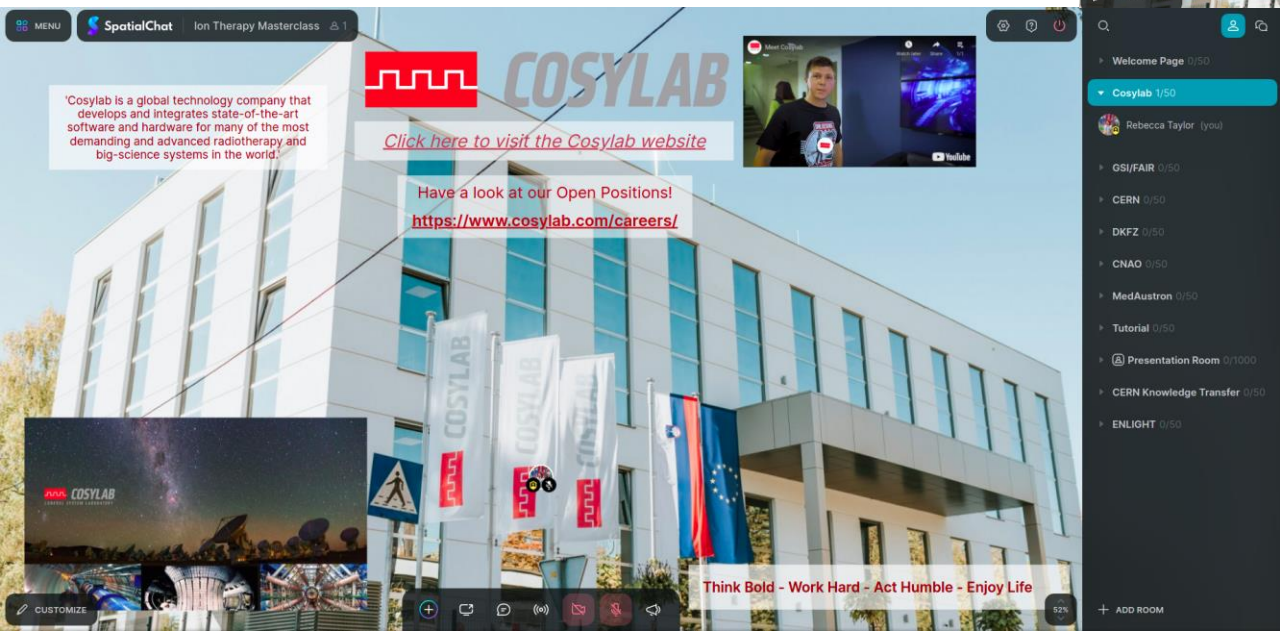
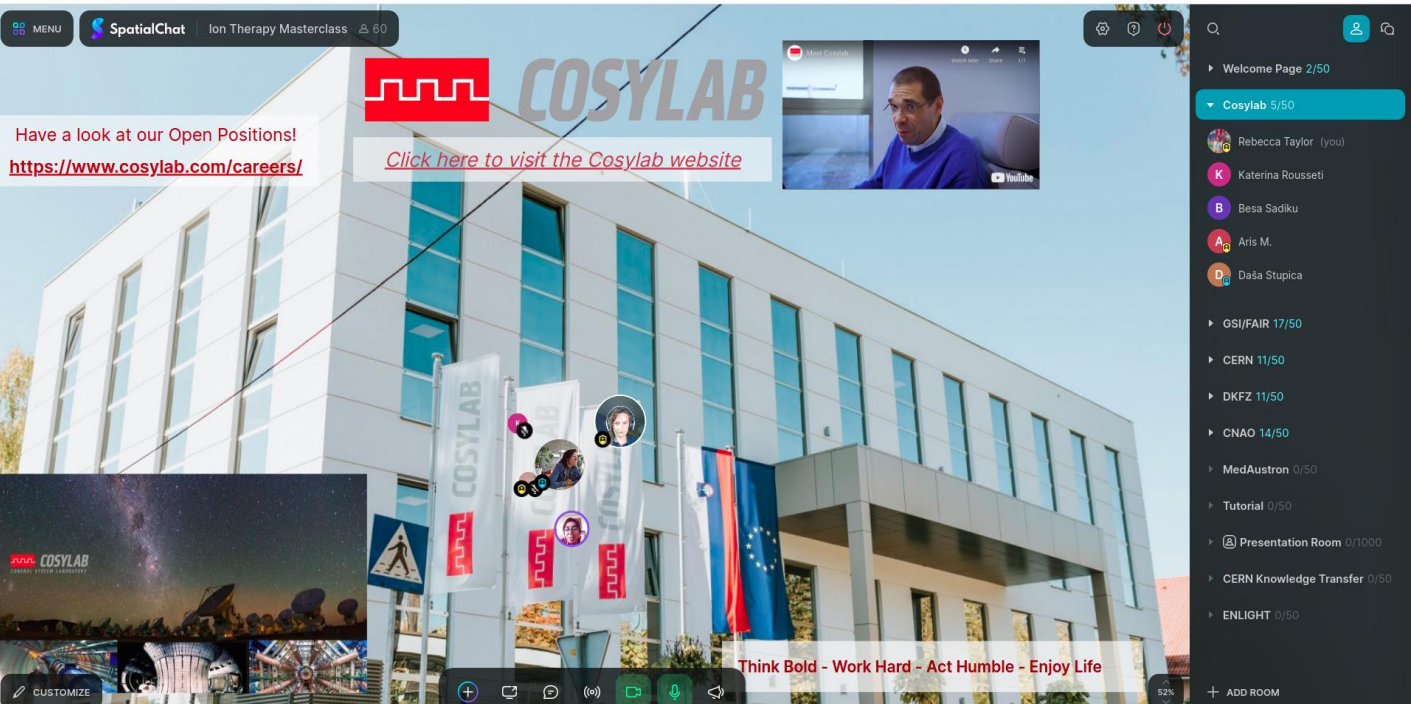
DKFZ



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Social Events: Career's Fair

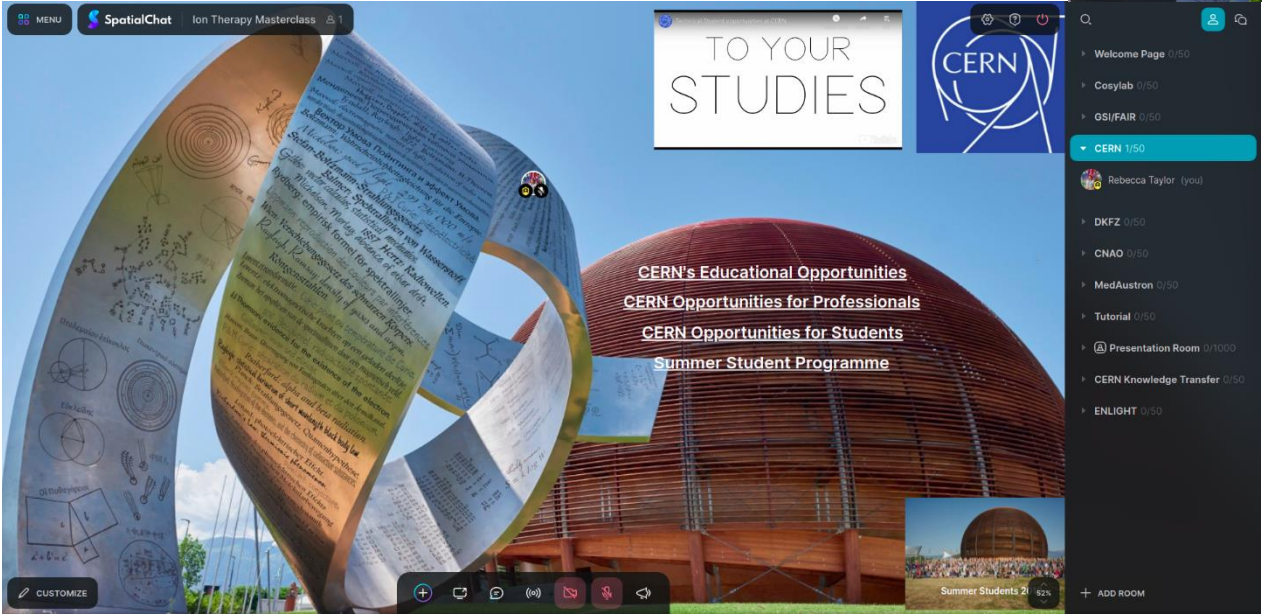
COSYLAB



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Social Events: Career's Fair

CERN



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Social Events: Career's Fair

GSI



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CNAO



MedAustron

08



Comments of Participants

Being online was a great advantage to get not only the students from all around the world to participate but also bring the experts

Opportunities to meet experts

We have no opportunity learn and have no experience in country

Interaction with foreign researchers, which is not a common experience

Variety of personalities and institutes

Sharing the knowledges between different centers



Comments of Participants

Interactivity

Availability of presentations and recordings immediately

Question time/sessions

Questions shared document to experts

Excellent explanations

speakers take time to answer all of the questions and that they answer any kind of question whether it is very simple or complicated

Patience answering questions

Availability for clarifications

MOTIVATING: The explanations were so interesting made me wanna learn more.



Comments of Participants

Plethora, variety of excellent Top level, well known Speakers/experts in different related fields and the way that explain the topic, from basic concepts to in depth details with enthusiasm, keep the interest of the audience

Well structured/planned, very well-prepared sessions, high-quality program covering relevant interesting topics giving valuable information

Overview of possible future studies fields and directions

Comments of Participants

Multidisciplinary, interdisciplinary approach, comprehensive school

Holistic approach of the topic of heavy ion therapy

Very informative

Combining physics concepts with biology and medicine topics

Balance between physics and biology aspects of the subject

Connecting accelerator physics, medical physics and biology

Starting from general and basic level, introducing concepts not cutting short

very useful for the ones that come from other fields

different aspects approached and discussed (in depth)

detail descriptions and basics done very well

Covers most topics needed to get a grasp on what is really happening in particle therapy
(starting from ion sources, accelerators, interaction with matter, radiobiology etc.)

Clear and concise, good insight in advanced cancer therapy technology

Deep technical insight

Approaching/analyzing particle therapy from different points of view



Comments of Participants

I will be able to use this tool for improve my Masters thesis results.

I recognized at least 2 niches in which my team could contribute to solving current research problems/questions - microbeams and high dose rates.