

# WP5

# Education and Training

22<sup>nd</sup> May 2024



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

# Objectives

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- Educate and provide hands-on experience to a new generation of researchers
- Allow them to optimally access and exploit the European research infrastructures
- Students, postdocs, technical staff, early stage researchers from multidisciplinary background and not involved in the field, oncology practitioners
- Specialised courses
- Secondments and internships so that they become facility users and learn best practice

# Tasks & Deliverables

Task	Deliverable	Lead	Due Date	% Completed	Status
5.1	Delivery of Specialised Training Courses	SEEIIST	M30	100%	Completed Deliverable submitted
5.2	Delivery of Masterclasses and train-the-trainer masterclasses	GSI	M47	95%	Completed Report in Progress
5.3	Provision of e-learning courses	UM	M30	100%	Completed Deliverable submitted
5.4	Organisation of secondments and internships: calendar of events	UM	M24	100%	Completed Deliverable submitted
M5.1	Specialised Courses and Masterclass Definition	SEEIIST	M18	100%	Completed Deliverable Submitted

# Task 5.1 – Specialised Courses

- 1<sup>st</sup> course - led by SEEIIST
  - held online limited to 60 participants to maximise student interaction
  - targeting advanced masters, Ph.D., postdocs and researchers from close fields
  - 36 faculty members, 35 hours of material
  - accelerators, magnet tech, biophysics, clinical aspects, radiobiology, treatment planning, simulations, dosimetry, moving targets, arc delivery, imaging, gantry design, beam dynamics, business development, entrepreneurship, certification
  - 44 students obtained attendance certificate
  - included train the trainer session
- students from 30 countries + 8 through nationality (44 EU, 11 third countries, 4 Balkan, 1 Ukraine)



**HITRI**  
Heavy Ion Therapy Research Integration

**4-8 JULY 2022**  
**FREE ONLINE**  
**ZOOM COURSE**

**SCIENTIFIC COMMITTEE**

- ▶ Hugh Durrant, Chair, Oxford Univ, SEEIST
- ▶ Nicholas Smeeth, Co-Chair, Univ of Malak
- ▶ Ugo Amaldi, TERA Foundation
- ▶ Giovanni Amis, CERN
- ▶ Kilian Baumann, Marburg Ion Beam TC
- ▶ Elena Berezhits, SEEIST
- ▶ Eleanor Beatty, LBNL, Liverm
- ▶ Jeff Buchhorn, NCI
- ▶ Alberto Degiovanni, Airo-RDAM
- ▶ Anthony Genova, ESRF/HE
- ▶ Maria Giuseppina Blagun, Univ of Pisa
- ▶ Christian Geiff, GSI
- ▶ Alexander Gerberhagen, PARTREC
- ▶ Angela Faverzi, CNAO
- ▶ Ylva Foka, GSI
- ▶ Pierre Foulet, Maastricht
- ▶ Aron Hübner, Maastricht Univ
- ▶ Kenneth Long, Imperial Coll
- ▶ Giulio Maglia, Maastricht
- ▶ Andrea Maltoni, INFN
- ▶ Monica Nocchi, CNAO
- ▶ Kalle Parodi, LMU
- ▶ Maria Palla, CNAO
- ▶ Ash Paulsson, CERN
- ▶ Lucia Piva, INFN
- ▶ Sandro Rossi, CNAO
- ▶ Marlene Sigmund, PSI
- ▶ Thomas Schuster, Maastricht
- ▶ Mario Schwick, Maastricht
- ▶ Hans-Joachim Ditzel
- ▶ Luka Spetic, Conslab
- ▶ Sude Shrivastava, Maastricht Univ
- ▶ Lutz Storz, Technische Univ, Wien
- ▶ Pablo Garcia Tello, CERN
- ▶ Holmuth Zink, Marburg Ion Beam TC

**SPECIALISED COURSE ON HEAVY ION THERAPY RESEARCH**

REGISTER NOW BY

📅 June 25, 2022

🌐 <https://indi.to/Q77kd>

**FOR MASTER'S, PHD AND POSTDOC RESEARCHERS**

# Task 5.1 – Specialised Courses

## Organising committee:

Manjit Dosanjh (SEEIIST) (Chair)  
Monica Necchi (CNAO)  
Angelica Facchetti (CNAO)  
Petya Georgieva (SEEIIST/CERN)  
Nicholas Sammut (Uni Malta)  
Rebecca Taylor (CERN)  
Joseph Bateman (Uni Oxford)  
Cameron Robertson (Uni Oxford)  
Kristaps Palskis (CERN)

## Scientific Committee - Manjit Dosanjh (in the chair)

Ugo Amaldi (TERA)  
Maurizio Vretenar (CERN)  
Elena Benedetto (SEEIIST)  
Mariusz Sapinski (PSI)  
Kenneth Long (Imperial College)  
Klemens Zink (Marburg-MIT)  
Eleanor Blakely (Berkeley)  
Piero Fossati (MedAustron)  
Karen Kirby (INSPIRE - Uni Manchester)  
Alex Gerbershagen (Uni Groeningen)  
Angelica Facchetti (CNAO)  
Monica Necchi (CNAO)  
Nicholas Sammut (Uni Malta)  
Sandro Rossi (CNAO)  
Giovanni Anelli (CERN)

Mario Schrenk (MedAustron)  
Thomas Schreiner (MEdAustron)  
Yiota Foka (GSI)  
Suzie Sheehy (Uni – Melbourne)  
Andrea Mairani  
Joao Seco (DKFZ)  
Anna Subiel (NPL)  
Marco Pullia (CNAO)  
Lucio Rossi (INFN)  
Giusy Bisogni (INFN)  
Katia Parodi (Uni Munich)  
Steve Myers (ADAM)  
Adriano Garonna (EBAMED)  
Manuela Cirilli (CERN)

# Task 5.1 – Specialised Courses

- 2<sup>nd</sup> course - clinical aspects - SEEIST in collaboration with GSI
  - held online 3<sup>rd</sup> to 7<sup>th</sup> July:
  - 557 students registered with 150 to 180 students logged in at any one time
  - targeting medical students, clinicians, oncologists
  - 39 hours of lectures, 39 faculty members
  - head and neck, sarcoma, prostate, liver, pancreas, organ motion, treatment planning, re-irradiation, gynae and rare indications, innovative methods, present and future clinical trials and radiobiology
  - included train the trainer session
  - 67 countries world wide; 36% from EU, 17% from SEE, 56% third countries
  - 77 students awarded certificate of attendance (80% attendance, 80% of polls); 27 train the trainer mention
  - network data (students, specialists, contact institutions used in marketing) inputted into WP2

# Task 5.1 – Specialised Courses

- 2<sup>nd</sup> course

## Organising Committee

Y. Foka, chair (GSI/SEEIIST)

M. Cirilli (CERN)

P. Fossati (MedAustron)

N. Sammut (Uni. Malta)

M. Dallas (AUPh)

D. Giannakeri (AUPh)

I. Mitsiou (AUPh)

K. Koritsidis (AUPh)

K. Kostakis (AUPh)

A. Puckett Anastasiou (AUPh)

E. Theodoridou (AUPh)

E. Xanthopoulou (AUPh)

## Scientific Committee

P. Fossati chair (MedAustron)

E. Orlandi (CNAO)

S. Harrabi (HIT)

S. Yamada (QST)

Y. Foka (GSI/SEEIIST)

N. Sammut (Uni. Malta)

# Task 5.1 – Specialised Courses



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



# Task 5.2 – Masterclass School

- led by GSI – Yiota Foka
- Online 17<sup>th</sup> - 22<sup>nd</sup> May 2021
- Report underway
- 36 lecturers (15 female)
- undergrads, masters, PhDs postdocs, researchers from close fields
- 1050 registrants
- 992 attended at some point – average of 600 per day (50% from EU, 12% from Balkan region)
- 158 attendance certificates awarded
- 33 hours of engagement time

**Heavy Ion Therapy MasterClass School** | 17 - 22 May 2021  
Online Course

The program is intended for the students of the following disciplines: Medical Physics, Physic, Radiotherapy, Radiology, Bioengineering and Imaging and Radiotherapy Techniques and early stage researchers

In collaboration with

**PHYSICS** | **RADIOLOGY** | **RADIOTHERAPY** | **BIOENGINEERING** | **MEDICAL** | **IMAGING & RADIOTHERAPY** | **PHYSICS** | **TECHNIQUES**

**Topics**

- Particle Therapy
- Treatment Planning
- Accelerator Physics
- Beam Delivery
- Radiation Protection
- Imaging
- Biophysics
- AI/ML for Particle Therapy

**Scope**

Focus on Heavy Ion Therapy Treatment Planning Systems (TPS) including lectures, treatment planning tool demonstrations, hands-on exercises and student projects.

**SIGN UP NOW TO THE FIRST HEAVY ION THERAPY COURSE!**

Registration deadline: 15 May 2021

**Programme Committee**

- Y. Foka (GSI/EMML, Chair)
- A. Gazibegović-Busuladžić (UNSA)
- N. Sammut (UHI, Malta)
- M. Sapinski (SEEST)
- J. Seco (DKFZ)
- M. Vretenar (CERN)
- N. Wahl (DKFZ)
- H.P. Wieser (LMU)

**Scientific Assistants**

- A. Mamaras (AUTH/CERN)
- A. Kapic (EPFL/CERN)
- D. Škriješelj (UNSA/DKFZ)
- R. Taylor (ICL/CERN)

**HITRI** | Heavy Ion Therapy Research Integration

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**  
17th May - 21st May 2021  
Evening Socials  
From 18:00

**MON** **Introductory Drinks**  
Meeting the other attendees with drinks!  
Speaker: Manjit discussing the ENLIGHT network  
Dress Code: Smart Casual

**TUE** **Language Cafe**  
Learn other languages & cultures!  
Speaker: Mimosa - ion treatment for beginners  
Dress Code: Traditional

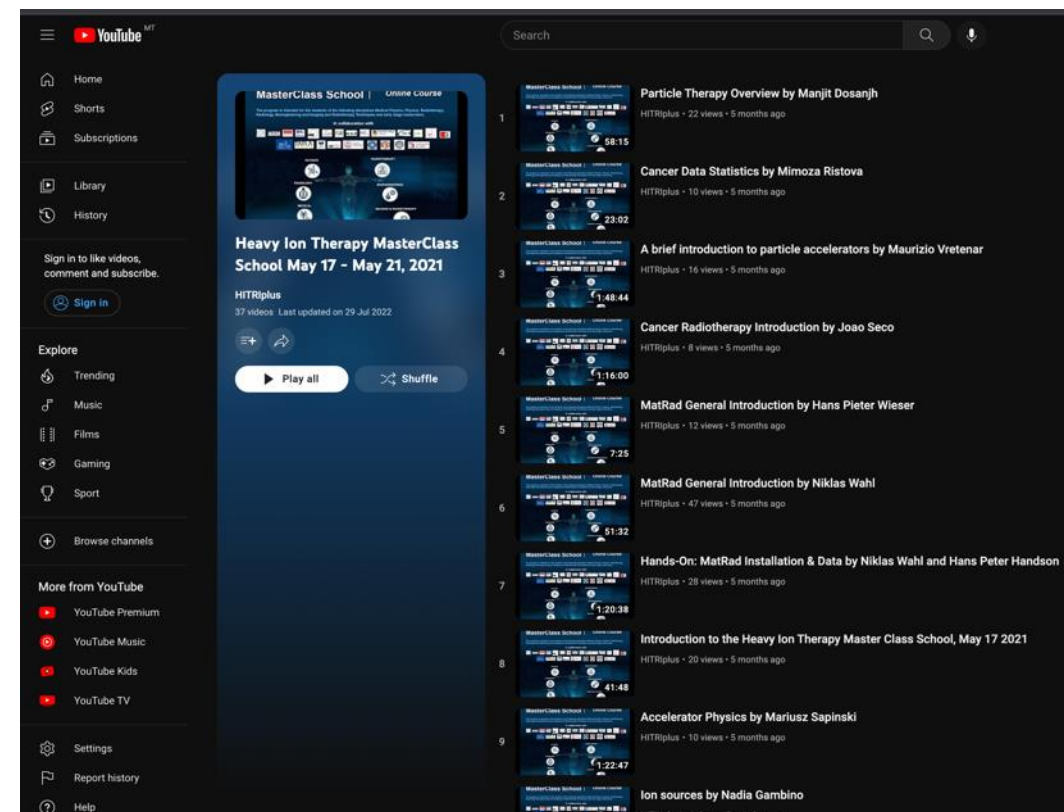
**WED** **Student Q&A**  
Ask advice & chat to current students  
Speaker: CERN Knowledge Transfer  
Dress Code: Pyjama Party

**THU** **Tours, Games & Disco**  
Share music tastes & play games & quizzes  
Dress Code: Impress Us.

**FRI** **Career Fair**  
Discussion with experts on career paths  
Speakers: CERN, GSI, CNAO, DKFZ & Cosylab  
Dress Code: Formal Attire

# Task 5.3 – e-learning Material

- led by UM
- conversion of task 5.1 and 5.2 into e-learning courses
- editing and cleaning;
- course overview, objectives, learning outcomes; suggested reference books, complementary material
- Task 5.1 1<sup>st</sup> specialised school recorded and made available online (**3,216 views** to date)
- Task 5.1 2<sup>nd</sup> specialised school recorded and made available online (**14,434 views** to date)
- Task 5.2 masterclass school recorded and made available online (**2,936 views** to date)
- **1,177 hours** watched by students;
- estimated **319 full course views**



# Task 5.4 – Secondments & Internships

- UM in collaboration with CNAO
- 8 opportunities available
- €2000/month for internships; €3000/month for secondments
- 56 applications (40 from EU or Balkan states)
- 25 eligible applications
- 2 internships offered ; Microdosimetry, Accelerator Physics
- 3 secondments offered; Radiation Oncology, Medical Physics, Radiotherapy
- 59 weeks in total
- countries represented: Italy/Palestine, Turkey, Albania, Romania
- All internships and secondments are complete

# Milestone 5.1 – Courses and Masterclass Definition

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- Led by UM
- scoping the content and level of current courses in particle therapy
- identifying content that can be adapted to focus on heavy ion therapy
- singling out gaps related to heavy ion therapy
- drawing up a syllabus based on a number of discussions with experts and specialists in the field
- report was submitted in M18

# Extra Initiative 1

- School of Hadron Radiotherapy in collaboration with ICTP 8-12 April
- Organised by P. Grubling (SEEIIST), S. Galic (Uni Mostar B&H), M Esposito (ICTP)
- school in-person training + recording
- hadron (including heavy ions) radiotherapy, accelerator technology, radiobiology, dosimetry and dose computation radiation protection, treatment planning
- funded through some SEEIIST savings
- 54 students (48% Third countries, 35% EU, 17% SEE)
- 14 lecturers, 24 hours of lectures
- plan to re-open D5.1, D5.3

## School of Hadron Radiotherapy

### Description:

The course provides specialized education and training on development and implementation of hadron, including heavy ions, radiotherapy and accelerator technology. It is designed for medical physicists in clinical roles with ambition to learn about newest technological developments in radiotherapy.

### MORE DETAILS:

This course equips medical physicists with advanced skills in hadron radiotherapy and accelerator technology. Focusing on both practical and theoretical aspects, it covers several important topics. These include the physics of particle accelerators, offering a comprehensive understanding of the advanced technologies driving this field, radiobiology for particle therapy, providing insights into the biological effects of ionizing radiation crucial for effective and safe treatments.

Participants will learn about dosimetry, dose calculation algorithms, radiation protection in ion radiotherapy facilities and engage in hands-on treatment planning exercises using RayStation TPS. This course is a gateway to mastering the latest technological advancements in radiotherapy, equipping medical physicists with the knowledge and skills to excel in the evolving landscape of cancer treatment.

### TOPICS:

- Physics of Particle Accelerators
- Radiobiology for Particle Therapy
- Dosimetry and Dose Computation of Particle Beams
- Radiation Protection for Ion Radiotherapy Facilities
- Hands-on Exercises: Treatment Planning with RayStation TPS

### SPEAKERS:

G. DEDES, Munich University, Germany (remote)  
M. DURANTE, CERN, Germany  
M. FERRARINI, CNAO, Italy  
G. GEORGEV, University of Sofia, Bulgaria  
A. J. LOMAX, PSI, Switzerland  
S. LORENTINI, Azienda Provinciale per i Servizi Sanitari, Trento, Italy  
S. ROSSI, HITRIplus  
M. VRETENAR, CERN, Switzerland

8 - 12 April 2024

Trieste, Italy

Deadline:  
29 January 2024

### DIRECTORS:

S. GALIĆ, University of Mostar, Bosnia and Herzegovina  
P. GRUBLING, SEEIIST Association, Switzerland

### LOCAL ORGANISER:

M. ESPOSITO, ICTP, Italy

### GRANTS:

A limited number of grants are available to support the attendance of selected participants, with priority given to participants from developing countries. There is no registration fee.

### FURTHER INFORMATION:

E-mail: [smr3927@ictp.it](mailto:smr3927@ictp.it)

Web: <https://indico.ictp.it/event/10465/>

Female scientists are encouraged to apply.



# Extra Initiative 2

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- 1 train-the-trainer event on 22<sup>nd</sup> October 2024 (after Hadron Therapy Symposium)
  - Focus on Treatment Planning
  - In-person in Thessaloniki, Greece
  - Organised by Yiota Foka (SEEIIST, GSI)
  - Funded by savings made by SEEIIST
- 
- Plan to include in D5.2

# Plans for the Future

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- Task 5.1      - re-open to include extra initiative 1
- Task 5.2      - Reporting and submission of deliverable
- Task 5.3      - re-open to include extra initiative 1
- Task 5.4      - Concluded

