



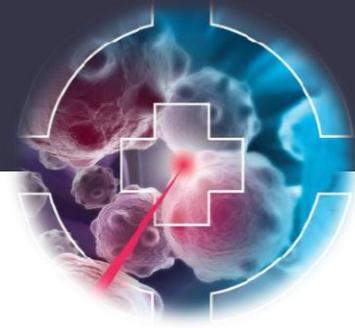
# OMA Optimization of Medical Accelerators – Introduction

Magda Klimontowska

*OMA School on Medical Accelerators  
CNAO, 4-9 June 2017*

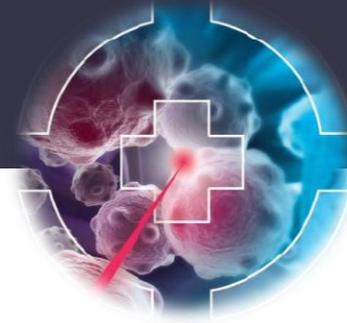


# European Training Network



- Horizon 2020: Marie Skłodowska – Curie Actions
- Researchers' training and mobility
- International, interdisciplinary and intersectoral collaboration

# Liverpool-coordinated networks



*(Beam Diagnostics, Physics)*

4.2 M€, 32 partners



*(Laser Applications, Engineering)*

4.6 M€, 38 partners



*(Accelerator Optimization, Physics)*

6 M€, 35 partners



*(Medical Applications, Life Sciences)*

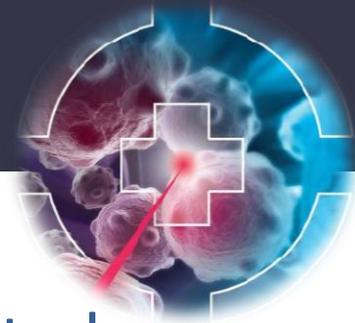
4.0 M€, 36 partners



*(Antimatter R&D, Physics)*

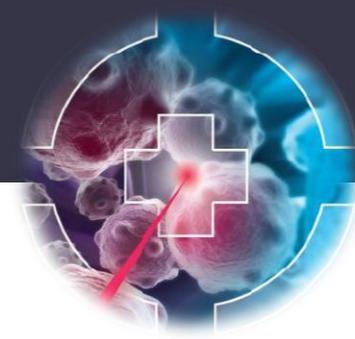
4.0 M€, 24 partners

# OMA as ETN

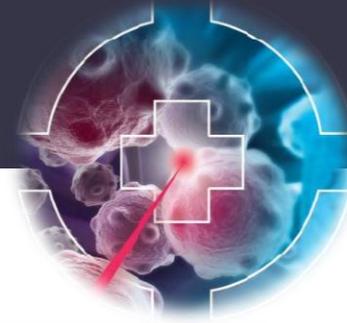


- **15 Early Stage Researchers** working on dedicated research projects for 3 years
- Individual project–based **training** + network activities and **events**
- Consortium of **more than 30 partner organisations**: universities, research centres, treatment centres and private companies.
- **Recognized importance** of R&D at interface between physics and life sciences at European level

# Network Beneficiaries



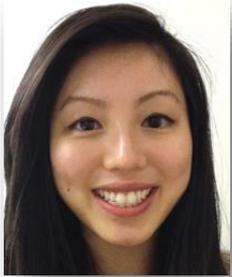
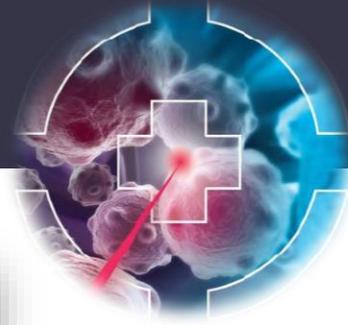
# Partner Organizations



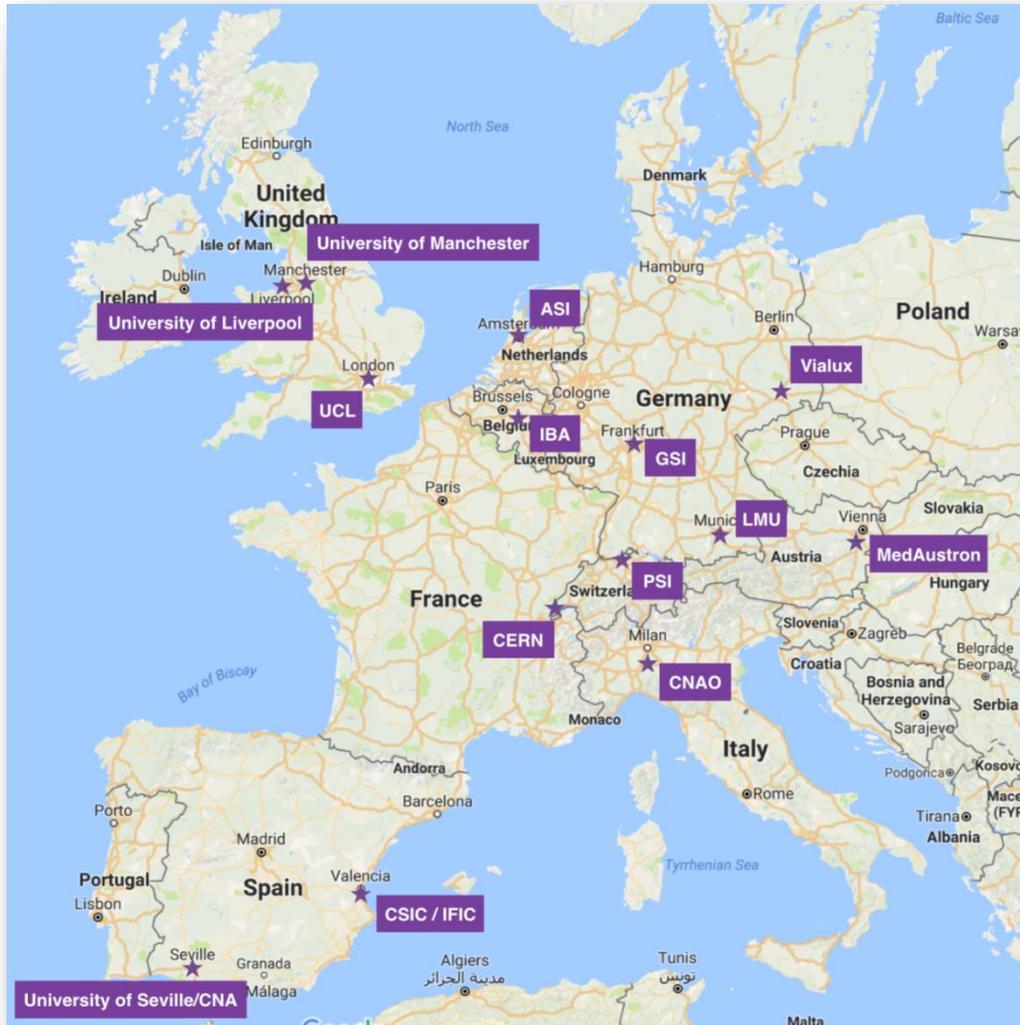
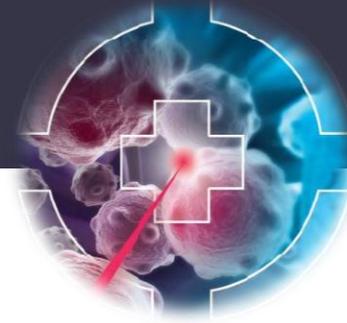
PENN RADIATION ONCOLOGY



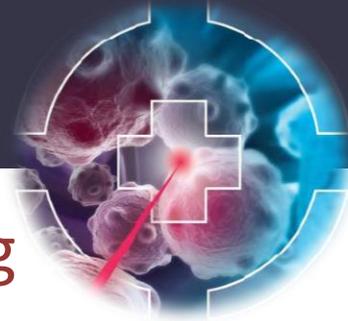
# Project Fellows



# Project Fellows

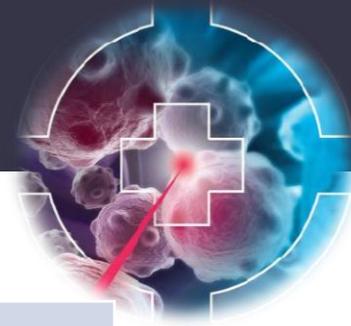


# OMA Research Overview



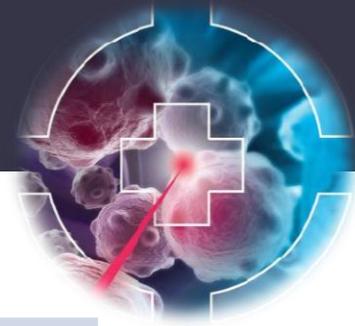
- Development of novel beam imaging and diagnostics systems
- Studies into treatment optimization including innovative schemes for beam delivery and enhanced biological and physical models in Monte Carlo codes
- R&D into facility design and optimization to ensure optimum patient treatment along with maximum efficiency

# Beam Imaging and Diagnostics



ESR1	Halo-Dose correlation in a medical accelerator
ESR2	A versatile high-speed radiation detection platform
ESR3	Imaging solutions for a novel prompt gamma camera
ESR4	RF-based Measurement of Ultra Low Charges
ESR5	Calorimeter for proton therapy and radiography
ESR6	Radiobiological effectiveness of protons

# Treatment Optimization



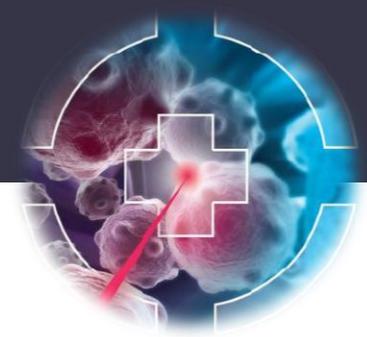
ESR7	Improvements on FLUKA for medical applications
ESR8	Tumour tracking in particle therapy
ESR9	A next-generation 4D-therapy control system
ESR10	Advanced Monte Carlo and imaging methods
ESR11	New encoding methodologies for ultra-fast 3D surface scanning.

# Facility design and optimization



ESR12	Light ion therapy software for data exchange
ESR13	Application of high gradient RF technology for hadron therapy accelerators
ESR14	Treatment facility optimization studies
ESR15	Gantry Design for Linac-boosted Protons

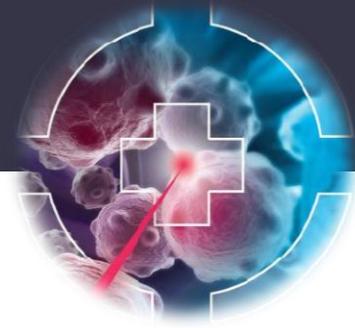
# Network Events



## Schools

- 1st OMA School – **Medical Accelerators**  
5-9 June, CNAO, Pavia, Italy
- 2nd OMA School – **Monte Carlo Simulations**  
6-10 November 2017, LMU Munich, Germany
- 3rd OMA School – **Particle Therapy**  
2019

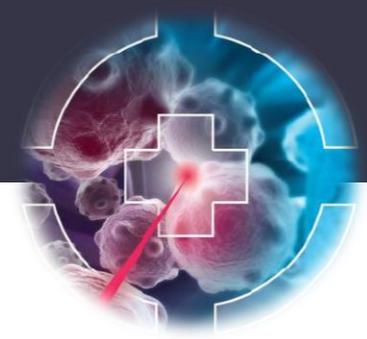
# Network Events



## Topical Workshops

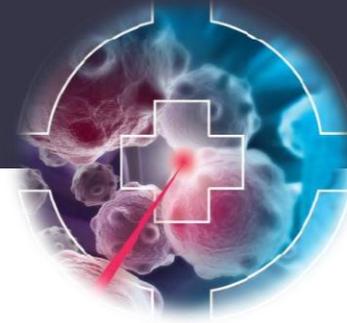
- 1st OMA Topical Workshop  
Facility Design Optimization for Treatment
- 2nd OMA Topical Workshop  
Diagnostics for Beam and Patient Monitoring
- 3rd OMA Topical Workshop  
Accelerator Design and Diagnostics

# Network Events



- **Final Conference** – autumn 2019  
Presentation of project scientific results.
- **Outreach Symposium** – 28 June 2019,  
Liverpool, UK  
Culmination of outreach activities of the  
project.

# Network communication



## Project website

[www.oma-project.eu](http://www.oma-project.eu)

The screenshot shows the homepage of the Optimization of Medical Accelerators Project website. At the top left is the University of Liverpool logo. The main header includes the project name and a search bar. A left-hand navigation menu lists various sections. The main content area features a large image of a medical accelerator with a text overlay describing the project's aim. Below this is a 'Welcome to OMA' section with the project's description and social media icons. At the bottom, there are two columns: 'Our Network' and 'News', each with a brief description and a 'Find out more' link.

**UNIVERSITY OF LIVERPOOL** OPTIMIZATION OF MEDICAL ACCELERATORS PROJECT

- Optimization of Medical Accelerators Project
- About us
- Network Structure
- Projects
- Vacancies
- News
- Events
- Dissemination
- Press
- Downloads
- Links
- EU Project T.E.A.M.
- Contact

Part of the School of Physical Sciences

### Research into the Optimization of Medical Accelerators

OMA's central aim is to assure the best possible cancer care for patients.  
[Find out more](#)

### Welcome to OMA

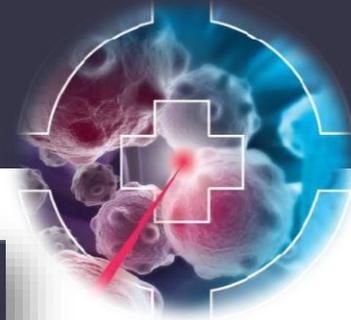
The Optimization of Medical Accelerator (OMA) is the goal of this new network within the Horizon 2020 Marie Skłodowska-Curie European Training Network scheme.

### Our Network

We work with leading research centres, universities and industry partners.  
[Find out more](#)

### News

Accelerators open up to new talents  
Open Positions in the OMA Project



Published every  
three months

**OMA Express**  
October 2016  
Issue 1

**Highlights**

- Who is who in OMA
- OMA welcomes first Fellows
- Upcoming OMA Events

**Optimisation of Medical Accelerators**

Although public knowledge of accelerator physics has increased in recent years with the work at CERN on the Large Hadron Collider, many people would not know that they benefit from accelerators in every aspect of their lives.

In fact, tens of millions of patients receive accelerator-based medical diagnoses and therapy every year. The most widely known products of medical accelerators are X-rays, which are used for imaging and cancer treatment, and radioactive isotopes, which are used for diagnosis. More recently the use of proton beam therapy has caught the media's attention as it offers a more targeted treatment for some cancer types, especially for children. However, despite its value to health and industry, accelerator science is still an emerging area of science and this creates exciting opportunities for research.

OMA is a new pan-European training programme that targets the 'Optimisation of Medical Accelerators'.

A cohort of 15 Fellows who were recruited from all over the world have started the projects this month and will push the frontiers for the use of accelerators in advanced cancer treatment.

OMA is positioned at the interface between life sciences, physics and engineering to present an interdisciplinary approach. We have brought together leading partners from universities, research centres, industry and clinical centres to help define and develop a cutting edge research programme. Our Fellows will get the opportunity to work with leading research institutes but also to have contact with potential end-users of the technology.

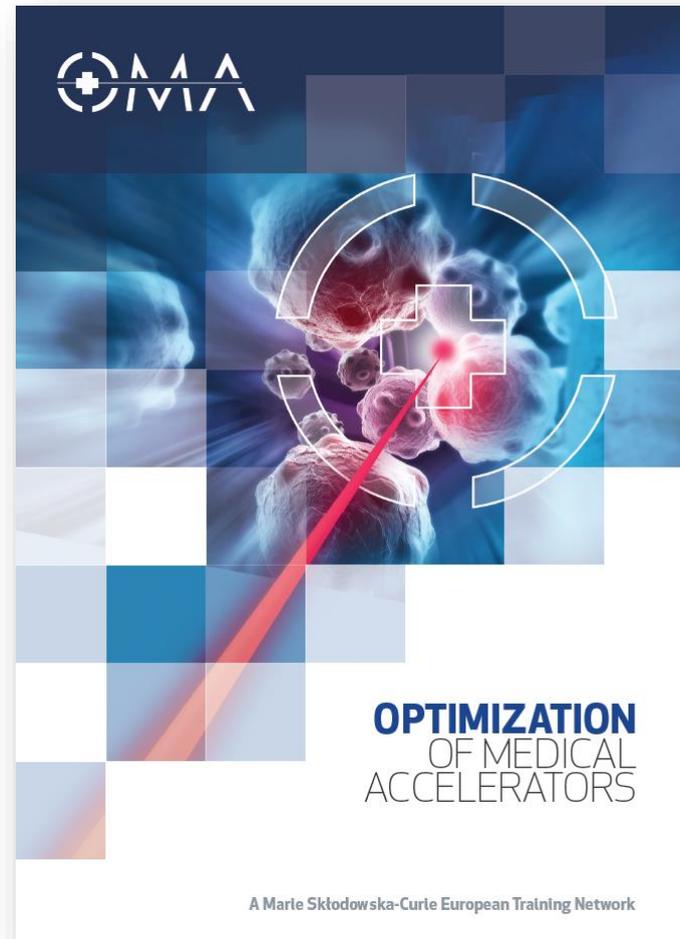
OMA will also offer a number of international events, such as Schools, Topical Workshops and Conferences which will also be open to participants from outside of the network. The OMA Express will be published quarterly and present highlights from the network and our Fellows.

Enjoy!

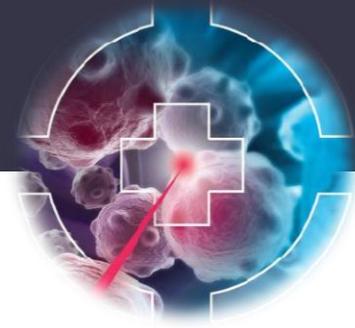
*Carsten P. Weisich*  
Prof. Carsten P. Weisich  
OMA Coordinator

# OMA Brochure

Presents all fellows,  
their individual  
research projects  
and all organizations  
in the network.



# Social Media

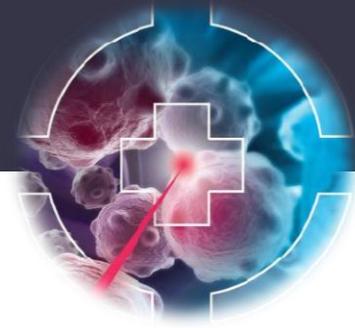


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<https://twitter.com/livuniphysics>



# Thank you!

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