Congress report

Bridging the future: from research to new clinical practice – Attendance record at the 5th European Congress of Medical Physics

Munich (kf). Under the slogan 'Bridging the future: from research to new clinical practice', over 1700 medical physicists from all over the world gathered in Munich-Garching from 11 to 14 September 2024. From basic research to clinical application, the exciting interdisciplinary field of medical physics was presented.

Over a total of four days, the 5th European Congress of Medical Physics (ECMP), held together with the 10th Trination Congress of the German, Austrian and Swiss Medical Physics Societies, was a unique forum for the exchange of the latest findings and innovative developments in all areas of medical physics. ECMP 2024 Conference President Professor **Yolanda Prezado**, Santiago de Compostela, explained: 'Medical physics is a very broad discipline, ranging from radiotherapy to diagnostic imaging with ionising and non-ionising radiation, audiology and artificial intelligence (AI).' Trination Congress president Professor **Katia Parodi**, Munich, commented that the program, drawn with the support of a very engaged international scientific committee, provided a timely overview of the most important developments and innovations in various traditional and emerging fields of medical physics, including synergies with different closely related disciplines.

Attendees were able to learn about the implementation of clinically innovative radiation therapies, ethical aspects of artificial intelligence and the implementation of AI solutions in daily healthcare, the latest innovations in a variety of diagnostic imaging modalities, ultrasound-mediated drug delivery, radiation protection, audiology and many other topics.

Impulses for the future

The novel topic of quantum machine learning has attracted a lot of attention. Professor **Issam El Naqa**, Head of the Department of Machine Learning and the Department of Radiation Oncology at the Moffitt Cancer Center in Tampa, presented an overview of the potential of this emerging approach leveraging advances in quantum computing at the Joint Session of the American Association of Physicists in Medicine (AAPM) and the European Federation of Organisations in Medical Physics (EFOMP). From a purely theoretical discipline, the first real applications are now emerging. Quantum machine learning could, for example, find future application in different areas of radiation therapy, from treatment planning to outcome predictions, or image data analysis.

Advances in X-ray imaging make an important contribution to medical diagnostics. In his opening keynote speech, Professor Dr **Franz Pfeiffer**, Munich, presented how new approaches exploiting the phase information of X-rays have great potential for improved medical imaging. Dark-field radiography and computed tomography can enable visualization of X-ray scattering in tiny lung structures, enabling more precise diagnosis of certain lung diseases. Analysing this small-angle scattering provides information on microstructures that cannot be seen with standard X-ray imaging.

Highlights without end – Award ceremony and presidential symposium

For his many years of service and outstanding achievements in the field of medical physics, Prof Dr **Mark E. Ladd**, Heidelberg, received the highest annual award presented by the DGMP: the Glocker Medal. Through his research in the field of ultra-high-field MRI, he and his team have

Trination Congress President

Katia Parodi, Ph.D.
Ludwig-Maximilians-Universität München
Chair for Experimental Physics - Medical Physics

Congress President

Yolanda Prezado, Ph.D.
Center for Molecular Research and Chronic Diseases, Santiago de Compostela

Scientific Organiser

European Federation of Organisations for Medical Physics
https://www.efomp.org/

German Society for Medical Physics
https://www.dgmp.de/

Austrian Society for Medical Physics
https://www.oegmp.at/

Swiss Society of Radiation Biology and Medical Physics
https://ssrpm.ch/

Venue

Science Congress Center Munich
Walther-von-Dyck-Straße 10
85748 Garching (Munich)

Conference Organiser

Conventus Congressmanagement & Marketing GmbH | Jena
Nicole Hirsch & Vanessa Pallister
M ecmp2024@conventus.de

Press contact
Katrin Franz
T +49 3641 31 16-281
M katrin.franz@conventus.de

succeeded in making ultra-high-field MRI technology accessible for use in hospitals. MRI scanners with magnetic field strengths of 7 Tesla can visualise pathological changes such as dementia, epilepsy or cancer at an early stage.

On top of an outstanding scientific program offering high-quality keynote speakers on a variety of timely medical physics topics, three internationally renowned pioneers have been invited to the presidential symposium. Prof Dr **Peter Hommelhoff**, experimental physicist at Friedrich-Alexander-Universität Erlangen-Nürnberg and winner of the prestigious Gottfried Wilhelm Leibniz Prize, presented the exciting concept of the 'Accelerator on a Chip'. This electron particle accelerator, which is the size of a microchip and enables revolutionary radiation sources, could be used in future to treat tumours in a highly targeted manner. In addition to Professor Hommelhoff's presentation, Professor **Katalin Hideghety**, Radiation Oncologist from Hungary, highlighted the exciting prospects of laser-driven accelerators for the future of modern radiotherapy, showcasing recent radiobiological results achieved in the context of the European Extreme Light Infrastructure. Prof. **Issam El Naqa** discussed ionizing radiation induced acoustics**,** a phenomenon exploiting thermoacoustic emissions produced by pulsed ionizing radiation, which can find intriguing applications both for dosimetry and treatment guidance in advanced radiotherapy.

The congress on the university campus in Munich-Garching also offered the opportunity to visit major research facilities that aim to promote innovation in biomedical applications, such as the Centre for Advanced Laser Applications (CALA), the Laboratory for Extreme Photonics (LEX), and the Munich Compact Light Source (MuCLS). Interested participants were able to take a look at the experimental neutron therapy facility at the FRM II research reactor.

Outlook at 2025

Prof Dr **Markus Buchgeister,** Berlin, and Prof Dr **Andrea Denker**, Berlin, invite you to the **56th Annual Meeting of the German Society for Medical Physics** in Berlin-Dahlem from 24 - 27 September 2025. In addition to the established topics, medical optics will be a new focus. The 100th anniversary of quantum physics will also be commemorated. Werner Heisenberg's formulation of quantum mechanics is one of the foundations of physics - without it, there would be no digital technology or medical diagnostics.

Link to the Press kit: https://ecmp2024.org/Press_Kit.pdf

Trination Congress President

Katia Parodi, Ph.D.
Ludwig-Maximilians-Universität München
Chair for Experimental Physics - Medical Physics

Congress President

Yolanda Prezado, Ph.D.
Center for Molecular Research and Chronic Diseases, Santiago de Compostela

Scientific Organiser

European Federation of Organisations for Medical Physics
https://www.efomp.org/

German Society for Medical Physics
https://www.dgmp.de/

Austrian Society for Medical Physics
https://www.oegmp.at/

Swiss Society of Radiation Biology and Medical Physics
https://ssrpm.ch/

Venue

Science Congress Center Munich
Walther-von-Dyck-Straße 10
85748 Garching (Munich)

Conference Organiser

Conventus Congressmanagement & Marketing GmbH | Jena
Nicole Hirsch & Vanessa Pallister
M ecmp2024@conventus.de

Press contact
Katrin Franz
T +49 3641 31 16-281
M katrin.franz@conventus.de