



EFOMP

EUROPEAN FEDERATION OF ORGANISATIONS FOR MEDICAL PHYSICS



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International Organization for Medical Physics



IDMP2024

Inspiring the next generations
of Medical Physicists



European Congress of Medical Physics
11-14 September 2024 | Munich, Germany



EFOMP leadership course
17th-19th March 2025



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Reflections on an Eventful Autumn and Looking Ahead to 2025



As we draw near to the end of 2024, it is truly rewarding to reflect on an exceptionally eventful autumn for EFOMP and the medical physics community. The season began with the highlight of the year: the [European Congress of Medical Physics \(ECMP\)](#), held in Munich this September. The congress was an extraordinary success, thanks to the tireless efforts of the local organisers and the overwhelming participation of delegates from across Europe and beyond. ECMP 2024 showcased the dynamism and innovation within our field, featuring a dedicated track for

young medical physicists. This initiative provided a platform for the next generation to shine, with numerous events and activities tailored specifically to them. The articles in this issue of EMP News richly document these vibrant contributions.

During the congress, we were delighted to present the [EFOMP Medal 2024](#) (Prof. Slavik Tabakov) and confer [honorary membership](#) (Dr. Marco Brambilla) on distinguished medical physicists. These prestigious accolades celebrate outstanding contributions to our field, and readers can find detailed interviews with the honourees in this issue.

Barely had we caught our breath from ECMP when the **International Day of Medical Physics (IDMP)** arrived on November 8. This annual celebration, which honours the birthday of the legendary Marie Curie, saw exceptional efforts from our National Member Organisations (NMOs). The dedication of NMOs to mark this occasion was truly inspiring, and our current EFOMP officers travelled extensively across Europe to attend [IDMP events](#). Their reflections on these celebrations are also featured in this issue.

Marie Curie's life epitomises **dedication, innovation, and female leadership**, transcending her time. It is fitting, therefore, to note with pride that EFOMP is currently led by two exemplary female leaders: our **President, Efi Koutsouveli**, and **Secretary General, Brenda Byrne**. Their commitment to EFOMP and the field of medical physics has been nothing short of remarkable,

as evidenced in their contributions over the last three months. More on their work can be found in their reports within this issue.

Promoting leadership and fostering the next generation of medical physicists is central to EFOMP's sustainability agenda. In alignment with this, EFOMP, in collaboration with European Cancer Organisation (ECO) and European Network for Training and Education of Medical Physics Experts (EUTEMPE) and under the coordination of Paddy Gilligan (EFOMP immediate Past President), is organising a [dedicated Leadership Course: "Leading Medical Physics to a Sustainable Future"](#). This course will take place in Brussels from **17th to 19th March 2025** in a hybrid format, offering both on-site and online participation. With contributions from high-level healthcare policymakers, including EC commissioners, this event promises to be transformative, and we strongly encourage everyone to register.

This season also saw EFOMP elections for various committees, and I am delighted to extend congratulations to **Dimitris Visvikis (Projects Committee)**, **Antonio Lopez Medina (International & European Matters Committee)**, and **Itembu Lannes (Professional Matters Committee)** on their re-elections. Additionally, it is my honour to welcome **Irene Polycarpou** as the incoming **Vice-Chair of the Communications and Publi-**

cations Committee for 2025. Irene will succeed me as Chair in 2026, and I look forward to seeing her vision shape the future of the committee. Looking to 2025, we have an exciting calendar of events and activities to anticipate. These include a series of **ESMPE Schools**, the second [EFOMP Symposium on Molecular Radiotherapy Dosimetry: The Future of Theragnostics](#) in Athens, and preparations for [ECMP 2026](#) in Valencia.

Reflecting on the work of the Communications and Publications Committee in 2024, I want to thank all committee members and our talented graphic designer, George Kassalias, for their invaluable contributions to the digital transformation and visual accessibility of EMP News. My gratitude extends to our authors and company members, whose consistent contributions ensure that we maintain the highest quality in every issue.

As we conclude a remarkable year, I hope you enjoy the holiday season and take time to rest and recharge. Here's to an exciting 2025 ahead!

Warm regards,
Sasha Ivashchenko
Chair, EFOMP Communications
and Publications Committee



Sasha Ivashchenko, MPE at the Department of Nuclear Medicine and Molecular Imaging of the University Medical Center Groningen, chair of the CP committee 2024-2025.

EFOMP President's Report

Efi Koutsouveli highlights actions supporting EFOMP's Sustainability Roadmap: "Leading Medical Physics to a Sustainable Future" course.



As we approach the end of my first year as EFOMP President, I am grateful for the opportunities, challenges, and experiences that have shaped this year. Staying true to our mission, EFOMP has prioritised outreach and strengthened partnerships with national, European, and international medical physics societies and healthcare organisations. These collaborations not only expand our reach but also bring valuable insights that enrich our community.

EFOMP's strategic roadmap for the coming years takes a holistic approach, encompassing all aspects of medical physics—cutting-edge research, robust education, transformative clinical practice, and long-term sustainability.

One particularly inspiring goal is the commitment to empowering early-career medical physicists, amplifying their voices, and supporting their growth. By nurturing this community, EFOMP aims to create a future where innovation, collaboration, and diversity thrive, with quality of care and safety as our core priorities. Recognising the critical role of young professionals and the energy they bring, we have organised several initiatives this year, including mentoring programmes, networking events, educational courses, and webinars tailored to their needs.

The “Leading Medical Physics to a Sustainable Future” Course

Aligned with our sustainability goals, we have recently launched the ‘*Leading Medical Physics to a Sustainable Future*’ course. This initiative stems from the success of previous EFOMP-EUTEMPE courses on ‘*Leadership in Medical Physics: Development of the Profession and the Challenges for the Medical Physics Expert (MPE) in Radiology*,’ led by Carmel Caruana. These courses have focused on equipping future MPEs in diagnostic and interventional radiology with the skills needed to take on strategic leadership roles at national and European levels.

However, the need for a unified career pathway

for MPEs across all subspecialties of medical physics has become evident. Harmonising education, training, and leadership competencies is crucial, especially as advancements in clinical practice increasingly interconnect specialties. Examples include multimodal imaging in radiotherapy, dosimetry for radiopharmaceutical therapy, the MPE's role in clinical trials, and the integration of artificial intelligence into diagnostics and therapy. These emerging practices demand a cohesive approach, enabling MPEs to manage complex healthcare environments effectively.

This vision aligns with EFOMP's *Malaga Declaration* (updated in 2023), which promotes the integrated and holistic management of physical agents in hospitals to ensure quality care and safety for patients, staff, caregivers, and communities.

Upcoming Leadership Course Details

EFOMP, in collaboration with EUTEMPE, ESMPE, ECO, ENEN, COCIR, and ICRP, is organising the ‘*Leading Medical Physics to a Sustainable Future*’ course from **17th–19th March 2025** in Brussels and online. Featuring top international speakers, the course will focus on developing leadership, management, communication, and pedagogical skills for medical physicists working at hospital, university, industry, national, European, and international levels. The three-day event will be accredited by the European Board for Accreditation in Medical Physics (EBAMP).

Course Objectives:

- To train and identify future leaders in medical physics, ensuring a strong pipeline of skilled professionals to advance the field and build effective teams.
- To educate participants on Europe's key structures of influence, enabling them to navigate and utilise these frameworks to benefit patients.
- To provide networking opportunities for aspiring and established leaders, fostering collaboration, innovation, and knowledge exchange to enhance healthcare practices.

- To develop participants' soft skills alongside their scientific expertise, recognising that technical competence alone is not sufficient for success in today's demanding environments.

The programme will include contributions from affiliated organisations, reflecting a commitment to interdisciplinarity, professional collaboration, and continuous training. Workshop sessions will provide space for discussions on professional growth, self-development, and maintaining well-being, enabling participants to interact with lecturers and peers in a collaborative environment.

This course is suitable for medical physicists at all career stages, working in any discipline (radiotherapy, nuclear medicine, radiology, hospital physics) and in both clinical and academic settings.

Registration and Programme of the Leadership Course

Guiding the next generation of medical physicists is a key challenge for EFOMP. If our profession is to thrive and adapt in a rapidly evolving environment, mentoring young medical physicists is vital to develop the effective, strategic leaders needed for the future. To support our early career community, EFOMP's governing committee decided to offer 30 low fee registrations to young persons (under 30y) coming from EFOMP National Member Organisations for attending the course in Brussels.

Inspiring the Next Generation

The 2024 International Day of Medical Physics (IDMP) celebrated the theme 'Inspiring the Next Generation of Medical Physicists.' During the global

celebrations organised by IOMP, I had the honour of speaking about opportunities and challenges within the European region. EFOMP officers also travelled across Europe to participate in events hosted by our National Member Organisations in Croatia, Estonia, Lithuania, Portugal, Slovakia, and Spain. These events were well-attended by young members and supported by industrial partners.



Figure: The Danish Society of Medical Physics (DSMF) sponsored cakes prepared in Danish hospitals to celebrate IDMP 2024. ^[1]

As the holiday season approaches, I would like to thank everyone for their contributions this year. I hope you all find time to relax with family and friends over Christmas and the New Year. Here's to a prosperous future for us all.

References

- [1] ©Eva Samsoe, used under CC BY-SA 2.0.

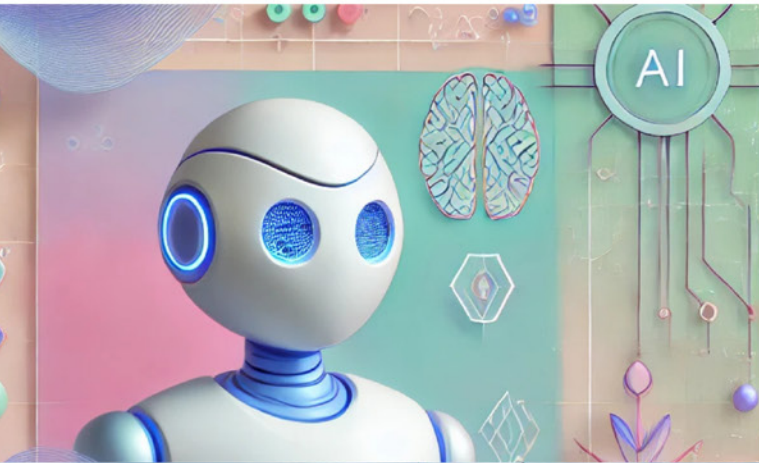


Efi Koutsouveli a Medical Physics and Radiation Protection Expert, has worked at Hygeia Hospital in Athens since 1993, specialising in radiation oncology and Hospital Quality Management Systems. Currently serving as EFOMP's President, she has a strong interest in Oncology Information Systems. In 2019, she received the IOMP-IDMP award for her efforts in promoting medical physics to a broader audience



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Proton Therapy Physics

From July 10–12, the ESMPE will host a Proton Therapy Physics School in Prague, tailored for medical physicists specializing in radiation therapy.

Registration is open!



Radionuclide Internal Dosimetry

The newest course on internal dosimetry for radionuclide therapy, taking place in Prague in February 2025, is now open for registration!

Registration is open!

All ESMPE schools offer a reduced fee for participants from the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Estonia, Greece, Hungary, Latvia, Lithuania, Moldova, North Macedonia, Poland, Portugal, Romania, Serbia, Slovak Republic, Spain, Ukraine.

Additionally, participants can apply for full financial support through individual applications for mobility grants via the ENEN++ (www.enen2plus.eu) or PIANO FORTE (pianoforte-partnership.eu) projects.

Learn more



EFOMP Secretary General Report

In this report, Brenda reflects on the final months of her first year as EFOMP Secretary General.

European Congress of Medical Physics (ECMP) 2024



Figure 1: View on the city hall of Munich. ^[1]

As the autumn leaves have fallen, we have had time to reflect on our most successful ECMP Congress to date. Held at the “Science Congress Center Munich” on the Galileo Campus in Garching-Munich, the event welcomed 1,300 participants, 206 speakers, and 286 exhibitors. Located in the heart of Munich’s scientific hub, the Congress exceeded all expectations, with highlights including Pre-Congress courses, engaging scientific and poster sessions, and wonderful social events.

Hosting the Congress on the university campus offered attendees the unique opportunity to visit

major research facilities promoting 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).

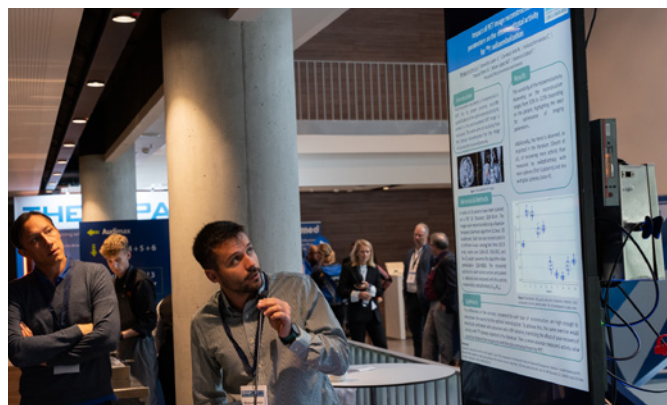


Figure 2: ECMP Poster session. ^[1]

The Congress began with ESMPE Pre-Congress Schools and the EUTEMPE Atelier, both of which were well attended. EFOMP also hosted the 18th ENEN PhD Event & Prize Competition and a dedicated PhD workshop for early-career physicists, detailed further in this edition of *EMP News*.



Figure 3: Awards session at the ECMP 2024. ^[1]

The official opening ceremony of the 5th ECMP Congress took place on the evening of 11th September, followed by traditional Bavarian food, drinks, and music—a fantastic way to kick off the event.



Figure 4: Opening ceremony of the ECMP 2024. ^[1]



Figure 5: Opening ceremony musicians.

During the Congress, attendees explored a variety of topics, including innovative radiation therapies, AI implementation in healthcare, advancements in diagnostic imaging modalities, radiation protection, non-ionising radiation, and audiology. Alongside an outstanding scientific programme, high-quality keynote speakers shared insights across the medical physics spectrum.

Day 3 Highlights

Day 3 featured the Presidential Symposium and a session on education, training, and professional matters for medical physicists. A standout moment was the joint session where Georgi Simeonov from the European Commission discussed the future of European recognition of medical physics experts.

Several joint sessions were held with organisations that EFOMP collaborates with, such as IAEA, ICRP, ESMRMB, AAPM, ESTRO, and ESR. Day 3 concluded with a memorable social event at the iconic “Ratskeller” in central Munich. Attendees enjoyed the neo-Gothic setting, indulged in food and drinks, and danced late into the night—though finding the way out of the venue proved a challenge!



Figure 6: Social event at the ECMP 2024. ^[1]

Incorporating Early-Career Sessions

Building on the success of ECMP 2022 in Dublin, early-career sessions were integrated into the main scientific programme. These sessions, which were often oversubscribed, covered topics ranging from medical device regulations to hot topics in medical physics. A dedicated session allowed early-career physicists to present their work and receive feedback from a soft skills expert.

The DIY fair and electronic poster presentations followed the Congress’s sustainable model and remained highly popular.

Final Day and Closing Ceremony

On the final day, participants delved into innovative radiotherapy, imaging, and photon-counting

CT. The closing ceremony, held in the Audimax theatre, saw EFOMP President Efi Koutsouveli present the EFOMP Honorary Membership award to Past President Marco Brambilla. Outgoing Congress President Yolanda Prezado passed the baton to incoming President Efi Koutsouveli, inviting us all to Valencia for the 6th Congress in 2026.

Our thoughts are with our colleagues in Valencia following recent tragic events, but we are confident they will be ready to host us in September 2026.

Acknowledgements

A special thanks to the 48 exhibitors and sponsors whose support enriched the Congress. The exhibition area provided an excellent opportunity to connect with companies showcasing cutting-edge technology for medical physicists and patients.

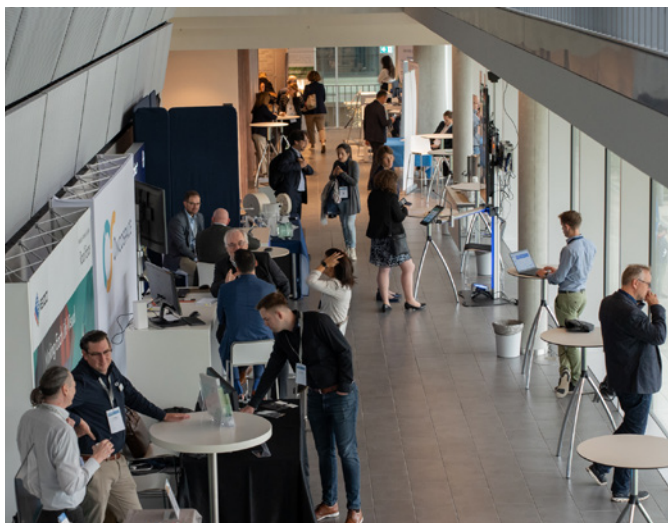


Figure 7. Exhibition

EFOMP extends gratitude to the Tri-Nations (Austria, Switzerland, and Germany) for their exceptional local organisation, and to Congress Presidents Yolanda Prezado and Katia Parodi for curating an outstanding scientific programme. From basic research to clinical applications, the Congress showcased the exciting interdisciplinary field of medical physics.



Figure 8. Chairs of the Young Investigator Session.^[1]

EFOMP Governing Committee Meetings at ECMP 2024

The EFOMP Officers held their second face-to-face meeting of the year during ECMP 2024. Key discussions and approvals took place, and annual reports were presented to EFOMP Council delegates at the EFOMP Council Meeting on 14th September.

Ahead of the Congress, EFOMP met with representatives from the International Commission of Radiation Protection (ICRP) for a half-day meeting. Discussions focused on mutual collaboration, mentorship programmes, and educational activities. ICRP representatives highlighted opportunities for medical physicists to contribute to task groups and serve as technical secretaries.

The work of EFOMP's ICRP liaison, Lorenzo Nicola Mazzoni, and the recent publication of the *Vancouver Call for Action to Strengthen Expertise in Radiological Protection Worldwide* were acknowledged as significant steps forward for radiological protection.



Figure 9. Logo of the SIG on Magnetic Resonance Imaging

Special Interest Groups (SIGs): Artificial Intelligence SIG Steering Committee elected

Our Artificial Intelligence SIG have elected their first Steering Committee and have begun their work. We look forward to seeing the outcome of their work in the coming months. During the ESMPE school in Milan in October 2024 on "Quantitative MRI: basic principles, optimization, quality assurance our latest SIG was launched". The call for members of the Magnetic Resonance Imaging SIG is open and you can read more about this SIG's activity and apply to become a member [here](#) via our website.

International Day of Medical Physics 2024

The theme for this year's International Day of Medical Physics (IDMP) was "Inspiring the Next Generations of Medical Physicists." I had the great honour to be invited to the Portuguese Association of Medical Physicists first Congress which was held in Fátima from the 7th to 9th of November. This was an inspiring event to be part of and I got the strong impression that the future of Medical Physics in Portugal is good. The first afternoon of the Congress was dedicated to three Pre-Congress schools and I spoke on Diagnostic Reference Levels. The second day contained a full programme of talks on professional matters and scientific content. I was delighted to learn that Portugal will commence their training programme for Medical Physicists in 2025 which has been dormant for many years and EFOMP looks forward to these young people getting involved in our early career SIG.

It has been an extremely busy first year as secretary general of EFOMP but one which I have enjoyed immensely. I look forward to working together with the EFOMP board members and our NMOs over the next two years to further "apply physics to healthcare for the benefit of patients, staff and public".



Figure 10. Participants in the Radiology Pre-Congress Course at APFISMED Congress, Fátima, Portugal.

References

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Brenda Byrne is a Principal Physicist working in the Mater Misericordiae University Hospital, Dublin, Ireland. Her primary areas of interest are diagnostic radiology, nuclear medicine and radiation protection. She has been a registered radiation protection adviser (RPA) since April 2000 and is a recognised medical physics expert (MPE). Brenda is the current Secretary General of EFOMP and Past Chair of the EFOMP Professional Matters Committee.

Physica Medica: Editor's Choice

For this winter issue of **EMP News**, I have selected the following three articles, recently published in Physica Medica (EJMP), which particularly caught my attention.



A. C. Kraan *et al.*, In-beam PET treatment monitoring of carbon therapy patients: Results of a clinical trial at CNAO

Phys. Med. 2024;125: 104493

<https://doi.org/10.1016/j.ejmp.2024.104493>

This article presents the results of the first phase of a clinical trial conducted at CNAO, where the bimodal non-invasive nuclear imaging system, called INSIDE, consisting of an in-beam PET (IB-PET) system with planar geometry and a charged particle tracker, was employed for in-vivo range monitoring in nine patients treated with carbon ion beams. The results, based on the PET images acquired after the delivery of the first field using two different methods, were promising. They demonstrated a sensitivity of the PET scanner for detecting range differences in carbon therapy of 3.7 mm and a partial agreement between the

3D information and the control CT. Based on this initial study, the method will be further explored in the second phase of the clinical trial.

B. Bordigoni *et al.*, Automated segmentation in pelvic radiotherapy: A comprehensive evaluation of ATLAS-, machine learning-, and deep learning-based models

Phys. Med. 2024;125: 104486

<https://doi.org/10.1016/j.ejmp.2024.104486>

This study illustrates the growing use of artificial intelligence for organ segmentation in radiotherapy treatment planning. More specifically, it examined the use of four automated segmentation approaches for computed tomography (CT) images of both female and male patients planned for radiotherapy (RT) targeting the pelvic region. The methods assessed varied in complexity, including atlas-based methods, a Random Forest-based model, and two commercially available Deep Learning-based (DL) tools for RT. The results indicate that DL outperformed the other methods and should therefore be strongly considered for implementation in an automated workflow to reduce segmentation times for routine treatments of pelvic-region targets.

E. Pace *et al.*, An inventory of patient-image based risk/dose, image quality and body habitus/size metrics for adult abdomino-pelvic CT protocol optimisation

Phys. Med. 2024;125: 103434

<https://doi.org/10.1016/j.ejmp.2024.103434>

The third and final article selected for this winter issue is a review of the metrics available for patient-specific optimisation variables used in abdomino-pelvic Computed Tomography (CT): body habitus or size (BH), sensitivity-specificity as a surrogate for image quality (IQ) metrics, and risk as a surrogate for the dose (RD). The article provides an updated inventory of metrics directly derivable from patient measurements or images. These metrics are not only listed but also critically evaluated and discussed in relation to each other. In addition, the authors offer valuable suggestions for advancing the use of these metrics by mapping them to the specific image quality criteria for particular clinical tasks, as outlined in internationally recognised guidance documents.



Iuliana Toma-Dasu, Editor-in-Chief of *Physics Medica* – European Journal of Medical Physics.

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Leadership Course

In collaboration with EUTEMPE, EFOMP is delighted to invite medical physicists to the "Leading Medical Physics to a Sustainable Future" course, taking place from March 17–19, 2025, in Brussels!

This course is designed for medical physicists at all stages of their careers and is suitable for professionals working across all disciplines—radiotherapy, nuclear medicine, radiology, and hospital physics—in both clinical and academic settings.

[Learn more](#)



2nd SMRD Symposium

Save the date for the 2nd Symposium on Molecular Radiotherapy Dosimetry: The Future of Theragnostics, taking place in Athens from November 13–15, 2025.

[Learn more](#)



[Learn more](#)



Depending on the scope of the event, participants can apply for full financial support through individual applications for mobility grants via the ENEN++ (www.enen2plus.eu) or PIANO FORTE (pianoforte-partnership.eu) projects.

EFOMP Medal of Honour 2024:

Meet Professor Slavik Tabakov

The EFOMP Medal honours an individual who has pursued an outstanding and internationally acknowledged contribution to the advancement of medical physics. EFOMP's Awards and Honours Task-Group has awarded the prestigious EFOMP Medal to Professor Slavik Tabakov this year, in recognition of his numerous contributions to our profession; a well-deserved honour that highlights the significant and long-lasting impact of his work.

Professor Tabakov, thank you for having this interview with me – as an early career medical physicist it is a great pleasure that I get to speak to someone as accomplished as you. Congratulations on receiving the EFOMP Medal Award! How did it feel to be recognised with such a prestigious honour?

I am very grateful to the EFOMP Leaders and Council for awarding me the EFOMP Medal. My largest projects in e-learning and e-Encyclopaedia are now used globally – but these were European projects for which I have worked with colleagues from almost all European countries. Also, my main activities are in the field of medical physics education and I accept the Medal also as a recognition for the colleagues, who like me work in education. Every development through research has three components: personal innovative ideas, an excellent research team and sound education. Many years ago, I decided to focus on one area of our profession and my decision was to dedicate my further professional life to medical physics education. It was not an easy decision, as we all love research, but I am happy that I chose this field, as it is helping thousands of colleagues globally.

I am especially grateful to my colleagues from Bulgaria ([BSBPE](#)) for the nomination and my colleagues from the Baltic and other states, who supported it.

Looking back at your journey, what initially inspired you to pursue a career in the field of medical physics and what motivated you to become so actively involved with the various International Organisations that you've served throughout the years?

In brief - I grew up in a family of medical doctors; my grandfather had the first X-ray fluoroscopic equipment in Bulgaria installed in our house. On top of this I have always loved sciences and thus medical physics became a natural union of both fields. I started my career in the Medical University of Plovdiv, Bulgaria, where I later built an MSc programme and continue to be involved.

In my time of study, before the 1980s, there were very few educational programmes focused on medical physics. At the same time, the 1970s and 1980s were revolutionary for medical diagnostics through the introduction of many new imaging methods. This revolution was one of the main advances in medicine of the 20th century. It was obvious that the effective introduction of this new medical technology into clinical practice required many more specially educated professionals – medical physicists and biomedical engineers. We should not forget that by 1985 there were only about 10,000 medical physicists in the world ^[1]. Most of these colleagues were working in the field of Radiotherapy in the developed countries. The number of medical physicists in Low and

Middle Income Countries (LMIC) was minimal and the distribution of medical physicists in the world is still very uneven ^[2]. It was obvious that the profession needed significant growth, which could be achieved only through education. Thus in 1989, I decided to dedicate my professional life to medical physics education, and after my family moved to the UK in 1991, I started many educational projects with my colleagues from King's College London, specifically mentioning Prof. Colin Robers and Dr Neil Lewis. Having said that, my wife and colleague Dr Vassilka (Assia) Tabakova was my most staunch supporter and collaborator. The 1st International Conference on Medical Physics Education, which we organised, was followed by the development of MSc programmes, initially in Bulgaria, and later by similar projects in Lithuania, Latvia and Estonia. EFOMP supported all these projects and I am very happy that these were some of the first bridges in our profession between Western and Eastern Europe.

I still continue to have activities in the IUPESM. Now looking back at these 35 years, I am happy to have collaborated and coordinated many international projects in medical physics education, of which 7 large European projects and over 20 IAEA projects. I would additionally mention the ICTP College of Medical Physics in Trieste, Italy, which we both with Prof. Perry Sprawls transformed in 2002 as a *"Train-the-Trainer"* activity (Figure 1). This College has educated over 1500 students from 82 LMIC, many of them developing spin-off educational activities in their own countries ^[3]. Additionally, I supported the establishment of 16 MSc programmes in different countries. All these activities are a significant part of the overall professional development which led to the tripling of medical physicists globally, compared with 1985, and most importantly increasing the number of medical physicists in LMIC, especially in Central and Eastern Europe ^[4], but also in Asia, Africa and Latin America.



Figure 1. Prof. Tabakov with colleagues and participants of the ICTP College on Medical Physics 2024, in Trieste, Italy.

I strongly believe in teamwork and the International Organisations in our field provide the background exactly for such joint activities. In 1997, I was elected a member of the IOMP Education and Training Committee. Later in 2000, I was elected Chair of this Committee and continued to work for the IOMP Executive Committee until 2022 (being President in the period 2015-2018), and

Undeniably, your contributions in our field over the years have been numerous — ranging from, as you mentioned, being the Founding Director of multiple MSc' Programmes, including two at King's College London, leading various international projects and developing e-Learning, to authoring and co-authoring multiple textbooks. But, is there a particular

project or achievement that you are most proud of?

We formed an excellent team in King's College London (KCL) and King's College Hospital (KCH). I am happy that when I took the lead of the MSc in KCL it had 8 students; later we founded with my colleagues two further MSc's, and when I retired recently the medical physics students there were above 100, making it one of the largest such MSc courses in the world (Figure 2). It was very hard work, but again the excellent team was of great importance. I am also very proud of our students and their achievements – for 25 years their projects received over 30 national and international awards [5].



Figure 2. Prof. Tabakov with KCL students in 2016.

Considering the e-learning projects, I am very happy with the results; we've developed not only the first e-Books and educational image databases of our profession, but these were some of the first e-Books with ISBN in the world. It was again a fantastic teamwork with colleagues from the UK, Italy, Sweden, Portugal, France, Ireland, Czechia and Bulgaria. This was a sequence of EU projects which also developed the first educational web site in medical physics, which is still active, and in 2004 our projects were awarded the inaugural EU Award for Vocational Education – the

Leonardo da Vinci Award. This was an enormous success for our profession and activated many colleagues in various countries to work in the field of e-Learning, where medical physics has a steady place as one of the founders [6, 7]. These projects were not only supported by EFOMP, but also were the first to include the Federation as a project partner.

However, if I have to specify one project, which I consider as the "Jewel in the crown", this will be the EMITEL project, which developed the unique e-Encyclopaedia of Medical Physics with Scientific Dictionary of terms, translated to 32 languages. This enormous project included over 150 specialists developing the encyclopaedic articles and over 200 colleagues doing the translations. As the project developer and coordinator, I am very grateful to all these colleagues from about 50 countries who worked voluntarily to develop this huge educational resource [8,9], which is now used, monthly, by over 5000 colleagues in the world (Figure 3). I have to specifically mention Prof. Magdalena Stoeva and Dipl. Ing. Assen Cvetkov, who developed the website of this free resource and my wife Dr. V. Tabakova, who was coordinating the International Network. This project was the first to include IOMP as a project partner. We recently completed the Update of the Encyclopaedia and Dictionary, which were published by the CRC Press and are now being updated on the internet.

Together with my wife we described these pioneering e-learning projects in a popular free ebook, which to our surprise has over 40,000 downloads [10]. By coincidence many of these projects have an anniversary this year [11].

To express my gratitude to my UK colleagues, who were firm supporters and contributors in these projects, I gifted to our MEP Department at KCL/KCH our first CD-ROM with ISBN, while I gifted to the IPEM my IOMP Harold Johns Medal for International Education Leadership.

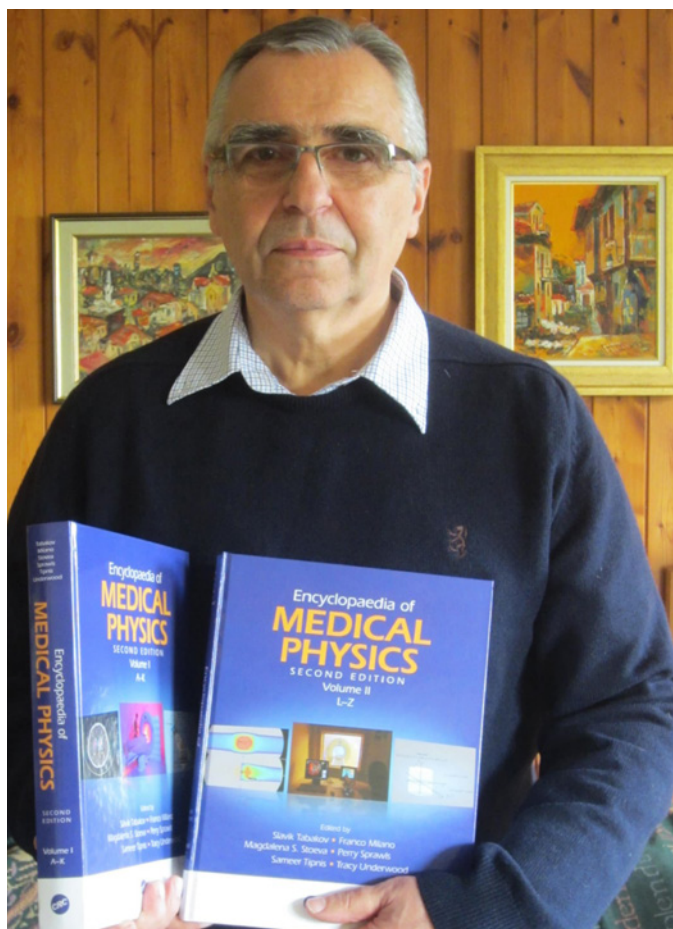


Figure 3. Prof. Tabakov holds the 2nd Edition of the Encyclopaedia of Medical Physics, that includes over 3300 cross-referenced full entries related to medical physics and associated technologies.

Throughout your career, you've witnessed significant advancements in medical physics. What do you think is the most exciting development currently happening in the field, and where do you believe we should focus our attention in terms of research moving forward?

As a whole, medical physics is an extremely dynamic profession. In my professional life in medical imaging I saw the introduction of various scanners, later of digital detectors and PACS, now of Artificial Intelligence (AI) in imaging and radiotherapy. However, one could see a clear pattern of fast research groups going ahead, with the industry, and huge groups of colleagues who after this have to implement the new equipment and methods in clinical practice, and in the education of the coming new generation. The gap between

the two groups has to be decreased. Due to this reason while I was IOMP President, I introduced an Award for colleagues who have not only invented, but also introduced in clinical practice their innovation (the IOMP John Mallard Award) ^[12].

In general, we have to encourage colleagues to write more books – both as detailed descriptors of the innovation and as guides for its implementation and also educational resources. With Prof. Kwan Ng and Prof. Russell Ritenour, we are Editors of the IOMP-CRC Series in Medical Physics and Biomedical Engineering. For 15 years we have supported the publication of about 100 textbooks, over 2/3 of all books in the Series. We would like to persuade our colleagues, additionally to the excellent research papers – which we all enjoy – to write books, which are more time consuming, but extremely important for the profession. To further support this process, we have to take an active role in the update of academic promotion in Universities, which currently places a heavier emphasis on paper publishing, compared with book publishing.

New medical equipment and methods in Radiotherapy develop rapidly, but as my sub-field is imaging, I shall say several words about my views related to these advancements. AI is definitely the field of the new generation. As a specific advice – I think we have to more actively shape the introduction of AI in our profession. I see this in three main phases. The immediate one is to have a model-syllabus for an academic module e.g. “AI in Medical Physics” – this will allow a synchronised approach in the early introduction of AI in the specificities of our scientific field. The mid-term phase I see as an active link between AI and Quantitative Imaging (QI), which is a very powerful diagnostic tool. It is important to work with our medical colleagues for increasing its clinical application. In this connection I see the long-term phase as better collaboration with our medical colleagues in AI and other novelties, which will additionally stabilise the place and appreciation

which medical physics has in healthcare.

I absolutely agree with you, the use of AI in diagnostic imaging is “the new black” and we, as medical physicists, should guide its clinical implementation. As someone who has shaped the careers of many in our field, what advice would you give to early career medical physicists, like myself, who aspire to make a meaningful impact?

Our profession, which is in the interface with medicine, is so multifaceted and dynamic that detailed advice today would need to be updated in several years. However, something of special importance is cross-border collaboration – not only with our medical colleagues and biomedical engineers, but also with colleagues from other fields of science. Physics is philosophy and in order to progress in it, one needs a broad horizon, which can be achieved best through interdisciplinary teamwork.

We have to constantly update our knowledge and professional development. To that end, together with Prof. Perry Sprawls, we founded the [IOMP Journal Medical Physics International](#), dedicated to education and professional development in our profession ^[13]. Together with our own progress we have to also help the progress of colleagues in other countries. In this connection I would encourage colleagues to volunteer and be active in the National Societies and International Organisations in our profession. In particular the International Organisations have huge impact on the profession, as: EFOMP, which collaborates with the EU in order to support various educational activities and Safety regulations development; IOMP, which spreads the knowledge from developed countries to the LMIC, thus achieving global development of the profession; IUPESM (the Union between IOMP and IFMBE), which arranged the global recognition of our scientific fields and professional occupations. These activities are slow, but extremely powerful and they

are paramount for professional development, and also for funding and dissemination. Most importantly, the activities of the National and International Organisations create the foundation of the profession and from there indirectly support healthcare.

Thank you very much for your time. Looking forward to your award presentation in Trieste next May during the Alpe Adria Meeting. Is there any last remark you would like to share with our readers? What are you most excited about for the future?

Thank you for the excellent questions, dear Eleni. I would only add that our profession is unique and all of the many colleagues I have met over the world appreciate it and love it. Our main aim is the benefit of the patient and we must keep this focus in all our practice and research, and in all our life. I am really excited to see how the new generation of talented medical physicists, some of them students of mine, are tirelessly working for the development of novel medical equipment and methods and their clinical applications, and some are already lecturers and top-level professionals. I sincerely wish all colleagues much success in our most human profession.

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Eleni Skouridi, a medical physicist at the State Health Services Organisation (SHSO), Cyprus's largest healthcare provider, has worked in the Nuclear Medicine Department and the East Anglian Regional Radiation Protection Service at Cambridge University Hospitals, UK. She now leads the implementation of a radiation dose management system across eight public hospitals and five National Breast Cancer Screening Centres in Cyprus, focusing on diagnostic imaging, medical imaging informatics, and IT in medical physics, including PACS/RIS workflows.

Meet this year's EFOMP Honorary Membership Awardee



Figure. EFOMP president, Efi Koutsouveli, presenting the Honorary Membership Award to Marco Brambilla, during the European Congress of Medical Physics 2024, in Munich.

EFOMP's Honorary Members are Medical Physicists who have made a significant contribution to our field. This prestigious award recognises individuals who through their career have contributed to advancements in research, education, training and other professional activities in Medical Physics, in Europe. Dr Marco Brambilla received this year's award in recognition of his numerous contributions to the field.

Dear Marco, first of all, thank you for having this interview with me and congratulations on the Honorary Membership award. By way of introduction, can you tell our readers a little bit about yourself and your so far professional journey?

After having my MSc in Physics in 1988, I started my professional journey with a 2-year scholarship at the National Institute of Cancer in Milan,

where I also completed my specialisation in Medical Physics. In 1991, I moved to the Hospital of Novara where I started my work as a medical physicist in the Nuclear Medicine Department, which lasted until 2000 when I then became the Head of the Medical Physics Unit. During this period, I also obtained my second specialisation degree in Health Statistics. Between 2001-2010 I was deeply involved in organising the radiation protection aspects at a hospital level, for both staff and patients; my involvement in Diagnostic and Interventional Radiology also began during that time, by personally taking care of the QC of all the radiological machines in the hospital.

In 2010 the unit was transformed into a Medical Physics department and since then we are providing medical physics services and radiation protection advice to a network of 6 General Hospitals and 1 University Hospital, including 3 Radiotherapy and 2 Nuclear Medicine Departments.

You have been associated with EFOMP for over a decade and during that time have served many positions including being the President of EFOMP between 2018-2020. Looking back, how did your relationship with EFOMP start – what made you join in the first place – and what do you think has been the most significant evolution within EFOMP since you first became a member?

My journey in the EFOMP started in 2012 with a phone call by my colleague and friend Renato Padovani, who asked about my availability as a candidate for the position of Secretary General of the EFOMP. My knowledge of the EFOMP at that time was rather limited. Becoming Secretary General gave me the opportunity, and the privilege if I may add, of interacting with all the national societies and with the sister organisations, like ESR, ESTRO EANM, HERCA, etc, while understanding the mechanisms of functioning of the federation. In the 6 years spent in this position I also formed my vision of EFOMP for the coming

years, which I had the opportunity to bring to life during my presidency of EFOMP between 2018 and 2020; integration between the different subspecialties, autonomy from other organisations and a strong European projection. We fulfilled this vision by strengthening the 3 pillars of the organisation: the European School of Medical Physics Expert (ESMPE), the European Congress of Medical Physics (ECMP) and the European Journal of Medical Physics (Physica Medica). We of course did so with a full involvement of the 4th pillar: the National Member organisations.

The most significant evolution within EFOMP was the introduction of Individual Associate Membership (IAM), which was deliberated by the Council in 2019 and paved the way for a future possible evolution of EFOMP into a European Society of Medical Physics which could finally bring together all the medical physicists in Europe, keeping at the same time the roots in the national member organisations.

Indeed, the pillars you've mentioned stand strong throughout time and have become more and more important – I'm really looking forward to the next European Congress in Spain!

You've undeniably achieved so much throughout your professional journey – are there any particular moments or accomplishments that stand out as the most memorable so far?

The most notable moment to me was the conclusion of the 2nd ECMP in Copenhagen in 2018 when, due to the success of the Congress, I had the certainty that ECMP would have become in the next decade the most important scientific initiative for the medical physics community in Europe. And the most notable accomplishment was the Council vote in 2019 regarding the establishment of the Individual Associate membership. This paved the way for the creation of a sense of belonging of individuals to a European

community which goes beyond national borders.

How did it feel when you learned that you were going to receive EFOMP's Honorary Membership award and what does this honour mean to you?

After receiving the news, I immediately thought that this is a signal that my retirement age is approaching quickly!! A part of it, I felt honoured and grateful towards the whole of the community of Medical Physics. We could not have achieved any of the undeniable progression in the standing and reputation of EFOMP, without the strong and voluntary work of many colleagues with whom I had the privilege of sharing ideas and working together to bring them to life. I cannot name them all and so I would not mention any. But each of them will recognise my sincere gratitude for their constant advice, help, and – why not? – criticism.

Thank you very much for your time. As a last question, looking back at your career, what advice would you give to our younger colleagues and those just starting out in the field? Why should they choose to get involved with EFOMP and its various Committees?

The younger colleagues should get involved in EFOMP because EFOMP is the European umbrella of all the MPE and the future of our profession will be European, or it will be nothing. Besides, they will have a lot of fun and create a network of colleagues which, to me, represents the most immaterial richness for which young people could aspire to.



Eleni Skouridi, a medical physicist at the State Health Services Organisation (SHSO), Cyprus's largest healthcare provider, has worked in the Nuclear Medicine Department and the East Anglian Regional Radiation Protection Service at Cambridge University Hospitals, UK. She now leads the implementation of a radiation dose management system across eight public hospitals and five National Breast Cancer Screening Centres in Cyprus, focusing on diagnostic imaging, medical imaging informatics, and IT in medical physics, including PACS/RIS workflows.

Interview with Dousatsu Sakata – Galileo Galilei Prize Winner 2024

In September, Physica Medica announced the winner of the Galileo Galilei Prize 2024. The Galileo Galilei Prize is awarded annually to the best paper published in Physica Medica Journal in the previous year. This year, the paper chosen as the best published in 2023 was titled: “Prediction of DNA rejoining kinetics and cell survival after proton irradiation for V79 cells using Geant4-DNA” by Dousatsu Sakata, Ryoichi Hirayama, Wook-Geun Shin, Mauro Belli, Maria A. Tabocchini, Robert D. Stewart, Oleg Belov, Mario A. Bernal, Marie-Claude Bordage, Jeremy M. C. Brown, Milos Dordevic, Dimitris Emfietzoglou, Ziad Francis, Susanna Guatelli, Taku Inaniwa, Vladimir Ivanchenko, Mathieu Karamitros, Ioanna Kyriakou, Nathanael Lampe, Zhuxin Li, Sylvain Meylan, Claire Michelet, Petteri Nieminen, Yann Perrot, Ivan Petrovic, Jose Ramos-Mendez, Aleksandra Ristic-Fira, Giovanni Santin, Jan Schuemann, Hoang N. Tran, Carmen Villagrasa, and Sebastien Incerti, published in Physica Medica, Volume 105, January 2023: 102508, DOI: <https://doi.org/10.1016/j.ejmp.2022.11.012>.

I had the honour of interviewing the first author of the article, Dousatsu Sakata, who has an impressive CV and scientific experience in the field of Medical Physics.

Meet Dousatsu Sakata (DS)

Dousatsu Sakata is a senior researcher at the National Institute of Advanced Industrial Science and Technology (AIST) in Tsukuba, Japan. He also holds visiting/honorary associate professor positions at Osaka University in Japan, the University of Bristol in the United Kingdom, and the University of Wollongong. He is currently developing Geant4-DNA as the deputy spokesperson,

mainly for medical physics and radiobiology applications.

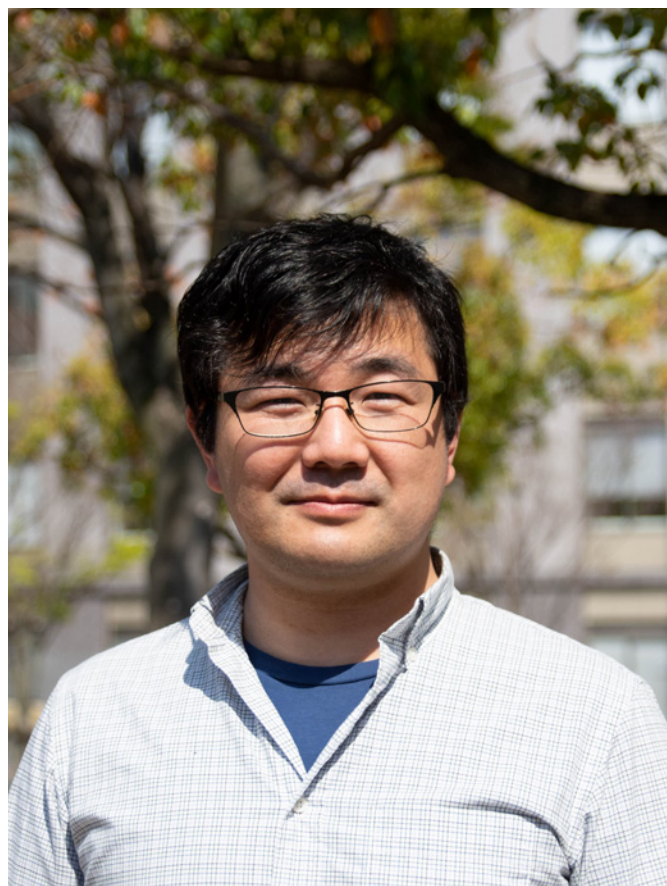


Figure. Dousatsu Sakata

What is your professional background and how did you find yourself passionate about this line of work?

DS: I hold a PhD in High Energy Nuclear Physics, which I earned while working on projects such as the ALICE experiment at CERN. After completing my PhD, I developed an interest in Applied Physics and transitioned into the field of Medical Physics, working at the University of Tokyo Hospital. At that time, I was surprised to discover that

the precise quantitative analysis of radiation-induced DNA damage and subsequent cell death was still not well understood. This led me, about ten years ago during my PostDoc, to join the Geant4-DNA international collaboration (<https://geant4-dna.org>) to explore this area further.

For those unfamiliar, the Geant4-DNA collaboration extends the Geant4 Monte Carlo simulation toolkit for radiobiological purposes. Under the guidance of Dr. Sebastien Incerti, I gained extensive knowledge in the computational aspects of radiobiology and began assessing radiation-induced damage in human cells. One of the main reasons I enjoy working in this field is the remarkable scientists I have collaborated with over the years. This work demands a multidisciplinary approach, bringing together experts from physics, chemistry, radiobiology, medical physics, and computing. It's exciting to be at the forefront of radiation biology, utilising powerful methods such as Monte Carlo-driven simulations.

What was your initial reaction when you heard about the award?

DS: I was incredibly delighted to receive news of the award. However, I must say that the Geant4-DNA collaboration is an essential initiative involving many exceptional scientists, and this paper was part of a significant, collective project. I was aware of the potential impact of our work. This study is the first to bridge nanodosimetry simulations with DNA repair and cell survival outcomes. Previous computational models mainly focused on assessing DNA damage but were unable to evaluate the whole repair mechanism.

Can you give a quick overview of what the paper is about for anyone who hasn't read it yet?

DS: In this paper, we present the results of our efforts to predict both DNA rejoining kinetics at low linear energy transfers (LET) and the cell

survival of V79 cells, which is a well-known and extensively studied cell line. Additionally, we released an application based on this research (called 'molecularDNA', see <https://moleculardna.org>), now integrated into the Geant4 toolkit. To help readers use this tool in their radiobiology studies, we chose to emphasise the DNA damage and subsequent rejoining rather than focusing on the physics, chemistry, and geometry of the model. This approach aims to make it easier for users to grasp the relevant aspects if they wish to work with the application.

I consider this paper a milestone for the Geant4-DNA collaboration - it has taken more than 15 years to reach this point!

Has this prize had any impact on your career in terms of international recognition or desired positions?

DS: Yes! This award has had a significant impact on my career. For example, it greatly facilitated my job search—many people reached out, inviting me to seminars and various scientific events, and several scientific societies contacted me. It was incredible to gain recognition from so many people and research groups after receiving the prize. Additionally, it's possible that this award has contributed to me having a higher salary today. (Laughs)

A lot of our readers are Early Career Medical Physicists. Do you have any advice for a young scientist who's just starting their career?

DS: I believe the most important factor for surviving and thriving in the research field is originality. There are two ways to create your own originality:

1. Become an expert in one topic. Athletes usually compete in a single or a limited number of events, and they excel by focusing on one specific goal. However, generally, nowadays,

this is becoming difficult as one of the survival strategies in the research field for most people.

2. Combine your passions and skills! In my case, my strengths are physics, computing, and radiobiology. If you can merge your unique skills to create your own originality, you will find success. Be motivated to explore everything that can contribute to building your unique profile as worthwhile as possible.

Any final thoughts you want to share with the reader?

DS: I'm currently submitting a new manuscript to the special issue of Physica Medica related to the 5th Geant4 International User Conference at the Physics-Medicine-Frontier that we organised this year in Osaka, Japan. The published model in our previous work did not integrate repair-protein/enzyme kinetics models. In this new paper, we've combined both into a single model! You'll be able to see all the details very soon. I hope medical physicists will take the time to read it - I believe you'll find it both informative and enjoyable!



Virginia Piva, is a Medical Physics Resident at Niguarda Hospital in Milan. She holds an MSc in Applied Physics from the University of Milan. Her main professional interests are advances in radiotherapy, dosimetry for radiometabolic therapy, and the implementation of AI techniques in the clinic. Alongside her residency, she is committed to promoting public understanding of medical physics, using science communication to spotlight the field's value. She joined the C&P Committee in 2024.

Meet the New Chair: Dental Imaging SIG

In the past year, EFOMP's Special Interest Groups (SIGs) have experienced significant growth, building on the momentum established by the launch of the first SIG_FRID. In 2024, one of the most recent additions, the Dental SIG, began its activities. Today, we are excited to shine a spotlight on the individuals driving this initiative and to learn more about their motivations for applying to the Steering Committee. Additionally, we explore their vision and objectives for the next three years of their term.



Hugo Trindade (HT) has around 20 years of experience in the medical physics field, working in hospitals and clinics in Portugal. He also has some work experience in the non-medical sector.



Eirini Tsaggari (ET) is a Medical Physicist and Regulatory Affairs Manager specialising in radiotherapy, radiosurgery, dental imaging dosimetry, quality assurance, and radiation protection. She

has gained extensive international experience in Greece, the United Kingdom, and Denmark, contributing to prominent institutions such as the Harley Street Clinic Cancer Centre in London and Herlev Hospital in Copenhagen. Currently, Eirini is part of a multidisciplinary team at a start-up called Copenhagen Imaging, where she drafts Clinical Evaluation Plans and Reports to ensure compliance with the Medical Device Regulation (MDR) and prepares Periodic

Safety Update Reports for medical devices. Her research includes notable work in radiotherapy physics, specifically won the Twin Beam Dual Energy CT project, which has been published in reputable journals. Eirini remains dedicated to advancing dental imaging through quality assurance and radiation protection practices.

Can you tell the readers something about yourself and the SIG that you are chairing now?

HT: My name is Hugo Trindade, and I am from Portugal. A large part of my work has been with dental offices, where I witness the daily challenges involved with dental radiography.

ET: I am a Medical Physicist with extensive experience in radiotherapy and radiosurgery. Over the past three years, I have developed a strong interest in dosimetry and radiation protection for Cone Beam CT scanners as part of my new role in a small start-up company focusing on the development of CBCT scanners. Currently, I serve as the secretary of the Dental Imaging SIG and am part of its steering committee. The Dental Imaging SIG primarily focuses on advancing knowledge and developing best practices in dental imaging, a rapidly evolving field with the potential to significantly improve diagnostic outcomes for patients.

Why did you decide to apply for the steering committee position of the Dental SIG?

HT: I have never been a member of any steering committee before, and I wanted to better understand how they operate.

ET: My decision to apply for the secretary position within the steering committee of the Dental Imaging SIG was driven by my desire to actively contribute to this exciting field. I believe that my background in radiotherapy and radiosurgery, combined with my familiarity with complex medical devices and recent focus on dosimetry and radiation protection in Cone Beam CT scanners, allows me to bring a unique perspective to the committee. I am excited to help shape the direction of the Dental Imaging SIG and ensure it remains a valuable resource for its members.

What is your vision or what would you like to achieve in the coming three years?

HT: It is essential to enhance the training of dental professionals to ensure adherence to the most basic safety rules. Furthermore, I would like to see the development of solid usage guidelines for paediatric dental radiology, particularly regarding exposure parameters.

ET: Over the next three years, I aim to foster a collaborative environment within the Dental Imaging SIG where members can share ideas, exchange knowledge, and learn from each other. I would like to see us develop comprehensive guidelines for the use of CBCT scanners in dental imaging, with a focus on dosimetry, effective dose calculation, Quality Control Protocols, and

the establishment of Dose Reference Levels. Additionally, I hope to expand our outreach efforts to attract more professionals to the SIG, particularly those early in their medical physics careers.

Why should people join the Dental SIG?

HT: Although the radiation doses used in dental imaging are relatively low, the sheer number of X-rays produced in dental offices is immense. It is crucial to deepen studies into current practices and identify areas for improvement.

ET: Our vision is to create a Dental Imaging SIG that is a vibrant community of professionals dedicated to advancing the field of dental imaging. By joining our SIG, members will have opportunities to network with colleagues, participate in stimulating discussions, and contribute to the development of best practices in dental imaging. I believe both experienced professionals and those just starting their careers will find opportunities to learn, grow, and make a meaningful impact.



Julia Cassar is currently the secretary of EFOMP's Communications & Publications Committee. She is continuously developing her knowledge in Medical Physics at the University of Malta and is also a member of the Malta Association of Medical Physics (MAMP).

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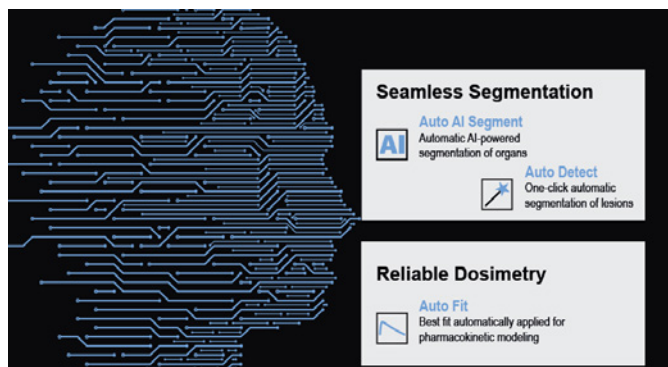


Figure. PLANET AI-powered automatic segmentation.

Contributing to routine clinical dosimetry for personalised patient care

Radionuclide-based therapies are currently limited to a small number of specialised centres. There is a growing need to increase treatment capacity and expand the range of radiotheranostic options.

DOSIsoft, a contributing partner in the EU-funded **Thera4Care** project (*Theranostics Ecosystem for Personalised Care*), plays a pivotal role in the "Dosimetry" work package (WP7). This initiative aims to advance dosimetric concepts, improve imaging equipment, and achieve one of the project's primary goals: enhancing clinical outcomes through AI-based imaging and personalised dosing protocols.

Over the next five years, DOSIsoft will focus on advancing dosimetry software to achieve:

- Enhanced dosimetry for wider clinical use.
- Support for new radionuclides.
- Improved quantitative AI-based imaging and dosimetrics.
- Standardised, quality-assured dosimetry workflows.

Aligned with the development strategy of PLANET®, these efforts will drive substantial improvements in the clinical implementation of SIRT and MRT dosimetry. In the era of precision oncology, PLANET® aims to become the benchmark dosimetry application, streamlining and harmonising new radiotheranostic processes to optimise clinical practice.

References:

[1] About PLANET

PLANET® Onco Dose Edition 3 is developed by DOSIsoft SA in France. Version 3.1 is FDA 510(k) cleared for 90Y Post-implantation and IIb class CE marked (MDD). The product or certain features may or may not be available for clinical use in any particular country.

[2] About DOSIsoft www.dosisoft.com

Founded in 2002, DOSIsoft designs, develops & delivers patient-specific imaging & dosimetry software solutions in Radiation Oncology & Nuclear Medicine to improve cancer patient safety & treatment quality. More than 20 years of innovation and R&D investments have led to world leading software used in over 600 hospital centres in 60 countries. Spin-off between Gustave Roussy and Institut Curie, DOSIsoft constantly innovates in partnership with the major cancer institutes and research centres in the world. It is now recognized as a key player in the dosimetry market.



Marc Uszynski Chief Executive Officer at DOSIsoft, France. 30-year-experience in product & business development in software, media and digital sectors bringing the company to a next level of international development.

Am I Hitting My Target?

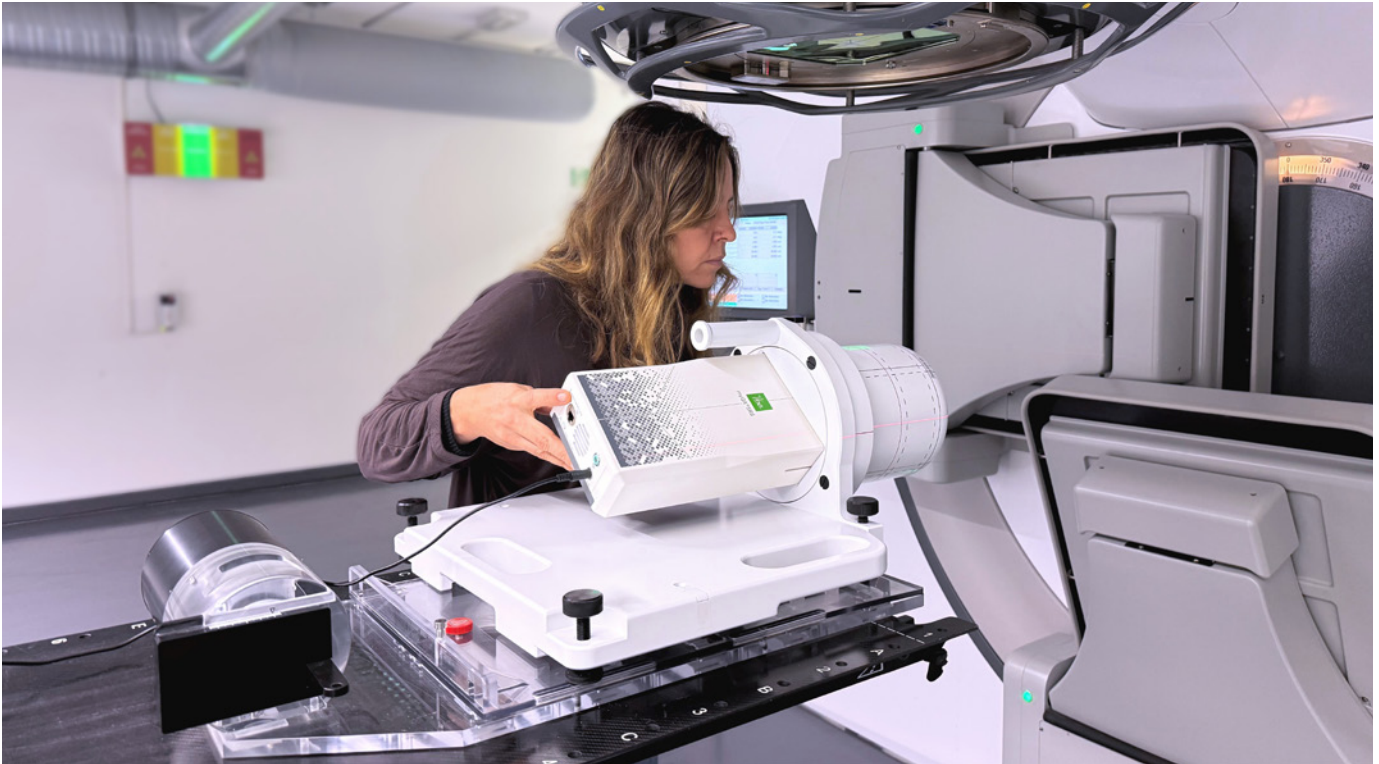


Figure1. myQA SRS® on Heavy Duty Respiratory Motion Platform.

Respiratory motion affects the accuracy of treatment delivery in SBRT (stereotactic body radiation therapy) for lung cancer, making it challenging to maintain precision. The targets, often small and difficult to localise, constantly shift due to the patient's breathing, which can lead to misalignment between the radiation beam and the tumour. Ensuring that pre-treatment QA is run accurately despite these movements is critical for both maximising tumour control and minimising damage to surrounding healthy tissue.

To address these challenges, how can we make sure that the correct quality assurance (QA) equipment and procedures are employed for precise QA? This includes evaluating motion management systems, ensuring that imaging and tracking technology is up to date, and verifying that real-time adjustments to the treatment plan are being made.

myQA SRS

myQA SRS is a game-changer for verifying stereotactic treatment plans in the radiation oncology clinic – enhancing treatment quality, workflow efficiency, and patient safety in the process. myQA SRS is an ideal detector array for QA of small targets, offering an ultra-high resolution of 0.4 mm, with 105,000 pixels across an active area of 12×14 cm² ensuring that no point of radiation goes undetected.

QUASAR Heavy Duty Respiratory Motion Platform

The QUASAR Heavy Duty Respiratory Motion Platform (Heavy Duty Platform) unlocks the user's ability to turn their static myQA SRS detector and phantom into an array in motion to verify the dose to a target in motion. The Heavy Duty Platform can

support a device of up to 45 kilograms. The Heavy Duty Platform comes standard with programmable motion software and enables inline translation in myQA SRS in the sagittal plane or at a user-defined rotated position. A wide range of waveforms operating at 0-60 BPM are easily replicated. In addition, the Heavy Duty Platform supports the easy import of waveforms from Varian®, Anzai®, CyberKnife®, Philips®, RespiSense®, and Siemens®.

Clinical Example

When performing patient QA (PQA) with a stationary detector, the patient is often assumed to remain static, without any movement. However, this is not the case. Motion, especially due to breathing, significantly affects the position of the target. Therefore, motion management should be implemented and tested. By utilising the Heavy Duty Platform with myQA SRS, the influence of motion on treatment delivery accuracy and PQA results can be evaluated. Additionally, motion management systems can be validated.

In the test case, myQA SRS was placed on the Heavy Duty Platform to introduce motion. A QA plan was created on the system, with the motion platform excluded from dose calculation as the myQA SRS detector and phantom were suspended over the platform. The QA plan was delivered three times:

1. The first delivery was done without any motion of the myQA SRS system to ensure the deliverability of the QA plan itself. This test resulted in a passing rate of 99.3% (3%/1mm/10% threshold).
2. The second delivery used myQA SRS on a motion platform (20 BPM, 2 cm amplitude) without motion management, causing dose spread and a passing rate drop to 13.5% (3%/2mm).
3. In the third delivery, the phantom moved similarly, but beam activation was limited to the exhale phase using motion gat-

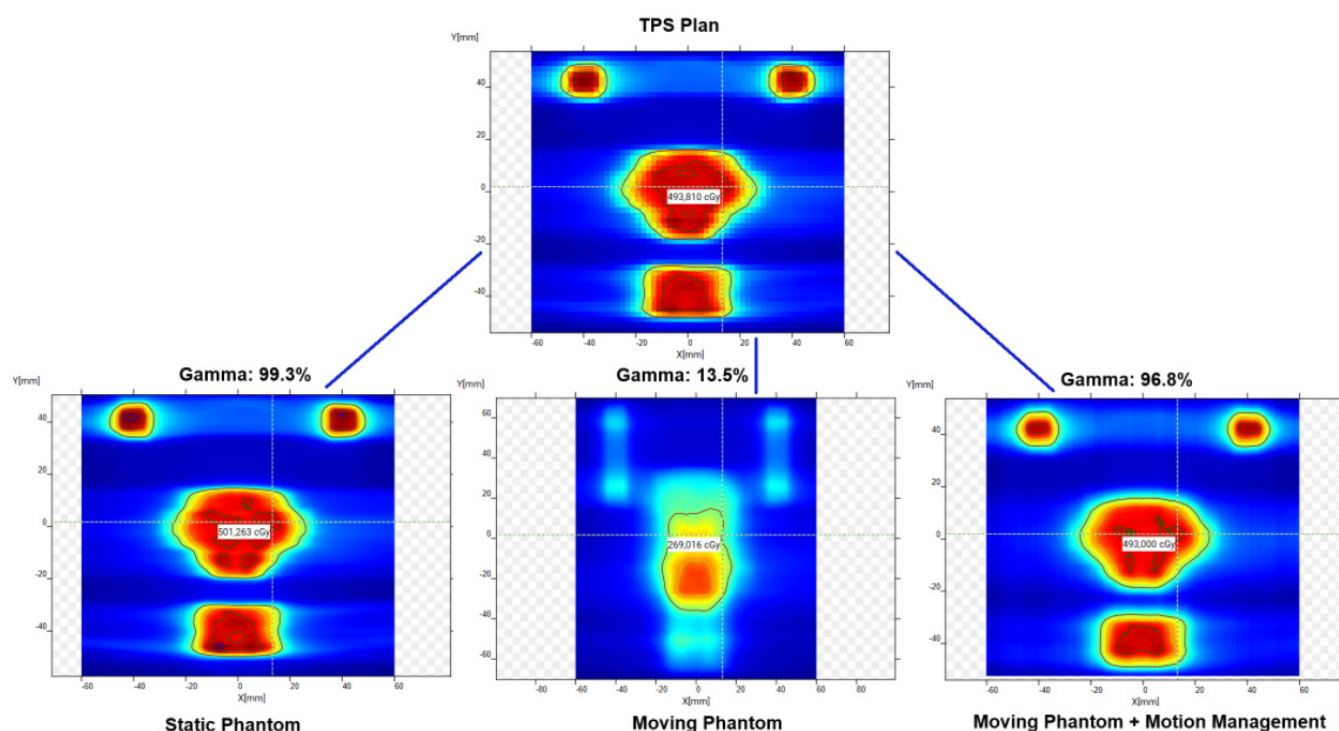


Figure2. myQA SRS and QUASAR Heavy Duty Respiratory Motion Platform.

ing. This improved the passing rate to 96.8% (3%/2mm/10% threshold) but extended treatment time due to irradiation only during exhale.

These tests clearly demonstrate that assuming the patient is static is an incorrect approach. Motion has a significant impact on delivery accuracy. While margins can be introduced to account for movement, increasing margins leads to more healthy tissue being irradiated. Therefore, it is advisable to explore and regularly test motion management approaches to reduce margins and ensure safe and effective treatments.

By combining myQA SRS with the QUASAR Heavy Duty Respiratory Motion Platform, users have a state-of-the-art QA toolset with programmable breathing and patient motion paths for quality assurance on motion-guided radiation therapy.



Sandra Kos, MSc., is a Product Manager at IBA Dosimetry, focusing on patient QA. She began her career as a Physicist in radiation therapy at University Hospital Zagreb, Croatia, before transitioning over 13 years ago to the RT industry, supporting clinics and driving innovation.



Matthew O'Neil, Product Manager at IBA Dosimetry, specializes in imaging quality assurance. He joined in 2021, bringing over five years of experience in QA for external radiation therapy, diagnostic imaging, Proton Therapy, and linear accelerator commissioning.



Rebecca Stumpf, M.Sc., is a Clinical Application Specialist at IBA Dosimetry. With six years of experience, she began in the service department, later transitioning to Service and Sales. She now oversees the IBA International Competence Center and supports clinical implementation of IBA products.



How can we address respiratory motion during SBRT treatment?

Motion has a significant impact on delivery accuracy.

Ensure Quality Assurance in motion-guided Radiation Therapy with the combination of myQA® SRS and QUASAR™ Heavy Duty Respiratory Motion Platform.



More information about
QUASAR™ Heavy Duty
Respiratory Motion
Platform



More information about
myQA® SRS

Enhancing Precision at the Institut de Cancérologie de Seine-et-Marne with LAP's LUNA 3D SGRT System

The Institut de Cancérologie de Seine-et-Marne (ICSM) is proud to be at the forefront of adopting innovative technologies in cancer treatment. Our facility is equipped with state-of-the-art technology, including TrueBeam STX with Dynamic Exactrac and RGSC, Clinac 2300ix, and HALCYON integrated with the LUNA 3D Surface Guided Radiation Therapy (SGRT) system. We treat approximately 1,700 patients annually, including 350 stereotactic and 200 Deep Inspiration Breath Hold (DIBH) treatments.

Our journey with SGRT began with implementing Dynamic Exactrac for patient positioning, alignment, and treatment monitoring. This system contributed to the success of our DIBH procedures, combining RGSC and SGRT with a threshold set at 3 mm to ensure high precision.

The installation of LUNA 3D at ICSM commenced with an LAP site inspection in January. This was followed by server preparation and theoretical training before the system delivery in February. The installation occurred fast, within a few days only in March, followed by practical training. This phased approach ensured that our team was well-prepared to use the new system.

The LUNA 3D system incorporates four strategically placed camera pods, three in front and one at the rear of our HALCYON, to enhance monitoring and positioning accuracy during treatments. The camera pods fit very well into our treatment room thanks to their attractive design.



Figure. LUNA 3D SGRT installed at HALCYON linac.

Before LUNA 3D, our HALCYON treatment workflow involved multiple steps, including patient setup with immobilisation systems, alignment using tattoo reference points, positioning at the treatment isocenter, and verification with CBCT imaging. The absence of a 6D couch and 2D kV imaging presented challenges, often requiring up to two CBCT scans to correct rotations and tilting. With LUNA 3D, this workflow has been significantly streamlined. The system allows verification of patient setup and alignment, including correcting rotational and tilt errors. This upgrade reduces the Frequency of multiple CBCT scans per session, improving treatment efficiency and precision.

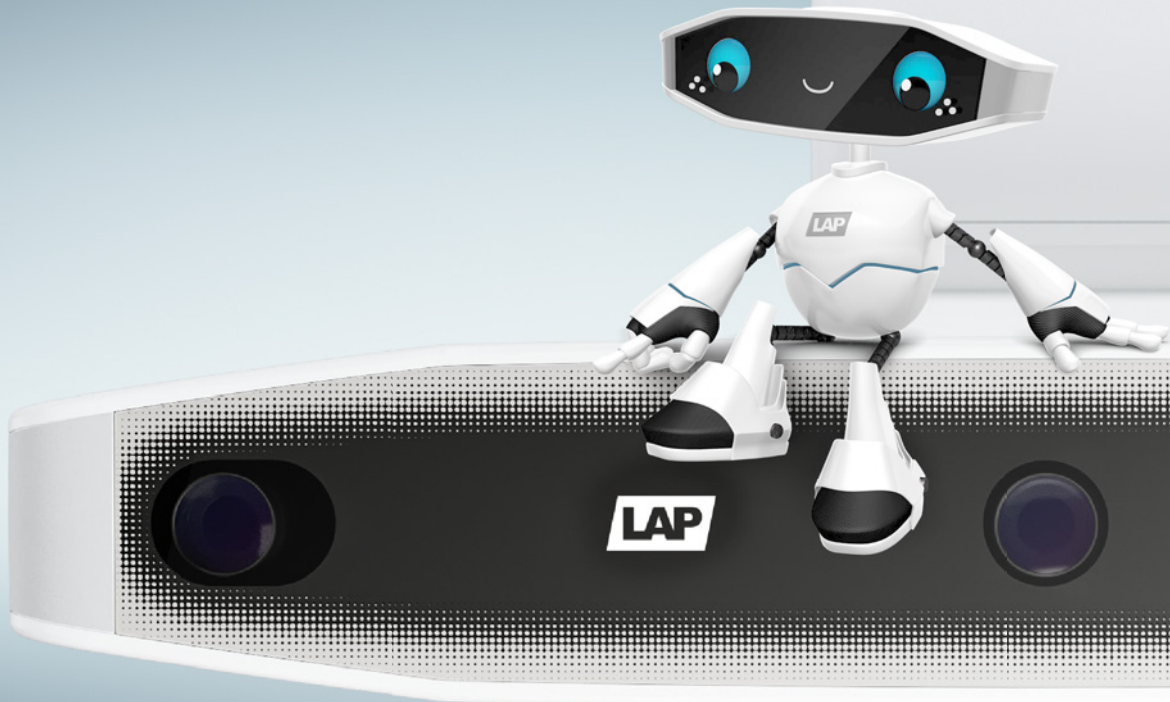
The primary objective of using LUNA 3D SGRT was to enhance the precision of patient setup and reduce radiation exposure. This advancement

saves time, decreases patient dose, and contributes to a more streamlined treatment process. Looking ahead, we aim to further optimise the use of LUNA 3D by moving towards eliminating tattoo reference points, thus enhancing the patient experience. Additionally, we are exploring the system's potential in continuous monitoring for improved safety and incorporating DIBH capabilities.

Implementing LUNA 3D at ICSM marks a significant step forward in our SGRT treatment capabilities. The LUNA 3D system ensures precise patient positioning and contributes to safer, more efficient treatments. We are excited about future advancements and sharing our experiences to support other medical physicists in embracing similar technologies. We received excellent support from the LAP branch in France throughout the project. We also had a team of experts from LAP Germany at our side. We are now looking forward to smooth, continuous clinical use for the benefit of our patients.



Dr Kassiss, Head of the Physics Unit at Institut de Cancérologie de Seine et Marne (www.icsm77.com), has 20 years of experience in radiotherapy. He has led the implementation of advanced treatment techniques, including VMAT and stereotactic methods, and played a key role in expanding radiotherapy centres. Notably, he has overseen the installation of state-of-the-art equipment such as the TrueBeam STX and CyberKnife systems.



NEW

LUNA 3D has FDA 510(k) clearance. Availability of products, features, and services may vary depending on your location.

LUNA 3D

The New More in SGRT



Get more informations:
www.lap-laser.com

www.lap-laser.com

Simply
Precise

Plan Checks Are Not the Same as Evaluating Plan Quality

Secondary dose calculations and 3D dose volume verification from treatment planning systems (TPS) are essential for validating planned treatment parameters, including radiation field intensities and the resulting dose volumes generated by the TPS. A thorough second check can enhance the standard of care, ensuring safe and accurate treatment for patients. But is this enough? Could the dose to critical structures be reduced to limit side effects? Is the plan complexity manageable for delivery systems?

TPS outputs rely heavily on user-defined criteria, meaning that a plan's quality depends on the planner's input, which in turn affects the 3D dose cloud. Plans are traditionally assessed against departmental clinical goals or population-based protocols defined by the physician. But what if the achievable dose could be aligned more closely with each patient's specific anatomy?

Plan Feasibility allows a priori estimation of the best possible sparing (Feasibility DVH, or FDVH) of an organ at risk (OAR) in high-energy photon planning, and is commercially available within the SunCHECK® software platform. Plan Feasibility provides clinicians with insights into how well they meet the objectives of a treatment plan — showing what can easily be improved and what is more challenging to improve. This physics-based dose prediction model can show what is specifically achievable for each patient prior to starting the plan. With the patient CT and structure set, SunCHECK can assign dose to the target while simultaneously calculating fall-off to nearby organs at risk, producing a guide for optimisation objectives for the treatment plan. Workflow automation can be achieved

through scripting/API connectivity to the TPS.

Research from the University of North Carolina (U.S.) shows that Plan Feasibility can positively impact clinical outcomes. Their study concluded that FDVH usage was linked to improved and more consistent OAR sparing, with significant patient-reported outcome improvements at six months post-treatment. Additionally, in an ASTRO 2024 presentation, Steve Kirsner, Director of Physics at Scripps Cancer Center in San Diego (U.S.), shared their experience testing SunCHECK Plan Feasibility as a post-planning quality assurance check of their knowledge-based planning.

Finally, Plan Complexity, available within SunCHECK, provides early insights into plan deliverability using metrics like Edge Metric and MU/Gy. The optimisation process in radiation treatment plan creation to achieve ideal dosimetry can sometimes overmodulate the plan, creating issues for delivery systems. Instead of detecting these issues during patient-specific QA, the complexity score flags plans that may require review before being delivered as treatment.

Plan Feasibility's potential to improve clinical outcomes and streamline planning is substantial compared to standard plan checks. As a complement to any TPS, FDVH helps clinicians align planning with realistic anatomical limits, providing a quantitative means to assess plan quality against clinical goals.

Tools like Plan Feasibility and Plan Complexity are reshaping radiotherapy planning and evaluation. They support precise validation of dose parameters and offer a clearer perspective on

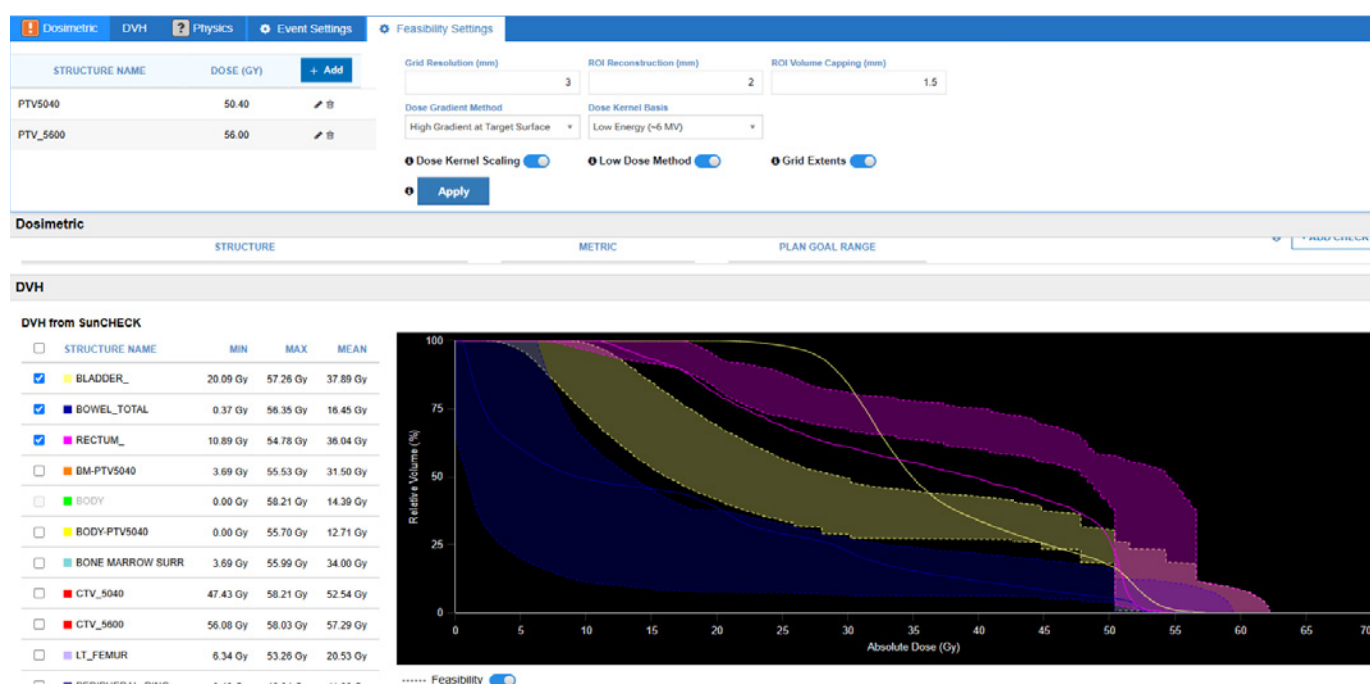
achievable outcomes based on individual anatomy. With features to estimate optimal organ sparing and pre-flag overly complex plans, these tools enable clinicians to make data-driven adjustments to improve patient safety, consistency, and outcomes. As these technologies advance, they pave the way for radiotherapy that is both accurate and adaptive, enhancing patient quality of life and optimising care efficiency.

To learn more about Plan Feasibility and Plan Complexity, please request a demonstration of the latest SunCHECK Platform functionality from your Sun Nuclear representative.

(1) Clinical Use of A Priori Knowledge of Organ-At-Risk Sparing During Radiation Therapy Treatment for Oropharyngeal Cancer: Dosimetric and Patient Reported Outcome Improvements Fried, David V. et al. Practical Radiation Oncology, Volume 12, Issue 3, e193 - e200



Dayna Bodensteiner, RTT, CMD is the Clinical Marketing Manager for Mirion Medical. As a former Radiation Therapist and Medical Dosimetrist, she has spent the last 23 years in industry, driving software and hardware innovation by listening to the clinicians needs. She is passionate about new technologies that elevate quality and consistency in treatment planning that have a direct impact on patient outcomes.



Feasibility graph from SunCHECK® showing bands of possibility with the actual plan DVH, visualised as the solid lines. This example shows how the low dose region to the bladder could be improved.

RUBY “Adaptive”: The First End-to-End Solution for Online Adaptive CT-Based Radiotherapy

Online adaptive CT-based radiotherapy has rapidly expanded in recent years. ART systems combine CBCT, automatic contouring, and automatic plan optimisation. This complex treatment technique requires robust quality assurance, especially an end-to-end test that accounts for its unique features. To ensure safe treatments, it is crucial to consider changing anatomy in the end-to-end test procedure. One common indication for CT-based online adaptive radiotherapy is prostate carcinoma where the bladder and rectal volume, as well as the position and shape of the prostate, can vary daily.

To address this challenge, PTW has developed a phantom for quality assurance of online adaptive CT-based radiotherapy systems. This phantom includes a new insert for the RUBY product family, facilitating the insertion of different organ sets and the positioning of anthropomorphic structures within the RUBY phantom. Two organ sets designed specifically for prostate cases include structures of the bladder, prostate and rectum which are made of high-quality, tissue-equivalent materials. The organ sets differ in terms of the volume of the bladder, rectum and prostate as well as in shape. The RUBY adaptive insert also allows an ionisation chamber to be positioned in each organ.

Using this new phantom, we implemented an end-to-end test quickly and intuitively on our Varian ETHOS system. Organ set A was combined with the RUBY adaptive insert for a planning CT. The organs were manually contoured, the prostate volume was used as the CTV, and the PTV was generated by adding a margin according to our clinical standard. A prostate plan was then optimised to the PTV according to the planning directive. The fractionation was artificially set to 50 x 2 Gy, facilitating dose verification. Performing the test in real clinical mode, the fractionation number of 50 allows for 50 test runs.

For the final test, the organ set was swapped, and the adaptive insert was combined with the RUBY phantom and tilting base. The RUBY system was then positioned on the ETHOS with a defined tilt and defined misalignment.

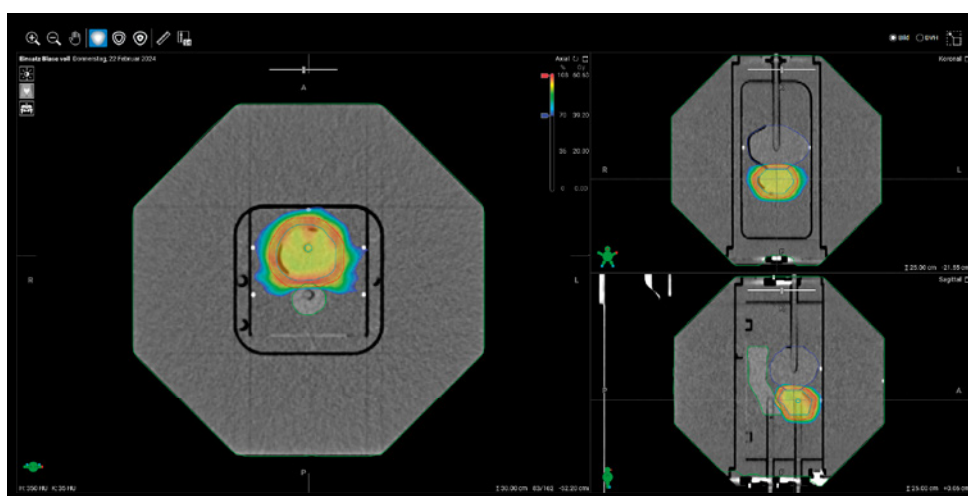


Figure 1. The IMRT prostate plan was optimised to the PTV. The prostate volume was used as the CTV, and the PTV was generated by adding a margin according to clinical standards. The ionisation chamber structure is positioned at a clearly visible measurement point using CT markers.

The ETHOS adaptive workflow begins with a CBCT, where the influencer organs (bladder and rectum) and the CTV are automatically contoured. In the case of RUBY, contours are identified, but manual contouring is required. Additionally, an ionisation chamber structure is needed for dose determination, positioned at a clearly visible measuring point using CT markers.



Figure 2. The “adaptive” RUBY insert is equipped with two prostate organ sets to account for daily changes in organ shape and position, while allowing users to measure dose in each organ.

Once the ionisation chamber structure is propagated, plan adaptation can begin. The plan adaptation process compensates for different organ shapes and changes in position due to the tilting and misalignment of the RUBY phantom, simulating real patient treatment.

After plan adaptation, an ionisation chamber is inserted into the phantom, and the new adapted plan is irradiated. The measured dose is then compared with the dose calculated in the new adapted plan, concluding the test.

This test procedure offers a fast and straightforward way to test the complete adaptive workflow comprehensively. Due to the changed organ structure and additional displacement and tilting of the phantom, significant plan adaptation is necessary, allowing for efficient system testing. The phantom solution is user-friendly, especially for system updates, necessitating fast and safe testing in everyday clinical practice.

To learn more about the adaptive radiotherapy QA workflow using the RUBY Phantom and “Adaptive” insert, read our application brochure.



Daniela Eulenstein holds a Ph.D. in medical physics obtained from the Carl von Ossietzky University in Oldenburg, Germany. After several years in clinical practice, she currently works as a medical physicist at PTW Freiburg.



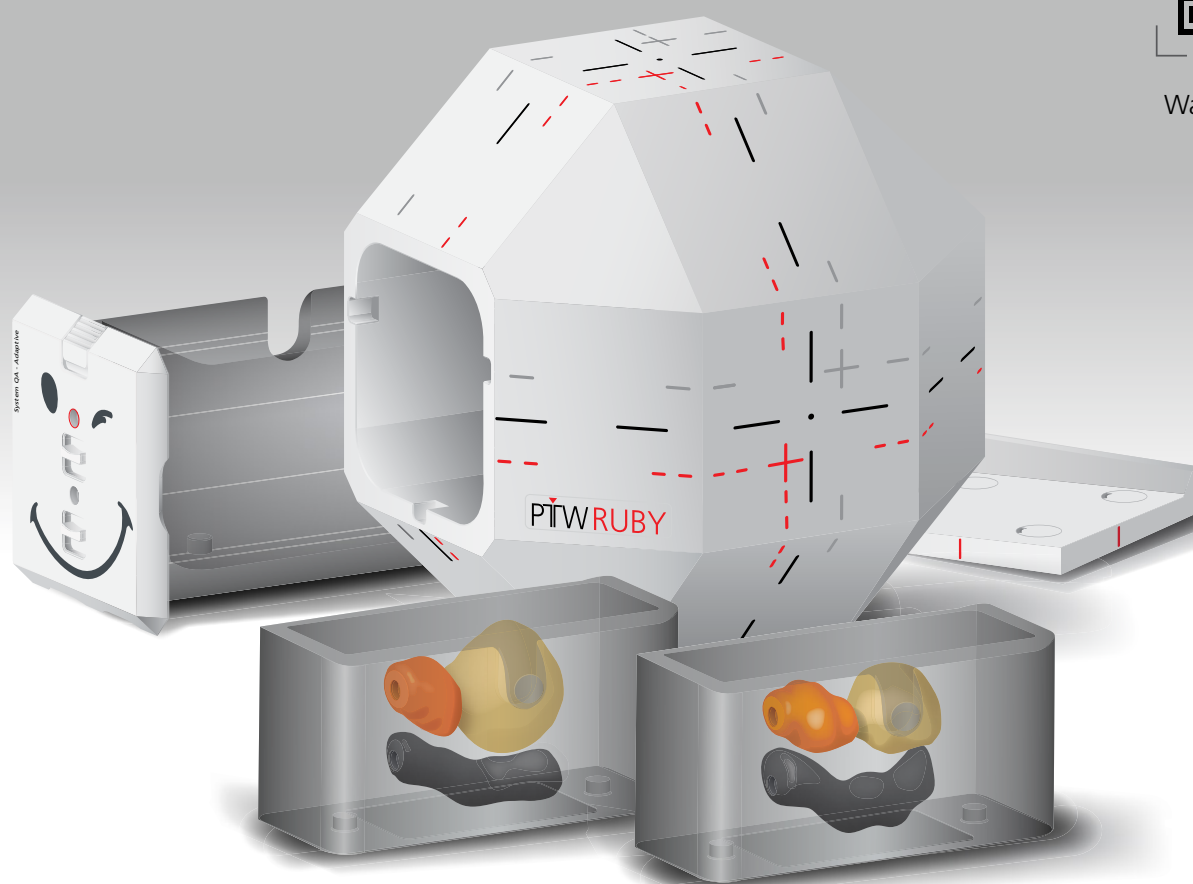
Luise A. Künzel holds a Ph.D. in medical physics obtained from the Eberhard Karl University of Tübingen, Germany. She is a medical physicist at Charité - Universitätsmedizin Berlin with a strong research interest in adaptive radiotherapy.



Anton Grauer holds a M.Sc. in medical physics obtained from the Technische Hochschule Mittelhessen Gießen, Germany. He is a medical physicist at the Radiologische Allianz Hamburg, Germany, focusing on the ETHOS system.



Want to know
more?



RUBY[®] System QA - Adaptive Insert

End-to-end QA for adaptive radiotherapy

Your advantages

- ▶ Two different organ sets consisting of bladder, prostate, and rectum
- ▶ Dose measurements in each organ using a PTW Semiflex 3D ionization chamber
- ▶ End-to-end testing of adaptive radiotherapy
- ▶ Easy to handle

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THE
DOSIMETRY
COMPANY

Optimising Nuclear Medicine Practices Using a Dose Management System

Efficient management of radiopharmaceuticals is essential in nuclear medicine (NM) departments for enhancing patient safety, reducing financial losses, improving protocol adherence, and minimising radionuclide waste. A recent global shortage of technetium-99m [1] has especially highlighted this critical need.

Studies investigating NM department efficiency emphasise clear patient preparation protocols, tracking of cancellations, and comprehensive staff training. For instance, interventions such as educating patients on preparation requirements and streamlining protocol compliance can signif-

icantly reduce procedural cancellations and associated financial losses [2]. Clinics implementing the Lean methodology in NM departments found significant improvements, including reduced queuing times, cost savings, and decreased operational defects. Lean practices enhanced patient volume capacity, boosted staff and patient safety, and improved overall satisfaction levels [3]. Another study on Lean management principles emphasised the timely placement of necessary supplies in each room to minimise waste [4].

The International Atomic Energy Agency (IAEA) recommends monitoring NM quality indicators such as productivity (by comparing study volumes over time) and radiopharmaceutical dose tracking (dispensed versus planned) [5].

- Optimization indicators in Qaelum’s dose management system DOSE include the following:
1. Diagnostic Reference Levels (DRL) compliance: compare administered radioactivity per radiopharmaceutical against DRLs to ensure that procedures in facilities are performed consistently and according to best practices, leading to better resource use.

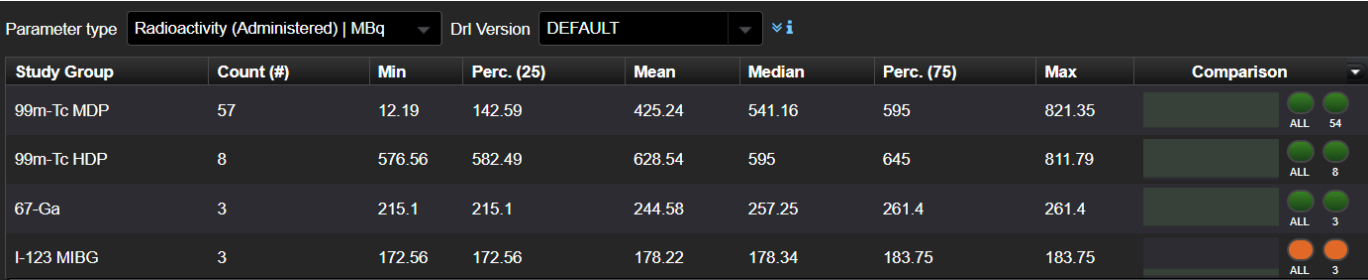


Figure 1. DRL compliance to compare administered radioactivity per radiopharmaceutical against DRLs to identify opportunities for optimization in dose management.

2. Usage and Error Analysis: record cases where errors occur, such as mismatched indications or patient preparation failures. Canned comments and customised reporting in DOSE can be used to notify relevant staff and reduce the recurrence of errors. Statistics and usage data can be reviewed to optimise ordering processes and forecast daily or monthly activity more accurately. Figure 2 shows a scatter plot and statistical table of the radioactivity administered (MBq) over two distinct time periods, highlighting the difference in activity between the two periods.

3. Patient Weight-Based Dose Optimization: monitor protocol-specific radioactivity administered relative to patient weight, to maintain diagnostic accuracy and minimise patient exposure, while conserving radionuclide supplies (Figure 3). Radioactivity per kilogram can also be monitored for DRL compliance, as well as a parameter in all the possible charts and tables of DOSE.
4. Wasted Activity Monitoring: compare the prepared and administered radioactivity using trend charts (Figure 4) to optimise administration and enable more efficient appointment scheduling and workflow management.

tion events, the affected area, and personnel involved are recorded in the Contamination Logbook. Radiopharmaceutical purity, an important indicator that determines the biodistribution and ensures desired image quality, is also tracked, where purity below 95% is highlighted in orange, enabling departments to detect and address batch-specific issues (Figure 5).

The recent ^{99m}Tc shortage underscores the importance of resource management in nuclear medicine departments. Tools in DOSE enable nuclear medicine departments to comply with DRLs and IAEA recommendations while effectively managing equipment function and resource use.

DOSE also facilitates compliance with requirements of the IAEA quality assurance (QA) program [6] through its Nuclear Medicine Management Logbooks. All radionuclide-specific contamina-

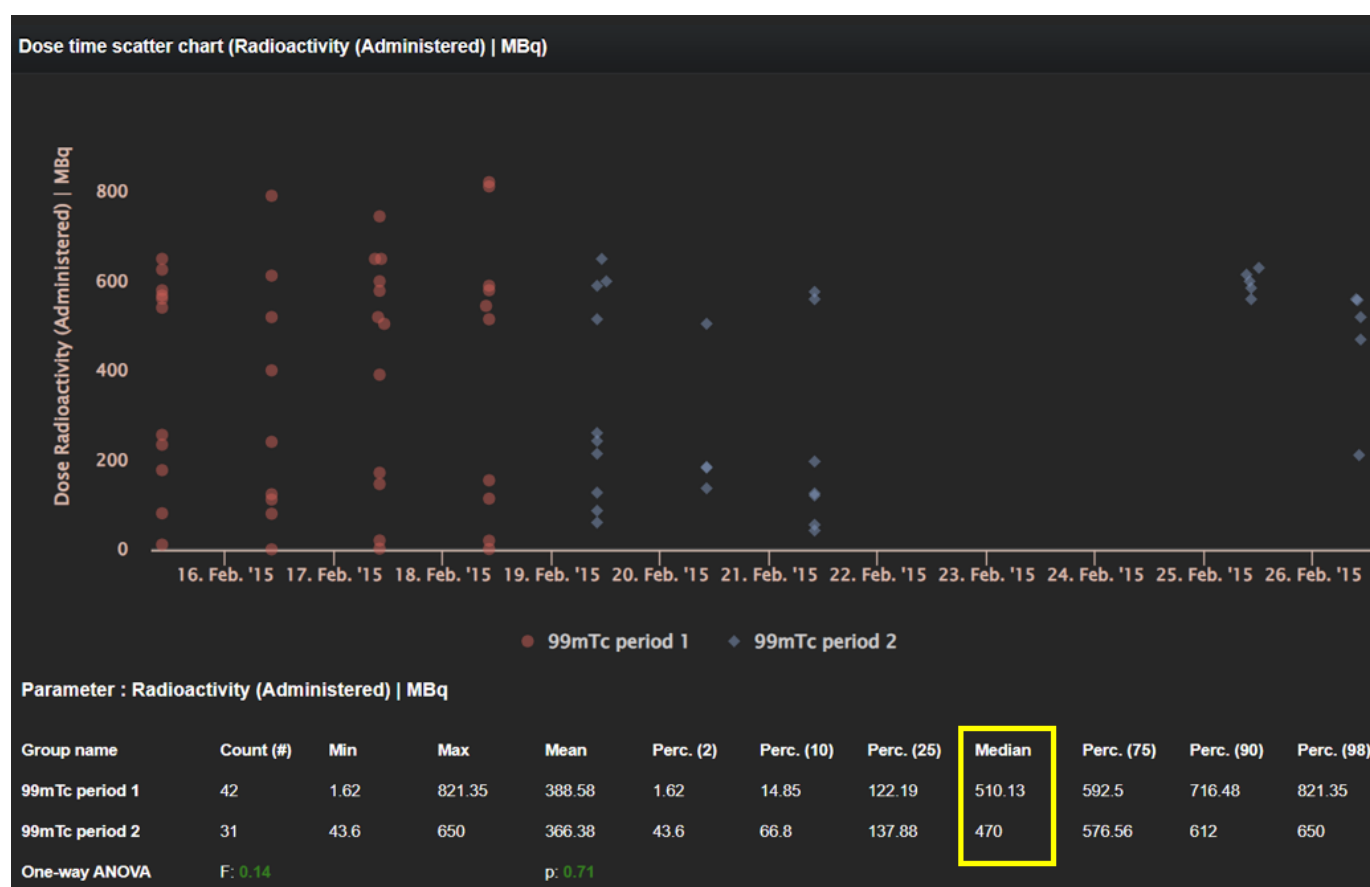


Figure 2. Radioactivity administered (MBq) over two distinct time periods displayed in a scatter plot (top) and statistical table (bottom), highlighting the difference in activity between the two periods.

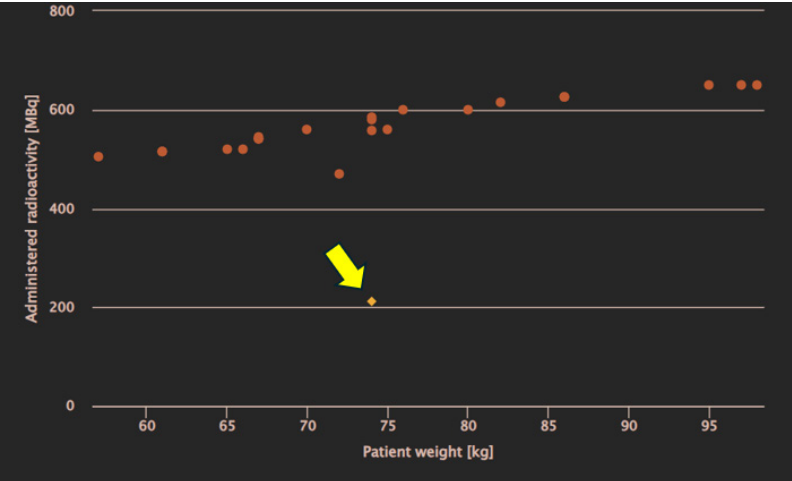


Figure 4. Daily trends comparing the radioactivity prepared (top) and administered (bottom) to target reasons for differences in activity for optimization.

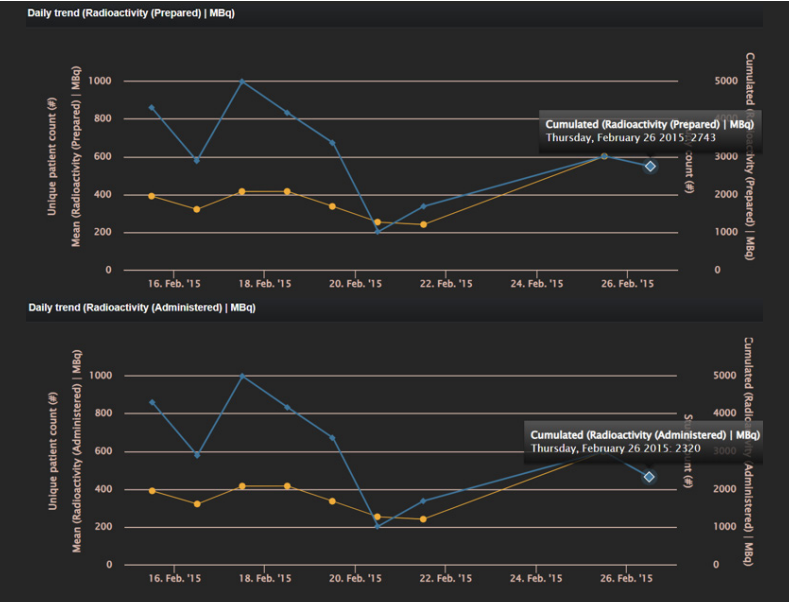


Figure 3. Administered radioactivity can be tracked with respect to patient weight to ensure correct and efficient dosage, allowing to easily spot outliers, as shown above.

Pharmaceutical Purity Management					
96.3 Average Purity 2 lot numbers with bad purity Pick a filter All					
Reference date	Lot number	Purity (%)	Expiration date	QC comment	Active
02/11/2015	1258945	94.4	02/11/2015		NO
02/16/2016	1258999	96.4	02/16/2016		NO
10/21/2016	123	94.5			YES
01/30/2017	123785	96.0			YES
07/23/2018	56781	96.0	07/23/2018		YES
03/14/2019	5987	97.8			YES
01/25/2021	569872	98.8			YES

Figure 5. Purity is recorded per pharmaceutical LOT number, providing all studies performed under the same LOT number. Purity below 95% is highlighted in orange.

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Anna Romanyukha holds a Ph.D. in Medical Physics from the Centre of Medical Radiation Physics (UOW, Australia) and an M.Sc. in Health Physics from Georgetown University (Washington DC, USA). She previously worked as a fellow at the National Cancer Institute (NIH) on projects including radiation dose estimation from diagnostic exposures. She now focuses on advanced software for patient radiation dose management and quality at Qaelum NV.



Niki Fitousi, PhD, is a certified medical physicist with expertise across Radiation Therapy, Diagnostic Radiology, Nuclear Medicine, and Radiation Protection. As Head of Research and Applications at Qaelum, she specialises in radiation dose management, quality, and efficiency in medical imaging. She also serves on the Medical Physics World Board of the International Organization for Medical Physics.

RTI Mako: the New X-Ray testing Tool Swimming Through the Market

5 reasons why Medical Physicists are switching to the new Mako Multimeter



Figure 1. Mako Shark series.

RTI Group are experts in X-ray Multimeters

Did you know that RTI Group developed the very first non-invasive X-ray multimeter in 1982? No other company in the world can have more experience when it comes to developing multimeters for X-ray testing.

With >40 years expertise, RTI Group have developed numerous hardware platforms, sharing names associated with aquatic creatures (fish), including the Barracuda (2001), the Piranha (2006 and rebrand

2014), the Cobia (2011), and now in 2024, the newest fish in the school, Mako (a Shark). These can all be found in the Ocean, with RTI Groups world-leading Ocean software providing ultimate usability and efficiency for your X-ray testing and QA.

Accuracy

Mako sharks feed on swordfish & tuna, they must be accurate! The new Mako X-ray metre is the most accurate X-ray testing tool on the market (kVp uncertainty of $\pm 1.5\%$), with unrivalled perfor-

mance across the widest kV range (18-155 kV). The groundbreaking new detector design takes strides beyond other metres, with the R/F Probe handling highest to lowest dose rates without need for any selections, covering Radiography, Fluoroscopy, CT and Dental modalities.

The dedicated “Mammo” Probe is the ultimate Mammography test tool, handling the entire clinical kV range from 18-49kV, even measuring the contrast-enhanced mammography ranges without the need to switch sensors above 40kV. With the widest angular measurement range, tomosynthesis acquisition can be measured, in addition to handling the latest systems & beam qualities on the market (including Titanium filters).



Figure 2. Mako protective transport case.

Efficiency

Mako (shark) is the fastest shark in the Ocean, and our X-ray metre has relatable efficiency. The role of a Medical Physicist can be all consuming. Getting the X-ray system back into action efficiently, while still performing the proper QA routine, is paramount. With Mako, the most efficient usability is experienced.

Place the Mako Probes in any orientation under the X-ray beam, no need to waste time on alignment or adjustments. Simply place and expose. It



Figure 3. Maiko X-Ray Mena with its Operational Tablet.

can also be set up fully wirelessly, with no range selections needed either. The advanced technology and design handles everything else.

Application Range

Mako sharks have wide-ranging habitats, and our Mako metre covers all X-ray modalities. The Ocean software is the display and gateway to the entire Mako system, which offers the broadest X-ray testing application range. Not only the Mako “R/F”, “Mammo” and “Dental” Probes, but a wide range of external Probes can be connected, even for simultaneous measurement.

For example, external dose probes (measure dose in 2 places at once), CT Probes (CTDI measurement with Ion Chamber & RTI CT Dose Profiler), Light probes (luminance and illuminance), DAP chambers (dose area product measurement), mAs probes (invasive mAs cable and non-invasive mAs clamp).

Whatever your needs and application, Mako can cover the widest range of applications covering all X-ray modalities.

Cost of ownership

Lavish budgets are not easy to come by, and you



Figure 4. Mako Holder for Mammography Applications.

need a tool that can support you for many years, with a good cost of ownership both up front, and during its lifetime.

While other sensors require yearly calibration, RTI products have a standard 2-year calibration cycle, reducing the costs, reducing the downtime, and reducing the amount of redundancy needed for when calibrations are due.

Our commitment to 10-day turnaround times is unmatched in the market, meaning that when you have to calibrate, you are not waiting around. We care about your experience.

When it comes to software, there are no extra fees for having more users. The licence is stored in the Mako system, so unlimited users can download the software, and departments can share a system without worrying about more costs. Ocean is free to download, and will always provide free updates.

While there may be restrictions on landing a Mako Shark, there are no restrictions on landing your Mako X-ray multimeter. If you want to join the revolution, ask about getting your Mako system today.



Michael Olding PhD, is Head of Product Management at RTI Group. Michael works on the interface between product development at RTI and global end users of RTI's products & solutions (physicists, engineers and medical professionals), and is passionate about ensuring user needs are at the forefront of new product development at RTI Group.

Simplifying the Personalization of Cancer Care: Radiation Oncology Continues to Transform



The field of radiation oncology has undergone tremendous transformations in recent years and become a prime example of precision medicine making a significant difference for cancer patients, not just in survival outcomes, but in better post-treatment quality of life. It seems, however, that the world hasn't caught on to this. Attitudes towards this now-very-tailored, effective, and even cost-effective approaches to cancer care remain mired in historical perceptions that no longer pertain.

This issue was highlighted early in 2024 in an analysis of news reports that found that there has been a growing negative sentiment in the media toward radiation oncology.

In his blog entitled *If Radiation Were a Drug...*, author Mark Storey, MD, radiation oncologist and former Medical Director at the Oklahoma Proton Center, notes the negativity swirling around the field of radiation oncology and suggests that radiation oncology professionals themselves may

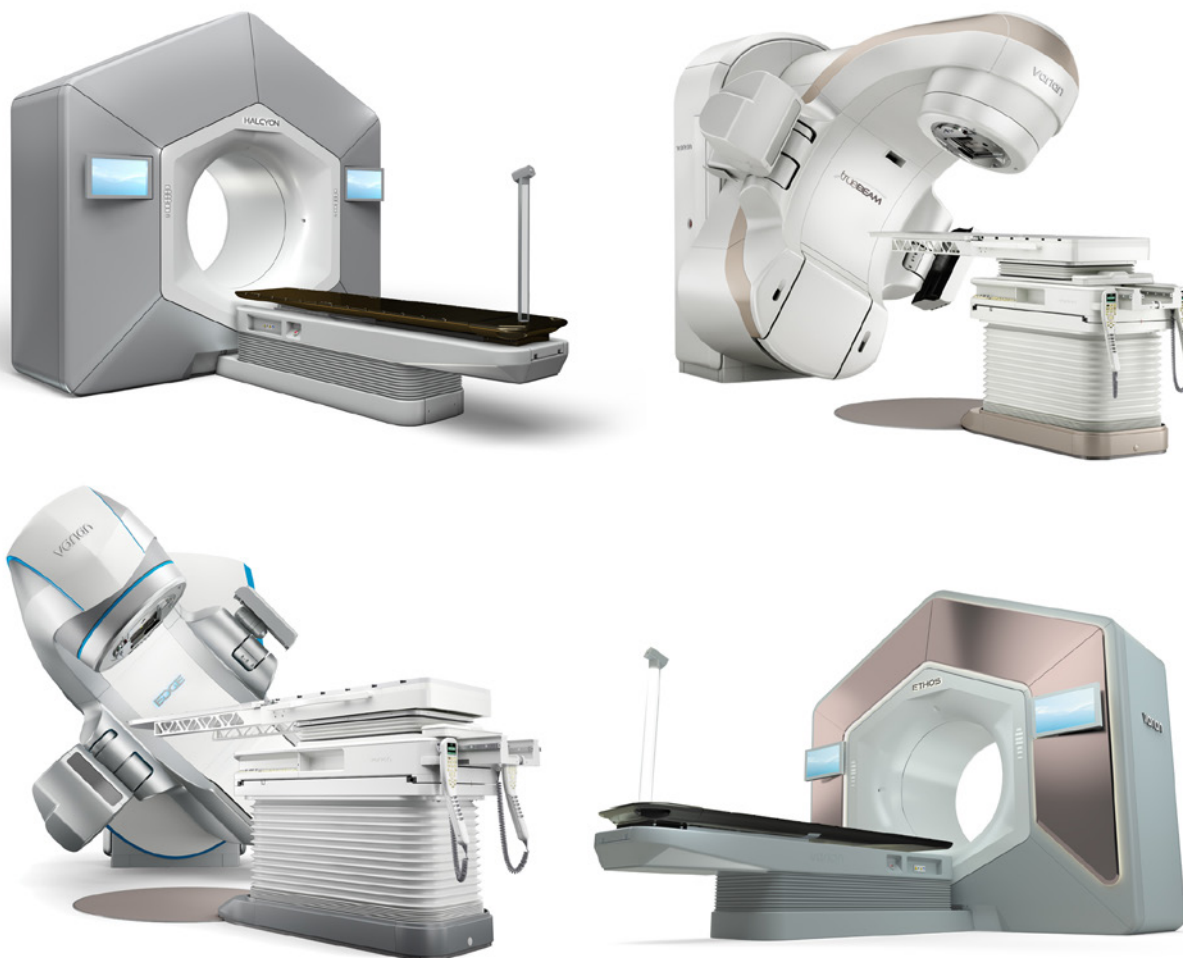


Figure 1. Varian Machines for Radiation Oncology Applications.

be partially responsible because of a reticence to promote the amazing advances that have revolutionized the field.

“Fortunately, I see the tide shifting,” he goes on to say. “I think we are demonstrating massive progress for oncology patients and unifying around the understanding that we’ll be a short, efficient, super-high value addition for many oncology patients. We are moving quickly, in many treatment indications, towards a non-invasive alternative to surgery,” he added. “We can overcome this.”

At Varian, we agree with Dr. Storey. Today, radiation oncology has become a highly personalized form of cancer care, every bit as tailored and specific to the patient as surgery might be.

“At Varian and Siemens Healthineers, it’s our ob-

ligation to develop solutions designed to not only enhance personalization at every point along the cancer care journey, but also to make those processes simpler, more automated, and easier to accomplish, all in an effort to enhance patient outcomes,” said Arthur Kaindl, Head of Varian. “We have been working for decades to empower clinical teams by improving precision at each step of the patient journey.”

This year, Varian’s annual insert in the ASTRO supplement of the International Journal of Radiation Oncology, Biology, Physics (the Red Journal), outlines some of the ways Varian teams have been working with colleagues across Siemens Healthineers—partners in imaging, diagnostics, healthcare IT, interventional radiology, and other specialties—to develop solutions that are designed to enhance personalization at every point along

the cancer care journey, with the ultimate goal of enhancing patient outcomes. It's a story we are determined to tell to push the pendulum in the right direction, as Dr. Storey exhorts us all to do.

[Read the Red Journal insert.](#)



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² [May Abdel-Wahab et al.](#), Global Radiotherapy: Current Status and Future Directions—White Paper. *JCO Glob Oncol* 7, 827-842(2021). <https://ascopubs.org/doi/10.1200/GO.21.00029>

³ Wawrzuta D, Klejdysz J, Chojnacka M. The rise of negative portrayals of radiation oncology: A textual analysis of media news. *Radiotherapy and Oncology* 2024;190:11008. <https://doi.org/10.1016/j.radonc.2023.110008>.

⁴ Storey M. If Radiation Were a Drug... *Protons* 101, 2023 Dec 10. <https://protons101.substack.com/p/if-radiation-were-a-drug>.

Meryl Ginsberg recently retired as public relations and marketing director at Varian, a Siemens Healthineers Company and continues to do freelance work for a variety of clients and causes.

University Hospital Würzburg Navigates Change Using Automation

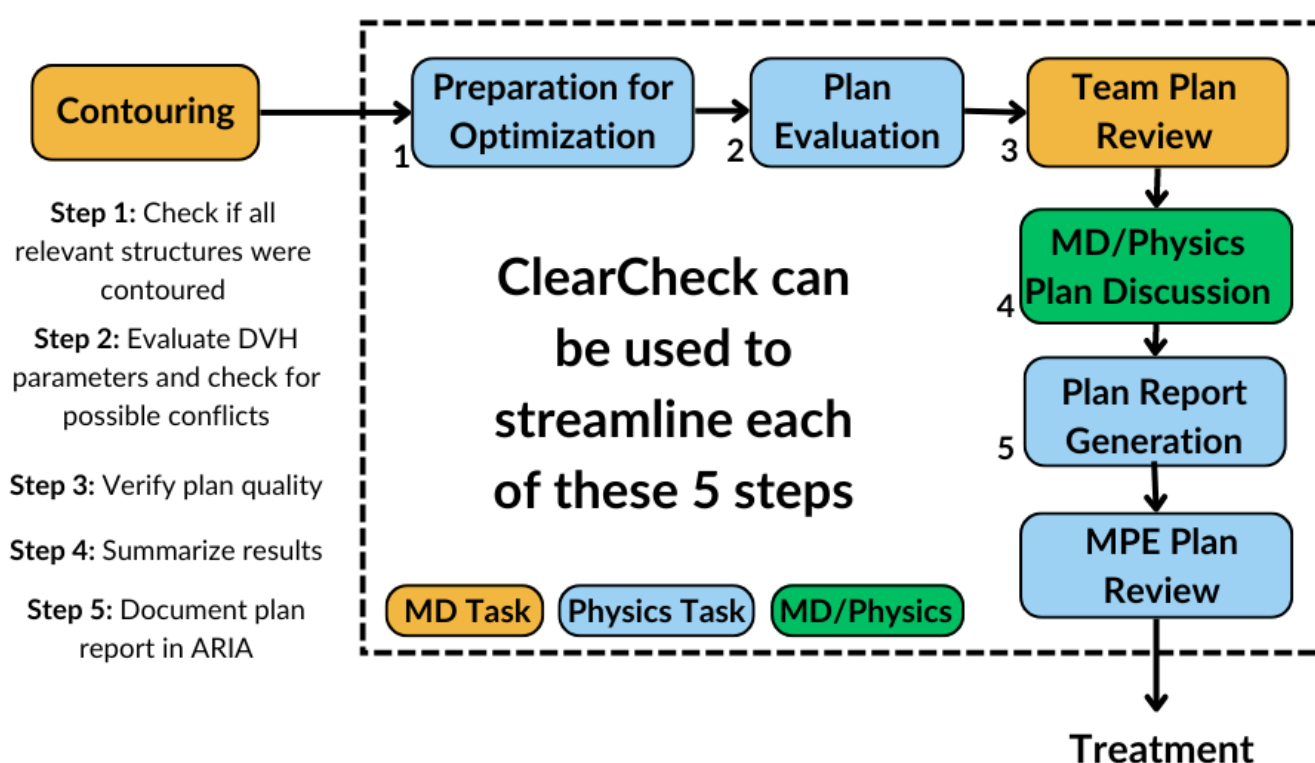


Figure 1. In the workflow path from Contouring to Treatment, University Hospital Würzburg leverages ClearCheck at multiple steps to ensure process consistency, quality, and efficiency.

In 2020, the Department of Radiation Oncology at University Hospital Würzburg transitioned from Pinnacle treatment planning system (TPS) to Eclipse. When seeking to replace the automated elements they had in place prior to their TPS change, they found ClearCheck from Radformation.

ClearCheck is an automated plan evaluation and documentation tool that ensures high-quality treatment plans through efficient plan checks,

dose constraints, and comprehensive documentation.

The physics team at University Hospital Würzburg saw the potential in ClearCheck to be a central platform for multiple different plan evaluation tasks. With automated features designed to facilitate the plan review process, they implemented ClearCheck to make their workflow more efficient and effective.

Automating multiple workflow steps with a single solution

Adopting a new TPS can be both exciting and daunting. For Würzburg, the change meant moving away from established workflows that heavily relied on custom scripts for automating various tasks like DVH evaluation and plan reporting.

In a new environment, they aimed for similar efficiency within the treatment planning process. While the team developed certain ESAPI scripts internally using their in-house expertise, these did not fully meet their needs for connectivity and comprehensive functionality. Then, they discovered ClearCheck.

“Despite the challenges and increased workload associated with changing TPS (Pinnacle to Eclipse), we gained more automated verification parameters and safety checkpoints, which benefits both physicists and MDs,” says Robert Schindhelm, physicist at University Hospital Würzburg.

With so many different functions available within ClearCheck, they no longer need in-house scripts or spreadsheets to keep their treatment planning and documentation process together. **Exploiting the software's customizability, the physics team was able to consolidate multiple efforts into the plan evaluation platform.**

All within the same software, they now easily:

- Perform DVH constraints evaluations
- Assess plan parameters
- Generate a full patient plan report—all within the same software.
- Compare plans side-by-side to determine the best fit
- Analyse plan sums—for boost plans or previous irradiation alike

“We’ve found that our plan verification workflow, from preparing for optimisation through plan review, could be perfectly automated through

ClearCheck.” says Robert.



Figure 2. A key feature of ClearCheck valued by the University Hospital Würzburg physics team is PDF-to-ARIA automation, syncing treatment plan reports to ARIA Documents for streamlined electronic documentation.

Efficiency and Time Savings

After implementing the tools that ClearCheck provides, the team noticed immediate improvements in their planning workflow. According to Robert, “Evaluations are automated and standardised, allowing for the verification of important dosimetric values and plan-specific parameters within seconds.”

On the reporting side, they were quickly captivated by the PDF-to-ARIA feature. Creating a very detailed, relevant report that directly populates to the ARIA Documents workspace eliminates the need for manual export/import, freeing up valuable physicist time which can now be assigned to focus on personalised patient care.

With more information at their fingertips, they’ve incorporated their physician colleagues into the optimisation and planning process. Physicians can now quickly verify key dose constraints and plan parameters, leveraging ClearCheck’s visualisation tools and streamlined data access. This empowers them to participate more actively in the planning process, leading to more effective teamwork and fewer planning iterations.

Conclusion

Powered by intelligent automation software, Robert and the physics team at University Hospital Würzburg have successfully navigated the major hurdles associated with a new treatment planning system. With the help of ClearCheck, they've unified many tasks on one platform, automating the planning workflow for higher levels of efficiency.

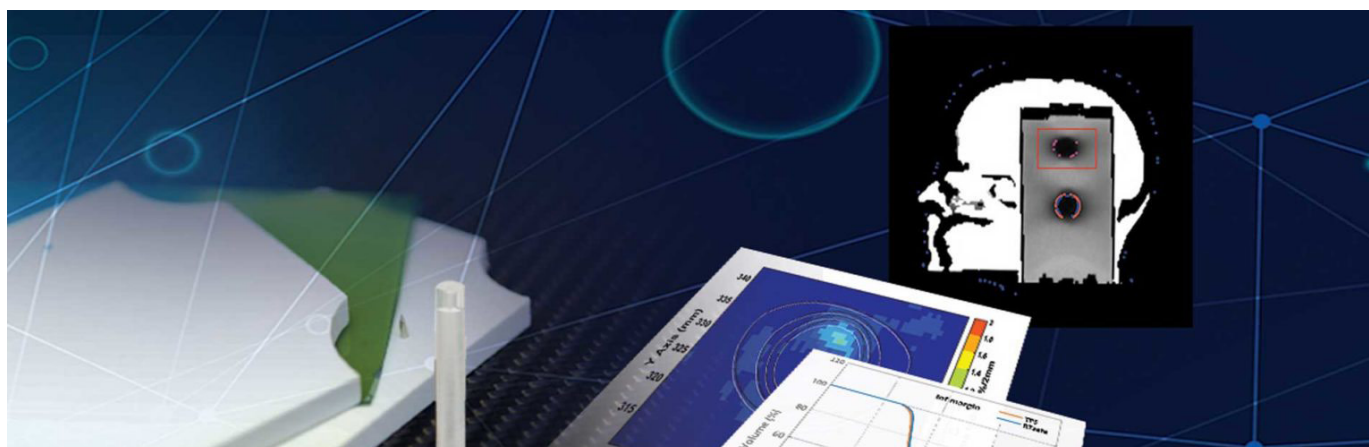
The implementation has had an unintended, yet highly positive, side effect: improved team communication. From plan notes to therapists to facilitating better conversation with physicians, ClearCheck simplifies communication and fosters collaboration. According to Robert, "ClearCheck has not only streamlined the planning process but also fostered greater collaboration among team members, enhancing overall efficiency and freeing up time to focus on elevating patient care."

To learn more about how University Hospital Würzburg has successfully used ClearCheck to enhance patient care, visit [Radformation.com](https://www.radformation.com) to read the case study.



Tyler Blackwell, MS, DABR, FAPPM, is a medical physicist at Radformation, specialising in clinical collaborations and community engagement. Previously, he worked as a clinical physicist for a decade and serves on AAPM committees and as a volunteer for the American Board of Radiology.

RTsafe Remote Dosimetry Services: Advanced Dosimetry, Simple Implementation.



Radiation medicine is advancing, and technological innovations are paving the way for more efficient and safer treatments. Stereotactic Radiosurgery (SRS) and Stereotactic Body Radiation Therapy (SBRT) are at the forefront of this technological leap, with modern SRS/SBRT applications increasingly gaining ground over conventional methodologies. These advanced techniques enable highly accurate and precise treatments, resulting in improved clinical outcomes and enhanced quality of life for patients. However, effectively implementing SRS and SBRT requires higher technological standards compared to conventional radiotherapy. Systems and procedures deemed sufficient for standard radiotherapy techniques cannot meet the demands of SRS/SBRT. The complex nature of the SRS/SBRT treatment process necessitates a commitment to the highest levels of accuracy and precision.

While more complex treatments typically translate to more targeted therapies, they also demand more intricate quality assurance (QA). This

has emphasised the importance of independent dosimetry audits as an effective means of verifying whether a radiotherapy centre's dosimetry practices meet the necessary standards to achieve treatment objectives and minimise the risk of unintended exposures. Audits also provide support and confidence when introducing new and complex techniques. Despite international recommendations highlighting the benefits of external verification of the accuracy and reliability of radiotherapy practices, access to audit opportunities remains insufficient in many radiotherapy centres worldwide.

RTsafe, which envisions more efficient radiotherapy on a global scale, has developed an innovative approach to End-to-End QA testing, focusing on both SRS and SBRT applications. A set of remote dosimetry services has been introduced to support radiotherapy centres in promoting best practices and ensuring high-quality SRS/SBRT treatments. These services allow centres to outsource the routine quality control programme of

their radiation oncology QMS using a cost- and time-effective solution.

Prime and SBRT phantoms, combined with point, 2D, and 3D remote dosimetry services, provide confidence and reliability for challenging SRS/SBRT applications.

RTsafe's remote dosimetry services offer point (OSL), 2D (EBT4 films), and 3D (polymer gel) dosimetric and geometric accuracy through independent dose measurements, ensuring traceability to a secondary standard dosimetry laboratory. This setup evaluates the entire treatment chain, including clinical and technical aspects, by simultaneously reviewing the procedures and protocols of the radiotherapy centre.

At the conclusion of the process, the user receives a comprehensive dosimetric report that includes comparisons between measurements and Treatment Planning System (TPS) calculations. These comparisons cover:

- 1D dose profiles and 1D gamma index
- 2D isolines and 2D gamma index maps
- 3D gamma index passing rates
- Dose Volume Histograms (DVHs)
- DVH metrics
- Dosimetric indices and spatial offsets

The evaluations are provided for each target and/or Organ-at-Risk (OAR), as defined by the end-user during the planning stage.

For more information on RTsafe remote dosimetry services, please visit rt-safe.com.



Emmanouil Zoros oversees product management, data analysis, and film dosimetry at RTsafe. He holds degrees in Applied Mathematics, Physics, and Medical Physics, with research focusing on quality assurance in stereotactic radiosurgery and Monte Carlo-based dosimetry.



Vasiliki Margaroni handles data analysis and provides scientific support at RTsafe. With degrees in Physics and Medical Physics, she is a PhD candidate specialising in quality assurance and dosimetry in modern radiotherapy and radiosurgery.

Early Career SIG at the ECMP 2024

ECMP 2024 has been a new opportunity for Early Career SIG to meet and greet his members and attract new young professionals with specific talks on early career interest

The Early Career Special Interest Group (EC-SIG) of EFOMP organised a special session at the European Congress of Medical Physics (ECMP) 2024 in Munich. This event built on the success of ECMP 2022 in Dublin, where the first connections between young EFOMP members were established, marking the creation of this interest group^[1]. From our perspective, the experience of the EC-SIG at ECMP 2024 was outstanding. The Steering Committee, in collaboration with the German Society, worked to create an inviting environment for meeting former members face-to-face and welcoming new young professionals who discovered the group during the various sessions of the event. Based on audience feedback and visitors to the EFOMP booth, we believe this effort was successful

In this edition, the SIG shared the achievements of its first year of work. Among the highlights is the creation of an interactive map of training and certification programmes across various EFOMP member states, now available on the EFOMP website^[2]. Beyond providing bureaucratic information and job status, this map aims to include contact details to help those interested in pursuing a professional career in Europe easily access the necessary support.

A major milestone for the Early Career SIG was the official launch of the mentoring programme, designed to connect young professionals in the field with experienced researchers^[3]. Dr Antonio López Medina sponsored this initiative alongside EFOMP President Efi Koutsouveli. Dr López Medina and Dr Irazola Rosales have already established the first mentorship matches, and the programme is now operational.

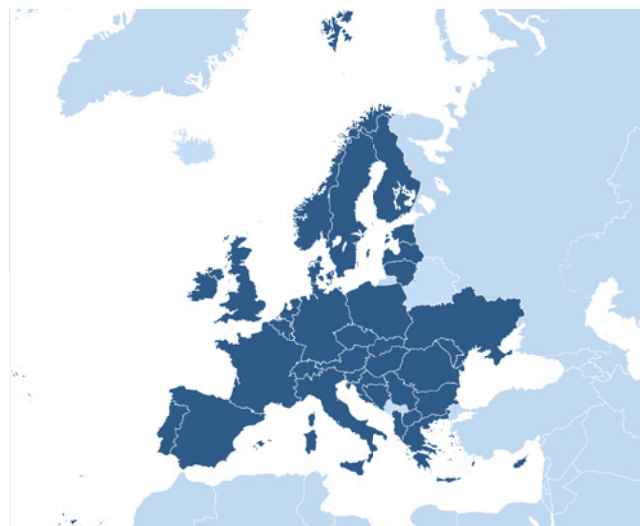


Figure 1. Interactive map for European Early Career MP^[2].

During the "Meet the Experts" session, participants had the chance to learn about the careers and experiences of experts in various fields of medical physics, including Dr Irene Polycarpou, Prof Mika Kortensniemi, and EFOMP President Efi Koutsouveli. We also met emerging talent in the field, Elia Lombardo, who presented her thesis findings on the use of artificial intelligence in adaptive radiotherapy. The speakers in the "Software as a Medical Device" session provided valuable insights into the regulations governing software development for clinical use and the associated responsibilities.

Key aspects of professional development for young physicists, such as discussing scientific results and presenting findings orally, were addressed in joint sessions with the young medical physicists group of the Deutsche Gesellschaft für Medizinische Physik (DGMP). After a "Tips and Tricks" talk by Danielle Dobbe-Kalkman, Senior Learning Specialist from the Dutch Expert Centre for Screening (LRCB), young medical physicists from across Europe gave short presentations of their work. These presentations were followed by constructive feedback from Danielle and the audience in a friendly and supportive environment.



Figure 2. Several members of the Early Career SIG steering committee at the ECMP2024 and tip-and-tricks join sessions with the DGMP young medical physicists group.

This focus on soft skills continued with a showcase of resources available on the EFOMP website for young medical physicists (www.efomp.org) and the presentation of EFOMP's sustainability initiatives.

There were also opportunities to enjoy the German experience, thanks to collaboration with the DGMP young medical physicists group. They organised a networking reception for young professionals at the campus pub, offering free drinks and entertainment. Additionally, a trivia session for attendees of Early Career SIG-organised events featured exciting prizes, adding a fun and engaging touch to the programme.

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- [1] The European Congress of Medical Physics (ECMP) 2022: A Report of Success by Naomi McElroy, EMPNews 03/2022 (2022). <https://www.efomp.org/uploads/6e0afbbba-32e7-489d-b86f-c7e3a541b7ce/EFOMP%20Newsletter%20Autumn2022.pdf>
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Dr. Jesús G. Ovejero works as a Medical Physics Expert in University of Navarra Clinic (Madrid, Spain) since 2024. He obtained his PhD in 2017 from University Complutense of Madrid investigating on nanoparticles for medical imaging and hyperthermia. He is deputy of SEFM to the EFOMP and member of steering board of Early Career SIG.

Special Interest Group for Radionuclide Internal Dosimetry (SIG_FRID)

The objective of SIG_FRID is to establish a network of medical physicists specialising in radionuclide dosimetry. SIG_FRID seeks to address the need for networking, education, research, and professional exchange in this field.

Currently, SIG_FRID has 232 members, and new applications are always welcome (see details below on how to join).

Steering Committee

Since March 2024, the Steering Committee comprises:

- **Manuel Bardiès** (Chair)
- **Julia Brosch-Lenz**
- **Carlo Chiesa**
- **Gerhard Glatting**
- **Silvano Gnesin**
- **Pablo Mínguez Gabiña** (Vice-Chair)
- **Steffie Peters**
- **Katarina Sjögren Gleisner** (Secretary)
- **Lidia Strigari**

SIG_FRID Steering Committee Priorities:

1. Scientific meetings.
2. Focus group management and follow-up.
3. Teaching, education, and dissemination.
4. Communication.
5. Professional, regulatory, and economic matters.

A summary of recent activities under these priorities is provided below.

Priority 1: Scientific Meetings & Case Reports

All scientific meetings and case reports are accessible via EFOMP's e-learning platform: [EFOMP e-learning](#).

The final Case Report of the year is scheduled for **3 December**, 12:00–13:00 CET. The topic will be announced shortly—save the date!

Priority 2: Focus Group (FG) Management and Follow-Up

Updated focus groups and their leaders:

- **FG1:** TAC fitting (*Gerhard Glatting*).
- **FG2:** Treatment Planning Systems (*Lidia Strigari*).
- **FG3:** Absorbed dose-effect relationships (*Lidia Strigari*).
- **FG4:** Voxel S-values (*Julia Brosch-Lenz*).
- **FG5:** DICOM standards (*Manuel Bardiès*).
- **FG6:** Accuracy of therapeutic activities in nuclear medicine (*Silvano Gnesin*).
- **FG7:** MPE education in internal dosimetry (*Katarina Sjögren Gleisner*).
- **FG8:** Simplified dosimetry (*Sasha Ivashchenko and Deni Hardiansyah*).

Note: FG8 is currently recruiting new members.

Priority 3: Teaching, Education, and Dissemination

A proposal for educational courses in nuclear medicine dosimetry has been approved by EFOMP. This includes 24 pre-recorded webinars covering the basics of clinical nuclear medicine dosimetry and the entire dosimetry workflow. These webinars, launching in mid-November, serve as prerequisites for the in-person **ESMPE School course** in Prague, **13–15 February 2025**, focusing on the practical application of clinical dosimetry.

- Register now: [EFOMP Registration](#).
- Course details: [ESMPE Programme](#).

Priority 4: Communication

SIG_FRID communicates through email lists and Slack, sharing updates on relevant papers, PhD opportunities, jobs, and grants. Monthly newsletters are sent to members, while **EMP News** is issued quarterly.

EU Opportunities

- **Marie Skłodowska-Curie Actions:** Funding for further training:
 - ▶ [Postdoctoral Fellowships](#).
 - ▶ [Staff Exchanges](#).
- **RATIONALE COST Action:** Networking opportunities in theranostics imaging and dosimetry, with options for short-term visits and student exchanges.
 - ▶ [More information](#).
- Other EU funding opportunities of interest:
 - ▶ Personalised cancer medicine: Details.
 - ▶ New cancer networks: Details.
 - ▶ Artificial intelligence in healthcare: Details.

Priority 5: Professional, Regulatory, and Economic Matters

- **Public Awareness:** SIG_FRID is collaborating with the Cancer Patient Europe Association to raise awareness of optimised nuclear medicine therapy through dosimetry.
- **EFOMP Policy Statement 19:** A short communication on dosimetry in molecular radiotherapy was submitted to ECO (European Cancer Organisation). Read it here: [EFOMP Policy Statement 19](#).
- A survey is in preparation to investigate variations in the administration limits of LUTATHERA® across EU countries.
- **EMA Consultation:**
 - ▶ The European Medicines Agency (EMA) has released a draft guideline on the clinical evaluation of therapeutic radiopharmaceuticals. Open for consultation until **31 January 2025**.
 - ▶ [Read the draft guideline](#).

Upcoming Meetings

- **Optimisation in X-ray and Molecular Imaging (OXMI):** 28–30 April 2025, Gothenburg, Sweden.
 - ▶ [Details](#).
- **38th EANM Annual Congress:** 4–8 October 2025, Barcelona, Spain.
 - ▶ [Details](#).
- **2nd Symposium on Molecular Radiotherapy Dosimetry:** 13–15 November 2025, Athens, Greece.

How to Become a SIG_FRID Member

SIG_FRID is open to professionals interested in radionuclide dosimetry. Membership is available to all EFOMP members. Instructions for joining can be found on the SIG_FRID page of the EFOMP website: [SIG_FRID Membership](#).



Pablo Mínguez Gabiña (PhD Lund University) is a senior medical physicist at the Gurutzeta/Cruces University Hospital in Barakaldo, Spain and a part-time professor at the faculty of engineering of the University of the Basque Country in Bilbao. He is the Vice-Chair of the Steering Committee of SIG_FRID.

CrossYGN Initiative – Preparing a new year rich in events



Figure. Pictures of the CrossYGN Sessions at ECMP 2024 in Munich.

The cross-sectional cooperation, made by the young sections of EFOMP (European Federation of Organisations for Medical Purposes), IRPA (International Radiation Protection Association), FuseNet (The European Fusion Education Network) and ENS (European Nuclear Society) as part of the *ENEN2plus work package WP3 - Task 3.4*, is already working on next year's opportunities and events.

But first, we would like to share the successful sessions we had last 11th September in Munich, on the occasion of the 5th European Congress for Medical Physics and the parallel ENEN PhD Event & Prize.

In the first workshop – “Nuclear for Health - The role of nuclear science from the target to the hospital”, Gawel Madejowski (ENS-YGN), Leticia Irazola Rosales (EFOMP) and Joel Piechotka (IRPA-YGN) gave many insights on the supply chain of radioisotopes, from the targets irradiation and their transportation, to the application in hospitals and their waste management. By mix-

ing work and personal experiences, our speakers highlighted the passion of young professionals in this crucial sector, but also the cross-disciplinary approach that characterises it.

Then, in the session “Interesting opportunities for young scientists and their mentors”, Carlos Vázquez-Rodríguez (ENS-YGN), James Tufnail (FuseNet), together with Joel and Leticia presented the large network of the abovementioned European YGN. Opportunities, projects, great networking activities, and much more... all this makes the community of nuclear young professionals and students so special and engaged. The event attracted both the ENEN PhD finalists and several ECMP participants keen to learn more about the topics presented.

Talking about the future, the YGNs have already started planning the next steps. First of all, a new podcast series is being prepared. Meetings and interviews with young professionals in every sector we represent will accompany you starting this

winter season. With these contests, the Cross-YGN initiative would like to showcase the multiple opportunities that the nuclear sector offers, the potential career paths, and the role of young, passionate, motivated people working in different fields.

Looking at 2025, the next spring will already offer a great opportunity for youth in nuclear at the 11th edition of Euratom Research and Training Conferences FISA-EURADWASTE, co-organised by Euratom, NCBJ, ENS, ENS-YGN and SNETP in Warsaw (11th-15th May 2025). The event will dedicate one full day (12th May) to Young Generation Network, Awards and Atomic Careers' Day, a fantastic occasion to gather with all European YGNs. Further details: [Programme | FISA EURADWASTE 2025 \(ncbj.gov.pl\)](#).

Moreover, the Plenary Sessions would be the right framework to sign the MoU between YGNs mother societies, one of the goals of the ENEN-2Plus project – Task 3.4, specifically dedicated to Cross-YGN cooperation.

Then, the ENEN2Plus 4th Secondary School Competition & Summer Camp, taking place in Bologna, Italy, from 14th to 18th July 2025, will give us the opportunity to meet pupils from European secondary schools, who are participating in a video challenge and presenting 3-minute clips

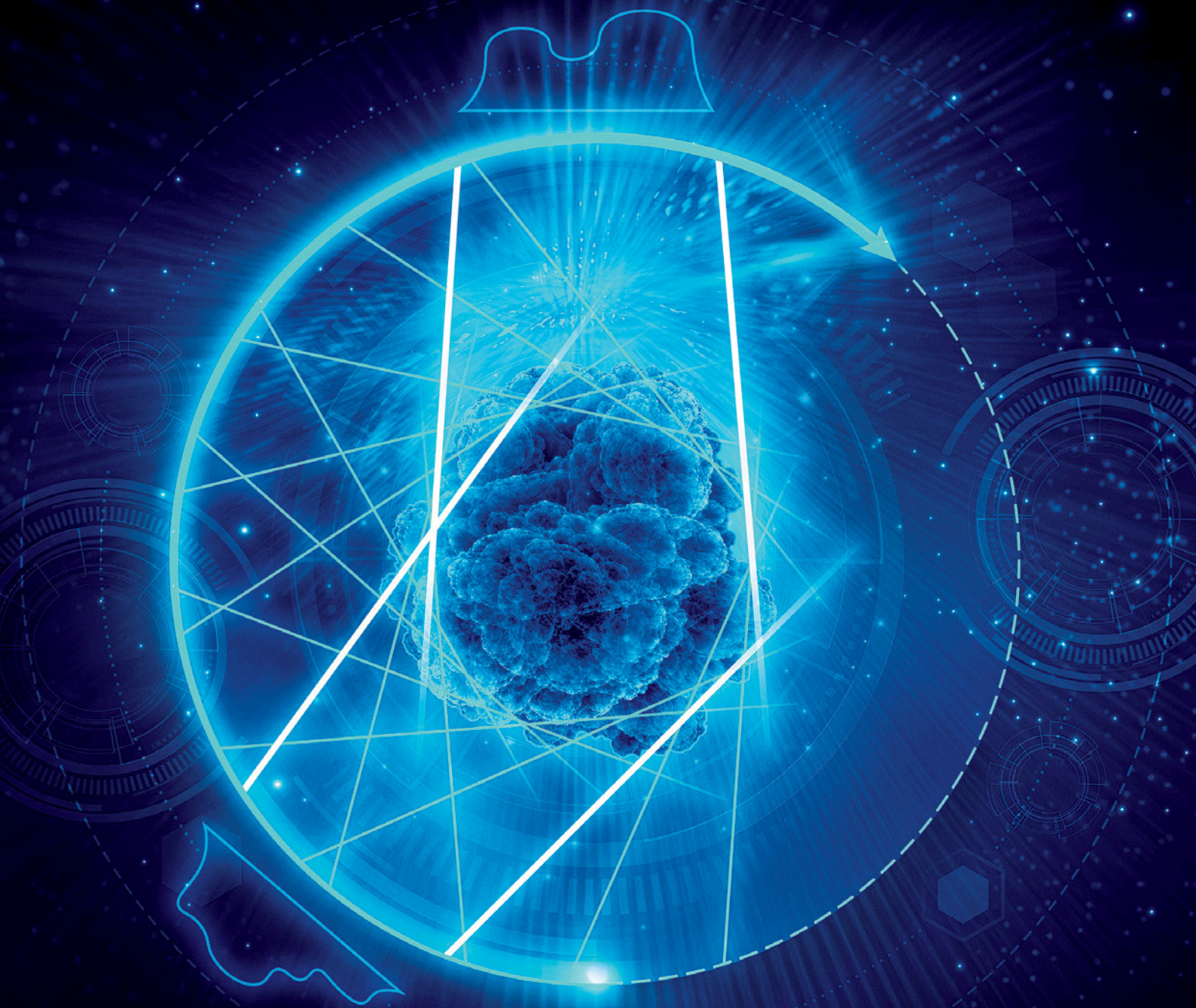
explaining a nuclear application in a creative and informative way. The Cross-YGN initiative plans to organise a workshop, targeting pupils' interests and passion, following the visit to the ENEA Brasimone Research Centre labs, an inspiring venue both for speakers and students to have fruitful meetings and exchange “on the field”.

The technical tour will also allow attendees to explore the multidisciplinary research and innovation explored at the Centre, which is one of the major research facilities dedicated to magnetic confinement nuclear fusion technologies, heavy liquid metal fission technologies (Generation-IV LFR), the development and qualification of innovative materials, and environmental radiometry, and radioisotopes production and innovative applications of ionizing radiation in oncological diagnosis and radiotherapy.



Mattia Baldoni is Communications Officer at the European Nuclear Society, which promotes the development of nuclear science and technology and the understanding of peaceful nuclear applications. Based in Brussels, ENS brings together more than 12,000 professionals from the academic world, research centres, industry, and authorities. ENS is also a long-standing partner of ENEN and it is participating in the ENEN2Plus project, leading the Task 3.4. (Setting up networking cross-YG and cross-professional organizations).

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Historical Explorations of Medical Physics 1: ICRP's First 50 Years, Birth, Adolescence and Adulthood

PREAMBLE

This is the first in a series of articles on the history of medical physics and radiation protection in medicine. Traditionally the social, governance and fit for purpose aspects of our development have often been overlooked. Biographical sketches often lack candour, energy, and truth. They can read like eulogies — like the lives of the saints and are equally uninteresting.

These articles will attempt fresh perspectives. This one deals with the first 50 years of ICRP, and the second will present a biography of an important player in the area which has surprising dimensions. Reading the available sources as a retired spectator can find the unexpected. The judgments made are those of the author, not of EFOMP.

INTRODUCTION

ICRP is a highly respected body in radiation protection. Its formal recommendations are widely used by medical physicists, regulators, governments, the EC, and the UN. They are based on science, value judgements and experience. Its users and advocates tend to think of ICRP as a scientific body; but, it is not. This article reviews its influence on the development of radiation protection (RP) in medicine from 1928 to 1977, its first fifty years, and assesses both its independence and its attention to medical exposures [1]. Pre ICRP practical safety advice from several countries found its way into the international system. In due course, the international advice influenced development throughout the world.



Figure 1. Monument to the X-ray and Radium Martyrs erected 1936 in Hamburg, now commemorating 359 early radiology workers. Courtesy of Wikimedia Commons, the free media repository. ^[2]

THE FIRST AND SECOND INTERNATIONAL CONGRESSES OF RADIOLOGY

The first international congress of radiology (ICR) was held in London in 1925 and resolved to address practitioners' concerns. They were safety, radiation measurements, and professional education for radiology. Commissions to deal with each of these were proposed and met at the second ICR in Stockholm in 1928. The commission on safety eventually became ICRP. It will celebrate its centenary in 2028.

The first set of safety recommendations, a three-and-a-half-page document, known as the 'Recommendations for X-ray and radium protection', were signed off at the 1928 congress, and are accessible (open access) on the ICRP website. This is the direct predecessor of all ICRP international recommendations.



Figure 2. Rolf Maximilian Sievert, whose name was given to the unit. First chairman of ICRP's predecessor 1928-1931. Later chairman of ICRP 1956 – 1962. Creative commons.

Here are a few quotations from the first recommendations:

'The dangers of over-exposure to X-rays and radium can be avoided by the provision of adequate protection and suitable working conditions. It is the duty of those in charge to ensure such conditions for their personnel.'

These sentences place duties on the employer that ICRP and the RP community have championed since; they were ahead of their time

Another quote:

'..... for whole-time X-ray and radium workers: (a) Not more than seven working hours a day. (b) Not more than five working days a week. The off-days to be spent out of doors. (c) Not less than one month's holiday a year. (d) Whole-time workers should not be called upon for other hospital service.'

This reflects the reasonable self-interest of the professional group(s) from which it comes. The lead equivalents for room and tube shielding were inadequate by today's standards. An indication of the prevailing circumstances can be gleaned from:

'if the protective value of the X-ray tube enclosure falls short of the values given the remaining walls, floor and ceiling may also be required to

provide supplementary protection for adjacent occupants -----.'

X-Ray room protection can still give rise to disputes. The author recalls the need for door shielding in radiology departments being hotly disputed by a group of regulators and a senior IAEA radiation protection expert.

Staff requirements take a full page. There is little mention of patient issues, other than the need to make adequate arrangements for protecting the operator against scattered radiation from the patient!

Advice on radium handling proposes that: *'Discretion should be exercised in transmitting radium salts by post.'*

These recommendations were further elaborated in the 1930s. The importance of time, distance and shielding were already evident. The risks feared were acute injury, and genetic damage from gonad radiation (rather than pregnancy). The 1934 Congress set a quantitative permissible dose level of 0.2 R (2mSv)/day or 1 R (10 mSv)/week.

WW II AND ICRP RECOMMENDATIONS IN THE 1950s

The 1940 ICR congress, planned for Berlin, was cancelled due to WW II. Arising from this, all the records of the earlier congresses were lost, and the field was inactive until late 1945. The creation and detonation of nuclear weapons ushered in an age in which secrecy prevailed. This climate was part of the backdrop to RP and health physics becoming recognised sciences, and to significant advances in survey instrumentation, monitoring techniques, and radiobiological research.

The legacy of the war was both positive and negative. On the positive side, epidemiological studies of bomb survivors provided information on cancer and leukaemia induction. And

experimentation with radioactive materials led to potentially valuable medical applications. On the negative side, was the culture of secrecy and the population fears at the horrors that accompanied the Hiroshima and Nagasaki bombings, continuous nuclear testing, and the highly politicised movements of the 1960s and later. The impact of these was underestimated in the RP communities including in medical physics.

The post war ICRP recommendations restarted in 1951 with further publications later in the 1950s. They recognised the newly available work on bioeffects, included clarifications on dose limits, and references to pregnancy began to appear. The numbered ICRP series began with ICRP-1 in 1959 and continues to this day. Its recommendations moved from lists of practical measures to a framework referencing the sciences. It dealt with basic concepts, critical organs, genetic dose, permissible doses and categories of exposure, among many other things. The thrust of medical concern was its increasing prevalence and gonad dose.

GOVERNANCE COMMENTARY ON ICRP, 1928 - 1977

The method of appointment to the commission has not received enough attention. It was described as follows:

'selection of the members shall be made by the ICRP from nominations submitted to it by the National Delegations to the International Congress of Radiology and by the ICRP itself. The selections shall be subject to approval by the International Executive Committee (IEC) of the Congress. Members of the ICRP shall be chosen on the basis of their recognized activity in the fields of medical radiology, radiation protection, physics, health physics, biology, genetics, biochemistry and biophysics, with regard to an appropriate balance of expertise rather than to nationality.) The membership of the ICRP shall be approved during each International Congress.'

Thus, ICRP was a self-perpetuating body. And, it could hardly be more exposed to a powerful interest group, i.e. a profession devoted to the use of radiation. This is at variance with the image of independence the commission projected. The connection lasted in this form for over 60 years and is essential to understanding the culture/ heritage of ICRP.

Exclusion of professionals from the social sciences/ humanities from membership of the commission was shortsighted and consistent with the scientific hubris of the era. It may account for the chronic difficulties RP had with its public messaging. In addition to its recommendations, ICRP became a prolific producer of reports, particularly in the medical area. The reports vary in quality and lack the status of formal recommendations. They are seldom adopted in regulations. Also, during this period, the confident Vatican-like authoritative voice and register of language used in ICRP publications began to emerge.

Authoritative national publications began to appear, e.g. in the UK and the US. For example, the 1957, UK Code of Practice had a curious provenance, including being issued by the Prime Minister's Office. This suggests the overriding security concerns of the era. The publication is unbound and loose-leaf, suggesting it is provisional. National publications often influenced ICRP positions.

The commission's early funding sources included ISR, the Swedish government, and WHO. In due course it established firm links with many international organisations including UNSCEAR, WHO, IAEA, FAO, ILO and IRPA. All of these raise some questions on independence.

Attention to medical exposures continued slightly, and there is a lack of a visible commitment to not harming patients. A half-page (out of 22) is devoted to patient exposures in ICRP-1. Medical exposures were exempted from dose limits as a

matter of practical necessity. It is reasonable to speculate that this owed something to the close relationship with ICR, compounded by a lack of explicit ethics sensibility.

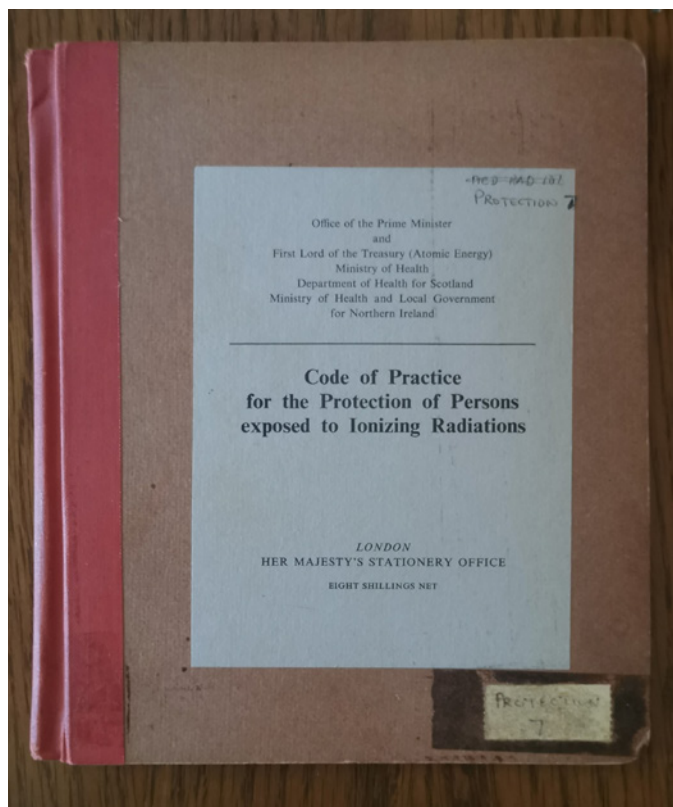


Figure 3. Cover of loose leaf UK 1957 Code. Heading declares its origins as The Prime Minister's Office. Originally in Cambridge University Library. Recovered from a rare bookshop by the author.

The origin of ICRP and its recommendations is often not fully appreciated by those using the system of RP, including medical physicists. It is important to recognise that the ultimate source of the system is an international medical radiology congress. On the positive side, without them, the good flowing from Röntgen's discovery might have been side-lined by the emerging alarming harms. On the negative side, the recommendations, while often commendable, are also often clearly advocacy on behalf of an interest group.

MAJOR DEVELOPMENT IN ICRP 26 (1977)

For the last decade of this period, the modern era was shaping up. ICRP played its part and,

in 1977, issued a new set of recommendations (ICRP-26). It was a major leap forward, superseded all previous recommendations, and was a rigorous, coherent, integrated framework for RP. It is the defining document of the system as we now know it.

It addresses genetic, somatic, stochastic and non-stochastic risks. The aims of RP were identified as prevention of non-stochastic effects and limitation of stochastic effects to an 'acceptable' level. Much attention was given to identifying and "quantifying" the 'acceptable level' and comparing it with societal risks. Quantities, units, and dose constraints, all received attention, as did tissue weighting factors for the first time. The headline annual value for a whole body effective dose of 50 mSv (5 rem). Classification of workplaces, medical supervision, and occupational exposure of pregnant women were addressed. The value of the 10-day rule and good technique are mentioned but without recommendations. The principles of Justification, Optimisation (including ALARA) and Dose Limitation easily dropped out of the system. All of this is now familiar, but the source of the record is ICRP-26. It is about 55 pages; 2.5 are devoted to medical exposures.

The scope, depth, internal consistency, and coherence of ICRP-26 is a great improvement on its predecessors. But all was not positive — the governance issues continued. Protection of the patient and environment were secondary to occupational/ public exposures, and justification was still framed without reference to patients' wishes. In addition, the impression that net benefit could be quantified accurately initiated a fiction from which RP, and medical physics, have yet to escape. Outcomes research was and still is far too primitive to allow such calculations. But it took over a generation of application before this unwarranted assumption began to be questioned at the operational level.

Nevertheless, on a positive note, ICRP-26 pro-

vided an apparently solid, rigorous, coherent framework for RP, and won the loyalty of generations of radiation protection professionals. It was a framework to be proud of, appeared both scientific and evidence based, and a good fit to the 'scientific hubris' of the era.



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Jim Malone is Professor (Emeritus) of Medical Physics/ former Dean of Medical School, Trinity College/ St James's Hospital, Dublin. He works/ed regularly with WHO, IAEA, IEC, ICRP and the EC. Publications include books: Ethics for Radiation Protection in Medicine, Mystery and the Culture of Science, and Tales from the Ivory Tower, an unusual memoir.

INTRODUCING **T3** X-ray QA Meter

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NEW **AG3** QA Software



The Farmer Dosemeter and Ion Chamber: History and Development (1955–2024) by Edwin Aird

Frank Farmer (FTF) earned a first-class degree in electrical engineering from King's College, London. He began his career in Medical Physics at Middlesex Hospital in 1940, moving to Newcastle General Hospital in 1945.

Farmer had a particular interest in measuring dose in radiotherapy. Using his electronics expertise, he designed an instrument to measure dose in radiotherapy, including the electronics required to measure the small currents from ion chambers. He also designed his own ion chamber with notable features in 1955: an inner electrode made of Elektron metal, a graphite-coated (dag) outer electrode inside a tufnol cap, and an amber insulator. The ion chamber cable was also permanently attached to the electrometer.

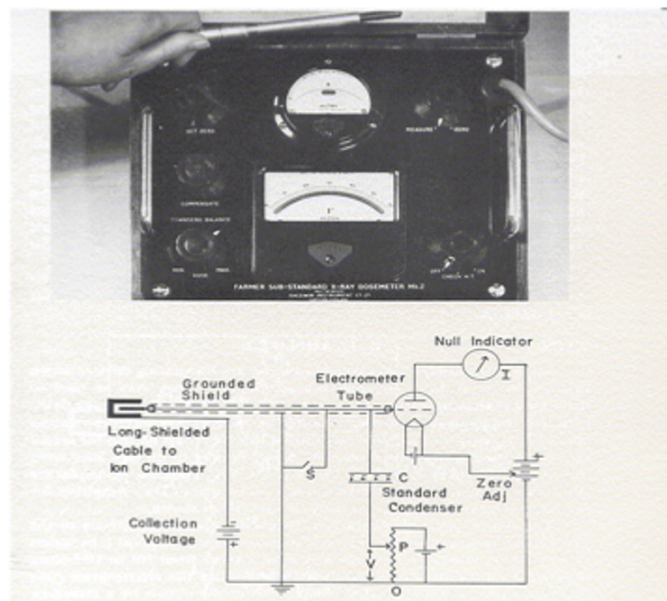


Figure 1. Initial experimental setup of the device.

A Hospital Physicists' Association survey in the 1960s revealed large sensitivity variations among these chambers in the SXT-DXT region. This was attributed to inconsistency in the average atomic number within the chambers, specifically the Tufnol and Elektron metal central electrode.



Figure 2. Attachment of chamber to double braided cable ^[1].

In 1967, I joined the Newcastle Regional Department of Medical Physics, working on various radiotherapy projects. One of my tasks from FTF was to improve the Farmer chamber's design.

It became clear that the materials needed to be pure and stable over time. The term "air-equivalence" was introduced to describe the balance of atomic numbers within the chamber.

The new design (Aird, Farmer, 1972) used 99.99% graphite for the chamber cap and 99.99% aluminium for the electrode. The insulator posed a challenge, as amber was not available in large quantities and varied in atomic number. Aided by J. Fowler and F. Farmer's 1956 publication, a suitable insulator was identified: PTCFE, which maintained excellent insulating properties under ionising radiation.

However, PTCFE's higher atomic number necessitated a reduced insulator surface area within the chamber. This was achieved by adding a graph-

ite sleeve while ensuring adequate insulation to prevent current between the electrodes. To minimise unknown electric field force lines that could affect initial charge readings, the sleeve was angled (an FTF request).

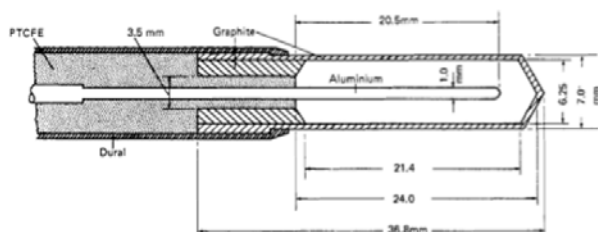


Figure 3. Finals design of graphite-aluminium chamber [1].

The final energy sensitivity curve (calibration factor vs energy in HVL mm Cu) illustrates the improved design compared to older chambers, particularly at low and medium energies.

Modern Farmer and Farmer-Type Ion Chambers
Frank Farmer did not patent his design, enabling manufacturers to create similar small-volume ion chambers under the “Farmer-Type” name. Some chambers diverged from the original by avoiding the use of graphite, which, while fragile, remains integral to close replicas of the original, such as the Phoenix NE2571 Farmer Chamber.

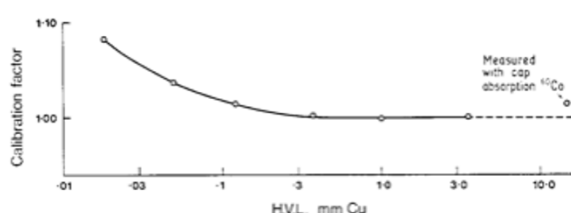


Figure 4. Characteristic of the final graphite/aluminium chamber shown in Figure 3 [1].

Recently, certain Medical Physics societies (e.g., SSRMP: MM Asparadalis et al., 2022) have recommended these chambers for SXT and DXT applications. The IAEA TRS398 also supports this group of chambers, including the NE2571 by Phoenix.

The latest design following the 1972 Farmer model, the FAR 65 from India (Sathiyam Saminathan

et al., Technology in Cancer Research and Treatment, 2013), omits the graphite angled collar.

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Adwin Aird began his career in 1967 as a research fellow at Newcastle University/NHS Medical Physics. Before retiring, he was a Head of Medical Physics at Mount Vernon Hospital in Northwood, working closely with the Gray Radiobiology Laboratory. A founding member of RTTQA, he played a key role in overseeing quality assurance for radiotherapy clinical trials in the UK. Additionally, he has taught extensively for ESTRO, specialising in Basic Physics for Radiotherapists, and have contributed significantly to international education in the field.

Teaching the Physics of Radiotherapy to Radiation Oncology Residents: Challenges and Rewards

Teaching radiotherapy physics to radiation oncology residents is challenging. Unlike classical physics, radiotherapy physics introduces complex concepts like dose calculations and particle interactions with matter, which are often absent from medical school curricula ^[1, 2]. As a result, many residents enter training with limited exposure to these advanced physics topics. Bridging this gap requires teaching strategies that emphasise clinical applications while building a comprehensive understanding. This article discusses these challenges and effective educational strategies for teaching radiotherapy physics to radiation oncology residents, ultimately enhancing their clinical competence and benefiting patient care ^[3].

Understanding the fundamentals of radiotherapy physics can be particularly difficult for residents due to its highly technical nature. Topics like dose distribution, beam modulation, and attenuation demand a level of understanding that far exceeds high school physics. Many residents, already under time constraints, struggle with such topics, finding it challenging to grasp complex concepts in the limited time allocated to their training ^[4]. The abstractness of subjects like radiation dosimetry and particle interactions further underscores the need for teaching strategies that break down complex ideas into more accessible forms ^[5]. To add to this difficulty, most radiation oncology residents come from medical rather than scientific backgrounds, often with minimal training in physics. This lack of foundational knowledge complicates their ability to absorb both theoretical and clinical aspects of ra-

diotherapy quickly. Therefore, educators must adapt by starting with basic principles before progressing to more complex clinical physics topics, creating a gradual learning curve ^[6].

The clinical responsibilities of residents often leave limited time for intensive physics study. This situation necessitates a curriculum that effectively integrates essential physics concepts with clinical training, maximising comprehension within a short timeframe ^[7]. Simulation-based training has been proposed as a practical solution, offering residents an opportunity to practice dose calculations and beam modulation in controlled environments, facilitating a smoother transition from theory to practice ^[8]. One effective approach involves the use of simulation tools such as virtual treatment planning systems. These tools allow residents to engage actively with physics, making abstract concepts more tangible and directly applicable to clinical practice ^[4]. Another strategy is the modular curriculum, enabling incremental learning by first introducing fundamental concepts, then moving on to advanced topics such as dose distribution and contouring, which gradually build residents' confidence ^[5]. Incorporating interdisciplinary collaboration is also crucial. Including medical physicists, dosimetrists, and other professionals in training sessions allows residents to gain practical insights and understand how physics impacts areas like treatment planning and patient safety ^[7]. Additionally, digital resources, such as interactive tutorials and online modules, provide flexible, self-paced learning options that reinforce

complex topics on residents' own schedules^[8].

Residents trained in radiotherapy physics are better prepared for clinical challenges. A solid understanding of physics not only helps them make informed treatment decisions but also facilitates effective collaboration with interdisciplinary teams, improving patient outcomes^[6]. For educators, the rewarding experience of witnessing residents' progress from beginners to confident clinicians further advances the field and ensures the future of high-quality oncology care^[4].



Figure. Radiation oncology residents engage in a dynamic learning environment, where they apply radiotherapy physics concepts in clinical practice.

In conclusion, teaching radiotherapy physics to radiation oncology residents is both challenging and rewarding. By utilising tailored educational strategies, educators can bridge knowledge gaps, foster resident competence, and ultimately improve patient outcomes. This approach not only enhances the quality of patient care but also contributes to the ongoing advancement of radiation oncology.

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Survey on Cybersecurity and Risk Mitigation in Radiotherapy

The risk of cyberattacks on healthcare facilities that disrupt services and compromise patient safety increases more and more, resulting in rising risks and costs ^[1,2]. Radiotherapy centres, which manage sensitive patient data and rely on highly integrated systems to deliver precise treatments, are particularly at risk.

In recent years, documented cyberattacks on radiotherapy centres have highlighted the risks such attacks can cause. However, some centres have identified mitigation measures and formulated corresponding recommendations. ^[3,4]

I am conducting an international online survey to assess these risks and effective mitigation measures. This survey is part of my master's thesis in Medical Physics, supervised by Dr Ralf Müller-Polyzou and Dr Melanie Reuter-Oppermann. Both researchers focus, among others, on healthcare business continuity management, particularly in radiotherapy ^[5, 6].

The research aims to collect insights from radiotherapy experts to understand existing vulnerabilities and countermeasures better. Participation takes only a few minutes, and all responses are anonymised.

The large number of international participants so

far confirms the importance of this topic. This article calls for additional participation to increase the participation within the European countries further. I also encourage participation from radiation oncologists and radiation therapists.

Please support me with your participation: [Link to the Survey](#).

By participating in my survey, radiotherapy experts contribute to a critical study to strengthen the security and resilience of radiotherapy facilities worldwide. The findings will be published, and valuable insights will be shared with the radiotherapy community to foster a collaborative approach to mitigating cyber risks.

This research is part of the Medical Physics distance learning programme at the University of Kaiserslautern-Landau. The master's programme is accredited by the German Society for



Figure. Personal call for participation in my survey: Cybersecurity and Risk Mitigation in Radiotherapy.

Medical Physics (DGMP) to meet the qualification standards for becoming an MPE in Germany^[7]. Designed for working professionals, the programme equips students with the advanced medical physics knowledge and practical skills necessary to address complex challenges in clinical environments.

References:

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Johannes Heitz is a radiation protection engineer and MPE in training at the Nuremberg Hospital, Germany. He is a part-time master's student in Medical Physics at the University of Kaiserslautern-Landau, Germany, focusing his thesis on cybersecurity in radiotherapy centres.

2nd Panhellenic Medical Physics Congress

The 2nd Panhellenic Medical Physics Congress, co-organized by the Hellenic Association of Medical Physicists (HAMP) and the Hellenic Society of Nanotechnology in Health Sciences, took place successfully on October 4-6, 2024, at the Eugenides Foundation in Athens, Greece. The congress was endorsed by the European Federation of Organisations for Medical Physics (EFOMP) and accredited by the European Board of Accreditation in Medical Physics (EBAMP), awarding 29 Continuing Professional Development (CPD) points to participants.



Figure 1. The conference lectures were held with a large attendance of participants.

With more than 870 registrations from scientists and professionals in Medical Physics and related fields, the conference had an impressive turnout. The presence of young colleagues was invaluable, as they made substantial contributions through their research. 34 volunteers were actively involved in planning, playing a key role in shaping the event, presenting the commitment and expertise that next generation medical physicists bring to scientific advancement.

The sessions covered groundbreaking topics in Radiotherapy, Nuclear Medicine and Diagnostics, alongside Biomedical Technology, Nanomedicine, Medical Informatics and Artificial Intelligence.

Highlights of the Conference:

- **Prominent Speakers:** Academics and professionals from Greece and abroad participated in the conference. Their lectures and presentations covered modern approaches in radiation

applications for diagnostics and therapy, as well as advancements in digital technology in the field of Medical Physics.

- **Participation and Research Contributions:** Overall, the conference featured an impressive number of 204 submitted abstracts, 51 of which were presented orally. 51 posted posters and 102 e-posters were displayed, enabling the attendees to engage with the research throughout the event.
- **Exhibition Area:** Alongside the conference sessions, an exhibition area showcased companies in medical technology, allowing participants to learn about the latest products and solutions.
- **Hands-On Course:** Professors I. Tsougos and M. Papanastasiou led a practical training ses-

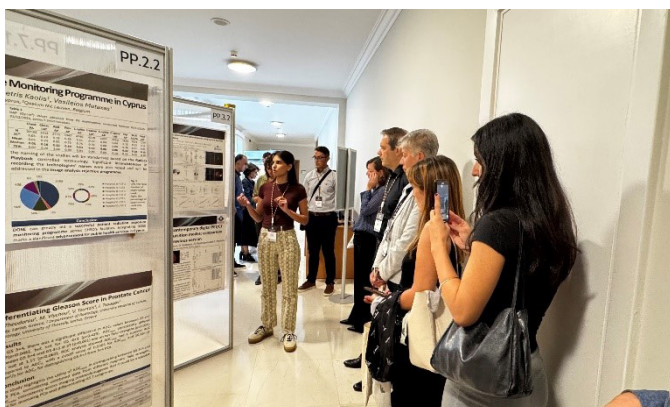


Figure 2. Posted Posters presentation area.

sion focused on quality control of ultrasound systems, using equipment supplied by four different manufacturers.



Figure 3. Hands-on course demonstrating quality control of ultrasound systems.

- **Round Table:** A collaborative session with HAMP, the Hellenic Radiological Society and the Hellenic Union of Technologists in Radiology & Radiotherapy, addressed the challenges in optimizing diagnostic imaging protocols using ionizing and non-ionizing radiation.



Figure 4. Students pictured with performers from the University of Art Ensemble Technik

- **Session on Employment Opportunities for Young Medical Physicists:** A dedicated session focused on employment prospects for young medical physicists in Europe, featured an interactive discussion between attendees and invited speakers with firsthand experience in international roles.
- **“Juniors’ Networking - Meet the Seniors”:** Early morning networking sessions allowed young professionals to communicate with experienced colleagues and medical industry representatives over breakfast.
- **Opening Ceremony:** The first day of the congress ended with the show “We are Stardust” presented in the Eugenides Foundation Digital Planetarium, as part of the opening ceremony of the 2nd Panhellenic Conference of Medical Physics.
- **Awards Ceremony:** During the closing ceremony, awards were presented to three oral presentations and two posted posters, encouraging research and innovation. Recipients received monetary rewards in recognition for their contributions.

Acknowledgments

HAMP’s Board members, the conference’s Organizing Committee President Prof. E. Efstathiopoulos, the Scientific Committee President Prof. P.

Karaikos, the Awards Committee President Prof. K. Theodorou, as well as the committee's members, 70 guest speakers, session coordinators, sponsors and volunteers, they all made an essential contribution to the success of the event. Special thanks are due to "Theotokis Travel Congress" agency, for its role in the congress logistics and organization.

Looking Forward

Following an invitation from HAMP's Board regarding the organization of the 3rd Panhellenic Medical Physics Congress in 2026, it was formally announced that the next Medical Physics Congress will be held in Larissa. The Organizing Committee President, Prof. E. Efstathopoulos, handed over the Book of Memories of Panhellenic Medical Physics Congresses, along with an hourglass, symbolizing continuity and progress, to the presidents of the next conference, Professors K. Theodorou and I. Tsougos.

We look forward to gathering again in Larissa in 2026 for the 3rd Panhellenic Medical Physics Congress, with HAMP being committed to ensure a successful event.



Konstantina Miliou is a Medical Physicist and PhD candidate at Democritus University of Thrace in Greece. Her research focuses on modern cardiac magnetic resonance imaging techniques.



Figure 5. The symbolic passing of the hourglass, representing continuity and progress, from the President of the Organizing Committee, E. Efstathopoulos, and HAMP's Board members to the organizers of the upcoming 3rd Panhellenic Medical Physics Congress in Larissa, Professors K. Theodorou and G. Tsougos.



Despoina Stasinou is a Medical Physicist working at the Radiation Oncology and Stereotactic Radiosurgery Centre of Mediterraneo Hospital in Athens, Greece. Her professional focus is on external radiotherapy. She is a PhD candidate researching the geometric and dosimetric uncertainties inherent in single-isocenter multiple brain metastases stereotactic radiosurgery. She is currently HAMP's Secretary Assistant.



ANALYSIS OF GEOMETRIC DISTORTIONS IN MRI

MEASUREMENT OF THE **DOSIMETRIC IMPACT** OF **GEOMETRIC DISTORTIONS**

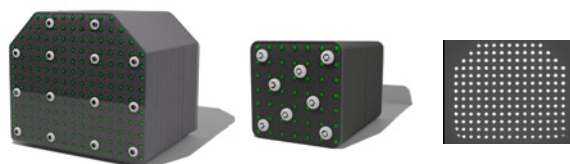
TURNKEY SOLUTION



- ✓ IN ACCORDANCE WITH AAPM RECOMMENDATIONS (TG 284)
- ✓ LONG-TERM MRI PERFORMANCE MONITORING
- ✓ CLINICAL SEQUENCE OPTIMIZATION

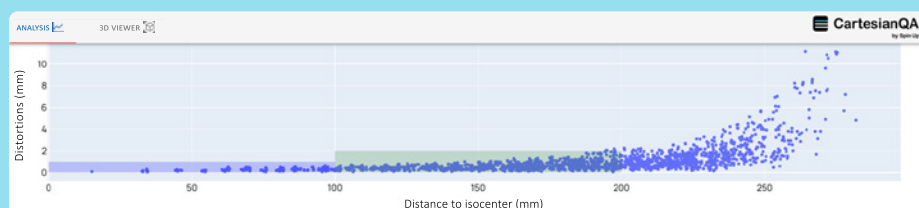
CARTESIAN 3D PHANTOM

- LIGHTWEIGHT (Body = 9.1 kg & Head = 2.5 kg)
- LARGE FOV COVERING (Body : 38x39x45 cm)
- SUB-MILLIMETER ACCURACY (+2000 fiducials)



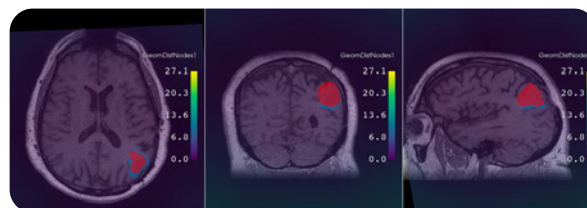
AUTOMATED DISTORTIONS ANALYSIS

- RESULTS VISUALIZATION VIA WEB APPLICATION
- EXPORT IN DICOM FORMAT AND INTEGRATION INTO TPS



CORRECTION OF DICOM RTSTRUCTS CONTOURS

- IMPACT OF DISTORTION ON RADIOTHERAPY CONTOURS



● DISTORTED CONTOURS ● REAL CONTOURS

THIS SET INCLUDES :

- Cartesian 3D phantom
- Cartesian RT module (Distortion field overlay & RTstructs correction)

11th International Conference “Medical Physics – the Current Status, Problems, the Way of Development. Innovation Technologies”



Figure 1. Bird view on the Taras Shevchenko National University of Kyiv.

The Taras Shevchenko National University of Kyiv, Ukraine, successfully hosted the 11th International Conference “Medical Physics – Current Status, Challenges, and Pathways to Development: Innovative Technologies” online via the Zoom platform from 25 to 27 September 2024. This prestigious event brought together over 100 participants from 15 countries and was endorsed by the European Federation of Organisations for Medical Physics (EFOMP) Governing Committee. The organising committee extends its gratitude to EFOMP for its support, as well as [All-Ukrainian Association of Medical Physicists and Engineers](#) and the Training and Research Centre for Radiation Safety at Taras Shevchenko National University of Kyiv for their efforts in planning and preparing the conference.

The conference aimed to consolidate the efforts of educational and research institutions, scientists, engineers, physicians, and professionals

from universities, hospitals, and clinics worldwide to address issues related to education and training in medical physics, radiation protection, biomedical engineering, and medical innovations. International experts and local medical physicists shared insights into their challenges and achievements, offering valuable perspectives on scientific advancements and their potential impact on healthcare practices in Ukraine and beyond.

The conference reports were organised into four primary thematic sections:

1. Learning and Training in Medical Physics
2. Radiation Safety
3. Biomedical Engineering
4. Innovations in Medicine

A webinar titled “Mental Health During Emergencies in Ukraine: Research and Recommendations”



Figure 2. Screenshot showcasing the list of online participants attending the conference.

was also held, addressing the urgent psychological needs of Ukrainian citizens and medical physicists amidst the ongoing Russian aggression.

Brenda Byrne, Secretary General of EFOMP, delivered a keynote address, “Empowering Growth: EFOMP’s Support and Opportunities for Professional Development in Medical Physics”. Ms Byrne provided an overview of EFOMP’s activities, European projects, and funding opportunities, outlining how EFOMP’s working groups engage medical physics professionals, academics, and trainees to foster growth and collaboration in the field.

Recognition of Excellence

The conference's editorial committee recognised the five best presentations by young researchers, awarding special prizes to their authors for their exceptional contributions:

- *“Secondary Cancer Risk Assessment of Pelvic Cone Beam Computed Tomography Imaging Protocols”* by Sundus Osman, Kaunas University of Technology, Lithuania
- *“Advances in Personalised Cancer Care: MR-guided Adaptive Radiation Therapy”* by Viktor Iakovenko, University of Texas Southwestern Medical Centre, USA

- *“Commissioning of Medical Linear Accelerators with Matched Parameters (Matched Linacs)”* by Serhii Brovchuk, LISOD Israeli Cancer Care Hospital, Kyiv, Ukraine
- *“Examination of the Effect of Inductive Moderate Hyperthermia on Sarcoma-45 Heterogeneity Using Magnetic Resonance Imaging”* by Valerii Orel, National Cancer Institute of Ukraine
- *“Children’s Bone Age Prediction Using Deep Learning Based on Hand X-ray Images”* by Ivan Riabko, Taras Shevchenko National University of Kyiv, Ukraine

All conference participants will receive certificates of attendance.

Conference Proceedings and Future Impact

The editorial committee is currently preparing the proceedings of the 11th International Conference *“Medical Physics – Current Status, Challenges, and Pathways to Development: Innovative Technologies”* for submission to the Web of Science scientometric database (Clarivate Analytics). The proceedings will feature scientific, methodological, and practical research outcomes aimed at advancing medical physics, radiation protection, and the adoption of cutting-edge technologies in healthcare.

A Shared Vision

Participants praised the conference for fostering excellence in medical services through innovation, collaboration, and lifelong learning. The event's vibrant and enthusiastic atmosphere underscored its success and the growing dedication of the medical physics community.

For more details about the event, please visit the conference [website](#) at or watch the [event recording](#).



Liudmyla Aslamova is the Director of the Training and Research Centre for Radiation Safety at Taras Shevchenko National University of Kyiv, Ukraine, an IAEA Expert, and the First Vice President of the Ukrainian Association of Medical Physicists and Engineers. She is passionately dedicated to advancing the field of Medical Physics. Ms Aslamova initiated the first international conference *“Medical Physics – Current Status, Challenges, and Pathways to Development: Innovative Technologies”* in Kyiv, Ukraine, in 2011 and has remained a key organiser of the event ever since.



Serhii Radchenko is the Head of the Medical Radiophysics Department at Taras Shevchenko National University of Kyiv, Ukraine, and serves as the Deputy Chairman of the Board of the Ukrainian Association of Medical Physicists and Engineers.

30 Years of Biomedical Engineering and Medical Physics in Estonia

On November 7, 2024, an anniversary conference was held in Tallinn to celebrate 30 years of biomedical engineering and medical physics in Estonia. The event was organized by the Department of Health Technologies at Tallinn University of Technology (TalTech), in collaboration with the Estonian Society for Biomedical Engineering and Medical Physics. TalTech is currently the only institution in Estonia offering Master's level education in biomedical engineering and medical physics, a program that has been running since 1994.

The conference opened with remarks by Professor Gert Jervan, Dean of the TalTech School of Information Technologies, and Professor Emeritus Hiie Hinrikus. Hiie Hinrikus is a pioneering figure in Estonian biomedical engineering and medical physics and one of the founders of the country's professional association in the field. She recently celebrated her 90th birthday. A key highlight of the conference was the announcement of the first recipient of the Hiie Hinrikus Scholarship, which supports Master's level students. The scholarship was awarded to second-year student Kristjan Talts, with Hiie Hinrikus herself presenting the award.

The conference featured a wide range of topics presented by both national and international research teams, as well as contributions from doctors, engineers, and medical physics experts from local hospitals. One notable international speaker was Veronica Rossetti, Chair of the Education and Training Committee of the European Federation of Organizations for Medical Physics. She spoke about the evolving role, demands, and requirements of medical physicists.



Figure. Professor Hiie Hinrikus presenting the scholarship to MSc student Kristjan Talts. ^[1]

The profession of medical physicist is a regulated occupation in Estonia, with the Estonian Society for Biomedical Engineering and Medical Physics overseeing the certification process since 2007, when the first relevant occupational standard was established. This standard, along with the certification framework, has been updated approximately every five to six years. The current joint qualification standard at EQF Level 8 for biomedical engineers and medical physicists includes 14 specializations, three of which are specifically for medical physics experts. Currently, there are 94 active certifications for biomedical engineering and medical physics in Estonia (EQF 7-8). However, the actual number of qualified professionals in these fields is only 66. Many specialists work across multiple related areas and often hold multiple specializations, meaning that the number of registered professionals is significantly lower than the number of certifications issued.

The number of qualified professionals at EQF Level 8 is roughly even between medical physics experts and chartered biomedical engineers. However, Estonia faces a significant shortage of specialists in medical technology and medical physics. To fully staff the national hospital network with qualified professionals, the number of certified biomedical engineers and medical physicists would need to be at least twice as much.

The Estonian Society for Biomedical Engineering and Medical Physics was founded on January 5, 1994. In the same year, the association became a member of the International Federation for Medical and Biological Engineering. In 1995, it joined the International Organization for Medical Physics, and since 1996, it has been a member of the European Federation of Organizations for Medical Physics. The society is also a member of the Estonian Association of Engineers. The presidents of the society have been Hiie Hinrikus (1994–2002), Jaanus Lass (2002–2024) and Joosep Kepler (since 2024). In 2024, a six-member board was elected, consisting of Joosep Kepler, Annika Kaalep, Markus Vardja, Dmitri Šutov, Sergei Nazarenko and Jaanus Lass. The society welcomes members who have an interest in biomedical engineering or medical physics and who hold or are pursuing higher education in these fields or who work in the areas of medicine, biomedical engineering or medical physics.



Jaanus Lass (PhD) is a board member of the Estonian Society for Biomedical Engineering and Medical Physics, a senior research fellow at the Department of Health Technologies at Tallinn University of Technology, managing director of AB Medical Service Ltd and a chartered biomedical engineer.

References:

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Highlights of the 62nd Congress of the French Medical Physics Society (SFPM)



Figure. SFPM Dijon.

The city of Dijon, located in the north-east part of France, in the Burgundy region, hosted the 62nd edition of the annual meeting of the French Medical Physics Society (SFPM) over three days in June 2024. Almost 600 attendees (including 60 students) came to the major annual scientific event of the French MP society. The audience was mainly comprised of medical physicists, as well as dosimetrists, RTTs, technicians and clinicians.

An attractive programme was put together by the scientific committee, combining both innovative

and practical topics. Almost 100 abstracts were submitted. More than 60 papers were selected for oral presentations, and around 30 electronic posters were accepted.

The congress featured scientific sessions on varied topics of interest for the three areas of medical physics expertise: radiation therapy, nuclear medicine and radiology. Sessions included expert invited speakers who kindly contributed to the congress, followed by proffered oral presentations.

During these three days, two parallel sessions were held, focusing on one side on imaging (nuclear medicine or radiology) and on the other side on radiotherapy.

This year, a one-day nuclear medicine workshop focused on current and future challenges for selective internal radiation therapy for prostate cancer was organised and highlighted by renowned SIRT experts such as Steffie Peters (Nimègue, NL). Radiology sessions were held on day two and day three, covering the latest innovations and techniques: photon-counting CT (Joël Greffier, Nîmes, FR, and François Dubus, Lille, FR), the use of AI in medical imaging (Fabrice Mériaudeau, Dijon, FR) and breast dosimetry in mammography and tomosynthesis (Ioannis Sechopoulos, Nimègue, NL).

Several keynote speakers were also invited to the radiotherapy sessions. Antoine Simon and Anaïs Barateau (Rennes, FR) delivered a very interesting overview of deformable image registration. In a session dedicated to MR-only workflow, Davide Cusumano (Mater Olbia, IT) gave a brilliant presentation detailing the challenges and opportunities for this new type of workflow. The audience also had the honour of listening to Livia Marrazzo (Careggi, IT) share her expertise on automated planning in clinical practices.

A joint session between the SFPM and the SFRO (French Radiation Oncology Society) was also organised on reirradiation. In this session, Ane Apelt (Leeds, UK) shared her experience in this field, especially with the on-going ESTRO workshop.

Joint sessions were also added to the programme. One of these focused on the importance of mentorship in a medical physicist's career. In particular, this session was led by Marianne Aznar (Manchester, UK), who shared her experience in the ESTRO mentoring programme, and Efi Koutsouveli (EFOMP, GK), who presented the future EFOMP mentoring programme.

During this joint session, we introduced for the first time the PhD student contest named My PhD in 180 Seconds. The challenge is to eloquently explain your thesis in simple terms in less than three minutes.

A final joint session, called the green session, was devoted to the sustainability of research and health activities and the possible contribution of medical physicists. During this session, Jacques Sainte-Marie (Paris, FR), a scientist specialising in digital technology and the environment at the INRIA research centre, outlined the challenges to be met for more sustainable research and development.

This congress was also a meeting place for companies active in the field of medical physics (radiotherapy and imaging) in a 1,000 m² exhibition hall. Companies were able to present their products and share the latest developments with customers in a convivial open space.

This year, the EFOMP joined the French annual congress for their annual meeting. The committees of the 62nd Congress of the SFPM were pleased to welcome President Efi Koutsouveli and the Officers of the EFOMP Board. It was an excellent opportunity to meet European colleagues and exchange views on the challenges in medical physics.

The congress aims to bring the SFPM members together every year. In this context, Laure Parent conducted her first general meeting as the SFPM President on day two.

Finally, the traditional social event evening took place in the historic city centre of Dijon: the attendees were brought together in Monsieur Moutarde cocktail bar, a trendy venue situated in a private mansion, which is a historic example of Burgundian architecture. It was a great opportunity to meet colleagues over creative cocktails, dishes and music—an unforgettable moment of

friendly and festive relaxation in a prestigious setting.

This year, four speakers were selected by the scientific committee and received special awards:

- **Best Young Physicist's Presentation:** Louis Marage for his work on the optimisation of the use of a tin filter in interventional radiology based on new image quality metrics.
- **Best Presentation:** Paul Rétif for his feasibility study of the multicentric use of diffusion tensor imaging for the identification of new organs at risk in intracranial stereotactic radiotherapy.
- **Best Poster:** Noémie Moreau for her work on PSQA in Radiotherapy: Prediction with deep hybrid learning for VMAT plans on Rapid Arc and IMRT plans on Halcyon machines.

- **Best My PhD in 180 Seconds Presentation:** Hugo Boniface for his work on neuroimaging harmonisation of analogue PET/CT and digital PET/MRI using a Hoffman phantom.

Congratulations to all of them!

Save the date for 2025!

The 63rd congress of SFPM will be held in Nantes on the west coast of France, from June 4 to 6, 2024.



AUBIGNAC Léone, PhD is the chairwoman of the 62st SFPM congress organisation committee. After completing a PhD in 2007, she obtained her clinical professional certification in 2008. Since November 2016, she is the head of the Medical Physics department of the Centre Georges François Leclerc, Dijon, France.



BESSIERES Igor, PhD is the chairman of the scientific committee of the 62nd SFPM congress. After completing a PhD in 2013, he obtained his clinical professional certification in December 2016. He is working in the Medical Physics department of the Centre Georges-François Leclerc, Dijon, France.

Annual Meeting of the Serbian Association of Medical Physicists



Figure 1. The guided excursion to the Old Mountain and the viewpoint Goat Stone.

The annual meeting of the Serbian Association of Medical Physicists took place from September 6 to 8, 2024 in Pirot, in the southeast of the Republic of Serbia. The local organizer of the meeting and various social events was a group of medical physicists from the University Hospital of Niš.

The annual meeting was very well attended by more than 40 Serbian medical physicists. In the scientific/professional part of the meeting, various topics related to medical physics in Serbia were presented by medical physicists from all over Serbia.

Topics included the role of SSDL laboratories in dosimetry audits, ethics in medical physics and radiation protection, the status of medical physics in Serbia, the application of AI and computer programming in radiotherapy, the determination of power factors for small fields, issues of film

dosimetry and dosimetric aspects of whole-body irradiation.

Two presentations by invited guests from Belgium and Croatia were also part of the program. Liviu-Cristian Mihalescu from the Belgian Nuclear Research Centre presented the importance of calibrations for measurements in radiotherapy and nuclear medicine. Đeni Smilović Radojčić and Slaven Jurković from the Department of Medical Physics and Radiation Protection at the University Hospital Rijeka, Croatia, presented the state of medical physics in Croatia with a focus on the future prospects of the application of physics at the University Hospital Rijeka.

The scientific/professional part of the meeting concluded with a round of questions and a meeting of the members of the Association, which focused mainly on the status of medical physicists in Serbia.

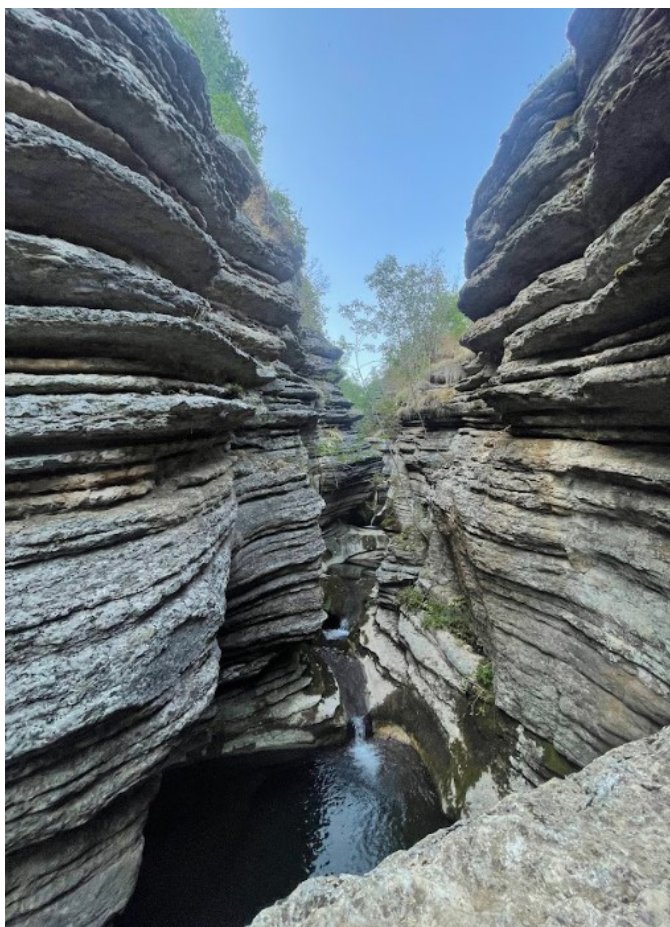


Figure 2. The Rosomac River canyon.

The informal part of the annual meeting was filled with guided excursions to the Old Mountain, the wonderful viewpoint Goat Stone and an impressive hike to the Rosomac River canyon and the 14th century Pogonovo Monastery. The evening events were something special, meeting old friends and making new ones, with an abundance of delicious traditional food and a local music band playing throughout the evening.

The Serbian Association of Medical Physicists was founded in October 2012 and has been a member of EFOMP since 2013. The association has a total of 70 members, 64 of whom work in the field of radiotherapy, 4 in nuclear medicine and 2 in diagnostic radiology.



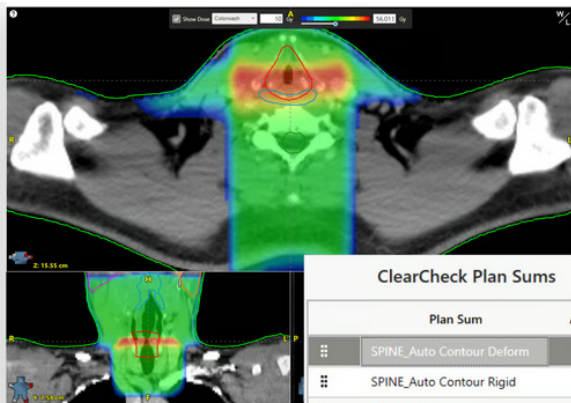
Ljubica Đozlija is a medical physicist in the Department of Medical Physics and Quality of Radiotherapy at the Vojvodina Oncology Institute in Novi Sad. She obtained an MSc in Medical Physics at the University of Novi Sad in 2022 and has been a member of the Serbian Association of Medical Physicists ever since.



Slaven Jurković is head of Department of Medical Physics and Radiation Protection at University Hospital Rijeka and associate professor at Medical Faculty of University of Rijeka, Croatia.

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The screenshot shows the 'Prostate Structure Checks' table, the 'Prostate Margin Checks' table, and the 'Conventional Plan Checks' table.

Structure Template	Structure Plan	Stray Pixels Volume Under 0.1 cc	Holes in Structure	Slice Gaps	Laterality	Contradicting Constraints	3D View	Pass/Fail
PTV	PTV	✓	✓	✓			3D	✓
Femur_R	FEMUR_RT	✓	✓	✓	✓ Right		3D	✓
Femur_L	FEMUR_LT	✓	✓	✓	✓ Left		3D	✓

Bolus Thickness: No bolus found

Expanded Structure Template	Expanded Structure Plan	Source Structure Template	Source Structure Plan	Ant	Post	Right	Left	Sup	Inf	Pass/Fail
PTV	PTV	CTV	GTV	0.5 ±0.05cm 0.48cm	0.5 ±0.05cm 0.48cm	0.5 ±0.05cm 0.48cm	0.5 ±0.05cm 0.48cm	0.5 ±0.05cm 0.48cm	0.5 ±0.05cm 0.48cm	✓

Plan Check	Expected	Prostate#100	Pass/Fail	Comment
Photon Dose Calculation Algorithm	AAA,13623	AAA,11031	✗	

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European Nuclear Education Network (ENEN) PhD Prize Event at ECMP 2024



Figure 1. ENEN PhD Group,

The ENEN PhD Event & Prize is an action of the European Nuclear Education Network (ENEN) to support research and science in the nuclear fields promoting the works of the young scientists and researchers who are finishing their PhD. It takes place on a yearly basis in the framework of the international congress in the field of nuclear science. EFOMP as a member of ENEN were delighted to host this important event at this year's ECMP 2024 Congress. One of the aims of ENEN is to include more participation from those students involved in medical applications of ionizing radiation. The event was held on Wednesday 11th of September 2024. The ENEN PhD Events are co-sponsored by the European Nuclear Education Network Association (ENEN), the European

Commission Joint Research Centre (JRC) and on this occasion EFOMP (providing the venue and refreshments).

The ENEN PhD Event consisted of 16 PhD presentations nominated by ENEN Members and selected by the ENEN PhD Prize Jury. One participant who was nominated by EFOMP was chosen to take part from a large group of applications. Each participant made a presentation of their research work for 15-25 minutes followed by 5 minutes of questions and discussion in a competitive but friendly environment.

All presentations were judged by the jury members considering the quality of the submitted pa-

per as well as the quality of the presentation itself. The participation in the discussion and clarity in answering the questions received was also taken into account in selecting the winners. The Award Ceremony of the ENEN Prizes was held during the opening ceremony of 5th European Congress of Medical Physics (ECMP2024), organised by the European Federation of Medical Physics (EFOMP) and hosted by the Medical Physics Societies of Austria, Germany and Switzerland.



Figure 2. 1st Prize winner Aurore Caquas receiving her prize from Francisco Javier Elorza ENEN President.

Congratulations to all the participants and the winners chosen were as follows:

1. Aurore Caquas - "The bathtub vortex: properties of the flow and gas entrainment"
2. Carlos Vázquez-Rodríguez - "Advanced implementation of the spray safety system into a 3D-GOTHIC PWR-W containment model and its impact on the hydrogen combustion risk"
3. Noelia Fuentes Solis - "Effect of Liquid Metal Environment on Nucleation and Propagation of Fatigue Cracks"
4. Catarina Isabel Guilherme Pinto - "3D cancer models for the theranostic evaluation of $^{64}\text{CuCl}_2$ "

Details about next year's event will be announced soon so keep in mind that applications related to medical field of nuclear research are accepted and you can contact EFOMP to seek a letter of recommendation if you are a member of a NMO. All details will be available on the ENEN website <https://enen.eu/index.php/phd-events/>



Brenda Byrne is a Principal Physicist working in the Mater Misericordiae University Hospital, Dublin, Ireland. Her primary areas of interest are diagnostic radiology, nuclear medicine and radiation protection. She has been a registered radiation protection adviser (RPA) since April 2000 and is a recognised medical physics expert (MPE). Brenda is the current Secretary General of EFOMP and Past Chair of the EFOMP Professional Matters Committee.

ECMP2024 Highlights from the RT Scientific Session on Adaptive Radiotherapy



The clinical radiotherapy session on Adaptive RT (chaired by Lorenzo Placidi and Jurgita Laurikaitienė) at the European Congress of Medical Physics 2024 in Munich, Germany provided an insightful overview of the current state of the art, ongoing challenges and future directions in this transformative field. This scientific session contributed an in-depth exploration of the latest advancements in the field of adaptive radiotherapy (Figure 1).

Adaptive radiotherapy (ART) is known as a dynamic and rapidly evolving approach that leverages the power of real-time patient data, advanced imaging, and sophisticated treatment planning to optimize cancer radiation therapy on an individual basis. Therefore, online adaptive radiotherapy has reached a pivotal stage, especially with dedicated MRI-Linac solutions, thanks to advances in imaging, computing and machine learning, making online treatment adaptation increasingly feasible. The keynote speaker clinical radiotherapy physicist Sara Hackett (University Medical Centre, Utrecht/NL) during her talk 'Adaptive radiotherapy' delved into the transformative potential of ART, highlighting how this innovative technique can enhance the precision, accuracy, and personalization of therapy for the cancer patients. Recently, as were revealed in the presentation 'The first clinically implemented and validated online Daily Adaptive Proton Therapy (DAPT) workflow' (by Katarzyna Czerska, Paul Scherrer Institute, Villigen/CH), ART is evolving not only in photon-based radiotherapy, but also in proton therapy, where treatment is adapted to



Figure 1. The view of the audience from the perspective of the session chairs, featuring online speaker Kirsten Legaard Jakobsen along with other session speakers and chairs, from left to right: Lorenzo Placidi, Sijia Chen, Sara Hackett, Valeria Faccenda, Joseph Panetta, Katarzyna Czerska, and Jurgita Laurikaitienė.

anatomical changes on a daily basis. Meanwhile, Sijia Chen (The First Affiliated Hospital of Xiamen University, Xiamen/CN) showed that a statistical process control analysis aimed at guiding adaptive radiotherapy decisions for nasopharyngeal carcinoma patients enables data-driven plan adaptations, enhancing both the precision and personalization of radiotherapy across the treatment course. Practical implementation of daily image-guided radiotherapy (IGRT) and daily adaptive treatment planning for patients receiving radiation therapy to the challenging abdominal targets providing valuable insights into the clinical benefits and workflow integration were analysed and presented by Joseph Panetta (Fox Chase Cancer Centre in Philadelphia, Pennsylvania/US) 'CT-based online adaptive radiotherapy of abdominal sites' and by Valeria Faccenda (Fondazione IRCCS San Gerardo dei Tintori, Monza/IT) 'Quantifying intrafraction motion in prostate SBRT: Analysis from initial clinical experience with a 4D transperineal ultrasound real-time monitoring system' (Figure 2).

I had the opportunity to present at an engaging session on Adaptive Radiotherapy during the European Congress of Medical Physics in Munich. Following an excellent introductory overview, colleagues shared their research on adaptive planning in proton and photon radiotherapy. Although my study was somewhat outside the main theme – addressing intrafraction prostate motion monitoring and gating rather than daily adaptive planning strategies – it complemented the discussion by exploring real-time patient adjustments and beam-off interventions when prostate motion exceeded predefined thresholds. Our analysis compared two distinct patient groups with prostate cancer, each managed with a different motion monitoring system, aiming to quantify prostate motion and assess whether the choice of monitoring system influenced observed motion patterns. It was a fantastic opportunity to share our findings with an audience of colleagues and experts, sparking engaging and

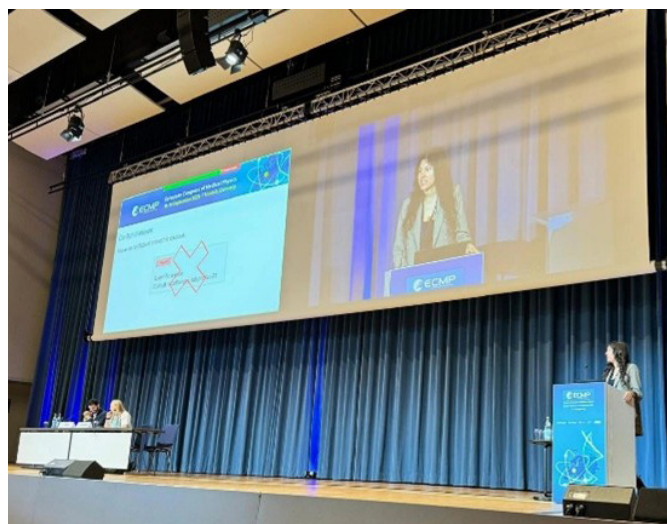


Figure 2. Insights shared by Valeria Faccenda, the speaker of the Adaptive RT session.

constructive discussions on this and many other topics.

In addition, during the online presentation 'A Comparison Study Between Daily Image-Guided Radiotherapy and Daily Adaptive Treatment for Prostate Cancer Patients' by Kirsten Legaard Jakobsen from Zealand University Hospital, Næstved/DK, shared several key points that 1) adaptation is possible on prostate patients with elective lymph nodes; 2) the quality of the IMRT plans are equivalent to the VMAT-plans used before; 3) the dose to the bladder is generally lower in the adaptive sessions than it would have been in IGRT-mode; 4) the margins can be reduced using adaptation; 5) the dose to other organs at risk will be reduced when the margins are reduced.

Despite the mentioned advantages of ART, still the main challenges such as rapid dose recalculation, workflow efficiency, and management of real-time intra-fraction motion remain and need to be addressed. In the future, the integration of AI-driven tools and faster computational algorithms promises to make adaptive therapy a routine, a reliable option for improving patient outcomes that are still lacking.

Overall, the European Medical Physics Congress

2024 was a dynamic showcase of interdisciplinary innovation, with sessions covering a wide range of topics from radiomics and functional imaging to novel adaptive techniques. The Congress underscored Europe's strong collaborative efforts to advance the practice of radiotherapy and medical physics, with a shared focus on improving patient care through cutting-edge research and technology integration.

Thank you to all the speakers for their valuable contributions, and to the organisers for their warm hospitality. See you all at [ECMP 2026 in Valencia, Spain!](#)



Lorenzo Placidi, after specialising in proton dosimetry and adaptive treatment at the Paul Scherrer Institute (Switzerland), has led the MRI-Linac medical physics group at Policlinico Gemelli, Rome, since 2019. He completed his PhD on dosiomics' clinical implementation at Università Cattolica del Sacro Cuore in 2022. His research includes MRgRT, on-line-adaptive techniques, MR quantitative imaging, radiomics, particle therapy, radiotherapy automation, AI, plan quality, and QA. He is an active member of AIFM, ESTRO, and EFOMP and serves on scientific committees for various meetings.



Jurgita Laurikaitienė, PhD in Physics. She is a Medical Physics Expert (in Radiotherapy) in Lithuania, recognized by national authorities. Currently Jurgita is responsible for organising the clinical practices for Medical physics students in the hospitals of Lithuania and is one of the Assoc. Prof. sharing her knowledge and experience during the lectures for the Medical physics students at Kaunas University of Technology.

Work Behind the Scenes for the ECMP Conference Early Career Track

Interview with Early Career Medical Physicist Tim Felgenhauer

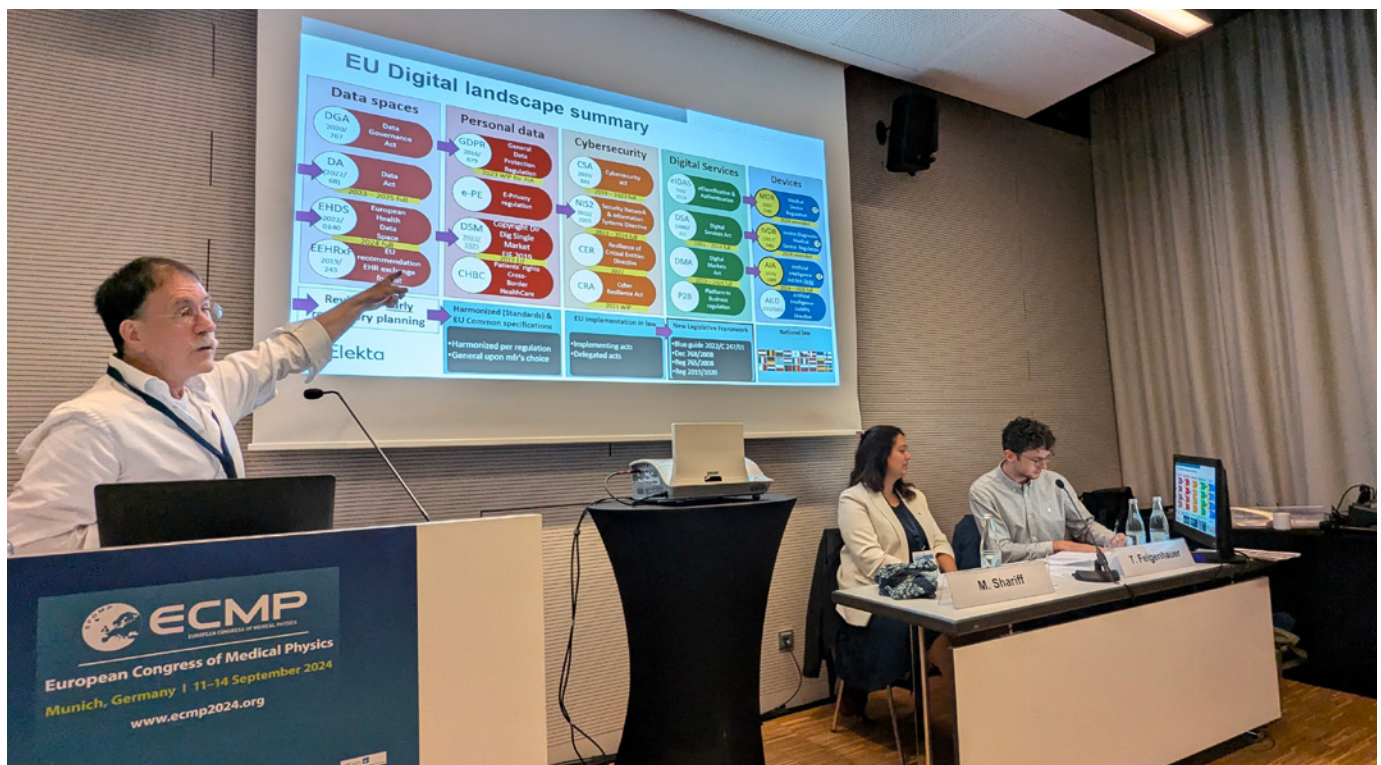


Figure 1. Leo Hovestadt presents on the EU digital landscape in the well-received session on the Medical Device Regulation.

This year's ECMP congress in Garching, Germany, included an Early Career Track jointly organised by the Early Career Special Interest Group (EC SIG) by EFOMP and the young Medical Physicists (jMP) within the German Association DGMP. We all appreciated the effort that has gone into tailoring a part of the congress especially to the needs of the young generation. Tim Felgenhauer, Early Career Medical Physicist and member of the jMP within the DGMP, reveals some of the preparation process that preceded the conference.

First of all, congratulations on a successful and well-visited Early Career Track. How did you become involved in the preparations?

Tim Felgenhauer (TF): Thank you! Well, it has become tradition that we from the Early Career/young Medical Physics Focus Group get a bunch of sessions that we can fill with our ideas and topics of interest.

Since this year's congress was also in cooperation with the DACH countries and the EFOMP, we had more timeslots than usual but also worked together with the people from the EC SIG.

The congress was in September. How much earlier did you start working on the programme for the Early Career Track? And how can we imagine your typical work group meeting?



Figure 2. Martin Fiebich, president of the German society DGMP, awards the Wolfgang Schlegel Grant to Jasmin Winter.

TF: I think the first brainstorming call was in January...so a lot earlier. We usually met in the late afternoon (around 3-5 people of the JMP/EC SIG) and everyone had their main session/tasks to report on. In the beginning, it was a lot of collecting ideas and seeing if we could organise corresponding speakers. We had lots of support from the congress president Katia Parodi and EFOMP president and secretary Efi Koutsouveli and Brenda Byrne!

The Early Career Track had six different sessions. Which session was attended best?

TF: The fullest by far was the panel discussion on the Medical Device Regulation (MDR), which definitely makes sense given the current trend of AI-implementation and new sets of rules for software as a medical device. I think the discussion could have gone on for hours, but time was

short and space was limited. Thankfully, some sessions were also live-streamed into another conference room.

Which session was your personal highlight?

TF: My highlight was the session for early career scientists where we gave them a chance to hold their abstract presentation in front of an audience of peers and with a presentation/rhetoric trainer from [EUTEMPE](#) who gave feedback.

And which one was the most difficult to organise?

TF: Probably the MDR-panel, since we had 2 speakers from the industry and 2 medical physicists. The contents of the presentations were hard to adjust so that it was not too dry (which, to be honest, hundreds and hundreds of pages

of regulations are). Another issue was that we did not really know how many people would be interested and if the discussion would be as fruitful as we imagined. Thankfully, it was well-received!

I assume preparations were not only limited to the Early Career sessions. What were other highlights for early career medical physicists?

TF: Another tradition is the bar night for the early career scientists. We have a generous sponsor every year that enables us to rent a bar for one night including a budget of drinks! Networking and most importantly just exchanging how clinical routine is done in different clinics is a very important part of being an MPE in my opinion, and it's also really easy to get to know new people in that atmosphere.

Thank you very much for the insight into the work behind the scenes. Please allow a very personal question at the end: Would you ever consider volunteering to organise a conference track again?

TF: Personally, I really wanted to concentrate on scientific work in the next year, but as a speaker of the jMP it's always hard to take yourself out of the equation concerning the organisation. We have a lot of motivated new members though, so we will see! It was definitely worth all the extra work and I got to know many amazing (and way more experienced) people!

Thank you for the interview!



Tim Felgenhauer is a Medical Physics Expert at the Department of Nuclear Medicine at the University Hospital Hannover. He is one of the speakers of the early career section "junge Medizinphysik" (jMP) of the German Association of Medical Physicists (DGMP).



Sonja Wegener is a Medical Physics Expert at the Department of Radiotherapy at the University Hospital Würzburg. As a member of the EFOMP Communications & Publications Committee, she conducted the interview.

ECMP2024 and DGMP-ÖGMP-SGMP Trination Conference: Bridging the Future: from Research to New Clinical Practice

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 for the ECMP 2024 and the 10th Trination Congress of DGMP, ÖGMP and SGMP. The congress on the university campus in Munich-Garching offered prior to its opening 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. Parallel, three very interesting one-day ESMPE-schools on radiobiology, PET imaging and the role of Medical Physicists in clinical trials and an ENEN PhD event commenced the congress, which started after the welcome reception session with typical Bavarian music and food at the industry exhibition area including a typical Alphorn as part of the music band.

ECMP 2024 president Professor Yolanda Prezado, Santiago de Compostela, and the Trination Congress president Professor Katia Parodi, Munich, organized a rich program with the support of a very engaged international scientific committee, providing a timely overview of the most important developments and innovations in various traditional and emerging fields of



Fig. 1. Typical Bavarian Alphorn player at the opening of the congress at the industry exhibition. ^[1]

medical physics, including synergies with different closely related disciplines. Besides the typical updates on current clinically innovative radiation therapies, ethical aspects of artificial intelligence and the implementation of AI solutions in daily healthcare, which are the latest innovations in a variety of diagnostic imaging modalities, were topics among the very interesting sessions.

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



Fig. 2. ECMP 2024 president Professor Yolanda Prezado, Santiago de Compostela, and the Trination Congress president Professor Katia Parodi, Munich. ^[1]

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 applications 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.

For the presidential symposium, the two organizers invited three well-known scientists to shed light on the future of possible new techniques in radiotherapy. Prof Dr Peter Hommelhoff, an experimental physicist at Friedrich-Alexander-Universität Erlangen-Nürnberg and winner of the prestigious German Gottfried Wilhelm Leibniz Prize, presented the exciting concept of



Fig. 3. Audience at the Audimax of the Science Congress Center Munich-Garching. ^[1]

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, a Radiation Oncologist from Hungary, highlighted the exciting prospects of laser-driven accelerators, showcasing recent radiobiological results achieved in the context of the European Extreme Light Infrastructure near Prague, Czech Republic. 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.

EFOMP and DGMP Awards at the closing ceremony

During the Awards ceremony, Dr. Marco Brambilla, AIFM and University Hospital Of Novara, Italy, former EFOMP Secretary General and EFOMP President received the Honorary Membership of EFOMP from the hands of the current EFOMP President Efi Koutsouveli, Athens, Greece, for his many years of excellent service to the European community of Medical Physics in EFOMP. Also for his many years of service and outstand-



Fig. 4. Left: EFOMP Honorary Membership awarded to Dr. Marco Brambilla by EFOMP president Efi Koutsouveli; Right: DGMP Glocker Medal awarded to Prof. Mark Ladd by DGMP president Prof. Martin Fiebich. ^[1]

ing achievements in the field of medical physics, Professor 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 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.

At the closing ceremony, current ECMP president Yolanda Prezado surprised her successor, the current EFOMP president Efi Koutouveli as president of the next ECMP2026 at Valencia, Spain, with the gift of a typical Spanish veil called “Mantilla”. With the invitation to the 56th Annual Meeting of the German Society for Medical Physics in Berlin-Dahlem from 24 - 27 September 2025 by Prof Dr Markus Buchgeister, Berlin, and Prof Dr Andrea Denker, Berlin, the congress closed.

Acknowledgement:

I greatly acknowledge the support by Katrin Franz (Conventus Congressmanagement & Marketing GmbH).

References

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Fig. 5. ECMP 2024 president Yolanda Prezado surprised her successor ECMP 2026 president Efi Koutsouveli with a typical Spanish “Mantilla”, since the next congress site is at Valencia, Spain. ^[1]



Markus Buchgeister, began his medical physics career in radiation therapy at Tübingen University Clinic in 1995. In 2010, he became Professor of Medical Radiation Physics at Berliner Hochschule für Technik. Since 2003, he has served as a DGMP board member for public relations and communications and held roles within EFOMP, including Communication and Publications Chair (2003–2009), German EFOMP Delegate (2009–2015, current), and Education and Training Chair (2017–2018).

SBRT phantom

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and patient repositioning

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QA in SBRT treatments

End-to-End QA

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Celebration of the International Day of Medical Physics 2024 in Croatia with the EFOMP President

This year, the Croatian Medical Physics Association (CROMPA) celebrated the International Day of Medical Physics (IDMP) with the 5th annual CROMPA symposium "Medical Physics in Croatia" and welcomed EFOMP President Efi Koutsouveli as a special guest. As part of the traditional CROMPA annual meeting, the symposium took place on November 7 at the Dubrava University Hospital in Zagreb, with more than 60 participants (Figure 1).



Figure 1. The participants of the 5th CROMPA Symposium at Dubrava University Hospital, Zagreb.

As the number of young physicists starting to work in the field of medical physics in Croatia is steadily increasing, this year's IDMP theme "Inspiring the next generation of Medical Physicists" reflects the important task of preparing young medical physicists for future challenges in their work through education and training. Therefore, the regulation of medical physics as a profession in healthcare and the introduction of specialisation in medical physics is the most important topic for Croatian medical physicists. The CROMPA Steering Committee discussed

this topic with the EFOMP President (Figure 2) at the beginning of the CROMPA Annual Meeting, where we presented the current state of medical physics in Croatia and the activities of CROMPA to the EFOMP President.



Figure 2. Meeting of the CROMPA Steering Committee with the EFOMP President at the Dubrava University Hospital in Zagreb. From left to right: Tomislav Bokulić, Ivana Kralik, Mihaela Justić, Iva Mrčela, Efi Koutsouveli, Hrvoje Hršak and Ante Matanić.

In addition, successfully selected scientific works of Croatian medical physicists and researchers for the year 2024 were presented at the symposium, which clearly demonstrate the potential and motivation of Croatian medical physicists to expand scientific achievements and improve the quality of clinical work. In her presentation, the EFOMP President introduced the EFOMP structure and strategic agenda for 2024-2026,

which is based on three pillars: Common training framework, automatic recognition of the MPE profession by the EU and roadmap for sustainability. She emphasised the involvement of young professionals in EFOMP programmes through Special Interest Groups (SIGs) and invited young Croatian medical physicists to join EFOMP activities through the Early Career SIG.

In February 2024, CROMPA became the EFOMP NMO for Croatia. Professional activities continued in 2024 through meetings and communication with the National Radiation Protection and Nuclear Safety regulatory body and the Ministry of Health, with the aim of regulating the profession, introducing a specialisation in medical physics and improving and optimising regulation for medical applications of ionising radiation. In addition, an EFOMP letter of support recommending that the profession of medical physicist be regulated as a health profession in Croatia was sent to the Croatian Minister of Health to support CROMPA's efforts to achieve a regulated profession. CROMPA's other main activities include participation in the PrISMA project 2024 – 2025, "Preparatory activities to support the implementation of quality and safety of medical applications of ionising radiation", which was launched under the EU4Health programme, and the IAEA TC CRO2024003 2026 - 2027 project proposal "Capacity building for the establishment of specialisation in medical physics in Croatia", which was submitted to the IAEA for approval.

Five years after the establishment of CROMPA, the number of members has increased from 30 in 2019 to 100 in 2024. CROMPA is expanding its size and activities for the benefit of the medical physics community in Croatia, and our annual symposia are becoming a tradition and a true celebration of the medical physics profession in Croatia.



Hrvoje Hrsak is CROMPA President, Medical Physicist in the Department of Medical Physics at the University Hospital Zagreb and Assistant Professor in the Department of Physics, Biophysics and Medical Physics at the Faculty of Medicine, University of Zagreb. He is the secretary of the EFOMP Professional Matter Committee.



Ivana Kralik is a medical physicist in the Department of Diagnostic and Interventional Radiology at Dubrava University Hospital in Zagreb. She is an assistant professor at the Department of Physics, Biophysics and Medical Physics at the Faculty of Medicine of the University of Zagreb and secretary of CROMPA.



Slaven Jurković has been working as a medical physicist for 30 years. He is Head of the Department of Medical Physics and Radiation Protection at the Clinical Hospital Centre Rijeka and Associate Professor of Medical Physics at the Faculty of Medicine, University of Rijeka, Croatia.

Italian Medical Physics Community Celebrates IDMP

Inspiring the next generations of medical physicists.

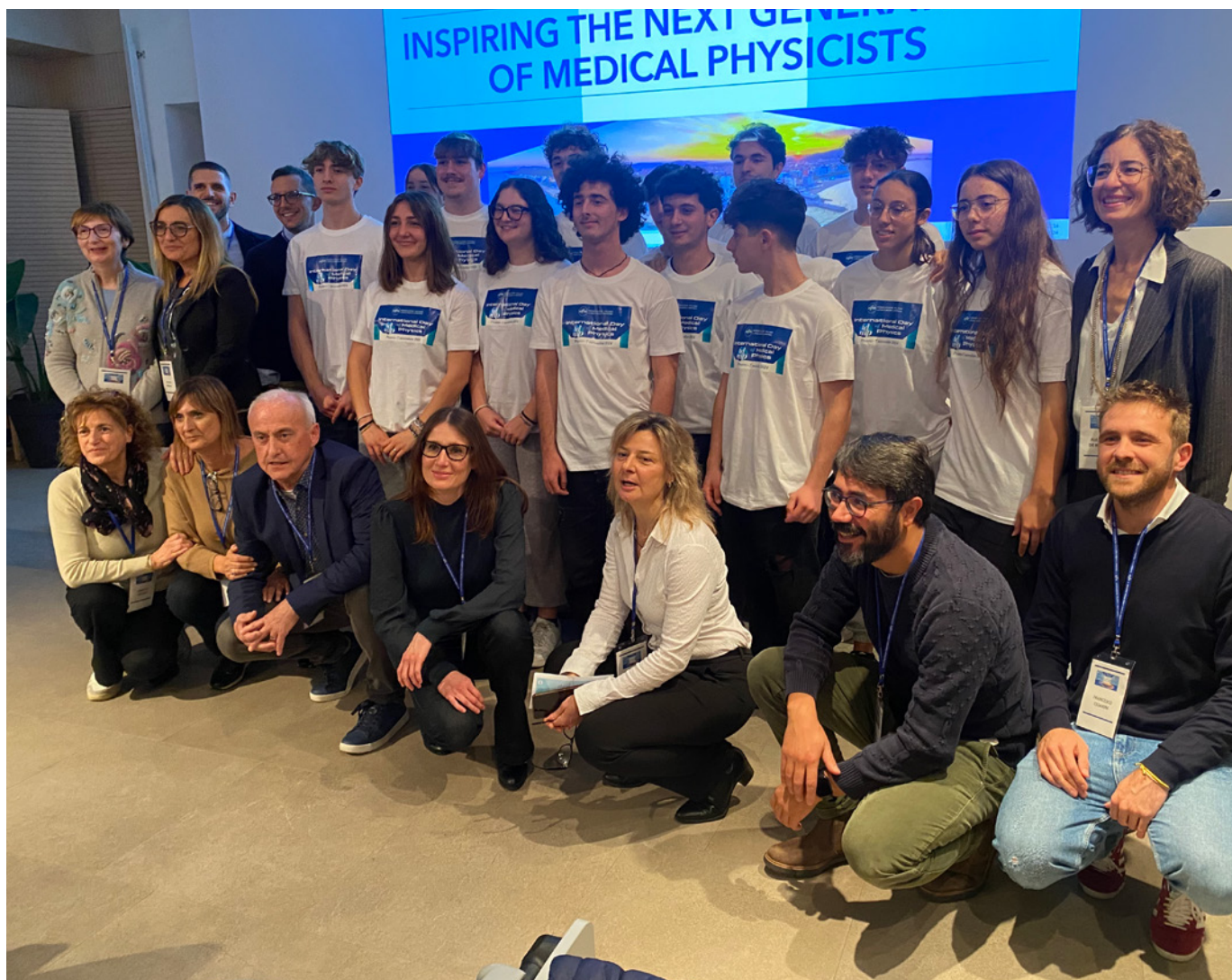


Figure. Members of the Italian Association of Medical Physics celebrating IDMP 2024.

The Italian Association of Medical Physics – AIFM – celebrated the International Day of Medical Physics in Pesaro, the Italian capital of culture for the year 2024. Celebrating the IDMP in the designated capital of culture is a tradition of AIFM. This year, the program has been strictly tailored

to the theme proposed by the IOMP, “*Inspiring the next generations of Medical Physicists*”.

AIFM has a very active section of young members who organised an interactive session of questions and answers on the motivation, bene-

fits, and outlook of being a medical physicist for an audience of high school students. Their fresh perspective was really appreciated.

In conjunction with the IDMP, an activity was organised with students from two classes of a science high school. "Liceo Scientifico Arturo Tosi" (VA) and medical physicists of Busto Arsizio Hospital. Acting as a "guide" the Director of Medical Physics, Lorenzo Bianchi, together with his colleagues, accompanied through the Nuclear Medicine, Radiotherapy, Radiology, and Diagnostic Imaging departments and discussed with the students the future of this discipline and the latest advancements in the scientific field. The students participated in a competition by preparing projects, and the winners presented their video during the IDMP event (see fig.1)

The celebration went on with contributions of influential medical physicists and scientists, including the famous virologist Prof. Roberto Burioni who played a pivotal role in the management of the pandemic at the national level. His thoughts on the value of science were profound and inspiring.

The special value of the interdisciplinary character of medical physics was a constant file rogue of the celebration, highlighted by medical physicists and physicians alike.

The physicist journalist and renowned writer Dr. Gianluca Dotti concluded the program with a narrative intervention on the "Heroes of Science". The IDMP also represented the opportunity to focus on the trend of new physicists entering the academic path to becoming an MPE as required in Italy. Fortunately, the current year represents a record in new registrations, confirming a trend already seen in 2023 for the first time in several years. AIFM likes to think that this might be partly due to the Association's strong commitment in promoting our discipline and profession.

110 medical physicists from all over Italy joined the event, plus roughly 50 students and a significant presence of representatives from the industry. The celebration of the IDMP keeps being deeply felt by the Italian medical physics community, already looking forward to next year's national congress in Verona and the next IDMP in Agrigento, in the heart of beautiful Sicily.



Dr. Carlo Cavedon graduated in Physics in 1992 at the University of Padova – Italy – and specialised in Medical Physics at the University of Milano in 1996. He is the director of the Medical Physics Unit of the University Hospital of Verona since 2009. He is currently the President of the Italian Association of Medical Physics (AIFM) and served as Chair of the association's scientific committee from 2016 to 2023. He is the author of more than 80 scientific publications in extension and more than 150 abstracts presented at international conferences.

Portuguese Association Of Medical Physicists International Day of Medical Physics 2024

“Inspiring the Next Generations of Medical Physicists”

Fátima, Portugal

On November 7th, 2024, Portuguese medical physics professionals gather to celebrate the International Day of Medical Physics (IDMP), under the theme "Inspiring the Next Generations of Medical Physicists". The event, organized by APFISMED (the Portuguese Association of Medical Physicists), was available both in-person and via online streaming, offering access to a global audience.

The program started with a welcoming address from the President of APFISMED, setting the stage for the international messages that follow. Brenda Byrne shared the official message from EFOMP (European Federation of Organizations for Medical Physics), reinforcing the importance of collaboration and innovation in the field and involving and inspiring the new generations.

Representatives from the IAEA (International Atomic Energy Agency), including Mauro Carrara, Olivera Ciraj, and Vesna Gershan, addressed the audience remotely.

Further highlighting the event's international reach, medical physicists from Mozambique, represented by Lucílio dos Santos (AMFM), and from Angola, represented by Alexandre Yacomba and Higidio Miezi Eduardo, were invited to join online, sharing perspectives on the growth of Medical Physics in their respective regions.

The program then shifted its focus to Portugal with a special presentation by Prof. Fernando Godinho, a distinguished figure in Portuguese Medical Physics. Godinho began his career in 1971 at the Portuguese Institute of Oncology (IP-OFG) and later served as Director of the Institute of Nuclear Medicine at the Faculty of Medicine of Lisbon (IMN-FML) from 1997 to 2009. Drawing on his extensive experience and deep knowledge of the field, he shared a personal vision of Medical Physics in Portugal, inspiring reflections on its development, current landscape, and future prospects within the country.



Figure 1. Prof Fernando Godinho.

The celebration concluded with a cocktail reception to mark the IDMP2024. This gathering provided a unique opportunity for professionals, students, and other stakeholders to network, share ideas, and celebrate the progress and impact of medical physics around the world.



Figure 2. Cocktail reception and celebration of the IDMP 2024.

Thank you all that joined us for this inspiring event and want to be part of the journey toward shaping the next generation of medical physicists!

Jorge Isidoro (President of APFISMED)



Figure 3. Jorge Isidoro with Sonja Wegener, Brenda Byrne, Roberta Matheoud and Annalisa Trianni, from left to right.



Jorge Isidoro, a Medical Physics Expert in nuclear medicine, has worked at ULS Coimbra since 1995 and is a senior hospital physicist. He also lectures on the Master's in Medical Physics at Coimbra University. A member of the EFOMP Professional Matters Committee and the ACSS Medical Physics Council, he contributed to key reports on medical physics in Portugal, including training and certification guidelines. He was part of the coordination team of DFM-SPF (2015–2021) and served as APFISMED president (2021–2024).

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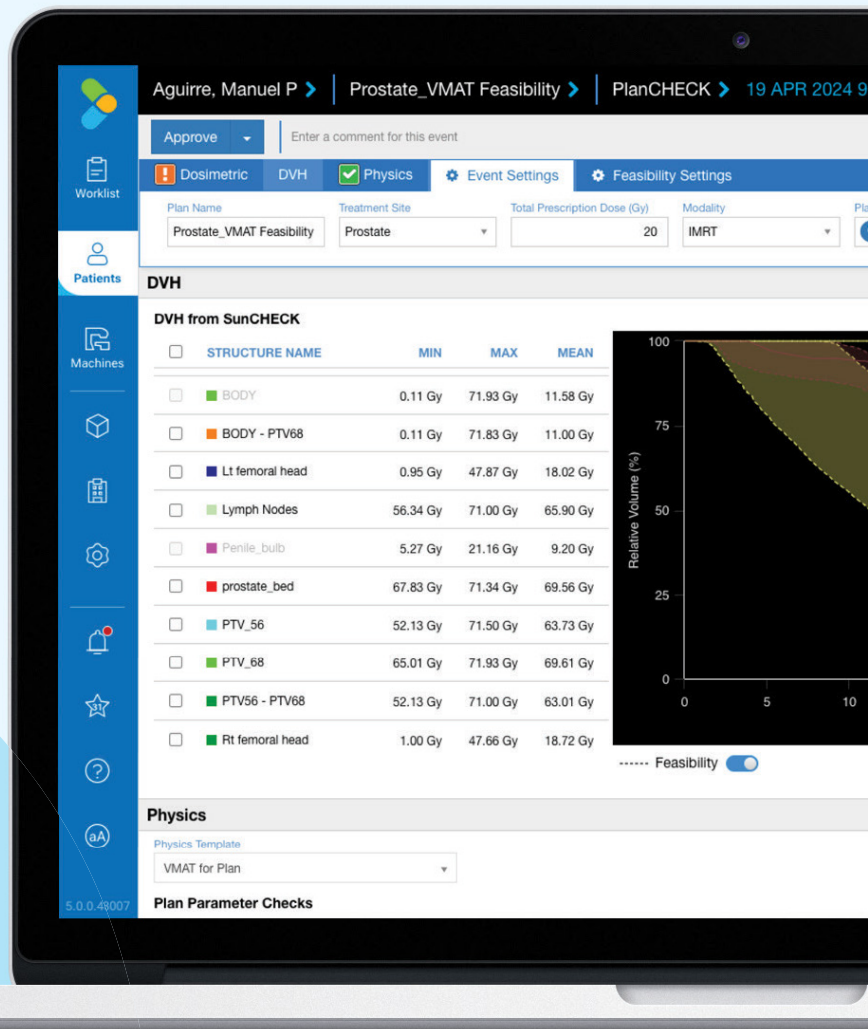


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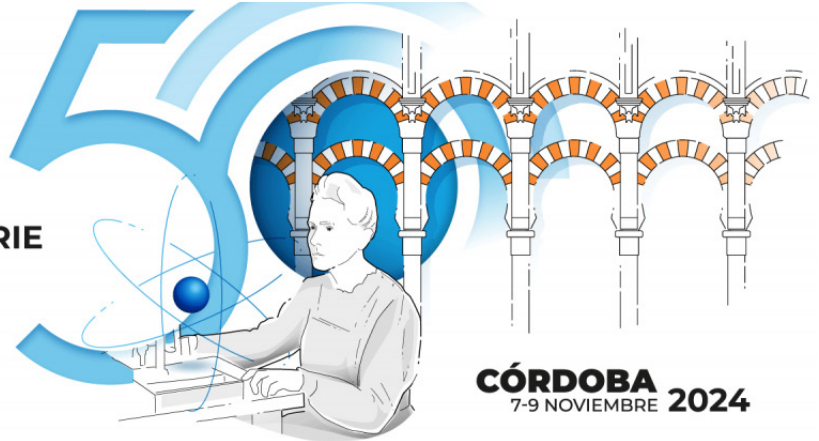
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International Day of Medical Physics in Spain

II REUNIÓN BIENAL
SEFM 2024
IV JORNADA CURIE



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7-9 NOVIEMBRE 2024

To coincide with the International Day of Medical Physics, the Spanish Society of Medical Physics will hold the IV Jornada Curie in Córdoba. Throughout the day, topics of special interest to early career medical physicists will be presented and among them, there will be a session where the mobility programs of different European projects and mentoring programs, including that of the EFOMP, will be explained.

On the following two days, November 8 and 9, the II Biennial Meeting of the SEFM will also be held in Cordoba, which will bring together most of the professionals of Medical Physics in Spain.

The EFOMP will also be represented by the chair of the European and International Affairs Committee, Antonio López Medina, who will participate in a round table on possibilities of international collaboration together with the Latin American Association of Medical Physics (ALFIM), represented by the vice-president (and future president) of this association, Erick Hernández.

Throughout the event, the 50th anniversary of the SEFM will also be commemorated, a significant milestone marking half a century of progress, collaboration and dedication in the field of medical physics in Spain. The history of Medical Physics

in Spain is linked to advances in medicine and technology, and the SEFM has played a crucial role in this development. Since its beginnings, our profession has promoted research, training and the implementation of new techniques, contributing significantly to the improvement of treatments and the quality of life of patients. This 50th anniversary is an opportunity to reflect on our achievements and recognize the efforts of all those who have contributed to the growth of our community. Some 400 medical physicists from Spain are expected to attend.



Antonio López Medina is a Medical Physics Expert at the University Hospital Complex of Vigo since 2000 and an Associate Professor at the University of Vigo since 2021. He is a member of the EFOMP European and International Matters Committee since 2019, serving as secretary from 2020 to 2023. Currently, he is the new chair of the European & International Matters Committee within EFOMP.

Virtual International Day of Medical Physics 2024 at the German Cancer Research Center (DKFZ)



The divisions of Medical Physics in Radiation Oncology (Head: Prof. Dr. Oliver Jäkel) and Medical Physics in Radiology (Head: Prof. Mark Ladd) organized a virtual event at DKFZ as part of the International Day of Medical Physics, which is celebrated annually on November 7th. Post-docs and PhD students gave an insight into their research work to inspire others for the field of medical physics.

Dr. Kristina Giske (Research Group Leader of the Group: Computational Patient Models) presented the digital patient twin, a detailed patient model that consolidates medical data from scans and other diagnostics during therapy. With a digital twin, clinicians can test and compare treatment strategies on simulated copies to find the optimal one – an impossible feat with a physical patient!

Dr. Niklas Wahl (Research Group Leader of the Group: Radiotherapy Optimization) demonstrat-

ed the basics of treatment planning for multiple modalities such as photons or protons, using the open source matRad research planning system developed by his group.

The PhD students Margareta Metzner and Pamela Ochoa Parra (PhD students of the Research Group: Novel Detection Techniques for Ion Beams) made radiation

visible with a little live balloon experiment and one of their detectors. It helps to understand how important it is to see radiation when treating patients. Anahita Bakhtiari Moghaddam and Christina Stengl (PhD students of the Research Group: Medical Engineering) showed different 3D printed anthropomorphic phantoms that accurately replicate human anatomy, organ image contrast, and their movements. These phantoms enable medical physicists to ensure the precision and safety of radiotherapy workflows, leading to more effective treatments and improved patient safety in increasingly complex clinical environments.

Finally, participants could attend guided virtual tours to the ETHOS Linac at DKFZ as well as to the Heidelberg Ion Beam Therapy Center (HIT) at Heidelberg University Hospital. During this virtual visits, Prof. Jäkel showed the treatment room of the ETHOS Linac to explain the treatment workflows with the adjacent 3-Tesla MRI.

At HIT, participants could see the ion sources, the synchrotron and its beam line. At the end the group visited the treatment room of the rotating gantry, and they also virtually entered the gantry itself to get insights behind the scene.



Prof. Jäkel is head of the Division of Medical Physics in Radiation Oncology at the German Cancer Research Center. He holds a PhD in Physics and since 2014 he has been a full professor at the Medical Faculty Heidelberg of Heidelberg University.

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International Day of Medical Physics 2024 at the Lithuanian National Cancer Institute (NCI)



Figure 1. The medical physicists at the NCI.

As has become tradition, the Lithuanian National Cancer Institute (NCI) celebrated International Medical Physics Day on 7 November. This year, the celebration was particularly innovative, featuring a “MedPhys” escape room designed by the Medical Physics Department. The event was so well-received that it was extended over several days to accommodate the enthusiastic participation of the NCI community.

“For several years, medical physicists at the NCI have utilized this day to highlight their profes-

sion, emphasizing the critical role they play in medicine and science. Our objective is to raise awareness about the specialty and the exceptional team of medical physicists within the Institute’s community and among external guests. In the past, we have organized open days featuring concise presentations on radiotherapy, diagnostics, and nuclear medicine. Additionally, we have engaged in press releases, radio programs, and creative presentations. This year, we sought a new format,” explained Dr. Jonas Venius, Head of the Medical Physics Department at the NCI.



Figure 2a-c. The specially designed escape room challenges.

This year, medical physicists invited colleagues to challenge their minds in an escape room. “The idea for the escape room was proposed about a month ago by our young medical physicist, Džiugilė Valiukevičiūtė, during a meeting. The team unanimously agreed, and the initiative was further developed by medical physicist Akvilė Šlėktaitė-Kišone. Through subsequent meetings, we refined the tasks to simulate the daily responsibilities of medical physicists. These tasks included quality control using film dosimetry, adjusting X-ray image brightness/contrast to reveal hidden objects, arranging radiation fields for prostate irradiation plans, identifying the correct number of brachytherapy needles, and using fluorescent tracers to determine radioactive decay laws and activity counts. The tasks were fine-tuned until the last moment, with some made easier and others more challenging. Special thanks to the entire team for not only preparing the tasks but also for decorating the room, making the experience visually engaging. We hope this year’s event not only left a lasting impression but also provided insight into the daily work of medical physicists” said Dr. Venius.

Congratulations to the entire medical physics community worldwide on this special day. Your dedication and expertise are vital to advancing medical science and improving patient care. We celebrate your contributions and look forward to many more years of innovation and excellence in the field of medical physics.

PSMR 2024: Forging the Future of Molecular Imaging on Elba



Figure 1. View from the beach in Biodala, the venue for the last three PSMR conferences.

The beautiful island of Elba recently hosted the [2024 PSMR](#) Conference on PET, SPECT, and MR Multimodal Technologies, Total Body and Fast Timing in Medical Imaging, marking the tenth anniversary of a gathering that has evolved into a vital hub for the global nuclear imaging community. This year's conference brought together a dynamic group of physicists, physicians, engineers, and researchers from across Europe, united by a shared commitment to advancing molecular imaging and therapy. In a series of interviews, key organisers and speakers reflected on the confer-

ence's roots, its development, and its future trajectory, particularly the integration of cutting-edge imaging technology, AI advancements, and its emphasis on fostering young talent in the field.

The Genesis and Growth of PSMR: A Decade of Progress

Nicola Belcari, a professor at the University of Pisa and one of the founding members of the PSMR conference, shared insights into the conference's origins and mission.



Figure 2. Sunset preceding the conference's social event.

"We started PSMR in 2012 here in Elba, under the joint effort of Alberto Del Guerra from Pisa, George Loudos from Athens and Jon Shah from Germany. At that time, the field was still grappling with serious technological issues such as MR compatibility of PET components and attenuation correction on MR imaging. These challenges inspired us to establish a platform where experts could collaborate and develop solutions together," Belcari explained.

The conference has since evolved to become a key venue for technical exchanges and innovations, as it rotates among countries like Germany, Greece, Portugal, and Italy.

"This year is our fifth time hosting PSMR on Elba, which feels right since the island has become part of the conference's identity. PSMR has a unique setup: it's small enough to allow in-depth discussions but large enough to support diverse perspectives. Over the years, we've seen collaborative groups and even consortia form here, some of which have successfully launched significant projects in nuclear imaging."

Expanding Horizons: The Introduction of Total Body PET

Stefaan Vandenberghe, from Ghent University, highlighted the integration of total body PET into the conference programme.

"In 2016, we organised the first dedicated Total Body PET conference in Ghent. This subfield has grown, and now we see a natural overlap with PET/MR technology. By including this track within PSMR, we create an opportunity for cross-disciplinary discussion Vandenberghe noted.

He believes that merging the technologies of PET/MR and total body PET allows for more effective collaboration, especially in areas like deep learning for fast reconstruction and attenuation correction, which are challenges common to both fields.

According to Vandenberghe, the conference's intimate setting enables valuable exchanges among researchers from different domains.

"It's particularly beneficial for young scientists who might feel lost at larger conferences. Here, they get to know the community, find mentors, and ask questions freely."

Bridging the Gap Between Physics and Medicine

Paul Lecoq, a particle physicist who transitioned to PET imaging over two decades ago, brings a unique perspective to the event. His experience in scintillating crystals and technology transfer



Figure 3. Official group photo of PSMR 2024.

has positioned him as a bridge between physics and clinical application.

"Medicine and PET molecular imaging have evolved to demand more sophisticated tools, especially with the rise of personalised medicine, immunotherapy, and theranostics. Total body PET and time-of-flight technology are areas of great potential, particularly as nanotechnology and quantum physics open up new possibilities," he explained.

Lecoq underscored the importance of creating environments that nurture collaboration.

"We started organising workshops on Fast Timing and Medical Imaging, as we realised that the community of developers and end-users would benefit from a platform that addresses both. This year, we merged our efforts with PSMR and Total Body PET, creating an unprecedented event that combines multiple approaches. For me, this merging of events under Nicola's leadership reflects an exciting evolution that we will continue to support."

Fostering a Collaborative Environment

A key element of PSMR's success lies in its ability to foster strong connections between attendees. The conference's location on Elba encourages participants to spend time together, both in for-

mal sessions and informal settings. Lecoq noted, *"Even outside the formal schedule, we see people discussing ideas on the beach or over meals. This constant interaction creates a culture of collaboration that goes beyond the conference itself."*

Belcari highlighted the importance of creating synergies between developers and clinical users.

"We don't develop technology for its own sake; our end goal is to serve medicine. PSMR is an environment where developers can learn about the clinical challenges from physicians and medical physicists, who in turn gain insights into the limitations and potential of imaging technologies."

Why the Medical Physics Community Should Attend

One of the central discussions at this year's event focused on the importance of including the medical physics community in PSMR. The organisers believe that this conference offers unique value to European medical physicists who want to stay at the cutting edge of imaging technology.

"It's essential for physicians and medical physicists to understand the devices they use, their limitations, and how they can be optimised for patient care," explained Belcari.

According to Lecoq, medical physicists play a critical intermediary role between engineers and clinicians.

"Medical physicists can bring valuable insights from clinical experience back to developers, helping to shape future technologies. PSMR is the perfect venue for this kind of exchange. The size and format allow for meaningful conversations, and these dialogues often result in practical solutions that enhance patient care."

The Unique Appeal for Young Scientists

In my personal opinion, for young scientists, PSMR offers an opportunity you don't get at larger conferences. The setting allows you to connect with experienced researchers, present your ideas, and receive constructive feedback in an encouraging environment. I really appreciated the balance between high-quality presentations and the relaxed atmosphere, which made it easier for her to network.

In recognition of the importance of supporting the next generation, PSMR offered 30 grants this year to help young researchers attend.

"We provide reduced fees and arrange affordable accommodation to ensure young scientists can participate," said Belcari.

Additionally, the conference included a pre-event training school for young medical physicists, featuring sessions on PET/MR and image reconstruction led by experts from UCL.

"This is a great opportunity for continuous learning, both for young scientists and more established professionals," Belcari added.

A Vision for the Future

As PSMR looks ahead to its next conference in Valencia in 2026, the organisers are committed

to preserving the conference's intimate format. Lecoq expressed some initial concerns about the conference growing too large.

"Our goal is to keep the event at a size where personal connections and meaningful exchanges remain possible. We chose Valencia carefully, aiming for a setting that, like Elba, encourages attendees to stay together and engage fully with the programme."

The organisers are also focused on encouraging young scientists to drive the field forward.

"The future of medical imaging lies in the hands of the next generation. It's our job to provide them with the resources, training, and inspiration they need to innovate and lead," Lecoq stated.

Final Thoughts: An Invitation to Valencia

As the conference concluded, the organisers invited attendees and the wider medical physics community to join them in Valencia for the next instalment of PSMR.

"This conference has demonstrated the strength of collaboration across disciplines. We hope that more members of the medical physics community will join us in Valencia to continue this journey," Belcari said.

Reflecting on my own experience, I really encourage others to attend the next conference in Valencia. For me, PSMR has been a transformative experience. It's more than a conference; it's a place to learn, network, and become part of a community committed to advancing medical imaging and radiotherapy.

PSMR 2024 on Elba provided a remarkable forum for the exchange of ideas and expertise. As it looks toward the future, the conference remains steadfast in its mission to foster meaningful collaboration, inspire innovation, and support the next generation of leaders in molecular radiotherapy.



Nicola Belcari is a Professor of Medical Physics at the University of Pisa and a pioneering expert in molecular imaging, with a focus on PET and SPECT technologies. As a co-organizer of the PSMR conference, Nicola has dedicated over a decade to fostering collaboration and innovation in multimodal imaging. His work bridges advanced imaging techniques and clinical applications, aiming to optimise diagnostic and therapeutic procedures in oncology. With numerous publications and extensive involvement in European research consortia, Nicola is committed to advancing personalised medicine and enhancing the clinical impact of nuclear imaging.



Stefaan Vandenberghe is a Professor of Medical Imaging at Ghent University and a leading expert in PET imaging technology, with a particular focus on total body PET and PET/MR systems. He directs the Medical Imaging and Signal Processing (MEDISIP) research group, where his work advances innovative imaging methods to enhance diagnostic precision and patient outcomes. Stefaan's contributions have significantly shaped the field of nuclear imaging, bridging technical development and clinical application. An active participant in international research networks, he is dedicated to pushing the boundaries of molecular imaging and fostering collaborative progress within the imaging community.



Paul Lecoq is a Senior Physicist at CERN and a renowned expert in scintillating materials and detector technology, with over 20 years of experience in applying particle physics advancements to medical imaging. His pioneering work in fast-timing and high-resolution detectors has significantly impacted PET and SPECT imaging, particularly in areas such as time-of-flight technology and nanotechnology applications. A visionary in technology transfer, Paul has championed the integration of quantum physics and molecular imaging to enhance diagnostic accuracy. He leads numerous international collaborations, inspiring the next generation of scientists to push the boundaries of imaging technology for medical applications.



Sasha Ivashchenko, MPE at the Department of Nuclear Medicine and Molecular Imaging of the University Medical Center Groningen, chair of the CP committee 2024-2025.

6th Summer School in Medical Physics 2024: Radiation Detector Concepts for Medical Physics

The hybrid event took place locally in Heidelberg, Germany, and both the online and the attendance phases ran smoothly. According to the hosts, Oliver Jäkel and Jürgen Debus, and the course leaders, Dr. Maria Martisikova, Dr. Tim Gehrke, Dr. Laurent Kelleter and Dr. Jose Vedelago, there were no technological concerns during either phase, despite the intensive interactive scientific activities.

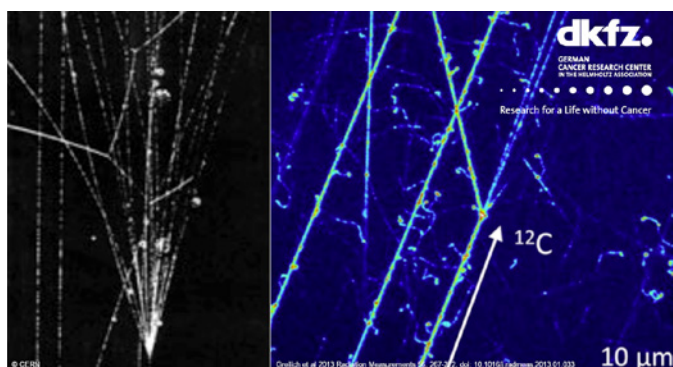


Figure. Nuclear interaction as seen in particle physics at CERN (left) and in today's particle therapy application (right).

Our summer school took place from Aug. 26th to Sep. 27th 2024. The online phase was scheduled from Aug. 26th to Sep. 22nd 2024. The attendance phase from Sep. 23rd to Sep. 27th 2024 was hosted as hybrid event. 35 participants attended online via Zoom (our so called "Live-Online-Phase") and 50 participants were on site in Heidelberg, Germany. The course was designed for PhD, MSc or BSc students and young scientists with a background in Physics, Medical Physics, Medical Engineering or similar. Participants came from around the globe, 29 countries in total.

During the online phase, participants could watch prerecorded lectures, to get an introduction into the basics of Radiation Detector Concepts. Our online live sessions during the online phase were held by internationally well-known experts from Germany and the US and they contributed with excellent talks about their topics. The first live session of the online phase on Sep. 2nd 2024 held by the course leaders Dr. Mária Martišíková, Dr. Tim Gehrke and Dr. José Vedelago from German Cancer Research Center (DKFZ) was scheduled as interactive seminar, allowing the participants to intensively discuss their expectations and questions. The session was an excellent start into the live online phase. The further 3 of 4 online sessions were recorded and participants had the opportunity to repeat them, if needed.

On Monday, Sep. 23rd 2024, at 1 p.m. the hybrid attendance phase started. On this day, lectures on different topics took place. On the second day, the main topic was "Imaging and image guidance". During the Science Slam in the afternoon, 6 participants presented their scientific projects to the audience. Two prizes were awarded. The first prize, which went to Rebekka Kirchgässner and consisted of €400 plus a 2-day stage at ADVACAM in Prague, was kindly sponsored by ADVACAM.

At the end of the third day, the main topic of which was "From Monte Carlo to LET estimations and in-phantom QA", the on-site participants had the opportunity to visit the HIT Facility. The online participants were offered a virtual guided

tour to the HIT Facility and the Ethos Linac as an option. During the Poster Session on Thursday afternoon, 9 authors presented (8 on site and one online) their own researches to the other participants. Four poster prizes were awarded: the 1st, two 2nd prizes and the 3rd, the 1st and one of the 2nd poster prizes were sponsored by The Dosimetry School (PTW). The summer school was finally concluded by our Round Table Discussions with the experts. On-site and online participants met our 9 experts (four course leaders and Prof. Jäkel, Prof. Karger, Dr. Silari, Tarifeno-Saldivia, Dr. Lukas Tlustos) in 5 small groups of participants and they could discuss all remaining questions in a more informal setting.

During the attendance phase, we welcomed 50 national and international young researchers and students in Heidelberg. Further 35 participants attended the school virtually via Zoom. More than 20 national and international speakers contributed with their talks and provided insights into their current research topics. Participants were very satisfied with the chosen format, independently whether they attended only online or on site in

Heidelberg. The organizers enjoyed hosting the summer school for such a nice and enthusiastic audience. We look forward to our next summer school in 2025. More information will be made available on our [website](#)

Some impressions of the attendance phase are provided on our [website](#):

Contact:

Local Organizing Team

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Prof. Oliver Jäkel

Prof. Jäkel is head of the Division of Medical Physics in Radiation Oncology at the German Cancer Research Center. He holds a PhD in Physics and since 2014 he has been a full professor at the Medical Faculty Heidelberg of Heidelberg University.



Prof. Jürgen Debus

Prof. Debus is a Medical Doctor in radiation oncology and holds a PhD in Physics. Since 2003 he has been a full professor at the Medical Faculty Heidelberg of Heidelberg University. He is also Chairman of the Department "Radiation Oncology" at the Heidelberg University Hospital.



Dr. Maria Martisikova

Dr. Martisikova is a research group leader in the Division E040 at DKFZ, focusing on development of novel detection and imaging techniques for ion beams. Her group works mainly with pixelized semiconductor detectors developed at CERN for applications in ion tracking in ion beam radiotherapy and imaging with ion beams.



Dr. Tim Gehrke

Dr. Gehrke has gained extensive experience with pixel detectors for applications in the field of Medical Physics. He is deputy group leader in the Division E040 at DKFZ. Before his PhD project, he obtained his Master degree in the field of accelerator physics at DESY / Hamburg University.



Dr. Laurent Kelleter

Dr. Kelleter is a former postdoctoral research scientist at the German Cancer Research Center within the Division of Medical Physics in Radiation Oncology. He was previously awarded a PhD in Experimental Particle Physics by University College London. His research focused on in-vivo monitoring and quality assurance techniques in ion-beam radiotherapy.



Dr. José Vedelago

Dr. Vedelago leads the research group “Translation Research for Ion Beam Therapy” within the Division E040 at DKFZ. Additionally, he holds a Principal Investigator position at Heidelberg University Hospital. The main research project aims to assess the impact of secondary radiation during proton and light ion beam therapy.

Upcoming Conferences and Educational Activities

This list was correct at the time of going to press.
For a complete, up-to-date list, please visit our

[EVENTS WEB PAGE](#)



Dec 1st, 2024 - Sep 27th, 2025

[SynthRAD2025](#)

Online, Europe

Jan 12th, 2025 - Jan 16th, 2025

[MR Safety: Reshape your skills
\(ESMRMB School of MRI\)](#)

Bolzano, Italy

Feb 8th, 2025 - Feb 10th, 2025

[EFOMP 2025 Medical Physics Conference](#)

Kuwait Cancer Control Center, Ministry Of
Health, Kuwait

Feb 13th, 2025 - Feb 15th, 2025

[EFOMP School for Medical Physics Experts on
Radionuclide Internal Dosimetry](#)

Prague, Czech Republic



Feb 17th, 2025 - Feb 21st, 2025

[matRad User Meeting & Hackathon 2025](#)

Heidelberg, Germany

Mar 9th, 2025 - Mar 12th, 2025

[ALFIM - X Latin American Congress of Medical
Physics](#)

La Antigua, Guatemala

Mar 17th, 2025 - Mar 19th, 2025

[EFOMP Leadership course on Leading Medical
Physics to a Sustainable Future](#)

Brussels, Belgium



Mar 17th, 2025 - Mar 21th, 2025

[3rd International Particle Minibeam Radiotherapy
\(PMBT\) Workshop](#)

[7th Proton Physics Research and Implementation
Group \(PPRIG\) Workshop](#)

Teddington, United Kingdom

May 21st, 2025 - May 24th, 2025

[EFOMP SCHOOL on new technologies in
radiotherapy & 12th AAMP Meeting](#)

Trieste, Italy



Jun 2nd, 2025 - Jun 7th, 2025

[63rd Annual PTCOG Conference \(PTCOG 63\)](#)

Buenos Aires, Argentina

Jul 10th, 2025 - Jul 12th, 2025

[EFOMP School for Medical Physics Experts on
Proton Therapy Physics](#)

Prague, Czech Republic



Sep 29th, 2025 - Oct 4th, 2025

[IUPESM World Congress on Medical Physics and
Biomedical Engineering 2025](#)

Adelaide, South Australia

Nov 13th, 2025 - Nov 15th, 2025

[EFOMP 2nd Symposium on Molecular
Radiotherapy Dosimetry: The Future of
Theranostics \(SMRD2\)](#)

Athens, Greece



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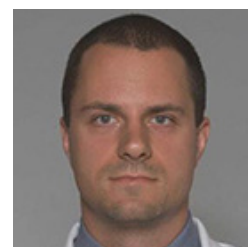
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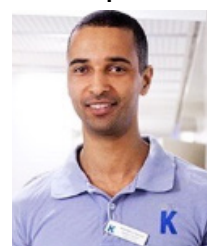
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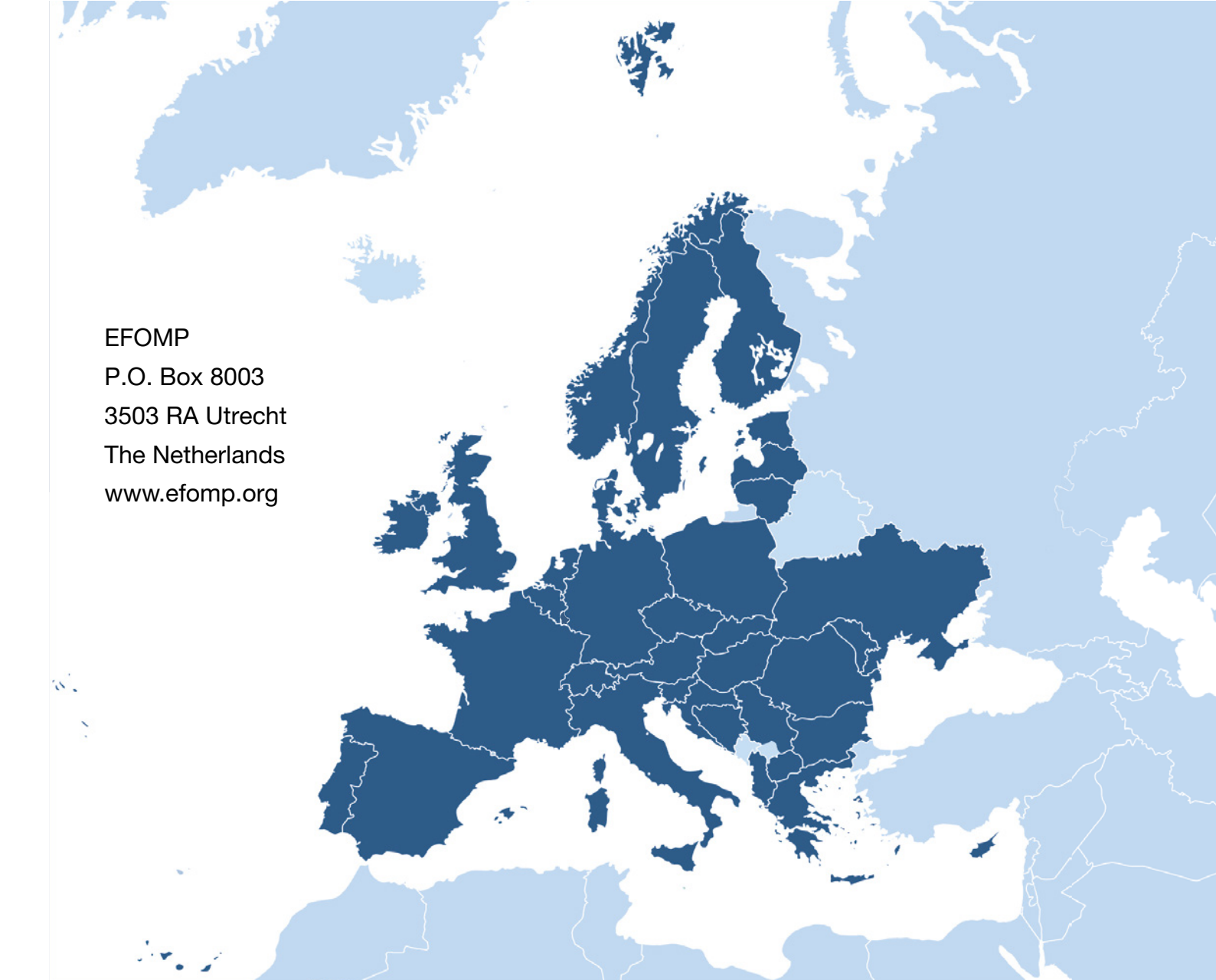
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EUROPEAN FEDERATION
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The European Federation of Organisations in Medical Physics (EFOMP) was founded in May 1980 in London to serve as an umbrella organisation for medical physics societies in Europe. The current membership covers 36 national organisations which together represent more than 9000 medical physicists and clinical engineers working in the field of medical physics. The office moved to Utrecht, the Netherlands, in January 2021.

The motto developed and used by EFOMP to underline the important work of medical physics societies in healthcare is “Applying physics to healthcare for the benefit of patients, staff and public”.

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