International Organization for Medical Physics

IOMP

eMPW

Volume 42 Number 1 June 2026



# Contents





Back to Content

# Editorial


## Chai Hong Yeong, PhD

Editor-in-Chief of IOMP e-Medical Physics World (eMPW)



CHAI HONG YEONG

Editor of IOMP eMPW

yeongchaihong@gmail.com


*"I would like to express my heartfelt gratitude to every author, contributor, and member of the eMPW Editorial Board and Sub-Committee whose dedication has made this issue possible. "*

Dear Colleagues,

It is my pleasure to welcome you to Volume 42, Issue 1 of eMPW — our first issue for 2026. Within these pages you will find a rich collection of reports, reflections, and contributions that together capture the energy, breadth, and shared purpose of our global medical physics community as we move through the first half of the new IOMP office term.

A central feature of this issue is the suite of **IOMP Executive Committee (ExCom) Reports** covering the period since the commencement of the 2025–2028 term. We are grateful to our President, Vice President, Immediate Past President, Treasurer, and the Chairs of all IOMP Committees for their comprehensive accounts of progress across IOMP's strategic activities and global initiatives.

In her **President's Message**, Prof. Eva Bezak shares several important developments from the new term, including the launch of the IOMP Strategic Plan 2025–2028, new collaborative agreements and MOUs with the World Health Organization and the International Society of Radiology, the establishment of two new task groups on artificial intelligence, and IOMP's participation in the WHO Global Diagnostic Coalition. These initiatives reflect a profession that is outward-looking, engaged, and increasingly influential on the global health stage.

This issue also celebrates the achievements of our community. We are especially proud to congratulate **Emeritus Professor Kwan-Hoong Ng**, Chair of the IOMP Awards and Honours Committee, on being awarded the **AOSR Gold Medal 2026.** This is the AOSR's most prestigious honour conferred on individuals who have rendered outstanding service to the development, teaching, or practice of radiology in the Asia-Oceania region. Remarkably, Prof. Ng is the only medical physicist, indeed the only non-radiologist, ever to receive this distinction, a testament to his lifelong contributions and to the growing recognition of medical physics within the wider radiological community.

# Editorial (Continued)

## Chai Hong Yeong, PhD

Editor-in-Chief of IOMP e-Medical Physics World (eMPW)

As we look ahead to the **International Day of Medical Physics (IDMP)** on 7 November 2026, themed ***"Advancing Global Health Equity: The Ethical Foundation of Medical Physics,"*** I warmly invite you to join the celebrations. The winning **IDMP 2026 poster**, designed by **Francesca Vittorini, Camilla Petrucci, and the Health Physics Team from San Salvatore Hospital in L'Aquila, Italy**, graces the cover of this issue. We also feature a report on **International Medical Physics Week (IMPW) 2026**, whose theme, ***"Sustainability in Healthcare: The Medical Physics Contribution,"*** resonated strongly across our regions.

We are delighted to present a strong line-up of event and conference reports. These include the **SIMIND Monte Carlo Workshop on Advanced Gamma Camera Modelling and Quantification,** held at Taylor's University, Malaysia; the **24th Southeast Asian Congress of Medical Physics (SEACOMP) and 7th Philippine Conference on Medical Physics (PCMP) 2026**; and a report on the **WiN Global Breast Cancer Awareness Webinar, "Science, Solidarity, Survival."** Our sincere thanks go to all the contributing authors for their thoughtful and engaging coverage.

This issue is further enriched by two stimulating feature articles: ***"From Fragmentation to Clarity: Rebuilding the Medical Physics Education Pathway in India"*** by **Dr. A. Surega,** and ***"Radiobiology Beyond the 4 R's: Expanding Paradigms in Radiotherapy"*** by **Prof. Arun Chougule.** Both offer valuable perspectives on the evolving science and profession of medical physics.

I would like to express my heartfelt gratitude to every author, contributor, and member of the eMPW Editorial Board and Sub-Committee whose dedication has made this issue possible. We hope you find it both informative and inspiring, and we look forward to meeting many of you at the congresses and celebrations ahead.

# International Organization for Medical Physics

# www.iomp.org

Fairmount House 230 Tadcaster Road York YO24 1ES United Kingdom, T: +44 (0) 1904 610821, F: +44 (0) 1904 612279, www.iomp.org

## IOMP Officers 2025-2028

### Prof. Eva Bezak
President

Adelaide University
Adelaide
Australia

### Prof. M. Mahesh
Vice President

Johns Hopkins University & Hospital
Baltimore, MD
USA

### Prof. Magdalena Stoeva
Secretary General

Medical University of Plovdiv
Plovdiv
Bulgaria

### Dr. Mohammad Hassan Kharita
Treasurer

Hamad Medical Corporation
Doha
Qatar

### Prof. John Damilakis
Past President

University of Crete
Iraklion, Crete
Greece

## IOMP Committee Chairs 2025-2028

### Prof. Robert Jeraj
Science

University of Wisconsin
USA

### Prof. Mika Kortesniemi
Education & Training

University of Helsinki and Helsinki University Hospital
Finland

### Prof. Kwan Hoong Ng
Awards & Honours

University of Malaya
Kuala Lumpur, Malaysia

### Dr. Simone Kodlulovich Renha
Professional Relations

National Commission of Nuclear Energy
Brazil

### Dr. Francis Hasford
Publications

University of Ghana
Ghana

### Prof. Chai Hong Yeong
Medical Physics World

Taylor's University
Malaysia

Back to Content

# IOMP President's Message


## Eva Bezak, PhD

President of IOMP


EVA BEZAK


President, IOMP
eva.bezak@adelaide.edu.au


*"Our Mission is to improve healthcare by promoting the advancement of medical physics education, science, and practice worldwide."*

Dear Colleagues and Friends,

Welcome to the June 2026 issue of eMPW, the electronic newsletter of the International Organization for Medical Physics (IOMP).

I am pleased to share several developments and activities undertaken since the commencement of the new IOMP office term in October 2025. These have included the appointment of committee members and the development of the **strategic agenda** for the 2025–2028 term, which is available on the IOMP website: https://www.iomp.org/iomp-strategic-plan/.

IOMP's **Mission** is to **improve healthcare by promoting the advancement of medical physics education, science, and practice worldwide**. Our **Vision** is **to be the leading global organisation advancing excellence, innovation, and equity in medical physics.** Achieving this vision requires us to draw upon the collective strengths of IOMP's Regional and National Member Organisations, particularly in education, research, medical technology, innovation, professional practice, and international collaboration.

The Strategic Plan establishes the key priorities that will guide IOMP's efforts over the coming years. These include strengthening the professional recognition of medical physicists, expanding education and training opportunities, advancing global health equity, supporting research and innovation, enhancing international collaboration, promoting sustainability in healthcare, and ensuring that IOMP remains a strong and effective voice for medical physicists worldwide.

In parallel, individual IOMP committees have developed their own strategic goals and activities in alignment with the overall Strategic Plan. Further information is available on the respective committee webpages.

# IOMP President's Message (Continued)

**Eva Bezak, PhD**

President of IOMP

## International Medical Physics Week 2026

One of the highlights of recent months was the successful celebration of International Medical Physics Week (IMPW) 2026. This year's theme, ***"Sustainability in Healthcare: The Medical Physics Contribution,"*** focused on the critical role of medical physicists in advancing environmentally, economically, and socially sustainable healthcare systems. The week featured a series of highly engaging webinars exploring sustainability from multiple perspectives, including sustainable healthcare design, environmentally responsible medical imaging practices, sustainability challenges in low- and middle-income countries, and the broader contributions of the physical and engineering sciences to sustainable healthcare. The excellent participation and discussions demonstrated the growing commitment of our profession to addressing global healthcare challenges through innovation, optimization, and collaboration.

I would like to thank all organizers, speakers, moderators, and participants who contributed to making IMPW 2026 a great success. The recordings remain a valuable resource for our global community. I would also like to thank all those young medical physicists from around the world who shared with me their perceptions on the theme.

## International Day of Medical Physics 2026

Preparations are already underway for the International Day of Medical Physics (IDMP) 2026, which will be celebrated on 7 November. The theme for this year is ***"Advancing Global Health Equity: The Ethical Foundation of Medical Physics."*** This theme highlights our collective responsibility to ensure equitable access to safe, high-quality medical physics services worldwide. It recognizes that ethical practice extends beyond technical excellence and includes our commitment to reducing disparities in access to diagnostic imaging, radiation therapy, nuclear medicine, radiation protection, education, and professional expertise. The winning IDMP 2026 poster is featured on the cover of this issue of eMPW. It was designed by **Francesca Vittorini, Camilla Petrucci, and the Health Physics Team from San Salvatore Hospital in L'Aquila, Italy**. Further information on IDMP activities will be presented by our IDMP Coordinators, **Dr. Erato Stylianou Markidou** and **Dr. Stephen Tronchin**, at **https://www.iomp.org/idmp-2026/**.

## Engagements

In June 2026, I had the pleasure of attending the **SEACOMP 2026** congress, where I delivered a lecture on leadership in education in medical physics. The conference provided an excellent opportunity to engage with colleagues across the Southeast Asian region and to discuss the evolving educational needs of our profession in the changing landscape, influenced by rapid growth of technology, impact of AI on healthcare and workforce shortages. Leadership development remains an essential component of strengthening the future medical physics workforce, and I was encouraged by the enthusiasm and commitment demonstrated by participants and SEAFOMP leadership.

# IOMP President's Message (Continued)

**Eva Bezak, PhD**
President of IOMP

In May, I participated online in the inaugural meeting of the **World Health Organization's Global Diagnostic Coalition (GDC),** together with **IOMP Past President Professor John Damilakis and Secretary-General Professor Magdalena Stoeva**. This important initiative brings together key stakeholders and international organisations involved in diagnostic healthcare services, with the aim of improving access to diagnostic equipment worldwide. The initial discussions covered advocacy, workforce development, medical technology, universal health coverage, and government planning for diagnostic equipment. Further discussions and activities will follow.

The data collected through the **2025 IOMP Medical Physics Workforce Survey** are currently being analysed. I would like to thank the 62 countries that responded to the survey. We look forward to presenting the findings in the coming months.

IOMP has also signed several new collaborative agreements and **MOUs**, including with **WHO, the International Society of Radiology (ISR), and the Institute of Physics and Engineering in Medicine (for administrative purposes)**. In addition, IOMP will hold a joint symposium with the **American Association of Physicists in Medicine** during its upcoming **Annual Meeting in Vancouver from 19 to 22 July 2026.** The symposium will focus on research collaboration.

In response to the rapid development of AI in health and medicine, IOMP has established **two task groups on AI**, led respectively by **Professor John Damilakis and Professor Mika Kortesniemi.**

Our **Women Subcommittee** has developed a **statement outlining inclusion and diversity requirements for IOMP conferences and IOMP-endorsed events**. The statement will be published on the IOMP website in the near future.

IOMP is also preparing to launch a **new journal** dedicated to the experiences, priorities, and challenges of low- and middle-income countries. We hope to publish the first issue in late 2027 and will soon begin appointing the editorial team. I encourage members of our global community to contribute to this important initiative. I would also like to thank **Professor Francis and Professor Damilakis** for initiating this project during the previous term.

That concludes this brief overview of recent developments. I now invite you to enjoy this issue of eMPW, with sincere thanks to **Professor Yeong and her team** for their dedication and hard work in bringing it together.

# IOMP Vice President's Message


## M Mahesh, PhD

Vice President of IOMP



M. MAHESH

Vice President, IOMP

MMAHESH@jhmi.edu


*"Having medical physics presence in such gatherings are important to advocate for the role of medical physicists with our physician colleagues"*

Dear Colleagues and Friends,

It gives me great pleasure to provide this brief report as Vice President of IOMP. It is already mid-year, and days are going quite fast. We, the IOMP ExCom, worked with the organizers of **ICMP 2027** and were able to postpone the conference from March to November due to the ongoing geopolitical situation in the region. More details, including actual dates of the conference, will be announced shortly.

On a different note, as mentioned in my previous report (eMPW Dec 2025), a revised **"terms of service"** was finalized and was approved by the IOMP council.

Also, in this mid-year 2026 report, I would like to report that I was invited to speak at the **International Congress of Radiology (ICR 2026)** conference, which was also the **49th Congresso Colombiano de Radiologia (CCR2026)** in Cartagena, Colombia. This conference was co-organized by the International Society of Radiology (ISR), which also celebrated its 100th anniversary.

It was an honour to represent IOMP at this conference, which was attended by a large number of radiologists from Colombia and other Latin American countries. More than that, I personally felt that it was important for IOMP to be present at these types of conferences. Having a medical physics presence in such gatherings is important to advocate for the role of medical physicists with our physician colleagues. In the long run, such relationships will enable greater recognition of medical physicists by our physician colleagues, such as radiologists and radiation oncologists.

At this conference, I was invited to give the following two talks:

1. **Role of Medical Physicists with AI for Quality and Safety**
2. **Radiation Dose Assessment and Optimization of CT Protocols**

# IOMP Vice President's Message (Continued)

**M Mahesh, PhD**

Vice President of IOMP

Being there in person, giving talks and interacting with radiologists with colleagues and more than that, the network developed during the conference will benefit our medical physics colleagues, such as in Mexico, when they begin to organize the World Medical Physics Conference in 2028. In fact, the president of the Mexican Radiological Society informally agreed to work closely with the medical physicists in Mexico.

Another highlight of the meeting was the **signing ceremony of the Memorandum of Understanding (MOU) between the IOMP and ISR organization**. Dr Allen Bibb, President of ISR and I representing IOMP signed the updated MOU between the two organizations that is valid for the next three years (see photo).

This year, in addition to serving as Vice President for IOMP, I am also serving as the board-chair for the AAPM. In that regard, I am proud of the **IOMP-AAPM Joint Session** on Sunday, July 19th, 2026, at the **2026 Joint AAPM/COMP Annual Meeting & Exhibition** to be held in Vancouver, BC. Several of us are preparing to present on the session titled, ***'Building Global Research Capacity Cross-Institutional Mentoring and Funding Pathways in Medical Physics'.*** For those attending the AAPM/COMP meeting, I welcome to check out our session.

Earlier this year as part of **International Medical Physics Week (IMPW)**, I organized and moderated a session on April 21st, 2026, titled, ***"The Role of Medical Physicists in Promoting more Environmentally Sustainable Practices in Medical Imaging"*** under the IMPW webinar theme of "Sustainability in Medical Imaging Physics".

Finally, it has been an exciting six months and cannot wait to report about the next six month of this year regarding medical physics activities.


*ISR President, Dr Allen Bibb and IOMP Vice President Dr M. Mahesh sign the Memorandum of Understanding between IOMP and ISR during the International Congress of Radiology in Cartagena, Colombia.*

# IOMP Immediate Past President and IUPESM Vice President's Message

**John Damilakis, PhD**

Immediate Past President of IOMP

JOHN DAMILAKIS

Past President, IOMP
john.damilakis@med.uoc.gr

*"The coming months will bring more details about the new IOMP journal. For now, please join us in celebrating this milestone. Building a successful journal is a team effort, and we are counting on you."*

## IOMP launches a new journal

The IOMP Executive Committee has officially approved the launch of a new journal in May 2026. This is a big moment for our organisation and for the field of medical physics worldwide.

The idea of launching a journal came up during the previous IOMP term. The **IOMP Publication Committee** carefully thought through what the journal should focus on. After getting formal approval from the Executive Committee, a special task group was set up to explore the market and find publishers that matched our vision.

The task group held its first meeting on 17 October 2023, bringing together dedicated members from the Publications Committee. They worked hard to compare different options and, in the end, recommended approving a proposal from Taylor & Francis.

An IOMP journal gives our community a dedicated home for sharing research, best practices and innovations. It raises the profile of medical physics and helps spread knowledge where it's needed most. But here's the honest truth: this is a demanding, multi-year challenge. A journal doesn't succeed on its own. It needs the active engagement of the entire medical physics community.

For the journal to grow strong, we need:

**Good topic coverage** – medical physicists submitting work across the full range of medical physics

**High-quality papers** – rigorous science that adds real value

**Good dissemination** – all of us reading, sharing and talking about the journal

**Strong citation levels** – citing work published in our own journal

# IOMP Immediate Past President and IUPESM Vice President's Message (Continued)

**John Damilakis, PhD**

Immediate Past President of IOMP

That means every medical physicist can play a part. Whether you are a researcher, clinician, educator or student, you can support the journal by submitting your best work, reviewing papers, citing articles and spreading the word to colleagues.

The coming months will bring more details about the new IOMP journal. For now, please join us in celebrating this milestone. Building a successful journal is a team effort, and we are counting on you.

### Global Diagnostics Coalition (GDC) inaugural meeting

The first Global Diagnostics Coalition (GDC) members meeting took place on **25 May 2026 at WHO headquarters in Geneva**, bringing together a diverse range of stakeholders committed to strengthening diagnostic capacity around the world. I had the honor of representing IOMP by participating online in this landmark event.

Access to quality diagnostic services remains critically low in many parts of the world. Without timely and accurate diagnosis, prevention, treatment, and monitoring of disease simply cannot happen effectively. Recognising this gap, the GDC was launched alongside the World Health Assembly in May 2025 as a WHO-administered network. Its mission is to improve access to diagnostics and diagnostic services as a fundamental pillar of healthcare systems, supporting universal health coverage and emergency preparedness.

The Coalition brings together Member States, UN agencies, academic institutions, the private sector, donors and professional and scientific bodies – all working to harmonise efforts and drive a coordinated global agenda on diagnostics.

The one-day meeting aimed to onboard members, introduce the Coalition's governance and terms of reference, and co-create priority thematic areas for collective action. Interactive plenary sessions were followed by parallel thematic workshops, with dedicated arrangements for remote participants to ensure full engagement.

The meeting produced a draft thematic framework and validated an approach for ongoing collaboration. For IOMP, being part of these discussions from day one ensures that medical physics perspectives, particularly in medical imaging, quality management and workforce development, are embedded in the Coalition's work from the outset.

IOMP looks forward to actively contributing to emerging workstreams and helping shape a future where quality diagnostic services are accessible to all, no matter where they live.

# Treasurer's Report

## Mohammad Hassan Kharita, PhD

Treasurer of IOMP

MOHAMMAD HASSAN KHARITA

Treasurer, IOMP
mhkharita@gmail.com

*"Corporate Membership offers companies the opportunity to increase visibility, support professional development, and engage with experts working across radiation medicine, imaging, radiotherapy, radiation protection, education, and healthcare technology."*

Dear Colleagues,

The International Organization for Medical Physics (IOMP) invites companies and industry partners to join its 2026 **Corporate Membership program** and contribute to the advancement of medical physics worldwide.

As the global professional organization representing medical physics, IOMP provides a unique platform for collaboration between industry and the international medical physics community. Corporate Membership offers companies the opportunity to increase visibility, support professional development, and engage with experts working across radiation medicine, imaging, radiotherapy, radiation protection, education, and healthcare technology.

For 2026, IOMP offers three Corporate Membership levels: Silver, Gold, and Platinum. The annual fee for **Silver Membership is €2,200**, while the newly introduced **Gold and Platinum levels are available at €3,000 and €4,000, respectively**. Each tier provides important benefits and discounted opportunities for communication, outreach, and sponsorship through IOMP channels.

### Benefits of Corporate Membership

IOMP Corporate Members benefit from global recognition and access to selected IOMP activities. Membership supports stronger connections between companies and the scientific community while helping advance education, innovation, and professional practice in medical physics.

### Advertising and Sponsorship Opportunities

Corporate Members are entitled to discounted rates for advertising and sponsorship opportunities, including newsletter banners, hosted articles, webinars, and sponsored eBlasts. These options provide practical channels for sharing innovations, educational activities, and company updates with the IOMP community.

# Treasurer's Report (Continued)

## Mohammad Hassan Kharita, PhD

Treasurer of IOMP

### Key Benefits for Corporate Members

| | |
|---|---|
| **Global Visibility** | Company name and website displayed prominently on the IOMP website. |
| **Professional Recognition** | Acknowledgement as a sponsor in the IOMP Medical Physics World Newsletter. |
| **Scientific Engagement** | Invitation to major international events, including world and international congresses in medical physics and biomedical engineering. |
| **Leadership Access** | Opportunity to nominate a representative to attend IOMP Council Meetings as a non-voting member. |
| **Marketing Advantage** | Discounted rates for advertising, sponsored articles, webinars, and sponsored eBlasts. |

### IOMP Corporate Membership Tiers

| Membership Tier | Annual Fee | Best Suited For | Advertising Discount |
|---|---|---|---|
| **Silver** | €2,200 | Companies seeking essential international visibility and entry-level engagement with IOMP networks. | 25% |
| **Gold** | €3,000 | Organizations aiming for stronger presence, broader promotional reach, and enhanced cost savings. | 50% |
| **Platinum** | €4,000 | Strategic partners seeking premium visibility, maximum discount value, and deeper engagement opportunities. | 75% |

### Advertising and Sponsorship Rates after Corporate Member Discounts

| Opportunity | Standard Cost | Silver Cost | Gold Cost | Platinum Cost |
|---|---|---|---|---|
| Newsletter banner, 1 issue | €500 | €375 | €250 | €125 |
| Newsletter banner, 3 issues | €1,200 | €900 | €600 | €300 |
| Newsletter banner, 6 issues | €2,000 | €1,500 | €1,000 | €500 |
| IOMP hosted article, 1 issue | €500 | €375 | €250 | €125 |
| IOMP hosted article, 6 issues | €3,000 | €2,250 | €1,500 | €750 |
| Webinar, 60 minutes | €1,200 | €900 | €600 | €300 |
| Sponsored eBlast | €1,200 | €900 | €600 | €300 |

# Treasurer's Report (Continued)

## Mohammad Hassan Kharita, PhD

### Treasurer of IOMP

**Building a Stronger Global Network**

Through Corporate Membership, IOMP aims to strengthen constructive engagement between industry and medical physics professionals worldwide. This partnership supports the exchange of knowledge, promotes innovation, and contributes to the safe and effective use of physics in medicine.

**Invitation to Join**

IOMP warmly invites current and prospective corporate partners to consider joining the 2026 Corporate Membership program. Companies interested in visibility, professional engagement, and meaningful contribution to the international medical physics community are encouraged to contact IOMP for further information.

For further information: Please contact the **IOMP Treasurer (mhkharita@gmail.com) or the IOMP Secretary General (sg.iomp@gmail.com)** regarding Corporate Membership, advertising discounts, and sponsorship opportunities.




Back to Content

# Education and Training Committee's Report


## Mika Kortesniemi, PhD

Chair of IOMP Education and Training Committee



MIKA KORTESNIEMI

IOMP Education & Training Committee Chair

Mika.Kortesniemi@hus.fi


*"Education and training are the foundation for future knowledge and scientific discoveries. This foundation must continuously evolve to keep track of our fast-developing professional and technological field."*

### 1. General aspects

The renewed composition of the IOMP Education and Training Committee (ETC) and Accreditation Board (AB) has proven efficient in driving forward the IOMP strategic goals as regards education and training. Overall, ETC provides prerequisites for our medical physics knowledge and profession, and thus our strategy has a fundamental connection to the core mission and vision of IOMP.

Our activities have included the following main topics: update of the **ETC strategic goals,** several **review and endorsement** tasks by the ETC, several **evaluations and recommendations on accreditation applications** by the AB, virtual meetings of **ETC and AB**, provision of **webinars**, and internal task allocation and coordination process with shared file areas to streamline our work.

ETC has also launched a dual project on the **use of artificial intelligence (AI)** to define policies for the internal IOMP use of AI and to support our medical physicist education and professional aspects as related to fast-developing AI methods. Finally, ETC is coordinating the **International Day of Medical Physics (IDMP) 2026** Activities with the theme of ethics and equity.

### 2. Update of the ETC strategic plan

Following the update of the IOMP strategy, the ETC strategic goals were defined to reflect and support the IOMP strategy from the perspectives of education and training. The ETC strategic plan was defined by the following three points:

1. **Improving global access to high-quality educational and training materials** by supporting selected webinars on relevant scientific, professional, and educational topics during the ongoing term and collecting potential topics also for future events.
2. **Strengthening the adoption of new automated and data-driven medical physics-related tools** by facilitating the dissemination of such tools through educational events and their materials.

# Education and Training Committee's Report

## (Continued)

**Mika Kortesniemi, PhD**

Chair of IOMP Education and Training Committee

3. **Developing and sustaining educational collaboration and partnership** with the main international organisations in relevant topics of medical physics, radiation protection, quality, and safety.

(The radiation protection was added on the third point based on the later comments)

### 3. Review and evaluation tasks performed by the ETC and AB

Guided by the IOMP statutes and bylaws, and specifically the terms of reference (ToR) of ETC, our main tasks include:

- Considering applications from national and regional organisations for sponsoring or endorsing educational and training meetings.
- Considering requests for review, comment, or endorsement of relevant documents.
- Evaluating and promoting medical physics education and training programs.

ETC has been evaluating three educational events and reviewing the educational publication. Additionally, AB has been involved in four accreditation tasks that are still partly ongoing. These tasks and related applications reflect the strengthening role of medical physics and the acknowledgement of IOMP in our global community.

### 4. Provision of webinars

Among many aspects related to the ToR of ETC, the overall primary task is to improve medical physics worldwide by disseminating systematic knowledge through education and training, and thus to advance the practice of physics in medicine. Accordingly, the ETC has been involved in the planning of future webinar events. Part of this activity has already been realised during the International Medical Physics Week in April, and the recent IOMP webinar on MRI in June. The upcoming webinars will address several essential and current topics in our profession, including developing tools of QA (especially freely available automated methods), different aspects of AI, and modality-specific topics. The webinars are also partly planned as adjuncts to on-site educational events.

### 5. Streamlining the internal work of ETC and AB

The IOMP ETC and AB involve a diverse group of experts from different parts of the world. Therefore, the coordination and task allocation of our work require efficient means where balanced involvement and consideration of personal field of expertise must be taken into account. These coordination and task allocation have been provided within the common file area which is always accessible to ETC and AB.

# Education and Training Committee's Report

(Continued)

**Mika Kortesniemi, PhD**

Chair of IOMP Education and Training Committee

### 6. AI projects

Following our first ETC virtual meeting, the ETC is conducting two projects related to the use of AI. The first project part aims for an internal IOMP policy document with a preamble establishing guidelines for AI usage and governance in IOMP, securing our IP rights. The second project part aims for a position paper with a preamble establishing education and professional guidelines for medical physicists to use AI safely, effectively, and ethically.

### 7. Finally

Education and training are the foundation for future knowledge and scientific discoveries. This foundation must continuously evolve to keep track of our fast-developing professional and technological field. The future activities of ETC and AB will be directed according to these guiding principles, which are also reflected in the ETC strategic plan.





Back to Content

# Awards & Honours Committee's Report


## Kwan Hoong Ng, PhD

Chair of IOMP Awards & Honours Committee


KWAN HOONG NG

IOMP Awards & Honours Committee Chair

kwanhoong.ng@gmail.com

*"The IDMP award forms part of IOMP's continuing commitment to celebrating outstanding contributions to the profession and increasing the visibility of medical physics worldwide."*

**AHC members (2025-2028):**

- Kwan Hoong Ng (Chair)
- Kelly Kisling (AAPM)
- Wayne Beckman (COMP)
- Rabih Hammoud (MEFOMP)
- Loredana Marcu (EFOMP)
- Ung Ngie Min (SEAFOMP)
- Taofeeq Abdalla Ige (FAMPO)
- Golam Abu Zakaria (EFOMP)
- Peter Metcalfe (AFOMP)
- Vera Uushona (FAMPO)
- Olga Avila (ALFIM)

Among the committee's recent activities, the call for **nominations for the International Day of Medical Physics (IDMP) Award** has been endorsed. The announcement has been disseminated to IOMP National Member Organisations (NMOs) and published on the IOMP website by the Secretary General and the Web Subcommittee. The award forms part of IOMP's continuing commitment to celebrating outstanding contributions to the profession and increasing the visibility of medical physics worldwide.

The committee also reported a significant development at the international level. The International Union of Pure and Applied Physics (IUPAP) has approved the **IUPAP Early Career Scientist Prize in Medical Physics for 2026**. This prize recognises exceptional achievements by emerging medical physicists and further encourages innovation and leadership among young professionals. The AHC is currently preparing the call for nominations, which will be submitted to the IOMP Executive Committee for endorsement before its release later this year.

**Call for Nomination: 2026 IDMP Award**

International Organization for Medical Physics

IOMP

**Announcement**

**Download Nomination Form**

**Deadline: 9 August 2026**

# Awards & Honours Committee's Report

(Continued)

**Kwan Hoong Ng, PhD**

Chair of IOMP Awards & Honours Committee

The AHC noted with sadness the **passing of Professor Emeritus Charles Mistretta of the University of Wisconsin–Madison, USA**, on 9 June 2026. Professor Mistretta, a recipient of the **IOMP Marie Skłodowska-Curie Award in 2012**, was internationally renowned as the pioneer and inventor of digital subtraction angiography (DSA), one of the most influential advances in modern medical imaging.

His groundbreaking work transformed vascular imaging and laid the foundation for many of today's interventional radiology and cardiovascular procedures. Through his scientific vision and innovation, Professor Mistretta made a lasting contribution to patient care and to the advancement of medical physics and biomedical imaging.

A tribute honouring his life and achievements has been published on the IOMP website https://www.iomp.org/a-tribute-to-charles-mistretta/. The medical physics community joins colleagues, friends and family around the world in remembering a distinguished scientist whose legacy will continue to inspire future generations.

# Professional Relation Committee's Report


## Simone K Renha, PhD

Chair of IOMP Professional Relation Committee



SIMONE K RENHA

IOMP Professional Relation Committee Chair

simonekodlulovich@gmail.com


*"By strengthening networks, supporting professional development, promoting advocacy, and fostering innovation, the PRC is contributing to a more connected, inclusive, and forward-looking professional community."*

The IOMP Professional Relations Committee (PRC), under the leadership of Simone Kodlulovich, continues to advance its strategic vision for the 2026–2028 term through a series of coordinated global initiatives. Building on its commitment to strengthening the medical physics profession worldwide, the PRC has established five working groups focusing on key priority areas:

1. **Global Network Development**
2. **Professional Development and Career Support**
3. **Partnerships and International Collaboration**
4. **Policy and Professional Advocacy**
5. **Professional Resources Website**

In this article, we present the priorities of the PRC working groups and highlight their initiatives to support career development, strengthen global networks, advance professional advocacy, and facilitate the integration of emerging technologies into professional practice. Collectively, these activities demonstrate the PRC's continuing commitment to empowering the global medical physics community and contributing to improved healthcare outcomes worldwide.

### Global Network Development

*By Qianxi Ni, Volodymyr Vashchyshyn, Manju Sharma, Hasin Anupama Azhari, and Leonel Torres*

The **Global Network Development Working Group** is dedicated to strengthening the worldwide medical physics community by systematically identifying countries without formal national medical physics societies and supporting the establishment of sustainable, locally led professional associations.

In alignment with the IOMP PRC Strategic Plan 2026–2028, the Working Group aims to **reduce professional isolation, enhance knowledge exchange, and promote equitable access to education, advocacy, and collaborative opportunities.** Particular attention is given to low- and middle-income countries and underrepresented regions, including Africa, Latin America, and Southeast Asia.

# Professional Relation Committee's Report
(Continued)

**Simone K Renha, PhD**

**Chair of IOMP Professional Relation Committee**

By supporting the establishment and development of national medical physics societies, the Working Group contributes directly to Objective 4.1, ***"Strengthening Global Medical Physics Networks,"*** while also advancing related goals in professional development, international collaboration, and policy advocacy.

The initial phase focuses on mapping global gaps by reviewing IOMP membership data, regional reports (AAPM, EFOMP, AFOMP), WHO country profiles, and published literature to identify countries lacking recognized societies. A priority list will be developed based on the number of practicing medical physicists, infrastructure, growth potential, and regional balance.

The 2nd phase emphasizes direct engagement with stakeholders in priority countries through virtual consultations to assess local challenges, regulatory environments, and readiness for association formation. Peer networking will be facilitated via regional forums and webinars, connecting emerging communities with established societies. Pilot initiatives will support 3–5 high-potential countries in drafting foundational documents and organizing inaugural meetings.

### The Partnerships and International Collaboration Working Group

*Manju Sharma, Whitney Coulor, Jake Van Dyk, and Sheaka Alobaidi*

The IOMP PRC has proposed to establish a **Partnerships and International Collaboration Working Group** within the PRC. This initiative recognizes that many PRC goals require coordinated external relationships. A structured partnership approach can help ensure that collaborations are reciprocal, sustainable, and aligned with IOMP priorities.

The working group will identify organizations whose missions align with PRC goals, including professional societies, academic institutions, certification and training bodies, and nonprofit or global health organizations. It will help define how these relationships should be structured, including when MOUs or letters of cooperation may be appropriate.

The group will also support communication about partner organizations through IOMP channels and connect PRC and other relevant IOMP initiatives with external collaborators. Over time, it will help review the PRC partnership program to ensure that partnerships remain feasible, non-duplicative, and linked to useful outcomes.

The objectives of the working group are to:

1. Define strategic partnerships that scale PRC's global impact by identifying and prioritizing partner organizations aligned with PRC goals.
2. Develop a process for defining partnership organizations via, for example, MOUs or letters of co-operation.
3. Create partnership pathways by communicating about the partner organizations via IOMP channels and by connecting PRC and other IOMP initiatives with external collaborators.
4. Establish a sustainable framework by developing a practical process to evaluate the PRC partnership program.

# Professional Relation Committee's Report
(Continued)

**Simone K Renha, PhD**

Chair of IOMP Professional Relation Committee

## Professional Development & Career Support

*Bronwin Van Wyk, Whitney Coulor, Volodymyr Vashchyshyn, Jake Van Dyk, Sheaka Alobaidi*

The IOMP PRC has proposed to establish a **Professional Development and Career Support sub-group.** The objectives/tasks of this sub-group are to:

1. **Create a discussion forum for medical physicists.** This initiative seeks to respond to many regions, where newly graduated MPs encounter significant challenges when transitioning into clinical practice. The group aims to play a pivotal role by engaging with international organizations to inspire early-career medical physicists (with and without a senior physicist) and guide them toward recognized pathways of professional development, e.g. protocol development, calibration, etc.
2. **Develop Professional Development and Career Support Soft Skills. T**his initiative seeks to empower personal attributes and interpersonal abilities that enable effective communication, collaboration, and adaptability in professional and personal settings.

**Levels of soft skills:**

- (Intra)Personal (Self-awareness, Resilience, Time Management, Adaptability)
- Interpersonal (Listening, Empathy, Conflict Resolution)
- Team & Organizational (Leadership, Collaboration, Project Management)

## Policy and Professional Advocacy

*Stephanie Parker, Bronwin van Wyk, Sheaka Alobaidi*

The IOMP PRC has proposed to establish a **Policy and Professional Advocacy Working Group** within the IOMP PRC. The initiative responds to ongoing global challenges facing the medical physics profession, including inconsistent recognition, varying regulatory and credentialing frameworks, and limited involvement in health policy decision-making. By creating a structured platform for advocacy, the working group aims to strengthen the visibility and integration of medical physicists as essential contributors to safe, high-quality healthcare systems worldwide. Through coordinated, evidence-based advocacy, the group seeks to enhance professional recognition, support workforce development, and improve awareness of the critical role medical physicists play across clinical and public health settings. Ultimately, this effort aligns with the PRC's broader mission to advance the profession globally and to promote better health outcomes through strengthened medical physics capacity.

The **objectives** of the working group are to:

1. Identify prior work on policy and advocacy in the field of medical physics
2. Develop a policy and advocacy framework that national member organizations and regional organizations can adapt to local health-system, regulatory, and workforce environments.
3. Create adaptable and practical resources such as policy briefs, talking points, slide decks, and template statements that National Member Organizations and regional bodies can use in their own policy environments.

# Professional Relation Committee's Report (Continued)

**Simone K Renha, PhD**

Chair of IOMP Professional Relation Committee

## Professional Resource Website

*Hasin Anupama Azhari, Jake Van Dyk, Stephanie Parker, Qianxi Ni*

The **Professional Resource Website working group** has set an ambitious vision to create a robust platform that **fosters mentorship, technological awareness, leadership, and career growth**, ensuring inclusive opportunities for medical physicists across diverse regions. A central priority is to promote certification, leadership, and professional skills training, alongside a structured mentorship program that provides clear pathways for growth and recognition. Career development remains at the forefront, with resources designed to support advancement, global networking, and equitable participation from LMIC professionals.

Equally significant is the establishment of an **AI and Future Technologies Resource Center**, promoting training, resources, and updates on emerging innovations. This initiative will integrate seamlessly with existing professional development pathways, ensuring members remain at the cutting edge of technological progress. Collaboration is the foundation of all activities, with partnerships being explored with Medical Physics for World Benefit (MPWB), AAPM, SCMPCR, and other organizations. On the infrastructure side, the subgroup is working toward a dedicated PRC section on the main IOMP website, with discussions underway to finalize its development.

## Review and Approval of National Member Organizations Society

Another responsibility of the PRC is to review applications from organizations and associations to become national member organizations (NMOs) of the IOMP. The PRC makes recommendations to the IOMP ExCom regarding the approval of the applications. Recently, the PRC has reviewed and recommended the approval of applications from the **Croatian Medical Physics Association (CROMPA)** and the **Latvian Association of Clinical Medical Physicists and Engineers (LAMPE)** to become NMOs. Because the IOMP Statutes do not allow more than one NMO per country, the **Croatian Biomedical Engineering and Medical Physics Society (CROBEMPS)** has requested that its membership status **change from NMO to Affiliate Member.** The PRC made the recommendation to the IOMP ExCom to approve the membership status change of CROBEMPS. The PRC looks forward to reviewing additional applications throughout the current term as the medical physics field continues to expand and grow.

## Conclusion

Through its coordinated initiatives, the IOMP PRC is advancing the global development of the medical physics profession. By strengthening networks, supporting professional development, promoting advocacy, and fostering innovation, the PRC is contributing to a more connected, inclusive, and forward-looking professional community. These efforts reinforce the critical role of medical physicists in healthcare systems worldwide and support the continued improvement of patient safety and clinical outcomes.

# Medical Physics World Board (MPWB) Committee's Report


## Chai Hong Yeong, PhD

Chair of IOMP Medical Physics World Board (MPWB)



CHAI HONG YEONG

IOMP MPWB Committee Chair

yeongchaihong@gmail.com


*" We welcome concise and timely news, articles, educational materials, interviews, reports, and feedback from our global medical physics community, particularly from underrepresented regions."*

The first half of 2026 marked the beginning of the new working term of the IOMP Medical Physics World Board (MPWB) and Web Sub-committee. Our activities focused on maintaining effective communication with the global medical physics community, supporting IOMP publications and outreach activities, and strengthening IOMP's digital platforms.

### Publications and Communication

The MPWB continued to coordinate two complementary IOMP publications: the **IOMP Newsletter** and **e-Medical Physics World (eMPW)**.

The **IOMP Newsletter**, published **every two months,** provides **concise and timely updates** on important medical physics events, announcements, and activities occurring during each two-month period. Three issues of the IOMP Newsletter have been published during the first half of 2026:

1. IOMP Newsletter, Vol. 8, No. 1, February 2026
2. IOMP Newsletter, Vol. 8, No. 2, April 2026
3. IOMP Newsletter, Vol. 8, No. 3, June 2026

The IOMP Newsletter now reaches **~70,000 subscribers,** representing a substantial growth from ~28,000 subscribers at the beginning of the previous MPWB term. This reflects the increasing reach of IOMP communications and the strong engagement of the international medical physics community.

In contrast, **eMPW**, which is published **twice a year,** provides a **more comprehensive** platform for updates and feature articles from IOMP Officers, Committees, Regional Organisations, National Member Organisations, and partner organisations. It also includes reports on conferences, webinars, awards, professional opportunities, educational resources, and other developments relevant to medical physicists worldwide. The present **June 2026 issue** reflects the breadth and diversity of medical physics activities across different regions.

# Medical Physics World Board (MPWB) Committee's Report (Continued)

**Chai Hong Yeong, PhD**

Chair of IOMP Medical Physics World Board (MPWB)

## International Medical Physics Week (IMPW) 2026

IMPW 2026 was a major communication and outreach activity during this reporting period. This year's theme, **"healthcare sustainability"**, highlighted the role of medical physicists in advancing environmentally, economically, and socially sustainable healthcare systems. The **IOMP School webinars** addressed topics including reducing energy consumption and medical waste, optimising imaging and treatment workflows, supporting remote quality control, applying artificial intelligence responsibly, and improving access to medical physics services in resource-limited settings. MPWB promoted IMPW 2026 through the IOMP website, Newsletter, email communications, and social media. Reflections and key messages from IMPW participants are also featured in this issue of eMPW.

## Website and Digital Development

The IOMP website remains the organisation's main platform for information dissemination. The website experienced a **cyberattack** in early May 2026. Although services were subsequently restored, the incident reinforced the need to strengthen the security and resilience of IOMP's digital infrastructure. Discussions on **upgrading and restructuring the website** had already begun before the cyberattack. The Web Sub-committee subsequently proposed redeveloping the website on a more modern, secure, and user-friendly platform to support the long-term reliability and sustainability of IOMP's online presence. The proposal was recently approved by the IOMP ExCom, and the redevelopment project will commence shortly.

## Social Media and Global Outreach

IOMP continues to maintain an active presence on LinkedIn, YouTube, X, Facebook, and Instagram, with a combined reach of more than **16,000 followers**. During the reporting period, these channels were used to promote IMPW, IOMP School webinars, publications, conferences, awards, professional opportunities, educational resources, and activities undertaken by IOMP Committees and Regional Organisations. Social media complements the IOMP website and mailing list by enabling faster dissemination of information and broader engagement with medical physicists, students, healthcare professionals, professional organisations, and members of the public.

www.iomp.org

# Medical Physics World Board (MPWB) Committee's Report (Continued)

## Chai Hong Yeong, PhD

Chair of IOMP Medical Physics World Board (MPWB)

### Priorities for the Second Half of 2026

During the second half of 2026, the MPWB and Web Sub-committee will focus on:

- maintaining the regular publication schedules of the IOMP Newsletter and eMPW;
- promoting International Day of Medical Physics (IDMP) 2026, whose official poster is featured on the cover of this eMPW issue;
- supporting the redevelopment and improved security of the IOMP website;
- strengthening coordination across the website, email communications, publications, and social media;
- increasing contributions from all IOMP regions;
- engaging more students and early-career medical physicists; and
- improving the representation of colleagues from low- and middle-income countries.

### Closing Remarks

I sincerely thank all members of the MPWB and Web Sub-committee, as well as the IOMP Officers, Committee Chairs, Regional Organisations, National Member Organisations, authors, reviewers, and colleagues worldwide who have supported our publications and communication activities. The MPWB remains committed to ensuring that IOMP's publications and digital platforms are accessible, inclusive, relevant, and responsive to the needs of medical physicists worldwide.

The continued success of eMPW, the IOMP Newsletter, the website, and IOMP's social media platforms depends on the active contributions of the global medical physics community. We welcome concise and timely news, articles, educational materials, interviews, reports, and feedback, particularly from underrepresented regions.

**IOMP MPWB COMMITTEE MEMBERS (2025-28):**

- Chai Hong Yeong, Malaysia – Chair
- Li Kuo Tan, Malaysia - Secretary
- Habib Ashoor, Bahrain
- Jae Lirio Inamarga, Philippines
- Joerg Lehmann, Australia
- Nashaat Ahmed Deiab, Egypt
- Nilendu Gupta, USA
- Rajni Verma, India
- Renato Dimenstein, Brazil
- Rosana Pirchio, Argentina

**IOMP WEB SUB-COMMITTEE MEMBERS (2025-28):**

- Chai Hong Yeong, Malaysia – Chair
- Li Kuo Tan, Malaysia - co-Chair
- Ezequiel Larger, Argentina
- George Kagadis, USA
- Mark Pokoo-Aikins, Ghana
- MD Akhtaruzzaman, Bangladesh
- Niki Fitousi, Belgium
- Nora AlRashidi, Kuwait
- Ruijie Yang, China
- Shalaine Tatu, Philippines

# Publications Committee's Report


## Francis Hasford, PhD

Chair of IOMP Publications Committee



FRANCIS HASFORD

IOMP Publications Committee Chair

haspee@yahoo.co.uk


*" the Committee is focusing on strengthening IOMP's flagship publications, enhancing global representation, exploring digital and open-access publishing strategies, supporting capacity building, and implementing mechanisms to evaluate publication performance"*

The Publications Committee of the International Organization for Medical Physics (IOMP) plays a vital role in advancing the organization's mission through scientific communication, knowledge dissemination, and the promotion of medical physics worldwide. By supporting **high-quality publications** and **strategic publishing initiatives**, the Committee contributes to education, research, professional development, and the global visibility of the profession.

The outgone Committee strengthened IOMP's publication portfolio, enhanced quality and accessibility of scholarly outputs, supported publication ethics and editorial standards, and contributed to the success of key publications such as Medical Physics International and Medical Physics World. These efforts helped reinforce IOMP's position as a leading international professional organization in medical physics.

The new Publications Committee is continuing the achievements of the previous. The Committee reflects **broad international representation**, with members drawn from Africa, Asia, Europe, Latin America, the Middle East, North America, and South-East Asia, together with ex-officio members from the IOMP Executive Committee and editorial leadership of IOMP publications. The diverse composition strengthens the Committee's ability to address global publishing challenges, promote equitable access to knowledge, and ensure that IOMP publications represent the perspectives and needs of the worldwide medical physics community.

The Committee operates under the IOMP Statutes and Bylaws and is responsible for supporting publications that advance medical physics through research, education, and professional programs; overseeing **publication agreements** with publishers of official IOMP journals; recommending **editorial appointments** to the IOMP members; identifying needs for **international scientific and professional publications**; and assisting regional and national organizations in developing **new publication initiatives**.

# Publication Committee's Report (Continued)

## Francis Hasford, PhD

### Chair of IOMP Publication Committee

For the current term, the Committee is focusing on **strengthening IOMP's flagship publications,** enhancing **global representation** in published content, exploring **digital and open-access** publishing strategies, supporting **capacity building** in scientific publishing through training and mentorship initiatives, and implementing mechanisms to **evaluate publication performance** and alignment with IOMP's strategic objectives.

Building on the strong foundation established by previous committees, the new Publications Committee is committed to enhancing the quality, reach, and impact of IOMP publications. Through inclusive representation, clear responsibilities, and a forward-looking strategy, the Committee aims to further support the advancement of medical physics and serve the global professional community effectively.

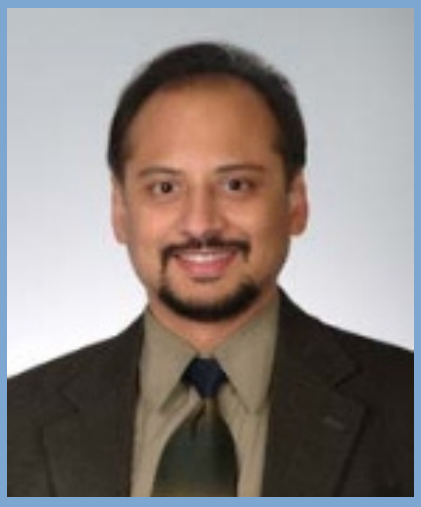
# Medical Physics International (MPI) Journal Report


## Francis Hasford and Sameer Tipnis

co-Editors-in-Chief

FRANCIS HASFORD

haspee@yahoo.co.uk



SAMEER TIPNIS

tipnis@musc.edu


**From Data to Care: Advancing Patient Safety Through Radiation Exposure Monitoring**

The publication of the Medical Physics International Proceedings, Vol. 2, No. 1 (2026) marks an important milestone in the global effort to strengthen radiation protection and optimize medical imaging practices. Featuring the proceedings of the **International Symposium on Radiation Exposure Monitoring in Medical Imaging (REM 2026**), the volume brings together leading experts, researchers, regulators, and healthcare professionals from around the world to explore how data-driven approaches can transform patient care.

Held under the compelling theme ***"Enhanced Patient Care through Effective Data Management,"*** REM 2026 reinforced the growing recognition that radiation exposure monitoring is no longer simply a regulatory requirement but a strategic tool for improving healthcare quality. The symposium demonstrated how advances in digital technologies, artificial intelligence, interoperability, and automated dose management systems are enabling healthcare providers to move beyond recording radiation exposure to using data intelligently for clinical decision-making and patient safety.

A recurring message throughout the proceedings is the transition from generic, population-based dose estimates toward individualized, patient-centred radiation management. Emerging technologies such as AI-assisted organ dose estimation, machine learning, and real-time analytics are paving the way for personalized dosimetry that considers each patient's unique characteristics and clinical context. These innovations promise to improve optimization of imaging protocols while ensuring that diagnostic benefits continue to outweigh potential risks.

The proceedings also emphasize that technology alone is insufficient. Effective radiation exposure monitoring requires robust governance, harmonized standards, secure data

# Medical Physics International (MPI) Journal Report (Continued)

**Francis Hasford and Sameer Tipnis**

co-Editors-in-Chief

infrastructure, multidisciplinary collaboration, and continuous professional education. Discussions on ethics, communication, and patient engagement remind us that transparency and informed decision-making are essential components of modern healthcare. Equally important is the integration of exposure monitoring into national e-health systems and international registries, creating opportunities for benchmarking, quality improvement, and evidence-based policy development.

Of particular significance is the broad international participation reflected in the scientific programme, with contributions spanning developed and developing countries alike. Presentations on diagnostic reference levels, population dose assessment, pediatric imaging, occupational exposure, and quality assurance demonstrate that the challenges of radiation protection are shared globally, while the solutions increasingly rely on collaboration across borders and disciplines.

For medical physicists, radiologists, radiographers, engineers, regulators, and policymakers, the REM 2026 proceedings provide both inspiration and practical guidance. They illustrate how data can be transformed into actionable knowledge that supports safer imaging practices, enhances patient trust, and improves healthcare outcomes.


As medical imaging continues to expand worldwide, the vision articulated throughout this volume is both timely and compelling: by harnessing intelligent data management, embracing innovation, and fostering international cooperation, the medical community can ensure that radiation exposure monitoring becomes a cornerstone of patient-centred care. In doing so, the field moves decisively from simply measuring radiation to delivering measurable improvements in the quality and safety of healthcare for all.

Access the publication from
www.mpijournal.org/proceedings.aspx

# IOMP Women Sub-Committee's Report


## Loredana Marcu, PhD

Chair of IOMP Women Sub-Committee



LOREDANA MARCU

IOMP Women Sub-Committee Chair

loredana@marcunet.com


*"Our mission is to advance medical physics practice worldwide, fostering the educational and professional development of female medical physicists, and promoting the highest quality medical services for patients."*

The year 2025 has marked the beginning of a new term (2025-2028) for our subcommittee, with new members joining from around the world. The IOMP-W subcommittee has grown to 16 members, dedicated to the work of IOMP.

Our **mission** is to advance medical physics practice worldwide, fostering the educational and professional development of female medical physicists, and promoting the highest quality medical services for patients.

Our **strategic agenda** for the new term aims to:

1. develop, implement, and coordinate activities and projects related to the role of women in the scientific and professional advancement of medical physics;
2. promote the role of women in medical physics, assist with their continuous professional development, and encourage female medical physicists to advance in the profession;
3. encourage and support the contribution of female medical physicists at major scientific conferences and congresses;
4. support early career females in their professional development and promote mentoring programs in leadership;
5. disseminate the work undertaken by the subcommittee through scientific publications, webinars, conference presentations, and social media.

In view of the above, the IOMP Women Subcommittee is focused on several activities aimed at attracting more women to medical physics and assisting women MPs with their continuous professional development.

In the first half of 2026, a main event organized by IOMP-W was the webinar dedicated to **International Women's Day**, which has become a well-appreciated tradition, with a large number of participants. The topic of the webinar focused on women's leadership in medical physics/physics, with three prominent speakers being invited:

# IOMP Women Sub-Committee's Report

(Continued)

**Loredana Marcu, PhD**

Chair of IOMP Women Sub-Committee

- **Natalka Suchowerska** (A/Prof at The University of Sydney, Australia; Vice President Help Ukraine Group (HUG)) whose talk ***"My Career, My Way; A Woman for All Seasons"*** was a personal reflection on building a meaningful, non-linear career in medical physics.

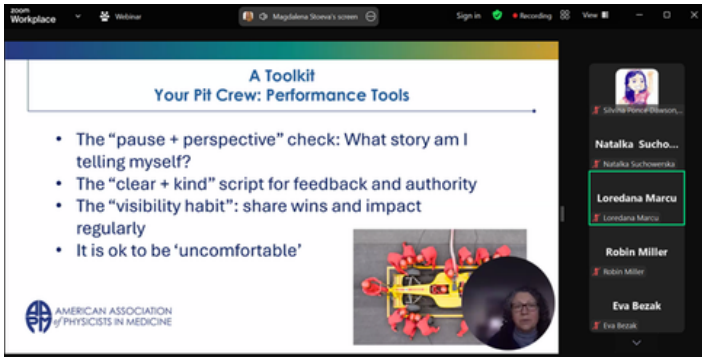
- **Silvina Dawson** (president of IUPAP) talking on the topic of ***"The impact of women in physics on the International Union of Pure and Applied Physics and on its mission to assist in the worldwide development of physics"***

- **Robin Miller** (president of AAPM, Chief Medical Physicist at Kaiser Permanente Capitol Hill on behalf of Northwest Medical Physics Center) is delivering a talk on ***"Leading as a woman: resilience and the power of perspective"***.

After the successful webinar, the speakers are co-authoring, under the umbrella of IOMP-W, an **article on women's leadership in STEM** fields to be published in a scientific journal.

Another important task of IOMP-W was putting together some guidelines for future conference organizations, regarding equity and diversity among the members of the organizing / scientific committee as well as among keynote, invited speakers, and session chairs. The document will be released as **IOMP recommendations for equity and diversity regarding conference organizations**.






# CELEBRATING AWARDS & HONOURS



Back to Content

# AOSR Gold Medal 2026


## *Heartiest Congratulations*

TO

## EMERITUS PROFESSOR KWAN HOONG NG

★ ON RECEIVING THE ★

## AOSR GOLD MEDAL 2026

The International Organization for Medical Physics (IOMP) warmly congratulates Emeritus Professor Kwan Hoong Ng on being awarded the AOSR Gold Medal 2026 – the highest honour of the Asian Oceanic Society of Radiology (AOSR). This prestigious recognition celebrates his outstanding contributions to radiology and medical physics, his visionary leadership, and his unwavering dedication to advancing medical physics and improving patient care across the Asia–Oceania region and beyond.

> *"This award is a testament to Professor Ng's exceptional legacy and his enduring impact on our profession and community."*

### ABOUT THE AOSR GOLD MEDAL

The AOSR Gold Medal is the most prestigious award of the Asian Oceanic Society of Radiology. It is presented to an individual who has made distinguished and outstanding contributions to the field of radiology and related sciences in the Asia–Oceania region and has significantly advanced the mission and values of the AOSR.

### ABOUT EMERITUS PROFESSOR KWAN HOONG NG

- A distinguished medical physicist and visionary leader in the Asia–Oceania region.
- Past President of the International Organization for Medical Physics (IOMP) (2009–2013).
- Past President of the Asian Oceanic Society of Radiology (AOSR) (2014–2016).
- Widely respected for his leadership, scholarship, mentorship, and commitment to strengthening medical physics and radiological sciences.



Back to Content

# Call for Nomination:
# 2026 IDMP AWARD


The IOMP is pleased to seek nominations for the IDMP Award. This award recognises excellence in Medical Physics professional service, with particular emphasis on promoting medical physics within the nominee's geographic region and highlighting the contributions medical physicists make to patient care.

The 2026 IDMP Award is given on the occasion of the International Day of Medical Physics (IDMP) and will be announced on **November 7, 2026.**

## ABOUT THE IDMP AWARD

The IDMP Award consists of an IOMP certificate. In addition, a short biography of the awardee will be published in e-Medical Physics World (eMPW).

## SELECTION CRITERIA

- Professional medical physicist holding a master's degree or higher (or equivalent)
- Active member of a relevant Medical Physics Society
- Active in promoting medical physics nationally and/or internationally
- Strong professional contribution within the nominating region
- Original/applied work of high scientific quality or a significant professional contribution in the past 3 years
- Nominee must not be a current member of the IOMP Awards & Honours Committee or Executive Committee

## NOMINATING PROCEDURE

- Each National Member Organization (NMO) and Regional Organization (RO) may nominate
- Nominations should be made by the President or Secretary General of the organization
- In exceptional circumstances, individuals may nominate a colleague directly after checking with the IOMP Awards & Honours Committee
- Self-nomination will only be considered in exceptional circumstances
- Nominees should be full members of an IOMP NMO

## REQUIRED DOCUMENTS

1. Nomination letter (max. 1,000 words)
2. Nomination form completed by the candidate and signed by the nominator
   https://www.iomp.org/wp-content/uploads/2026/06/IOMP-award-form-2026_revised.docx
3. Curriculum vitae including publications
4. Brief biographical sketch (500 words)

Submission deadline: **9 August 2026**
Submit online via Google Form: **https://forms.gle/cUhb66wBxJmJgXUx5**
All submissions and supporting materials must be in PDF format.

One medical physicist per IOMP Regional Organization (EFOMP, AFOMP, SEAFOMP, MEFOMP, ALFIM, FAMPO and North America) will be selected.

Winners will be announced on **November 7, 2026.**

For more information, please visit **www.iomp.org/awards-honours**

Back to Content

International Organization for Medical Physics
www.iomp.org

Fairmount House 230 Tadcaster Road York YO24 1ES United Kingdom, T: +44 (0) 1904 610821, F: +44 (0) 1904 612279, www.iomp.org

# INTERNATIONAL MEDICAL PHYSICS WEEK (IMPW)

# IMPW 2026 Report:

## Celebrating the International Medical Physics Week 2026

## *"Sustainability in Healthcare: The Medical Physics Contribution"*

**Timothy Kemiki**

Recent Graduate, Department of Physics, Federal University of Technology, Minna, Nigeria

During the recently concluded **International Medical Physics Week (IMPW) in April**, which focused on **healthcare sustainability**, I gained valuable insights into what this concept means in practice.

As highlighted on the IOMP website, the theme recognised the urgent need to embed environmental, economic, and social sustainability within healthcare systems and emphasised the important role of medical physicists in advancing sustainable practices worldwide. As healthcare systems face growing pressures arising from **climate change, rising costs, and disparities in access,** our profession is uniquely positioned to develop solutions that are efficient, resilient, and sustainable. Whether through **reducing energy consumption in imaging and therapy, minimising waste in clinical workflows, or implementing innovative service models in resource-limited settings**, the work of medical physicists can contribute directly to improved patient outcomes and stronger environmental stewardship.

Although the presentations covered a diverse range of topics, several key messages stood out:

- Hospitals can **reduce medical waste** by more than 70% and shorten examination times for CT, MRI, and radiography while maintaining or improving clinical effectiveness.

- There is an urgent need to bridge the **global knowledge gap**. Providing free access to advanced knowledge and training, including concepts such as machine learning, can support substantial improvements in healthcare systems in low- and middle-income countries.

- **Free software tools** such as ATIA (Automatic Tool for Image Analysis) and pyATIA can support daily or weekly quality control monitoring. Results may be transmitted to an off-site medical physicist, who can review trends and identify parameters that fall outside tolerance levels. This approach can complement, rather than replace, comprehensive annual quality control assessments.

- **Artificial intelligence** can improve the efficiency and performance of healthcare systems, but it also consumes considerable energy. Medical physicists should therefore ask whether the clinical and operational benefits justify the associated environmental cost. One statement from the meeting particularly resonated with me: ***"AI requires HI"*** — the intelligent use of artificial intelligence still depends on human intelligence.

- Promoting **environmentally sustainable practices** in medical imaging is also a personal responsibility. Change begins with well-designed systems, but its success ultimately depends on the people who implement, sustain, and continuously improve them.

# IMPW 2026 Report: (Continued)

## Celebrating the International Medical Physics Week 2026

## *"Sustainability in Healthcare: The Medical Physics Contribution"*

**Timothy Kemiki**

Recent Graduate, Department of Physics, Federal University of Technology, Minna, Nigeria


**Sustainability and LMI Countries:**

Three regions, three perspectives. But let me start with the one that hit closest to home.

***Dr. Iyobosa B. Uwadiae, President of the Nigerian Association of Medical Physicists (NAMP):***
She didn't sugarcoat it. Africa has 60% of its medical physicists concentrated in just 3–4 countries, and 60% work only in radiotherapy. Meanwhile, cancer centers are destroyed (Sudan), machines sit idle, and over 100 physics graduates have no jobs.

Her boldest point? "The Container" – we've boxed medical physics into imaging and therapy. But what about applying our skills to diabetes, heart disease, or malaria? During COVID, local scientists built the ventilators. Why not low-cost diagnostic tools for rural clinics now? She called us to break out – and with a median age of 19.7 in Africa, the time is now.

***Prof. Hasin Anupama Azhari, Director of the South Asia Centre for Medical Physics and Cancer Research (SCMPCR):***
She framed sustainability as operational viability, not just green metrics. In Bangladesh, patients wait 1.5 years for treatment because a machine is down with no spare parts. The physicist's job? Keep machines alive through rigorous QC. A machine that lasts 15 years instead of 7 is the ultimate sustainability win.

***Patricia Mora Rodriguez, President of the American Association of Medical Physics (ALFIM) (2022-2025):***
She built a pyramid - before you talk about the environment, you need access, optimization, workforce, collaboration. Her example? The IAEA Appia remote QC tool – a cheap, locally-made phantom plus free software – lets one physicist support 22 sites across Latin America. That's sustainability through smart, low-tech collaboration.

# IMPW 2026 Report: (Continued)

## Celebrating the International Medical Physics Week 2026

## *"Sustainability in Healthcare: The Medical Physics Contribution"*

**Timothy Kemiki**

Recent Graduate, Department of Physics, Federal University of Technology, Minna, Nigeria

### What I learned (aligned with the objectives):

The main LMIC challenges are fragile infrastructure, brain drain, lack of recognition, and inequitable access – and medical physicists are uniquely positioned to solve them.

Regional practices differ, but common threads exist: adapt protocols to local resources, use remote support networks, and redefine our role beyond imaging/radiotherapy.

### Addressing the Big Questions:

The webinars also allowed participants to ask questions. Two answers from the recent IMPW caught my attention:

- **Why discuss sustainability? This isn't physics.**
- Sustainability is achieved through measurement and optimization—that is physics. We already have the expertise; we just need to apply it. The real problem is that we are often too busy.

- **Do automated tools like ATIA threaten medical physics jobs?**
- No. For a medical physicist covering 500 X-ray units or 100 CT scanners, daily manual QC is impossible. This tool doesn't replace you; it extends your reach, letting you focus on troubleshooting and corrective action. Automation makes the work more effective, not less.

### Conclusion

By participating in the recently concluded IMPW, I witnessed first-hand the crucial role that medical physicists play in advancing healthcare sustainability. Every session was informative, clearly presented, and delivered by excellent speakers. I believe this year's IMPW successfully raised awareness of sustainability, and I look forward to future events highlighting other critical issues in medical physics. Engaging with IMPW transforms a relatively unseen scientific discipline into a shared global mission. Participants do not merely gain knowledge; they become part of an international network committed to ensuring that radiation is used to heal while minimising potential harm.

**If you would like to learn more about IMPW – please keep reading.....**

# IMPW 2026 Report: (Continued)

## Celebrating the International Medical Physics Week 2026

## *"Sustainability in Healthcare: The Medical Physics Contribution"*

**Timothy Kemiki**

Recent Graduate, Department of Physics, Federal University of Technology, Minna, Nigeria

### What Is IMPW All About?

**International Medical Physics Week (IMPW)** is a global campaign organised by the **International Organization for Medical Physics (IOMP)** to raise awareness of the vital role that medical physicists play in healthcare. Held annually, usually in April or May, IMPW is a dedicated week of global outreach that demonstrates how the application of physics in medicine directly improves patient diagnosis, treatment, and safety.

At the heart of IMPW is the IOMP School, which offers free educational webinars on a wide range of contemporary topics. These have included breast imaging, radionuclide therapy, radiation protection—such as contact shielding and imaging during pregnancy—advanced physics topics, including monochromatic X-rays, the biological effectiveness of protons, and the Geant4 project, as well as leadership, artificial intelligence in healthcare, and energy sustainability. National and local organisations may also conduct independent activities to engage healthcare professionals, students, patients, and the wider community.

### Why Is IMPW Essential?

IMPW brings visibility to a profession that often remains unseen by patients but is fundamental to safe and effective modern healthcare. Medical physicists help ensure that technologies such as radiotherapy systems, CT scanners, MRI systems, and nuclear medicine equipment are used accurately, safely, and effectively. The IMPW webinars are designed for a broad audience, and engagement with the programme offers distinct benefits to different groups:

#### 1. For the General Public and Patients

This is where the importance of medical physics becomes tangible. When patients undergo an X-ray, nuclear medicine scan, or radiation treatment, they may never meet the medical physicist who helps make the procedure safe and effective.

IMPW webinars explain, in accessible ways, how technologies such as artificial intelligence can assist in detecting tumours and how proton therapy can target cancer while reducing radiation exposure to surrounding healthy tissues. Such knowledge can strengthen public understanding and trust in medical technology.

Participants may also learn about the **principle of ALARA** — keeping radiation exposure as low as reasonably achievable—which can help address concerns when an imaging examination involving ionising radiation is recommended. Better-informed patients are also more prepared to ask relevant questions about equipment calibration, radiation safety, and quality assurance, thereby contributing to higher standards of care.

# IMPW 2026 Report: (Continued)

## Celebrating the International Medical Physics Week 2026

## *"Sustainability in Healthcare: The Medical Physics Contribution"*

**Timothy Kemiki**

Recent Graduate, Department of Physics, Federal University of Technology, Minna, Nigeria

### 2. For Medical Physicists, Healthcare Professionals, and Healthcare Systems

IMPW helps **bridge communication and knowledge gaps across healthcare disciplines**. Nurses who understand the principles behind radiation protection and shielding can become more active participants in maintaining a strong radiation safety culture. Radiation therapists with a sound understanding of treatment-planning physics may be better able to recognise potential discrepancies before treatment is delivered. Physicians can also learn about emerging developments such as theranostics, which combines diagnostic imaging with targeted therapy and creates new opportunities for personalised patient care.

For practising medical physicists, hearing how new technologies and improved clinical practices have benefited patients can also reinforce the broader purpose of their work beyond routine technical responsibilities.

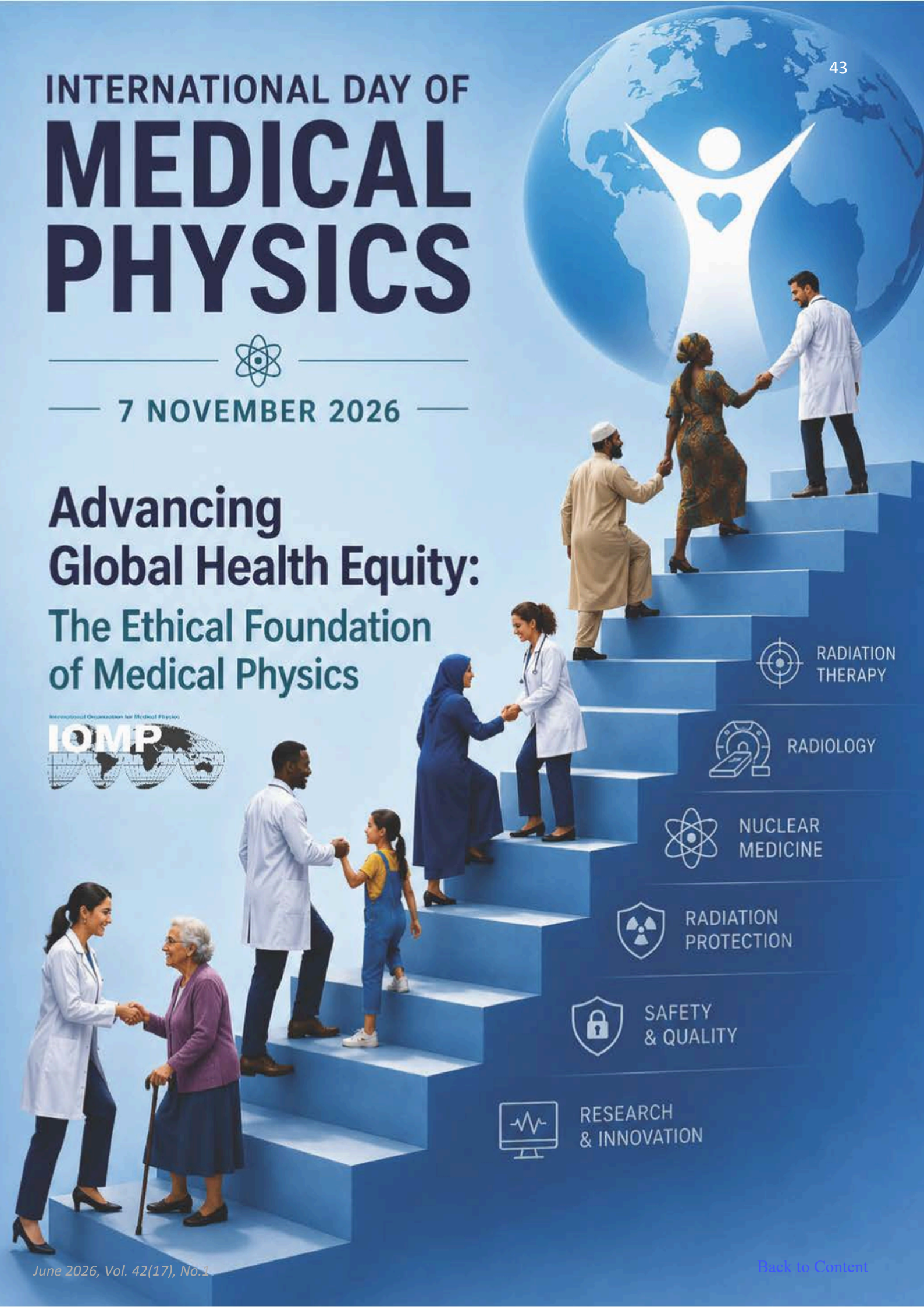
When clinicians and physicists learn common best practices from international experts, IMPW can help reduce disparities in healthcare delivery. It supports the goal of ensuring that patients in countries such as Nigeria or Nepal can benefit from the same principles of safe, accurate, and high-quality care as patients in New York or other well-resourced settings.

### 3. For Students and Aspiring Professionals

IMPW can serve as a **career catalyst**. Medical physics faces workforce shortages in many parts of the world, and IMPW helps inspire the next generation to enter the profession.

Undergraduate and postgraduate students can attend free webinars and discover how their interests in physics, mathematics, computing, or engineering may lead to careers that directly improve patient care. IMPW also connects students with international experts and may expose them to research opportunities, professional networks, scholarships, and further training.

The programme provides valuable insights into emerging areas such as artificial intelligence in medical imaging, FLASH radiotherapy, adaptive radiotherapy, and advanced radionuclide therapies. This exposure can help students align their final-year projects, postgraduate studies, and career plans with the future needs of medical physics and healthcare.






Back to Content

# Post Event Report: SIMIND Monte Carlo Workshop: Advanced Gamma Camera Modelling and Quantification (7-9 & 17 April 2026)

**Shalaine Tatu, MSc**

PhD candidate, Taylor's University, Malaysia
Philippine Nuclear Research Institute, Republic of the Philippines

## Introduction

On **7-9 April 2026**, the **SIMIND Monte Carlo Workshop on Advanced Gamma Camera Modelling and Quantification** was held at Taylor's University Lakeside Campus, Subang Jaya, Malaysia.

Organised in collaboration with the ASEAN College of Medical Physics (ACOMP), Taylor's University, Lund University, and Institut Fizik Malaysia, the workshop brought together researchers, medical physicists, and postgraduate trainees for an intensive programme focused on quantitative SPECT imaging, gamma camera modelling, and practical applications of the SIMIND Monte Carlo simulation platform.


The workshop featured **Professor Michael Ljungberg** of Lund University, Sweden—the developer of the SIMIND Monte Carlo program—as the expert instructor, with **Dr. Mohd Akmal Masud** (Sarawak General Hospital) as co-instructor.

The organising committee was spearheaded by **Prof. Dr. Chai Hong Yeong** (Taylor's University) and **Dr. Mohd Aminudin Said** (National Cancer Institute, Malaysia).

# Post Event Report: SIMIND Monte Carlo Workshop: Advanced Gamma Camera Modelling and Quantification (7-9 & 17 April 2026) (Continued)

**Shalaine Tatu, MSc**

PhD candidate, Taylor's University, Malaysia
Philippine Nuclear Research Institute, Republic of the Philippines

## About the Speaker

**Professor Michael Ljungberg, Ph.D.** is Professor of Medical Radiation Physics at Lund University, Sweden, and project manager of the Nuclear Medicine Physics group. With a distinguished career spanning clinical practice and academia, his expertise encompasses nuclear medicine imaging, internal dosimetry, Monte Carlo modelling, quantitative SPECT/CT, and patient-specific radionuclide therapy planning. He has authored more than 170 scientific publications and continues to contribute actively to international collaborations and doctoral supervision.

A major highlight of Professor Ljungberg's career is the development of the SIMIND Monte Carlo simulation program, which he began in 1983 and has since evolved into a leading platform for modelling scintillation cameras and SPECT systems. His pioneering work in quantitative SPECT has established key methodologies for image correction, activity quantification, and patient-specific dosimetry, significantly advancing the field of nuclear medicine.

## Workshop Objectives

The workshop was designed to provide hands-on training in Monte Carlo simulation for advanced SPECT system modelling, with emphasis on practical workflows that participants could adapt for imaging optimisation, dosimetry research, and education in their own institutions. By the end of the workshop, participants were expected to be able to:

- Explain the role of Monte Carlo simulation in SPECT system modelling and quantitative imaging validation.
- Install and configure SIMIND on their laptops (Windows/macOS/Linux) and verify a working environment.
- Define and modify SPECT camera models in SIMIND (collimator type, detector parameters, energy resolution, energy windows).
- Simulate projection data for common source geometries and phantoms (point/line sources, uniform cylinder, Jaszczak/NEMA-like setups).
- Quantify key imaging performance metrics from simulations (sensitivity, spatial resolution/FWHM, scatter fractions, penetration contributions).
- Evaluate acquisition and correction strategies (e.g., energy window selection, TEW/DEW concepts, attenuation/scatter corrections) using controlled simulation experiments.
- Generate simulation datasets suitable for reconstruction studies (OSEM parameter tuning, resolution recovery modelling, noise–resolution trade-offs).

# Post Event Report: SIMIND Monte Carlo Workshop: Advanced Gamma Camera Modelling and Quantification (7-9 & 17 April 2026) (Continued)

**Shalaine Tatu, MSc**

PhD candidate, Taylor's University, Malaysia
Philippine Nuclear Research Institute, Republic of the Philippines

## Programme:

| Time | Day 1 (07 April 2026) |
|---|---|
| 09.00-09.30 | Welcome message, expert introduction, and workshop overview |
| 09.30-10.30 | Refresher: SPECT physics & quantitative challenges (attenuation, scatter, septal penetration, collimator-detector response, PVE) |
| 10.30-11.00 | *Coffee break* |
| 11.00-12.00 | Why Monte Carlo for SPECT? Validation and optimization use-cases |
| 12.00-13.00 | SIMIND Overview: architecture, inputs/outputs, typical workflows, computation considerations |
| 13.00-14.00 | *Lunch break* |
| 14.00-15.00 | Practical 1: Baseline point source simulation |
| 15.00-15.30 | *Coffee break* |
| 15.30-16.30 | Practical 2: Command-line control and automation |
| 16.30-17.00 | Mini-project briefing: choose a radionuclide + task (e.g., $^{99m}$Tc, $^{123}$I, $^{177}$Lu, $^{153}$Sm) and define metrics |
| 17.00 | End of Day 1 |

| Time | Day 2 (08 April 2026) |
|---|---|
| 09.00-10.00 | Camera/collimator modelling in SIMIND (LEHR/MEGP/HEGP concepts; energy windows; energy resolution) |
| 10.00-10.30 | *Coffee break* |
| 10.30-12.30 | Scatter and septal penetration: mechanisms and how to quantify in simulation |
| 12.30-14.00 | *Lunch break* |
| 14.00-15.00 | Practical 3: Point/line sources and system performance |
| 15.00-15.30 | *Coffee break* |
| 15.30-17.00 | Practical 4: Collimator and phantom simulations |
| 17.00 | End of Day 2 |

| Time | Day 3 (09 April 2026) |
|---|---|
| 09.00-10.00 | Using SIMIND outputs for reconstruction studies (projection formatting, Poisson noise realism, calibration concepts)<br>Reconstruction parameter concepts: iterations/subsets, post-filtering, resolution recovery/CDR modelling) |
| 10.00-10.30 | *Coffee break* |
| 10.30-12.30 | Practical 5: Phantom-based quantification |
| 12.30-14.00 | *Lunch break* |
| 14.00-15.00 | Practical 6: Advanced simulation and reconstruction |
| 15.00-15.30 | *Coffee break* |
| 15.30-17.00 | Practical 7: Reconstruction and computation |
| 17.00-17.30 | Wrap-up: recommended best practices + pathways to clinical translation |
| 17.30 | End of Day 3 |

# Post Event Report: SIMIND Monte Carlo Workshop: Advanced Gamma Camera Modelling and Quantification (7-9 & 17 April 2026) (Continued)

**Shalaine Tatu, MSc**

PhD candidate, Taylor's University, Malaysia
Philippine Nuclear Research Institute, Republic of the Philippines

## Pre-workshop Session

On 6 April 2026, a pre-workshop virtual installation support session was held to help participants prepare their software environments. Led by Dr. Akmal Masud, the relevant SIMIND installation procedures were demonstrated. This included setting the environmental variables to the directory of SIMIND folder. Participants who encountered difficulties in running SIMIND were assisted.

## During the Workshop

Day 1 introduced the scientific background of quantitative SPECT, including attenuation, scatter, septal penetration, collimator-detector response, and partial volume effects, followed by a discussion on how these factors may be addressed in reconstruction. Participants were then introduced to the SIMIND platform, including its architecture, inputs and outputs, and typical computational workflow. The first practical sessions focused on baseline point source simulation, creation of input files, execution of simulations, and basic command-line control and automation.

*Prof. Ljungberg discusses the physics of gamma ray detection modelled in SIMIND.*

# Post Event Report: SIMIND Monte Carlo Workshop: Advanced Gamma Camera Modelling and Quantification (7-9 & 17 April 2026) (Continued)

**Shalaine Tatu, MSc**

PhD candidate, Taylor's University, Malaysia
Philippine Nuclear Research Institute, Republic of the Philippines

On the second day, the participants learned about **camera and collimator modelling, scatter and septal penetration analysis, and comparisons between voxel-based and analytical phantoms.**

The third day focused on the **integration of SIMIND outputs with reconstruction studies,** including the use of the CASToR reconstruction program and smc2castor conversion.

Additional practical sessions covered **phantom-based quantification, image-based phantoms such as XCAT and Zubal, tumour definition, activity and density assignment, attenuation correction, reconstruction parameter settings.**

The workshop concluded with a **virtual follow-up session** on 17 April 2026, during which multi-core simulation, penetration routine, image processing and SIMIND validation were discussed.


*Prof. Michael Ljungberg (third from left) with the participants of the SIMIND Monte Carlo Workshop.*

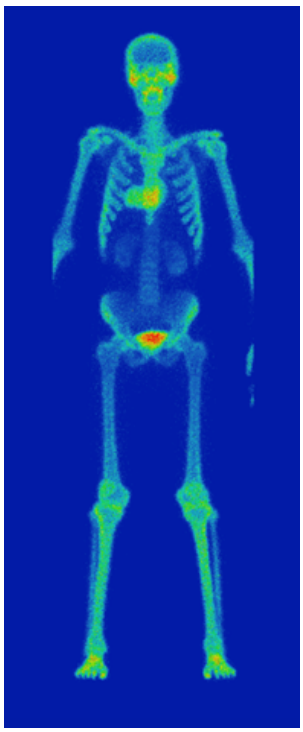
# Post Event Report: SIMIND Monte Carlo Workshop: Advanced Gamma Camera Modelling and Quantification (7-9 & 17 April 2026) (Continued)

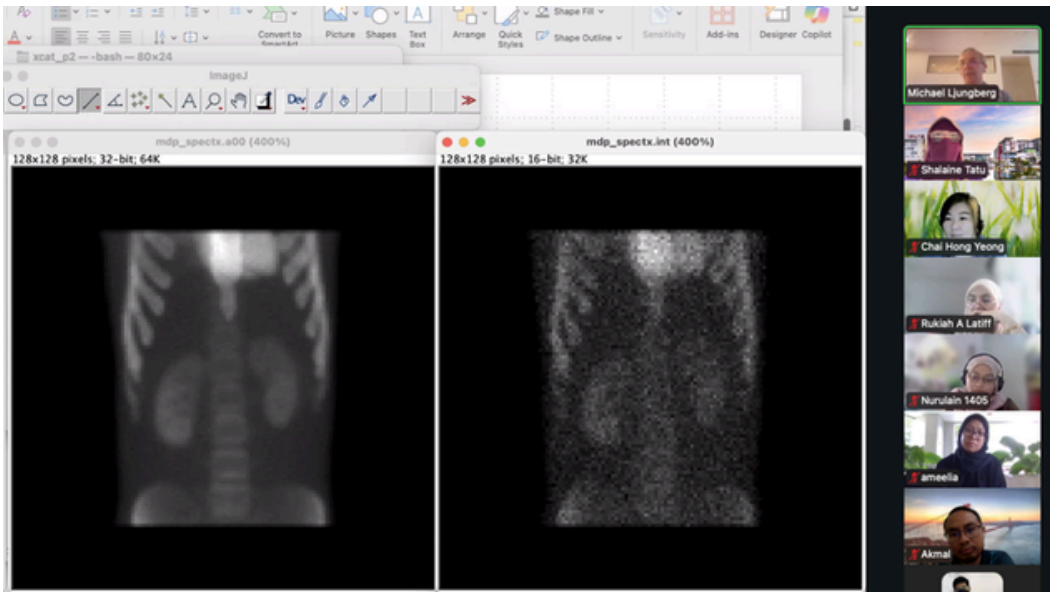
**Shalaine Tatu, MSc**

PhD candidate, Taylor's University, Malaysia
Philippine Nuclear Research Institute, Republic of the Philippines

One of the main highlights of the workshop was the opportunity for participants to learn directly from Professor Michael Ljungberg, whose longstanding work in nuclear medicine physics and development of the SIMIND program has had a substantial impact on quantitative SPECT and dosimetry research. The workshop **combined conceptual lectures with practical exercises,** which allowed participants not only to understand the underlying physics of simulation but also to apply that knowledge immediately through guided tasks. Participants left the workshop with exposure to working SIMIND scripts and input files, a better understanding of simulation-based validation, and clearer pathways for applying Monte Carlo methods to protocol optimisation, camera characterisation, reconstruction studies, and institution-specific research projects.

The workshop represents an important milestone in medical physics education and capacity building in the region, providing a structured platform for advanced training in gamma camera modelling and quantitative imaging. Beyond the technical knowledge gained, participants established a special interest group dedicated to knowledge sharing, collaboration, and mutual support in SIMIND-based simulation research. This emerging network is expected to strengthen regional expertise in quantitative nuclear medicine and foster future collaborative projects across ASEAN institutions.






*Demonstration of application of Poisson noise in reconstructed SIMIND images during the virtual session*


# Conference Report

# 24th SEACOMP & 17th PCMP

# Philippines Hosts Its Largest SEACOMP:
## 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

The **Society of Medical Physicists in the Republic of the Philippines (SMPRP),** in partnership with the **Southeast Asian Federation of Organizations for Medical Physics (SEAFOMP),** proudly hosted the 24th Southeast Asian Congress of Medical Physics (SEACOMP) together with the 7th Philippine Conference on Medical Physics (PCMP) from **10 to 13 June 2026** at the historic **Manila Hotel.**

Inspired by the uniquely crafted congress theme, **S.E.A.C.O.M.P**. - ***Synergizing Education and Advancing Clinical Outcomes in Medical Physics,*** an acronym that reflects the very name of the congress itself, the meeting brought together medical physicists, physicians, educators, researchers, students, regulators, industry partners, and healthcare professionals from across Southeast Asia and beyond to exchange knowledge, strengthen professional networks, and advance the safe and effective application of physics in medicine.

The congress reflected the shared commitment of SMPRP, SEAFOMP, the International Organization for Medical Physics (IOMP), and the Asia-Oceania Federation of Organizations for Medical Physics (AFOMP) to promote scientific excellence, professional development, innovation, and regional collaboration.

# Philippines Hosts Its Largest SEACOMP:
## 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

### A Historic Homecoming

SEACOMP 2026 marked a significant milestone for the Philippines as it hosted the Southeast Asian Congress of Medical Physics for the third time. The congress welcomed **369 registered participants**, making it the largest SEACOMP ever hosted in the Philippines and one of the most well-attended gatherings of the Southeast Asian medical physics community.

Delegates representing academia, hospitals, government agencies, professional organizations, and industry gathered in Manila to celebrate scientific excellence while strengthening partnerships that continue to shape the future of medical physics throughout the region.

### A Scientific Program that Embodied S.E.A.C.O.M.P.

Before the official opening of the congress, participants attended **hands-on workshops** featuring the latest advancements in radiotherapy technologies and clinical workflows. The sessions included ***"Precision in Motion: Intelligent Workflow and Precise Treatment with uRT-linac 506c & AI Empowerment in Oncology Healthcare"*** presented by United Imaging Healthcare and ***"Elevating Radiotherapy Workflow: ARIA-AURA EMR Reporting and Advanced Arc Therapy with RapidArd Dynamic"*** facilitated by Siemens Healthineers. These workshop sessions provided participants with practical exposure to emerging technologies and workflow innovations in radiotherapy and oncology care.


*Pre-congress workshops facilitated by United Imaging Healthcare and Siemens Healthineers, followed by a panel discussion and a commemorative group photo.*

# Philippines Hosts Its Largest SEACOMP:
# 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

### An Inspiring Opening to SEACOMP 2026

The Opening Programme on 11 June 2026 officially commenced four days of scientific exchange and regional collaboration.

Congress Chairs **Mr. Ramon Carlo L. Cruzpero** and **Mr. Delmar Arzabal** warmly welcomed delegates to Manila, emphasizing that the congress was more than a scientific meeting—it was a gathering of colleagues, mentors, students, and friends committed to improving healthcare through medical physics.

In her opening remarks, **Professor Dr. Chai Hong Yeong**, President of SEAFOMP, congratulated SMPRP for successfully hosting the congress and thanked the organizing committee, volunteers, sponsors, exhibitors, invited speakers, and delegates whose collective efforts made the event possible.

Reflecting on the congress theme, she reminded participants that although medical physics is built upon science, technology, and precision, its true purpose is centered on people - patients, students, colleagues, mentors, and future professionals. As she concluded her term as SEAFOMP President, she described the Federation as her "second family," founded on trust, friendship, collaboration, and a shared vision of improving patient care throughout Southeast Asia.

She concluded by encouraging young medical physicists to become active members of their professional societies, volunteer their talents, and one day assume leadership roles within SEAFOMP, AFOMP, and IOMP, reminding everyone that leadership begins with a willingness to serve.


*Opening remarks by Congress Co-Chairs Ramon Carlo Cruzpero and Delmar Arzabal, followed by welcome speech from SEAFOMP President, Prof. Dr. Chai Hong Yeong.*

# Philippines Hosts Its Largest SEACOMP:
## 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital


*The opening ceremony concluded with a vibrant Filipino cultural performance that warmly welcomed international delegates while showcasing the country's rich heritage and hospitality.*

Throughout the four-day meeting, participants attended an extensive scientific program comprising plenary lectures, keynote presentations, parallel scientific sessions, the prestigious 21st John Cameron Memorial Lecture, educational workshops, industry symposia, AI-focused roundtable discussions, the ASEAN College of Medical Physics (ACOMP) Workshop, the Internal Dosimetry Workshop, product demonstrations, and the highly anticipated Anchali Krisanachinda SEAFOMP Quiz.

Scientific discussions spanned radiotherapy physics, diagnostic and interventional radiology, nuclear medicine, medical imaging, artificial intelligence, radiation protection, internal dosimetry, theranostics, quality assurance, personalized medicine, emerging technologies, and medical physics education. Collectively, these sessions demonstrated how continuous professional education, interdisciplinary collaboration, and scientific innovation are fundamental to achieving better clinical outcomes for patients throughout Southeast Asia and beyond.

# Philippines Hosts Its Largest SEACOMP:
# 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

### Keynote Address by the President of IOMP

Setting the tone for the scientific program, the congress then featured an inspiring **Keynote Address** delivered by **Prof. Dr. Eva Bezak, President of the IOMP.** Her keynote lecture, ***"Leading with Impact: Synergizing Education and Clinical Excellence in Medical Physics,"*** perfectly echoed the congress theme by emphasizing the transformative role of leadership, education, mentorship, and international collaboration in advancing the profession. Prof. Bezak underscored that medical physicists must lead not only through scientific and technical excellence but also by cultivating future leaders, fostering innovation, strengthening educational pathways, and translating research into meaningful improvements in patient care. Her address provided an inspiring vision for the days ahead, reinforcing that the future of medical physics depends on the collective commitment of the global community to educate, collaborate, and lead with purpose.



*IOMP President, Prof. Dr. Eva Bezak delivering her plenary keynote on leadership in medical physics.*

### Congress Highlight: The 21st John Cameron Memorial Lecture

A highlight of the congress was the **21st John Cameron Memorial Lecture,** delivered by **Prof. Agnette dP. Peralta,** MS, FIOMP, one of the pioneers of medical physics in Southeast Asia.

Her lecture, ***"Health Technology Assessment in Medical Physics,"*** emphasized the growing importance of evidence-based health technology assessment (HTA) in evaluating and implementing medical technologies that are safe, effective, sustainable, and patient-centered. She underscored the expanding role of medical physicists in ensuring that technological innovation translates into measurable improvements in healthcare delivery and clinical outcomes.

# Philippines Hosts Its Largest SEACOMP:
## 24th SEACOMP & 7th PCMP Unite the Region in Manila
10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

Prof. Peralta is the founding president of the Society of Medical Physicists in the Republic of the Philippines (SMPRP) and one of the founding members of both the Southeast Asian Federation of Organizations for Medical Physics (SEAFOMP) and the Asia-Oceania Federation of Organizations for Medical Physics (AFOMP). She is also a fellow of the International Organization for Medical Physics (IOMP), recognizing her exceptional contributions to medical physics education, leadership, and regional cooperation.

Her selection as the 21st John Cameron Memorial Lecturer was especially meaningful as SEACOMP returned to the Philippines, celebrating her pioneering legacy and the country's enduring contributions to the advancement of medical physics in Southeast Asia particularly in the Philippines.



*The 21st John Cameron Memorial Lecture delivered by Prof. Agnette dP. Peralta.*

### Advancing Innovation Through Industry Partnership

An integral part of SEACOMP 2026 was its vibrant Commercial Exhibition, which brought together leading industry partners from around the world to showcase the latest innovations in medical physics, diagnostic imaging, radiotherapy, nuclear medicine, quality assurance, radiation protection, and healthcare technologies. Complementing the scientific programme, the exhibition provided delegates with valuable opportunities to explore emerging technologies, engage directly with manufacturers and technical experts, and discover innovative solutions that continue to shape the future of patient care.

The success of the congress was made possible through the generous support of 13 sponsors and the participation of 49 exhibitors, whose commitment to education, innovation, and professional development greatly enriched the overall congress experience.

# Philippines Hosts Its Largest SEACOMP:
## 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

**United Imaging Healthcare** served as the Platinum Plus Sponsor, while **idsMED, PTW, BEBIG, LAP, and Siemens Healthineers** were recognized as Platinum Sponsors. **RTI** and **Bayer** supported the congress as Silver Sponsors, while **BaseMed** and **Elekta** were Bronze Sponsors. The exhibition was further strengthened by the participation of **Transmedic, Vision RT, Quantum Precision, RaySearch Laboratories, C-RAD, RaySafe,** and many other valued industry partners whose exhibits showcased cutting-edge technologies and practical innovations supporting modern medical physics practice.

Throughout the four-day congress, the exhibition hall became a dynamic hub for scientific exchange and professional interaction. Delegates engaged in meaningful discussions with industry leaders, explored state-of-the-art technologies, and gained firsthand insights into innovations that support safer, more efficient, and more patient-centered healthcare. These interactions fostered valuable partnerships between academia, clinical practice, research, and industry, underscoring the important role of collaboration in translating technological advances into improved healthcare delivery.

The Organizing Committee extends its sincere appreciation to all sponsors, exhibitors, and industry partners for their unwavering support and invaluable contributions. Their continued partnership was instrumental in the success of SEACOMP 2026 and will continue to play an important role in advancing medical physics and improving healthcare throughout the region.

# Philippines Hosts Its Largest SEACOMP:
## 24th SEACOMP & 7th PCMP Unite the Region in Manila
10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

### An Evening of Fellowship: The Gala Dinner and Social Night

Beyond the scientific sessions and educational activities, SEACOMP 2026 celebrated one of its most cherished traditions—the Gala Dinner and Social Night, an evening dedicated to friendship, fellowship, and the enduring bonds that unite the Southeast Asian medical physics community.

Held in an atmosphere of warmth and celebration, the gala brought together delegates, invited speakers, industry partners, and guests for a memorable evening that reflected the renowned Filipino spirit of hospitality. The event provided a welcome opportunity for participants to reconnect with longtime colleagues, forge new friendships, and celebrate the shared accomplishments of the profession in a relaxed and festive setting.

The evening was enlivened by cultural performances, music, and entertainment that showcased the rich heritage and vibrant traditions of the Philippines, offering international delegates a memorable glimpse into the country's culture while reinforcing the congress's spirit of inclusivity and regional unity. Conversations extended well beyond the dinner tables as delegates exchanged experiences, shared aspirations, and strengthened collaborations that will continue long after the congress concluded.

A highlight of the evening was the recognition of outstanding contributions to the medical physics community through the presentation of awards, certificates, and professional recognitions, celebrating excellence in research, education, leadership, and service.

More than a social gathering, the Gala Dinner embodied the essence of the SEA-blings—a regional family brought together not only by a shared profession but also by mutual respect, friendship, and a collective commitment to advancing medical physics across Southeast Asia. In many ways, the evening captured the heart of SEACOMP 2026, reminding delegates that while scientific excellence drives the profession forward, it is the relationships, collaborations, and sense of community forged along the way that make the journey truly meaningful.



# Philippines Hosts Its Largest SEACOMP:
## 24th SEACOMP & 7th PCMP Unite the Region in Manila
10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

# Philippines Hosts Its Largest SEACOMP:
## 24th SEACOMP & 7th PCMP Unite the Region in Manila
10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

### Inspiring Future Medical Physicists: The Anchali Krisanachinda SEAFOMP Quiz

One of the most anticipated educational activities of the congress was the **Anchali Krisanachinda SEAFOMP Quiz**, named in honor of Prof. Anchali Krisanachinda, whose unwavering dedication to medical physics education and regional collaboration continues to inspire generations of medical physicists across Southeast Asia.

This year's competition introduced an exciting new format that reflected the evolving spirit of SEAFOMP. Moving away from the traditional country-based contest, participants were grouped into multinational teams composed of members from different Southeast Asian countries. This innovative approach encouraged participants to learn from one another, exchange diverse perspectives, and work together in solving challenging medical physics questions, placing collaboration and teamwork at the heart of the competition.

The quiz featured multiple rounds that tested participants' knowledge of radiotherapy, diagnostic and interventional radiology, nuclear medicine, radiation protection, dosimetry, medical imaging, and medical physics fundamentals. Contestants were also challenged to demonstrate analytical thinking, problem-solving skills, and their familiarity with the history and activities of SEAFOMP. The new team format fostered lively discussions, strengthened friendships among participants, and generated enthusiastic audience engagement throughout the competition.

**More than a competition,** the quiz celebrated the values that have long defined the SEAFOMP community - lifelong learning, mentorship, teamwork, and regional friendship. By bringing together young medical physicists from different countries into collaborative teams, the activity fostered new professional connections and strengthened the growing family of SEAFOMP, ensuring that the friendships formed during the congress will continue to flourish long after the final round of questions.

# Philippines Hosts Its Largest SEACOMP:
## 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

### Strong Scientific Contributions Across Southeast Asia

The congress featured 82 accepted scientific papers, comprising **46 oral presentations** and **36 poster presentations,** reflecting the vibrant research landscape of Southeast Asia.

The presentations spanned a broad range of topics, including **radiotherapy physics, diagnostic and interventional radiology, nuclear medicine, medical imaging, radiation protection, quality assurance, artificial intelligence, imaging optimization, internal dosimetry, theranostics, and other emerging technologies.** Together, they showcased the depth of scientific expertise within the region and highlighted how research continues to improve the safety, quality, and effectiveness of patient care.

Recognizing the importance of supporting the next generation of researchers, SEAFOMP awarded **five SEAFOMP Travel Awards** to outstanding early-career medical physicists, enabling them to attend the congress, present their research, and engage with leading experts from across Southeast Asia and beyond. The 2026 SEAFOMP Travel Awardees were **Ms. Nurulain Farhanah Binti Khairuman (Malaysia), Ms. Veni Setyowati (Indonesia), Ms. Kannika Meerod (Thailand), Ms. Maria Cecilia Rosero (Philippines), and Mr. John Eros Templonuevo (Philippines).**

Beyond providing financial assistance, the Travel Awards offered valuable opportunities for scientific exchange, mentorship, professional networking, and international collaboration. The program reflects SEAFOMP's continuing commitment to empowering promising young medical physicists, fostering regional cooperation, and supporting the professional development of future leaders who will contribute to the advancement of medical physics throughout Southeast Asia.

*SEAFOMP Travel Grant Awardees and SEAFOMP ExCom*

# Philippines Hosts Its Largest SEACOMP:
# 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

### Recognizing the Next Generation: SEAFOMP Young Leaders Award 2026

An inspiring highlight of the congress was the presentation of the **SEAFOMP Young Leaders Award 2026**, an initiative that recognizes promising young medical physicists who have demonstrated outstanding leadership potential, professional excellence, and meaningful contributions to the advancement of medical physics in their respective countries and across Southeast Asia.

The award reflects SEAFOMP's commitment to developing future leaders who will continue to strengthen education, research, clinical practice, and regional collaboration. By recognizing emerging professionals early in their careers, the Federation encourages active engagement in professional societies and prepares the next generation to assume leadership roles within SEAFOMP, AFOMP, IOMP, and their respective national organizations.

Representing six SEAFOMP member organizations, the awardees exemplified excellence in clinical practice, research, education, and professional service. Their accomplishments reflect the remarkable progress of medical physics throughout the region and the bright future of the profession under a new generation of dedicated leaders.

The Young Leaders Award served as a powerful reminder that the future of medical physics depends not only on scientific innovation but also on investing in people. By recognizing and mentoring emerging professionals, SEAFOMP continues to cultivate a strong pipeline of leaders who will sustain the Federation's mission for years to come.

*The winners of the SEAFOMP Young Leaders Award 2026*

| Country | Awardees |
|---|---|
| Indonesia | **Dr. Akbar Azzi, F.Med.** |
| Malaysia | **Dr. Janatul Madinah Wahabi, PhD** |
| Singapore | **Dr. Calvin Koh Wei Yang, PhD** |
| Vietnam | **Dr. Soai Dang Quoc** |
| Thailand | **Mr. Pitchayut Nakkrasae, M.Sc.** |
| Philippines | **Ms. Nikkitita M. Magdaong, M.Sc.** |

# Philippines Hosts Its Largest SEACOMP:
# 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

### A New Chapter for SEAFOMP

A major highlight of the Closing Ceremony was the formal turnover of the SEAFOMP Executive Committee, recognizing the dedication and accomplishments of the outgoing officers while welcoming the new leadership that will guide the Federation through its next chapter.

**Outgoing SEAFOMP ExCom (2022–2026):**

- President: Dr. Chai Hong Yeong (Malaysia)
- Vice President: Dr. Taweap Sanghanthum (Thailand)
- Secretary-General: Mr. Delmar Arzabal, MSc (Philippines)
- Treasurer: Dr. Kitiwat Khamwan (Thailand)

**Incoming SEAFOMP ExCom (2026–2029):**

- President: Dr. Supriyanto Pawiro (Indonesia)
- Vice President: Dr. Kitiwat Khamwan (Thailand)
- Secretary-General: Mr. Ramon Carlo L. Cruzpero, MSc (Philippines)
- Treasurer: Dr. Taweap Sanghanthum (Thailand)


*Outgoing (left) and incoming (right) SEAFOMP ExCom during the leadership turnover ceremony.*

The transition symbolized both continuity and renewal, ensuring that SEAFOMP remains well-positioned to address the evolving challenges and opportunities facing medical physics in Southeast Asia. With a new Executive Committee representing several member organizations across the region, the Federation reaffirmed its commitment to strengthening regional collaboration, advancing education and research, promoting professional excellence, and supporting the continued growth of medical physics.

# Philippines Hosts Its Largest SEACOMP:
# 24th SEACOMP & 7th PCMP Unite the Region in Manila
## 10-13 June 2026 | The Manila Hotel (Continued)

**Ramon Carlo L. Cruzpero[1,2] and Elisa Jemimah T. Pineda[1]**

[1] University of the Philippines Manila, [2] University of the Philippines- Philippine General Hospital

### A New Benchmark for SEACOMP

With record-breaking attendance, an outstanding scientific programme, distinguished faculty, vibrant scientific contributions, and strengthened regional partnerships, SEACOMP 2026 set a new benchmark for medical physics congresses in Southeast Asia. Over four memorable days, it advanced education, research, innovation, professional development, and excellence in patient care.

By bringing together medical physicists, clinicians, educators, researchers, students, regulators, professional organisations, and industry partners, the congress fostered new collaborations, inspired future leaders, celebrated regional achievements, and strengthened the enduring friendships that define the SEACOMP community.

As delegates left Manila, they carried home valuable scientific insights, expanded professional networks, renewed inspiration, and cherished memories. Hosting SEACOMP for the third time, the Philippines proudly concluded another successful chapter in the Federation's history.

The torch now passes to **Phuket, Thailand,** for the **25th Southeast Asian Congress of Medical Physics (SEACOMP 2027), held jointly with the 27th Asia-Oceania Congress of Medical Physics (AOCMP 2027).** Until the **SEA-blings** meet again, the friendships and collaborations forged in Manila will continue to inspire innovation, leadership, and excellence in medical physics.

**Watch the full video of the congress here**

# The WiN Global Breast Cancer Awareness Webinar, Vienna (October 31, 2025), highlights "Science, Solidarity, Survival."

**Kwan Hoong Ng, PhD**

Emeritus Professor, Department of Biomedical Imaging, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

On October 31, 2025, the WiN (Women in Nuclear) **https://win-global.org/**

The Global Breast Cancer Awareness Webinar was organised around the theme **"Science, Solidarity, Survival."** This theme reflects humanity's continuing fight against breast cancer, one of the most significant health challenges affecting women worldwide. As breast cancer continues to affect individuals, families, and communities across cultures and continents, the webinar sought to harness scientific progress, early detection, public awareness, and community support to improve health outcomes.

The theme embodies a powerful philosophy. **Science** provides the knowledge, technologies, and clinical strategies required to prevent, detect, and treat breast cancer. **Solidarity** reflects the collective commitment of policymakers, healthcare professionals, scientists, advocates, survivors, and communities. **Survival** represents both the ultimate goal of cancer care and the resilience of those who confront the disease. Together, these three concepts provide a framework that recognises the complexity of breast cancer while honouring the courage of those affected by it.

The initiative arose from a sobering reality: breast cancer remains among the most commonly diagnosed cancers in women worldwide. Nevertheless, advances in early detection, imaging, treatment, and supportive care have created important opportunities to save lives and improve long-term outcomes. The hybrid webinar, organised by **Women in Nuclear Global (WiN Global) in partnership with the International Atomic Energy Agency (IAEA)**, embodied a shared movement in which science meets solidarity and survival becomes a collective mission.

**Ms Amal Elrefaei, Vice-President of WiN Global,** served as the moderator and guided participants through a programme that brought together diplomatic leadership, scientific expertise, clinical perspectives, and deeply personal testimonies. The opening remarks by **Ms Hasna Al Blooshi** set the tone for a comprehensive exploration of breast cancer encompassing policy, technology, clinical practice, advocacy, and lived experience.

The diplomatic dimension of the initiative was strongly represented through statements by **His Excellency Mr Kaifu Atsushi, Ambassador of Japan to the IAEA,** and **Her Excellency Ms Matilda Aku Alomatu Osei-Agyeman, Ambassador of Ghana to the IAEA.** Their participation underscored the recognition that breast cancer transcends national boundaries and requires a coordinated international response. The presence of these distinguished diplomats demonstrated how countries can unite to address shared health challenges and support equitable access to cancer care.

# The WiN Global Breast Cancer Awareness Webinar, Vienna (October 31, 2025), highlights "Science, Solidarity, Survival." (Continued)

**Kwan Hoong Ng, PhD**

Emeritus Professor, Department of Biomedical Imaging, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

**Ms Lisa Stevens, Director of the IAEA Division of Programme of Action for Cancer Therapy**, delivered a presentation entitled ***"The Role of Policymakers, Governments and International Organisations in Enhancing Breast Cancer Management and Awareness."*** She highlighted the essential roles of health policy, national planning, international cooperation, and sustainable infrastructure in strengthening breast cancer services worldwide. Her insights demonstrated that effective cancer care depends not only on clinical expertise and technology but also on coordinated policies, trained workforces, financing, and equitable access. Her additional role as Vice-President of WiN IAEA further illustrated the intersection between nuclear science, healthcare advocacy, and humanitarian action.

The technological dimension of breast cancer detection was addressed by **Ms Virginia Tsapaki,** a medical physicist from the IAEA Division of Human Health. Her presentation, ***"IAEA Contribution: Focus on Mammography Technology and Its Added Value to Breast Cancer Imaging,"*** examined the role of mammography and related imaging technologies in the early detection and diagnosis of breast cancer. The IAEA's contribution to quality assurance, professional training, radiation protection, and access to advanced imaging demonstrates how radiation science can be applied directly to improving women's health worldwide.

**Emeritus Professor Dr Kwan Hoong Ng** of Universiti Malaya brought his passion for supporting cancer survivors, academic excellence and international recognition to the discussion. He highlighted the global challenge of breast cancer while affirming the rising survival rates made possible through early detection and scientific progress. He explained how imaging technologies and new predictive approaches based on patient data can save lives, especially when coupled with international collaboration and improved access in low-resource settings. Addressing survivors, he emphasised that scientific breakthroughs are meaningful because they restore real women's lives and futures. He acknowledged multidisciplinary teamwork and closed by reminding the audience of Albert Einstein's words: ***"There are only two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle."***

**Professor Dr. Mee Hoong See,** a consultant breast surgeon from the Universiti Malaya Medical Centre (UMMC), presented the clinical perspective. Her presentation on diagnosis, treatment and patient care experience brought the human dimension of breast cancer into sharp focus. Through her clinical expertise, participants gained insights into the daily realities of breast cancer treatment, the evolution of surgical techniques and the critical importance of personalised patient care. Her experience dealing with patients provided a grounding reality to the technological and policy discussions, reminding the audience that behind every statistic lies a human story.

# The WiN Global Breast Cancer Awareness Webinar, Vienna (October 31, 2025), highlights "Science, Solidarity, Survival." (Continued)

**Kwan Hoong Ng, PhD**

Emeritus Professor, Department of Biomedical Imaging, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

**Ms. Udie Soko,** founder and executive director of the Zambian Cancer Society and a breast cancer survivor herself, spoke next. Her participation highlighted the global nature of breast cancer challenges while demonstrating how individual experiences can catalyse broader social change. Ms. Soko's work in founding and leading the Zambian Cancer Society illustrates how personal battles with cancer can transform into advocacy that benefits entire communities and nations.

By empowering participants to take preventive health measures, the webinar catalysed positive change that could enable earlier detection. The strengthening of community support for breast cancer initiatives creates lasting infrastructure for ongoing advocacy and support.

The enhanced collaboration between scientific and humanitarian communities represents a model for addressing other global health challenges. The successful integration of radiation science and medical physics expertise, clinical practice, survivor advocacy and international diplomacy demonstrates how complex problems require interdisciplinary solutions. This collaborative approach could serve as a model for addressing other diseases where technology, policy and community support must work in concert.

The timing of the webinar during Breast Cancer Awareness Month is strategically significant, aligning with global efforts to focus on the breast cancer issue. However, the initiative's impact extends beyond October, creating lasting connections and commitments that continue throughout the year. The hybrid format of the event, accommodating both in-person and virtual participants, reflects the modern reality of global collaboration while ensuring maximum accessibility.

By bringing together diverse voices and expertise, the webinar created a comprehensive resource for understanding breast cancer from multiple perspectives while honouring the experiences of those who have faced the disease directly and the memory of those lost to breast cancer.

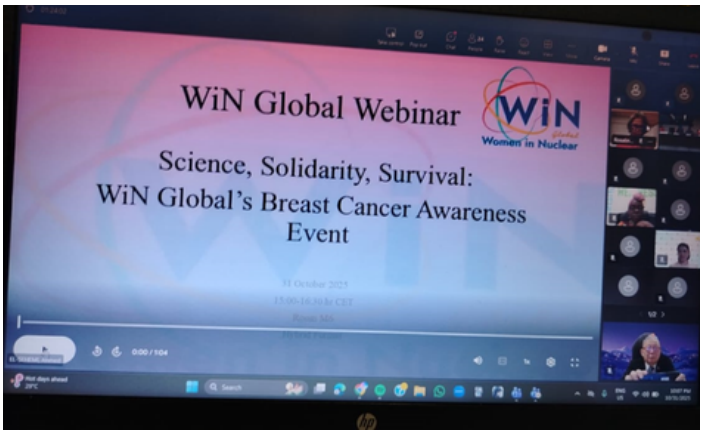
In conclusion, the WiN Global Breast Cancer Awareness Webinar has brought together voices from science, policy, clinical expertise and personal testimonies. It represents more than awareness, but action, inspiration and collective commitment to a future where breast cancer's impact is diminished through early detection, improved treatment and strong community support.

***Science provides the knowledge, solidarity gives us strength, and together they improve the prospect of survival.***

# The WiN Global Breast Cancer Awareness Webinar, Vienna (October 31, 2025), highlights "Science, Solidarity, Survival." (Continued)

**Kwan Hoong Ng, PhD**

Emeritus Professor, Department of Biomedical Imaging, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia




*Opening of the WiN Global Webinar*


*The presenters (Top row) Ms. Lillian Phua, Prof. MH See, Emeritus Prof. KH Ng (Middle row) Ms. Udie Soko, Ms. Rosalin Tan.*

*(From left) Ms. Lisa Stevens, Ms. Amal Elrefaei, H.E. Ms Matilda Aku Alomatu Osei-Agyeman, H.E. Mr. Kaifu Atsushi, Ms. Hasna Al Blooshi*

*Group photo of on-site panel members and participants at the IAEA, Vienna.*

# From Fragmentation to Clarity: Rebuilding the Medical Physics Education Pathway in India

**A.Surega, PhD, MSc**

Medical Physicist, Tamil Nadu Government Multi Super Specialty Hospital, Chennai, India
suregaanbumani@gmail.com

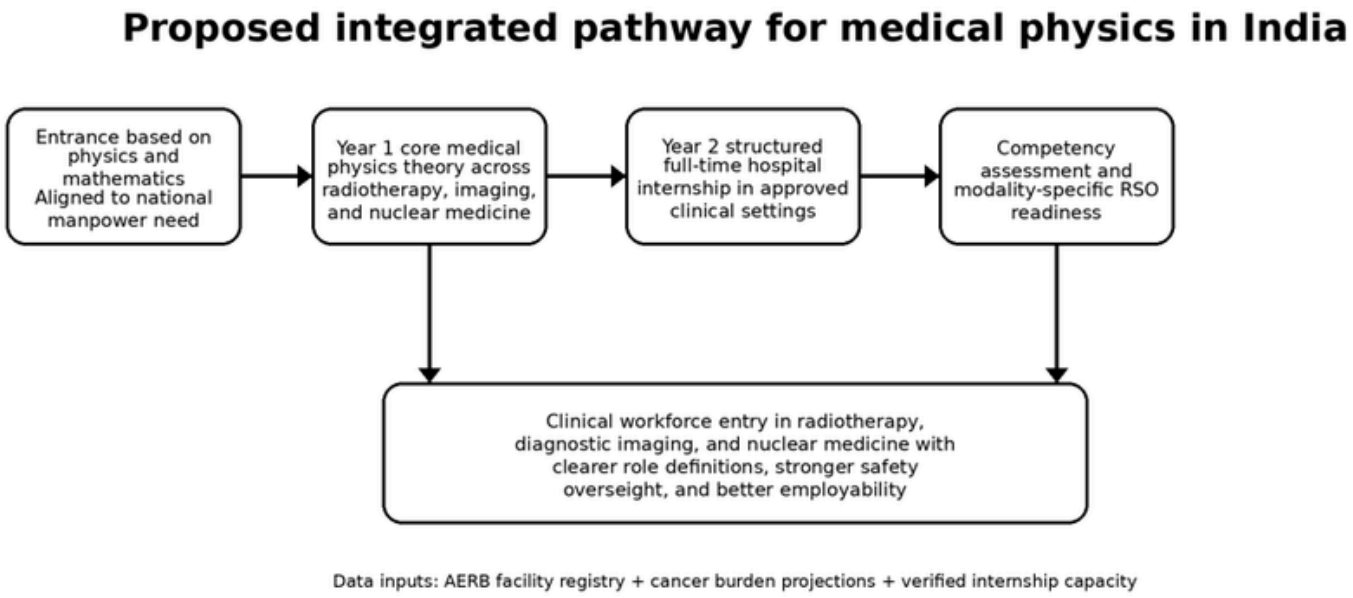



*Figure 1. A more coherent education-to-employment pathway can reduce uncertainty and strengthen patient safety*

## Introduction

Medical physics in India stands at an important crossroads. Over the past few years, I have seen a recurring pattern across education, clinical training, and recruitment: the system is not short of intent, but it is **short of alignment.** Universities, hospitals, and regulators each play essential roles, yet they often operate as separate islands. The result is uncertainty for students, uneven employability for graduates, and avoidable ambiguity in clinical practice. The way forward is not a dramatic reinvention of the profession. It is a more careful connection of the parts that already exist.

The first problem is **structural.** A medical physics degree is an academic qualification, but clinical practice requires supervised training. In principle, this is a sound model. It protects patients and ensures that professional entry is linked to competence rather than to classroom exposure alone. The difficulty in India is that postgraduate intake has grown faster than the availability of structured clinical internships. When the number of students admitted each year is not matched to verified hospital training capacity, graduates are left waiting for a pathway that was never fully mapped to begin with. In that sense, the bottleneck is not lack of regulation; it is lack of planning.

# From Fragmentation to Clarity: Rebuilding the Medical Physics Education Pathway in India (Continued)

**A.Surega, PhD, MSc**

Medical Physicist, Tamil Nadu Government Multi Super Specialty Hospital, Chennai, India
suregaanbumani@gmail.com

A second issue is the **widening gap** between what medical physicists are trained to do and how the workforce is sometimes described. Medical physics is a physics-led clinical discipline. Its core responsibilities include dosimetry, commissioning, quality assurance, optimisation, and radiation protection. These are not interchangeable with technology-based clinical roles. Radiotherapy technology, diagnostic radiography, and nuclear medicine technology are all vital professions, but they are not the same as medical physics. When equivalence is declared too casually, the distinction between scientific custody and operational service becomes blurred, and that blur ultimately weakens both professional clarity and patient safety.

This is why **recruitment language** matters so much. A single notification may appear administrative, but it also signals what the system believes is comparable. When MSc Radiotherapy Technology is treated as equivalent to MSc Medical Physics without a rigorous bridge structure, the profession receives a subtle message: depth can be substituted by convenience. That is not a minor wording issue. It affects student choices, institutional expectations, and the long-term identity of the field. A transparent bridge mechanism can exist, but it must be competency-driven, accredited, and explicit. Equivalence should never be used as shorthand for evidence.

A more constructive model would begin with **seat planning and training design** that are tied to real clinical need. India already has useful data sources: AERB records show where radiation facilities are licensed and expanding, while cancer burden projections and health-system indicators help estimate future demand. These inputs should inform national planning for medical physics admissions and internship slots. If clinical training capacity expands, intake can expand with it. If capacity is limited, intake should be adjusted accordingly. This is not a restriction for its own sake; it is stewardship of the profession.

The **internship** itself also deserves to be broader and more deliberate. Medical physics is no longer confined to radiotherapy alone. Diagnostic imaging and nuclear medicine are now major contributors to patient care and to population radiation exposure. That means the training pipeline should expose students to all three domains in a structured way: radiotherapy for dosimetry and treatment safety; diagnostic imaging for optimisation, shielding, and protocol awareness; nuclear medicine for radionuclide handling, patient protection, and modality-specific safety practice. A graduate who has been trained across these settings is better prepared for the real shape of modern healthcare.

**Radiation Safety Officer** roles are another area where clarity would make an immediate difference. In many settings, RSO responsibilities are closely aligned with the technical training of medical physicists, especially when those physicists have completed supervised exposure in the relevant

# From Fragmentation to Clarity: Rebuilding the Medical Physics Education Pathway in India (Continued)

**A.Surega, PhD, MSc**

Medical Physicist, Tamil Nadu Government Multi Super Specialty Hospital, Chennai, India
suregaanbumani@gmail.com

modality. If the profession is serious about patient safety, then radiation safety authority should be matched to demonstrated competency, not assigned only by habit or historical precedent. Aligning modality-specific RSO roles with physics-trained professionals would strengthen safety oversight while also creating meaningful, legitimate employment pathways for graduates.

The solution, then, is not a sudden overhaul. It is a **coordinated framework** that respects existing institutions while reducing unnecessary separation between them. A common entrance process grounded in physics and mathematics, a two-year postgraduate structure with a hospital-based internship, national intake calibrated to workforce demand, and clearly defined technical pathways for allied clinical professions would bring welcome order to the system. Most importantly, it would create a career path that students can understand from the start: study, supervised practice, competency, and then responsible clinical entry.

Medical physics is a profession built on **precision**. The education system that feeds it should be equally precise. India does not need to dilute standards to improve employability, and it does not need to expand titles to create opportunity. What it needs is coherence. When education, training, recruitment, and radiation safety speak the same language, the profession becomes stronger, the pathway becomes fairer, and patients benefit from the clarity that the field has always promised.

## Short biography

**Dr. A. Surega** is a Medical Physicist at the Tamil Nadu Government Multi Super Speciality Hospital, Chennai, India. She holds an MSc in Medical Physics from Anna University and a PhD in Medical Physics from Vellore Institute of Technology. With over 15 years of clinical experience in radiation oncology, her work spans advanced radiotherapy techniques, brachytherapy, quality assurance, and radiation safety.

She is a certified Radiation Safety Officer and has contributed extensively to clinical practice, research, and education. She has authored multiple peer-reviewed international publications in areas including treatment planning, dosimetry, and radiobiological modelling. Her professional interests extend to medical physics education, workforce development, and the integration of data-driven approaches in healthcare systems.

In addition to her clinical and research work, she is an IBM-certified Data Science professional and has completed certifications in Psychological First Aid and healthcare management from leading international institutions. She is actively engaged in advancing discussions on aligning education, clinical training, and regulatory frameworks to strengthen patient safety and professional clarity in medical physics.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

Dean and Chief Academic Officer, Swasthya Kalyan Group, Jaipur, India
Past President AFOMP, Past IOMP ETC Chair
arunchougule11@gmail.com

## Abstract

Radiotherapy is a cornerstone of cancer care, used in approximately 50–60% of patients for curative or palliative treatment. Its effects are primarily mediated through radiation-induced DNA damage and tumour cell death. Traditionally, radiotherapy has been guided by the "4 R's" of radiobiology: repair, reoxygenation, redistribution, and repopulation. However, advances in molecular biology, tumour immunology, and systems biology have revealed more complex mechanisms influencing tumour and normal-tissue responses. This article reviews radiobiology beyond the classical framework, focusing on the tumour microenvironment, antitumour immunity, cancer stem cells, genomic instability, and metabolic reprogramming. It also discusses the translational relevance of these concepts to personalised radiotherapy, multimodality treatment, radiogenomics, and emerging approaches such as ultra-high-dose-rate FLASH radiotherapy.

## 1. Introduction

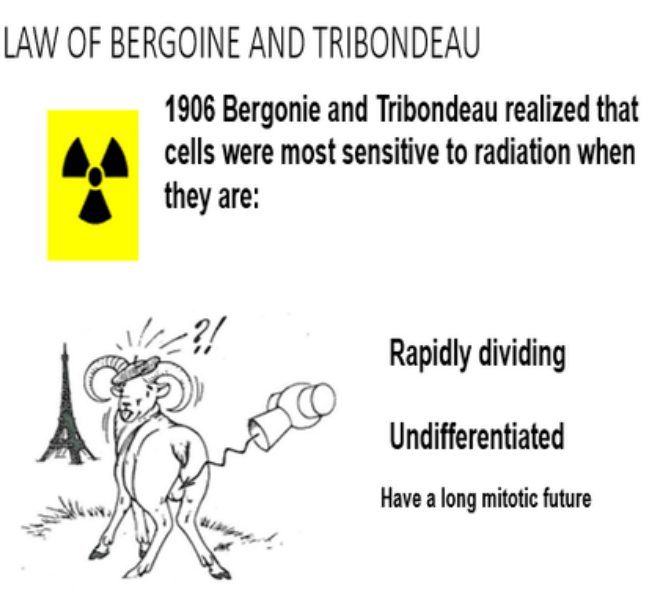
The global cancer burden continues to rise, increasing the need for effective, accessible, and personalised treatment. Radiotherapy is a major component of cancer care and is used for curative, adjuvant, neoadjuvant, and palliative purposes. Its therapeutic effects arise mainly from ionising-radiation-induced DNA damage, leading to mitotic catastrophe, apoptosis, senescence, necrosis, and other forms of tumour cell death.

The biological basis of radiotherapy has developed through more than a century of research and clinical experience. The Bergonié–Tribondeau law, proposed in 1906, suggested that radiosensitivity increases with cellular proliferation and mitotic activity and decreases with differentiation. This principle provided an early explanation for differences in the radiation responses of tumours and normal tissues.

Subsequent work by Regaud and Coutard showed that fractionated irradiation could improve tumour control while reducing damage to late-responding normal tissues. Their findings established that radiation response depends not only on total dose but also on dose per fraction, treatment duration, and delivery schedule, forming the basis of modern fractionation.
These observations were later consolidated into the classical "4 R's of radiobiology": repair of sublethal damage, reoxygenation of hypoxic tumour cells, redistribution through radiosensitive cell-cycle phases, and repopulation during treatment. Together, these principles remain fundamental to understanding and optimising fractionated radiotherapy.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**



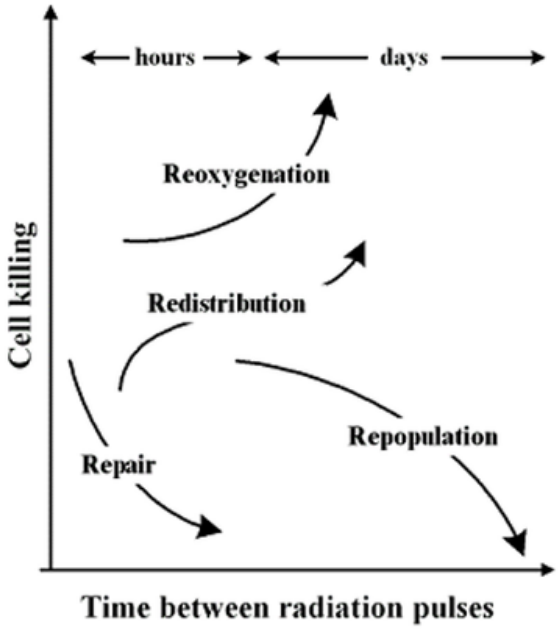




*Table 1: The 4 R's remain foundational to radiotherapy.*

| Principle | Description | Clinical Relevance |
|---|---|---|
| **Repair** | Repair of sublethal radiation-induced DNA damage, particularly in normal tissues | Fractionation permits normal-tissue recovery between treatment fractions |
| **Reoxygenation** | Previously hypoxic tumour cells become better oxygenated during treatment | Improved oxygenation increases tumour radiosensitivity |
| **Redistribution** | Surviving cells progress through different phases of the cell cycle | Fractionation may allow tumour cells to enter more radiosensitive phases, particularly G2/M |
| **Repopulation** | Proliferation of surviving tumour and normal cells during treatment | Accelerated tumour repopulation may reduce treatment efficacy, particularly when treatment is prolonged |

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

## 2. Classical Foundations: The 4 R's of Radiobiology

Before considering the expanded framework of contemporary radiobiology, it is important to review the classical "4 R's": **repair, reoxygenation, redistribution, and repopulation.** These principles remain fundamental to understanding the biological basis of fractionated radiotherapy.

### 2.1 Repair

Repair refers to the ability of cells to restore sublethal radiation-induced damage, particularly DNA lesions, between radiation exposures. Normal tissues generally have greater capacity to repair sublethal damage than many tumour cells. Delivering radiotherapy in multiple fractions therefore allows normal tissues time to recover between treatments, reducing toxicity while preserving tumour control.

### 2.2 Reoxygenation

Hypoxic tumour cells are less sensitive to ionising radiation because oxygen enhances the fixation of radiation-induced DNA damage. During fractionated treatment, oxygenated tumour cells may be preferentially eliminated, while changes in tumour perfusion, cellular density, and oxygen diffusion allow previously hypoxic cells to become reoxygenated. These cells may consequently become more radiosensitive during subsequent fractions.

### 2.3 Redistribution

Cellular radiosensitivity varies throughout the cell cycle. Cells are generally most radiosensitive during the G2 and M phases and more resistant during the late S phase. Following irradiation, surviving tumour cells continue to progress through the cell cycle. Fractionated treatment may therefore allow cells to redistribute into more radiosensitive phases before the next radiation exposure, thereby enhancing tumour cell killing.

### 2.4 Repopulation

Repopulation describes the proliferation of surviving tumour and normal cells during a course of radiotherapy. In normal tissues, repopulation supports tissue recovery and reduces treatment-related injury. In tumours, however, accelerated repopulation may counteract radiation-induced cell killing and compromise local control. This effect is particularly important when overall treatment time is prolonged or when unplanned treatment interruptions occur.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

## 3. Limitations of the Classical Model

Although the 4 R's remain fundamental to fractionated radiotherapy, they focus mainly on cellular responses and do not fully account for tumour heterogeneity, immune interactions, the tumour microenvironment, molecular determinants of radiosensitivity, or systemic and non-targeted effects. Conventional radiobiology also relies heavily on clonogenic survival, which measures reproductive cell death but does not adequately capture immune, stromal, metabolic, vascular, or delayed genomic responses. These limitations have led to a broader framework incorporating molecular, immunological, microenvironmental, and systemic determinants of radiation response.

## 4. Emerging Radiobiological Concepts Beyond the 4 R's

### 4.1 Intrinsic Radiosensitivity and Radiogenomics

Radiosensitivity varies between patients, tumour types, and regions within the same tumour because of genetic, epigenetic, and phenotypic differences, including alterations in DNA-repair genes such as TP53, ATM, and BRCA1/2. Radiogenomics links genomic characteristics with radiation response and may help predict tumour control and normal-tissue toxicity, guide dose and fractionation, and support biomarker-driven treatment individualisation. Its integration into treatment planning is an important step towards precision radiotherapy.

### 4.2 Immunological Effects of Radiation

Radiation is both cytotoxic and immunomodulatory. Immunogenic cell death can release tumour antigens and danger signals, activate dendritic cells, and recruit cytotoxic T cells. Irradiated tumours may therefore act as in situ vaccines and occasionally produce regression of distant, non-irradiated lesions—the abscopal effect. Although uncommon with radiotherapy alone, this effect may be enhanced by immune-checkpoint inhibitors. Current research aims to optimise dose, fractionation, sequencing, and target selection to improve immune-mediated tumour control.

### 4.3 The Tumour Microenvironment

The tumour microenvironment comprises malignant, stromal, immune, endothelial, and extracellular-matrix components that influence treatment response. Radiation can alter cytokine signalling, immune-cell infiltration, fibroblast activity, extracellular-matrix structure, perfusion, vascular function, and hypoxia. Radiation response therefore depends not only on direct tumour-cell killing but also on microenvironmental changes that affect tumour control, resistance, recurrence, and toxicity.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

### 4.4 Hypoxia and Oxygen-Dependent Radioresistance

Hypoxia causes radioresistance by reducing the fixation of radiation-induced DNA damage. It also activates hypoxia-inducible pathways, metabolic adaptation, angiogenesis, DNA repair, cell survival, and cancer stem-cell maintenance. Strategies to overcome hypoxia include radiosensitisers, oxygen-modifying interventions, hypoxia-targeted therapies, dose painting, and imaging-guided dose escalation.

### 4.5 Cancer Stem Cells

Cancer stem cells possess self-renewal and tumour-initiating capacity and may resist radiation through enhanced DNA repair, reduced apoptosis, greater antioxidant defence, quiescence, and protective niches.

Their survival may contribute to recurrence and metastasis. Investigational strategies include pathway inhibition, niche disruption, metabolic targeting, and adapted fractionation, although effectiveness may vary by tumour type and biological context.

### 4.6 DNA-Damage Response and Repair

Ionising radiation produces multiple DNA lesions, particularly double-strand breaks, which can cause chromosomal abnormalities, genomic instability, or cell death. Double-strand breaks are repaired mainly through non-homologous end joining and homologous recombination. Tumours with repair deficiencies may be more radiosensitive and vulnerable to synthetic-lethal approaches, such as combining radiotherapy with PARP inhibitors in BRCA1/2-altered tumours. Such combinations require careful evaluation of efficacy and toxicity.

### 4.7 Bystander Effects and Genomic Instability

Radiation effects can occur in neighbouring non-irradiated cells through soluble mediators, gap-junction signalling, extracellular vesicles, and oxidative stress. Radiation may also cause delayed genomic instability in descendant cells, including mutations, chromosomal aberrations, micronuclei, altered gene expression, and reproductive cell death.

These effects have implications for normal-tissue injury, secondary malignancy, and low-dose exposure. Therapeutic strategies aim to increase oxidative stress selectively in tumours, inhibit tumour antioxidant defences, or protect normal tissues. The key objective is to widen the therapeutic ratio and support biomarker-guided, individualised radiotherapy.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

### 4.8 Metabolic Reprogramming

Cancer cells often display altered metabolism, including increased glucose uptake and aerobic glycolysis. Radiation can further disrupt mitochondrial function, glucose and lipid utilisation, amino-acid metabolism, oxidative stress, and redox balance. These adaptations may support tumour survival. Targeting glycolysis, mitochondrial metabolism, glutamine dependence, or antioxidant pathways may therefore enhance radiosensitivity and support biologically guided patient selection and treatment monitoring.

### 4.9 Epigenetic Modifications

Radiation can produce persistent changes in gene expression through DNA methylation, histone modification, chromatin remodelling, non-coding RNAs, and altered microRNA expression.
These changes may affect DNA repair, cell-cycle control, apoptosis, immune recognition, and tumour plasticity. Epigenetic agents, including histone deacetylase and DNA-methyltransferase inhibitors, are therefore being investigated as radiosensitisers, although normal-tissue toxicity remains a concern.

### 4.10 Redox Biology and Oxidative Stress

Much of the effect of low-linear-energy-transfer radiation arises indirectly through water radiolysis and reactive oxygen species, which damage DNA, proteins, lipids, and organelles.
Tumour cells may resist this injury by strengthening antioxidant defences involving glutathione, thioredoxin, superoxide dismutase, and NRF2. Targeting these pathways may increase tumour radiosensitivity while preserving normal-tissue protection.

### 4.11 Vascular Effects of Radiation

Radiation alters tumour vasculature in a dose-dependent manner. Low doses may promote vascular normalisation, whereas high doses can induce endothelial-cell death and vascular collapse. These changes affect tumour oxygenation, drug delivery, and treatment response. Growing recognition of intratumoural heterogeneity, cancer stem cells, hypoxia, immune infiltration, and stromal signalling has expanded radiobiology beyond clonogenic survival and the classical 4 R's. This broader framework is often expressed through additional R's.

### 4.12 The 5th R: Radiosensitivity

Radiosensitivity is the inherent susceptibility of tumour and normal cells to ionising radiation. It varies between patients, tumour types, and tumour regions because of differences in DNA repair, cell-cycle regulation, hypoxia, epigenetics, metabolism, and cancer stem-cell content. This variability supports biomarker-guided dose selection and personalised radiotherapy.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

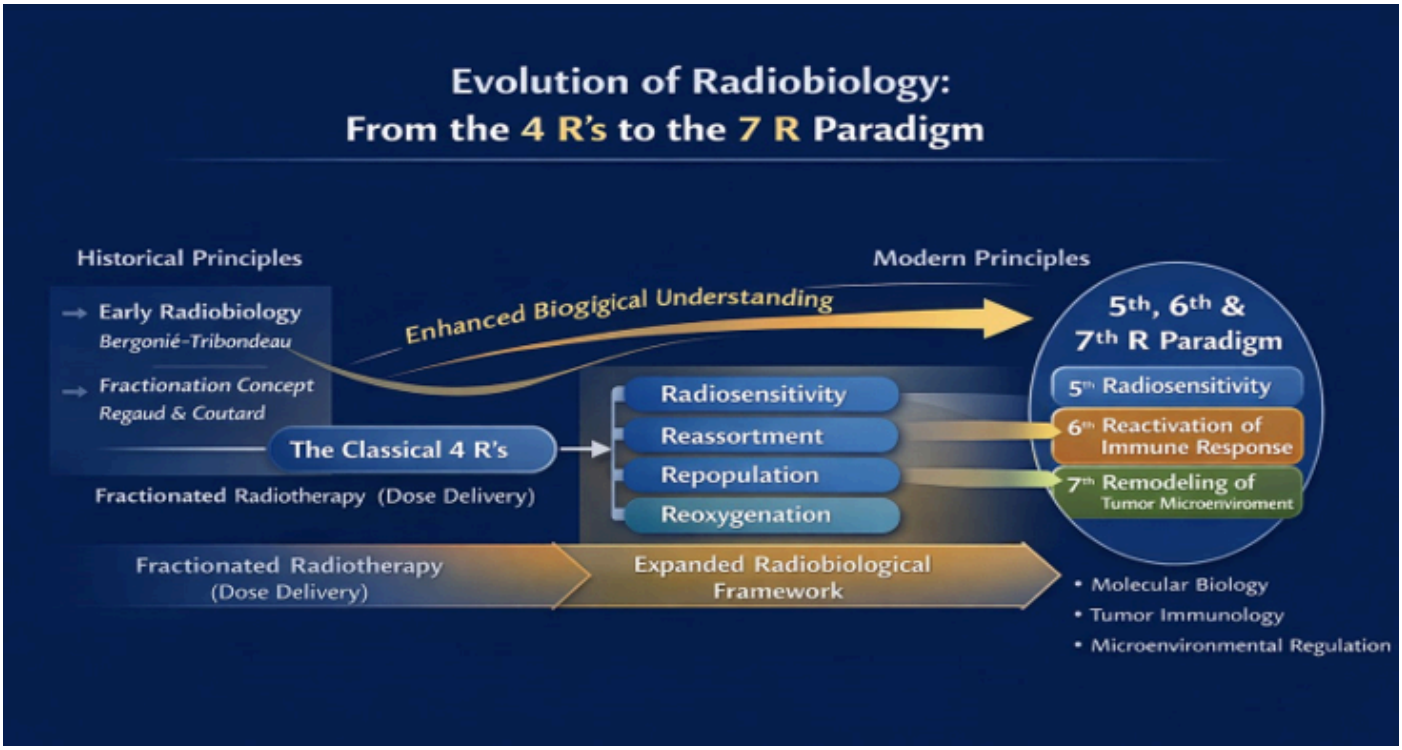
**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

### 4.13 The Sixth R: Reactivation of the Immune Response

The sixth R reflects growing recognition that radiation can reactivate antitumour immune responses. Radiation-induced immunogenic cell death, tumour-antigen release, inflammatory signalling, and modification of the tumour microenvironment may promote local and systemic immunity. This concept has important clinical implications in the era of immunotherapy. Rather than functioning solely as a local cytotoxic modality, radiotherapy may serve as an immune adjuvant capable of enhancing responses to immune-checkpoint blockade and other immunotherapeutic approaches.

### 4.14 The Seventh R: Remodelling of the Tumour Microenvironment

The seventh R emphasises that radiation response is shaped by dynamic interactions among tumour cells, stromal components, vasculature, hypoxic regions, extracellular matrix, and immune infiltrates. Radiation may induce vascular modification, fibroblast activation, extracellular-matrix remodelling, inflammatory signalling, and changes in hypoxic niches. These processes can either enhance tumour control or promote resistance and normal-tissue injury. The seventh R therefore extends the focus of radiobiology beyond tumour clonogens to encompass the entire biological ecosystem in which the tumour develops and responds to treatment.






Back to Content

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

## 5. Integration with Advanced Radiotherapy Techniques

Precision oncology shifts cancer treatment from a uniform approach towards therapy tailored to tumour biology, genetics, and patient-specific factors. In radiation oncology, treatment is increasingly guided not only by anatomical imaging and physical dose parameters but also by radiobiological insights into radiosensitivity, resistance, normal-tissue tolerance, and tumour heterogeneity.

The integration of molecular biology, genomics, immunology, and computational modelling with radiation science supports the central goal of precision radiotherapy: maximising tumour control while minimising toxicity.

Technological advances further enable the exploitation of biological differences:

- IMRT: improves dose conformity and normal-tissue sparing;
- IGRT: enhances targeting accuracy;
- SBRT: delivers ablative doses in a small number of fractions; and
- Proton therapy: provides favourable dose distribution with minimal exit dose.

Together, these established techniques support tumour dose escalation, normal-tissue preservation, and the integration of biological targeting into treatment planning.

## 6. Integration with Advanced Radiotherapy Techniques

Precision radiotherapy tailors treatment to tumour biology, molecular characteristics, and patient-specific factors. Beyond anatomical imaging and physical dose, modern planning increasingly incorporates radiosensitivity, radioresistance, normal-tissue tolerance, and tumour heterogeneity to improve the therapeutic ratio.

This approach integrates molecular biology, genomics, immunology, functional imaging, and computational modelling with radiation science. Key technologies include:

- IMRT: delivers highly conformal dose distributions;
- IGRT: improves targeting accuracy through treatment imaging;
- SBRT: delivers ablative doses in a few precise fractions; and
- Proton therapy: reduces exit dose and normal-tissue exposure.

These techniques support dose escalation, organ-at-risk sparing, hypofractionation, adaptive treatment, and biological targeting. However, precise dose delivery must be matched by an equally precise understanding of tumour and normal-tissue biology.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

## 7. Clinical Implications

### 7.1 Personalised Radiotherapy

The integration of genomic, molecular, imaging, and clinical data may enable radiotherapy to be tailored to the individual patient. Predictive biomarkers have the potential to identify:

- intrinsic tumour radiosensitivity or radioresistance;
- susceptibility to radiation-induced normal-tissue toxicity;
- likelihood of local recurrence;
- tumour hypoxia and other resistant biological subregions; and
- patients most likely to benefit from particular fractionation schedules or combination treatments.

Such information could support biologically informed dose prescription, fractionation selection, target delineation, and normal-tissue dose constraints. However, many proposed biomarkers still require prospective validation, analytical standardisation, and demonstration of clinical utility before routine implementation.

### 7.2 Combination Therapies

Modern cancer management increasingly involves combining radiotherapy with systemic treatments, including:

- chemotherapy;
- immunotherapy;
- molecularly targeted therapies;
- DNA-repair inhibitors; and
- metabolic or epigenetic agents.

These combinations may improve tumour control through complementary or synergistic mechanisms. Chemotherapy may enhance radiosensitivity or inhibit tumour-cell repopulation, while targeted agents may interfere with DNA repair, growth signalling, angiogenesis, or metabolic adaptation. Immunotherapy may amplify radiation-induced antitumour immune responses.

The effectiveness and safety of combined treatments depend on radiation dose, fractionation, treatment sequencing, drug selection, and tumour type. Careful optimisation is required because biological synergy may enhance both tumour control and normal-tissue toxicity.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

### 7.3 Adaptive Radiotherapy

Adaptive radiotherapy involves modifying the treatment plan in response to changes occurring during the treatment course. These changes may include alterations in:

- tumour size and shape;
- patient anatomy;
- organ position or filling;
- tumour motion;
- weight or body contour;
- oxygenation, metabolism, or functional imaging characteristics; and
- treatment response.

Current adaptive approaches are primarily anatomy-based, using repeat computed tomography, cone-beam computed tomography, or magnetic resonance imaging. Future biologically adaptive radiotherapy may incorporate functional imaging, circulating biomarkers, and early response indicators to modify treatment according to evolving tumour biology rather than anatomy alone.

### 7.4 Normal-Tissue Protection

An expanded understanding of radiobiology may improve normal-tissue protection through:

- highly conformal treatment planning;
- image guidance and motion management;
- radioprotective and mitigating agents;
- biomarker-guided dose constraints;
- prediction of individual susceptibility to toxicity;
- optimisation of dose rate and fractionation; and
- adaptive modification of treatment plans.

Normal-tissue responses are influenced by organ architecture, dose distribution, fraction size, irradiated volume, patient comorbidities, genetics, immune status, and concurrent systemic therapy. Incorporating these factors into predictive models may improve treatment individualisation and reduce both acute and late toxicities.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

## 8. Future Directions

### 8.1 Radiogenomics

Radiogenomics integrates genomic, transcriptomic, epigenomic, and radiobiological data to investigate interindividual variation in tumour response and normal-tissue toxicity following radiotherapy. This emerging discipline seeks to move radiotherapy from empirically derived, population-based dose prescriptions towards biologically personalised treatment.

Advances in high-throughput sequencing, computational biology, artificial intelligence, and imaging analytics have accelerated the identification of potential biomarkers of radiosensitivity, radioresistance, and radiation-induced toxicity. Integration of validated genomic information into treatment planning could support:

- patient-specific dose and fractionation selection;
- prediction of treatment response;
- identification of patients at increased risk of toxicity;
- selection of appropriate radiosensitising agents; and
- biologically informed treatment intensification or de-escalation.

Before widespread clinical adoption, radiogenomic models will require validation in large, diverse patient populations, harmonisation of analytical methods, and prospective demonstration that their use improves clinical outcomes.

### 8.2 Artificial Intelligence (AI)

AI has the potential to analyse complex, multidimensional datasets that exceed the capacity of conventional statistical approaches. Potential applications include:

- automated segmentation and treatment planning;
- prediction of tumour response and normal-tissue toxicity;
- integration of imaging, genomic, dosimetric, and clinical data;
- identification of radiobiological phenotypes;
- adaptive treatment decision support; and
- prediction of long-term outcomes.

AI may facilitate the translation of biological complexity into clinically actionable models. Nevertheless, its implementation requires high-quality datasets, external validation, transparent reporting, explainability, bias assessment, regulatory oversight, and continued clinical supervision.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

### 8.3 FLASH Radiotherapy

FLASH radiotherapy delivers radiation at ultra-high dose rates and has demonstrated reduced normal-tissue toxicity in several preclinical models while maintaining tumour control. This phenomenon, commonly referred to as the FLASH effect, has generated considerable interest because of its potential to widen the therapeutic ratio.

Proposed mechanisms include:

- transient oxygen depletion;
- altered reactive oxygen species chemistry;
- differential redox responses between tumours and normal tissues;
- modulation of immune and inflammatory responses; and
- reduced exposure time for circulating immune cells.

However, the biological mechanisms underlying the FLASH effect remain incompletely understood. Important questions also remain regarding optimal dose rate, total dose, pulse structure, irradiated volume, tissue specificity, beam modality, dosimetry, and clinical reproducibility. FLASH radiotherapy should therefore be regarded as a promising but still investigational approach.

### 8.4 Multi-Omics Integration

Multi-omics approaches combine information from genomics, transcriptomics, epigenomics, proteomics, metabolomics, and other molecular domains. When integrated with radiomics, pathology, dosimetry, and clinical data, these approaches may provide a more comprehensive understanding of radiation response.

Multi-omics integration could help identify:

- biological subtypes associated with radiosensitivity or resistance;
- molecular pathways underlying treatment failure;
- predictive biomarkers of toxicity;
- targets for combination therapies; and
- temporal changes in tumour biology during treatment.

The major challenges include data standardisation, computational complexity, tumour sampling limitations, spatial heterogeneity, cost, and the need for clinically interpretable models. Prospective trials will be required to determine whether multi-omics-guided radiotherapy improves patient outcomes.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

### 8.5 Biologically Guided and Spatially Adaptive Radiotherapy

Future radiotherapy may increasingly incorporate spatially resolved biological information into treatment planning. Functional and molecular imaging can identify hypoxic, highly proliferative, metabolically active, or radioresistant subregions within tumours. These regions may become targets for selective dose escalation or "dose painting".

Repeated biological imaging during treatment may also enable spatial adaptation as tumour characteristics evolve. Such approaches require robust image acquisition, registration, segmentation, dose accumulation, and biological-response modelling. They also require evidence that the imaged biological feature is reproducible, clinically relevant, and modifiable through altered dose delivery.

### 8.6 Patient-Specific Computational Modelling

Mechanistic and data-driven models may increasingly be used to simulate tumour growth, oxygenation, immune response, DNA repair, normal-tissue injury, and treatment response. Digital twins and other patient-specific modelling frameworks could integrate longitudinal clinical, imaging, biological, and dosimetric data to predict how an individual patient may respond to alternative treatment strategies.

These models may eventually support prospective comparison of different doses, fractionation schedules, treatment sequences, and combination therapies. Their clinical value will depend on model interpretability, uncertainty quantification, continuous validation, and integration into practical clinical workflows.

## 9. Conclusion

Radiobiology has evolved substantially beyond the classical 4 R's. Contemporary understanding now encompasses intrinsic radiosensitivity, DNA-damage response, immune modulation, cancer stem-cell behaviour, metabolic and epigenetic regulation, vascular effects, tumour-microenvironment dynamics, and systemic and non-targeted radiation responses.

These advances are transforming radiation oncology from a discipline centred predominantly on physical dose delivery into one increasingly informed by molecular biology, genomics, immunology, imaging, and systems-level modelling. For radiation oncologists, medical physicists, radiobiologists, and other members of the multidisciplinary team, incorporating these biological dimensions is essential to achieving the objectives of precision oncology.

# Radiobiology beyond the 4 R's: Expanding paradigms in Radiotherapy for cancer treatment and management (Continued)

**Arun Chougule, PhD, FIUPESM, FIOMP, FAMS**

The future of radiotherapy lies in biologically optimised treatment, in which dose, fractionation, spatial distribution, treatment timing, and combination strategies are tailored to the biological characteristics of the tumour and the individual patient. Achieving this goal will require validated biomarkers, robust computational models, advanced imaging, adaptive technologies, and well-designed prospective clinical trials.

Radiotherapy is therefore not merely the delivery of a prescribed physical dose; it is the deliberate manipulation of biological responses across space and time. Embracing radiobiology beyond the classical 4 R's is essential for translating scientific knowledge into meaningful improvements in tumour control, normal-tissue protection, and patient outcomes.

The guiding principle for the next era of radiation oncology may be expressed simply: **the right dose, delivered to the right biological target, at the right time. Dose initiates the damage; biology determines the outcome.**

## References

1. Citrin DE. Recent developments in radiotherapy. N Engl J Med. 2017;377 (11): 1065–75.
2. Baumann M, Krause M, Overgaard J, Debus J, Bentzen SM, Daartz J, et al. Radiation oncology in the era of precision medicine. Nat Rev Cancer. 2016;16(4):234–49.
3. Binnewies M, Roberts EW, Kersten K, Chan V, Fearon DF, Merad M, et al. Understanding the tumour immune microenvironment. Nat Med.2018;24(5):541-50.
4. Jing X, Yang F, Shao C, Wei K, Xie M, Shen H, et al. Role of hypoxia in cancer therapy by regulating the tumour microenvironment. Mol Cancer. 2019;18(1):157.
5. Vozenin MC, Hendry JH, Limoli CL. Biological benefits of ultra-high dose rate FLASH radiotherapy. Nat Rev Clin Oncol. 2019;16(12):771–82.
6. Hall EJ, Giaccia AJ. Radiobiology for the radiologist. 8th ed. Philadelphia: Lippincott Williams & Wilkins; 2019.
7. Joiner MC, van der Kogel AJ. Basic clinical radiobiology. 5th ed. Boca Raton: CRC Press; 2018.
8. Barker HE, Paget JTE, Khan AA, Harrington KJ. The tumour microenvironment after radiotherapy: mechanisms of resistance and recurrence. Nat Rev Cancer. 2015;15(7):409–25.

# Calendar of Events (Jul - Dec 2026)

GLOBAL / INTERNATIONAL

**AAPM | COMP 68th Annual Meeting & Exhibition**

**When:** Jul 19 – 22, 2026
**Where:** Vancouver, BC, Canada
**Website:** https://www.aapm.org/meetings/

EUROPE (EFOMP)

**EFOMP 7th Summer School in Medical Physics 2026**

**When:** Aug 24 – Oct 2, 2026
**Where:** Heidelberg, Germany / Online
**Website:** https://www.efomp.org/index.php?r=events

ASIA-OCEANIA (AFOMP)

**ESTRO Meets Asia 2026 (ESTRO–FARO Joint Meeting)**

**When:** Aug 28 – 30, 2026
**Where:** Singapore
**Website:** https://www.estro.org/

ASIA-OCEANIA (AFOMP)

**PTCOG-AO 2026 — 6th Annual Conference, Particle Therapy Co-Operative Group Asia-Oceania**

**When:** Sep 4 – 6, 2026
**Where:** Chennai, Tamil Nadu, India
**Website:** https://ptcog-ao2026.com/

ASIA-OCEANIA (AFOMP)

**AOCMP 2026 — 26th Asia-Oceania Congress of Medical Physics (AFOMP flagship)**

**When:** Sep 9 – 11, 2026
**Where:** Busan, Republic of Korea
**Website:** https://www.iomp.org/aocmp-2026-abstract-submission-deadline-extended-to-16-may-2026/

EUROPE (EFOMP)

**EFOMP "Time To Adapt" — Adaptive School for Medical Physicists**

**When:** Sep 10 – 12, 2026
**Where:** Sardinia, Italy
**Website:** https://www.efomp.org/index.php?r=events

EUROPE (EFOMP)

**ECMP 2026 — 6th European Congress of Medical Physics (EFOMP flagship)**

**When:** Sep 23 – 26, 2026
**Where:** Valencia, Spain
**Website:** https://www.efomp.org/index.php?r=fc&id=ecmp

GLOBAL / INTERNATIONAL

**ASTRO 68th Annual Meeting**

**When:** Sep 26 – 30, 2026
**Where:** Boston, Massachusetts, USA
**Website:** https://www.astro.org/meetings-and-education/micro-sites/2026/annual-meeting

GLOBAL / INTERNATIONAL

**IDOS 2026 — IAEA International Symposium on Standards, Applications and Quality Assurance in Medical Radiation Dosimetry**

**When:** Oct 5 – 9, 2026
**Where:** IAEA Headquarters, Vienna, Austria
**Website:** https://www.iaea.org/events/idos-2026

LATIN AMERICA (ALFIM)

**30º Congresso Brasileiro de Física Médica (ALFIM region)**

**When:** Oct 7 – 10, 2026
**Where:** Brazil
**Website:** https://www.alfim.info/

GLOBAL / INTERNATIONAL

**EANM 2026 — 39th Annual Congress of the European Association of Nuclear Medicine**

**When:** Oct 17 – 21, 2026
**Where:** Vienna, Austria
**Website:** https://eanm26.eanm.org/

EUROPE (EFOMP)

**ESMPE (European School for Medical Physics Experts) - School for Stereotactic Radiotherapy**

**When:** Oct 29 – 31, 2026
**Where:** Cluj, Romania
**Website:** https://www.efomp.org/uploads/esmpe-2026/ESMPE_Stereotactic_Radiotherapy.pdf?v=4

GLOBAL / INTERNATIONAL

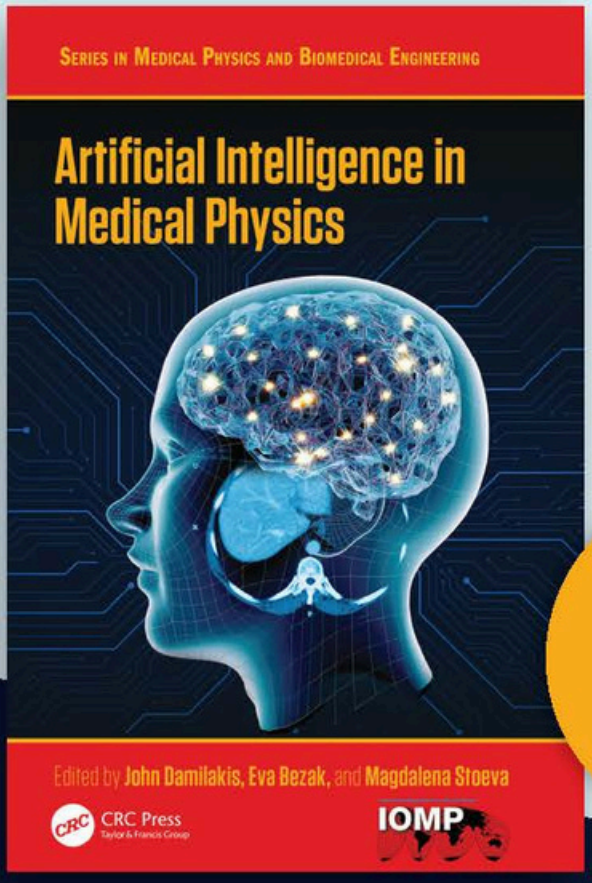
**PTCOG-NA 12th Annual Meeting (Particle Therapy Co-Operative Group, North America)**

**When:** Nov 6 – 8, 2026
**Where:** USA (venue TBC)
**Website:** https://www.ptcog-na.org/meetings-and-events

GLOBAL / INTERNATIONAL

**RSNA 2026 — 112th Scientific Assembly & Annual Meeting**

**When:** Nov 29 – Dec 3, 2026
**Where:** Chicago, Illinois, USA
**Website:** https://www.rsna.org/annual-meeting




# SPECIAL OFFER

## for International Organization for Medical Physics Members

**ORDER NOW**
**SAVE 30%**
with code
CDC26

Enjoy an exclusive 30% discount on this essential resource. Don't miss this opportunity to enhance your knowledge and stay ahead in the rapidly evolving field of medical physics.

# Discover the Transformative Power of AI in Medical Physics

Artificial Intelligence (AI) is revolutionizing medical imaging, radiation oncology, and healthcare decision-making, offering exciting opportunities and addressing critical challenges. This essential book brings together global experts to explore how AI is reshaping medical physics and enhancing patient care.

### What's Inside:

- **AI in Diagnostic Imaging:** Learn how algorithms improve image quality while potentially reducing patient dose.
- **Radiotherapy Innovations:** Explore automated treatment planning, robust dose calculation, and real-time adaptive techniques.
- **Ethical and Workforce Considerations:** Understand the importance of data governance, algorithm transparency, and the evolving educational needs for healthcare professionals.

### Who Should Read This Book:

Medical physicists, radiologists, radiographers, medical engineers, hospital managers, and academic scholars will find this book an invaluable resource for navigating the intersection of AI and healthcare.

### Key Features:

- Focuses on a highly relevant and emerging topic.
- Provides practical insights from leading global experts.
- Covers the latest advancements in AI applications for medical physics, including diagnostic imaging and radiotherapy.

## Enhance your knowledge and stay ahead in the rapidly evolving field of medical physics.

### Want to Publish with Us?

We're always looking for innovative ideas and expert contributions. If you're interested in publishing with us, contact Rebecca Hodges-Davies at **Rebecca.Hodges-Davies@tandf.co.uk**. Let's bring your expertise to the world!

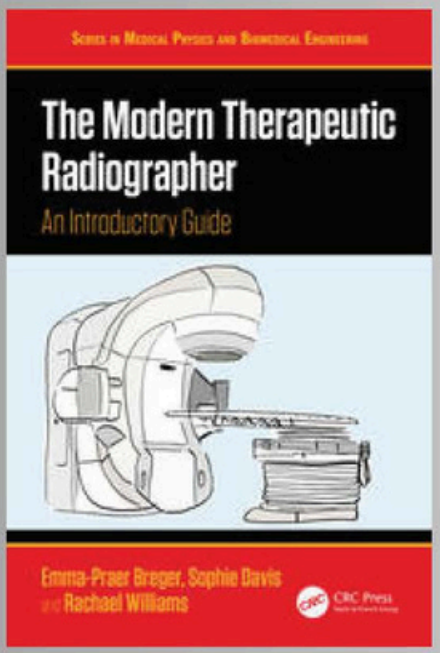
Routledge Taylor & Francis Group | CRC Press Taylor & Francis Group

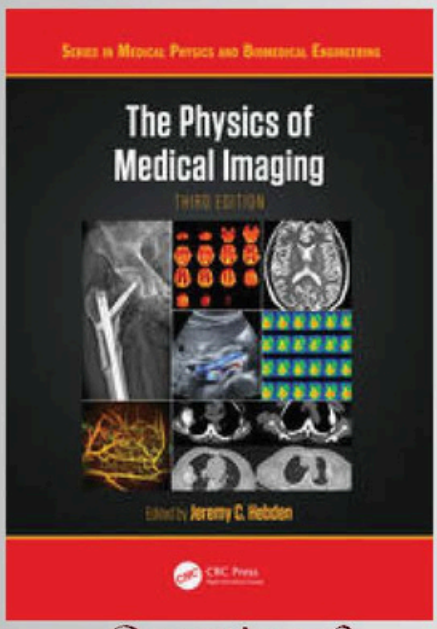
CRC Press
Taylor & Francis Group

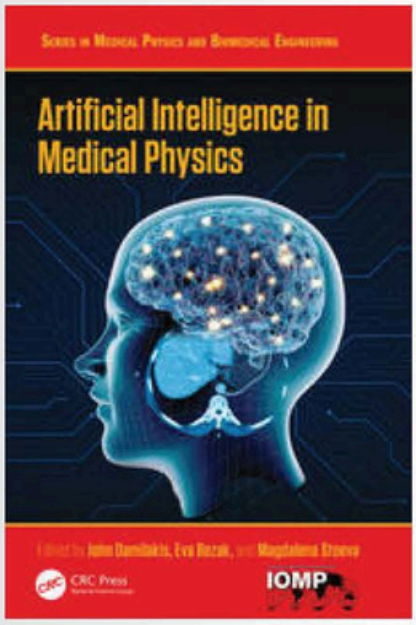
# Have your say

CRC Press, the official book publisher of the IOMP, seeks feedback on their publishing programme.

Complete a short survey by scanning the QR code and recieve a complimentary ebook.


Questions?
Contact Senior Commissioning Editor
Rebecca.Hodges Davies@tandf.co.uk



Back to Content