EFOMP

ECMP 2018:
Bridging Knowledge across Specialities

And what Medical Physicists do besides science.

The European Federation of Organizations for Medical Physics Bulletin

European Medical Physics News

Autumn 2018

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Editorial

Dear Readers,

we as editors are very proud to release this Autumn 2018 issue of European Medical Physics News: a wealth of news in our European medical physics community has been collected and communicated, the layout has been improved by resorting to a professional publishing expert, the Editorial Board of our Newsletter has been extended to include all the members of the EFOMP's Communication and Publications Committee, and this reflects into a joint effort which produced this great issue of EMP News, the first one with this new layout and extended editorial board.
In particular, we welcome in the board the Vice Chair-elect of the Communication and Publications Committee, Prof. David Lurie.

The main feature of this Autumn 2018 issue is the series of articles related to the second European Congress of Medical Physics (2nd ECMP), held in Copenhagen on last August, and related events. You will find a number of articles describing how this highly successful Congress (both in terms of attendance and scientific/technical level) represented a fundamental step in the progress of our European Federation.

But we cannot underestimate the relevance of two facts which occurred in the last months and reported with two articles on pages 4-8 of this issue: the new possibilities of **EFOMP National Members Organisation to become Associated Societies with our scientific journal: Physica Medica - European Journal of Medical Physics (see article on pages 4-5 by the EFOMP President), and the increased interest in becoming official EFOMP Company Members (see article on pages 7-8).**

For 2019, important activities/events in which EFOMP is involved are illustrated in this issue, with articles on ECR 2019 (27th February- 3rd March, Vienna, Austria) and the forthcoming ESMPE Schools.

Workforce and training issues in the UK are illustrated in three articles by Prof. B. Ferry, Dr. L. Parvin, and our editor M. McJury, respectively, providing a clear view of the status in these aspects of medical physics in the UK.

An highlight of this issue is the announcement that **Italy will host the 3rd ECMP in Turin on 24-26 September 2020. Please save the date!**

I admit that I was delighted by the proposal of our editor C. Caruana to start a section of EMPNews dedicated to "What Medical Physicists do in their free time!": you can find in this issue the first two articles of this interesting series.

We are sure you will most enjoy reading the article by Prof. P. Sharp, Past EFOMP President, on "Is there life after the Presidency?". We are grateful to Prof. Sharp for sharing his feelings on this otherwise delicate issue, which points to the passion and full participation which characterizes the activity of all colleagues involved in high-level responsibilities for the benefit of our profession and of our European community of medical physicists.

Mark McJury contributes also his review of the recent publication in medical physics (**"Clinical 3D Dosimetry in Modern Radiation Therapy"**), the second article in this series, started this year.

The Editorial Board of EMP News thanks the contributors of all articles to this nice Autumn issue!

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Paolo Russo & Your editorial team (pubcommittee@efomp.org).

European Medical Physics News, October 2018


Paolo Russo


Efi Koutsouveli


Markus Buchgeister


David Lurie


Eva Samsøe


Mark McJury


Marco Brambilla


Carmel J. Caruana


Cesare Gori

A new possibility for EFOMP National Members Organisation to become Associated Societies with Physica Medica: European Journal of Medical Physics

Physica Medica: European Journal of Medical Physics is published by Elsevier for the European Federation of Organisations for Medical Physics (EFOMP) and Associazione Italiana di Fisica Medica (AIFM). EJMP is the official journal of the Irish Association of Physicists in Medicine and Société Française de Physique Médicale.

Physica Medica is among the leading publications in the field of Medical Physics and in 2017 the Impact factor reached the value of 2.24 with a constant increase in the last three years.

EFOMP promoted at the beginning of 2018 a revision of the agreement with the publisher to strengthen the relationships between the Journal and the National Members Organisations with a particular attention to its "Low income" members. This was done by providing a discounted fee for the members of a number of national societies listed in the following Annex with the clause that EFOMP should take care of the financial aspects of their subscriptions.

An amendment dated 4th May 2018 to the agreement dated 9th November 2015 (the "Agreement"), was agreed and signed between Elsevier Limited ("the Publisher"), and the Associazione Italiana di Fisica Medica (the "Society") and the European Federation of Organisations for Medical Physics (the "Federation"). A new category of subscribers to the journal has been introduced: "Low-Income members". The five types of subscribers are now:

(a) "Members": the individual members of the Society. Currently the members of the Italian Association for Medical Physics (AIFM)

(b) ("Other Members"): the individual members of the Associated Societies, any other national member of the Federation and any other scientific societies wishing to become co-sponsors of the Journal. Currently, the members of the French Society of Medical Physics (SFPM) and Irish Association for Medical Physics (IAPM)

(c) "Low-Income Members": individual members of selected national Federation societies outlined in Annex 4

Annex 4

Low-Income EFOMP National Members
Bosnia Erzegovina
Bulgaria
Croatia
Cyprus
Czechia
Estonia
Greece
Hungary
Latvia
Lithuania
Macedonia
Moldova
Poland
Russia
Serbia
Slovakia
Slovenia
Romania

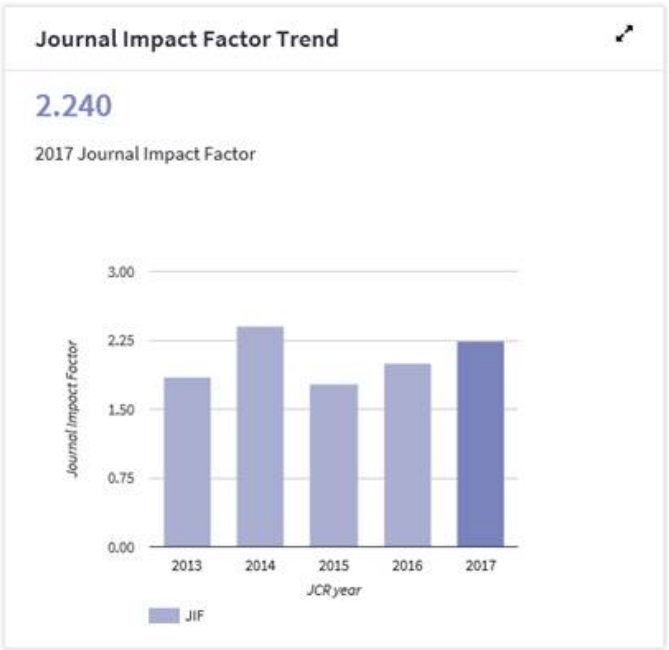


Fig. 1: Journal Impact Factor Trend, © EFOMP

(a) "Non-Members": individual subscribers (meaning individuals who are not corporations, libraries, instituti-

ons, Members, Other Members or organizations)

(b) "Institutions": all subscriptions other than the Members, Other Members, Non-Members and Individual Subscribers

According to this agreement the Federation shall invite Low-Income Members of the Federation to become affiliated with the Journal. Depending on the number of Low-Income Members delivered to the Publisher by the Federation per calendar year a fee will be payable by the Federation to the Publisher as follows;

- For 1 to 50 Low-Income Members, the Federation will pay the Publisher 750 €
- For 51-100 Low-Income Members, the Federation will pay the Publisher 1,500 €
- For 101-200 Low-Income Members, the Federation will pay the Publisher 2,800 €
- For 201-300 Low-Income Members, the Federation will pay the Publisher 4,125 €
- For 301-400 Low-Income Members, the Federation will pay the Publisher 5,200 €
- Over 400 13 € per member

In the leadership meetings held between EFOMP and the Czech Association for Medical Physics (CAMP), held the 25th January 2018 in Prague it was agreed that CAMP will have 150 of their members registered as "Low-income members" starting from 1st January 2019.

In the leadership meetings held between EFOMP and the Polish Society for Medical Physics (PSMP), held the 30th May 2018 in Prague it was agreed that PSMP will have 100 of their members registered as "Low-income members" starting from 1st January 2019.

Each Society, regardless of the number of members entitled to receive the electronic subscription to EJMP, will pay only 13 € per member per year directly to EFOMP in conjunction with the annual subscription to EFOMP. Any difference between the corresponding flat rate applied by the Publisher and the income from such subscriptions will be covered directly by EFOMP.

Starting from January 2019, CAPMP and PSMP will appear on the front page of the EJMP as Associated societies. EJMP will become then the Official journal of the Czech Republic, France, Ireland, Italy and Poland.

The content of the agreement was announced at the EFOMP Council meeting held in Copenhagen on the 25th of August 2018.

In the coming months, the possibility of becoming Associated Societies to Physica Medica EJMP will be illustrated in the upcoming leadership meetings between the EFOMP President and the NMOs.

I think that this could be an excellent opportunity for the NMOs to provide their members with an additional service: the free electronic access to one of the leading voice in the panorama of Medical Physics publications. At the same time, EFOMP is fulfilling one of its key role: to strengthen the activities of the National Member Organisations by bringing about and maintaining the systematic exchange of professional and scientific information.

Marco Brambilla

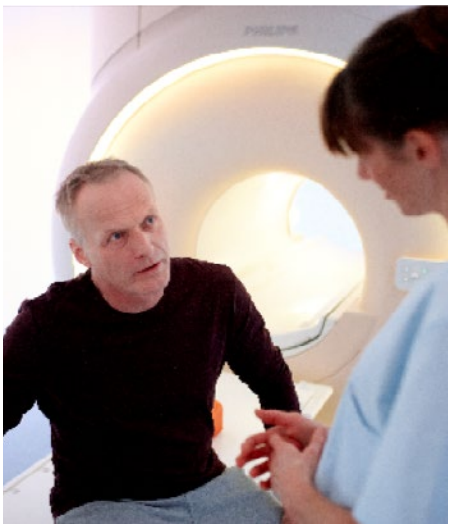
President of EFOMP

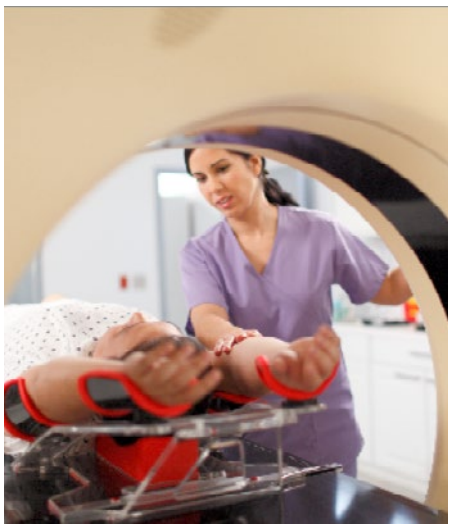
Marco Brambilla, PhD. Educated in medical physics and health statistics at the University of Milano specialized in Nuclear Medicine, Diagnostic, Computed Tomography (CT) Interventional Cardiology and Radiology. Currently head of the Medical Physics Department, University Hospital of Novara, Italy and 6 General Hospitals in Piedmont, Italy. President of the European Federation of Organisations for Medical Physics (EFOMP).

Physica Medica - European Journal of Medical Physics - is supported by EFOMP and by 34 National Societies

EFOMP Company Members:
Philips Radiation Oncology Solutions The confident path to treatment

Philips offers a proven portfolio of dedicated radiotherapy solutions that span diagnostic imaging to treatment planning. By integrating tools, systems, and software – we help you to improve patient care, accelerate time to treatment and enhance patient satisfaction. We work with you to understand sources of uncertainty and inefficiency throughout the process.





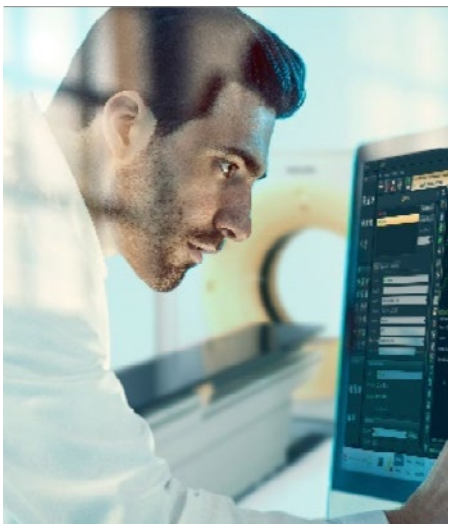


Fig. 1, 2 and 3: Photographs © by Philips

"Today's radiation oncology treatment planning processes are still fragmented, labor-intensive and time-consuming, potentially producing inconsistent results and delaying the start of treatment," said Ardie Ermers, General Manager Radiation Oncology, Philips. "Creating a patient-specific treatment plan that is designed around a robust assessment of the patient is essential. By integrating leading tools, systems and software, Philips helps improve patient care, time-to-treatment and patient satisfaction."

At this year's ESTRO conference, Philips highlighted a portfolio of solutions to help enable a confident path to treatment focused on the key areas of imaging and simulation, treatment planning, and tumor follow-up and response. For imaging and simulation, Philips' iPatient for Big Bore CT provides a patient-centered imaging workflow that helps drive consistency in image quality from on scan to the next across diverse patient populations, which is particularly relevant for cancer patients. The recently announced IQon Spectral CT Elite features enhanced tumor characterization, providing diagnostic certainty for oncology clinicians and their patients. The Philips Ingenia MR-RT platform is the world's first MR system with a commercial MR-only simulation package, leading a paradigm shift in radiotherapy planning. With the planned extension of MR-only simulation, Philips is committed to expanding the impact of this innovation and simplifying MR-based planning workflows. Philips' leading radiation treatment planning solutions include Pinnacle3 16.2 with Auto-Planning, featuring advanced automated tools that reduce the total time required to create IMRT or VMAT plans. IntelliSpace Portal 10 is an advanced visualization and analysis

solution designed to give radiologists a comprehensive clinical view while helping them work quickly and to reduce variance in analysis – offering Tumor Analysis and Treatment Response tools with a streamlined workflow for follow-up and analysis of oncology patients. Philips Vereos Digital PET/CT, the world's first and only fully digital PET/CT system, delivers improved detectability and characterization of small lesions. The system offers uncompromised detectability and quantification at half the PET dose [4]. Vereos also provides improved lesion detectability in one tenth of the time.

— Philips' iPatient for Big Bore CT provides a patient-centered imaging workflow that helps drive consistency in image quality from on scan to the next across diverse patient populations,

Philips addresses challenges in Radiation oncology with advanced imaging solutions, scalable and customizable treatment planning, and intelligent workflow automation. And as a committed partner, we help our customers maximize value and future-proof their investments.

Ardie Ermers, MSc

With 19 years of global experience in Radiology and Oncology for Philips, Ardie Ermers has developed a broad understanding of the opportunities and challenges in this global market. He started in Best, the Netherlands, for Philips General X-ray as Operations and Logistics Manager after which he leads the integration of ADAC and Marconi in Europe Middle East and Africa. After launching the new MR portfolio in 2005 as a Global Product Manager for Philips MRI, Ardie moved to Seattle in 2006 to lead the West Zone Sales team for MR. In 2010 Philips launched Ingenia and as the National Sales Manager for MR, he grew share aggressively. In 2013, he took over the Business Leadership role for AMI North America and launched the Digital PET product Vereos successfully. In December 2014, he was leading the Diagnostic Imaging Business for Philips in North America with a strong focus on the horizontal integration of Radiology in the Continuum of Care. Since January 2017, Ardie has taken on the role as Global General Manager for Radiation Oncology. This is the first area to establish a leadership position and position Philips as a global leader in Oncology. Ardie resides in Delray Beach Florida, USA

EFOMP's Examination Board (EEB): It's not how good you are, it's how good you want to be!

General information

EFOMP's Examination Board (EEB) has introduced the European Diploma of Medical Physics (EDMP) and the European Attestation Certificate to those Medical Physicists that have reached the Medical Physics Expert level (EACMPE). These diplomas do not replace any national certificates. However, they confirm proof of knowledge, skills, and competencies requisite for the delivery of high standard Medical Physics services.

Medical Physicists certified in one or more sub-disciplines of Medical Physics (diagnostic and interventional radiology, nuclear medicine and/or radiation oncology) by a national competent authority are eligible to sit for the EDMP exams. Medical Physicists certified in one or more sub-disciplines of Medical Physics by a national competent authority who have at least full time 2 years equivalent of advanced, structured experience and continuous professional development (CPD) are eligible to sit for the EACMPE exams. Detailed information about EDMP and EACMPE eligibility criteria and examination structure has been uploaded on https://www.efomp.org/index.php?r=pages&id=eeb-about

EDMP or EACMPE?

Currently, medical physicists in European countries face difficulties in providing the necessary qualification evidence when they seek employment in other EU Member States or other countries. The EDMP facilitates mobility of young medical physicists in Europe and beyond. Furthermore, EEB also provides an attestation certificate to those medical physicists that have reached the Medical Physics Expert level to be recognized by the relevant competent authorities of the EU according to the new EU BSS. Both EDMP and EACMPE will improve your CV considerably and is an excellent way to boost your career.

1st exams in Prague, 2017

The 1st EEB exams were organized in Prague, Czech Republic, on the 6th and 7th of July, 2017. The number of eligible applications was 18 i.e. 14 for the EACMPE and 4 for the EDMP. Nine (9) candidates passed the EACMPE

— ***Both EDMP and EACMPE will improve your CV considerably and is an excellent way to boost your career.***

exams and three (3) candidates passed the EDMP exams.

2nd exams in Copenhagen, 2018

The 2nd EEB exams were held in Copenhagen, Denmark on the 21st and 22nd of August 2018. The number of eligible applications was 18 i.e. 16 for the EACMPE and 2 for the EDMP. From those applicants who took the exams, 9 passed the exams and 4 failed.

3rd exams in Warsaw, Poland, October 8 and 9, 2019

Next Examinations for the EDMP and EACMPE in the fields of

- Diagnostic and Interventional Radiology
- Nuclear Medicine
- Radiation Oncology

October 8 and 9, 2019, Warsaw, Poland

Save the date!

Please note there is limited capacity of places for the EEB exams. Therefore, in the event of high demand, a 'first come first served' policy will be imposed.

Prof. John Damilakis

MSc, PhD, FIOMP EFOMP Immediate Past President

EEB Chair

John Damilakis is full professor and chairman at the Faculty of Medicine of the University of Crete and director of the Medical Physics department of the University Hospital of Herakli-on, Crete, Greece. He is coordinator or an active research member of several European pro-jects. He has more than 200 publications concerning research topics of embryo/fetal dosi-metry, CT dosimetry and medical radiation protection (199 articles in PubMed, September 2018). He has been awarded several Prizes in recognition of his work in the field of Medical Physics.

EFOMP EXAMINATION BOARD

EFOMP

2nd European Congress of Medical Physics in Copenhagen, DK.

Eva Samsøe on behalf of the local organizing committee (LOC)

The 2nd European congress of Medical Physics (ECMP) took place in the Danish Capital, Copenhagen, from Aug. 23 to 25 2018. The congress, which is organized by EFOMP, was hosted by the Danish and Swedish medical physics societies. The 2nd version of the ECMP was a great success with over 800 participants from all over Europe and beyond.

The H. C. Ørsted Institute (Fig. 1), part of the greater Niels Bohr Institute (NBI) of Copenhagen University was chosen as congress venue. A lot of preparations were necessary to make the Institute ready for a big congress. The exhibition, which was really impressive, was built in the main corridor of the institute, the so-called "Vandrehallen" (The Walking Hall, Fig. 2) which constitutes a long walking path through the central part of the institute. The auditoria, which hosted the scientific program were located along and on both sides of the Vandrehallen while the institutes' many class rooms on the first floor made it possible to conduct exams and to have class exercises during the many pre-congress activities.

Fig. 1: The H. C. Ørsted Institute, venue of the congress (copyright S. Holm)

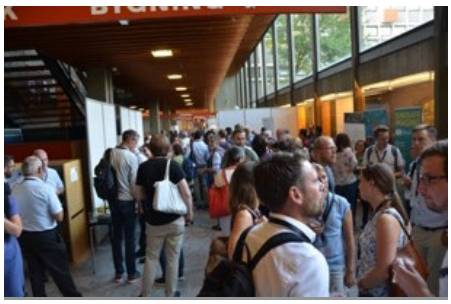


Fig. 2: Vandrehallen with delegates and exhibition (copyright S. Holm)

Fig. 3: Full audience for the ESMPE pre-course on medical statistics (copyright S. Holm)

Daily tours were arranged to the original Niels Bohr Villa, part of the NBI. Here the delegates had the opportunity to step into Niels Bohrs' original office and the famous Auditorium A, where also George de Hevesy and Werner Heisenberg, among other great personalities and researchers, spent important research time developing and founding nuclear medicine and quantum mechanics as we know it today.

The ECMP week at the H. C. Ørsted Institute started already on Monday Aug. 20th with a 2-day summer school on imaging modalities in radiotherapy organized by LOC chair Dr. Jens Edmund and the NBI. The summer school was a success with over 40 participants predominantly from Denmark and the rest of Europe, but also Niger, Israel and Iraq were represented.

On Tuesday and Wednesday, the EFOMP Examination Board (EEB) organized exams in all subspecialties. EFOMP received 18 eligible applications where of 16 were for the European Attestation Certificate to those Medical Physicists that have reached the Medical Physics Expert level (EACMPE) and 2 were for the European Diploma of Medical Physics (EDMP). Thirteen applicants ended up taking the exams and 9 out of the 13 passed (all of them received the EACMPE) while four failed. Congratulations to the 9 candidates receiving the European attestation Certificate.

The day before congress kick-off, three European School of Medical Physics Experts (ESMPE) pre-meetings were organized: "Statistics in Medical Physics" (ESMPE-general, Fig. 3), "IMRT&VMAT planning in practice" (ESMPE-RT) and "Fundamentals of Nuclear Medicine Dosimetry" (ESMPE-NM). The courses were well-attended with 122, 36 (full) and 60 participants, respectively.

A fourth pre-meeting "Patient specific dosimetry for cardiac CT perfusion imaging" (DR) with 20 participants was offered outside the ESMPE frame and jointly organized by EFOMP and the European Metrology Program for Innovation and Research (EMPIR).

Wednesday evening the congress participants were invited to the Copenhagen City hall for an icebreaker reception (Fig. 4). The city of Copenhagen served their traditional pancakes accompanied by wine, soft drinks and a lively atmosphere. Congress and EFOMP president Marco Brambilla welcomed the many participants to the congress while a City Council representative and the Danish health authorities welcomed the participants to Copenhagen.

Finally, on Thursday the ECMP was initiated. The congress program offered 4 parallels sessions on the subspecialties in addition to radiation protection and non-ionizing radiation tracks including MRI. Each day started with 4 parallel refresher courses followed by scientific sessions yielding a total of 12 refresher courses and almost 30

Fig. 4: City hall welcome reception (copyright S. Holm)

Fig. 5: After Dinner Party in the Ceremonial Halls of the University at Copenhagen (copyright S. Holm)

Fig. 6: After Dinner Party Band: Please note, that one of the twin singers is the Chair of the Congress local organising committee Jens Edmund! (copyright S. Holm)

scientific sessions during the three days. The scientific content was expressed in form of 259 oral presentations and over 200 posters. The congress gold sponsors offered various lunch symposia each day followed by interesting joint sessions with EFOMPs many sister societies. Nine joint sessions took place during the congress. Thursday and Friday afternoon, ECMP2018's welcome nation Germany arranged two special sessions on MR/US image guidance in radiotherapy and on ion beam therapy.

The first congress day was completed with a welcome reception at the congress venue with speeches by EFOMP Past President and IOMP Vice President Prof. John Damilakis and LOC chair Dr. Jens Edmund. The event included a poster reception, so that the congress delegates had the possibility to experience the many interesting physical and electronical posters while having a chat, some finger food and a glass of wine with international colleagues.

Friday evening was spent in the Copenhagen University Ceremonial Halls (Fig. 5), with an after-dinner party, live music, drinks and snacks. The presidents of the two hosting societies, Klaus Seiersen (Denmark) and Marie-Louise Aurumskjöld. (Sweden) and the president of the welcome-nation Germany, Katia Parodi, welcomed the guests to the historical building which, due to the sensitivity of the paintings, does not tolerate rock music (!). Fortunately, the impressive building and its paintings does not object to jazz and barbershop music, which was exactly what filled it afterwards in the form of a three-toned singing performance by "The Barbars" consisting of LOC Chair Dr. Jens Edmund, his twin brother Rasmus and their high-school friend Martin plus band (Fig. 6).

The best poster and best oral awards were revealed Saturday afternoon in connection with the congress closing ceremony. Congratulations to Marianne Aznar (University of Manchester, UK) with the best poster: "A novel methodology to differentiate shrinkage versus erosion in CBCT images of lung tumours" and to Sofia Spampinato (Aarhus University Hospital, DK) with the best oral presentation: "Contouring and dose reporting for lower urinary tract sub-structures in cervix cancer". The winners received a mobile inspired by the Niels Bohr atomic model in addition to a free subscription to an ESMPE course including some travel reimbursement.

All accepted abstracts were published in a supplement to EFOMPs journal, the European Journal of Medical Physics (EJMP). Furthermore, EJMP will publish a focus issue with up to 40 full length papers selected from the conference contributions. The contributions will be selected by the focus issue guest editors who are nominated by the EJMP editor in chief. The final manuscripts will undergo a full peer-review process and the focus issue will be published online on April 2019. The papers were free to download from the EJMP website for one month after the congress.

— ***The winners received a mobile inspired by the Niels Bohr atomic model in addition to a free subscription to an ESMPE course including some travel reimbursement.***

Thank you to our fabulous student volunteers, our many sponsors, supporters and exhibitors, the congress office CAP Partner and of course to you: our many skilled congress participants and presenters. We are looking forward to seeing you and your colleagues for the 3rd ECMP in Torino 2020!

Eva Samsøe

Medical Physicist at the Danish Centre for Particle Therapy in Aarhus

Eva Samsøe (1973) obtained her PhD in Atomic Physics from Lund University, Sweden in 2004. She has been working as a medical physicist at Herlev Hospital since 2005 and at the Danish Centre for Particle Therapy in Aarhus since 2018. Eva was appointed the MPE in 2014 and her focus area is radiotherapy of head and neck cancer. She is an active member of the Danish Head and Neck Cancer Group, DAHANCA and the Danish Comprehensive Cancer Center and has been a member of the board of the Danish Society of Medical Physics (DSMF) since 2015. Eva is married and has three children.

Speech at After-dinner party, ECMP, August 2018

Klaus Seiersen, President, Danish Society for Medical Physics

Though most of you have already been here a couple of days, I would also like to welcome you all to Denmark and to our wonderful capital of Copenhagen.

This year's European Congress of Medical Physics is hosted through a joint collaboration with our colleagues and neighbours from Sweden only a few kilometers from where we are right now, and we also offer a special welcome to our other neighbours from Germany, who have organized some of the scientific sessions in the programme. So, welcome to all of you.

Medical physics has a long history in Denmark. The discovery of x-rays reached the Danish newspapers only 5 days after the initial public announcement in Vienna in January 1896, and already at the end of January, physics professor Ellinger was giving public talks here in Copenhagen, where he even demonstrated x-ray imaging of hands and feet of members of the audience. He enthusiastically explored the new rays, e.g. by taking a pelvic x-ray of a friend, with an exposure time of 75 minutes. What a friend!

A Danish newspaper concluded, that only "future will decide whether this discovery will make any impact on medical science". Barely two weeks later, physicist Martin Knudsen acquired the first diagnostic x-ray in Denmark, that of a fractured leg, and in March, professor Ellinger installed the first x-ray equipment at a Danish hospital. In December the same year, the first Danish attempts of x-ray radiotherapy were performed here in this city.

After the discovery of radium, Denmark in 1912 decided to buy this new substance for treatment at several different centres in the country. The money was collected from private donations, establishing a long tradition of private funding for cancer research in Denmark, and Professor Niels Bohr became an important part of this collection work. The first physicist was employed at a radium station in 1921, and later separate medical physics departments were established to help the doctors manage this new and amazing - but also dangerous - ionizing radiation.

Tabt.

I Forgaars er tabt et sammenfoldet Stykke Bly, hvori der l'gger en lille Ebonit-Kapsel, som er meget værdifuld for Ejeren.

Finderen er anmodet om at aflevere den hos Landbohøjskolens Portner.

AUKTIONER.

Fig. 1: 31 January 1914, Danish newspaper „Nationaltidende

TRANSLATION: „Lost. Yesterday, a folded piece of lead was lost, inside a small capsule of ebonite, which is very valuable to the owner. Finder is requested to deliver it to the doorkeeper of the Veterinarian School".

And that was apparently quite necessary!

For example, at the establishment of the radium station in Aarhus, a doctor travelled by boat from Copenhagen to Aarhus carrying with him a simple bag containing radium worth about 80.000 euros in today's money.

He handed over the bag to the purser, and got it back upon arrival in Aarhus, only to discover that he had been handed the wrong bag. The police was alerted, and luckily, they quickly tracked down the right bag and recovered the radium untouched.

I enjoy telling this story when explaining to doctors, why they need physicists.

…I could also tell the story of physicist Ellinger, who only two months later dropped a large quantity of radium while walking through Copenhagen and put an anonymous add in a newspaper asking if anyone had found it. No one responded, and perhaps… perhaps, it is still out there in the streets of wonderful Copenhagen.

Thank you.

Klaus Seiersen

President, Danish Society for Medical Physics

Klaus Seiersen, PhD, Medical Physics Expert. Educated in medical physics at the Department of Oncology, Aarhus University Hospital, Denmark. Now working at the Danish Centre for Particle Therapy. President of the Danish Society for Medical Physics.

Speech at After-dinner party, ECMP, August 2018

Marie-Louise Aurumskjöld, President, Swedish Society for Medical Physics

We also would like to say a few words from Sweden. I am the president of the Swedish Association of Medical Physics and today I also speak for our colleagues and friends from the Swedish Society of Radiation Physics which unfortunately could not be here tonight.

This year became a special year for our Swedish Medical Physicists, allowing our annual National meeting to leave room for the ECMP in Copenhagen.

In Sweden we organise a meeting for Medical Physicists annually; it is the only meeting where we have the opportunity to meet each other over the specialties, except for the European Congress of Medical Physics which has the same concept. At the meeting, we award those who did a good job for hospital physics during the year and give scholarships and prizes. We also pay attention to the younger generation by awarding the best master degree project.

We have exhibitors, invited speakers, sessions with oral presentations, poster sessions and workshops. Our friends at the Swedish Radiation Safety Authority also participate and provide us with important information. And at the end of the meeting an award is given for the best oral presentation in each speciality.

What is required for a meeting to be successful? I will think of three things.

A well-functional organization committee, that can arrange all the practical things around the meeting and make it all possible.

The second thing is an interesting program, which requires a program committee. Without an interesting program, no one wants to attend, except those who will be asked by a committee member.

We think that you have done a great job of preparation and also the program for this years´ ECMP, thanks to all of you that managed this. No one mentioned and no one forgotten!

The last thing are the participants. Without participants - no meeting. You are the meeting. You came here to learn and share knowledge. Meetings and congresses are the opportunity to meet old and new friends and colleagues.

If you are not already connected I think you need to take the opportunity. This place is filled with medical physicists from all over Europe. Wish you all a pleasant evening!

Marie-Louise Aurumskjöld

President, Swedish Society for Medical Physics

Marie-Louise Aurumskjöld, PhD. Educated in medical physics at the University of Lund. Now working at the Skane University Hospital. President of the Swedish Society for Medical Physics.

Speech at After-dinner party, ECMP, August 2018

Katia Parodi, President, German Society for Medical Physics

Dear friends and colleagues from Denmark, Sweden and all around Europe,

it is a pleasure and a great honor for the German Society of Medical Physics to be the Welcome-Nation of ECMP 2018 in Copenhagen, and I would like to thank EFOMP, particularly the President Marco Brambilla, along with the local organizers of the Danish and Swedish Societies, particularly their Presidents Klaus Seiersen and Marie-Louise Aurumskjöld, for this privilege.

I would like to start connecting to the speech of Klaus. Wilhelm Conrad Röntgen discovered the X-rays in Würzburg in 1895 and made an immense contribution to medicine. Nowadays we are also aware of the risks coming from ionizing radiation. Therefore, we have high safety radiation standards and the medical physicist are responsible for their compliance. It is our aim to improve the medical techniques to get better diagnostics and more effective therapies while decreasing exposure to ionizing radiation. In 1896 it took 75 min to take a pelvic image using X-rays. Nowadays we require only a few ms.

With this in mind, our contribution to the ECMP programme included a refresher course about risk management and two scientific sessions on advanced image-guided photon therapy and ion therapy. I would like to thank my German colleagues who contributed with their presentations to these sessions and you all for the numerous attendance.

I would also like to take this opportunity to invite you to celebrate with us the 50th anniversary of our Society in Stuttgart next year. Back in 1969, not a single study program for medical physics existed in Germany. Most colleagues were physicists who developed their skills on their own effort. Today almost 20 universities offer the possibility of a specialized curriculum in medical physicist, and we are making efforts in a dialogue with the authorities to improve educational standards, training and continuing education programs. But also this effort should not be restricted to the national barriers, and we are looking forward to stimulating discussions within EFOMP and the different educational programs on the European level to ensure together high quality and thus an even better impact of medical physics on medical science.

In this spirit, I wish us all a nice continuation of the Congress and very fruitful networking in this outstanding location!

Katia Parodi

President, German Society for Medical Physics

Katia Parodi, PhD. Educated in medical physics at the Universities of Genoa and Dresden, along with various experiences at Massachusetts General Hospital, USA, and the Heidelberg Ion Therapy Center, Germany. Now Professor and Chair of Medical Physics at the Physics Faculty of the Ludwig-Maximilians-Universität in Munich, Germany. President of the German Society for Medical Physics.

ESMRMB-EFOMP Joint Session at ECMP2018: Goddag, Kopenhagen!

The ESMRMB (European Society for Magnetic Resonance in Medicine and Biology) was very excited when we were invited to the ECMP 2018. What an exciting meeting, what a great location!

The cooperation with the EFOMP office in preparation for ECMP was most pleasant and extremely efficient.

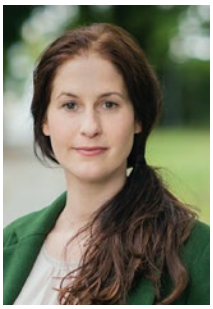
The ESMRMB booth was located next to the ESR booth and right opposite the coffee break area and on the way to lecture halls, right in the center of the attendees' attention. In their preparation of the meeting, the ESMRMB Board had decided to offer an exclusive discount for ESMRMB Educational Programmes, which was very well received by the ECMP participants.

The highlight of the meeting for us was definitely the EFOMP-ESMRMB Joint Session, held on 24th August and entitled "The expanding role of MR in radiation therapy". The session programme had been planned by Richard Bowtell (ESMRMB President 2018/19) together with David Lurie (liaison with EFOMP). The attendance of the session was overwhelming, with hardly a spare seat in the room! This was undoubtedly testament to the increasing importance of MR in radiation therapy and the thirst for physicists' knowledge in this area. Heinz-Peter Schlemmer (Heidelberg/DE) started off with his presentation on "Benefits of MRI for Radiation Therapy"; his slide headed "We need you, MR Physicists, MR Radiologists, MR Technologists" was applauded by the audience. Uulke van der Heide (Amsterdam/NL) then continued with a talk on "MRI for radiotherapy treatment planning", highlighting the challenges and the ways in which they are being addressed. The lectures were rounded off by Cornelius van den Berg (Utrecht/NL), who reported on "New Technologies for MR guided Radiotherapy", in which he described the amazing technology being developed and its potential benefits. The session ended with a brief but lively discussion with the audience. One thing was made very clear, that the physicist's contribution is crucial in order to optimize the role of MRI in radiation therapy!

— The ESMRMB is committed to scientific and technical excellence, to innovation and quality in healthcare, to the promotion of knowledge and understanding, and to interdisciplinary co-operation.

Interactions on-site once again confirmed us in our endeavour. The ESMRMB is a non-profit and apolitical society, which promotes the development and practical application of magnetic resonance in medicine and biology within Europe. It fosters co-operation both between workers in different European countries and between those in the various disciplines in its field. The ESMRMB is committed to scientific and technical excellence, to innovation and quality in healthcare, to the promotion of knowledge and understanding, and to interdisciplinary co-operation. We, therefore, invite all EFOMP Members to also join our society and join forces with medical professionals active in the field of MRI.

A heartfelt thank you goes out to the EFOMP office for their great support in preparing for our trip as well as on-site help. We can't wait to contribute to the ECMP 2020 in Torino and are looking forward to a fruitful cooperation between our societies.



Vera Schmidt

Vera Schmidt was born in Vienna/Austria and became ESMRMB Executive Director in 2018. She started to work for the European Society of Radiology (ESR) as an on-site freelancer 1998 when she was a student. Her first ESMRMB congress however was in Basel in 2005. Stimulating her creativity by writing articles for newsletters, websites or small texts for the social media is one of her favorite tasks and she thanks the EFOMP for this opportunity and the great conference in Copenhagen!

David Lurie

David Lurie holds a Chair in Biomedical Physics at the University of Aberdeen where he leads a team working on MRI technology and applications. He is coordinator of the 9-partner "IDentIFY" EU Horizon-2020 project, developing Fast Field-Cycling MRI and he was awarded IPEM's Academic Gold Medal in 2017. David chaired the Physics in Medical Imaging subcommittee of ECR in 2017 and is EFOMP's representative on the programme planning committee for the 2018 and 2019 congresses.

Matthias van Osch

Matthias van Osch is a professor in Radiology with a special focus on cerebrovascular imaging within the Leiden University Medical Center, Leiden, The Netherlands. He is currently also chairing the scientific program committee of the ESMRMB 2019 to be held in Rotterdam, The Netherlands from 3rd - 5th October 2019. Special focus topics on this meeting will be: Machine learning in MRI, Gadolinium-free imaging and Efficient MRI. He hopes to welcome many members of the EFOMP in Rotterdam.

Best oral presentation award at ECMP2018: Contouring and dose reporting for the lower urinary tract in cervical cancer

Young Ph.D. student project presented: Sofia Spampinato was the winner of the best oral presentation

The work presented at the 2nd ECMP is part of a Ph.D. study aimed at developing dose-effects models for urinary toxicity after radiotherapy in cervix cancer. The gold standard treatment for Locally Advanced Cervical Cancer (LACC) includes the first phase of External Beam Radiation Therapy (EBRT) with concomitant chemotherapy followed by an Image-Guided Adaptive BrachyTherapy (IGABT) boost to the high-risk region. For current bladder

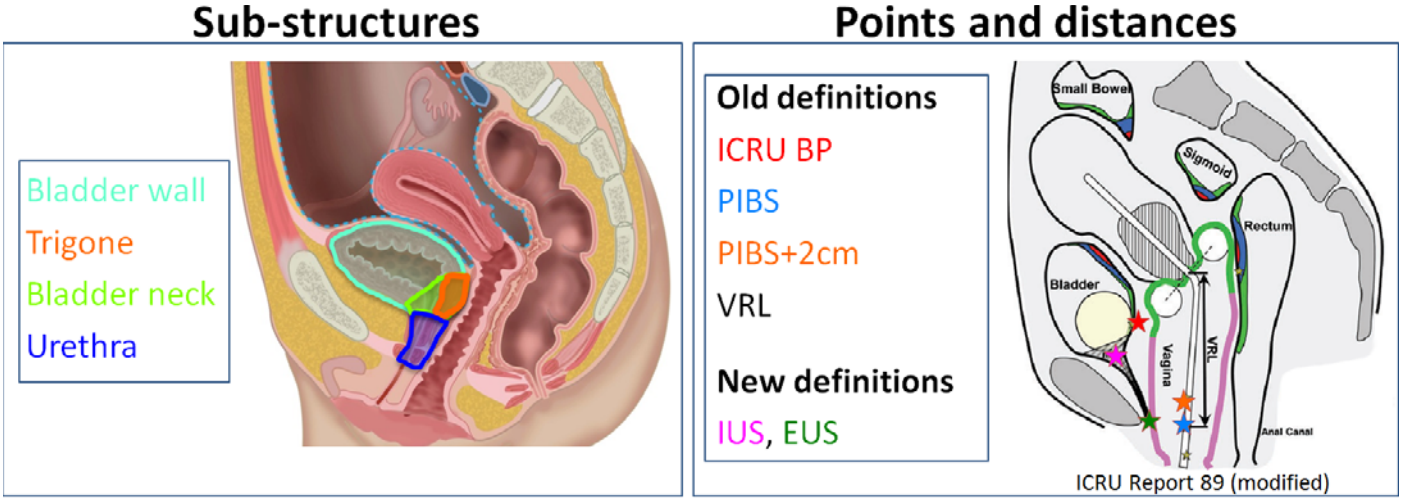


Fig. 1: . Left) Main lower urinary tract substructures identified in the study. Right) Dose points and reference distances used in the study.

dose reporting, two parameters are recommended: the minimal dose to most exposed 2 cm3 of the bladder (D2cm3), and the International Commission on Radiation Units & Measurements Bladder Point (ICRU BP), defined as the most posterior extent of the Foley bladder balloon inserted during the IGABT treatment. Nevertheless, specific dose constraints are not yet available probably due to the lack of dose-effect curves for urinary toxicity. For a comprehensive understanding of late adverse effect after radiotherapy, trials are needed to effectively score urinary endpoints. This can be done either by a physician or patient reported outcome, and their combination is the most powerful tool for assessing the toxicity grade. Whit this in mind, the multicenter prospective observational EMBRACE I study (www.embracestudy.dk), started in 2008 and closed in 2015 with 1416 patients enrolled, aimed at developing models for clinical outcome including volumetric, dosimetric, clinical and biological risk factors through reporting on treatment and outcome parameters.

> ***However, the underlying hypothesis that all adverse effects have the same cause may not be true.***

On the other hand, a common approach in the construction of dose-effect curves is to pool together different endpoints and then look for a single representative dose parameter. However, the underlying hypothesis that all adverse effects have the same cause may not be true. Urinary toxicity is a complex phenomenon including several endpoints (frequency, incontinence, cystitis, bleeding, fistula, etc.) that could be linked to damage to different substructures.

The first step to improve the understanding, presented at the 2nd ECMP, was to identify the main substructures potentially involved in radiation-induced toxicity and to compare the dose distributions with the current dose reporting. In addition to the bladder wall, the trigone, the neck and the urethra were also considered (Figure1a). Furthermore, the PIBS and PIBS+2cm points, already used for vaginal dose reporting, were considered as potential urethral dose surrogates. The Vaginal Reference Length (VRL), defined as the distance from the PIBS point to the sources, was also extracted. Finally, two new points, Internal Urethral Sphincter (IUS) and External Urethral Sphincter (EUS) were introduced as urethral dose surrogates (Figure1b).

105 patients treated with radiochemotherapy and two fractions of Pulsed-Dose-Rate (PDR) IGABT were selected for the study. Substructures were contoured on each IGABT plan using T2-weighted MR images. DVH parameters, dose points and distances were extracted and the cumulated dose was calculated in EQD2 using an **α/β** of 3, an half-repair time of 1.5 hours and considering as EBRT contribution the prescription dose.

Comparing the D2cm3 for bladder wall and trigone, as well as the D0.1cm3, the correlation was poor because hotspots were often located in the bladder dome. On the other hand, the correlation of trigone D2cm3 and D0.1cm3 with ICRU BP was better, because its position coincides with the bladder base. All parameters related to bladder base (ICRU BP, trigone, bladder neck, urethra) showed a good correlation with VRL, meaning that this parameter is a good indicator for dose sparing. Finally, PIBS and PIBS+2cm were not good urethral surrogates especially for high dose ranges, so new points (as IUS and EUS) need to be considered.

In conclusion, the current dose reporting in LACC treatment does not exhaustively describe dose distributions in the lower urinary tract. Further understanding of dose-effect relationships may be gained by systematic delineation of substructures.

Authors

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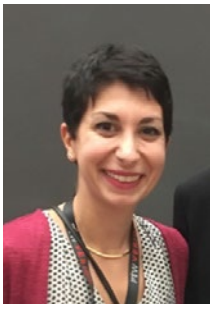


Sofia Spampinato

Department of Clinical Medicine - The Department of Oncology, Aarhus University Hospital, Aarhus, Denmark

Sofia Spampinato is a PhD student in the Department of Oncology at Arhus University Hospital (Denmark) supervised by Prof. Kari Tanderup. She obtained her Master's degree in Physics in 2012 at the University of Catania (Italy) and continued with a residency in Medical Physics at the AOU Policlinico-Vittorio Emanuele in Catania, obtaining the Italian accreditation in 2016. During her clinical residency she also carried out research activities in the fields of dosimetry and Quality Assurance. She moved to Denmark in early 2017 for her PhD and her research line is now the development of dose-effect models for urinary toxicity after brachytherapy in cervix cancer within the EMBRACE framework.

From a special focus session at ECMP2018: Modern educational techniques in Medical Physics

For the first time at the European Congress on Medical Physics, a dedicated focus session on educational techniques has been organized by the EFOMP Education and Training Committee. This is an extended summary of the introductory presentation of this session given at the ECMP2018 at Copenhagen.

Fig. 1: Teaching in the "classic style": My Christmas lecture, where bored students are desperately awaiting the Glühwein to reach its drinking temperature. © S. Scherf

When you start teaching a Medical Physics course or give even a single lecture, it is wise to know a little bit about your audience, especially about their composition and pre-existing knowledge of your topic and, naturally, their interests. Besides having an oral self-presentation round of each individual (fine for small groups) or filling out a questionnaire (works also for large groups), a quicker and more up-to-date way is to use an(usually anonymous) online-feedback tool via smartphone-like "invote.de" (sorry – the tool is in German, but you can post your questi-

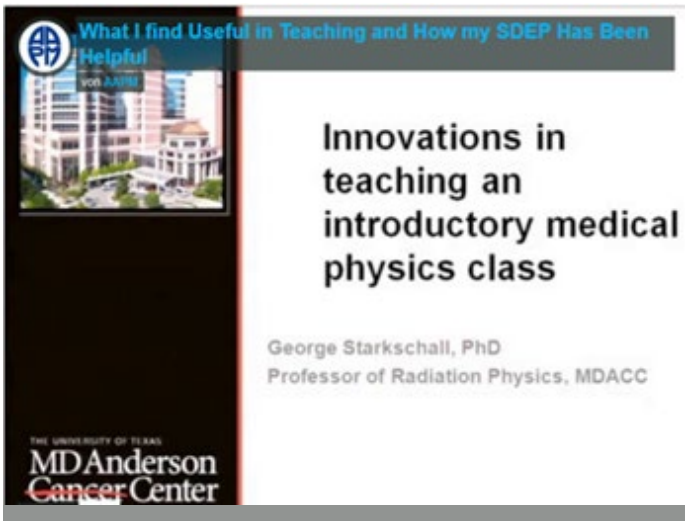


Fig. 2: Title slide of Georg Starkschall's presentation on "Innovations in teaching an introductory medical physics class" at the 2010 AAPM summer school. © Georg Starkschall

Fig. 3: Title slide of Robert Beichner's presentation on "Multiple Technologies to Address Multiple Instuctional Needs" at the 2010 AAPM summer school. © Robert Beichner

ons in any language!). I used this tool in my presentation at ECMP2018. Even if due to the very limited time during my talk, I could only evaluate and show some of the responses during my presentation, I can analyse it offline afterwards, too. So I know now, that up to 40 participants responded to my questions via "invote.de", consisting of 60% male and 40% female participants. Among these, 11 are teaching in diagnostics, 3 in imaging, 9 in radiotherapy, 8 in radiation protection, 2 in nuclear medicine and even 5 are not teaching at all (naming multiple subjects as free text was possible).

What is regarded as the "classic style" of teaching (not limited to Medical Physics subjects)? From my own experience of many lectures it is, that someone stands in front of a black or white board in an audience hall and is often clicking through powerpoint slides, summarizing content from his or her favourite lecture book or re-view papers on the subject (Fig. 1). This is the case for almost any kind of audience like students, physicists, physicians, RTs, nurses… This can get very boring! If you are lucky, he or her is of the very old style, that is using the board or flip-chart to de-velop the key points of the subject taught by writing and sketching in a dialogue manner together with the audience. As you may have experienced yourself in such lectures, it is the involvement of youself and your thoughts and ideas, that will keep you awake.

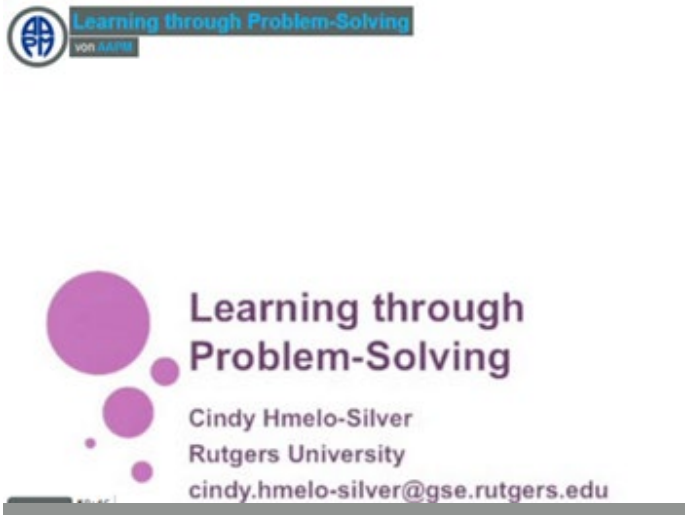


Fig. 4: Title slide of Cindy Hmelo-Silver's presentation on "Learning Through Prob-lem-Solving" at the 2010 AAPM summer school. © Cindy Hmelo-Silver

Times have changed and as already stated above, there are now more tools available besides boards to write on. If you are teaching at a university or similar larger institution, you may have the chance to participate in didactic seminars, where new concepts and the use of new tools are presented. Already at 2010, the AAPM sum-mer school "Teaching Medical Physics: Innovations in Learning" addressed this topic. This summer school presentations were recorded and videos are available for free at: vimeo.com/channels/ss2010. Fig. 2-4 are screenshots of titles of some of the presentations given there to get you even more interested to check out the videos yourself! Just one month prior to ECMP2018, there was again a workshop of AAPM at Nashville, TN, on "Improving the Teaching and Mentoring in Medical Physics". Course director was Victor Montemayor, who is also the current chairman of the AAPM Committee on Medical Physicists as Educators (MPESC). I just list three titles of presentations given there for you: "What Neuroscience Research Has to Tell Us About the Effects of Learning on the Brain" (Laurie Cutting), "Best Practice: Project-based Learning (PBL) in Medical Physics" (Rebecca Howell) and "Best Practice: Flipped Learning in the Medical Physcis Classroom" (Matt Studentski). Do you rec-ognize already known keywords of modern style teaching: Neuroscience, Project-(also: Problem-)based Learning and Flipped (classroom) Learning. If you have not heard about these, here is a very (!) brief introduction to the basics of the later two teaching concepts:

Project-/Problem-based learning and/or the flipped classroom approach just intro-duces the audience to basic knowledge like facts, tables of data, formulas and hints on where to start searching for information of the subject in books and in the internet. This is mostly the longest time you will spent in kind of the "old style" standing in front of the audience, since key mark of these new teaching techniques is the for-mation of groups, that work on a problem scenario or a set of problems on their own. The basic idea behind this approach is "peer instruction": Based on pre-existing knowledge or understanding and continuation of your introductory information the correct solution or a reasonable approach to solve the problem will mingle out by arguments exchanged within the group. The teacher or lecturer is just an "accom-panying expert", that consults in a regular sequence with the group, preventing them to get too far off or to provide deeper specific information upon request if needed. The results

of the groups are finally presented to the whole audience, so the new knowledge can be gathered by all. Very important to this approach is the teamwork-aspect: if you can explain it to your fellow student, you got it! In the flipped- classroom approach, the basic information material is provided prior to the lecture in printed or electronic form (e.g. via learning management platforms like "moodle") and has to be studied in advance. During the time present in the class-room, a set of problems is worked on, mostly in groups as well. But very important: no basics are repeated in class, otherwise you end up in the old style!

What are the Pros and Cons of these "new style" teaching methods?

As you can easily see from the open approach in group discussions of solutions, it is the project and problem solving competence, that is focused on, as well as the competence to learn and work in groups, enforcing team and communication skills. If you have worked in groups yourself, you surely know, that the composition of the group is an important key to its success. It always needs someone that did not get it on the first grasp, so it needs someone else in the group to explain and answer the "stupid questions" posed. Let me compare this to a dough that needs kneading (questions) to distribute the ingredients (answers/knowledge) evenly. While it was maybe plain luck in the past, if the composition of your group was good for its suc-cess, results of modern teaching analysis indicate, that a good mixture or heterogeneity of the group is an important key. It has to be paid attention to existing knowledge, as well as to social skill aspects among the group members when forming the groups. Special tools like questionnaires can facilitate formation of such balanced groups.

— Special tools like questionnaires can facilitate formation of such balanced groups.

When these modern techniques are introduced, students, as well as teachers, will have get used to it. It requires discipline and self-control of your learning or teaching attitude. Due to additional aims addressed with these techniques, you have to con-centrate the content down to essentials, so less formulas and facts are taught, since the main emphasis is put on competences to solve and successfully accomplish a new project. If you start a course from scratch, this is basically no extra labor (except that you cannot copy your own teacher of the past…), but if you have already set out your lectures in the "old style", you have to start over again. Or maybe not complete-ly, as there might be an "intermediate style" of teaching, too. Since a few years and as result from own teaching experience, as well as input from didactic seminars, I created my own "mixture". I use activating breaks of discussions of the students with their neighbors. This introduces a "change of view", such that the students look at some else than me and have to express their thoughts and ideas to someone be-sides listening to me. To catch misunderstandings or misconceptions, I have alter-nating students summarizing the content at the start, in the middle and at the end of the lecture. At the same time, the others get the content presented once more (var-ied repetition is a key to memory!). To train problem solving competence, I have this person try to answer/solve a question/problem within 3 minutes (clock on the beam-er is counting down! But 3 minutes are more time than you may guess first hand). To add a bit of team competence training, this is usually done with the help of another student acting like the telephone-joker in the "who wants to be a millionaire"-quiz on TV. Being a "telephone-joker" is limited to two times, so quickly the "good ones" are out of the game.

With this example of a teaching concept, I have not even touched the field of good animations, videos or presenting original pieces of equipment during a lecture of a Medical Physics subject. All this together will make up the smart arrangement and activating interaction with the audience that will render your lecture a success in gained knowledge for the audience. These concepts are regarded as an educa-tional resource, too, just like the animations or videos e.g. that you may use. The goal of an initiative of the EFOMP Education and Training Committee is to establish a network of Medical Physics teachers, who are interested in and would like to share their concepts and materials as Open Educational Resources (OER) under the creative commons licensing (CCL or GPL) con-

cept (something to inform about in another article to be written!). EFOMP would like to create a teaching material re-pository to this end. At the start, already existing materials and concepts of teaching could be made available there. Preferably in English, but this is just a matter of translation. Foremost is the creation of links between in-terested and active teachers in Medical Physics in Europe and maybe also beyond, as there exist already links to the AAPM MPESC. So if you are interested to exchange your concepts, get in con-tact with me at: Buchgeister@Beuth-Hochschule.de!

PS: I have to give you the other results of my "invote.de" feedback during my presentation at ECMP2018. Among 35 responders, 40% had already experience with some kind of "new style" teaching, while 60% did not. Asked, if they were satis-fied with their teaching result, 53% out of 32 responders answered with yes, 47% with no. So at least for almost half of them, there might be the interest for improve-ment. Among 28 responders who are teaching, 79% would be willing to try some-thing new, 4% would refuse and 18% already teach in the "new style". My resume of these figures in total is, that there is a change of style in teaching Medical Physics on the way in Europe. And I would like to make the Education and Training Commit-tee of EFOMP as well as the European Congress of Medical Physics the place to exchange new concepts as well as tools/media and foster this change of teaching Medical Physics!

Prof. Dr. Markus Buchgeister

Chairman of the EFOMP Education and Training Committee

Markus Buchgeister finished his doctoral thesis in 1991 in the field of high--temperature superconductivity. In 1995 after 3 years as Post-doc, he switched field to medical physics in radiation therapy at the university clinic of Tübingen. At this time he also started teaching medical technical assistants at the local school of the university clinic, which he and hopefully his students enjoyed as well. In 2010, he received a call for a position as professor for medical radiation physics at the Beuth University for applied sciences at Berlin. Since 2003, he is engaged as co-opted DGMP board member for public relations and communications of the German Society for Medical Physics. Parallel, he served as chairman of the EFOMP Communication and Publications Committee 2003-2009 and from 2009-2015 as German EFOMP delegate. In 2016 he was elected as EFOMP vice-chairman of the Education and Training Committee that he is chairing in 2017-2018.

2nd European Congress of Medical Physics in Copenhagen, DK.

Participants' reports from ECMP2018: The view of two young Medical Physicists

ECMP 2018 was a great event, connecting the different subspecialties and creating a common forum for sharing knowledge, broadening network and focusing on nuclear medicine, diagnostic radiology, non-ionizing medical radiation, radiation dosimetry, radiation protection, and radiation therapy physics. I cannot express my gratitude enough due to the vast benefit I got from learning about the state of art techniques and approaches at the scientific sessions and lectures. Also, the really precious meetings with colleagues and participants, learning tricks from their experiences, debating current topics of common interest were other great chances. It is my understanding that at ECMP 2018 the focus was too much higher degree on the upcoming, novel technologies and approaches, in each field.

More than 250 presentations and 300 posters showed a great success on efforts made by the medical physics organisations for many years. Thus enabling and leading us to change our ways to continue to innovate, build new technologies. This congress emphasized the critical roles of automation, informatics, deep learning, radiomics, fulfilling the gaps in particle therapies. Despite just mentioning the applications of novel techniques and approaches, with the new vision that we gained during the Congress, it motivates and forces us to be one step ahead and take more responsibilities to be the pioneers leading the innovative developments of the field.

The opening session for me was a clue, showing overall logics behind all of the Congress. That session was "Risk Management in Radiotherapy", explaining the roles and opportunities for advancing things for medical physicists in designing and performing risk assessment in radiotherapy with practical examples of risk analysis to illustrate methods employed such as FMEA.

In the sessions about proton therapy planning international, multi-institutional projects were mentioned, current treatment planning techniques and procedures used in proton therapy were explained, together with methods to address uncertainties in proton therapy.

A new subject has begun to be heard more and more in the recent years: Radiomics. Therefore, it also found a wide place for itself at ECMP 2018. So, the contribution of the factors such as hypoxia, cellular phenotype, cell kinetics etc. to personalised therapy using tools such as radiomics and mathematical/computational modelling was discussed. Besides, there were other sessions, focused solely on the broad enough topic of radiomics, in which were discussed the basics of image analysis involving multidimensional data and the impact of radiomics on personalized radiotherapy, including where radiomics approaches are implemented in tumor detection tools that could work to recognize malignancy textures where human eyes could not detect any such findings from different imaging modalities.

I made a presentation with the title "Train The Trainer Workshop On Medical Physics Support For Nuclear Or Radiological Emergencies" which originated from a workshop developed by IAEA, held by Argonne National Laboratory, in consultation with the WHO, IOMP, IRPA and held by CDC and REAC/TS. I am grateful for the ENEN+ project for the opportunity to share my experience and increase my knowledge during ECMP.

As the great author, Hans Christian Andersen said, "Life itself is the most wonderful fairy tale" this Congress made us feel exactly that way. Having the chance to come across the best weather and charming atmosphere of Copenhagen. Living the "hygee" from head to toe if we admit its meaning as "creating a warm atmosphere and enjoying the good things in life with good people" during the Congress while exchanging information, making fulfilling discussions, during the coffee breaks, lunches, dinners and tasting "pandekager" during carefully organised social events such as in pleasant Town Hall. Thanks to the EFOMP's, Danish Society for Medical Physics', The Swedish Hospital Physicists Association's and the local organizers'efforts.

Nur KODALOĞLU

Medical Physicist, Nuclear Engineer MSc.

I am graduated from Hacettepe University Nuclear Engineering Department in 2007. I got my master degree in Hacettepe University - Clinical Oncology- Radiotherapy Physics Program in 2011. I am a PhD. Student at the same department in Radiotherapy Physics Program. I passed the first International Medical Physics Board Certification (IMPCB) exams in 2017. In 2018 June, I won a innovation award among more than health technologies, social innovation, advanced technologies with designing a bra and a shielding to reduce the out-of-field dose of the contralateral breast. I worked at Turkish Atomic Energy Authority for almost one year and have been working at Ankara Numune Research and Training Hospital since 2012.

2nd European Congress of Medical Physics in Copenhagen, DK.

Participants' reports from ECMP2018: The view of two young Medical Physicists

The 2nd European Congress of Medical Physics (2nd ECMP) took place 23-25 August 2018 at the H.C. Ørsted Institute in Copenhagen, Denmark. ECMP offered a unique and precious opportunity for all participants of different medical physics specialties to exchange ideas and share their knowledge and experience.

High-level conference sessions were held in four auditoriums and the participants were capable of attending various medical physics topics in the form of invited talks, oral presentations, and posters exhibition. A wide range of scientific topics was covered for all different subfields of medical physics such as: diagnostic radiological physics, therapeutic radiological physics, nuclear medical physics, and medical health physics. In-depth research findings associated with photon-RT, particle-RT, DR-CT, NM-RT, QA, dosimetry, MR, laser, SUV, etc. derived from many hospitals and university hospitals were presented and talked out during sessions via questions which were encouraged by the chairmen and during coffee-breaks.

Fig. 1: Impressions of the Congress, © Georgia Pentrou

The purpose of the 2nd European Congress of Medical Physics was to connect the medical physics specialties and create a common forum for networking, sharing knowledge, and focusing on the physics within the field of medicine and it was successfully achieved. Also, the Congress facilitated successfully the synergy between industry, research, and clinical practice that ultimately leads to improvements in health care.

Overall, a very well organized conference was carried out with a provision of services (guidance, assistance, information) for all participants and a bridging of specialties was achieved promoting unity, integrated team approach to health care for an optimal clinical outcome.

Georgia Prentou

Ph.D. Student Medical Physics Laboratory of Medical School at the National and Kapodistrian University of Athens

Georgia Prentou is a Ph.D. Student working in the Medical Physics Laboratory of Medical School at the National and Kapodistrian University of Athens. Her research focuses on assessment of uncertainties and their impact on dose distributions and plan evaluation tools of modern radiotherapy techniques.

Italy will host the 3rd ECMP in Turin on 24-26 September 2020

The echo of the success of the Copenhagen 2nd ECMP hasn't yet faded down and EFOMP is already on the move towards the organization of the next ECMP to be held in Turin on 24-26 September 2020 (Fig. 1).

The high achievements of the Copenhagen Congress both in terms of the number of participants and scientific quality are at the same time stimulus and background for a further development of medical physics within Europe and abroad.

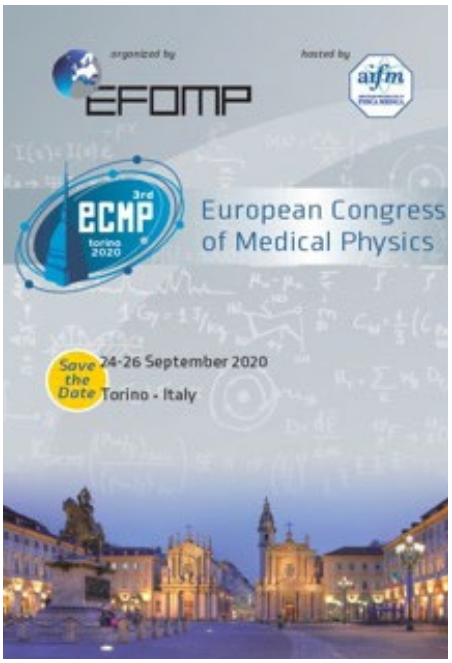


Fig. 1: Announcement of the 3rd ECMO Congress to be held in Turin, Italy on 24-26 september 2020

The Italian Association of Medical Physics (AIFM) is proud of having been selected as EFOMP partner in hosting the 3rd ECMP. Actually, AIFM, having organized its own 2018 national congress with a comprehensive budget above 320.000 euros, stands as a solid pillar for the next coming certainly far-reaching international congress. Moreover, our past president John Damilakis has been included as EFOMP representative within the local AIFM organizing committee. His large experience provides a further guarantee for a fruitful partnership between AIFM and EFOMP.

On the other hand the selected venue, the congress center Lingotto, closely connected to the city center, is perfectly equipped (Fig. 2) for hosting the very large number of participants we consider appropriate for a Congress aiming at pushing European medical physics a further step ahead, that is at demonstrating worldwide that Europe holds the lead in many subspecialties of our discipline. The local organization is ready to appropriately handle the attraction of a very large number of scientists from the whole of Europe and from America and Asia as well.

Turin is one of the major Italian congress destinations thanks to its main characteristics: a strategic position and easy access from Italy and from abroad, top-level congress structures and services, quality accommodation, from deluxe to low-cost and, additionally, historical and artistic tourist points of interest.

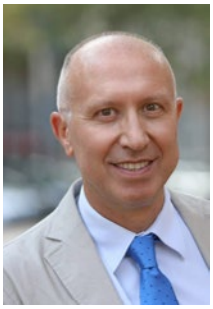
— Turin is one of the major Italian congress destinations thanks to its main characteristics: a strategic position and easy access from Italy and from abroad

Finally, Turin, a calm, quiet and well-organized city in northern Italy, is located in a magnificent scenario in the view of the Alps (Fig. 3) and moreover the month of September offers the best weather for enjoying the famous traditional open-air cafés and restaurants.

In conclusion, there are all the prerequisites for a great 2020 ECMP Congress and AIFM will do its best in order to fulfill such a goal. Welcome to everybody in Turin!

Fig. 2: The venue. The Lingotto Conference Center

Fig. 3: Night view of the city center of Turin



Michele Stasi

President, Italian Association of Medical Physics (AIFM)

Degree in Physics – University of Turin, Specialization in Medical Physics – University of Milan,
Qualification and registration at the National Register of Qualified Experts – grade III;
Director of Medical Physics Dep. A.O. Ordine Mauriziano Torino & Candiolo Cancer Institute-IRCCS, Italy, President of the Italian Association of Medical Physics (AIFM), National Scientific Certification as Full Professor of Medical Physics Contract Professor at University of Turin,
Member of the Ethics Committee, Candiolo Cancer Institute-IRCCS;
Referee for the following scientific Journal: Physica Medica, Medical Physics, Radiotherapy and Oncology, Physics Medicine and Biology,
Scientific Committee Referee of ESTRO 34, ESTRO 35, ESTRO 36, ESTRO 37, ESTRO 38, Chair of Local Committee Organizer ESTRO 35, Torino 2016;
Member of the following scientific associations: AIFM, ESTRO, AAPM;
Author of 270 paper. 77 of which have been indexed and 3 monographs. H-index: 16 (by Scopus)

Cesare Gori

Member, Communication & Publication Committee

Cesare Gori has been running the Department of Health Physics at the University Hospital of Florence, Italy from 1992 up to 2014. At present Cesare is acting as RPE for the University of Florence. Founding member of the Italian association of medical physics and EFOMP delegate, collaborated as expert in the drafting of RP 174 "European Guidelines on the MPE" and ICRP 138 "Ethical Foundations of the System of Radiological Protection". Member of the Communications & Publication Committee.

European Congress of Radiology 2019: Medical Physics and the "Big Picture" (27th February- 3rd March, Vienna, Austria)

The theme chosen for the 2019 European Congress of radiology is the big picture. Medical physics is about the exchange of scientific ideas with our medical and radiological colleagues to optimize patient care and experience and develop new ideas as part of the multidisciplinary team. The European Congress of radiology delivers on this mission year on year. In 2019 we see the congress celebrating twenty-five years in Vienna. This sees the big

Fig. 1, 2 and 3: Impressions of the ECR, © Paddy Gilligan

picture accessible in one location. The Congress for over 25,000 attendees reflecting the 80,000 strong membership of the European Society of Radiology. Having been involved in the Congress over the last decade or so, it has become obvious that the scientific content of presentations has improved, the teaching and refresher courses available to physicists are second to none, and the Congress trade exhibition has now become the launch pad for many new and exciting products.

The physics subcommittee, EFOMP along with the ESR and EFRS have worked to raise the physics content to a new level with over thirty sessions in the five days of Congress. Whether you want to hear about new developments around, big data Artificial intelligence reconstruction algorithms and spectral ct from top physics speaker or simply add the basics of MR to your knowledge portfolio this year's program is an essential educational opportunity (with lots of cpd points). Radiation safety and optimization is a key theme of the 2019 congress and underpins the Eurosafe program one year after the transposition deadline of EU directive 59/13. Although we can benchmark our doses, what does this mean, in scientific terms, for image quality and clinical performance, how do we assess this image quality and what can big data tell us?.

The hallmark of the diagnostic and interventional Medical physics imaging community and EFOMP are interwoven through the program and we are blessed to have such physicists attend speak and attend each year in Vienna. However, we also are a community and 2019 see the big picture reflected in two networking events for physicists: a social drink and snack (and some tunes) in Charlie Ps pub on Wahringer Strasse on Thursday the 28th February 7-9 pm and a coffee and chat on the Saturday at the Efomp booth on Saturday the 2nd March. Details and how to register interest for such events will be on the EFOMP website. We have had some offers on the fees at the Congress at the recent ECMP congress in Copenhagen and the young investigator program is available to Ph.D. physics students under the age of thirty-five. There are five medical physics refresher courses, two special focus sessions on 3D printing and 7 Tesla MR, 1 new horizon session on the liquid biopsy, five euro safe imaging sessions on the new BSS. a special EFOMP workshop on the big picture: deep learning in optimization. This congress in the beautiful and accessible city, which won recently the accolade of best city to live in in the world, is a must for medical physicists. The Congress also provides an excellent platform for the presentation of research and electronic posters in medical physics, and if you haven't submitted for 2019, 2020 is not far away. The physics program and stellar lineup of speakers are available at this link. So see you in Vienna next spring : https://www.myesr.org/sites/default/files/2018-08/ECR%202019%20Folder%20Web%20Physics%20Programme%20147x200.pdf

Physics Highlights | ECR 2019

REFRESHER COURSES

Lung nodule management in 2019 Patient-specific dosimetry Striking the balance: image quality assessment in radiological optimization

Dose management in paediatric radiology

Demystifying MRI: things you always wanted to know

Dose reduction and image quality implications of iterative image reconstruction in CT

E³ - EUROPEAN DIPLOMA PREP SESSION

Principles of imaging and radiation protection

E³ - RISING STARS PROGRAMME: EFRS RADIOGRAPHERS' BASIC SESSIONS

Radiation protection: all you need to know ESR MEETS AFRICA Radiology in Africa: facing challenges and opportunities

NEW HORIZONS SESSION

The role of imaging in the era of liquid biopsy

SPECIAL FOCUS SESSIONS

7 Tesla MR goes clinical

The 3D printing lab from bench to bedside

COFFEE & TALK (OPEN FORUM) SESSIONS

Clinical audit across Europe: how to increase uptake and support

BSS transposition

Bonn Call for Action Implementation Toolkit: free access to a wealth of resources

Radiation protection in paediatric patients - same principles, different approach: use cases

Dissemination of ESR iGuide/CDS/guidelines in Europe: use cases

Dissemination of ESR iGuide/CDS/guidelines beyond Europe: use cases

Access to the medical physics expert (MPE) in the imaging department:

use case EuroSafe Imaging meets Canada

Safe Imaging Team approach and safety culture in the imaging department

EUROSAFE IMAGING SESSIONS

Team approach and safety culture in the imaging department

Diagnostic reference levels (DRLs) based on clinical indication Artificial intelligence and radiation protection

Advanced clinical dosimetry in interventional radiology

Getting the balance right: radiation risk and imaging benefit in paediatric procedures

CT radiation risk in children: an overview

JOINT WORKSHOPS & SESSIONS

EFOMP Workshop: Big data and the big picture: deep learning in optimisation of medical imaging Joint

Session of the ESR and EFOMP: Medical imaging and emerging issues in occupational radiation exposure

Joint Session of the ESR and EFRS: Patient safety in medical imaging

ESR Audit and Standards Session: Audit across Europe: directive and perspective

ESHIMT Session: Artificial intelligence in hybrid imaging

Paddy Gilligan

chair of the 2019 European Congress of Radiology Physics Subcommittee

Paddy Gilligan is the chair of the 2019 European Congress of Radiology Physics Subcommittee. He is chief diagnostic and nuclear medicine physicist at the Mater Private Hospital Eccles street, Dublin 7, Ireland where he has worked for 27 years. He is associate professor of clinical medicine in University College Dublin. He is a member of the state Irish National Radiation Safety Committee where is he is chair of the population dose and optimisation committee, former director of the Radiological Protection Institute of Ireland, and a member of the Health information quality authority advisory board on EU directive 59/13. He is the former president of the Irish National Member organisation of medical physics. He is the vice chair of the Irish faculty of radiology radiation safety committee and a member of the European society of radiology radiation safety committee. He runs a medical physics workshop at the Robert Boyle Summer school each July.

EFOMP school for Medical Physics Experts

The EFOMP School for Medical Physics Experts (ESMPE)[1] and the European School of Multimodality Imaging and Therapy (ESMIT)[2] recently signed a Memorandum of Understanding (MoU). ESMPE and ESMIT are the educational bodies of the European Federation of Organisations for Medical Physics (EFOMP) and the European Association of Nuclear Medicine (EANM), respectively.

- The Dosimetry Committee of the EANM has been involved in education since its creation in 2001. Education was delivered to nuclear medicine professionals, during Continuing Medical Education (CME) sessions during the EANM congresses. Specific 1.5 days courses were designed as yearly events, taking place at the EANM educational facility in Vienna.
    - The "Basic dosimetry and therapy" course inaugurated a novel type of education where the presence of a "couple" of physician and physicist was highly encouraged. This proved to be very stimulating, alternation of physics and medical lectures promoted exchanges between professionals. Yet, this formula generated contrasted reactions: Some participants lauded the initiative, others expressed their frustration as the content was felt overly simple (in their own field) or overly complex (in the field that wasn't theirs).

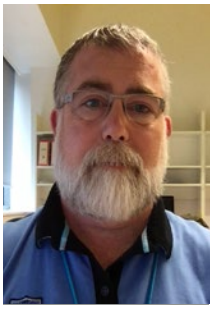
— A new cycle of dosimetry lectures will begin in January 2019, during the winter ESMPE school in Prague.

    - In parallel, the EANM "Advanced dosimetry" course was designed by physicists for physicists – a somehow more conventional approach. These were run for a rather small attendance, with usually less than 15-20 participants. The Physics Committee of the EANM also organised or participated in lectures under the EANM umbrella.
- The first edition of EFOMP-driven nuclear medicine schools started in 2013. In 2015, a cycle of lectures on nuclear medicine dosimetry was organised in Prague by the EFOMP in collaboration with the Czech Association of Medical Physicists and the Czech Technical University in Prague. The first edition in 2015 was more oriented in the theoretical aspects, whereas the second was more focused on practical applications. These ESMPE 2.5 days summer schools were well attended. A reasonable pricing and sponsoring to less favoured countries allowed physicists to register. The faculty was provided by the EANM Physics and Dosimetry Committees. A new cycle of dosimetry lectures will begin in January 2019, during the winter ESMPE school in Prague. In addition, a lecture on the "Bases of Nuclear Medicine Dosimetry" will be delivered on August 22, 2018, as a satellite event to the 2nd European Congress of Medical Physics in Copenhagen. The essence of ESMPE lectures is to participate in the training of medical physics experts[3]. These courses are accredited by EBAMP (European Board of Accreditation for Medical Physics)[4].
- The European School of Multimodality Imaging and Therapy (ESMIT) was founded in 2016 as an initiative of the EANM to revisit education in nuclear medicine. Three levels of education are considered. The first consists of basic education via webinars accessible on the web. The second level is an ambitious program were up to 160 participants can attend 4 different tracks per session. These Lv2 courses are designed mostly to address clinical aspects of nuclear medicine. Lv3 courses are 1.5 days courses designed for a

1 *https://www.efomp.org/index.php?r=pages&id=esmpe-about*
2 *http://www.eanm.org/esmit/about-2/*
3 *https://www.efomp.org/uploads/ESMPE_manual_2017.pdf*
4 *http://www.ebamp.eu*

maximum of 12 persons per session and represent the higher level of education delivered by ESMIT. They consider all aspects of nuclear medicine and the whole range of professionals involved in the field.

- The MoU between ESMPE and ESMIT aims at harmonizing the education dispensed by the different bodies, and to make sure that all professionals and levels of educations are addressed. Experts from both structures will collaborate to develop courses. The training will benefit from the existence of accreditation bodies. For physicists, this will be made through the EBAMP, for both ESMIT and ESMPE events.
    - ESMPE will focus on educating physicists, in nuclear medicine physics, radiation safety and dosimetry. ESMPE lectures will essentially deal with theoretical/practical medical physics aspects of nuclear medicine and will heavily promote the use of OpenSource, freely accessible software.
    - ESMIT will address a wider range of professionals and will focus on the multidisciplinary aspects of nuclear medicine, with education by/for the various actors in the field (physicians, physicists, radiopharmacists/chemists, technologists). Clinical workstations present at the ESMIT education facility in Vienna will represent a major asset in that respect.
- The MoU represents at the same time the acknowledgment of past achievements and the promises of a more structured collaboration in medical physics education of professionals involved in nuclear medicine.



Manuel Bardiès

(Web Of Science Research ID: L-3136-2014)

Manuel Bardiès (Web Of Science Research ID: L-3136-2014) obtained his Doctorate on radiopharmaceutical dosimetry from Paul Sabatier University (Toulouse III) in November 15, 1991. He has been developing research in radiopharmaceutical dosimetry within INSERM (National Institute of Health and Medical Research) since 1992, in Nantes then in Toulouse (after 2011). Manuel is a member of the EFOMP School for Medical Physics Experts board.

ESMIT

ESMPE
European School for
Medical Physics Experts

ESMPE European School for Medical Physics Experts

Nuclear Medicine Dosimetry, Practical approach

Jointly organised by ESMPE and ESMIT

24th-26th January 2019, Prague, Czech Republic

The EFOMP and EANM (The European Association of Nuclear Medicine) in collaboration with the Czech Association of Medical Physicists and the Department of Dosimetry and Application of Ionizing Radiation of Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague would like to invite you to the next ESMPE in **Nuclear Medicine 2019**.

The school is aimed at advanced tasks connected with radiopharmaceutical dosimetry in a context of therapeutic nuclear medicine. The school will cover mostly practical computing aspects, on freely available software (Slicer 3D).

This two-and-half day event will be accredited by EBAMP (European Board of Accreditation for Medical Physics) and is intended for practising clinical Medical Physicists who are involved in Nuclear Medicine dosimetry. As is the case in most ESMPE schools, there will be an optional examination at the end for those seeking a higher level of certification beyond attendance.

Content

Refresher on the basics of Radiopharmaceutical Dosimetry – Radiopharmaceuticals and clinical applications - TRT and SIRT – relevance of dosimetry

Introduction to Slicer – Basic features – Plugins – Input / Output – basic image/data processing

SIRT Dosimetry – Data input – DICOM files management – Image segmentation – Absorbed dose calculation – Result output

TRT Dosimetry- Data input – DICOM files management – image fusion - Image segmentation – Absorbed dose calculation– Result output

Dosimetry Optimization – Implementing robustness in nuclear medicine dosimetry – Scripting – Electronic notebooks.

Final exam

The final exam is voluntary. Participants can gain additional credits when successfully pass the test.

Organizers

Jaroslav Ptáček, Tereza Kráčmerova (Czech Republic)

Manuel Bardiès (Scientific Chair)**, Alberto Torresin** (Chair of the School)

Faculty

Manuel Bardiès	CRCT, Toulouse, France.
Carlo Chiesa	Istituto Tumori, Milan, Italy
Ludovic Ferrer	ICO, St Herblain, France
Glenn Flux	Joint Department of Medical Physics, RMH, Sutton, UK

Time-table

Thursday 24th January 2019				
	Session	**Title**	**Description**	**Lecturer**
8:00-9:00	Registration			
9:00-10:00	Setting the Scene	Nuclear Medicine Dosimetry	Diagnostic vs. Therapeutic Nuclear Medicine – Nomenclature (TRT, MRT, SIRT, RIT, et.) - Aims of dosimetry – Main steps of patient-specific dosimetry.	Bardiès
10:00-10:30	Coffee break			
10:30-11:30	First steps with Slicer	Introduction to Slicer	Input/output DICOM Visualization	Ferrer
11:30-12:30		Slicer modules that can be used for Nuclear Medicine Dosimetry	Dicom (RT) Advanced Visualisation Image fusion Segmentation	Ferrer
12:30-14:00	Lunch break			
14:00 -16:00	SIRT (1)	SIRT Example	Presentation of a clinical case Data Input Visualisation Definition of the dosimetry workflow	Chiesa
16:00-16:30	Coffee break			
16:30 -18:00	SIRT (2)	SIRT Example (continued)	Advanced processing Segmentation Result output	Chiesa
20:00-23:00	Social dinner - participants + lecturers			

Time-table

Friday 25th January 2019				
	Session	**Title**	**Description**	**Lecturer**
9:00-10:00	MRT Dosimetry	Patient Specific Dosimetry in MRT	Introduction to MRT dosimetry concepts Pre- vs. peri- vs. post therapeutic dosimetry	Flux
10:00-10:30	Coffee break			
10:30-12:30	PRRT (1)	PRRT Example	Presentation of a clinical case Data Input Visualisation Definition of the dosimetry workflow	Flux
12:30-14:00	Lunch time			
14:00-16:00	PRRT (2)	PRRT Example (continued)	Advanced processing Image registration Segmentation	Flux
16:00-16:30	Coffee break			
16:30-18:00	PRRT (3)	PRRT Example (continued)	TAC Fitting Absorbed dose calculation Post processing and presentation of results	Flux
Saturday 26th January 2019				
	Session	**Title**	**Description**	**Lecturer**
9.00-11:00	Optimization (1)	Tools for improving dosimetry reproducibility	Presentation of tools that allow increasing traceability of dosimetric calculations (Electronic notebooks)	Ferrer
11:00-11:30	Coffee break			
11.30-13:00	Optimization (2)		Round Table	Ferrer
13:30-15:00	Final examination			

ESMPE
European School for Medical Physics Experts

ESMIT

Further Information

Course language	English
Level	MPE
Registration fee* (2 main meals, 5 coffee breaks, 1 social dinner)	300 € 350 € (from 09.12.2018)
Reduced registration fee* • subsidized by EFOMP • first-come, first-served policy • deadline for application (23.12.2018)	150 € - for the first 10 attendees (max. 2 from one country) coming from the following European countries: Albania, Belarus, Bosnia, Herzegovina, Bulgaria, Croatia, Cyprus, Estonia, Greece, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkey, Ukraine.
Maximum number of participants	40
Duration	24th January 2019 – 26th January 2019
Study load	16 hours of lectures and demonstrations
Venue	Department of Dosimetry and Application of Ionizing Radiation, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague, Břehová 7, 115 19 Prague 1, CZECH REPUBLIC
GPS coordinates	50°5'27.737"N, 14°24'58.713"E
Accommodation	Individual
Information, program, etc. Practical information at:	www.efomp.org to be announced
Registration	Electronic registration via EFOMP website
Registration period	1st September 2018 – 23rd December 2018

* payment must be done in 14 days following the pre-registration, otherwise pre-registration will be cancelled and neither free place nor subsidized or ordinary fee can be granted for repeated registration

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EFOMP ČSFM CZECH ASSOCIATION OF MEDICAL PHYSICISTS

Medical Physics leadership in action: Project management tools for the Medical Physics leader

Many of the challenges facing health care systems are shared by most other sectors of modern society. The ever-increasing demand for better outcomes, more efficient workflows and safer practices is pitted against limited and diminishing resources. A battery of counter-actions has been proposed and are being implemented, such as new management and organization tools for more efficient workflows. Against this backdrop of change there is an ongoing discussion on the role of the Medical Physicist in medicine and how it must evolve to accommodate the new political, economic and technological landscapes. The response from the Medical Physics communities have been clear on many common aspects on the road ahead for our profession, however one stands out as critically important: Leadership.

> ***— "As patient care is a multi-disciplinary team endeavor, this requires not just a mastery of physics but also deep clinical knowledge, strong communication, and leadership skills"***
>
> ***- Ehsan Samei et al, AAPM Medical Physics 3.0 Ad Hoc committee***

Effective and efficient leadership of teams can be made much easier through the use of project management tools. Therefore EUTEMPE module "MPE01: Leadership in Medical Physics, Development of the profession and the challenges for the MPE (D&IR)" features in this year's program a new component called "Project management tools". This component will consist of an operational to-do list for project leadership in action: how to deliver projects in a structured, systematic and standardized way. Why is project management important for Medical Physicists Experts to engage in? Because achieving safer and a higher quality practice through optimization is a team effort in the radiology department. Having a team leader, clearly defined roles, well thought out plans, employing adequate risk analysis, engaging the right stakeholders and setting up clear quality criteria is more likely to achieve the desired outcomes than a team without these tools.

Although many different project management systems exist today we will be considering the PRINCE2 project management system in the module, as it is one of the most widely used methods for managing projects in the world and can be universally applied to any project regardless of the scale, type, organization, geography or culture. PRINCE2 has several advantages which are interesting for healthcare:

- It's focused on what needs to be done, rather than prescribing how everything is done
- Specialist aspects of any project, such as Medical physics, are easily integrated with PRINCE2
- Separates management from specialist roles, allowing experts to focus their efforts on their areas of expertise rather than to be stretched thin taking care of other duties
- It ensures that participants focus on the viability of the project based on its business case, rather than seeing completion of the project as an end in itself

- Promotes learning from project experience and thereby continual improvement in organizations

As an example in my facility, we're running a large project on quality assurance of imaging equipment using this method, involving all major radiology departments in Sweden. The project consists of about 60 work packages with over 20 teams working all over Sweden. Being the project manager, I'm positively supported in my role using a structured framework and the feedback from the participants in the project has been favorable. Other examples from our hallways include managing a team of clinicians for delivering a process for optimization of CT protocols and examinations, and managing a book project as editors on MATLAB programming for Medical Physicists. All based on PRINCE2 methods.

In conclusion, structured work conquers unstructured work in complex environments. And this years' MPE01 module will equip you with a basic set of tools to get you started.

Johan Sjöberg

Karolinska University Hospital, Stockholm, Sweden

Johan is a certified practitioner in PRINCE2 project management. He is a member of the Medical Physics sub-committees for ECR 2019, ECR 2020 as well as of the program planning committee for the Swedish national Medical Physics meeting. He is project manager of a national initiative on QA of medical imaging equipment in Sweden. He is a past participant of the EFOMP-EUTEMPE module 'Leadership in Medical Physics, development of the profession and challenges for the MPE' (www.eutempe-net.eu/mpe01)

EUTERP Foundation
What is the EUTERP?

The EUTERP Foundation was established in June 2010 following a 3-year European project to establish a platform for radiation protection education and training and ultimately to facilitate the movement of radiation protection professionals and radiation workers. It is a not-for-profit European organization and was set up under Dutch law because the original project coordinators were from the Netherlands. The aim of the EUTERP is to be the focal point for all information relating to the education and training (E&T) of Radiation Protection Experts (RPEs), Radiation Protection Officers (RPOs) and radiation workers. Information provision is primarily through the EUTERP website at www.euterp.eu. Here we have highlighted the important reference documents, provided web pages with the training guides developed under the ENETRAP projects (I, II and III) and a comprehensive library with direct links to free publications and links to sellers of other important publications. More recently we have started to include links to electronic learning material and we plan to expand this facility. We provide News items on the website home-page and a Newsletter is issued to all interested stakeholders three or four times per year. The website is updated on an almost daily basis – there have been nearly 500 news items announced since the website was relaunched in 2014. When the news is particularly pertinent to education or training and not just on radiation protection, we also announce it to the community through the EUTERP LinkedIn Group. Anyone is free to join this group on LinkedIn to ensure they have the latest information without having to look up the website each day. A perhaps more responsive social media outlet, because it is even more interactive, is Twitter and while the EUTERP does have a Twitter account, it has not been very active because the resource to tweet each day has not been readily available. We hope this will change in the near future with an additional person now on the EUTERP Board.

The EUTERP Community

Any community is obviously made up of people, who are vital for the well-being of any organization. Our community of stakeholders is comprised of the EUTERP Board, the EUTERP Associates, the EUTERP National Contact Points and of course all the training providers as well as those on the receiving end of training.

The Board of Directors is elected by and from within the Associates of the EUTERP. It is currently composed of eight persons from 8 of the 25 Associates. A call for new Board member nominations has been sent recently to all the Associates and the newly elected Board will meet in February 2019 to fulfill the programme of work established by the current Board. Although the statutes of the EUTERP stipulate that we have a President, Treasurer and Secretary, the Board works together as a team to deliver its work programme that is set each year within very tight budget constraints. The EFOMP was one of the founding Associates of the EUTERP and has provided its

secretarial support for the last 8 years through its representative, Penelope Allisy.

The Associates of the EUTERP are those who have a very strong interest in radiation protection E&T, usually as education and/or training providers. We currently have 25 Associates from organizations in 14 countries and 2 international organizations, EFOMP and CERN. There is no limit to the number of Associates that we can have and by a steady recruitment drive, we have been able to maintain a very low annual subscription rate of only 395 euro. The Associates have many benefits, ranging from electing the Board, influencing the work programme, participating as partners in European projects and receiving sponsorships, to mention a few.

As part of the vision of the EUTERP, we have actually recruited National Contact Points (NCPs) from every European country. Their function is to provide information on the requirements for training of RPEs, RPOs and radiation workers in their country. Each NCP has a profile page and a country web page on the EUTERP website where they can describe the legislation and the training framework relevant to their country. Naturally, some NCPs are more responsive than others to these requirements, and while we do our best to ensure that the information is

— ***The Associates of the EUTERP are those who have a very strong interest in radiation protection E&T***

available, where it is not present, we would appreciate the help of medical physicists in encouraging their NCP to send in the information. If this is not readily available in English, we can help with the translation. Your support would be much appreciated!

Workshops - Past and Future

A positive interaction between training providers and other stakeholders takes place when the EUTERP holds a workshop. The exchange of ideas, information and current practices helps us all in our goal to provide the best outcomes for all stakeholders, legislators, training providers and trainees. In general, the workshops consist of presentations (oral and posters) that highlight the main topics, and a significant part of the programme is devoted to discussions within working groups. Participants are expected to produce recommendations on education and training issues, to be addressed to relevant local, national and international stakeholders. The EUTERP President provides a summary report of the Workshop in the final session that serves to steer the EUTERP work programme as well as providing input to international discussions.

Three workshops were held during the initial EU Project period and four more since 2011. The most recent workshop was held as EUTERP@IRPA, on Wednesday afternoon during the regional congress in the Hague in June this year. Working within the overall conference theme of "Encouraging sustainability in radiation protection", the session was run as a mini-workshop with just two core topics: - training for radiation workers, and, evaluating the impact of training programmes. These topics were chosen as they had not had a particularly high profile in recent E&T events at conferences and it was felt IRPA18 provided a good opportunity to stimulate some discussion. Indeed, after each of the two opening presentations given by Joanne Stewart of PHE and Michèle Coeck of SCK-CEN, there was a lively audience participation over the questions posed by the speakers. The audience was around 70 participants, mostly training providers, and many from the health-care sector. A summary report about this mini-workshop will be available in the September EUTERP Newsletter. Both discussion sessions drew out constructive comment, observation and suggestions that are being taken forward to help shape the next full workshop.

The next Workshop has the title "Optimizing radiation protection training" and will be held in Malta from 10 to 12 April 2019. The second call for abstracts will be launched shortly and the following topics are highly solicited:

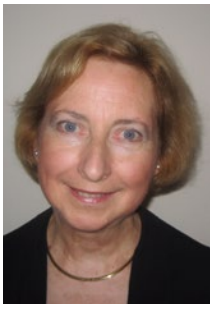
- New developments and innovation in RP training
- Needs analysis
- Design of training
- Evaluation of training
- Trainer standards and competencies
- Outreach and networking

The abstract submission deadline is 21 December 2018. We look forward to receiving your abstract on one or more of these topics and to hearing your paper or reading your poster in Malta next year. The Programme Committee will meet to finalize the programme in February 2019. Note that the EFOMP will have a sponsored registration; maybe it will be you? The venue is the Dolmen Hotel in Qawra, St Paul's Bay, Malta, which has lovely facilities and we have negotiated preferential rates. Airfares from everywhere in Europe are also at a low rate as the timing is early in the holiday season. Why not stay on for a holiday after the Workshop – if you book at the same time, the hotel will guarantee the reduced rate using the EUTERP code and your partner can share your room for only 10 euro extra each night!

Conclusion

This short article has been written to introduce you to the wealth of information already available through the EUTERP, its website, the Newsletters, social media exchanges and the Workshops. You can act as a driver to ensure that the information is kept up to date and pertinent to your needs. In addition, the EUTERP has been developing a course and opportunities database and this is scheduled to be fully operational as an outcome of our vision for 2020:

"The EUTERP Foundation is recognized by its Associates, National Contact Points and the European Competent Authorities as the focus for radiation protection training information for RPEs, RPOs and radiation workers."



Penelope Allisy-Roberts

EUTERP Secretary, EFOMP representative

Penelope Allisy-Roberts has a BSc (Physics) MSc (Radiobiology), PhD (Radiological Physics), and was Head of the Regional Radiation Physics Service in Birmingham, UK, followed by Director of Medical Physics and Medical Engineering at Southampton University Hospitals and finally as the Director of the Ionizing Radiation Department at the International Bureau of Weights and Measures (BIPM) from which she retired in 2012. She has served on the Boards/Councils of the Institute of Physics and Engineering in Medicine, the Society of Radiological Protection and most recently the European Federation of Organisations for Medical Physics, which she represents on the EUTERP Board. She has also served on various UK government committees and was a representative on the Article 31 Group in the 1990s. She has served on the editorial boards of several journals and is currently an Editorial Board Member of the Journal for Radiological Protection. She is a Chartered Physicist, a Clinical Scientist, joint author of a textbook for radiologists in training and was coordinator of the UK 2002 Medical and Dental Guidance Notes. She was awarded a UK honour (OBE) in 1999 for services to radiation protection.

Contact: secretary@euterp.eu

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VISUALIZATION

PLAN
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VERIFICATION

AND
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THERE IS A NEW INTELLIGENCE IN TOWN.

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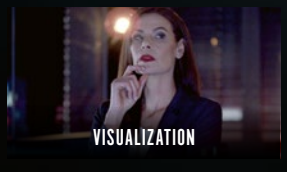

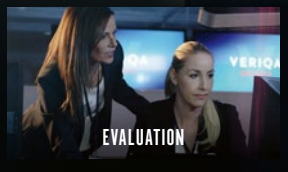

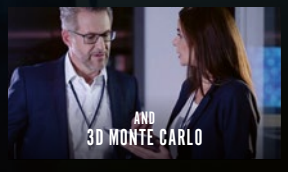

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4D PHANTOM MEASUREMENTS AND TRACK-IT DATA MANAGEMENT · ALL IN ONE MULTI-TASKING PLATFORM

COMING SOON

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PTW

ENEN+ PROJECT: Attract, retain and develop talented nuclear scientific expertise beyond academic curricula

The ENEN+ is a project launched by the European Nuclear Education Network (ENEN) Association, aiming at the revival of interest of young generations in the careers in the nuclear sector. The main motivations of this project are the attraction of new talents to careers in nuclear fields, their development beyond academic curricula and the increase of their retention in nuclear careers. Other purposes of this project are to involve nuclear stakeholders within the EU and beyond and in long-term to sustain the revived interest for nuclear careers. There are four nuclear disciplines which this project focuses on: nuclear reactor engineering and safety, waste management and geological disposal, radiation protection and medical applications.

There are 22 partners participating in this project, consisting of 8 universities, 5 international organisations, 4 leading research centres, 3 major industrial companies and 2 technical support organisations. EFOMP is one of the partners participating in this project and the discipline of interest for medical physicists is the medical applications field. More information on the project can be found on the webpage http://plus.enen.eu/

So far four meetings have been realized regarding the project. The kick-off meeting took place in October 2017 where the whole project and the tasks to be implemented were presented, the second meeting was in Budapest and the third meeting took place in Brussels. A fourth, informal meeting was realized during ECMP 2018 in Copenhagen. For the implementation of the project objectives, mobility grants are provided for learners, who desire to improve their skills and knowledge. These grants are provided by the ENEN Association through this project, co-funded by the European Commission (H2020). They are intended to cover mobility costs and access fees necessary for the mobility action of the applicant.

Concerning the medical application field, there are four groups of scientists interested in medical applications, including Medical Physicists, who can be eligible for applying:

-B. Sc. students interested in following a master education in the field of Medical Physics

-M. Sc. students in Medical Physics interested in extracurricular experience or academic exchange,

-Ph.D. and Post Docs scientists in Medical Physics interested in academic and research exchange, access to research infrastructures and cooperation with EURATOM research projects and

-Professionals, interested in changing their careers to Medical Physics, or building up their life-long learning on medical applications.

The expected income of this project is 2000 secondary school pupils reached by information on nuclear field and 60 pupils at the nuclear summer camp, 200 BSc students at nuclear internships, 150 MSc students at nuclear internships and EMSNE exchange visits, 20 BSc/MSc students presenting their work at international conferences, 70 PhD candidates or Post Docs at exchange visits, internships or research within EURATOM H2020 projects and 65 candidates for nuclearization and lifelong learning training.

Currently, three calls for mobility grants have been launched. Twenty applications by Medical Physicists have been received for the categories of M. Sc. students, Ph.D. / Post Docs students and professionals seeking for lifelong learning. Among the applications, there were grants accepted for participation in ECMP 2018 in Copenhagen, in the pre-meetings organized by the European School of Medical Physics Experts (ESMPE) and the EUTEMPE-NET modules. All the applications met the requirements and the applicants will receive the mobility grants requested. Medical Physicists who are interested in applying can visit the webpage: https://enenplus.fluidreview.com/ for application and apply to the Medical Application field. All necessary information on the basic rules (mobility manual) can be found at http://plus.enen.eu/wp-content/uploads/2018/03/ENEN-PLUS-Mobility-Manual-v2-Feb-28-2018.pdf

We would like to draw attention to two new events. One of them is the First European Competition for Secon-

dary School Pupils, more information about which can be found on the competition website: https://plus.enen.eu/competition/

The other event is a summer school organized for B. Sc. students during the summer of 2019. Details of this event will be published soon.

Virginia Tsapaki

EFOMP Projects Committee Past Chair

EFOMP team leader for ENEN+ project

Email: virginia@otenet.gr

Twenty-five years of experience in Diagnostic, Interventional Radiology and Nuclear Medicine. Participated in multiple European projects. More than 180 presentations and posters in national and international conferences. EFOMP Board member. IOMP Secretary General (SG). Field of expertize: Patient and staff dosimetry, optimization, diagnostic reference levels, dose tracking software."

Dimov Asen

EFOMP representative in ENEN+ project

Email: adimov_sl@yahoo.com

Twenty years of experience in Diagnostic, Interventional Radiology and Radiotherapy. Participation in a number of National and International projects focussed on institution building or research. More than 110 presentations in conferences and educational courses. Fields of expertize: radiation protection, quality assurance and optimisation, risk assessment, national patient dose surveys, diagnostic reference levels.

Iro Triantopoulou

EFOMP representative in ENEN+ project

Email: iro.trnt@gmail.com

Medical physicist working in Konstantopoulio General Hospital of Athens. Participated in radiobiology research to the National Center for Scientific Research "Demokritos". Fields of expertize: radiobiology, paediatric radiotherapy, quality assurance of non-ionizing radiation applications, radiation protection, diagnostic radiology.

Csilla Pesznyak

ENEN board member

Coordinator of the medical physics part of ENEN+ project

Email: pesznyak@reak.bme.hu

Csilla Pesznyak is an associate professor at the Institute of Nuclear Techniques of the Budapest University of Technology and Economics and MPE at the National Institute of Oncology, Budapest, Hungary. She is a board member of ENEN and a coordinator of the medical physics part of ENEN+ European H2020 projects.

ENEN+ PROJECT

FIRST EUROPEAN NUCLEAR COMPETITION FOR SECONDARY SCHOOL PUPILS

SUMMER SCHOOL
1-5 JULY 2019
BUDAPEST, HUNGARY

BACKGROUND OF THE PROJECT

The primary motivation of the ENEN+ project is to substantially contribute to the revival of the interest of young generations in careers in the nuclear sector in the following nuclear disciplines: Nuclear reactor engineering and safety; Waste management and geological disposal; Radiation protection and Medical applications

PARTICIPANTS

The competition is open to secondary school pupils, who are currently enrolled in secondary schools in European States. Teams must have two pupil members and one teacher.

The 15 finalist teams will be invited and supported to attend the summer school in Budapest, Hungary.

TASKS AND TOPICS

The task of the participants is to compose a **3-minute video** on one or more of the four nuclear disciplines. Suggestions for topics include, but are not limited to:

- Jobs in nuclear
- Create a story about nuclear
- History of nuclear science and technology
- Future of nuclear technology
- Nuclear in daily life
- Radiation for health

COMPETITION WEBPAGE

Detailed information on administrative matters, including registration and video submission is provided on the competition webpage after 15th June 2018:

https://plus.enen.eu/competition/

Submissions for the competition (registration form and video) should be sent to Csilla Pesznyak – at the following e-mail address:

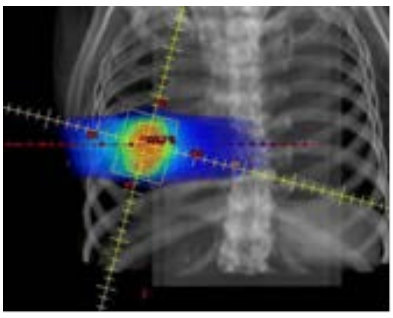
Nuclear.Competition@reak.bme.hu

KEY DEADLINES

1st October 2018 - Video submission opens

1st March 2019 - Video submission deadline

1st April 2019 - Deadline for nomination of 15 finalists



Coordinated Support Action in the H2020 EURATOM NFRP12 Support for careers in the nuclear field (2016-2017)

Delivering the future multi-faceted NHS Medical Physicists Workforce

Professor Berne Ferry PhD FRCPath, Head of National School for Healthcare Science.

Healthcare is changing fast in an exponential fashion. The need to put patients at the centre of care has already shifted the focus from treatment to prevention. Going forward, healthcare will have to embrace disruptive technologies and unequivocally accept the requirement to digitise healthcare. Scientific Leadership will be central to drive these changes in the NHS. Key scientific technologies, from genomics and proteomics to smarter imaging, more sophisticated diagnostics and the inclusion of data science, cut across all areas of medicine.

In the UK, the increasing pace of these technological changes and the power of their interconnectivity are acknowledged by all scientists in the NHS. As scientists we want the NHS to be at the forefront of these advances and understand that we will be key to delivering them for the NHS so that patients will benefit from better health and quality of life. For this reason, the healthcare science community in the UK, led by the Chief Scientific Officer- Professor Dame Sue Hill- have been planning for the future and preparing the scientific workforce to be ready to " Step up to the Plate" and take on the challenges that are here now and those that lie ahead.

Following the publication in 2008 of "A vision for Healthcare Science"[1] the UK set about modernising the education and training of NHS scientists. The aim was to produce a world class scientific workforce within the NHS integral to multi-professional team working and able to deliver excellent and innovative services, as well as leading on clinical research and development.

Central to the plan to modernising scientific careers was the need to construct a single coherent education, training and development structure linking all scientific specialties and all levels – supporting new roles and opportunities for scientific development in NHS. In order to oversee and implement this structure and manage the training programmes, the National School of Healthcare Science (NSHCS) was created and now sits within Health Education England (HEE). Now in 2018, healthcare science in the UK is more unified and recognisable as one profession with a higher profile inside and outside the service. Senior scientists lead multiprofessional teams delivering national organisational scientific enterprises for patient benefit.

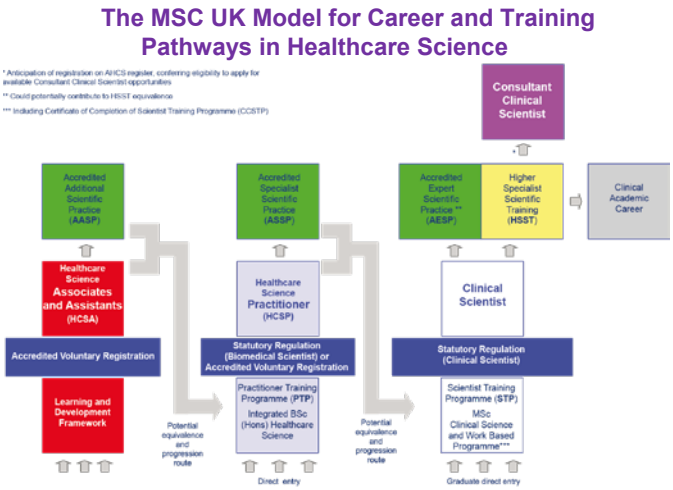


Fig. 1: Figure 1 illustrates how the healthcare scientific programmes range from apprenticeship programmes for school leavers through to undergraduate degrees and pioneering workplace and academic blended masters scientist training programmes (STP) that lead onto to the ground-breaking doctoral level higher specialist scientific training (HSST) programmes that aim to produce the consultant scientific leaders of the future.© Dr. Chris Gibson

Figure 1 shows the structure of the educational and training programmes overseen by the NSHCS. This figure illustrates how the career and training pathways for healthcare scientists in the UK allow for run through training from apprenticeships at level 2 through to stand alone undergraduate degrees or apprenticeship undergraduate degrees which lead into the masters level Scientist Training Programme (STP) which results in highly trained clinical scientists who register with the Health and Care Professions Council. The highest doctoral level programme delivering higher specialist scientists (HSST) incorporates completion of a world class management and leadership diploma, the FRCPath or equivalent and submission of a doctoral level clinical research project.

The role of scientists from the medical physics workforce has been essential and significant in developing and ensuring the success of the new training programmes. To date, clinical engineering and medical physics department in over 43 UK Hospitals have participated in this national training programme. Table 2 shows the numbers of medical

1 *The Future of the Healthcare Science workforce. Modernising Scientific Careers, the Next Steps. Department of Health. UK, November 2008.*

Figure 2

Numbers of Trainees since start of Scientist Training Programme.

STP	Total Numbers
Start Date	All Trainees
2011	71
2012	77
2013	70
2014	89
2015	81
2016	75
2017	98
2018	85
All Years	646

Fig. 2: Figure 2 shows the numbers of medical physics and clinical engineering trainees that have been trained for the NHS since 2011. Data from the NSHCS

physicists that have been trained in the STP programme since the establishment of the NSHCS in 2011. Nearly 650 medical physicists have been trained in the pioneering blended training programmes where workplace based acquisition of clinical competencies in hospitals is complemented by attainment of a highly relevant academic Master's degree delivered by some of the UKs top universities. The largest workforce need has been radiotherapy physics on and this is reflected in the numbers of trainees (data not shown). The numbers have remained steady over the 8 years with an increasing trend.

Table 3 shows the numbers of medical physics and clinical engineering trainees who have embarked on the Higher Scientist Specialist Training scheme. This is a five year programme and the first cohort of higher specialist scientists are not due to graduate till 2019 at the earliest. These scientists will be expected to have a mastery of the academic/ theoretical /clinical knowledge of their field, but they will also have undertaken high-level leadership and management training and will be capable of being researchers in their professional field. This group of medical physicists will be the future Consultant Clinical Scientists and Scientific leaders of the future.

The NSHCS has only recently begun to collect, where possible, destination data from the medical physics trainees who have completed the STP programme. The data we have been able to collect to date from the physics trainees as they exited has not been exhaustively verified but may serve as a useful indicator of the destinations of these scientists. The exit surveys indicates that 78.2 % of successful medical physics STP trainees obtained clinical scientist positions in hospital departments, it would be interesting to see how many of these go on to enrol in the HSST programme. The destination of 10% of medical physics and clinical engineering STP graduates is unknown whereas 3.75% chose to undertake a PhD programme of research. Less than 10% medical physics and clinical engineering STP trainees either failed the programme or left before completion.

Figure 3 Numbers of HSST trainees in medical Physics and Clinical Engineering since 2011

HSST Start Year	Total No of Trainees starting
2014	89
2015	81
2016	75
2017	98
All Years	646

Fig. 3: Figure 3 shows the numbers of medical physics and clinical engineering trainees that have been trained for the NHS since HSST started in 2014. Data from the NSHCS

Professor Berne Ferry

PhD FRCPath, Head of National School for Healthcare Science

Berne Ferry has been Head of the National School of healthcare Science since April 2017. Her background is as a consultant clinical scientist and clinical lead of the Clinical Laboratory Immunology service at the Oxford University Hospital Trust (OUH). She was also the Lead Scientist in the Oxford University Hospitals Trust from 2012 till 2017.

The IPEM Masters level Accreditation Scheme

Introduction

The introduction of the new UK training scheme for clinical scientists from 2010 (see previous article by Mark McJury) meant that the previous training scheme for medical physicists and engineers, managed by the Institute of Physics and Engineering in Medicine (IPEM), became redundant for the hospital employment sector, and it was closed down. One aspect of this highly-regarded training scheme had been the IPEM accreditation of the masters degrees that had to be taken by all trainees. These were run by several different universities and had also been popular with other students, a good proportion of them from overseas, who were not on the training scheme but who wanted to gain a qualification in medical physics/engineering.

In 2012 a meeting of representatives from these universities indicated that there was considerable support for IPEM to continue to accredit masters courses as a 'kitemark' of academic quality. It was also clear from this meeting that a significant number of students taking these degrees had employment aspirations outside the NHS; for example working in industry or in academic research. Furthermore, whereas students on the training scheme had had to enter the degree with a first degree in physics or engineering, universities also reported taking in students with other qualifications (e.g. medicine, radiography etc.).

The New Accreditation Scheme

Following this useful meeting a working party consisting of members of the IPEM Course Accreditation Committee (CAC) set out to construct what became the Masters Level Accreditation Framework (MLAF). Our aim was to have a framework which would:

- allow students with a wider range of previous qualifications to enter accredited courses – at the discretion of the university of course.
- have two streams – Medical Physics and Clinical Engineering, allowing each university to decide which stream was a appropriate for their degree/s
- ensure that each accredited course contained core content (within either the physics or engineering field) which would cover the essential knowledge and skills for a graduate biomedical engineer or medical physicist
- but, at the same time, have enough flexibility to allow HEIs to tailor their course content to local strengths such as staff expertise and research specialisation.
- not prescribe the way in which the material is divided up into modules, but would allow each university to choose the modules to suit their own conventions and needs.

A decision was also made to redefine the descriptors of academic standards away from a rigid syllabus-based approach. Instead a learning outcome-based approach was adopted, focussing on describing a minimum standard each student must attain to meet the accreditation standard. This educational approach matches that of the UKSPEC[1](Engineering Council) and the Physics Subject Benchmark Statements[2] (Quality Assurance Agency (QAA)) and means that the learning outcomes map on to educational standards.

Figure 1 shows the overall structure of the framework as it now appears after some minor revisions in 2017. Note the two different streams at entry and core level. This structure, the details of the learning outcomes for each subject, and further information can be found on the IPEM web pages[3].

1 UK Spec for engineering: https://www.engc.org.uk/ukspec

2 Quality Assurance Agency, Subject benchmark statement for physics, astronomy and astrophysics (2017): http://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-physics-astronomy-and-astrophysics-17.pdf

3 IPEM masters level Accreditation Framework (MLAF) https://www.ipem.ac.uk/ResearchAcademicAccreditation/AccreditationofAcademicCourses/IPEMsMastersLevelAccreditationFramework.aspx

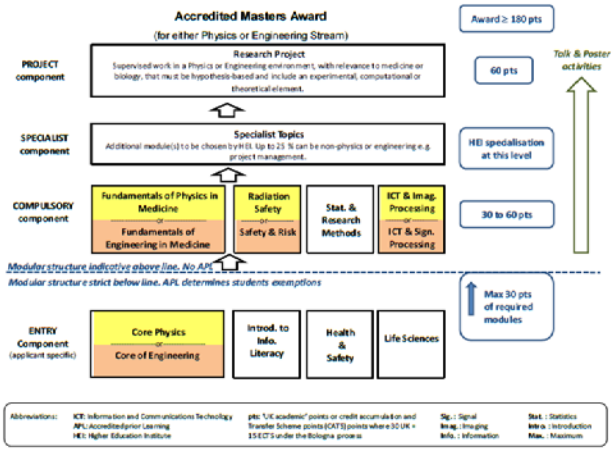


Fig. 1: The Masters Level Accreditation Framework

Overall the degree must contain 180 UK credit points (CATS) (=90 ECTS points on the European system). It is expected that, depending on his/her previous studies, each student will only complete some of the entry components; these are designated as being at the UK FHEQ4 Level 6 (i.e. undergraduate level). This allows for students from different backgrounds to reach the level required in these subjects. (In fact, UK rules state that no more than 30 points of a masters level degree can be at level 6.)

The compulsory component contains learning outcomes considered essential to being a physicist or engineer working in medicine or biology. The specialist component is where HEI diversification is encouraged, and HEIs can design their own learning outcomes over a minimum of two separate and distinct modules, so long as they meet the FHEQ Level 7[4](masters level) descriptors. Up to 25 per cent of credits at the specialist component can be appropriate non-physics or engineering topics, such as a project management module. The flexibility of this specialist component favours innovative new courses in medical physics and biomedical engineering, and allows for diversification of the named degree title (i.e. medical physics and medical instrumentation).

— ***The final project component is less flexible and is fixed at 60 UK CATS points;***

The final project component is less flexible and is fixed at 60 UK CATS points; this is the sector standard. Additionally, in order to foster communication skills, a talk and poster activity must be completed by the student during their degree programme. Most often one or both of these activities is associated with the student's project.

The process

Application for accreditation is by a form[5], submitted electronically to IPEM and accompanied by the payment of a fee, currently £500 for UK universities and £1,000 for those outside the UK. A one-day visit is then arranged on a date to suit the institution and the assessors (normally 2 for each degree course). During the day the assessors will have discussions with members of the teaching staff, especially the programme director, will examine material such as exam papers, exam scripts and external examiners' reports and will also spend some time talking to past and present students. The university is expected to pay the reasonable travel and accommodation expenses of the assessors.

The assessors then report back to the members of the CAC, who make final decision in an online meeting. This will be communicated to the university as soon as possible. There are several possible outcomes raging from rejection (very, very, unusual!) to immediate acceptance. The most usual outcome is for the assessors to give temporary accreditation for one year and ask that a few essential changes be made in that time. On assurance that this has taken place, then accreditation is extended to three years. After that time period the university may re-apply and be given accreditation for a further 5 years.

4 Masters degree characteristics: QAA 'Master's degree characteristics' The Quality Assurance Agency for Higher Education 2015: http://www.qaa.ac.uk/docs/qaa/quality-code/master's-degree-characteristics-statement.pdf?sfvrsn=6ca2f981_10

5 IPEM masters level Accreditation Framework (MLAF) https://www.ipem.ac.uk/ResearchAcademicAccreditation/AccreditationofAcademicCourses/IPEMsMastersLevelAccreditationFramework.aspx

Commitments and benefits

IPEM accreditation of a masters degree is an indication that the degree is suitable for medical physicists/engineers and is of a good academic standard. This is clearly of benefit when marketing a degree programme. In addition, each university which is accredited is asked to supply us with a volunteer assessor who can carry out assessment visits to other universities. A key benefit of this is that there is a useful sharing of best practice within the community.

Another benefit is that accredited programmes are eligible for the IPEM Student Prize Award Scheme; a prize of £250 is awarded every year for the best project report on each course.

In his article in this edition, Mark McJury described the Route 2 method of becoming a registered clinical scientist. While an accredited degree is not essential for this, it can be very useful in demonstrating an applicant's depth of knowledge in the field; such degrees have been used as evidence by many students.

— Currently there are 14 accredited degree programmes at 10 different universities

Currently there are 14 accredited degree programmes at 10 different universities[6]; several of these have now completed their first three years of accreditation and have applied for re-accreditation. Currently there is only one accredited degree programme outside the UK (in Malaysia) but the Course Accreditation Committee would welcome more applications from other countries.

Conclusion

Separation of masters degree accreditation from the training scheme has allowed development of this new, wider, scheme. The first few years of operation have shown that it is highly regarded and gives credibility to MSc programmes in the medical physics/engineering area. We look forward to receiving more applications from universities outside the UK.

6 *IPEM masters level Accreditation Framework (MLAF) https://www.ipem.ac.uk/ResearchAcademicAccreditation/AccreditationofAcademicCourses/IPEMsMastersLevelAccreditationFramework.aspx*

Liz Parvin

BSc, PhD, FInstP, MIPEM

Liz is a retired senior lecturer from the Open University, where she developed and ran their MSc in Medical Physics until 2015. She was part of the team that developed the accreditation scheme discussed in this article, and is currently secretary of IPEM's Course Accreditation Committee.

Practising as a Medical Physicist/Engineer in the UK

Following this issue's theme on medical physics training in the UK, this article focusses on why and how to become registered to practice as a Clinical Scientist (medical physics specialism) in the UK.

Protecting the public: Regulation and Registration

To deliver safe and effective care, it is vital that practising healthcare professionals meet high standards of training, skill and behaviour. This also protects the public and enables them to have confidence in the healthcare system and practitioners who treat them. To ensure high standards of practice, the 30 or so UK healthcare professions are regulated by 9 independent bodies (see Figure 1) – governed by a set of regulatory arrangements upheld in UK law. Additionally, the Professional Standards Authority (PSA) acts as the independent voice for patients, service users and the public in the health professions regulatory system, providing policy advice and conducting annual performance reviews of the health professions regulatory bodies.

Care Council for Wales
General Chiropractic Council
General Dental Council
General Medical Council
General Optical Council
General Osteopathic Council
General Pharmaceutical Council
General Social Care Council
Health & Care Professions Council
Northern Ire. Social Care Council
Nursing & Midwifery Council
Pharmaceutical Council of Northern Ire.
Scottish Social Services Council

Fig. 1: The 9 UK healthcare professions regulatory bodies.

[For regulation and a list of regulatory bodies outside the UK, look here: http://www.healthregulation.org/]

Regulators and Protected Titles

Regulators' responsibilities include:

- setting standards of education and training for the professions that they regulate;
- maintaining a register of those who demonstrate they meet these standards;
- setting standards of conduct, ethics and competence required to remain on the register;
- investigating concerns about professionals who are registered and taking appropriate action where individuals might present a risk to the public;
- taking action against those falsely claiming to be a registered professional.

Part of this involves the use of protected titles. Scientific work in healthcare is performed by a broad range of scientists – medical laboratory scientists, medical physicists and engineers, pharmacists, biochemists, and so on, and these 'modalities' are grouped under the umbrella term Clinical Scientist. In the UK, the title Clinical Scientist is protected by law. You may only use the title Clinical Scientist if you have been admitted to the register, having fulfilled the standards applying to Clinical Scientists. In other words, to practise, you must be on the register. The title covers scientists across 13 modalities (see the full list here: http://hpc-uk.org/aboutregistration/protectedtitles/). Protection of this title guarantees that a professional has, for example, undertaken a specific number of years of postgraduate professional training and supervision. The same is not true of many other unprotected titles where there is no guarantee of the level of training and professional skills.

What Standards?

To join the register, you must demonstrate that you meet the regulators set of standards of training, professional skills and conduct. The standards are used to assess 'fitness to practise' and are typically split into three areas:

- Standards of Conduct, Performance and Ethics (including character and health)
- Standards of Proficiency (including education and training)
- Standards of Continuing Professional Development (CPD)

Who holds the register for Healthcare Scientists/Engineers?

Who holds the register for Healthcare Scientists/Engineers?

Healthcare professions in the UK are regulated by the Health & Care Professions Council (HCPC). One of the key functions of the HCPC is to hold and maintain a register of healthcare professionals who have met their standards (of training, professional skills and conduct). Currently, 16 healthcare professions are represented in the register. This register is searchable, and publicly available (http://hpc-uk.org/check/).

The HCPC works in partnership with the public and professional bodies to maintain the register, set professional standards, and approve educational and training programs. They also have a duty to investigate complaints and take action where standards have not been met.

What are the routes to registration?

Depending where you live and work, there are different routes to join the register.

Living and working in the UK

The route available depends on whether or not you have completed an approved training course.

Training courses:

current UK Clinical Scientist (medical physics) training courses follow a generic template (Scientist Training Program (STP), see figure 2). This three year training program consists of 3 components: a taught component delivered by an approved academic partner, which leads to an MSc in Medical Physics (which includes a 6 month research project); a set of 12-week workplace rotations, to enable the trainee to achieve a set of general medical physics competencies; a specialist placement, when the trainee can develop deeper experience and competence in a specific area of medical physics and complete a research project. Course assessment includes formal exams, submission of a detailed training portfolio of evidence, and interview – which lead to the award of a Certificate of Attainment. The next article gives some further information on how UK training courses are approved and accredited.

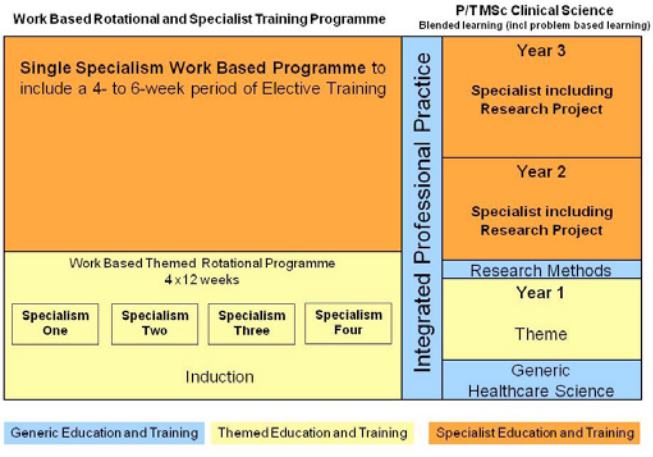


Fig. 1: Figure 2. The generic UK STP training program template. (Reproduced with permission, National School of Healthcare Science, UK).

Registration routes:

- Route 1: If you have completed an approved training course in the UK (and obtained a Certificate of Attainment/Equivalence), you are eligible to apply using this 'approved qualification' route. Currently, training courses consist of a 3-year program of taught courses (leading to an MSc qualification), The HCPC keeps a register of approved training courses, which is available on their website (http://www.hcpc-uk.org/education/programmes/register/).

- Route 2: If you have not completed a formal training course, but have extensive relevant workplace experience totalling at least six years (three years of which must be as a supervised trainee). This route also involves the submission of a training portfolio of evidence and interview.

NB Experience obtained outside the UK can be used as part of either Route 1 or 2.

Living and working Outside the UK

If you have trained outside the UK and do not have a qualification from an approved UK training centre, currently there are two routes to registration (NB this will change following Brexit – the nature of this change is currently unclear):

- **European Mutual Recognition (EMR) route:** European Directive 2005/36/EC promotes free movement of workers throughout the EU. If you have EMR rights (you can check this on the HCPC website), your qualifications will be assessed for compatibility with the HCPC standards, and you are advised of any compensation training needed to meet the standards.
- **International route:** For those already considered fully trained, qualified and working overseas, but wishing to become registered in the UK as a Clinical Scientist. An Assessment of qualifications and experience will be undertaken, sometimes with additional requirements to provide evidence of English language proficiency.

How do you maintain your registration?

Once you become a registrant, it is equally important that you maintain professional competence and continue to meet the HCPC standards. Taking part in continuing professional development (CPD) is a requirement for registration, and you need to continue to meet the Standards of CPD to remain on the register. As part of ensuring standards are met, the HCPC has an audit scheme. At registration renewal, a small percentage (currently ~ 2.5%) are randomly selected for audit, when further details of CPD activity will need to be submitted for review.

Summary

Regulation and registration are central to protecting the public and maintaining high standards of professional practice in healthcare. In the UK, the HCPC is the regulator for Clinical Scientists, which includes medical physicists. To become registered, you must demonstrate that you have met the professional standards set by the HCPC. Different routes to registration are available, depending on where you live and work, and on whether or not you have completed an approved training course.

Mark McJury, PhD FIPEM FHEA

Consultant Clinical Scientist

Editor-in-Chief, IPEM Reports Series

Hon. Sen. Lecturer, University of Glasgow

Assoc. Lecturer, Open University

Based in Glasgow, UK.

Mark McJury obtained his PhD in MRI in 1991, working on MRI microscopy in Peter Mansfield's group at the University of Nottingham. Later work on MRI gel dosimetry, with Steve Webb at the Royal Marsden, lead to a shift to work based around radiotherapy physics, virtual simulation & imaging at Sheffield, Belfast, and Glasgow. He is currently a Consultant Clinical Scientist, Editor-in-Chief of IPEM Reports, Hon. Sen. Lecturer University of Glasgow, and Assoc. lecturer at the Open University. Arguably his best work, however, is bringing up his three children and recent interest in baking.

The “young Medical Physics” working group of DGMP

Fig. 1: The work grouping at the annual meeting of the DGMP 2017 at Dresden.

The “young Medical Physics” (jMP) is a working group within the German Society of Medical Physics (DGMP). It was founded in 2016 to enhance the representation of young medical physicists and those who want to become one. We, the jMP, aim to actively participate in the DGMP and to bridge the gap between the existing society, its members and the next generation. In addition, we want to represent the interests of young medical physicists concerning studies and clinical education. Another important topic of our work is the linking of young medical physicists among each other, so problems can be discussed, solutions found, and information interchanged.

— ...we organize social events, such as a hiking tour or a buddy program to connect young medical physicists among each other...

Our homepage www.jmp.dgmp.de provides field reports on various topics, informative content on education possibilities and job exchange, as well as online seminars organized by this group.

Apart from the homepage, we are also present at the DGMP annual congress. Our sessions are a fixed component of the program. Besides a fixed program including the introduction and discussion of possible career paths in the field of medical physics, we offer sessions of different kind dealing with Ph.D. projects, judicial topics, and education. Additionally, we initiate discussion panels to give the audience the possibility to exchange experiences and to come to new ideas. Furthermore, we organize social events, such as a hiking tour or a buddy program to connect young medical physicists among each other and to help congress-freshmen to better find their way through the DGMP annual congress. To support the “very young” potential medical physicist, we organize a “school day” at the Congress to introduce the medical physics to even the youngest and to raise awareness and interest for this versatile field. In order to enhance the relations to other fields, we collaborated with other young societies at the Congress, e.g. the “young forum” of the German Society for Bio-Medical Technology (DGBMT).

The cooperation with other young societies is not only restricted to congresses. We aim to create an international network among young medical physicists and among related fields. In order to achieve this, we already collaborated with the young German Society for Radiation Oncology (jDEGRO) at the DEGRO annual meeting and we have several projects planned for 2019 together with the young German Physical Society (jDPG), such as collaborate pupil projects and a weekend seminar for physics students to introduce them to the field of medical physics and to show the numerous possibilities for research, clinical work or in the industry.

Fig 02: : A meeting of the working group - also involved a member of the DGMP's managing board.

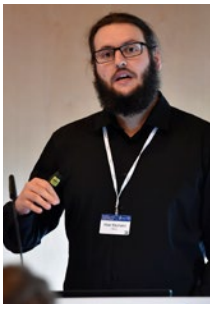
Fig. 3: Moderation of the discussion at one of the sessions organized by the work group at the annual meeting of the DGMP.

Background of such pupil projects and seminars is, that medical physics is still a niche subject. Hence, we aim to increase the popularity of this field. Besides the projects organized in collaboration with other working groups, we organize a student's day, where we inform about medical physics and where we show the most interesting aspects of this job.

The core team of the jMP consists of 8 members, medical physics working in the clinic as well as Ph.D. students and master students, all working on different projects all over Germany. In order to develop new projects and to resume existing ones, we are closely connected every day and meet for a weekend meeting annually.

Layla Riemann

Layla Riemann obtained her master degree in medical radiation sciences at the TU Dresden/the OncoRay Institute. Her master thesis was about MR-integrated proton therapy. She joined the jMP in May 2017 and aims to give young people who are new to the field of medical physics an insight into this interesting and diverse subject.



Kilian Baumann

Kilian Baumann obtained his master degree in physics at the LMU in Munich and his master degree in medical physics at the THM in Giessen. At the time he is a PhD student at the univer-sity in Marburg and is working on the degradation effects of human lung tissue in the proton therapy of lung cancer patients. He is one of the founding members of the jMP and sees this working group as an excellent op-portunity to link young people interested in the field of medical physics to each other and to stronger represent their interests in the German Society of Medical Phyics.

What Medical Physicists do in their free time!
The similarities and complementarities of music and physics

I think most people can agree that listening to music can provide you with a great sensation. Playing the music yourself, however, can extend that to a magnificent feeling. From early on, I showed an interest in music maybe because of its immediate appealing nature or maybe just finding joy in playing an instrument. So, I was interested in music long before my interest in the field of science came along. The music group that performed at the recently held 2nd ECMP in Copenhagen which I am a central part of, for example, was already formed in the early 90ies when I still though I would study social and political sciences (see figure 1).



Figure 1 legend: From early on, music has been a core element in my life. Left: musical session with me (piano) and my brother (guitar) 1994-95. Middle: Early performance at high school around 1995 with the vocal group, the Barbars. Right: London recording session around 2004-2005 with the Barbars.

For me, music and (medical) physics both have similarities and complementarities. In my mind, they are both creative sciences in the sense that ideas can grow to great products obeying the basic rules defining the area. For music; cords, harmonies, limitations and advantages of musical instruments and vocals span those rules. For physics; the laws of nature, experimental data and math provides the usual basic framework. They are complementary in the sense that music is less restricted in formalizing a new idea and choices does not have to be justified to the same extend. I simply take this cord because it "sounds good" – something that I find of great relief when relaxing




with music and in sharp contrast to physics. Both fields contain a craft that has to be learned, e.g. play in instrument or read nodes (music) and master algebra or programming (physics), in order to make sense.

Music and physics also both contain an introvert and extrovert side. I can find great pleasure in playing around with different musical arrangements at the piano at home as well as loosing track of time immersing into an interesting piece of research within medical physics. This is the introvert part. The extrovert part of music, the exposure of your musical ideas and skills to an audience, typically consist of practicing with your music group up to a single event, the concerts, that requires great attention, concentration and performance for a short intense period (a couple of hours max), immediately followed by a sensation of great relief and relax after wards (see figure 2).

This part is also present in science in the form of congress presentations and teaching but in general constitutes a much smaller part of the total time spent on medical physics as compared to music. In this way, science is more like an (lifelong) ongoing marathon with small stops of exposure. The extrovert part, however, is necessary for making the scientific community aware of your research and can ultimately lead to fruitful cooperation with other scientists. The necessity to stand in front of an audience in science, is feared by some and embraced by others. I

certainly belong to the latter group drawing on my experiences and routine from musical performances (figure 3).

Sports and music took up most of my free time when I was young(er) while physics played a minor part. After the first years at university this balance gradually shifted and currently, I would say medical physics occupied the majority of my waking hours while music and sports today play minor roles. However, music is a core element in my life that I consistently return to simply because I can't help it. Should you be interested in listening to some of the music that I have been involved in producing, simply search on "barbars" in your music streaming service or iTunes.

Jens Morgenthaler Edmund

Herlev and Gentofte University Hospital, Herlev, Denmark.

Dr. Jens M. Edmund was chair of the ECMP 2018 local organizing committee. He received his master's degree in biophysics in 2003 and PhD in radiation dosimetry in 2007. He became diplomate of the American board of radiology in 2011 and medical physics expert in 2014. He works as a medical physicist at Herlev Hospital in the capital region of Denmark and is adjunct associated professor at the Niels Bohr Institute.

Monalisa Camilleri (Malta): Diagnostic Medical Physicist and National Athlete

Running has always been my passion but excelling in my professional career is also crucial. It's not easy to be successful both in athletics and in your profession as one needs to find a balance between running and the daily job. The key to success is determination, motivation and discipline. I started running at 9 years as a hobby. Athletics Malta recognized my talent and I was selected to represent Malta in an international competition. At that moment

Fig. 1: Photo by Wally Galea

I realized that athletics was no longer a hobby but a sport at which I wanted to be successful. I grew up learning how to balance schoolwork with athletics to achieve great results in both. Now I am 27 - thinking back I feel that athletics has helped me in my studies. In an individual sport, there is the coach to guide you but during the race, you are alone and have to make your own decisions. Similarly, at university, there is the lecturer to guide you but you are left independently to solve problems and make your own choices. It is an analogy that helped me in my career. At 17 I broke the Malta Junior Record in the 3000m and two years later I improved the record whilst I was in my first year of my degree in mechanical engineering. During my university studies, I represented my country several times at the European Team Championships (2010, 2012, 2013, 2014, 2017). In 2013, during my last year at university, I started 3000m steeplechase and established my first record in this event. The year 2015 was a rough year as I was reading for my master's degree in Medical Physics and it wasn't easy to maintain my athletic performance level. During my two-year Medical Physics training (Leeds, UK) I had doubts whether I could still perform well. However, both my athletics' coach Xandru Grech and my thesis supervisor Prof Carmel Caruana motivated me to go beyond my limit. At the peak of my dissertation work, I broke the 3000m Steeplechase National Record twice, improved my time in the 1500m to represent Malta in the 1st European Games held in Baku and achieved a distinction in my dissertation. I then started full-time employment as a Medical Physicist. The lead Medical Physics Expert Dr. Mark Borg has been supportive. Last year, I qualified for the first time in the Games of Small States of Europe (GSSE) and established another national record in the steeplechase during the European Team Championships (in Malta). This year I qualified for

Fig. 2: Winning Team

the 2019 GSSE (in Montenegro) for steeplechase, 1500m and 5k significantly improving my times and establishing another steeplechase record and participated in the 39th World Medical and Health Games (in Malta; www.medigames.com) where I won two gold medals in the 1500m and 3000m. It was an amazing experience where I met retired athletes who are now focused on their healthcare career. There were participants up to the age of 80 years! I encourage Medical Physicists around the globe who do athletics as a hobby or to keep fit to participate in these games. They are open to any level of fitness and age!

Mona Lisa Camilleri

Medical Physics (Diagnostic and Interventional Radiology)

Mater Dei Hospital, Malta

Is there life after the Presidency?

No, this is nothing to do with Mr. Trump! Efi Koutsouveli asked if I would write a short piece on what I was doing now that I was no longer President (or past-President) of EFOMP. I readily agreed because, as I have said before, you don't do anything to upset a Greek woman as they have a history of bloody revenge. Clytemnestra murdered her husband while he was having a bath – well she had a good reason as he had sacrificed one of her daughters to propitiate the gods. Medea murdered two of her sons when she discovered that her husband was being unfaithful. A little excessive in my view, particularly as she also killed the unfortunate woman by sending her a poisoned dress!

Is there life after the Presidency? Well, of course, there is but being President does have an effect on your life in many ways. In my case, it gave me a broader outlook on the international side of medical physics. It gave me a chance to see how medical physics was practised in the various countries in Europe and, with the support of Board and Council, try to have a positive effect on its development. I admit that before joining EFOMP my perception of medical physics was largely based on how it was run in the UK. My professional experience was in medical imaging, principally nuclear medicine, while radiotherapy and radiation protection are the main areas of medical physics in most European countries, so I had to quickly acquaint myself with the relevant regulatory framework.

Given the attitude of a small majority of the UK towards the European Union, it might seem strange for me to say that the EU has been a strong positive force in the development of medical physics in Europe. The EU has many shortcomings, as our Greek colleagues know only too well from the way in which it handled the financial crisis in their country. But it does give us a European identity and provides us with a source of useful funding, such as that for the EUTEMPE project, and the opportunity to frame legislation for the betterment of our profession. Of course, it also provides a threat as competing groups can use the legislation to strengthen their professional position at our expense but, as medical physics societies are able to speak a single voice through EFOMP this means that we can usually have a powerful influence on these discussions.

So, having parted company from EFOMP what do I do? Well as I am also now retired such a change makes quite a difference to my life. I could have looked to join in the activity of another international organisation. Rightly or wrongly, I have the view that you should step back from such activity once you stop being a practising medical physicist and let younger people take over. I am happy to help wherever I can and have just finished being a member of the Local Organising Committee for ECMP 2018. I miss the friendships that developed, although it was nice to meet up again with many people in Copenhagen, and I don't get the trips to interesting European countries. But I do now have more time to indulge in my interests in travel (albeit with me paying for it) and opera.

— I have been fortunate in visiting many European countries during my time with EFOMP

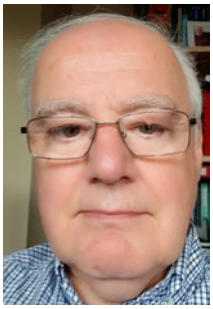
I have been fortunate in visiting many European countries during my time with EFOMP but that often meant spending most of the time in a hotel, although that is not to complain about the superb hospitality that we always received from the local NMO. But now I have been able to travel more widely and in recent years have visited Ethiopia, Sudan, Iran and am about to pay my third visit to India in a few weeks' time. The choice of these countries wasn't an arbitrary one as, together with Egypt which I visited many years ago, they have many historical links. For example, Taharqa was a Nubian (part of what we know as Sudan) king who became an Egyptian pharaoh and Sudan has more pyramids than Egypt.

Opera is one of my passions. Unfortunately, living in a relatively small city in North-East Scotland means that It is not easy for me to get to see live opera; Aberdeen only has two visits a year from Scottish Opera and then they only bring up one opera. I have been a strong supporter of the Edinburgh Festival and the Fringe. So, for a few days in August I can feast on recitals, plays, circus (yes!) and opera. One of my favourite composers is Wagner and for the past few years, they have been performing Wagner's

Ring Cycle at the Festival. Five and a half hours may seem like a long time to watch an opera, but I just get absorbed in the wonderful and complex music and time passes. Sometimes I can combine the travel and opera and I try to visit the Staatsoper in Vienna at least once a year. My ideal day is visiting some of the great art galleries, a coffee and cake in one of the many coffee houses and a night at the opera. Other than that, I have to make do with the live transmissions to the local cinema from the New York Metropolitan Opera and London's Royal Opera House or recordings on DVDs. But these don't give the atmosphere found in a live performance. On my bucket list is a visit to La Scala to see Verdi.

— My ideal day is visiting some of the great art galleries, a coffee and cake in one of the many coffee houses and a night at the opera.

Being the President of EFOMP was a great honour and, while at times it could be stressful, it was an experience that I wouldn't have missed. I would urge medical physicists throughout Europe to engage with EFOMP, it is having an important effect on your future. Only be careful not to upset any female medical physicists from Greece!



Peter Sharp

Peter Sharp is the Emeritus Professor of Medical Physics at Aberdeen University. Until his retirement in 2012 he was Head of the Department of Medical Physics and Clinical Director of Medical Physics in Aberdeen. He has been involved in research into imaging techniques for over 40 years; initially in Nuclear Medicine and latterly also in ophthalmology.

He set up the first NHS Positron Emission Tomography (PET) Centre in Scotland and chaired the committee that advised the Scottish Government on the introduction of PET for cancer management for the whole of the Scottish health service.

He has published over 150 papers in peer reviewed journals and 3 books. He has been awarded the Norman Veal Medal of the British Nuclear Medicine Society, the Queen's Anniversary Prize 2000, in recognition of his department's „Pre-eminence in medical imaging technology for over 30 years", and the Healthcare Science Award from the Scottish Government. In 2013 he was awarded the Lady Margaret MacLellan Prize which is given in recognition of outstanding contributions to medical science in Scotland.

He was President of the European Federation of Organisations for Medical Physics from 2012 - 2014, and of the Institute of Physics and Engineering in Medicine from 1997-1999.

He is a Fellow of the Royal Society of Edinburgh. In 2012 he was made an Officer of the Order of the British Empire for his services to healthcare science.

Book review
Clinical 3D Dosimetry in Modern Radiation Therapy

Recent advances in radiation delivery (IGRT, SBRT, protons, etc.) requiring dosimetric validation have driven rapid changes in 3D dosimetry methods and instrumentation. This book, part of the CRC Press series on Imaging in Medical Diagnosis and Therapy, offers a comprehensive overview of the current status of 3D clinical radiotherapy dosimetry.

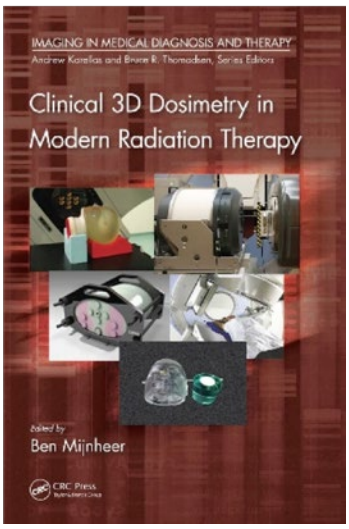


Fig. 1: Clinical 3D dosimetry in modern radiation therapy CRC Press Taylor & Francis Group, 2018 ISBN 978-1-4822-5221-7

Editor-in-Chief Ben Mijnheer has recruited impressive team authors, all international experts in their area of radiation dosimetry. The book's 26 chapters are structured into 5 sections: Introduction, Instrumentation, Measurement and Computation, Clinical Applications, and Emerging Technological developments. They are comprehensive in their coverage, in fact touching on more than 3D dosimetry. The Introduction section offers an overview of the field and discussion of accuracy requirements in contemporary radiotherapy. Instrumentation covers reference dosimetry, point detectors, polymer gel dosimeters, radiochromic detectors, electronic portal imaging device detectors (EPIDs), and 2- and semi-3D dosimetric systems. Measurement and Computation cover small field dosimetry methods, special delivery techniques, 4D dosimetry, light ion beam dosimetry, Monte Carlo applications in clinical 3D dosimetry, and quantification of differences in dose distributions. Clinical Applications covers acceptance testing, commissioning and QA of linacs and treatment planning systems, patient-specific QA, audits using end-to-end tests, Brachytherapy 3D dosimetry, doses outside the treatment volume in external beam radiotherapy, imaging doses in radiotherapy, and dose verification of protons and carbon ion beams. The final section covers dosimetry of small animal irradiators, dosimetry of synchrotron systems, and for those interested in MR-linacs, 3D dosimetry in magnetic fields.

Being part of the Medical Physics series, this book aims to give details on current and emerging techniques for clinical dosimetry. So, topics of current interest such as calibration in flattening filter free beams, small radiation fields, and proton beams are explicitly covered. The book aims to be and indeed is, very comprehensive, with coverage of techniques for full 3D, pseudo-3D and semi-3D dosimetry. Some may argue it is perhaps too large, and not always clinically relevant. Despite well over a decade of research, a polymer gel and radiochromic dosimetry techniques have not found a place in routine clinical dosimetry in most centres. They are currently the only truly 3D dosimeter systems and continue to be an area of active research, which justifies their inclusion, but including two sizeable chapters may seem generous.

For clinical dosimetry of complex doses in 2D and semi-3D, the current commercial solutions appear here (ArcCHECK, Delta4, OCTAVIUS, etc.), though comparisons aren't made particularly easy (and OCTAVIUS doesn't

even appear in the book's Index).

The book is written by European, US & Australian authors, and published by a US publisher. Hence the dosimetry and QA frameworks described throughout, tend to be those from IAEA / AAPM, rather than based on the IPEM guidelines which UK-based scientists will be more familiar.

In summary, this is a comprehensive text on 3D dosimetry, aimed at a clinical scientific audience. The size (~650 pages), and price (~£150) for the hardback book leads me to expect that it may be more likely found on departmental and library shelves, that those of an individual. However, the ebook is currently much more affordable (~£36). As such, it is a very solid and thorough textbook and has little competition.

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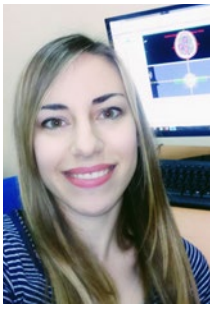
Summer 2018 Social media comments



Georgia Prentou in LinkedIn

European #MedicalPhysics News, Summer 2018 Issue is here! I am so grateful since a synopsis of my PhD research is announced in the Section of „ #PhDprojects in Medical Physics". The section is very interesting and inspirational because it offers us a good chance to get informed about our colleagues' research projects and innovative ideas!

ELSE Company in LinkedIn

We're proud to announce our company member partnership with EFOMP! We strongly believe and support their projects and we're always open in facing the new challenges of the near future delighted to collaborate with the best medical physics experts! Giacomo Bartesaghi

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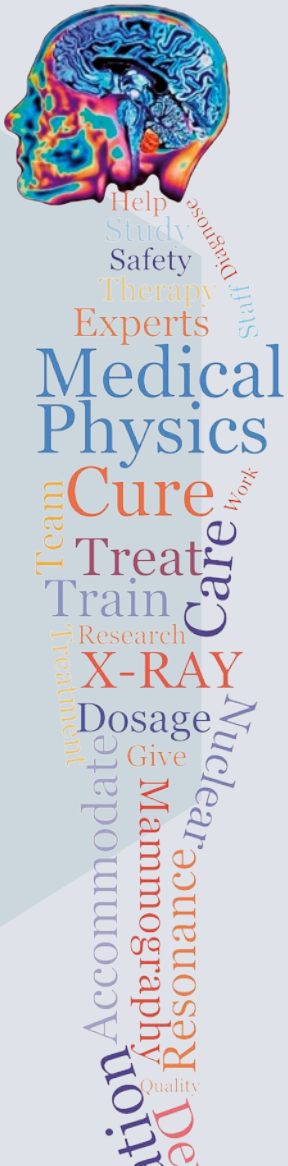

ORGANIZING SECRETARIAT

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Date	Description	URL	Location
Oct 13, 2018 – Oct 17, 2018	31st Annual European Association of Nuclear Medicine Congress	EANM2018	Düsseldorf, Germany
Oct 22, 2018 – Oct 26, 2018	Joint ICTP-IAEA Advanced School on Quality Assurance and Dosimetry in Mammography	ICTP_IAEA	Trieste, Italy
Oct 26, 2018 – Oct 27, 2018	2nd ESTRO Physics Workshop - science in development	ESTRO	Malaga, Spain
Nov 1, 2018 – Feb 8, 2019	EUTEMPE-NET module 01: Leadership in Medical Physics, Development of the profession and the challenges for the MPE (D&IR)	EUTEMPE_NET_MPE01	Prague, Czech Republic
Nov 11, 2018 – Nov 14, 2018	18th Asia-Oceania Congress of Medical Physics (AOCMP) & 16th South-East Asia Congress of Medical Physics (SEACOMP)	AOCMP_SEACOMP	Kuala Lumpur, Malaysia
Jan 24, 2019 - Jan 26, 2019	European School for Medical Physics Experts (ESMPE) Nuclear medicine edition 2019	EFOMP.org	Prague, Czech Republic
Feb 7th, 2019 - Feb 9th, 2019	Image-guided radiotherapy in clinical practice	ICR	The Royal Marsden NHS Foundation Trust, London, UK
Feb 27th, 2019 - Mar 3rd, 2019	25th European Congress of Radiology	MYESR	Vienna, Austria
Mar 1st, 2019 - Mar 2nd, 2019	10th IAPM Annual Scientific Meeting and IAPM Workshop	IAPM	Dublin, Ireland
Apr 10th, 2019 - Apr 12th, 2019	EUTERP Workshop - Optimising radiation protection training	SCKCEN Academy	Qawra, Malta
Apr 26th, 2019 - Apr 30th, 2019	ESTRO 38	ESTRO	Milan, Italy
Jun 11th, 2019 - Jun 14th, 2019	6th Joint Congress 22SEFM-SEPR17	congresosefmsepr	Burgos, Spain
Jul 4th, 2019 - Jul 6th, 2019	European School for Medical Physics Experts (ESMPE) Interventional Radiology edition 2019	EFOMP	Prague, Czech Republic


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FOR MEDICAL PHYSICS

The European Federation of Organisations in Medical Physics (EFOMP) was founded in May 1980 in London to serve as an umbrella organisation for medical physics societies in Europe. The current membership covers 34 national organisations which together represent more than 8000 medical physicists and clinical engineers working in the field of medical physics. The moto developed and used by EFOMP to underline the important work of medical physics societies in healthcare is "Applying physics to healthcare for the benefit of patients, staff and public".

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