



Asia-Oceania Federation of Organizations for Medical Physics

AFOMP Newsletter

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EDITORIAL BOARD

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Advisors: Prof. Tae-Suk Suh &
Prof. Hasin A. Azhari
Editor: Dr. V. Subramani

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Editorial

Medical Physics-Achievements, Challenges and Horizons



Dear Readers,
Wish You All Happy and Prosperous New Year 2021
Warm Greetings from Editorial Board!

We are pleased to welcome you for reading this latest issue of AFOMP Newsletter January 2021. This issue presents with lots of information about the Execute Committee of AFOMP activities including messages from AFOMP officials, highlights of recently held AOCMP2020 congress, reports of execute committee, AFOMP IDMP2020 celebrations, scientific invited articles, AFOMP awards and honors, announcements, advertisements, book review and upcoming scientific events in the field of Medical Physics.

As an Editor, I am happy to communicate with you all at the beginning of this New Year 2021 and to would like to share my perception on achievements, challenges and the horizons of Medical Physics Profession. We may introspect ourselves that what have we achieved so far as Medical Physicists in the field of radiation medicine in general and what are the impactful contributions of Medical Physics to cancer patients and cancer research? in particular.

To give brief perspectives on that the scientific achievements from the radiation physics based discoveries, inventions and innovations have made great strides in ensuring safe and effective use of radiation in clinical practice thereby improving diagnostics and therapeutics accuracy and reproducibility, reducing and mitigating errors and uncertainties, identifying, analyzing and managing risk of radiation. This phenomenal improvement made significant benefits to patient's quality of life and to extent with better cancer tumor control with minimal side effects.

However, we are facing grant challenges in clinical, academic and professional areas such as physics, technology, biology, education and training and also cultivating the leadership quality among our fraternity. In order to overcome the challenges, it is necessary to think and work beyond the boundary of our conventional approaches in dealing challenges and to have contemporary and perhaps non-traditional approaches in clinical practice, research and education and truly applying principles and laws of physics in medicine and biology beyond medical radiation physics.

We are in the era of convergent science and hybrid technology towards practicing precision medicine for personalized patient care, where the transdisciplinary team science is required. The expanding roles in clinical practice are emerging in participating in direct patient consultation about the complex technology-driven clinical process. Similarly expanding horizons of medical physics in cancer research are emerging in the field of computational physics, in-silico modelling, quantitative imaging biomarker, optical imaging, artificial intelligence, big-data analytics and computing, computational or systems biology, immuno-oncology, thermal oncology, nano-particle-mediated oncology, targeted, molecular oncology and physical sciences oncology and physics of cancer metastasis and tumor development. We may have more visibility of our profession in the health care system when we contribute to other field of medicine focusing on translational research in addition to the current practice. Therefore, it is necessary to include contemporary and transdisciplinary science subjects into the medical physics curriculum for preparing the next generation of Medical Physicists for the valued services to the society. In my opinion, the future of medical physics lies in 3 P's such as (i) promoting the profession (ii) protecting the fraternity and (iii) personalizing the patient care. It is a professional call to action.

Hope you will be enjoying in reading this issue and welcome your comments and feedback.

"A person who never made a mistake never tried anything new." Albert Einstein

With Warm Regards
Dr. V. Subramani
Editor, AFOMP, Newsletter
Asst. Professor, Radiation Oncology (Medical Physics)
All India Institute of Medical Sciences,
New Delhi-110029 INDIA
Email: manismpaiims@gmail.com

President's Message



Dear AFOMP members,

Kindly accept my New Year greetings. I wish and hope that 2021 will bring us back to normal life.

The Year 2020 was very difficult and hard time for each one of us due to the unprecedented COVID-19 pandemic. The COVID-19 pandemic has affected each one of us in every aspect of life and medical physicists are no exception. However, as health professionals and warriors, we have been brought up and taught to encounter the obstacles and difficulties.

During the pandemic, the health services needed to be continued and therefore medical physicists also contributed hugely to tackle the pandemic during COVID 19. The Radiotherapy facility, Radio Diagnosis, Nuclear Medicine, Radiological Procedures, Radiation Safety, QA, QC, education and training continued with immense challenges than usual.


AFOMP also took many steps to keep the education, training, and dissemination of knowledge unperturbed. The technological advancements have helped in this endeavor greatly. AFOMP started monthly webinars for the benefit of the medical physicists as most of the conferences are either postponed or cancelled. However the 20th AOCMP is held in Phuket Thailand in hybrid mode that is virtual as well as in person. Thanks to the organizers for the determined efforts.

AFOMP took a lead in the drafting and publishing of comprehensive AFOMP guidelines on **radiation oncology operation during COVID-19 and diagnostic radiology services during COVID-19 pandemic- medical physicists' perspective**. This was the need of the hour and played a pivotal role in improving the professional relation of medical physicists among clinical practitioners and technologists in the respective fields and also aided in enhancing the status of medical physicists in hospitals. These guidelines are available on the AFOMP website.

If you read my presidential message in the AFOMP newsletter of January 2020, you will see that, we planned many activities to celebrate the 20th anniversary of AFOMP. With the support of AFOMP EXCOM and the participation of NMO's, we could achieve many of our goals in the 20th anniversary despite all pandemic situations.

This year, as we celebrate the 20th Anniversary of AFOMP, we have started the AFOMP lifetime achievement award for outstanding contribution of medical physicist from the AFOMP region for his/her contribution to medical education, training, research and professional development. This year the awardees are Prof. Anchali Krisanachinda and Dr. Donald Mclean. Congratulations to both.

AFOMP has introduced the Outstanding Medical Physicist award for medical physicists, who made outstanding contributions to the advancement of medical physics and health care through



research, clinical developments, education and training activities, service development and the professional matters over the last twenty years of AFOMP. We carefully and consciously selected 21 medical physicists for the award of AFOMP Outstanding Medical Physicist. Congratulations to all. The list is available on the AFOMP website.

This year Journal of Medical Physics - JMP (AMPI journal) is recognized as one of the official journals of AFOMP. To encourage publication of research articles in AFOMP official journals, AFOMP has started an AFOMP best publication award. This year's awardee is Prof. Masatoshi Saito from Japan. Thanks for the support of the AFOMP official journals. I am sure that this will be an encouragement to all of you to publish your research work in the AFOMP official journals and in turn benefits all the members. We have planned another young investigator award and hope to materialize it soon. Your suggestion, support for more awards to appreciate and encourage the contribution of medical physicists from AFOMP are welcome.

To improve the professional status of medical physicists in the AFOMP region, we have to work collectively and effectively. To achieve this, communication, co-operation and commitment are very important and I urge you all to kindly communicate and cooperate. Your commitment to the profession will take us to the achievement of the desired goals.

Once again, I wish very happy New Year and hope that we will be able to achieve much more than our expectation in 2021.

Take care, stay safe

Prof. Arun Chougule
President AFOMP

Vice-President's Message



Dear Colleagues,

What a year this has been. I trust that you are safe and well and have managed to continue all the services medical physicists provide without too many disruptions. I think the year has proven that we are a determined and resilient group who will accept challenges and adapt to new working conditions undaunted. Medical physicists have been part of the frontline workers who contributed towards health service continuation, COVID guideline development as well as safe and effective patient diagnosis and treatments.

Yes, there have been setbacks, but overall, we can still call this year a success. Online meetings and educational programs have become an instant hit, with excellent participation recorded for AFOMP, IOMP and AOCMP2020 webinars and conference presentations.

This year also marks the 20th anniversary of AFOMP and I would like to pay tribute to the founders of AFOMP, thanks to whom we now have functional and collaborative regional organization. As such, several new AFOMP awards have been established to celebrate the work and success of our members. These include:

- a) AFOMP life-time achievement award to honour a medical physicist who has established a distinguished career in their fields, serving the profession and the community.
- b) AFOMP journal prize for the best paper published in an AFOMP journal and authored by an AFOMP member
- c) AFOMP outstanding medical physicist award – established on the occasion of the 20th anniversary of AFOMP, recognising medical physicists who worked in the AFOMP region for the last 20 years and put tremendous efforts for medical physics professional development, medical physics education and research, those who made a significant impact on science and organized scientific activities in AFOMP region to disseminate scientific knowledge for the welfare of the profession and society, they have served in national medical physicist organization and AFOMP, have served their country, AFOMP region and the community.

I would like to warmly congratulate all winners of these prestigious AFOMP awards (their names can be found at: <https://afomp.org/category/award-winners>) for their service to our region but also for serving as role models and mentors, setting up a legacy of dedication, professionalism and leadership.

These awards would not have happened without the hard work of the Honours and Awards Committee (AHC), who prepared the terms of references for these awards, and pedantically and methodically evaluated all nominations in a timely manner. Hence I wish to thank the AHC for their excellent service. Next year, yet another award will be established to recognize the achievements of our younger members – so watch the AFOMP communications and website for the nomination call for the young achiever award.

Best Wishes
Eva Bezak
Vice President, AFOMP

Secretary General's Message



Dear colleagues and friends,

It's been a pleasure and an honor to greet all of medical physicists in Asia Pacific regions. I invite all of you to go through the recent events and activities relevant to the areas of physics and engineering applied to medicine in the AFOMP region published in the Volume-13, Issue-1, December 2020 of AFOMP Newsletter.

The COVID-19 pandemic is the greatest crisis of our age. As a vital component of healthcare system Medical physicists all across the world has contributed to the prioritize care and ensure patient and staff safety.

Every crisis brings new openings. Through current pandemic is a golden time to find new ways to interact and learn from each other. Modern communication technologies have removed the distance between us, which are successfully shown by the conducted monthly ACPSEM accredited webinar program of AFOMP. Tremendous growth in the application of artificial intelligence (AI) in medical physics brings a great challenges to the continuous professional developments. Those lectures by experts contains a wealth of information on the variety of topics. AFOMPs webinars remained a great success with a large number of participants all across the globe.

Besides these AFOMP has initiated many activities to inspire and mark professional and academic excellence like paper publication award, best physicist award, life achievement award on the occasion of the 20th anniversary of AFOMP and it is a continuous process to stimulate the MP organizations.

The AFOMP Newsletter has becoming an important media of sharing the activities, knowledge and present status of the medical physics with its readers. I would like to thank to all the persons who has contributed in this issue and editorial board members for their everlasting support and make this newsletter such productive creation.

Please feel free to offer any suggestions for the improvement of our newsletter.

Lastly, I wish you a happy, successful and prosperous year ahead.

Thank you and Stay Safe

Prof. Dr. Hasin Anupama Azhari
General Secretary, Asia Oceania Federation of Organization for Medical Physics (AFOMP).
CEO, South Asia Centre for Medical Physics and Cancer Research (SCMPCR)
Head, Dept. of Medical Physics and Biomedical Engineering, Gono University

Report of The 20 th AOCMP-18 th SEACOMP-120 th JSMP-12 th TMPS and the ACOMP

The 20th AOCMP-18th SEACOMP-120th JSMP-12th TMPS and the ASEAN College of Medical Physics (ACOMP) took part in Phuket, Thailand from 3 to 5 December 2020 (AOCMP-SEACOMP 2020). The success of the Congress was facilitated by the close collaboration of the Regional Organisations: the Asia-Oceania Federation of Organisations for Medical Physics (AFOMP) and the South-East Asian Federation of Organisations for Medical Physics (SEAFOMP) with the National Member Organizations, JSMP and TMPS. AOCMP-SEACOMP 2020 attracted 402 delegates of 265 in person and 137 online, and exhibitors and was supported by a 48 strong team of the host organisation – the Thai Medical Physicists Society.

According to the pandemic COVID-19 which prevents the travel internationally, most of the participants at the AOCMP-SEACOMP 2020 were from Thailand only, but it also attracted delegates from other continents, thus having participants from 24 countries. The largest delegations were from Thailand, Japan, Malaysia and Indonesia included 170 Oral presentations and e-Posters, 45 Invited Lectures and 6 Mini Symposia. Most of these are in the fields of Radiation Therapy, Medical Imaging, Radiation Safety, AI and Education and Clinical Training of Medical Physics during COVID-19. All abstracts of these were published as an e-Book of Abstracts, supplement to the IOMP Journal Medical Physics International Issue June 2020, which is available as a free e-publication from <http://www.mpijournal.org/MPI>

Many companies had Exhibition stands at AOCMP-SEACOMP 2020, thus allowing the participants to see the latest developments in the medical-physics-related industry. The sponsors and exhibitors at AOCMP-SEACOMP 2020 (as per their boot number) were: Bayer, Abex Global, Siemens, Philips, GE, Business Alignment, Premier Business Inter, Kamol Sukosol, Dispomed, PT Healthcare, Biz Line, Nuclear System Company, Thailand Institute of Nuclear Technology, Brainlab, IBA Dosimetry, PTW, Sun Nuclear, Lap Laser, Frontier Tour Travel, JSMP, CU Book. We express sincere gratitude to all sponsors and exhibitors!

At the current AOCMP-SEACOMP 2020, it was reported that the number of medical physicists globally has now reached 30,000 and our goal is to further double this number in the next 15 years. The number of medical physicists in AFOMP region is reached about 11000; however the number is very less for a population of 4.7 billion in Asia- Pacific. Need about 25000 MP by 2035.

The increase of the number of medical physicists is directly related to the education and training in medical physics and IOMP with its Regional Organisations has made sound steps in this direction. One of these steps is the establishment of the “ASEAN College of Medical Physics” – a sequence of educational mini-Symposia, which was inaugurated at AOCMP-SEAFOMP 2020. The support for this activity from the leaders of the profession was overwhelming. Thus AOCMP-SEACOMP 2020 included 6 mini-Symposia, covering various topics of importance for the profession (please see the list further down). We want to specially thank all colleagues who contributed to the AOCMP –SEACOMP-ACOMP and mini-Symposia.

To accommodate this ACOMP and Mini-Symposia, AOCMP-SEACOMP 2020 included a novel

organisation of the Programme: having all mornings associated with the Mini-Symposia and all afternoons for scientific presentations and poster sessions. This re-organisation of the programme was accepted very well by all participants. It was discussed some of the Mini-Symposia to be presented again at the next ACOMP-School, thus giving the opportunity to more colleagues and students from other continents to benefit from them.

Finally we want to thank all Organisers and AOCMP-SEACOMP 2020 Committee members, as well as all colleagues who contributed and participated at the AOCMP-SEACOMP 2020. The truly international friendly spirit at the Conference in Phuket was one of the main pivots of the success of AOCMP-SEACOMP 2020.

Anchali Krisanachinda, President AOCMP-SEACOMP 2020

Professor Dr. Arun Chougule, President AFOMP

Freddy Haryanto, President SEAFOMP

Shigekazu Fukuda, President JSMP



AFOMP EXCOM Reports

Report of President

I am thankful to all the AFOMP EXCOM for their active participation and support in carrying out the responsibility. I also thank all the NMO's for their response to my call so as to increase the visibility of medical physicist and increase the status of the profession.

Some of the points which needs mention in the report are

1. ACPESM accepted our request to hold AOCMP2019 along with EPSM2019 at Perth. Australia, during 28- 30 October 2019. This arose due to sudden backing out of Kuwait organisers and MEFOMP of AOCMP2019 at Kuwait. The conference organisers provided subsidised registration fees to AFOMP members as compared to ACPESM members, we appreciate it. The conference went very well with good participation from AFOMP member countries. We received a good share from the savings of AOCMP-EPSM2019, thanks to EPSM2019 organisers and ACPESM.
2. The Prof. Kiyonari Inamura Memorial AFOMP orator 2019 was Prof. Kwan Hong Ng. AFOMP provided 08 travel grants to AFOMP delegates for facilitating the participation in AOCMP2019
3. As AFOMP was founded in May 2020, AFOMP EXCOM decided to celebrate 2020-21 as AFOMP 20 th Anniversary year. A special logo for this occasion was developed
4. In 20 th anniversary year, AFOMP decided to start AFOMP Life time achievement award. Thanks to Eva Bezak, Chair AHC and the members for the hard work in preparing the guidelines, application forms and assessing/evaluating the applications received very meticulously. This year's AFOMP Life time achievement awardees are Dr. Anchali Kisanachinda and Dr. Donald Maclean
5. On 20 th Anniversary year AFOMP decided to recognise and honour medical physicists from AFOMP region who have contributed to AFOMP, to medical physics education, professional development and research. AFOMP outstanding Medical physicists award was executed, thanks to Eva Bezak, Chair AHC and the members for the hard work in preparing the guidelines, application forms and assessing/evaluating the applications received very meticulously. Twenty one awardees are selected, the flyer prepared and circulated, put on AFOMP website.
6. Journal of Medical Physics [JMP] was accepted as one the three AFOMP official journals
7. AFOMP decided to encourage the research article submission to the AFOMP official journal and decided to award one publication every year from the AFOMP official journal as best research publication, to be awarded cash prize and certificate. All the three journals agreed to contribute US\$ 1000, one time support, to sustain the award. JSMP has already deposited US\$1000. Thanks to all.
8. To sustain the activities of AFOMP, it was decided to raise the corpus funds of AFOMP and hence corporate membership for 5 years by paying US\$ 5000 is planned. We have received US\$ 5000 each [Total US\$ 15000] from three corporate, PTW, Sun Nuclear and ROSALINA. Communications are going on with many manufactures, marketing companies; everyone's support to increase the corpus fund is expected.
9. The unprecedented COVID19 pandemic has also affected AFOMP activities and participation, however to rise to the occasion and to keep continued activities, all efforts are made. AFOMP started a COVID19 resource page on AFOMP website

10. AFOMP brought out guidelines for medical physicists in radiation oncology to cope up COVID19 also AFOMP brought out guidelines for radiology staff during COVID19
11. AFOMP started monthly virtual webinars since June 2020 and getting very good response. **The** schedule for January – June 2021 monthly virtual webinar is finalised and released. To help participants to get CPD accreditation and CME points, the webinars are accredited by ACPESM with 2 CME points each webinar. The participants are provided with certificate.
12. AFOMP celebrated IMPW2020 by arranging two virtual webinars, on 11 and 14 May, 2020
13. AFOMP celebrated IDMP2020 by arranging virtual webinar on 7 th November 2020
14. Due to COVID19 pandemic, the organisers of AOCMP2020 have hard time, the conference now planned to be hybrid mode.
15. The Prof. Kiyonari Inamura Memorial AFOMP orator 2020 is Prof. KY Cheung
16. On the occasion of 20 th Anniversary of AFOMP, MPI journal is bringing out special issue, all NMO's were chased to submit the article. AFOMP is submitting the article
17. Prof. Tae Suk Suh, Immediate past president is awarded IDMP2020 award, congratulations.
18. In AFOMP region, S Korea, three universities providing medical physics education are accredited by IOMP.
19. The AOCMP2021 will be held in COX Bazaar, Bangladesh during 10-12 December 2021
20. AFOMP website is updated frequently to provide the relevant information.

I thank each one of you for your support, directly/indirectly, for discharging my duties as President AFOMP. We hope and wish that the COVID19 pandemic gets over soon and the world comes to normal

With good wishes,

Prof. Arun Chougule
President AFOMP

Report of Awards and Honors Committee

Committee Chair: Eva Bezak (Australia)

Committee Members: Kanchan Adhikari (Nepal), Noriah Jamal (Malaysia) - inactive, Freddy Haryanto (Indonesia), Hidetoshi Saitoh (Japan), Youngyih Han (South Korea)

The committee has been expanded by 2 new members from Japan and South Korea.

The committee has been very busy in 2020 and the following activities have been accomplished since the last report (October 2019):

1. New awards have been established (with TORs developed): Lifetime Achievement Award, Outstanding Medical Physicist Award (this is a special award on the occasion of the 20th Anniversary of AFOMP), and the Best publication award.
2. Three nominations were received for Prof Kiyonari Inamura Memorial AFOMP Oration. The 2020 Orator is Professor Dr Kin Yin Cheung, Senior Medical Physicist at the Medical Physics & Research Department, Hong Kong Sanatorium & Hospital Medical Group.
3. Lifetime achievement award: 7 nominations were received for the AFOMP Lifetime Achievement Award. The nominations were evaluated in 4 categories (maximum 10 points each). Due to only 0.25 point difference in the overall mark, 2 awardees were announced in this inaugural year for this award: Anchali Krisanachinda and Ian Donald McLean.
4. AFOMP Outstanding physicist award: 36 nominations were received from 14 NMOs. All the nominations received were critically evaluated under 4 categories using a 50-point scale each, totalling to a maximum of 200 points. During this process, the outstanding medical physicists awarded by IOMP in 2013 from the AFOMP region were excluded because they have already received the highest award and they are already AFOMP outstanding medical physicists. Result: 21 physicists from 13 NMOs were awarded the Outstanding Medical Physicist Award in the AFOMP region. Certificates have been kindly prepared by Chai-Hong Yong. The awardees are: KY Cheung, Masahiro Endo, Howell Round, Arun Chougule, Nobuyuki Kanematsu, James Lee, Tatsuaki Kanai, Chen-Shou Chui, Hee-Joung Kim, Noriah Binti Jamal, Sung Kyu Kim, Hasin Anupama Azhari, Koichi Ogawa, Kum Bae Kim, Hossein Mozdarani, Hyun-Tai Chung, Wan Ahmad Kamil Abdullah, B Paul Ravindran, Agnette de Perio Peralta, Jianrong Dai, Nisa hawapun
5. AFOMP Journal Prize for the Best Paper published in an AFOMP Journal (Radiological Physics and Technology, Physical and Engineering Sciences in Medicine and Journal of Medical Physics) authored by an AFOMP member. 21 publications were nominated in total by the 3 AFOMP official journals. In the first round, a shortlisting process was conducted and 6 papers were shortlisted for the final evaluation. Papers are evaluated on originality, science, clarity and impact (maximum 10 points each). The final result is expected by 26 November 2020. This has been a lot of work, requiring a significant amount of time from the AHC members. It is proposed that the best paper award could be judged in future by the science committee – if supported and approved by ExCom.
6. The journal prize is supported by 3 NMOs (Australia, India, Japan) – all pledging a one-of financial support of USD1000.

Eva Bezak
Chair, A & H committee, AFOMP

Report of Secretary General

During this COVID 19 Pandemic I must say AFOMP has continued its activities more precisely in 2020. Though no face to face meeting was held, several online meetings of AFOMP Excom on skype was organized. Not only that regular each activity is coordinated with each member and combined teamwork make AFOMP in this year very effective.

I also thankful to the NMOs for their continuous correspondence with AFOMP. We have tried further progress in MP Field in this region, considering this AFOMP has introduced many awards as follows

AFOMP Awards:2020

Kiyonari Inamura Oration Award

Life Time Achievement award

Outstanding Medical Physics Award

Best Paper Publication Award

All the committees' chair and members have done extraordinary activity in the year 2020. The guidelines, selection, evaluation of the awardees have been done very meticulously by the AHC committee. The PRC, ETC make alive AFOMP through webinars and do a tireless job to make it successful during this pandemic. The inputs of SC for the MP society of the AFOMP region is remarkable. This year another achievement is increase our resources in terms of funds to make AFOMP sustainable. President Arun is continuously trying to contact the vendors for funds. FC also aware of these and trying their best.

Being secretary-general, AFOMP I have tried to communicate all NMOs to stimulate your contribution to the progression of medical physics. We need cooperation between NMOs as well with AFOMP EXCOM. For the continuous outcome of AFOMP activities, NMO's contact details need to be informed regularly after completion of their terms. Otherwise, we do not have any link with those NMOs. Also less developed, underprivileged countries/ regions of AFOMP need to be recognized and the established countries should come forward to help them in medical physics through AFOMP.

Prof. Dr. Hasin Anupama Azhari
Secretary General, AFOMP

Report of Education and training committee

The year 2020 came unexpected with the outbreak of covid19. The whole world is changed dramatically by this pandemic, with no exception of medical physics community.

In order to reduce the impact of covid19, and to ensure that cancer patients receive radiotherapy in a safe and orderly way during the pandemic, education and training committee (ETC) of AFOMP released “AFOMP GUIDELINES ON RADIATION ONCOLOGY OPERATION DURING COVID-19” with the help of President Dr. Arun Chougale and EXCOM on April 4th. This guideline was developed for use in radiation oncology with a particular perspective of medical physics. The guideline was circulated among AFOMP members and medical physics community, and received many positive responses. On April 29th, medical physics for world benefits (MPWB) invited ETC chairman, Dr. Xiance Jin, and scientific committee chairman, Professor Tomas Kron to give a talk through webinar on “ International Medical Physics Guidelines for COVID-19” for medical physics community worldwide.

Due to the spread of covid19, on site international meetings were canceled for 2020. In order to enforce the continuous education for young medical physicists, under the supervision and help of professor Arun Chougale and EXCOM, with the close work with scientific committee and professional development committee, ETC of AFOMP organized monthly online webinar for medical physicists in AFOMP regions and worldwide. An average of 350 participants joined monthly webinar.

The Webinar is endorsed by the Australasian College of Physical Scientists & Engineers in Medicine (ACPSEM) and is accredited with 2 CPD points for each one.

Thanks for the organization of Professor Kwan H Ng, ETC of AFOPM organized medical physicists from the AFOMP regions, contribute a chapter on “Asia Pacific Chapter of Medical Physics during the COVID-19 Pandemic: Clinical Practice, Teaching and Research” to a Taylor and Francis Focus Series book: Medical Physics during the COVID-19 Pandemic: Clinical Practice, Teaching and Research. The authors contributed to the chapter are: Xiance Jin (Radiation and medical Department, First Affiliated Hospital of Wenzhou Medical University, Wenzhou, China, 325000), Fu Jin (Department of Radiation Oncology, Chongqing University Cancer Hospital, No.181, Hanyu Road, Shapingba District, Chongqing City, 400030), Hasin Anupama Azhari (Department of Medical Physics and Biomedical Engineering, Gono Bishwabidyalay University, Bangladesh), Woo Sang Ahn (Department of Radiation Oncology, Gangneung Asan Hospital, University of Ulsan College of Medicine, 25440, Korea). Cheryl Lian Pei Ling (Singapore Institute of Technology ,Singapore), Congying Xie (Radiation and medical Department, Second Affiliated Hospital of Wenzhou Medical University, Wenzhou, China, 325000), Hui-yu Tsai (Department of Nuclear Engineering and Science, Institute of Nuclear Engineering and Science, National Tsing Hua University, Taiwan). This book chronicles the experience, innovative strategies and contribution of global MP community to healthcare during the COVID-19 pandemic.

It is still not clear when the covid19 will pass. It may last for the following two to three years, at least it will continue to affect our normal years for the following a few years. ETC of AFOMP will continue to figure out a better way to serve our community in the AFOMP regions.

Education and training committee of AFOMP

Sr. No.	Date of webinar	Speaker	Topic	Moderator
01	5 June 2020	Prof. Tomas Kron & Dr. Peta Lonski	Total Body Irradiation with X-rays and Electrons: Dosimetry and Techniques	Dr. Jin Xiance
02	2 July 2020	Prof. Arun Chougule	Radiobiology of Radiotherapy - NSD to BED	Dr. Chain Yeong
03	6 August 2020	Prof James Lee	Proton Beam Therapy in Singapore - the NCCS journey so far	Prof. Anupama Azhari
04	3 September 2020	Prof Abu Zakaria	Dosimetry of Small Photon Radiation Fields: Comparison of the IAEA TRS 483 & the German DIN 6809 8 protocols	Dr. Kanchan Adhikari
05	1 October 2020	Dr. Chai Yeong	Establishment of nuclear medicine facility and radiopharmaceuticals in nuclear medicine	Dr. J. Jeyasugiththan
06	5 November 2020	Prof. Arun Chougule	Dose reference levels - DRL	Dr. Michale Lee
07	4 December 2020	Prof. D.N. Sharma	Recent advances in brachytherapy and challenges	Dr. Delmar Arzabal
08	07 January 2021	Dr. Dayanand S Shamurailatpam	Proton Therapy: Why and How?	Dr Md Akhtaruzzaman
09	11 February 2021	Dr. Eva Bezak	An overview of targeted beta and alpha therapies	Dr. Mary Joan
10	04 March 2021	Prof. Chen Shou Chui	IAEA TRS - 398 "Absorbed Dose Determination in External Beam Radiotherapy"	DR. V. Subramani
11	01 April 2021	Prof. Hossein Mozdarani	Biological paradigms affecting radiotherapy outcome.	Dr Jeannie Hsiu Ding Wong
12	06 May 2021	Dr. Hyun Tai Chung	Basic principles, dose planning, advantages & quality assurance of a Gamma Knife Radiosurgery	Supriyanto Ardjo Pawiro,
13	03 June 2021	Dr. Yibao Zhang	Knowledge based planning: research and practice for cancer treatment	Dr. Mary Joan

Dr. Xiance Jin
Chair, Education & Training Committee, AFOMP

Report of Scientific Committee

Reporting period: 1/1/2020 – 1/10/2020

The science committee was appointed in Jan 2019 with following office holders:

Science Committee Chairperson – Tomas Kron, Australia

Committee Members:

- Arun Chougule, India, President, AFOMP
- Freddy Haryanto, Indonesia
- Jeyasingam Jeyasugiththan, Sri Lanka.
- Shinji Kawamura, Japan
- Kuo Men, China
- Suresh Poudel, Nepal
- Md Akhtaruzzaman, Bangladesh
- Jeannie Wong, Malaysia

2020 has been a challenging year due to the COVID 19 Pandemic. No face-to-face meeting was held but the committee had several virtual meeting. The support of Rajni Verma in setting up a ZOOM meeting for Sept 2, 2020 is greatly appreciated.

Virtual meetings held in 2020:

May 27, 2020

June 24, 2020

Sept 2, 2020

Activities in the reporting period:

1. Virtual meetings

2. Discussion of AOCMP in Thailand – several communications with conference convener Anchali

3. Contribution to program design, particularly the set-up of a minisymposium on Research during COVID.

4. Contribution to review of AOCMP abstracts (only few abstracts were reviewed by the chair at short notice)

5. Support pledged for new initiative: Best paper award in AFOMP official journals:

- Physical and Engineering Science in Medicine (formerly Australasian Physical and Engineering Science in Medicine) - <https://www.springer.com/journal/13246>
- Journal of Medical Physics - <http://www.jmp.org.in/>
- Radiological Physics and Technology - <https://www.springer.com/journal/12194>

6. PhD abstracts to be summarized for first newsletter in 2021.

15/11/2020

Tomas Kron

Funding Committee (Hajime Monzen)

The Funding Committee raises funds from a range of sources and distributes them throughout the new era, enabling member nations and organizations, especially in developing countries, to build sustainable pathways for medical physicists of all abilities and to clearly communicate our core values of courage, determination, inspiration.

Activities

- Exco member listed supporting companies.
- Companies are in deficit due to influence of the coronavirus, donations have not been obtained.

Iori Sumida Ph.D : Osaka University (Japan)

Masahiko Okumura Ph.D : Kindai University (Japan)

Nguyen Tan Chau M.S: Cyto-Ray Hospital (Vietnam)

Ung Ngie Min, Ph.D: University of Malaya (Malaysia)

Youngyih Han. Ph.D: Samsung Medical Center, Sungkyunkwan University (Korea)

Dr. Hajime Monzen Ph.D,
Chair Funding Committee, AFOMP

Report of Professional Relations (PRC) Committee

Advisors: Prof Dr Anchali Krisanachinda (Thailand)
Prof Dr Kwan Hoong Ng (Malaysia)

Chair: Assoc. Prof. Dr Chai Hong Yeong (Malaysia)

Committee: Prof Dr Arimura Hidetaka (Japan)
Dr Brad Cassls (Australia)
Dr Jia-Cheng Lee (Taiwan)
Dr Kitiwat Khamwan (Thailand)
Dr Mary Joan (India)
Dr Supriyanto Ardjo Pawiro (Indonesia)
Dr Yuchuan Fu (China)

Terms of Reference:

- To promote and support international cooperation on continued improvement on medical physics professions in the Asia-Oceania region.
- To advice on and promote the standards of practice in medical physics and professional conduct.
- To identify the needs for professional relations and professional standards development through symposia, conferences, regional meetings, workshops, etc. and assist with the organization of these activities.
- To assist regional or national medical physics organizations to prepare AFOMP sponsorship proposals for professional relations meetings.
- To consider applications from national and regional organizations for sponsoring or endorsing meetings.
- To manage the AFOMP travel support programs.
- To prepare or provide support to develop where appropriate, policy statements, professional recommendations, codes of professional practice, and to establish or help to establish expert groups to address specific national, regional, or worldwide professional issues when needed.

Report for Jan – Dec 2020 Activities

1. JSMP 2020

The 119th JSMP was successfully held on May 15 – June 14 during JRC2020 web congress, in concurrent with the 79th annual meeting of the Japan Radiological Society, 76th annual meeting of the Japan Society of Radiological Technology and the International Technical Exhibition of Medical Imaging 2020. AFOMP representatives, Prof Dr Arun Chougule, Prof Hasin Anupama Azhari and AP Dr Chai Hong Yeong have been invited to deliver recorded presentations during the conference.

2. AOCR 2020 & 2021

AFOMP endorsed the Asia-Oceania Congress of Radiology (AOCR 2020) which supposed to be held physically at Kuala Lumpur on 23 – 25 July 2020. However, due to the COVID-19 pandemic, the congress has been postponed to 1 – 4 July 2021 at Kuala Lumpur as a hybrid conference.

Programme is still in development. AFOMP can propose to send a speaker (recorded presentation).

3. **AFOMP Monthly Webinar 2020**

AFOMP Monthly Webinar 2020 series were successfully held on the first Thursday of every month from Jun – Dec 2020. The webinars (Jul – Dec) are endorsed by the ACPSEM with 2 CPD points for each webinar. Certificate is sent to every registered participant who must have attended at least 40 min of the webinar.

No	Date	Speakers	Topics	Moderators	No of Participants
01	5 Jun 2020	Prof Dr Tomas Kron & Dr Peta Lonski	Total Body Irradiation with X-rays and Electrons: Dosimetry and Techniques	Dr Jin Xiance	
02	2 Jul 2020	Prof Dr Arun Chougule	Radiobiology of Radiotherapy- NSD to BED	AP Dr Chai Hong Yeong	183
03	6 Aug 2020	Dr Sung Yung Park	Implementing Proton Beam	Prof Dr Anupama Azhari	130
04	3 Sep 2020	Prof Dr Golam Abu Zakaria	Dosimetry of Small Photon Radiation Fields: Comparison of the IAEA TRS- 483 and the German DIN 6809-8 Protocols	Dr. Kanchan Adhikari	133
05	1 Oct 2020	AP Dr Chai Hong Yeong	Establishment of Nuclear Medicine Facility and Radiopharmaceuticals in Nuclear Medicine	Dr. J. Jeyasunghithan	~100
06	5 Nov 2020	Prof Dr Arun Chougule	Diagnostic Reference Levels (DRLs)	AP Dr Jeannie Wong	~100
07	4 Dec 2020	Prof Dr D.N. Sharma	Recent Advances in Brachytherapy and Challenges	Dr. Delmar Arzabal	

Comments collected from the participants (summary):

- **Overall:** About 70% of the attendants have commented that the webinars are well organized, topics are beneficial, and speakers are knowledgeable and have explained the topics well. ~90% of participants thanked the AFOMP team for their excellent efforts.
- **Technical:** sometimes the audio was interrupted, provide a more convenient way to login to the webinar, the webinar should be longer, timing management, don't post announcement when the webinar is ongoing as the message will be pop-out and interrupt the presentation.
- **Contents & Speakers:** All topics are very beneficial and relevant; excellent presentation, speakers have answered all the questions well, need more time for discussion, get more younger scientists to speak, should organize bi-monthly, good to have 2 or more speakers per webinar.
- **Suggestions:** more talks on proton therapy, radiobiology, multidisciplinary research that would benefit postgraduate students, MR-Linac.

4. **AFOMP Monthly Webinar 2021**

AFOMP decided to continue the Monthly Webinar for 2021. The first 6 month programme is as following. AFOMP encourages more young physicists to join as speakers and moderators. This series of webinars are also endorsed by ACPSEM with 2 CPD points for each webinar.

No	Date	Speakers	Topics	Moderators
01	7 Jan 2021	Dr. Dayanand S Shamurailatpam	Proton Therapy: Why and How?	Dr Mohammad Amin Mosleh-Shirazi
02	11 Feb 2021	Dr Chen Shou Chui	IAEA TRS-398 “Absorbed Dose Determination in External Beam Radiotherapy”	Dr V Subramani
03	4 Mar 2021	Dr Eva Bezak	An Overview of Targeted Beta and Alpha Therapies	Dr Hajime Monzen
04	1 Apr 2021	Dr Hossein Mozdarani	Biological Paradigms affecting Radiotherapy Outcome	Dr Md Akhtaruzzaman
05	6 May 2021	Dr Hyun-Tai Chung	Basic Principles, Dose Planning, Advantages and Quality Assurance of a Gamma Knife Radiosurgery	Dr Supriyanto Ardjo Pawiro
06	3 Jun 2021	Dr Yibao Zhang	Knowledge-based Planning: Research and Practice for Cancer Treatment	Dr Mary Joan

5. AOCMP-SEACOMP 2020

AFOMP representatives, Prof Dr Tomas Kron, AP Dr Chai Hong Yeong, Dr Xiance Jin, AP Dr Jeannie Wong, Prof Dr Arun Chougule and Prof Dr Hasin Anupama Azhari will be conducted a forum on “Medical Physics Practice and Science in Times of COVID” during the AOCMP-SEACOMP 2020 (hybrid).

6. Proposal

Year 2020 has been a relatively quieter year for PRC activities due to the COVID-19 pandemic. The committee hope to be more active in 2021 (depending on situation) and wish to expand the committee by inviting members from the following countries: Singapore (Mr Somanesan), Vietnam (Dr Hoang Anh Tung), Cambodia (Mr Vanyat), Korea (any proposal?). We would also like to invite comments and proposal from AFOMP council for activities in 2021.

Prepared by,

Chai Hong Yeong
Chair, PRC
20 Nov 2020

Treasurer's Annual Report

Item Description	(A) Expenditure	(B) Income
Accounting activity	5146.69	32,019.34
Balance(B)- (A)	26,87265	
Fund brought forward from 20	US\$40,162.73	
Balance carried forward by 2020	US\$ 67,035.38	

Account of Income and Expenditure for the Year 2020

Income

14/11/19	PTW	US\$	5000.00
02/12/19	JSMP (Oration)(JPY200,000)	US\$	1800.00
18/12/19	Sun Nuclear	US\$	5000.00
24/01/20	AFOMP Subscription	US\$	614.25*
27/02/20	ROSALINA Instruments India	US\$	5000.00
17/03/20	ACPESM	US\$	7927.14
23/06/20	JSMP	US\$	1000.00
20/08/20	AFOMP Subscription	US\$	5,677.95
	Total	US\$	32,019.34

Expenditure

24/10/19	AOCMP Expenses	US\$	4484.00 **
07/07/20	AFOMP Website (Networths Systems)	US\$	662.69
	Total	US\$	5146.69

EXPENSES

AFOMP & SEAFOMP Travel Awards 2019

1. Mara Wang- China	USD 800
2. Jaun Paul Bustillo- Philipines	USD 500
3. Wong Yin How- Malaysia	USD 500
4. Shraddha Srivastava- India	USD 800
5. kawchar patwary- Bagladesh	USD 800
6. Suresh Poudel - Nepal	USD 800
	USD4200
AFOMP Oration Plaques	USD 150
AFOMP EXCOM Plaque	USD 134
Total	USD 4484**

AFOMP Member up to date 2019

Australia & New Zealand
 Bangladesh - Affiliate (BMPS)
 Hong Kong
 Indonesia
 Japan
 Korea
 Malaysia
 Myanmar
 Peoples Republic of China

Singapore
Taiwan
Thailand
Vietnam
Income
10 Jan 2020

NMO	Member Nos	Years Paid	Economy Index	Total
China	400	2019	50%	300.00
Malaysia	50	2019	50%	37.50
Philippines	70	2019	50%	52.50
India	1050	2019	10%	157.50
BMPA	163	2019 - 2021	10%	73.35
				\$620.85

From this amount I will deduct the IOMP membership payment from Nepal that was handed to you (KHNg) in cash – \$6.60 - therefore the total amount I will transfer to the AFOMP account is \$614.25*

NMO	Member Nos	Years Paid	Economy Index	Total
Thailand	200	2020	100%	300
Vietnam	80	2020	50%	60
Myanmar	33	2020	10%	4.95
Japan	2457	2020	100%	3685.5
Australasia	667	2020	100%	1000.5
Taipei, China	350	2020	100%	525
Bangladesh - BMPS (affiliate)	250	2020	10%	37.5
Singapore	43	2020	100%	64.5
				\$5,677.95

Prof.Kwan Hoong Ng
Treasurer
November 15, 2020

AFOMP IDMP 2020 Celebrations- 7th November 2020

Prof. Arun Chougule, President AFOMP

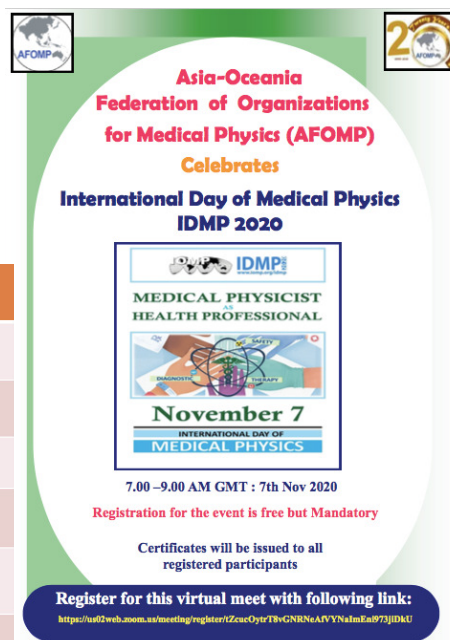
This year International Day of Medical Physics (IDMP) celebrations were very special due to COVID19 pandemic situation worldwide, which has changed the conventional method of almost doing anything & everything. This has a huge impact on education system as well as organizing conferences/seminars. Today technology is playing a very crucial role in knowledge dissemination through various virtual meeting or gathering platform. Therefore this year Asia-Oceania Federation of Organizations for Medical Physics (AFOMP) has used virtual platforms to celebrate IDMP. The program was scheduled on 7th November 2020 at 7:00 am GMT. This year's theme of IDMP

"Medical physicist as a health Professional"

is very relevant and useful as we are still struggling to get recognized as a health professional in most of the Asia-Oceania region.

The registration link was generated to register for the program in advanced. Around 350 registrations from all around the world were received for the program. The program included various interesting talks from imminent speaker relevant for the theme and occasion

TIME	PROGRAM
7.00-7.05 AM GMT	IOMP Presidential Message Dr. Madan Rehani (IOMP President)
7.05-7.25 AM GMT	Opening remarks and talk on Medical Physics in AFOMP Dr. Arun Chougule (AFOMP President)
7.25-7.40 AM GMT	Growing Tall Poppies: Empowering young medical physicists Dr. Eva Bezak (AFOMP Vice- President)
7.40-8.00 AM GMT	Role of Medical Physicists in the era of High tech Technology Dr. Tae Suk Suh (AFOMP Immediate Past President)
8.00-8.20 AM GMT	Medical Physicist as Health Professional Dr. Hasin Anupama Azhari (AFOMP Secretary General)
8.20-8.30 AM GMT	IOMP IDMP Awardee 2020: Dr. Tae Suk Suh
8.30-9.00 AM GMT	Q & A- feed back, conclusion



Program was organized under leadership of Prof. Arun Chougule President of AFOMP

The "program coordinator" for this virtual celebrations was Rajni Verma, AFOMP webmaster



. The program started with playing of recorded IDMP message from Prof. Madan Rehani, President IOMP followed official opening of the program by AFOMP president Prof. Arun Chougule. He has talked about the status of medical physics in AFOMP region and various challenges and efforts of

AFOMP for better recognition of medical physics as subject and profession. After his talks Prof. Eva Bezak, vice president, AFOMP explained the importance of leadership in overall development of profession. She emphasized on importance of preparing new line leadership. She explained the concept of leadership in very interesting way



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Due to some unexpected medical emergency in the family he was not able to participate in the live virtually program but made sure the availability of his recorded presentation with organizers. He talk focused on the increasing technological challenges in medical physicist life with rapidly developing high tech technology in radiotherapy, radio-diagnosis and Nuclear Medicine.

He presented his view of systemic approach to combat these challenges and given in sight of futuristic technological development in medical physics. His presentation was followed by the talk from Prof. Hasin Anupama Azhari, secretary general AFOMP. She has chosen the theme of this year's IDMP as her title of the talk. She explained and justified beautifully the role of medical physics as health professional in health care industry. She also emphasized the importance of professional development and role of medical physics in this pandemic time. Various aspect of administration view to establishment of medical physics as a profession was presented. After talks from the speakers, it was time to hear the IOMP IDMP awardee of this year who was none other than Prof. Tae Suk Suh. AFOMP has sent heartiest congratulations to Prof. Tae Suk Suh for his outstanding achievement. This award signifies his life long commitment to medical physics profession and his contribution in development medical physics as subject.

Prof. Tae Suk Suh has sent his written message for all AFOMP members and colleagues, which was read by Prof. Arun Chougule for benefit of all the participants. The whole program witnessed very active participation in form of live discussion at the end. The program was concluded with remarks form all the eminent speakers for the day with happy note to work hard in wake of better visibility and recognition of medical physics as a profession.

organizers are thankful to AFOMP EXCOM, all AFOMP NMO's, all the speakers, participants and volunteers.



International Webinar

Remembrance IDMP 2020

Challenges and Contribution for Women in STEM: Medical Physics

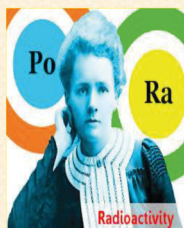
01 December 2020, Tuesday
GMT 7:00 AM-9:05 AM

Speakers
Inspiring Motivational Speech
for the Young Generations

Session of Early Careers
Young Drives



Prof. Dr. H. Anupama Azhari
General Secretary, AFOMP
Welcome Speech



Marie Skłodowska Curie



Dr. Rajni Verma
IOMP-W
Moderator



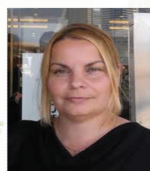
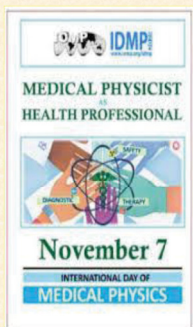
IOMP Celebrates IDMP
since 2013 Every Year on
7th November,
the Birthday of
Marie Skłodowska Curie



Ms. Nupur Karmaker
Ex-Treasurer, BMPS
Moderator



Ms. Jannatul F. Soma
Member, BMPS
Vote of Thanks



Prof. Dr. Magdalena Stoeva
Chair, IOMP-W
Bulgaria



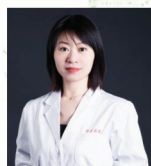
Prof. Dr. Eva Bezak
Vice President, AFOMP
General Secretary, IOMP
Australia



Dipl. Ing. Kirsten Hierholz
Chief Medical Physicist
Radioonkologie und
Strahlentherapie
Germany



Dr. Chai Hong Yeong
Chair, PRC, AFOMP
Committee Member, IOMP-W
Malaysia



Dr. Jianjian Qiu
Associate Professor
Dept. of Radiation Therapy
Fudan University
China



Dr. Vijitha Ramanathan
Head, Department of
Radiography & Radiotherapy
General Sir John Kotelawala
Defence University
Sri Lanka



Ms. Sadia Afrin Sarah
Bangladesh



Ms. Xin Yang
China



Ms. Pratibha Singh
India



Ms. Zulaikha Jamalludin
Malaysia



Ms. Ishani Jayakody
Sri Lanka

Register in advance for this meeting:

<https://bdren.zoom.us/meeting/register/u5EucumqrTsUG9XYP-8Tb7Fzz9cLrqXmsqyV>

Facebook Live: www.facebook.com/bmpsorgbd



Remembrance IDMP 2020

Challenges and Contribution for Women in STEM: Medical Physics

01 December (Tuesday) 2020

Time: 07.00 AM – 09:05 AM Greenwich Mean Time (GMT)

Program Schedule

Moderators

Ms Nupur Karmaker Member and Ex-Treasurer, BMPS Joint Secretary, OWSDNCBD Lecturer, Gono Bishwabidyalay (University), Bangladesh	Dr. Rajni Verma Member, AMPI Committee Member, IOMP-W Assistant Professor Dept. of Radiological Physics, SMS Medical College and Hospitals, Jaipur, India
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Welcome Speech

07:05-07:10	Prof. Dr. Hasin Anupama Azhari General Secretary, AFOMP OWSD Executive Board Member, Asia and Pacific Region Committee Member, IOMP-W Dean, Faculty of Physical and Mathematical Sciences Chairman, Dept. of Medical Physics and Biomedical Engineering (MPBME) Gono Bishwabidyalay (University), Savar, Dhaka, Bangladesh
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07:10-07:58 Inspiring Motivational Speech for the Young Generations

07:10-07:18	Prof. Dr. Magdalena Stoeva Chair, IOMP Women Subcommittee Editor in Chief - Health and Technology Journal - Springer Nature - IUPESM- WHO Officer, International Union for Physical and Engineering Sciences in Medicine (IPESM) Professor, Translational Neurosciences Centre, Medical University – Plovdiv, Bulgaria
07:18-07:26	Prof. Dr. Eva Bezak General Secretary, IOMP Member: IOMP-W Vice President, AFOMP Director, Translational Cancer Research, University of South Australia
07:26-07:34	Dr. Chai Hong Yeong Chair, Professional Relations Committee, AFOMP, Vice President, South-East Asia Federation of Organizations for Medical Physics (SEAFOMP) Web Sub-Committee (Newsletter), IOMP Committee Member, IOMP-W Associate Professor,

Register in advance for this meeting:

<https://bdren.zoom.us/meeting/register/u5EucumqrTsuG9XYP-8Tb7Fzz9cLrqXmsqyV>

After registering, you will receive a confirmation email containing information about joining the meeting

Facebook Live: www.fb.com/bmpsorgbd



Remembrance IDMP 2020

Challenges and Contribution for Women in STEM: Medical Physics

01 December (Tuesday) 2020

Time: 07.00 AM – 09:05 AM Greenwich Mean Time (GMT)

07:34-07:42	Dipl. Ing. Kirsten Hierholz	School of Medicine, Taylor's University, Malaysia Chief Medical Physicist, Radiation Oncology and Radiation Therapy, Darmstadt Hospital, Germany
07:42-07:50	Dr. Jianjian Qiu	Associate Professor and Clinical Medical Physicist, Department of Radiation Therapy, Huadong Hospital, Fudan University
07:50-07:58	Dr. Vijitha Ramanathan	Head, Department of Radiography & Radiotherapy, General Sir John Kotelawala Defence University, Sri Lanka
08:00-08:55	Session of Early Careers: Young Drives	
Topic	Challenges, Status, Leadership: Women Medical Physicist	
08:00-08.10	Ms. Sadia Afrin Sarah	M.Sc. Medical Physics Student, Gono Bishwabidyalay, Bangladesh
08:10-08.20	Ms. Xin Yang	M.Sc. Medical Physics Student, Fudan University, China
08:20-08.30	Ms. Pratibha Singh	MSc. Medical Physics Student, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India
08:30-08.40	Ms. Zulaikha Jamalludin	M.Sc. Medical Physics Student, University of Malaya, Malaysia
08:40-08.50	Mrs. Ishani Jayakody	M.Sc. Medical Physics Student, University of Colombo, Sri Lanka
Discussion & QA		
08:50-09:00	Discussants	Prof. Dr. Magdalena Stoeva Prof. Dr. Eva Bezak Dr. Chai Hong Yeong Dipl. Ing. Kirsten Hierholz Dr. Jianjian Qiu Dr Vijitha Ramanathan
Vote of Thanks		
09.00-09:05	Jannatul Ferdusy Soma	General Member, BMPS

Register in advance for this meeting:

<https://bdren.zoom.us/meeting/register/u5EucumqrTsuG9XYP-8Tb7Fzz9cLrqXmsqyV>

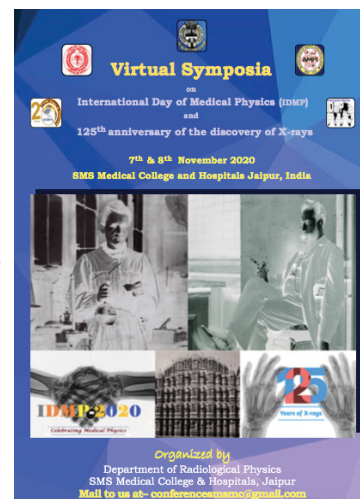
After registering, you will receive a confirmation email containing information about joining the meeting

Facebook Live: www.fb.com/bmpsorgbd

Virtual Symposia to celebrate the International Day of Medical Physics & the 125th anniversary of the discovery of X-rays SMS Medical College & Hospitals, Jaipur 7th & 8th November 2020

Prof. Arun Chougule and Mary Joan

The Department of Radiological Physics, SMS Medical College & Hospitals Jaipur, India celebrated the International Day of Medical Physics (IDMP) 2020 on the theme, "Medical Physicist as Health Professional" by organizing a virtual symposium to commemorate the birthday of great physicists and Nobel laureates Madame Marie Curie and Bharat Ratna Sir C V Raman on 7th November 2020. The 125th anniversary of the discovery of X-rays and the 175th birth year of Prof W C Roentgen was celebrated by the virtual symposium on 8th November 2020. The scientific programme included several lectures on the role of medical physicists as healthcare professionals in the use of radiation in medicine by eminent speakers across the globe. Medical Physicists play a fundamental role in the development and application of medical radiation technologies and ensure the quality and safety of imaging and treatment procedures. This year's IDMP celebrations gave us the opportunity to understand and tackle the concerns of medical physicists as healthcare professionals. The virtual symposia organized by the department of Radiological Physics, SMS Medical College and Hospitals, Jaipur was an effort to make the medical physicists ready to meet the professional challenges of modern healthcare systems and now we could confidently say that this was a morale booster for all those medical physicists facing professional challenges of diverse multi dimensions. Medical physicists from different parts of the world had participated in these virtual symposia and showed their solidarity with peers.



The scientific programme of the first virtual symposium on the 7th November 2020 started with lighting of the lamp and Sarasvati Vandana [Invoking the presence of the Goddess of knowledge, learning and wisdom] as per the Indian tradition. The Principal and Controller of SMS Medical College and Hospitals Jaipur and the Hon. Vice Chancellor of Rajasthan University of Health Sciences Jaipur who were patrons of these events sent their felicitation messages and the video clips were played before starting the scientific lectures. Dr Mary Joan, organizing secretary of the virtual symposium welcomed all the participants, speakers and has given an overview of the program and the significance of celebrating the international day of medical physics 2020 with virtual symposia. Prof Arun Chougule organizing chairman (President AFOMP, Chair ETC and

Accreditation Board IOMP) gave the first talk on the theme of IDMP celebrations this year "Medical Physicist as Health Professional". He showcased the diverse roles of medical physicists in various applications of radiation in healthcare and the significance of their role in the efficient and effective use of these applications. Prof S D Sharma Head, Medical Physics section, Radiological Physics and Advisory Division, Bhabha Atomic Research Centre Mumbai spoke on the journey of



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8th NOVEMBER 2020
125th Anniversary of X-ray discovery

PROF. WILHELM CONRAD ROENTGEN
FATHER OF RADIOLOGY

DR. ARUN CHOUGULE, PhD, FRCR, FRCR, FRCR, FRCR, FRCR
Senior Professor & Head
Department of Radiological Physics
SMS MEDICAL COLLEGE, JAIPUR
President AFOMP
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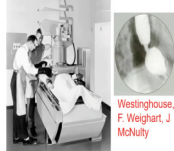
The ICTP & Trieste University Master of Advanced Studies in Medical Physics

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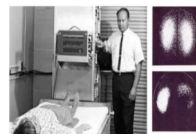


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1965-1975: Full application of physical methods in imaging diagnostics –
(medical physicists in 1965: 6,000 specialists worldwide)



New X-ray Image Intensifiers



Introduction of Gamma Camera



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Prof Mahesh Mahadevappa



Professor of Radiology and Cardiology
Johns Hopkins University School of Medicine
Chief Physicist - Johns Hopkins Hospital, Baltimore, MD

Dr Mahesh is a fellow of the AAPM (2007), ACR (2009), American College of Medical Physics (2011), Society of Cardiovascular Computed Tomography (SCCT) (2011) and International Organization of Medical Physics (IOMP) (2019). He was 2nd Vice-President of RSNA (2011). He serves as subject-matter-expert (SME) to the United Nations-International Atomic Energy Agency (UN-IAEA). Dr Mahesh is also member of the Education and Scientific Committee of IOMP. Dr Mahesh is board certified from the American Board of Radiology (ABR) in diagnostic radiological physics and is a member of the Radiation Control Advisory Board (RCAB) for the State of Maryland.

Research Interest and overall Publications:

His research interests are in medical imaging, particularly in areas of computed tomography (CT), interventional fluoroscopy and digital mammography. Dr Mahesh is the author of the textbook titled “MDCT Physics: The Basics – Technology, Image Quality and Radiation Dose”.

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The virtual symposium on 8th November was an attempt by the department of radiological physics, SMS Medical College and Hospitals Jaipur to pay tributes to the great physicist Prof W C Roentgen and his legacy as this year we are celebrating the 125th anniversary of the discovery of X- rays and the 175th birth year of Prof Roentgen. The scientific programme started with the lighting of the lamp and

Saraswati Vandana. Prof Arun Chougule presented the biography of Prof Roentgen highlighting the milestones in his life leading to the historical discovery of X-rays and how it completely changed the medical practice thereafter. Prof Roentgen's decision to not patent the discovery paved the way for cheap availability of X-ray examinations making it affordable for everyone who is in need. Following Prof Chougule's talk, Prof Mahesh Mahadevappa, Johns Hopkins University USA spoke on the impact of discovery of X-rays on the practice of medical physics. He very concisely described how the medical physics practice was before X-rays and how it achieved prominence and significance over time with technological advancements. He emphasized that medical physicist should increase their professional utility by enhancing knowledge to gain recognition from clinical colleagues. Prof. Renato Padovani, medical physics consultant, ICTP, Italy shared his experience on how medical physics education is essential to tune to clinical and technological developments in LMI countries and the efforts put forth by ICTP in this regard.

A good number of people from LMI countries already received the training from ICTP in collaboration with other international agencies and they are instrumental in establishing radiological facilities in their home countries. Prof Slavik Tabakov, Director, department of medical engineering and physics, King's college, London (Immediate past President IOMP and Vice President IUPESM) spoke on 125 years from the discovery of X-rays: an evolution of medical physics and medical imaging diagnosis. He holding the leadership positions of many international organizations for medical physics enlightened the virtual gathering about the international prospects and the recognized teaching and training programmes worldwide so that the younger generation of medical physicists could take advantage. The first IDMP celebration broadcasted live by IOMP was held at Jaipur in 2017 and Prof Tabakov mentioning that and sharing pictures from the event brought in nostalgic feelings. The queries from the audience to each speaker were answered at the end of each talk. The highlight and very interesting aspect of the virtual symposia was the panel discussion on impact of X-ray discovery on radiotherapy, radiology imaging and medical physics. Stalwarts from respective specialties very actively interacted and put forth their valuable opinion on various queries raised by the audience. It was indeed a morale booster for each and every one attended. Prof Pratik Kumar, head, department of medical physics, AIIMS, New Delhi moderated the panel discussions. Prof G K Rath, head, NCI and IRCH, AIIMS, New Delhi, Prof Deep Narayan Srivastava, department of radio diagnosis, AIIMS, New Delhi, Prof Paul Ravindran, department of radiological physics, CMC Vellore, very actively took part in the discussions sharing their experience, current information and much valued knowledge on the current and futuristic perspective of medical physicist as a multi-disciplinary health professional. The organizing chairman, Prof Arun Chougule delivered the concluding remarks.

Over 250 participants from across the world were present at any point during both the virtual symposia. The diversity in the professional roles of the attendees were also noted and it was very heartening to see professionals working in the field of radiation oncology, radiology, and nuclear medicine including medical physicists, radiation oncologists, radiologists, nuclear medicine physicians, radiation technologists, students and several non-medical radiation professionals who are dealing with radiation attended both the virtual symposia.

These virtual symposia organized by the department of radiological physics, SMS medical college and hospitals Jaipur was a great opportunity to reach out and raise awareness about the role of medical physics in healthcare as well as the role of medical physicists in Hospitals. We could wholeheartedly say that the purpose of IDMP celebration initiated by International Organization of Medical Physics (IOMP) is fulfilled in all aspects including awareness about the role and importance of medical physics professionals among fellow medical and nonmedical professionals, students community and general public by the activities organized by the Department of Radiological Physics, SMS Medical College and Hospitals, Jaipur, India. Let the life and work of Madame Curie, Sir. C. V. Raman and Prof. W. C. Roentgen enlighten and inspire us to achieve greater heights.



The organizers of the virtual symposia, the department of radiological physics under the able leadership and guidance of Prof Arun Chougule, Organizing Chairman and Dr Mary Joan, Organizing Secretary would like to thank every participant for their active attendance. There are great times ahead of us. Our respective countries need our services. Each one of us is needed in our country, community, university and hospital to ensure decisive, visible and measurable actions are taken for the medical physics profession. We hope that the spirit of these virtual symposia will make each and every one of us to be a leader within and beyond our own spheres of influence and commit to take pragmatic action to accelerate professional and personal development.

Invited Articles:

Perspectives on Translational Research in Healthcare Settings

Prof. Eva Bezak, University of South Australia



I have been asked to write a few words about translational research in healthcare for the current issue of the AFOMP newsletter. It has turned out to be not such a simple task as there is ample excellent literature available on what translational research is – using various nuances of its definition. It is interesting to note that the term translational research initially emerged mostly in cancer care in the 1990s and then was more broadly adopted into healthcare research in the last 15- 20 years.

So what are the different types of research that lead to research translation? Let's start from the beginning, defining basic and clinical research first.

According to the National Institute of Health (NIH), USA, basic health research is defined as : *“Basic science research helps us understand the principles, mechanisms and processes that underlie living organisms. Through basic research, scientists try to answer fundamental questions about how life works. For example, they may examine how cells talk to each other, how proteins fold or how gene activity is controlled. The knowledge gained from this work serves as the foundation for biomedical advances that help protect and improve human health. It can be difficult to predict how a basic research study will lead to human health benefits. The line between discovery and medical application can be long and hard to trace. The fundamental knowledge gained through basic science often leads to unanticipated breakthroughs in how to predict, prevent, diagnose and treat disease. Research into specific disease targets, called translational or applied research, depends on a broad and diverse scientific research portfolio to create the foundation that makes further scientific discovery possible.”* (<https://www.nih.gov/news-events/basic-research-digital-media-kit#overview>)

Clinical research, on the other hand, is defined by NIH as :

“Clinical research aims to advance medical knowledge by studying people, either through direct interaction or through the collection and analysis of blood, tissues, or other samples. A clinical trial involves research participants. It follows a pre-defined plan or protocol to evaluate the effects of a medical or behavioural intervention on health outcomes. By taking part in clinical trials, participants not only play a more active role in their own health care, but they also can access experimental treatments and help others by contributing to medical research.” (<https://www.nichd.nih.gov/health/clinical-research>)

While the definitions above, in regard to basic and clinical research may be fairly clear and standard, more variation exists when defining the translational research. I will present a few of the definitions that can be found in literature:

1. NIH [3]: *Translational research includes two areas of translation. One is the process of applying discoveries generated during research in the laboratory, and in preclinical studies, to the development of trials and studies in humans. The second area of translation concerns research aimed at enhancing the adoption of best practices in the community. Cost-effectiveness of prevention and treatment strategies is also an important part of translational science.* (<http://grants.nih.gov/grants/guide/rfa-files/RFA-RM-07-007.html>.)

2. According to Rubio et al : *Translational research fosters the multidirectional integration of basic research, patient-oriented research, and population-based research, with the long-term aim of improving the health of the public. T1 research expedites the movement between basic research and patient-oriented research that leads to new or improved scientific understanding or standards of care. T2 research facilitates the movement between patient-oriented research and population-based research that leads to better patient outcomes, the implementation of best practices, and improved health status in communities. T3 research promotes interaction between laboratory-based research and population-based research to stimulate a robust scientific understanding of human health and disease.*

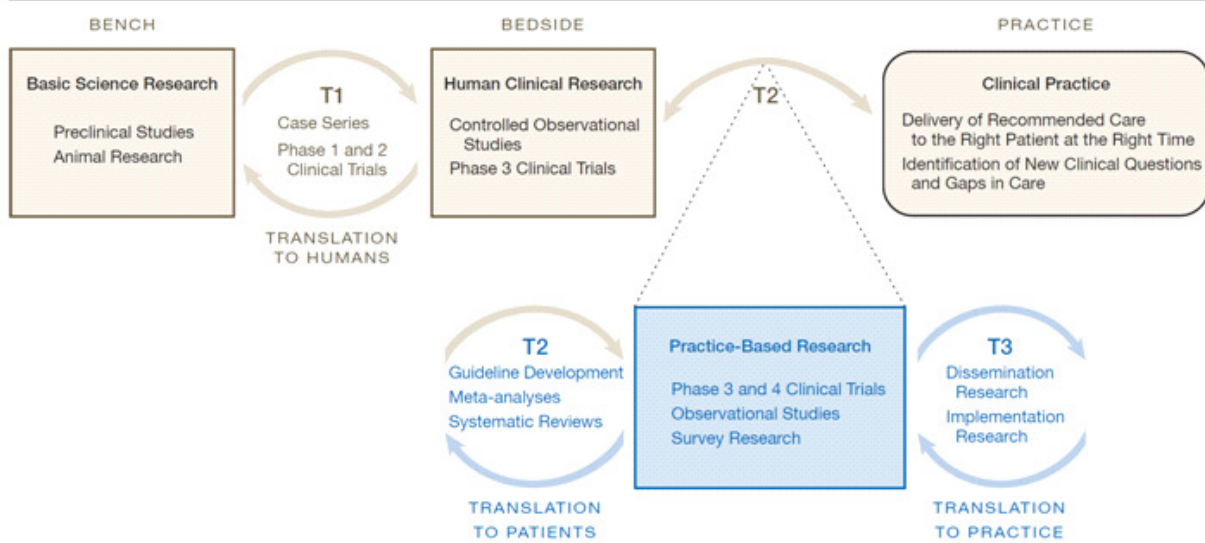
3. Or Wikipedia : *Translational research – a term often used interchangeably with translational medicine or translational science or **bench to bedside** – is an effort to build on basic scientific research to create new therapies, medical procedures, or diagnostics. Basic biomedical research is based on studies of disease processes using, for example, cell cultures or animal models. The adjective "translational" refers to the "translation" (the term derives from the Latin for "carrying over") of basic scientific findings in a laboratory setting into potential treatments for disease.* (https://en.wikipedia.org/wiki/Translational_research)

4. A slightly different aspect is discussed by Ganon : *“The common justification for much research funding is that the outcomes will move from the laboratory to the clinic and patient care, or be converted into jobs and money. The term “translational research” is widely used in this context by medical research institutes and an increasing number of university departments to convey the message to politicians and taxpayers that research activities ultimately serve the public.”*

Pomeroy and Sanfilippo discuss two categories of translational research: a) basic to clinical and b) clinical to population. The individual steps include: 1) Basic biomedical research, 2) Clinical translation, 3) Demonstration of efficacy (e.g. of a novel cancer therapy), 4) Translation to practice, and where applicable, 5) Translation to broader populations (e.g. everyone in the world implementing the intensity modulated radiation therapy). Research results from steps 1, 2 and 3 impact policies related to bringing new diagnostic and therapeutic tools through clinical trials, while research findings from steps 4 and 5 inform policy at a higher level, e.g. in regards to guidelines development or financing of [health care delivery in various populations](#) .

Figure 1 schematically shows the main steps of basic and clinical research translation into clinical practice and guideline development. Step T1 aims to transition the research knowledge from basic/laboratory phase to a clinical environment. Step T2 is to advance clinical research to clinical practice and step T3 is a practice based research focused on implementation and dissemination of results based on high level clinical evidence - such as that obtained from Phase 3 and 4 clinical trials.

Figure. “Blue Highways” on the NIH Roadmap



The current National Institutes of Health (NIH) Roadmap for Medical Research includes 2 major research laboratories (bench and bedside) and 2 translational steps (T1 and T2). Historically, moving new medical discoveries into clinical practice (T2) has been haphazard, occurring largely through continuing medical education programs, pharmaceutical detailing, and guideline development. Proposed expansion of the NIH Roadmap (blue) includes an additional research laboratory (Practice-based Research) and translational step (T3) to improve incorporation of research discoveries into day-to-day clinical care. The research roadmap is a continuum, with overlap between sites of research and translational steps. The figure includes examples of the types of research common in each research laboratory and translational step. This map is not exhaustive; other important types of research that might be included are community-based participatory research, public health research, and health policy analysis.

Figure 1. Schematic of inter-relation of basic, clinical and translational research. Practical adoption of this schema should allow for faster translation of research into clinical practice. Courtesy Westfall et al .

Translational research depends on active collaboration and communication between scientists and clinicians from multiple disciplines and is supported by the establishment of teaching-research-clinical practice centres. Novel training models and methods of communications may need to be implemented to ensure preparedness of scientists and clinicians to work in the translational research space . This means that health research at universities or research centers must be informed by clinical needs, and at the same time health providers must support and/or create an environment in hospitals/clinics that is inclusive of research. Table 1 below from Rubio et al , shows an excellent summary on training (inputs and outcomes) in translational research.

Table 1. Logic model for training in translational research (courtesy Rubio et al).

Inputs	Activities	Outputs	Short-Term Outcomes (Training Changes)	Intermediate-Term Outcomes (Practice Changes)	Long-Term Outcomes (Impact)
Financial inputs: institutional investments; tuition; National Institutes of Health funding of trainees (T32, Clinical and Translational Science Award, etc.); and other federal and private funding of trainees. Human resources: trainees (clinicians and bench scientists); program faculty and administrators; mentors (clinical researchers, bench scientists, geneticists, biomedical engineers, social scientists, and behavioral researchers).	Didactic coursework about research methods, epidemiology, biostatistics, research management, ethics, basic science, scientific communication, and community engagement. Mentored clinical research, including scholarly writing, presentation, and publication of results. Cross-disciplinary research collaborations. Practicums in community academic partnerships.	Well-trained and well-mentored translational researchers working in a collaborative, participatory, multidisciplinary environment and linking bench, bedside, and community-based resources in a cyclical process. Innovative thinking and problem solving.	Increased satisfaction of trainees. Increased satisfaction of faculty, program administrators, and mentors. Effective translational research studies designed in collaboration with multidisciplinary colleagues. Relevant ethical and legal issues considered during the design and implementation of clinical research. Competitive grant proposals prepared for translational research funding.	Effective translational research studies conducted in a multidisciplinary environment. Effective use of human subjects in clinical translational research trials. Cross-disciplinary research teams managed in a collaborative and participatory manner. Research manuscripts submitted for publication in peer-reviewed research journals.	Increased national capacity for translational research. Improved human health status indicators.

You may ask, why all this effort? What are the benefits of translational research? Without going into too much detail, they include: faster implementation of novel healthcare technologies into clinical practice; faster dissemination of clinical data and experiences; stronger collaboration between researchers/universities, clinicians/hospitals and industry; more focused potential for investment and

commercialisation of medical innovations; and ultimately better therapy and diagnosis for communities around the world.

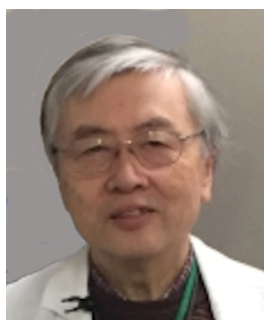
Wishing you all the very best
Eva Bezak
Vice-President, AFOMP

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Application of Radiomics in Cancer Therapy and Research

Gopishankar Natanasabapathi¹, Yoichi Watanabe^{2*}



¹Department of Radiation Oncology, Dr. B. R. A. Institute Rotary Cancer Hospital, All India Institute of Medical Sciences, New Delhi, India.

² Department of Radiation Oncology, University of Minnesota, Minneapolis, MN, USA

Corresponding Author: Yoichi Watanabe



I. Introduction

Radiomics is an evolving field of translational research that thrives on extracting mineable data from clinical images. It aims to find associations between qualitative and quantitative information extracted from clinical images and clinical data, with or without associated gene expression, to support evidence-based clinical decision-making [Gillies RJ et al.]. It relies on the hypothesis that mineable data can be extracted from medical images and provide additional information on genes, proteins, and tumor phenotype. It then can be used for patient care [Lambin P012, 2017]. An increasing number of parameters can be considered in oncology for decision making. Tumors have many characteristics and intrinsic heterogeneities that could be extracted from imaging through radiomics. Such additional information on the tumor characteristics enhances the possibility to predict biological and medical parameters, i.e., the treatment outcome. Contrary to subjective evaluation of tumor characteristics such as necrosis or heterogeneity, radiomics use data characterization algorithms, automatically extracted from a delineated volume/region of interest (on a CT, PET, or MRI scans), to render a mineable feature space. The quantitative radiomics features can be determined through dedicated software, which accepts the medical images as an input. Even though several tools are developed to perform this unique task, it is challenging and necessary to check the input data quality and select the optimal parameters to ascertain a reliable output.

II. Radiomics role in Personalized Medicine

Personalized medicine holds immense promise in cancer care. With the increasing understanding of the complexity of tumor heterogeneity, we are realizing that one size does not fit all. Hence, cancer therapy should be tailored to patients, possibly by considering their individualized tumor molecular signatures. The search for personalized medicine has yielded numerous targeted agents. Novel medications have demonstrated significant activity within subsets of tumors that harbor specific targetable mutations. Solid cancers are spatially and temporally heterogeneous, thus limiting the use of invasive biopsy-based molecular assays. Such a limitation provides a vast potential for medical imaging, capturing intra-tumoral heterogeneity in a non-invasive way. Here, radiomics can be applied to make cancer therapy more individualized to every patient. Few examples shown in Table 1 show promising applications of radiomics with such a goal in mind.

Table 1. Various cancer-related studies conducted with Radiomics

Study	Features	Extraction Software (ES) & Statistical Method (SM)	Outcome Prediction (OP) & Performance (P)	Number of Patients	Characteristics of Tumor
Yu et al.	Mean Breadth Spherical disproportion	ES: IBEX SM: GLM	HPV status AUC: 0.86667 & 0.91549	315 pts	Oropharyngeal Cancers
Aerts et al	Statistics Energy Shape compactness 2 Grey level nonuniformity Run-length nonuniformity	ES: IBEX SM: Logistic regression	Overall Survival C-index: 0.69	545 pts	Lung and Head and neck cancers
Zhang et al.	8 features signature	ES: Matlab: MRI based features	3 y PFS C-index: 0.737 (95% CI: 0.549-0.924)	118 pts	Nasopharyngeal carcinomas
Li et al.	8 features signature	ES: PyRadiomics on SPAIR T2W MRI SM: ANN	Infield recurrence Accuracy: 0.812	306 pts	Nasopharyngeal carcinomas
Kawahara et al.	7 features	ES: IBEX SM: ANN	Local control after radiosurgery AUC: 0.87	54 pts	Brain metastasis

III. Radiomics Workflow

In the radiomics workflow, there are eight essential steps [Figure 1]. A chosen patient undergoes imaging for examination. The images are reconstructed for volumetric information, which gives guidance for the region of interest (ROI) delineation. The crucial step in any radiomics approach, in general, consists of segmentation, i.e., delineation of the region of interest (ROI) in two-dimension (2D) or the volume of interest (VOI) in three-dimension (3D). The ROIs/VOIs define the region in which radiomics features are calculated. Finally, the radiomics



Figure 1: Radiomics workflow

features (or imaging biomarkers) are used for modeling to help treatment decisions [van Timmeren J et al.].

IV. Radiomics feature category

Radiomics assist in deriving various features from clinical images. In the radiology lexicon, qualitative semantic features are commonly used to describe lesions [Rizzo et al.]. In the radiomics, quantitative features are mined from the images by software implementing mathematical algorithms [Larue RTHM et al.]. The extracted features exhibit different levels of complexity and express properties, firstly, of the lesion shape and the voxel intensity histogram, secondarily, of the spatial arrangement of the intensity values of voxel-level (texture). They can be extracted directly from the images or after applying different filters or transforms (e.g., wavelettransform). Table 2 summarized the standard radiomics features.

Table 2: Quantitative features are usually categorized into the following subgroups:

Quantitative Features Category	Features	Description and example
Shape	ROI shape, volume, maximum diameter along orthogonal directions, maximum surface, tumor compactness, sphericity, etc.	The surface to surface volume ratio of a spiculated tumor shows a larger value than round tumor volume.
First-order statistics	Histogram-based properties report the mean, median, maximum, minimum values of the voxel intensities on the image, as well as their skewness (asymmetry), kurtosis (flatness), uniformity, randomness (entropy), etc.	Describe the distribution of individual voxel values without concern for spatial relationships.
Second-order statistics	Texture features, calculating the statistical interrelationships between neighboring voxels. Gray-level co-occurrence matrix (GLCM), gray-level run-length matrix (GLRLM), etc.	They provide a measure of the spatial arrangement of the voxel intensities, and hence of intra-lesion heterogeneity.
Higher-order statistics	Fractal analysis, Minkowski functionals, wavelet transform, and Laplacian transforms of Gaussian-filtered images, which can extract areas with increasingly coarse texture patterns.	Obtained by statistical methods after applying filters or mathematical transformation of the images, to identify repetitive or non-repetitive patterns, suppressing noise, or highlighting details.

V. Machine learning and Radiomics

Machine learning (ML) is a division of artificial intelligence in which an algorithm learns by inference from a data set. The main objective of ML is to generate a model capable of classification, prediction, and estimation of a situation from selected available data. [Figure 2] It improves the decision-making process as it encompasses a higher number of parameters than humans. ML is an ideal tool to be used with radiomics features to build predictive models for precision medicine. Parameters resulting from clinical observations, biology, genomics, and radiomics data may improve the clinician decision-making process [Giraud P et al. 2019]. Radiomics are actively being explored as prognostic and predictive tools, correlated with histologic and genomic characteristics in several cancer types [Giraud P et al. 2019].

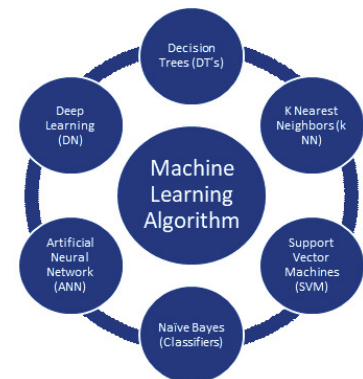


Figure 1: Machine Learning Algorithms for Radiomics

VI. Radiomics methodological challenges

In radiomics, it is challenging to choose which and how many parameters to extract from the images. Each radiomics tool calculates a different number of features belonging to different categories, and the initial choice may appear somehow arbitrary. Nonetheless, data analysis methods strictly depend on the number of input variables, possibly affecting the final result [2]. There are no consistent guidelines that have been established about the smallest ROI that can be used in radiomics studies. The choice is affected by the imaging modality (including voxel size) and the features being used. Some authors have suggested 5 cm³ as a suitable cutoff for CT. For PET, which has much larger voxel sizes than CT, Brooks &

Grigsby showed that selecting ROIs smaller than 45 cm^3 can influence comparisons of intra-tumoral uptake heterogeneity metrics [Brooks & Grigsby 2014]. Believability is obtained through interpretability of models, correlation with other biomarkers, external validation by independent research groups using independently collected data. More than 400 radiomics studies have been published since 2014. Despite all of these results, radiomics has yet to make an impact on clinical decision making. A problem for most studies is that they lack big data sets.

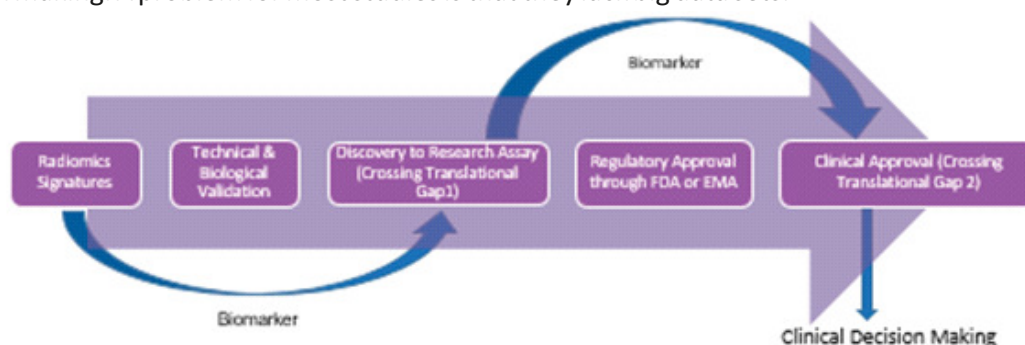


Figure 3: Methodology Challenges in Radiomics

There is an issue with the universality of radiomics analyses because the feature values are strongly influenced by the image qualities and imaging protocols. The other problem is that the results are statistically significant without being clinically significant.

VII. Summary

The ability to maintain reliable, large-scale data for radiotherapy studies remains a major challenge. Several ongoing institutional and multi-institutional initiatives such as the RTOG, radiogenomics consortium, and EuroCAT are developing such infrastructure. However, plenty of work is needed to overcome issues related to data sharing hurdles, patient confidentiality issues, and the lack of signaling pathway databases of radiation response. The research community needs to develop cost-effective multi center communication systems that allow transmission, storage, and access to large data sets of images, dosimetry, and biomarker information.

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Monte Carlo Method as An Educational Tool for Radiation Interaction: Photons and Charged Particles

Suffian Mohamad TajudinPhD^a, Kwan Hoong Ng PhD^b



^a School of Medical Imaging, Faculty of Health Sciences,
Universiti Sultan Zainal
Abidin, Terengganu, Malaysia

^b Department of Biomedical Imaging, University of Malaya, Kuala Lumpur,
Malaysia



Introduction of the Monte Carlo Method

The use of random numbers in the calculation is typically referred to as the Monte Carlo (MC) method. Monte Carlo method is a calculation using random numbers and statistical modelling to estimate mathematical functions and mimic the operations of complex systems [1, 2]. In Monte Carlo, the incident photons on the material are tracked for the point of photon interactions, the type of interactions either absorption or scattering, the direction of scattered photons and else, where random numbers are chosen that are associated with particular probabilities to stipulate the determination outcome.

The Monte Carlo is widely used in medical physics such as an absorbed dose calculation to a tumour and radiation shielding. The number of Monte Carlo simulation applications are increasing drastically with the improvements in computers' performance [3, 4]. There are many studies for radiation shielding materials that have been performed by Monte Carlo methods such as GEANT4 [5], MNCP [6], FLUKA [7], PENELOPE [8], EGS5 [9] and PHITS [10] codes. According to the Institute of Physics & Engineering in Medicine (IPEM), UK, the design of radiation shielding should also take into the best simulation code to evaluate the shielding adequacy [11].

However, this does require a good understanding of computer programming and training to reach a solution. As an example, two persons who are running an identical Monte Carlo code to solve the same problem, the obtained results might be different between each other. Several researchers had attempted to develop a user-friendly and easy-to-use environment for the calculation of photon attenuation such as GRIC-toolkit [12], Simu-Rad [13], μ Finder [14] and Phy-X/PSD [15]. Simu-Rad based on the Monte Carlo method of EGS5 code will be explained briefly with several calculations.

← → ↺ ⬆ localhost/egs/

[CLICK TO DISPLAY](#)

Thickness (cm)	<input type="text" value="10"/>
Material Type	<input type="text" value="Water (H2O)"/>
Particle Type	<input type="text" value="Photon"/>
Particle Energy in MeV	<input type="text" value="0.25"/>
Number of Particle/Photons	<input type="text" value="20"/>
<input type="button" value="Generate"/>	

SIMU-RAD (Copyright: LY2018002738) As An Educational Material

It seems now that soon, the Monte Carlo methodology will be widely used for the study of radiation properties, despite experimental. Sime-Rad had been developed using PHP and Java applet to integrate and visualize the EGS5 Monte Carlo simulations engine into an easy to use web-based environment. By integrating EGS5 code into our system, this system can be used for wide areas like radiation physics and shielding.

Figure 1. User-friendly interface to perform radiation simulation with simple one “Generate” click to get the photon trajectories output.

Through the Simu-Rad program, one could easily change the properties of radiation such as the types of radiation, its energy (MeV) and the number of incident photons to simulate from the selectable option in simulator interface (Fig. 1). FIVE (5) types of materials were prepared in the simulator as follows:

- (1) Water (H₂O) - for soft tissue water-equivalent;
- (2) Polymethyl methacrylate (PMMA) - commonly used as phantom material;
- (3) Lead (Pb) - used for radiation shielding or collimator design;
- (4) Concrete - used for radiation shielding such as radiation room design;
- (5) Aluminum (Al) - commonly used as a radiation filter in diagnostic radiology.

Result and Discussion

Despite its easy usage, it is recommended to limit the number of incident photons for simplicity of manually eye evaluation at the output Simu-Rad programme to show photon trajectories for further analysis (Fig. 2). We must bear in mind the purpose of developed Simu-Rad is for education purpose only, where the statistical error will be large when only 50 numbers of photons simulated. In a real case of simulation, millions of photons should be simulated for a more accurate result.

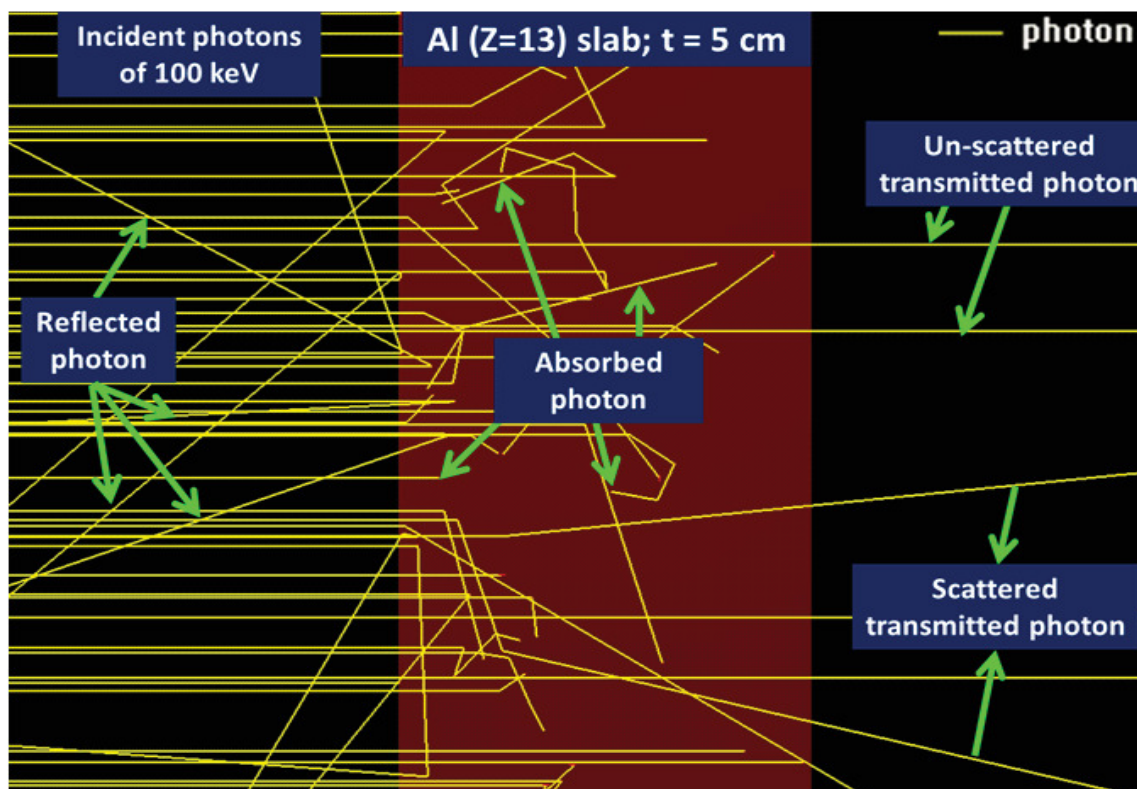


Figure 2. The output of Simu-Rad programme shows the photon trajectories inside the aluminium material by showing the types of photon interactions.

Figure 2 shows an example of 100 keV photon interaction inside a 5 cm thick aluminium. The photon trajectories could be analyzed as these two conditions:

- (1) the number of unscattered photons passes through the material, and
- (2) the number of transmitted photons (unscattered photons + scattered photons) pass through the material.

Most photons were absorbed inside the material through two steps of photons interaction; Compton scattering either once or multiple scattering and followed by photoelectric absorption. One could consider how the main interaction varies depending on the photon energy and the material by using the selectable option at the Simu-rad interface.

The analysis of Simu-Rad results in Figure 3 (a) and (b) show they met the exponential decay equation as expected. The linear attenuation coefficient (μ) of aluminium at that particular energy was deduced from the exponential fitting. The Simu-Rad output the values of $\mu = 0.227 \text{ cm}^{-1}$ for the first case and $\mu = 0.119 \text{ cm}^{-1}$ in the latter case. The error of μ values from exponential fitting for (a) and (b) is 4.9 % and 4.4 %, respectively. The μ value in the latter case is lower than the first case as we could understand the photon trajectories where some photons will undergo Compton scattering inside the material and exit the material rather than absorbed. The XCOM database value for 662 keV photons is 2.07 cm^{-1} . The disagreement was expected as the number of photons simulated in the program restricted to 50 photons to give poor statistics. The percentage deviation values are still acceptable because they do not exceed 10% (9.6 %) for the first case. To reduce the error, the number of incident photons simulated needs to be increased, particularly to obtain reliable results.

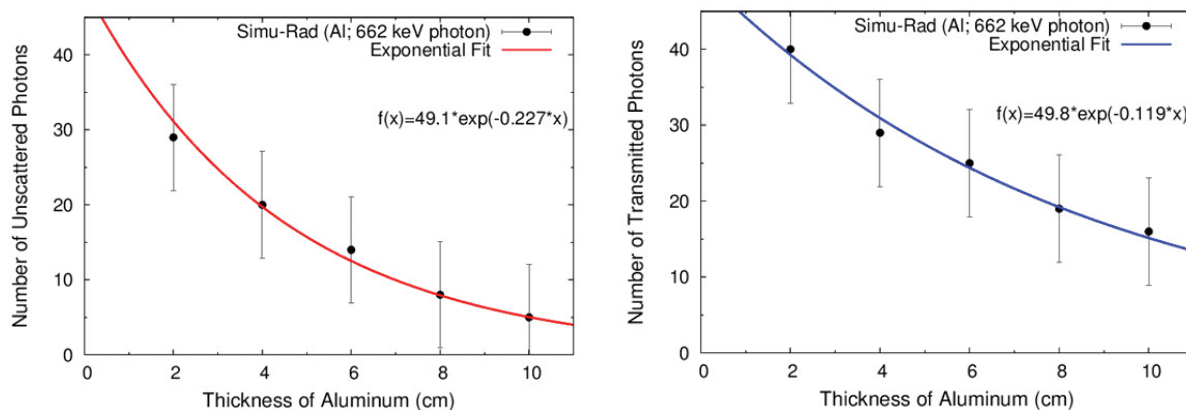


Figure 3. Simu-Rad result of 662 keV photons for 50 incident photons striking the aluminium to give; (a) $\mu = 0.227 \text{ cm}^{-1}$ is for unscattered photons while (b) $\mu = 0.119 \text{ cm}^{-1}$ for transmitted photons.

Conclusion

The Monte Carlo method in medical physics is commonly used for dose calculation, detector design, radiation shielding and medical application. For example, calculating the number and average energy of the primary photons, Rayleigh scattered and Compton scattered photons passing through a shielding material are important to understand the photon interactions and efficiency of shielding

materials. There have been extensive efforts to improve the shielding and dose assessment by using Monte Carlo method.

The Monte Carlo method could be adopted and used in the classroom environment to fulfil the growing demand of technology in the students' learning process. One who has no programming knowledge to simulate photons in a material through the developed programme. The simulator could become a computer-aided learning tool for a wide variety of people, such as radiation workers, radiography and medical imaging students, and those working with radiation. The simulation program will also benefit the institution that has no irradiation facility or radiation sources.

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AFOMP

Prof. Kiyonari inamura memorial AFOMP oration Awardee 2020



Professor Kin Yin Cheung PhD, FIOMP, FIPEM, FHKIE, CertMedPhy, CRadP, CEng is Senior Medical Physicist at Medical Physics & Research Department, Hong Kong Sanatorium & Hospital. He is also Adjunct Professor at Tung Wah College, Adjunct Associate Professor at University of Hong Kong, and Adjunct Associate Professor at Chinese University of Hong Kong. He is an Honorary Member of Hong Kong College of Radiologists.

Professor Cheung was the Founding President of AFOMP (2000-03), President of IOMP (2012-15) and President of IUPESM (2015-18). He has played a leading role in creating a platform for promoting and facilitating the collaboration on development of medical physics amongst the countries in the AFOMP region and beyond. While serving as IOMP President, he played a key role in establishing an international consensus on the definition and roles and responsibilities of medical physicists in healthcare and on the basic requirements for their education and training through the preparation, consultation and endorsement of two IOMP Policy Statements on the subjects.

He also played an important role in promoting the formal recognition of medical physicists as healthcare professionals by national authorities through collaboration with IAEA in getting the definition and roles and responsibilities of medical physicists in healthcare specified for the first time in the current version of International Basic Safety Standards. During 2005 to 2016, he has served as a consultant/expert in a number of IAEA projects on improving medical physics in radiation medicine.

Professor Cheung has been actively engaged in research and development work initially in the field of radiation oncology physics and more recently in MR-guided radiation therapy, including MR-Linac based online adaptive radiotherapy, and proton therapy. He has published/presented more than 240 scientific peer-reviewed papers, abstracts, book chapters, and oral and poster presentations in major international conferences.

Professor Cheung has made outstanding contributions on training of radiation oncologists, radiologists, medical physicists and radiation therapists in Hong Kong. He has played a leading role in establishing the systems for formal clinical training and professional certification of medical physicists in Hong Kong



Arun Chougule
Professor Arun Chougule
President AFOMP

AFOMP

AFOMP LIFE TIME ACHIEVEMENT AWARD



Dr Anchali Krisanachinda

Life time achievement awards of the Asia-Oceania Federation of Organizations for Medical Physics recognise persons for their outstanding contribution to Medical Physics education, training, research and medical physics profession development in AFOMP region.

The award was established in 2020 and A/Prof Anchali Krisanachinda of Chulalongkorn University in Bangkok is one of the two inaugural awardees.

Dr Anchali Krisanachinda commenced her studies at Chulalongkorn University in Bangkok followed by an MSc from University of London, U.K. and a PhD in Medical Radiation Physics from Finch University in Chicago, USA in 1997. She is currently Chair, M.Sc. and Ph.D. (Medical Physics) at Chulalongkorn University and Chair of Clinical training for ROMP, DRMP, NMMP for residents. Her research work in Nuclear Medicine spans 40 years and is documented in more than 50 peer reviewed publications in scientific journals. Through her research, training and development work with the International Atomic Energy Agency (IAEA) her impact has been worldwide contributing not only to improved use of radioactivity for diagnosis but also better radiation protection of staff and patients.

Dr Krisanachinda has been associated with AFOMP since its very beginning having been the inaugural treasurer 2000 until 2015. She has been equally active for other medical physics associations such as the International Organization for Medical Physics (IOMP) and particularly the South East Asia Federation of Organizations of Medical Physics (SEAFOMP), of which she was a founding member in 2000 and became President in 2007. At present she is President of the Thai Medical Physicist Society (TMPS) and continues her contributions to the international medical physics world through many activities in IOMP, SEAFOMP and AFOMP.

Anchali Krisanachinda has been a mentor and role model for countless medical physicists in Thailand and the whole AFOMP region. Her dedication to training and education is demonstrated by her academic work at Chulalongkorn University in Bangkok as well as internationally through many activities for the International Centre for Theoretical Physics (ICTP) in Trieste and the IAEA for which she chaired several clinical training programs.

Dr Krisanachinda has also been very active in organising scientific and educational events. She brought the 1st, 9th, 12th, 16th and 20th Asia-Oceania Congress on Medical Physics (AOCMP) to Thailand combined with the South East Asian Congress of Medical Physics (SEACOMP). The 16th AOCMP meeting in 2016 was as International Conference on Medical Physics (ICMP) for IOMP bringing hundreds of international colleagues to Bangkok.

Dr Krisanachinda has outstanding achievements, overcome many challenges and broadened our horizon. The Asia-Oceania Federation of Organizations for Medical Physics is delighted to present Dr Anchali Krisanachinda with the AFOMP Life Time Achievement Award 2020.



Arun Chougule
Professor Arun Chougule
President AFOMP

AFOMP

AFOMP LIFE TIME ACHIEVEMENT AWARD



Dr Donald Ian McLean

Life time achievement awards of the Asia-Oceania Federation of Organizations for Medical Physics recognise persons for their outstanding contribution to Medical Physics education, training, research and medical physics profession development in AFOMP region.

The award was established in 2020 and Dr Donald Ian McLean of Canberra Hospital, Australia is one of the two inaugural awardees.

Dr McLean commenced his studies at the University of NSW in Sydney, followed by a degree in Education from Canberra. This focus on education would remain throughout his whole career. He completed a Masters degree and a PhD at the Queensland University of Technology in Brisbane, Australia in 1996. Donald McLean has continued his academic work over the years in parallel with clinical work and teaching ever since resulting in over 90 peer reviewed publications in international journals.

Donald McLean has supervised many postgraduate research students and has been a mentor for many other colleagues in AFOMP countries, an activity which has been sustained over his career. He has also been involved in many workshops and conferences and was Track Co-Chair "Diagnostic Physics, Medical Imaging" track for The World Congress on Medical Physics and Biomedical Engineering which was held in Sydney 24 to 29 August, 2003. In particular as regional co-ordinator for IAEA he tried to make sure high quality education and training materials were available for everyone who needed them.

In 2006 he moved from Australia to Vienna to take up a position as Medical Physicist, Dosimetry and Medical Physics Section, International Atomic Energy Agency (IAEA). It is in his time at the Agency until 2011 that he promoted medical imaging and its relation to medical physics and radiation protection all over the world. Dr McLean was involved in the preparation and publication of 17 IAEA documents which provide guidance and standards for the use of ionising radiation in many areas of medicine. However, his main focus stayed within Asia-Oceania where many of the IAEA projects in which he was involved were carried out. Consequently, he joined the Asia-Oceania Federation of Organisations for Medical Physics (AFOMP) Education and Training Committee in 2008 as member.

One of Dr McLean's most distinguishing traits is his kindness and ability to listen. This has made him so efficient as a role model and mentor for many colleagues in AFOMP countries.

The Asia-Oceania Federation of Organizations for Medical Physics is delighted to present Dr McLean with the AFOMP Life Time Achievement Award 2020.



Arun Chougule
Professor Arun Chougule
President AFOMP

**AFOMP Journal Prize, 2020 awarded to
Prof. Masatoshi Saito. Congratulations !**

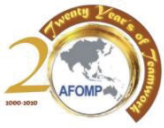


We are pleased to inform you that this year, the AFOMP introduced a new award for its members AFOMP Journal Prize for the best paper published in an AFOMP journal.

In this regard, a total of 21 papers were submitted by the editors of the 3 official AFOMP journals for the best paper published in 2019. After careful evaluation by the AHC committee, headed by Prof Eva Bezak, the following publication has been awarded the AFOMP Journal Prize for the best paper published in an AFOMP journal in 2019. The award will consist of a cash prize of US\$400, a certificate, and a memento.

The winner is:

Masatoshi Saito (Japan): Simulation of photon-counting detectors for the conversion of dual-energy-subtracted computed tomography number to electron density. RPT Vol.12(1): 105-117, 2019
<https://doi.org/10.1007/s12194-018-00497-0>



AFOMP 21 Outstanding Medical Physicist Awardees



Dr. K.Y. Cheung
Hong Kong



Dr. M. Endo
Japan



Dr. H. Round
New Zealand



Dr. A. Chougule
India



Dr. N. Kanematsu
Japan



Dr. J. Lee
Singapore



Dr. T. Kanai
Japan



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Dr. H. J. Kim
South Korea



Dr. N. B. Jamal
Malaysia



Dr. S. K. Kim
South Korea



Dr. H. A. Azhari
Bangladesh



Dr. K. Ogawa
Japan



Dr. K. B. Kim
South Korea



Dr. H. Mozdarani
Iran



Dr. H. T. Chung
South Korea



Dr. K. B. Kim
South Korea



Dr. H. Mozdarani
Iran



Dr. H. T. Chung
South Korea



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Malaysia



Dr. B. P. Ravindran
India



A. P. Peralta
Philippines



Dr. J. Dai
China



Dr. N. Chawapun
Thailand

Prof. Tae Suk Suh awarded with prestigious IOMP IDMP 2020 award.
Congratulations from AFOMP !



AFOMP Congratulate
Prof. Tae Suk Suh
He is awarded with prestigious " IOMP IDMP
Award 2020" by IOMP this year.
He is a true achiever and Inspiration to all
young medical physicists.

Announcement

Inviting PhD Citations in the AFOMP region

Dear colleagues,

As discussed at the AOCMP/SEACOMP meeting in Thailand a few days ago, the AFOMP Science committee would like to showcase the academic work our PhD students do all over the AFOMP region. We intend to do this by publishing a few selected abstracts and a few more titles of PhD theses completed at Universities in the AFOMP region in the AFOMP newsletter.

The AFOMP Science Committee will administer the process and NMOs are encouraged to submit suitable PhD abstracts (see eligibility below) to

*Prof Tomas Kron, PhD, FIOMP, FIUPESM
Peter MacCallum Cancer Centre, Melbourne, Australia
Tomas.Kron@petermac.org*

Deadline for submission is March 31, 2021.

In this first round we are considering all PhDs which were formally awarded in any university within an AFOMP member country in the calendar year prior to the newsletter publication (this is 2020) to be eligible. The topic must be broadly related to medical physics and ideally be categorisable into the six subspecialties identified by IOMP:

- Radiation Oncology Physics
- Medical Imaging Physics
- Nuclear Medicine Physics
- Medical Health Physics (Radiation Protection in Medicine)
- Non-ionizing Medical Radiation Physics
- Physiological Measurement

NMOs submitting PhD abstracts are requested to identify which subspecialty each abstract is pertaining to.

At this point in time it is unclear how many abstract will be received (please consider sending them in). The AFOMP Science Committee will select up to 3 full abstracts from three different subspecialties. In addition to this we intend to publish the titles of PhDs submitted. If the number is too large we will ensure that each participating member country has at least one title included.

Published abstracts promote the PhD candidate to readers of AFOMP newsletter and the Science Committee will keep a record of the work. The breadth of abstracts and titles will highlight the huge range of different activities occurring in medical physics. An additional advantage of this process will be generating interest in medical physics in the host academic departments and universities.

Tomas Kron

On behalf of the AFOMP Science Committee



International Union for Physical and Engineering Sciences in Medicine

www.IUPESM.org

The IUPESM represents
the combined efforts of
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SCMPCR: First Online E-learning Course on Medical Physics in Bangladesh

Kafshad Taius Nur, Mohammad Ullah Shemanto and Hasin Anupama Azhari
South Asia Centre for Medical Physics and Cancer Research (SCMPCR), Savar, Dhaka, Bangladesh

In modern times there are lots of updated new technologies are introducing into the healthcare sectors from diagnostic to treatment level. According to international rules and regulations, qualified medical physicists (QMP) are mandatory for the accurate, precise, and quality treatment to radiotherapy and radiology departments as a partner of the medical doctors and technicians.

To manage the huge growing demand of patients, SCMPCR is constantly working to create skilled manpower for cancer treatment by international experts along with national and international collaborative approaches in the field of Radiotherapy, Diagnostic Radiology, and Nuclear Medicine. These online programs will be a revolutionary program through developing a good quality of education at low resources and help in sharing knowledge to a broader scale. Hopefully the gap between developed and developing country will minimize through these type of activities.

In parallel to accredited hands on training, in-service training program SCMPCR has started e... program. During Covid 19 pandemic ELP program has been initiated and it will continue with other programs in future. Till now, 2020 two ELP with accreditation has done. Also from the year of 2021 It will conduct accredited course on MP three times a year with national and international reputed speakers. SCMPCR is trying to provide CPD points through online examination.

First e-learning program of SCMPCR (SCMPCR ELP-01) :

To meet the challenge of digitalizing the health care sectors, e-learning interference for education and training could greatly benefit. It is to mention that, During COVID-19 like other organizations SCMPCR is continuing its activities for its sustainability. Hence, SCMPCR has implemented an online program titled SCMPCR ELP-01 with three lectures without any registration fee.

Program Structure:

A moderator in the medical physics field is usually selected from countries in the South Asia region. He/she elaborate the whole procedure and then a speech on the mission and vision of SCMPCR will be delivered. Furthermore, he/she will speak a few words about the importance of e-learning and why such programs requirements and beneficial.

Program detail ELP 01:

Moderator: Ms. Jeevanshu Jain, Medical Physicist, Advanced Center for Treatment, Research and Education in Cancer (ACTREC), Tata Memorial Centre, Navi, Mumbai, India

Lectures:

❖ **First Speaker:** Mr. Venkataraman Poopathi, Chief Medical Physicist and Radiation Safety Officer, Dr. Rela Institute and Medical Centre, Chennai, India

Title: Re-Focusing Brachytherapy Physics in Radiation Oncology
Date: 27th June

❖ **Second Speaker:** Dr. Sayed Mansoor Naqvi, Assistant Professor, and Radiation Safety officer

Topic: Operational Radiation Protection Practices in Radiology.
Date: 15th July

❖ **Third Speaker:** Dr. Raju Srivastava, Medical Physicist, Department of Radiation Therapy,

Ghent University Hospital, Gent, Belgium

Topic; Current Practice of Medical Imaging in Modern Treatment of Radiotherapy by

Date: 25th July

Mode:

The online platform were google meet. The IT specialist design this platform as per the need of ELP with the necessary information of the program. Only registered participants were allowed to enter through user name and password. In this system, SCMPCR took the attendance of the participants and saved it for certificate distribution.

Post Program Activities:

Evaluation: It is an option for judging the program and can be done for continuous improvements in the successive programs. Regarding this SCMPCR provides an evaluation form through a link to the participants.

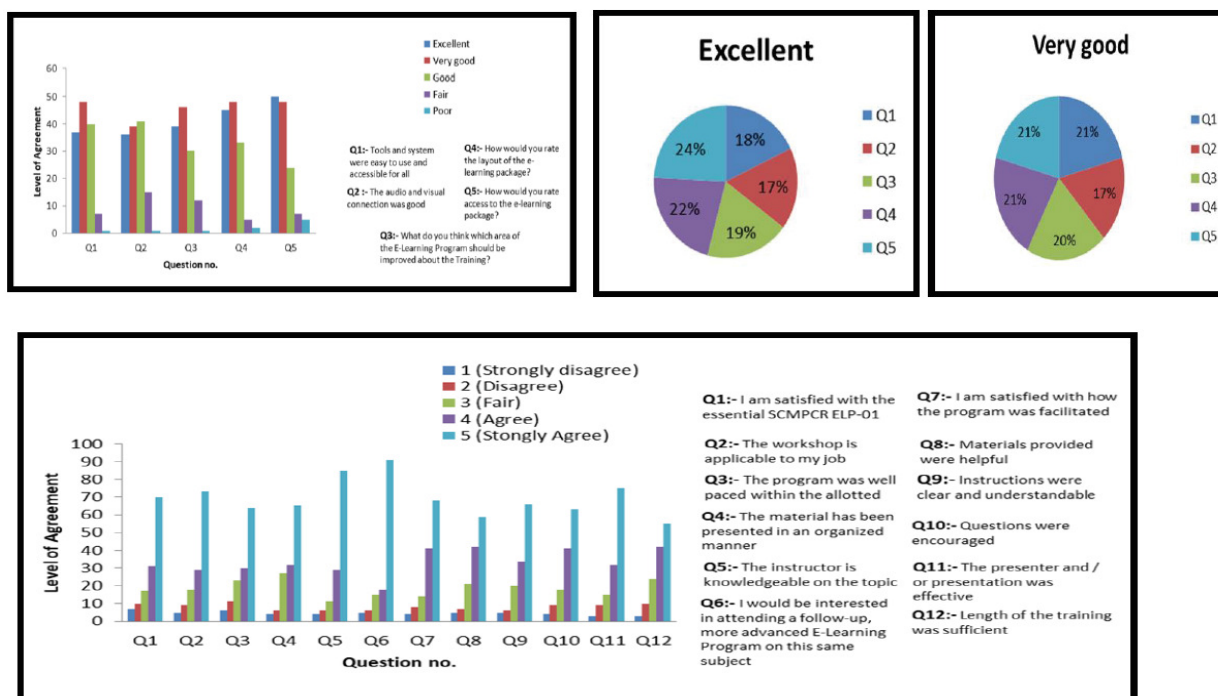
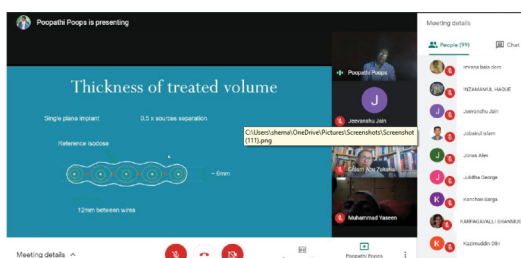


Fig: Evaluation report of SCMPCR ELP-01

Certificate:

Anyone attending all three programs has got a certificate of attendance. About 270 people registered worldwide, and more than 120 people took part in the live program and get a certificate.



EBAMP Accredited e-learning program (SCMPCR ELP-02) :

After the overwhelming response from the first e-learning program of SCMPCR, the authority has decided to conduct its 2nd e-learning program in October-2020 which was more organized with some advanced facilities where SCMPCR develop its e-learning platform using Moodle learning management system.

This course was accredited (Accreditation Code APP00133) by the European Board for Accreditation in Medical Physics (EBAMP) as a CPD event for Medical Physicists at EQF Level 7 and awarded 12 CPD credit points.

SCMPCR introduced the first e-learning accredited program for Medical physicists in Bangladesh.

SCMPCR authority has decided to continue this type of accredited e-learning program (EBAMP and IOMP), three times a year, parallel to the hands-on workshop and in-service training program. Each program will consist of a series of lectures with 2-5 internationally well-known qualified experts.

Procedure of selection

The total number of registered participants was 270 from more than 35 countries. Only 78 participants have been selected through the selection committee based on their needs, experiences, publications and the committee gives higher priority to the developing countries participants.

Program detail

Two lectures followed by examination as well as the distribution of online certificate

Mode

The online platform was the SCMPCR website which was developed by Moodle learning management system. The IT specialist design this platform as per the need of ELP with the necessary information of the program. The option of a polling system, exam method, the chat is possible, only registered participants were allowed to enter through user name and password. In this system, SCMPCR took the attendance of the participants and saved it for certificate distribution.

Moderator

The Moderator for the ELP-02 was Dr. Vijitha Ramanathan (Head of the Department of Radiography and Radiotherapy, Faculty of Allied Health Sciences, General Sir John Kotelawala Defense University, Sri Lanka) who conducted the program very smoothly.

The First lecture

Speaker: Dr. K. Joseph Maria Das, Professor, Department of Radiotherapy, Sanjay Gandhi Postgraduate Institute of Medical Sciences, and Uttar Pradesh, India.

Date: 10th October 2020

Topic: Image Registration in Radiotherapy which started at 2.30 PM GMT.

Duration: 1 hr lecture session is followed by Q and A session for 15 minutes

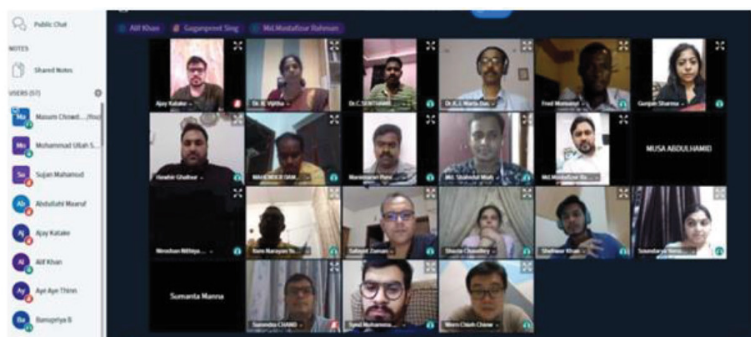


Fig: Screenshot of the lecture

The Second lecture

Speaker: Mr. Holger Wirtz, Head of Medical Physics, CTO, Lake of Constance Radiation Oncology Center, Singen, Germany

Date: 17th October 2020: Time was 2.30 PM GMT.

Topic: Radiotherapy in Developing Countries: Actual status, Solutions, and Opportunities. The

Duration: 1 hr lecture session is followed by Q and A session for 15 minutes

Preparation of examination

All related documents and the lecture slides were distributed to all the participants for the preparation.

Examination

After the lecture session, the examination and evaluation of the program were held. The pass mark is 40 for the examinees, A certificate mentioning 12 CPD credit points is given only to those who got the pass mark and others received an attendance certificate only.



Fig: ELP-02 Certificate

Concluding session

The Program was concluded by Prof. Dr. Hasin Anupama Azhari, CEO, SCMPCR as she thanked everyone for joining the program and giving the efforts for learning something new.

Conclusion: SCMPCR authority hugely wish to thank all the speakers who have dedicated and shared some of their valuable and precious time to the success of this experience for the benefit and professional growth of Medical Physicists Community. In 2021, SCMPCR authority will organize three accredited e-learning courses with a series of lectures on a specific discipline. Those programs are scheduled in February on Brachytherapy, July on QC of Diagnostic Radiology, October on Advanced Techniques of Radiotherapy. We believe that with those e-learning initiatives we can reach more people and the knowledge can be shared on a broader scale. We expect the support and active participation from the medical physicists and related personals all over the world to achieve our goal.

ACOMP Courses planned for 2021

1. Title: Radiobiology in the era of precision medicine

Tentative date: TBC (tentative March 2021)

Duration: 8-10 hours of online course (2-2.5 hours/day)

Coordinator: Chai Hong Yeong and Aik Hao Ng, Malaysia

Lecturers: Eva Bezak, Aik Hao Ng, Lau Fen Nee, Jasmine Lim

Synopsis: The course aims to provide basic understanding of radiobiology principles, its clinical applications and implementations in radiation therapy. It will address the molecular and cellular responses to radiation-induced damage and factors that affect cell survival curve. Biological basis for fractionation of radiotherapy and dose-response relationships in the clinic as well as other approaches to improve radiotherapy will be covered in depth, which include treatment interruption and retreatment issues, targeting hypoxia, biological modifiers and combined radiotherapy/chemotherapy. This course also includes current understanding of radiobiology in radionuclide therapy, latest development of the biomarkers and its clinical applications in precision medicine. This course will advance the knowledge of medical physicists, radiation oncologists, nuclear medicine physicians and other related professionals with radiobiology key points that might be useful and practical in their clinical routine while bridges the gap for the application of radiobiology principles in state-of-art theranostic procedures.

2. Title: PET/CT: From conception, site planning, commissioning and integration to healthcare

Tentative date: 22 April 2021

Duration: 3 hr

Coordinator: S Somanesan, Singapore

Lecturers: Tay young Soon, Jasper Singh Chahal, S Somanesan, Lim Shi Meei.

Synopsis: The necessary discussions, specification writing, planning and site identification besides the shielding calculations are preliminary requirements to setup and offer a PETCT service. This is followed by the commissioning and acceptance testing that confirms the item purchased indeed meets stated specifications. This is followed closely by the requirements such as radiation safety training necessary to deliver a PETCT service. This course will advance the knowledge and skill set of medical physicist from all over on setting up and running a state of the art PET/CT service.

3. Title: Modelling in Molecular Radiotherapy/Imaging

Tentative date: April 2021

Duration: 2 days

Coordinator: Deni Hardiansyah, Indonesia

Lecturers: Gerhard Glatting (Ulm University, Germany), Ali A. Attarwala (Bruker GmbH,

Germany), Manuel Bardies (CRCT, France)*, Yixuan Zou (Genentech, USA), Deni Hardiansyah

(UI, Indonesia)

Synopsis: The calculation of the absorbed dose in molecular radiotherapy based on the MIRD scheme relies on the determination of the time-integrated activity coefficients (TIACs) and S values. An adequate knowledge in modeling is needed to analyze and calculate individual values of the TIACs and

Svalues from individual patients. Several modeling techniques that oftenly used in molecular radiotherapy are the Physiologically-based Pharmacokinetic (PBPK) model, Monte Carlo simulations and uncertainty/variability analysis. Modelling also plays an important role in molecular imaging. This course will advance the knowledge and skill of the medical physicist and professionals on the modeling techniques in molecular radiotherapy/Imaging.

4. Title: A hands-on course on Implementing CBCT-based IGRT

Tentative Date: Q3 2021

Duration: 12 hours of face-to-face learning (in 2-3 sessions) plus 8 hours of self-learning time

Coordinator: Hafiz M Zin, Malaysia

Lecturers: to be confirmed

Synopsis: The course is aimed at medical physicists and all other professionals in radiotherapy who are involved in the clinical practice of image guided radiotherapy (IGRT) with a dedicated focus on CBCT-based IGRT. The course will improve the fundamental understanding of the basis of implementation of CBCT-based IGRT and will provide relevant skills required to successfully implement the technology in clinical practice. The course would benefit attendance by all the professionals involved in the treatment chain: oncologist: medical physicists and radiation therapist. The course wil be delivered through lectures, hands-on practice, problem- based learning and quiz. The contentment of the course includes Uncertainties in Radiotherapy, CBCT technology for IGRT, Quality Assurance of CBCT and Planning target volume (PTV) margin calculation.

5. Title: Physics and Quality Control of Full-Field Digital Mammography

Tentative Date: September 2021

Duration: 2 days

Coordinator: Noriah Jamal, Malaysia

Lecturers/Instructors: To be announced

Full-Field Digital Mammography (FFDM) took place in clinical practice after 35 years Screen-Film mammography system was used in the clinical practice. It was reported that FFDM continues to gain clinical presence during the next few years. Medical physicists are required to adhere to the procedures, testing frequencies and performance criteria outlined in the Quality Control (QC) manuals provided by the manufacturers of FFDM systems. As a result of this requirement, QC for FFDM has become more complicated. The primary objective of this course is to provide the medical physicist with an overview of the current equipment used in FFDM. The second objective is to enhancing skill of the medical physicist in performing QC tests of FFDM system.

For Inquiry:

KH Ng, ACOMP Director

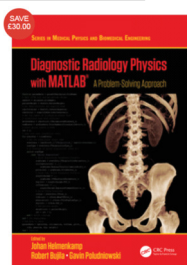
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2020 CRC PRESS BOOK REVIEW

Dr. R. K. Bisht, Sr. Medical Physicist

Dept. Radiation Oncology, National Cancer Institute, AIIMS, New Delhi



1st Edition

Diagnostic Radiology Physics with MATLAB®

A Problem-Solving Approach

Edited By Johan Helmenkamp, Robert Bujila and Gavin Poludniowski

Published in 2020

Imaging modalities in radiology produce ever-increasing amounts of data which need to be displayed, optimized, analyzed and archived: a "big data" as well as an "image processing" problem. Computer programming skills are rarely emphasized during the education and training of medical physicists, meaning that many individuals enter the workplace without the ability to efficiently solve many real-world clinical problems.

This book provides a foundation for the teaching and learning of programming for medical physicists and other professions in the field of Radiology and offers valuable content for novices and more experienced readers alike.

It focuses on providing readers with practical skills on how to implement MATLAB® as an everyday tool, rather than on solving academic and abstract physics problems. Further, it recognizes that MATLAB is only one tool in a medical physicist's toolkit and shows how it can be used as the "glue" to integrate other software and processes together. Yet, with great power comes great responsibility. The pitfalls to deploying your own software in a clinical environment are also clearly explained. This book is an ideal companion for all medical physicists and medical professionals looking to learn how to utilize MATLAB in their work.

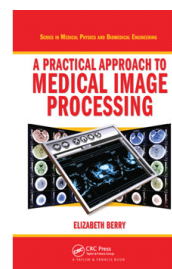
A Practical Approach to Medical Image Processing

By Elizabeth Berry

Published June 29, 2020

The ability to manipulate and analyze pictorial information to improve medical diagnosis, monitoring, and therapy via imaging is a valuable tool that every professional working in radiography, medical imaging, and medical physics should utilize. However, previous texts on the subject have only approached the subject from a programming or computer science viewpoint at a mathematically inaccessible level. Unlike these previous publications, **A Practical Approach to**

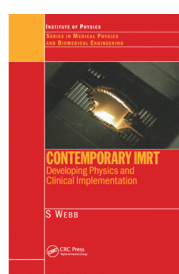
Medical Imaging Processing provides hands-on instruction, using the freely available software program ImageJ, on all of the skills needed to perform filtering and image enhancement techniques used in structured image discrimination.



In this unique text, the author focuses exclusively on image processing and treats medical images in a generic way to highlight the features that all digital images have in common. The book first

introduces the main topics in image processing and as it progresses, you will discover relevant points of good practice. The author validates each technique with a corresponding case study, which originates from a published journal article. The case studies demonstrate how the concepts of image processing are applied to real-life situations, such as how to uncover information suffering from distortion and pixel-size limitations. The accompanying CD-ROM contains the Windows version of the ImageJ software, digital images, and documents to be used during the practical activities included in each chapter.

With its highly functional workbook approach, **A Practical Approach to Medical Image Processing** allows you to build your skills in image manipulation and to enjoy the benefits of this valuable field without having to code or develop your own program.



Contemporary IMRT

Developing Physics and Clinical Implementation

By S. Webb

Published on June 29, 2020

The most important radiotherapy modality used today, intensity modulated radiation therapy (IMRT), is the most technologically advanced radiotherapy cancer treatment available, rapidly replacing conformal and three-dimensional techniques. Because of these changes, oncologists and radiotherapists need up-to-date information gathered by physicists and engineers. Focusing on new developments and the preliminary clinical implementation, Contemporary IMRT: Developing Physics and Clinical Implementation discusses the relationship between these advances and applications.

Capturing contemporary technological advances, the book reviews modern applications of IMRT & shows how IMRT is used now and how it will be used in the future. The book begins with a historical background of IMRT as well as a discussion of the current state of IMRT. It also covers technical solutions that have been commercialized, such as the sliding window technique, step-and-shoot, tomotherapy, and the Cyberknife. The final chapter explores imaging developments and new planning methods, including gradient-descent and split modulation.

Covering recent advancements in IMRT and showing how these techniques and devices have been implemented, Contemporary IMRT: Developing Physics and Clinical Implementation provides state-of-the-art findings for oncologists, radiotherapists, radiographers, physicists, and engineers.

1st Edition

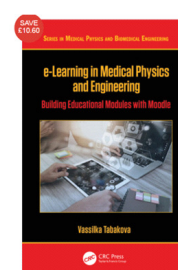
e-Learning in Medical Physics and Engineering


Building Educational Modules with Moodle

By Vassilka Tabakova

Published May 17, 2020

The need for qualified specialists to work with and apply sophisticated technology in





contemporary medicine is rapidly growing. Professional bodies predict that meeting the needs of healthcare globally will require almost tripling the number of Medical Physicists by 2035. Similar challenges exist in the constantly growing profession of Medical Engineering. They can be solved most efficiently and effectively with the tools of e-Learning, and a free and open-source Virtual Learning Environment (VLE) platform such as Moodle is a welcome solution.

The Moodle VLE platform is a free, open source learning management system that is the most popular choice for higher educational institutions worldwide. However, the best practices of the Moodle system are still unknown to many. This practical guide provides educators, programme administrators, and programme directors with a condensed guide to Moodle and step-by-step instructions on how to create a single course or an entire educational programme. It also discusses cost-effective ways to apply e-Learning in an educational institution.

This guide is accessible to all professionals, even those without specialist IT skills, and will be helpful to educators of all levels in Medical Physics and Engineering, as well as in other medical and medical-related specialties or disciplines with a strong imaging component.

AOCMP-2021

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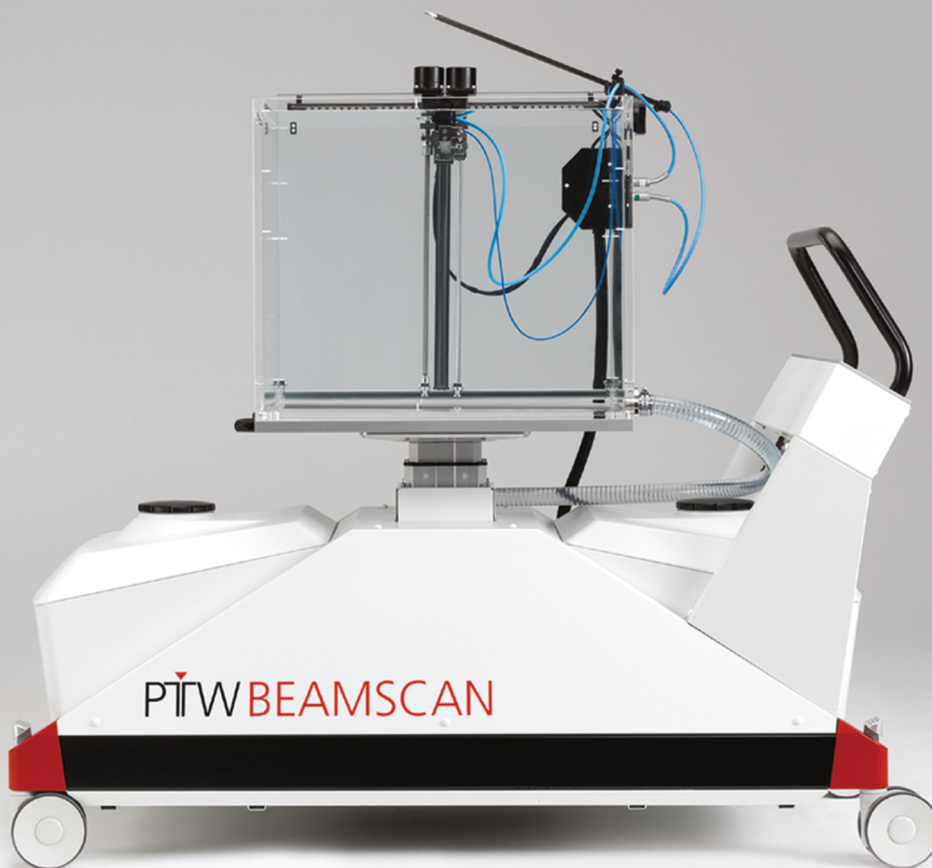
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MEETING CALENDAR 2021

Upcoming Events

International Conference on Medical Physics, Radiation Protection and Radiobiology ICMPPRP
January 14-15, 2021 in Zurich, Switzerland.

IAEA-International Conference on Advances in Radiation Oncology (ICARO-3)- Online
Feb 16th, 2021 - Feb 19th, 2021.

Joint ICTP-IAEA Workshop on Risk Assessment in Advanced Radiotherapy Techniques- Online
Feb 25th, 2021 - Feb 27th, 2021.

Australasian Brachytherapy Group 30th Annual Scientific Meeting- Virtual Event
Apr 19th, 2021 - Apr 21st, 2021.

Virtual 8th MR in RT Symposium- Online
Jun 16th, 2021 - Jun 19th, 2021

EFOMP - 3rd European Congress of Medical Physics
Turin, Italy.
Jun 16th, 2021 - Jun 19th, 2021

AAPM Annual Meeting Columbus, OH
July 25 – 29, 2021

ÖGMP, DGMP and SGSMP- three Medical Physics Societies conference
Vienna, September 19th, 2021 - Sep 22nd, 2021

ASTRO's 63rd Annual Meeting
October 24-27, 2021
McCormick Place West, Chicago

RSNA 2021 (Chicago, Illinois, United States)
107th Scientific Assembly and Annual Meeting of RSNA
November 28 – December 1, 2021

The 21st Asia-Oceania Congress of Medical Physics
Bangladesh

Officers and Council of AFOMP

President :- Prof. Dr. Arun Chougule



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Dean, Faculty of Paramedical Sciences, Ex-Pro Vice-Chancellor
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Sr. Professor & Head, Department of Radiological Physics,
S.M.S. Medical College & Hospitals
Jaipur-302015, India E-mail : arunchougule11@gmail.com

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AFOMP correspondence should be addressed to:
Email: ahasinanupama@gmail.com

Past President :- Dr. Tae-Suk Suh



Dr. Tae-Suk Suh
Dept. of Biomedical Eng., College of Medicine,
The Catholic University of Korea,
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Telephone: +82-2-2258-7232
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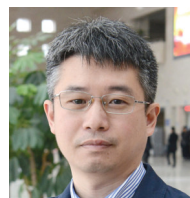
Dr. Kwan-Hoong Ng
Department of Biomedical Imaging
University of Malaya
59100 Kuala Lumpur, Malaysia
Tel: 603 7950 2088 Fax: 603 7958 1973
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Prof. Tomas Kron, Australia
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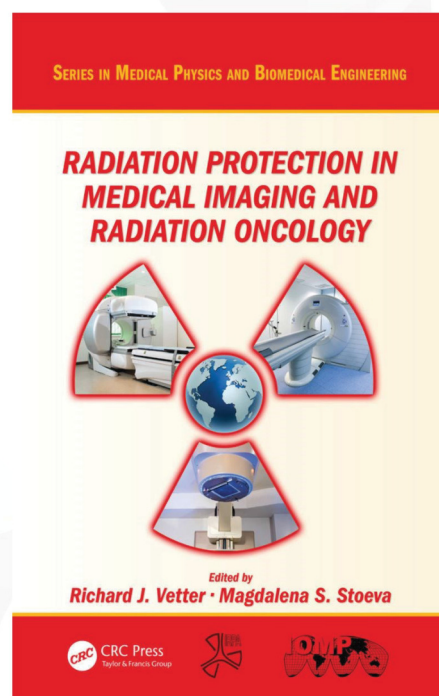
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