AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

IMPROVING HEALTH THROUGH MEDICAL PHYSICS

AAPM NEWSLETTER

May/June 2022 | Volume 47, No. 3

Special Interest Feature:

Women's Professional Subcommittee

IN THIS ISSUE:

COVID-19 UPDATE

Notice as of Sunday, May 1, 2022, 9AM Eastern Time.

- COVID-19 Information for Medical Physicists
- As of August 1, 2021, AAPM allows in-person meetings and AAPM-funded travel for those fully vaccinated, with the understanding that individuals may participate virtually if they do not feel comfortable traveling. Meetings at AAPM HQ must follow guidelines established by EXCOM as appropriate to circumstances at the time of the meeting.

AAPM NEWSLETTER is published by the American Association of Physicists in Medicine on a bi-monthly schedule.
AAPM is located at 1631 Prince Street, Alexandria, VA 22314

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SUBMISSION INFORMATION

To keep all reports uniform, we kindly request that submissions be made through a QuestionPro portal.

Questions? Contact Nancy Vazquez

PUBLISHING SCHEDULE

The AAPM Newsletter is produced bi-monthly.
Next issue: July/August 2022
Submission Deadline: June 3, 2022
Posted Online: Week of July 4, 2022

CORPORATE AFFILIATE ADVERTISING

Advertising Rates & Deadlines

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EDITOR'S NOTE

I welcome all readers to send me any suggestions or comments on any of the articles or features to assist me in making the AAPM Newsletter a more effective and engaging publication and to enhance the overall readership experience. Thank you.

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

2022 AAPM ELECTIONS

2022 AAPM SUMMER SCHOOL

Small Field Dosimetry, Stereotactic Radiosurgery, and Stereotactic Body Radiation Therapy: The Future is Here

Southern Methodist University & UT Southwestern Medical Center | Dallas, TX

IMPORTANT DATES:

- **MAY 17:**
  Deadline to cancel registration with no penalty
  Deadline to reserve or cancel on-campus housing
- **June 7:**
  On-campus housing check-in begins

Join us
live and in-person
June 7–12, 2022!

aapm.me/school

SPRING IS IN THE AIR

NEWSLETTER EDITOR'S REPORT

Welcome to the May/June edition of the 2022 AAPM Newsletter! Spring is in the air as I write this, but preparations are already in full swing for the first in-person AAPM Annual Meeting since 2019. The 2022 AAPM Spring Clinical Meeting in New Orleans, LA, was a great success and a good first experience of the return to large in-person meetings. Based on the photos I saw on social media, participants thoroughly enjoyed this opportunity to meet with colleagues in person again. Thank you to the AAPM staff who work so hard behind the scenes to make these meetings happen!

We also have another jam-packed issue of the Newsletter. In addition to the regular contributors, we have our first update on International Council activities from Chair **Jatinder Palta** and Vice-Chair **Ana Maria Marques da Silva**. In addition, this issue contains the Women's Professional Subcommittee newsletter, with reports ranging from the #WeWhoCurie exhibit at the Smithsonian Museums in Washington, D.C., to the disproportionate impact the pandemic has had on women. There are also reports on many other topics, including a virtual career expo held by the Working Group for Non-Clinical Professionals and a refresher on how to nominate AAPM members for fellowship (it's time to start thinking about deserving nominees for next year!) There's also a call for mentors to participate in the launch of the AAPM Mentorship Program; this is a great opportunity to mentor outside of your own institution.

Whether you read the Newsletter cover-to-cover or only have time to read a few articles that catch your eye, we're grateful for the time you spend with the Newsletter content. Our goal is to keep the AAPM Newsletter relevant and interesting to everyone who wants to learn what's happening in medical physics. We're always interested in submissions and suggestions from AAPM members, which can be submitted directly through the link on the Newsletter page. Please enjoy this issue of the Newsletter and send us your feedback and ideas for the future. And as always, please share the Newsletter articles you enjoy with your social media network. ■

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AAPM LAUNCHES NEW MENTORSHIP PROGRAM: VOLUNTEERS NEEDED!

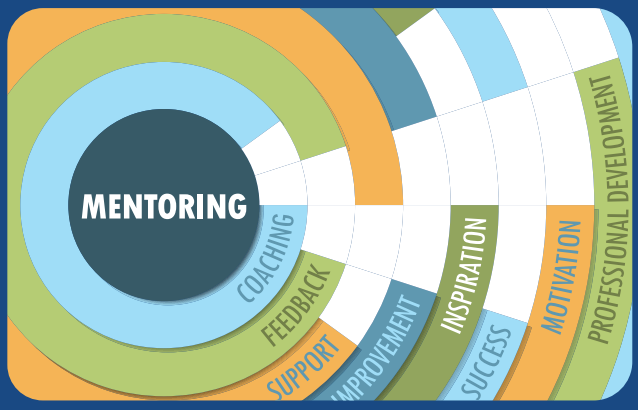
Call for Mentors to participate in the launch of the AAPM Mentorship Program! The AAPM Mentorship Program is actively recruiting volunteers from all disciplines, work environments and education levels to serve as mentors to other AAPM members. Participation is open to any AAPM member. The Program is currently recruiting mentors at this stage of the launch and will open to mentee sign-ups once mentor recruitment goals have been achieved. More details including an FAQ and sign up can be found here.

What is Mentorship?

Mentorship is 1 on 1, virtual or in person. The AAPM Mentorship Program is not just for professional mentorship, it can be used to support any form of personal or career development, including navigating an early career post-residency, being more productive in research and grant writing, how to climb the academic ladder, becoming a better educator, strategizing career changes and moves, management and leadership skills, or even retirement! The individual aims of the mentoring relationship are up to the participants.

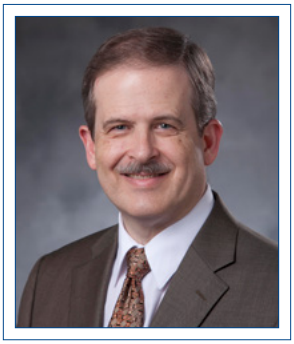
What Mentorship is Not:

This is not a clinical training program. Mentorship offers a personalized opportunity to work on your individual career development goals, develop new skills and expertise and access objective evaluation of your performance from an experienced member of AAPM. Mentorship can increase your networking opportunities, help to clarify your career direction, and provide support and motivation in meeting the challenges of work and home life.



UPDATE FROM THE SPRING BOARD OF DIRECTORS MEETING

CHAIR OF THE BOARD'S REPORT



The AAPM Board of Directors recently completed a successful spring Board meeting (March 29–30), held virtually again this year. In this report, I will summarize a few of the key take-away points from this Board meeting and highlight a few items on our list for priority attention this year by the Board.

An update was given on the progress of several ad hoc committees, including interim reports from the Ad Hoc Committee to Explore Future Directions in the Science of Physics in Medicine (AHFDS), chaired by **John Hazle**, and the Ad Hoc Committee to Develop Advocacy Materials for Administrators on the Business Case for Medical Physics in Clinical Departments (AHBCA), chaired by **Jennifer Johnson**. These ad hoc committees address two of our key priority areas of strategic focus, including how we position ourselves for impact in future directions in science and medicine, and how we help advocate for our members in clinical environments. Both ad hoc committees have made excellent progress this year and plan to bring final reports to the Board for consideration and action later this year.

We also reported on the progress of several other ad hoc committees, including a committee to recommend new website management systems for our association (AHWMS), an ad hoc committee addressing the effects of COVID on our meetings (AHRICM), and an ad hoc committee looking at the future format of AAPM meetings (AHFFM). There are several other ad hoc committees underway or being planned for this year by President **Dan Bourland**.

We also received a report and recommendation from the Ad Hoc Committee on Gender-Neutral Language in Governance Documents (AHGNL), chaired by **Julianne Pollard-Larkin**, that has completed its work and has brought forward recommended gender-neutral language for all our governance documents, including Bylaws, Rules, and Policies. The Board approved recommended gender-neutral language for the Bylaws at this meeting, which will be put forward to the membership for a vote later this year. Suggested wording changes for Rules and Policy documents will be considered later in the year.

The Board also heard reports from each of our Officers, Executive Director, and each Council chair; received the report from the Audit Committee; approved the recommendations of the Awards and Honors Committee; approved our slate of candidates for this year's elections; approved several changes recommended by the Rules Committee; and approved several new Corporate Affiliate applicants.

James T. Dobbins III, PhD
Duke University Medical Center
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The Board greatly appreciates the opportunity to serve our association, and we welcome feedback and suggestions from our members. I thank you for the chance to serve as your Board Chair, and I look forward to working with the Board this year on important matters to advance our field and the work of AAPM.

CHAIR OF THE BOARD'S REPORT, Cont.

One key aspect of this spring Board meeting was our annual strategic planning effort. As a part of embracing board best-practices, we are identifying a few key areas of strategic focus for the association over the next few years. These strategic areas of focus are in addition to the previously approved strategic plan from several years back that includes 8 areas of principal activity of AAPM, with success narratives for each and careful follow-up by our Board to ensure that we are achieving excellence. The areas of strategic focus provide additional strategic clarity and represent large-scale priorities where we see timely need for emphasis in our allocation of resources, time, and effort. The Board approved two such areas of key strategic focus for the next 3–5 years: (1) articulating our value, and (2) expanding our scientific scope and overall presence in medicine. These two items continue our previously defined areas of key strategic focus, with appropriate updating and enhancement. The Board also added a third area of key strategic focus with a shorter timeline: coordinating our initiatives. This third key strategic focus will ensure good alignment and coordination of all our internal AAPM activities.

The Board is also working this year on improving our communications on many fronts, including from the Board to the membership, and drafting and approving a charge for our new Governance Committee that will help the Board establish best practices in effective and efficient governance. Other areas of follow-up effort include more strategic agenda setting for our Board meetings and strengthening our new Board orientation. Efforts on these items are underway and will continue. ■

INFORMATION FROM HQ

EXECUTIVE DIRECTOR'S REPORT

Return to In-Person Meetings

I sit down to write this article while in New Orleans attending the AAPM Spring Clinical Meeting. The enthusiasm of the attendees and HQ team is palpable! The pandemic certainly upended a primary source of member engagement, and I am relieved that we can safely gather once again. The AAPM volunteers and HQ team have been challenged and stretched by many new meeting planning processes, but I believe that we are approaching AAPM offerings a bit smarter, applying lessons learned over the past two years. I look forward to seeing you via something other than a Zoom meeting…soon!

AAPM Meeting News

AAPM Summer School Small Field Dosimetry, Stereotactic Radiosurgery and Stereotactic Body Radiation Therapy: The Future is Here
June 7–12, 2022
Southern Methodist University and UT Southwestern Medical Center, Dallas, TX

AAPM Webinar Series on Inertia or Excellence: Equity, Diversity, and Inclusion within AAPM

June 14, 12:0 pm–1:00 pm ET
Webinar #3: Recruiting for Workforce Excellence
Speakers: Jean Moran, Eric Ford, Kelly Paradis
Register

Missed any of the previous webinars? The Archived webinars can be found here.

AAPM 64th Annual Meeting & Exhibition
Celebrating Medical Physics: Transforming Human Health
July 10–14, 2022
Washington, DC

Make plans to attend the AAPM 64th Annual Meeting & Exhibition, featuring the theme *Celebrating Medical Physics: Transforming Human Health*. Reconnect with friends and colleagues — all in our Nation's Capital. Register by June 8 to receive the early bird registration fee.

Reminder That You Can Support AAPM Without Spending a Penny

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Angela R. Keyser
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Twitter: @AngelaKeyser

AAPM's HQ Team…At Your Service!
Who does what on the AAPM HQ Team? See a list with contact information and brief descriptions of responsibilities online. An Organization Chart is also provided. We are now providing information about the diversity of our team as well.

Please consider clicking through if you see something that interests you. "Clicks" show that online advertising works and encourages advertisers to continue using online means to reach YOU, their audience.

When browsing through AAPM.org or reading the AAPM e-News, **click on an advertisement**. Again, "clicks" = VALUE to the advertiser. While a small percent of AAPM's revenue is currently generated from this source, we can make it grow so these opportunities provide a greater return to the organization in support of AAPM programs.

As you review the program for the Annual Meeting, plan to **participate in the Vendor Track** consisting of **Vendor Showcases** as well as **Partners in Solutions** and **Educational Topic Specific Guided Tours**. Plan to **visit the Exhibit Hall** and **engage with AAPM Corporate Partners**. It is important to remember that the fees that the exhibitor partners pay to participate support the overall program. Attendee engagement is vital to exhibitors who want to educate you about their latest products. Show the exhibitor partners that their continued participation in AAPM meetings makes smart business sense and thank them for their support through the challenges with virtual meetings.

Employers advertise in the AAPM Career Services/ Placement Center because they know that it reaches qualified AAPM Members. When you are thinking about changing jobs or have a position to fill, **use the AAPM Career Services** as it too provides a substantial return to the organization in support of AAPM's mission.

Interested in Volunteering?

AAPM relies heavily on the volunteer efforts of its members to accomplish its scientific, educational, and professional missions. Without AAPM members who are willing to devote time and energy to the advancement of medical physics, AAPM would not achieve its goals. If you are interested in volunteering, please review the Committee Classifieds online to see what positions are available.

Election Process Online Only!

Elections for the 2022 Officers, Board Members-at-Large and Nominating Committee Members will open on June 1st and will run through June 22nd. The AAPM Bulletin Board System (BBS) will be used during the election process to allow members to discuss issues of concern with the candidates and the election in general. This is an online-only process, so be alert for e-mail announcements.

2022 Accomplishments of Note To-Date

- Negotiation of the Content Management System contract with Allegiant, with implementation through year-end.
- Negotiation of the Learning Management System contract with CourseWorks, with implementation through 3rd quarter.
- Navigating the many added complexities associated with a hybrid Spring Clinical Meeting and Annual Meeting
- Progress with the Enterprise Risk Management process
- Support for five very impactful Council retreats in 1st quarter
- Preparation for the audit of AAPM's 2021 financials
- Launch of the AAPM Mentorship Program
- Support for increased number of AAPM Webinars and Specialty Meetings
- Repairs to HQ from the 3rd quarter 2021 flood almost complete ■

OUR CONDOLENCES

Jianzhong Li, MS

Our deepest sympathies go out to the family.
We will all feel the loss in the Medical Physics community.

If you have information on the passing of members, please inform HQ ASAP so that these members can be remembered appropriately. We respectfully request the notification via e-mail to: 2022.aapm@aapm.org
(Please include supporting information so that we can take appropriate steps.)

ARPA-H FINDS ITS PLACE

LEGISLATIVE AND REGULATORY AFFAIRS REPORT

The Advanced Research Projects Agency for Health (ARPA-H), President Biden's new research agency tasked with improving the U.S. government's capabilities to accelerate medical breakthroughs for prevention, treatment, and cure of significant diseases, will be housed within the National Institutes of Health (NIH). Health and Human Services (HHS) Secretary Xavier Becerra announced the decision during the March 31, 2022, House Appropriations Subcommittee hearing. The decision was not unexpected as policymakers and advocates touted NIH's resources and administrative framework as assets for the nascent agency. ARPA-H's director will report directly to Secretary Becerra, rather than the head of NIH.

President Biden's FY2022 budget included a $6.5 billion request to fund the establishment of ARPA-H. The omnibus appropriations bill included $1 billion to establish the ARPA-H, pending passage of legislation formally establishing ARPA–H. That appropriation required Secretary Becerra to decide whether to place the agency within NIH or elsewhere within the department. The appropriations bill's language allowed for the appropriation of the funds wherever the agency would reside, inside or outside of the NIH. Critics have expressed concern that the advancement of ARPA-H comes at the expense of NIH's annual base budget because under the proposed budget, funding for NIH would decrease.

There had been debate over the logistics and purpose of this agency, mainly whether it would be housed in NIH or be a separate entity. Notably, Rep. Anna Eshoo (D-CA), the chair of the House Energy and Commerce Health Subcommittee, argued for ARPA-H to be created as "an independent, empowered, risk-taking agency." She posited that housing ARPA-H in NIH fosters a "bureaucratic structure, rather than a transformational one." ■

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We will continue to monitor this dynamic situation and provide updates to you. If you have questions or require additional information, please contact me.

AAPM 2022

JULY 10–14 | WASHINGTON, DC

64TH ANNUAL MEETING & EXHIBITION

CELEBRATING MEDICAL PHYSICS
TRANSFORMING HUMAN HEALTH

EARLY BIRD REGISTRATION DEADLINE: JUNE 8

aapm.me/annual

IMPORTANT DATES:

- **May 11:** Annual Meeting Scientific Program Available Online
- **June 8:** Deadline for Early Bird Registration
- **June 15:** Deadline for Registration Fee Refund (with written notice); Deadline for Housing Reservation
- **July 1:** Check Payment Deadline

TOP 5 REASONS

to attend the AAPM Annual Meeting **LIVE & IN-PERSON:**

AAPM 2022
JULY 10–14 | WASHINGTON, DC
64TH ANNUAL MEETING & EXHIBITION
CELEBRATING MEDICAL PHYSICS
TRANSFORMING HUMAN HEALTH

1. **Interact with equipment/service providers.** See and evaluate emerging technology and solutions. Attend live educational sessions with product experts.
2. **Develop and maintain relationships** with medical physicists and commercial product experts from around the country and the world.
3. **Attend scientific, clinical, and professional sessions.** Meet the experts and start a dialogue.
4. **Attend committee, task group, and working group meetings.** Learn about cutting edge work relevant to medical physics and patient care. Become involved.
5. **Meet government and regulatory specialists** attending this meeting in the nation's capital.

#AAPM2022 | aapm.me/annual

UPDATE FROM THE INTERNATIONAL COUNCIL

INTERNATIONAL COUNCIL REPORT

J. Palta

A.M. Marques da Silva

AAPM has been actively engaged in international affairs for much of its history. Many AAPM members have worked directly with several international organizations, including the International Organization for Medical Physics (IOMP) and the International Atomic Energy Agency (IAEA), beyond others. The international activities have contributed significantly to all aspects of the profession of medical physics, improving global health through medical physics.

The AAPM's By-Laws and Rules were revised in September 2020 with an overwhelming support of its members to create the International Council (IC). The IC will now act as a single point of contact for all international engagements, both within and beyond the AAPM, in an organized and coordinated fashion through centralized management and communication for the betterment of all parties.

The IC's vision is to have a sustainable, measurable, and meaningful impact on global health related to medical physics, the international medical physics communities, and medical disciplines associated with medical physics (e.g., radiology, nuclear medicine, and radiation oncology).

The IC will identify and develop strategies for advancing the practice of medical physics globally. Also, we want to address global disparities in healthcare and develop mitigation strategies in collaboration with other stakeholders, including international medical physics organizations, international radiology and radiation oncology societies, and NGOs that deal with the cancer burden and other diseases requiring medical physics involvement. We will also develop consistent metrics to demonstrate measurable value in the international arena and establish formal mechanisms for oversight and accountability. Standard procedures will be designed to disseminate information regarding opportunities to be involved internationally. In addition, calls for involvement in international activities will be routinely distributed.

IC membership includes representatives from the other four councils, providing direct lines of communication, greatly enhancing the coordination of international efforts among the councils.

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INTERNATIONAL COUNCIL REPORT, Cont.

The International Council has six committees: Global Clinical Education and Training Committee (GCETC), Global Data and Information Exchange Committee (GDIEC), Global Liaisons Committee (GLC), Global Medical Physics Education and Training Committee (GMPETC), Global Need Assessment Committee (GNAC), and Global Research and Scientific Innovation Committee (GRSIC).

The Global Clinical Education and Training Committee (GCETC) is chaired by **Shada Wadi-Ramahi**, with **Laura Padilla** as Vice Chair. Their goal is to respond to global needs for clinical training and develop resource-stratified education and training programs for clinical medical physicists, physicians, and allied health professionals. In addition, GCETC is putting together a proposal to initiate virtual clinical training modules, develop "how to" YouTube videos, and work on a program to train the trainers for rapid dissemination of clinical knowledge in Low to Middle Income Countries (LMICs).

The Global Data and Information Exchange Committee (GDIEC) is chaired by **Nilendu Gupta** and co-chaired by **Grace Gwe-Ya Kim**. Their goal is to create and maintain a comprehensive electronic platform to support various global initiatives. GDIEC is currently working on reviewing and updating the IC webpage content on the AAPM Website.

The Global Liaisons Committee (GLC) is chaired by **Jatinder Palta** (Chair) and **Ana Maria Marques da Silva** (Vice Chair). Their goal is to establish liaisons with global NGOs and appropriate professional societies to coordinate global projects. GLC has reached out to global stakeholders, which appointed liaison members, including IAEA, IOMP, Radiating Hope, Rad-Aid, Rayos Contra, MPWB, ESTRO, and ASTRO. GLC will foster collaboration with the global stakeholders to avoid duplication of effort and harmonize global projects related to medical physics. GLC is in the process of establishing MOUs with all global stakeholders in medical physics.

The Global Medical Physics Education and Training Committee (GMPETC) is chaired by **Stephen Avery** with **David Gierga** and **Adel Mustafa** serving as Vice Chairs. Their goal is to develop need-assessed medical physics training, education, and certification requirements based on comprehensive assessments of local needs and resources, for different world regions. The GMPETC is working with the medical physicists in Africa to develop a unified strategy for medical physics education in Africa. The African Strategy for Fundamental and Applied Physics (ASFAP) seeks to build synergy between fundamental physics and practical applications which is crucial for a robust medical physics education in Africa.

The Global Need Assessment Committee (GNAC) is chaired by **Wil Ngwa** and **Stephanie Parker** serves as Vice Chair. Their goal is to provide visibility to AAPM globally and establish it as a global partner with international medical physicists. GNAC is currently collecting data from a globally distributed survey to medical physicists and institution/radiation oncology department leaders. The resources for the activities of the GNAC survey were guaranteed by the AIP Venture Fund titled "Increasing Access to Medical Physics Education and Research Excellence (AMPERE) for Global Health," in a joint proposal led by Wilfred Ngwa and Stephen Avery. The publication of the survey will bring additional awareness of medical physics, helping to articulate and market the value of medical physicists throughout the healthcare enterprise. One of the GNAC divisions is the Equipment Donation Program Subcommittee (EDPSC), which collaborates with physicists in developing countries to promote global standards for clinical medical physics metrology and the safe use of medical physics equipment. The EDPSC strives to maximize the value of AAPM resources through the solicitation of donated equipment and services. A Global Representatives subcommittee has been created to establish a global network of regional representatives in each world area. The purpose of the network is to maintain open communication with colleagues and peer organizations to be aware of their progress, assess their potential needs, and determine the optimal collaboration methods to meet these needs continuously. Members of the subcommittee are originally from different world regions and can use their contacts, cultural backgrounds, and language skills to target and work productively with the local representatives. Given the importance of establishing clear and consistent communication with medical physicists in multiple regions around the world, the sub-committee will facilitate networking channels with North American and other regional representatives to identify global needs.

INTERNATIONAL COUNCIL REPORT, Cont.

The Global Research and Scientific Innovation Committee (GRSIC) is chaired by **Robert Jeraj** and **Fang-Fang Yin** as Vice Chair. Their goal is to facilitate global medical physics research activities to improve international scientific collaboration, create global research resources, provide mentoring opportunities, and enable exchanges of scientific data, tools, and researchers. In addition, GRSIC shall identify, evaluate, and potentially recommend novel medical devices and hardware or software solutions to improve patient care in medical physics fields. Finally, GRSIC would like to be a catalyst for translating innovative medical physics into clinical applications. GRSIC is already supporting a clinical trial exploring prostate hypofractionation in several African countries by providing advanced dosimetry QA and data infrastructure support, the efforts that will be expanded to other global clinical trial efforts. GRSIC has established a Global Research Mentorship Program (GREMP) in Medical Physics, a structured mentorship program aimed to increase and support international medical physics research collaborations. Finally, GRSIC is organizing a series of research education webinars to strengthen the skills of medical physicists globally and highlight promising researchers from different geographical areas around the world, particularly early-mid career scientists.

At our recent retreat in February, we came up with following short-term priorities:

- Organize an IC Town Hall as soon as possible to increase awareness of IC volunteers in variations and needs of medical physics globally and to provide a framework for them to face realities and challenges facing medical physicists in a global context.
- Establish effective communication between IC committees and other AAPM councils
- Improve the communication of IC roles and actions to AAPM members and external public.
- Promote sustainable international education/training/research activities in medical physics connecting AAPM members with global healthcare scenarios.

In summary, by establishing an International Council, AAPM accomplishes its mission of advancing medicine through excellence in the science, education, and professional practice of Medical Physics on a domestic and global scale. All AAPM members, including junior physicists and trainees, interested in participating are invited to contact the International Council. ■

Dear IOMP Council members,

The IOMP election process is now completed. No issues were reported. Please find below the results of the elections for the term 2022-2025:

OFFICERS:

POSITION	NAME
Vice President	Eva Bezak
Secretary- General	Magdalena Stoeva
Treasurer	Ibrahim Duhaini

CHAIRS OF COMMITTEES:

POSITION	NAME
Science	M. Mahesh
Education and Training	Arun Chougule
Professional Relations	Simone Kodlulovich Renha
Publications	Francis Hasford
Awards and Honors	Kwan Hoong Ng
Medical Physics World Board	Chai Hong Yeong

Congratulations to the newly elected ExCom. IOMP wishes to thank you all for your cooperation in the process and the Tellers for a very professional job.

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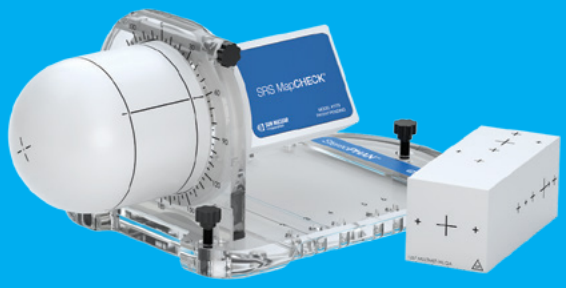

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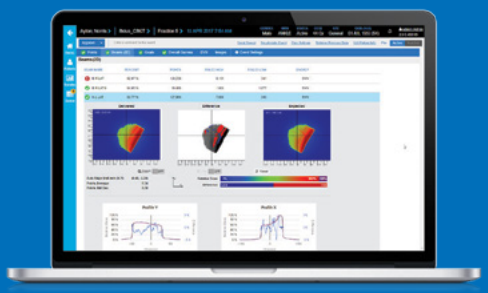

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(DREAM) DIVERSITY RECRUITMENT THROUGH EDUCATION AND MENTORING PROGRAM:
A 2021 FELLOW'S EXPERIENCE

EQUITY, DIVERSITY AND INCLUSION COMMITTEE REPORT

As part of the 2021 DREAM Summer fellowship program, I was given the opportunity by AAPM to work under **Madan Rehani, PhD** at Massachusetts General Hospital. Within the first week of my interaction, I committed to work with Dr. Rehani beyond the allocated time in the summer. The interaction was very fruitful despite being remote and it led to two publications in less than a year[1, 2]. These were the very first publications of my life. I had the opportunity to get acquainted with several projects related to patient radiation safety, risk communication and enhance my MATLAB coding skills. The prospect of learning about a novel topic initially seemed challenging. However, with the tremendous support Dr. Rehani provided, I was able to excel in my assignment. I must say that I never expected what I could gain despite the challenges caused by the COVID-19 pandemic. It was exciting to learn about submitting articles to journals and dealing with reviewers' comments. I am extremely grateful for the great opportunity AAPM offered me through the DREAM program, and I am confident that future scholars will substantially benefit from this program. ■

References:

1. Zewde N, Ria F, Rehani MM. Organ doses and cancer risk assessment in patients exposed to high doses from recurrent CT exams. *Eur J Radiol.* 2022 Apr;149:110224. doi: 10.1016/j.ejrad.2022.110224. Epub 2022 Feb 19. PMID: 35217250. https://pubmed.ncbi.nlm.nih.gov/35217250/

2. Vassileva J, Zewde NT, Reim M, Holmberg O, Rehani MM. Communication of radiation risk from imaging studies: an IAEA coordinated international survey. *J Radiol Pro*t. 2022 Mar 23. doi: 10.1088/1361-6498/ac6047. Epub ahead of print. PMID: 35320786. https://pubmed.ncbi.nlm.nih.gov/35320786/

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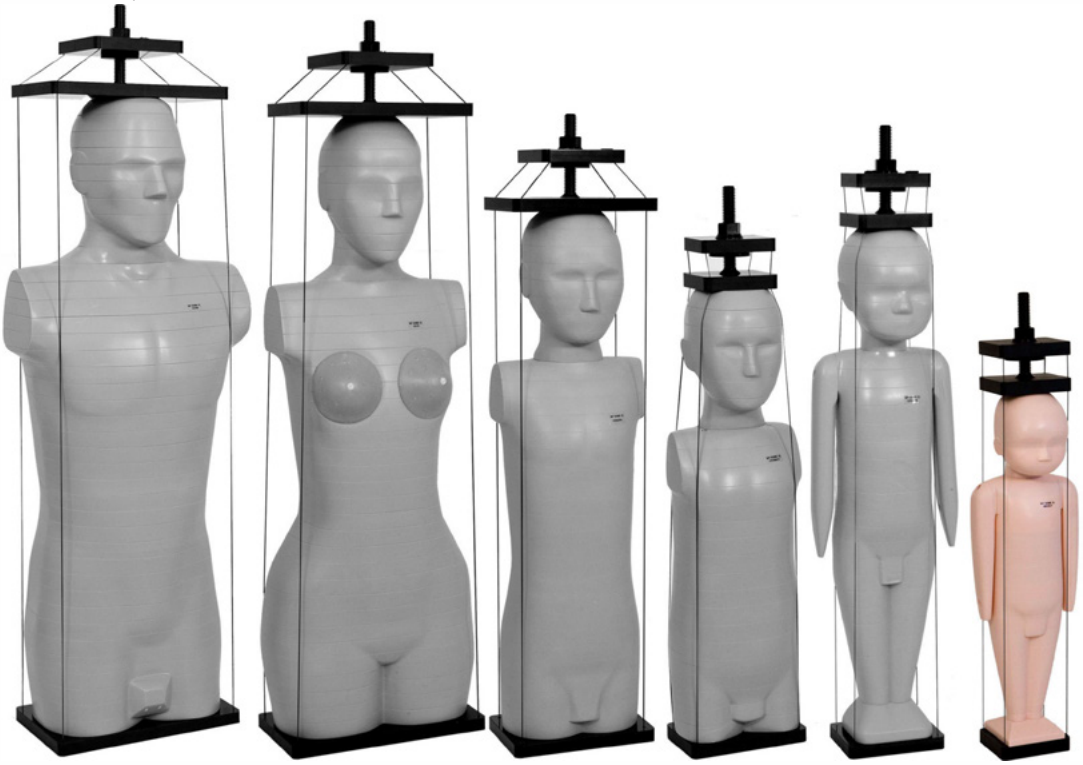
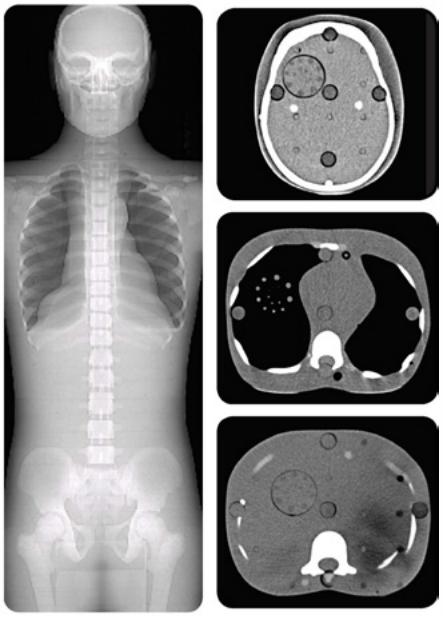


ATOM

DOSIMETRY PHANTOMS



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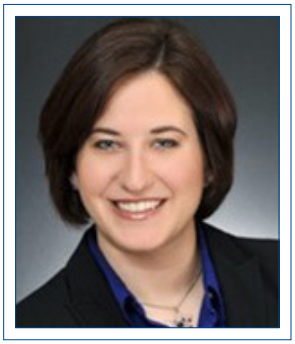
SURF'S UP ON THE NEW PUBLIC EDUCATION WEBSITE

EDUCATION COUNCIL REPORT

D Scanderbeg



L. Genovese

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Written on behalf of the Public Education Committee

The Public Education (PE) Committee of AAPM is charged with promoting public education in matters pertaining to medical physics and dissemination of information related to the practice of medical physics to the general public under the Education Council and Board of Directors. As part of this commitment, PE has launched a new website (www.medicalphysicsinfo.org). The website has been under construction for several years with an outside website development contractor as well as dedicated members contributing to content creation, review, and input on the website design. The goal was to create a website with content aimed at the general public to inform them on the field of medical physics. The new website has five main sections: What is Medical Physics?; History, Radiation and Medicine; Careers; and Ask the Experts (ATE). This last section is one of the highlights of the website, as it allows for interaction with the public by addressing the questions they have posted. Development of the ATE component was funded in part by a grant from the American Institute of Physics (AIP). A summary of the websites five sections is presented below.

What is Medical Physics?

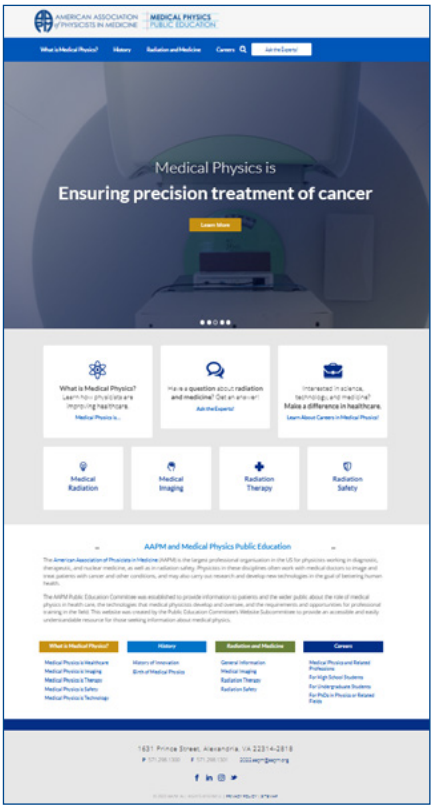
This section is an overview of our profession and what it means to be a medical physicist. This section helps to give the public a brief look at how we contribute to the broader healthcare community and how our jobs play an important role in keeping them safe and healthy.

History

This section has two subsections: one for innovation and discoveries in medical physics and one for the birth of medical physics legal acts and institutions. The sections are set up as timelines and include hyperlinks to other relevant areas of the website. In the innovation subsection, readers can view the timeline from the discovery of x-rays in 1895 through modern exploration of Moore's Law in 2020. The birth of medical physics section starts in 1900 with the founding of the American Roentgen Ray Society (ARRS) and runs through 2001 and the working agreement between the American Board of Medical Physics

AAPM Public Education Committee website launch March 21, 2022

- www.medicalradiationinfo.org
- Information focused on general public audience
- History and timeline
- Career guidance for students
- "Ask the Experts" section



(ABMP) and the American Board of Radiology (ABR).

Radiation and Medicine

This section is a summarized landing page of links to pages for medical radiation, medical imaging, radiation therapy and radiation safety. It also directs readers to the "Ask the Experts" page so they can submit questions of their own. The page links are robust and offer the public insight into what we do and how we do it.

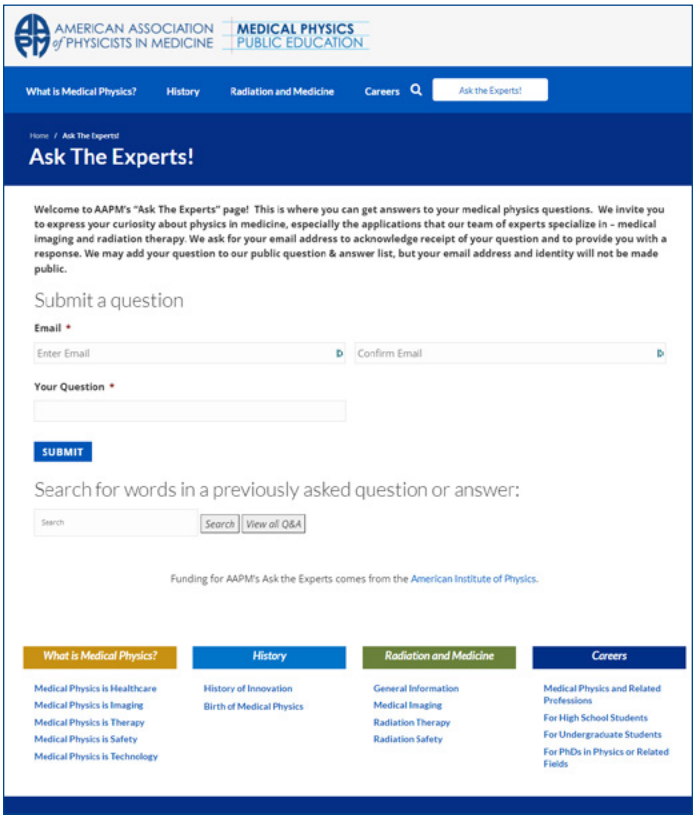
Careers

This section is a great resource for anyone interested in exploring a career in medical physics. There's a link for careers and related professions, one with information for undergraduate students, another link with information for high school students, and a fourth is for PhDs in physics or related fields. These links provide thoroughly sourced information to the general public for anyone curious about or interested in pursuing medical physics as a profession.

Ask the Experts

This section is sponsored by the American Institute of Physics (AIP) and it is centered around direct interactions with the public and answering questions posed to the group. In launching the website, there were a number of frequently asked, pre-populated questions that were addressed and posted. However, our panel of subject matter experts are standing by to promptly reply to questions that are submitted.

PE has been working with the American Association of Physics Teachers (AAPT) and the Public Education website will be highlighted on the AAPT website for teachers to use as a resource. Additionally, the Public Education committee will be working on adding additional material in the coming months with new content as well as expanding and updating current content. We would like to thank the members of the Public Education Website subcommittee, the Working Group on "Ask the Expert" and the Working Group on Public Education and Ask the Expert Website Content Review for their hard work and commitment, as well as AAPM headquarters staff, particularly **Farhana Khan** and **Michael Woodward** for their support in launching the Public Education website. We welcome you to come surf the website and even pose a question you are frequently asked by family, friends, or patients! ■



MODIFICATION OF A STANDARD FOR RESIDENCY PROGRAMS REGARDING NONCOMPETE, NONDISCLOSURE AND NON-DISPARAGEMENT AGREEMENTS

NEWS FROM CAMPEP

Written on behalf of the CAMPEP Board of Directors

The Commission on Accreditation of Medical Physics Education Programs (CAMPEP) is responsible for maintaining and upgrading the Standards upon which accreditation is based. Occasionally a new Standard needs to be developed in response to an issue that arises in the review of an educational program. One example of the need to develop a Standard has been the recognition that some residency programs have required its participants to agree to various restrictive covenants, and that sometimes these agreements were revealed to the resident for the first time in the letter of appointment. To address this issue, CAMPEP recently revised Residency Standard 6.7. This article describes the result of that revision and our process for arriving at the revised Standard.

Restrictive covenants are any type of agreement that places a limitation on the resident after they have completed their residency. Examples of these are noncompete agreements, nondisclosure agreements, and nondisparage agreements. A noncompete agreement restricts the geographical region in which the resident may practice medical physics upon completion of the training program; a nondisclosure agreement prevents the resident from revealing information they have learned in their training period; a nondisparage agreement restricts the resident from communicating any negative statements regarding the residency to parties outside the residency program.

Such restrictive agreements are found primarily in private medical physics practices. These agreements are often necessary if there are some aspects of the practice that might give it a competitive advantage over another practice operating in the same geographic region. These restrictive agreements can be very broad. For example, a noncompete agreement may prohibit a resident from practicing medical physics anywhere in the state in which they received their training. A nondisclosure agreement can be construed to prohibit the resident from applying any of the knowledge they have learned as a resident to their clinical practice as a medical physicist. A nondisparage agreement may prevent a resident from speaking freely to CAMPEP during a site visit. CAMPEP views such extreme restrictions as being contrary to the role of a residency program as an educational institution.

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CAMPEP has modified one of its Residency Program standards that relates to noncompete, nondisclosure and nondisparage agreements that are sometimes used by programs.

On the other hand, some residency programs, in particular programs based in private medical physics practices, believe they require some level of restrictions to compete successfully in the client market. If a private practice had to be concerned that a resident they train will, upon completion of the residency, establish a competing practice across the street, the private practice might be reluctant to continue the residency. Private practices have had a long history of successful training of entry-level physicists, and they provide residents with a model for the practice of medical physics that is somewhat different from that of the academic-based medical physicist. The medical physics community needs these private practice residencies to prepare a sufficient number of medical physicists to meet the demands of the job market.

So, how did CAMPEP develop and implement a Standard that addressed the issue of restrictive covenants that emphasized the role of the residency program as an educational program, but was also a Standard that a private-practice residency could live with?

The first step was to develop a draft Standard. Fortunately, several members of the CAMPEP Board of Directors have had experience with private practice medical physics as well as private-practice-based residencies and were able to provide us with a great deal of input. The draft Standard originally addressed only noncompete agreements. It allowed noncompete agreements, but restricted them in length of time after completion of the residency the restriction was in effect, the geographic region in which the restriction was enforceable, and the type of medical physics practice that was restricted, that is, a private practice.

After the Standard was approved by the CAMPEP Board, it was distributed to all residency program directors for comments. In the thirty days that the proposed Standard was open for comment, we received many thoughtful and insightful comments from program directors, both in private practice and in hospitals and universities. These comments ranged from proposing that CAMPEP disallow any restrictions to those who proposed even tighter restrictions than were in the approved Standard. For these comments, we are very grateful, as it gave us good perspective as to how the program director community would view this Standard.

Based on these comments and suggestions, we modified the Standard. In the modified text of the Standard, noncompetition restrictions were allowed, but were limited in time to no more than 2 years following completion of the residency, to a geographic region no more than 50 miles from the primary training location, and to working for direct competitors, that is other medical physics private practices or their clients. There is no restriction to a resident being hired by a hospital or university as an in-house medical physicist. Moreover, the terms of such noncompete agreements must be disclosed on the practice's public website, and may not be amended after receipt of a potential resident's application. This allows potential applicants to the residency program to be made aware of any restrictions prior to the application and interview process. If a residency applicant is not willing to abide by a program's restrictions, then they should not be applying to that program. Nondisclosure agreements are limited to a practice's intellectual property such as practice spreadsheets, and business-related properties such as pricing, and not to the skills learned in a clinical residency. Finally, no restriction may be made on a resident's right to make open and honest statements about the residency to CAMPEP. Moreover, any restrictive covenants are prohibited when such covenants may be in violation of the law.

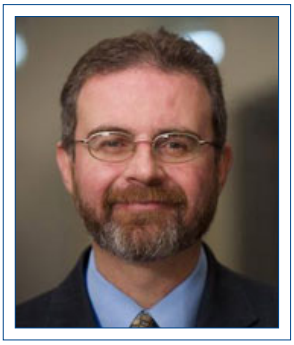
The modified Standard went into effect 30 days after the Board voted to pass the modified Standard, and it can be found as Standard 6.7 on the CAMPEP website.

The Standards for Graduate Programs can be found here.

Again, we wish to express our sincere thanks to all Program Directors who provided the many thoughtful and insightful comments on this Standard during our comment period. These comments were very informative and guided the CAMPEP Board's discussions and final decision on this Standard. We hope this discussion clarifies the process by which CAMPEP develops its Standards and obtains input from program directors to assist us in improving a Standard. ■

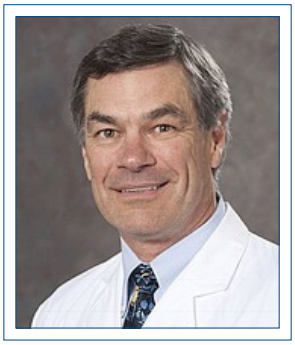
WALKING-AROUND KNOWLEDGE AND OLA

ABR UPDATE


M. Podgorsak, ABR Trustee


K. Kanal, ABR Trustee


R. Pooley, ABR Trustee


J. A. Seibert, ABR Governor


G. Ibbott, ABR Associate Executive Director

What is "walking-around knowledge" in the context of the ABR's Online Longitudinal Assessment (OLA) program? This question is raised on occasion by participants who receive OLA questions they feel fall outside their practice domains. First, however, let's look at some background:

Most ABR diplomates participate in the Continuing Certification (CC, formerly known as MOC) program. CC was adopted by the ABR in 2012 in compliance with the Continuing Certification program developed by the American Board of Medical Specialties. CC is required for diplomates who were certified since 2002, and all ABR volunteers participate in CC.

One of the four components of CC is Part 3: Assessment of Knowledge, Judgment, and Skills, which is met by most participants through Online Longitudinal Assessment (OLA). As of this writing, more than 3,700 medical physicists are actively answering questions, which constitutes 99.1% of those enrolled in CC. (Diplomates who opt out of OLA must pass a traditional MOC exam every five years to maintain their certification.) Nearly 330 new diplomates (those who became certified after the oral exam last August) joined the program in the first three months of 2022.

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OLA questions are designed to test "walking-around knowledge." Participants who agree to be "question raters" set the passing standard for each question. Data indicates that OLA contributes to continuous learning.

OLA questions are intended to evaluate the participant's "walking-around knowledge". By this we mean that a medical physicist whose practice includes the clinical area addressed by the question will answer the question correctly most of the time without having to consult external references. Questions generally assume knowledge of common equations and constants but will provide values that would usually be looked up.

The trustees are often asked why OLA cannot be more "granular"; that is, why it can't be tailored to one's own practice. We explain below and in a previous AAPM Newsletter article that clinical medical physicists are expected to be conversant in topics that may be outside their daily practice, but that constitute common imaging or radiation therapy practice. We also explain below that each OLA question is "scored" by participants to determine its degree of difficulty. For OLA to perform optimally, it's necessary for a sufficient number of participants to score each question. If practice areas were to become defined too narrowly, insufficient numbers of physicists might be available to score the questions, making it difficult to judge performance.

Of medical physicist OLA participants, 48% are "question raters": after answering an OLA question, these participants are asked whether they believe a minimally qualified participant who is trained and clinically active in the area would answer the question correctly. This question contributes to the OLA passing standard for the question, which is the average of ratings given by question raters.

The question raters therefore are determining the passing standard for OLA, and whether the question constitutes "walking around knowledge." As part of our ongoing quality assurance program, questions that don't perform to our psychometric standards are reviewed to determine if the question is overly simplistic or if it truly does not represent "walking around knowledge." We encourage participants to sign up to become question raters and contribute to the scoring. You can do this on your OLA dashboard page.

A feature of walking-around knowledge is that the questions cover topics that may not be in a participant's direct area of expertise but are issues with which they can reasonably be expected to be familiar. Some examples of walking-around knowledge for diagnostic medical physics include:

- Understanding of basic parameters such as kVp, HVL, etc. for different imaging modalities.
- Familiarity with important imaging principles and dose estimates for common exams as well as radiation safety and risk estimates for different imaging modalities.

For nuclear medical physics:

- Knowledge of the important characteristics of radionuclides commonly used for nuclear imaging.
- Methods of image production for SPECT and PET, as well as basic scintillation camera imaging.

For therapeutic medical physics:

- Tolerance doses for important sensitive structures.
- Important features of novel treatment modalities such as proton therapy, brachytherapy, stereotactic radiosurgery and body radiotherapy, Gammaknife, Cyberknife, etc.
- Radiation protection parameters such as maximum permissible dose for radiation workers.

A topic that is closely related to CC is MedPhys 3.0 (MP3.0), an initiative from AAPM that has at its core the premise that "medical physicists have a unique calling and expertise to be scientific agents of precision and innovation in the development and practice of medicine. MP3.0 aims to foster a culture within medical physics of seizing such opportunities, engaging proactively and meaningfully in patient care, and growing and building upon the unique skills of medical physicists." In addition, "MP3.0 currently has a number of projects underway including the production of a video series designed to express the value of medical physics to patients, administrators, and physicians, educational offerings at the upcoming RSNA and AAPM meetings, a webpage with examples of MP3.0 in practice, and white papers to delineate how physicists can enact, express, and enhance the full value of physics toward human health." These initiatives clearly speak to the importance of the medical physicist in the clinical environment as a resource and a well of information to support other clinical professionals, for the benefit of our patients.

ABR UPDATE, Cont.

A goal of OLA is to stimulate continuous professional development. Evidence that OLA contributes to continuous learning is found in a review of participants' responses to variant questions. Overall, medical physicist participants answer OLA questions correctly about 80% of the time. Except for participants in nuclear medical physics, a participant who answers a question incorrectly will receive a similar question on that topic a couple of weeks later. Participants understand that they will have time to review the topic and read the reference(s) cited by the rationale for the original question. The program metrics indicate that participants answer the variant questions correctly approximately 75% of the time, demonstrating that most participants used the intervening time to learn more about the topic. ■

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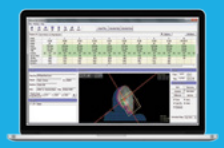
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ACR ACCREDITATION & MORE: INFO FOR MEDICAL PHYSICISTS

UPDATES FROM ACR HQ

Helical CTDI Study Well Underway! Participate!

The study group is in the process of analyzing approximately 350 protocol pairs for assessing generalizability of estimating CTDIvol using a helical measurement technique, as described by **Stephanie Leon, PhD**, et al in 2020. Our goal is to submit an abstract to RSNA around the time this newsletter is published and continue collecting data through the summer and perhaps into fall for a manuscript. The current Excel template for recording measurements is here, and you can upload your data through the study landing page. Background and additional details are as follows:

Leon et al published in a paper in 2020 demonstrating the feasibility of using a helical acquisition technique for estimating CTDI during medical physics annual surveys. I have partnered with those researchers and other interested colleagues to investigate the generalizability of their proposed measurement method. In other words, their results indicate that the helical measurement method can work, and we are now investigating whether the helical method can reliably work for everyone.

We encourage all our colleagues who practice in CT to add a handful of extra measurements to their CT testing routine and contribute data to the study. The more data we can collect for analysis, the more we will all learn from the results! You can download the Excel template with instructions here, and you can drag & drop your completed Excel templates at the study landing page. You can also find a shortened link to the study landing page in my Twitter profile.

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In each issue of this newsletter, I will present information of particular importance or relevance for medical physicists. You may also check out the ACR's accreditation web site portal for more accreditation information and QC forms. A big THANK YOU to all the other staff that keep ACR programs running and assist with creating the content in this column.

Congratulations to Caffi Meyer of UCLA, ACR's 2022 Medical Physics Graduate Student Scholarship awardee! ACR recognizes the value of engaging our younger and incoming generations of medical physicists. The goal of the Scholarship and Morin Fellowship is to help the awardees understand how the ACR works and the breadth of issues it takes on. In addition to building a community of early career medical physicists with direct connection to more senior colleagues, these individuals will have insight on how to stay involved with ACR and create change as they move through their careers. ACR looks forward to welcoming Caffi at ACR 2022, which will have taken place a couple weeks prior to publication.

When you submit data, you'll need to attest that your dosimetry equipment has been calibrated within 24 months of your measurements, and that you are not submitting PHI, facility information, or CT device identifiers. The study collaborators are finalizing a date to close data collection, likely midyear, so please contribute soon!

Changes to ACRedit Website are Imminent! No More Sharing of Logins!

Yes, I know I've published this a couple times, but it's important and I want to make sure it's in front of as many eyeballs as possible:

All modalities except radiation oncology will soon see an updated interface when they visit the accreditation system. ACRedit is the website and database through which all accredited facilities submit their data. ACR's Accreditation and IT staff have been working diligently for approximately three years to build out a brand-new database and interface for ACRedit, with the goal of improving front-end user experience in both obvious and non-obvious ways. The new ACRedit platform, called ACRedit Plus, is also a critical security upgrade for the ACR, which handles significant amounts of patient and facility data. This column will highlight some of the important differences and features that you and your clinics or clients will see when logging into ACRedit Plus.

Perhaps the most critical change in ACRedit Plus for the medical physics audience is that sharing of login information will no longer be reasonably possible, because ACRedit Plus will leverage multifactor authentication (MFA) through Okta. However, there will be upgraded permissions features to ensure that necessary personnel can participate in the various tasks required throughout the accreditation process. Importantly, facility personnel will be able to assign permissions to external personnel, such as a medical physicist, and the medical physicist will be able to remotely, securely, and legitimately log into ACRedit Plus to conduct their pieces of the accreditation process. The permissions can then be assigned back to the facility personnel. Of course, each person will initially need to configure their login credentials and MFA, but I suspect this will not be the first time most of you have been required to undertake such a process for data security. We appreciate in advance your patience while everyone becomes familiar with the new process for accessing ACRedit Plus.

For each facility there will be a section called "Additional Personnel." Because ACRedit Plus will be an interface through which confidential information will be shared, only personnel listed as either primary facility contacts or as Additional Personnel will be able to receive information from ACR staff via phone. Medical physicist personnel should be listed within the medical physicist section of a facility's personnel list. If your practice includes occasional or regular calls on behalf of clients or clinics submitting materials to ACR, we recommend working with them to be sure you're added to their personnel list.

Due to interaction between databases and IT systems, once ACRedit Plus launches, the TRIAD Windows Client will not be available for image upload in the current accreditation system. Submitting facilities that have not migrated to ACRedit Plus will need to use the TRIAD Web Client. ACR Accreditation and IT staff are working to create as little disruption as possible, and information on the process will be communicated directly to affected facilities and/or available at ACRaccreditation.org.

When users login to ACRedit Plus, they will immediately notice the updated dashboard. The dashboard is designed to allow the user to quickly see modalities up for renewal, pending tasks, and other information. The user can easily navigate directly to the pending tasks. I have included below a screenshot of the dashboard at the time of submitting this column (please note that the system is still in user acceptance testing, and some details in the screenshot may change before deployment):

Also important: Microsoft is retiring Internet Explorer, so users of ACR websites and platforms, including ACRedit and soon ACRedit+, should not expect the ACR platforms to be compatible with Internet Explorer going forward.

ROPA Announcement

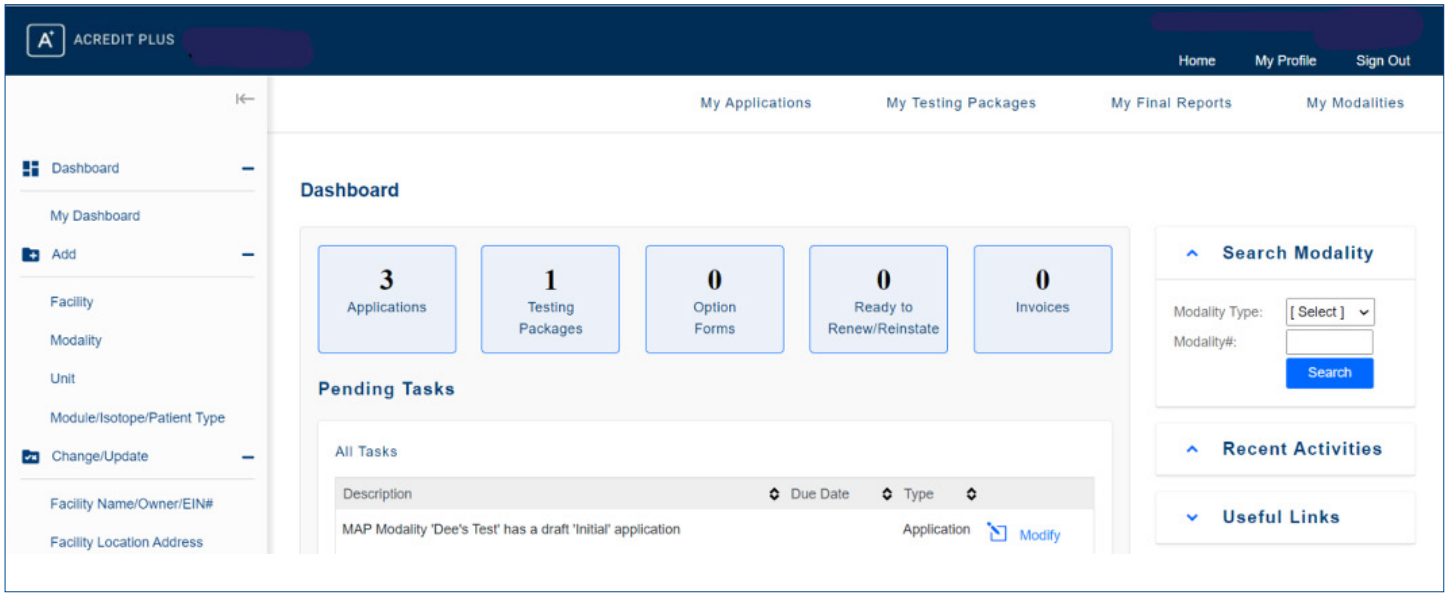
Due to COVID-19, the ACR Radiation Oncology Accreditation program is **only** performing virtual site surveys.

UPDATES FROM ACR HQ, Cont.

Please complete the following ***before submitting your application:***

- Start updating or gathering the Checklist information for the virtual survey found here: Pre-Virtual Site Survey Facility Checklist. This checklist will help you organize your data for the virtual review.
- Submit a Ticket with the completed Checklist through accreditation support

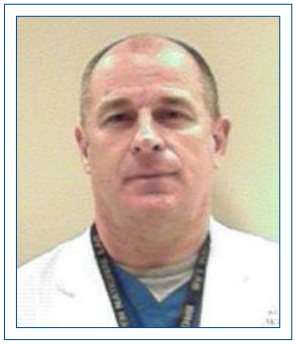
Once your application submission is complete, the virtual site survey must be scheduled within 90 days. ■



AAPM'S AND ASTRO'S RESPONSES TO THE NEED FOR STANDARDIZING RADIOPHARMACEUTICAL THERAPY TRAINING

ASTRO QUALITY IMPROVEMENT

B. Bednarz



R. Hobbs

In recent years, the medical community has seen a renaissance of radiopharmaceutical therapy (RPT) applications owing to the success of delivering highly selective drugs that can be labeled with both imaging and therapeutic isotopes into patients, a process that has been coined "theranostics." With the rapidly growing number of radiopharmaceuticals that have been approved for clinical use or that are in late-stage clinical trials, there is a call for medical physicists to play an important role in this burgeoning field in terms of both research and clinical service. To answer this call, the field must address training gaps that exist based on the current training curricula for radiation oncologists and qualified medical physicists (QMPs).

AAPM has defined a QMP as an individual who has earned a master's degree or doctoral degree in medical physics or equivalent disciplines from an accredited college or university and who has been granted certification in a specified subfield of medical physics by an appropriate national certifying body and abides by the certifying body's requirements for continuing education.[1] The roadmap for completing these requirements typically involves standardized didactic and clinical medical physics training beginning at the start of graduate school, extending through clinical residency training and culminating with fulfilling continuing education requirements. The typical curricula taken by QMPs throughout this roadmap are comprehensive and meet the requirements of the national certifying bodies for each medical physics subfield. One of the challenges with RPT is that it does not clearly fall under the exclusive purview of any of the existing medical physics subfields. Nuclear medicine professionals are familiar with the pharmacokinetics and imaging components of RPT, while radiation oncology is most familiar with the therapeutic aspect of RPT and the associated safety framework, including failure mode and error analyses and the precise balance between efficacy and safety.

As such, AAPM is committed to providing guidance and education to medical physicists from both sub-specialties (and others) and is working together with both ASTRO and SNMMI. These societies have recently been working to improve the training requirements for QMPs related to RPT. Another of the important challenges is that currently, only fixed activity or mass-based

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- Medical physicists play an important role in the burgeoning field of theranostics, in terms of both research and clinical service.
- The field must address training gaps in radiopharmaceutical therapies that exist based on the current training curricula for radiation oncologists and qualified medical physicists.
- AAPM, ASTRO, SNMMI and other organizations are working together to improve the training requirements for qualified medical physicists related to RPTs.

prescriptions are FDA-approved and available to the general public. Under these circumstances, the role of the physicist is reduced and limited to activity quantification verification in a dose calibrator and radiation safety concerns, a role that could conceivably be filled by other professionals, such as nuclear medicine technologists. However, ASTRO, SNMMI, IAEA, NCI, ICRU, and other concerned organizations all agree that personalized dosimetry-based treatment planning for RPT (PDRPT) is highly desirable and likely to become the norm for RPT treatment planning in the near future. This imaging and dosimetry-intensive process would require the direct involvement of QMPs. Many medical physicists currently perform dosimetry in their institutions, mostly for treatment validation or other retrospective studies. However, there is a clear lack of standardization of dosimetric processes, results, and programs that include didactic training rarely provide hands-on experience for RPT dosimetry. Due to the rapid foreseeable growth of RPT in the clinic over the next decade and the advanced technical skills related to PDRPT required to deliver these treatments, it is crucial that the current gaps in training be addressed.

In 2020, ASTRO published the consensus document "A Framework for Patient-Centered Pathways of Care for Radiopharmaceutical Therapy."[2] The document builds upon previously published practice parameters for RPT written jointly by the ACR, ACNM, ASTRO, and SNMMI to serve as a guide for physicians on how to provide appropriate care for patients.[3] The consensus document highlights the importance of enhanced coordination and collaboration among qualified personnel with diverse expertise in oncology care, image acquisition, image interpretation, quantitative imaging, dosimetry calculations, radiation quality assurance, and radiation safety. The document refers to this team of RPT expertise as the "cornerstone" of the framework for patient-centered RPT care. A QMP plays a pivotal role in providing expertise for many of the critical services outlined above, which are needed to successfully deliver RPT to people being treated for cancer.

ASTRO's Framework document has been a prominent companion piece to the ongoing Radiopharmaceutical Therapy Master Class that has been offered for the last three years at ASTRO's Annual Meeting. This intensive course has provided training on relevant aspects of physics, pharmacology and radiobiology, as well as offered logistical and practical training in clinical use of radiopharmaceuticals. This targeted education has focused on clinical indications, difficult cases, medical physics considerations, development of standard operating procedures for clinical implementation, billing and troubleshooting theranostics delivery though multidisciplinary presentations from experts from radiation oncology, nuclear medicine, medical oncology, and medical physics.

Manuscripts, working groups and master classes all contribute to standardizing and strengthening the safe and effective delivery of RPT, but cannot be performed in a silo. These tools must serve as complementary resources for structured formal training to address the current gaps. A working group was assembled by ASTRO with the goal to develop a framework for RPT curriculum development so that education leaders can integrate learning materials into existing resident education.[4] The framework covers training in radiation biology, medical physics and clinical radiation oncology and includes numerous reference materials to supplement resident training in RPT. While the framework addresses gaps in resident training, where QMPs often teach physics topics to residents, similar frameworks are needed for medical physics training beginning in graduate school education and covering all the way through continuing education to maintain board certification. Moreover, tools that enable safe and effective application of this training are needed in addition to the didactic materials, such as process flow charts with identification of potential sources of error (failure mode and error analysis), potential solutions, checklists and checkpoints with intermediate values, common database of standard images and dosimetry for validation and comparison.

All key stakeholders, including medical physicists, play an important role in establishing this framework. One of the primary charges of the newly formed AAPM Radiopharmaceutical Therapy Subcommittee (RPTSC) is to take an active role in the education of the community regarding RPT methodologies and clinical practice. Currently a number of new Task Groups (TG) and Working Groups (WG) have been created or proposed by RPTSC, including several on radiopharmaceutical-specific modalities (90Y microspheres dosimetry TG and MPPG,

ASTRO QUALITY IMPROVEMENT, Cont.

177Lu-based therapies TG, an I-131 WG), as well as a TG on activity quantification, standards in dose calibrators and traceability and SPECT/CT QA for RPT programs. The RPTSC has been selected to organize the 2023 AAPM Summer School on RPT. In addition, the RPTSC will soon be drafting recommendations to CAMPEP on how medical physics graduate programs can refine their curriculum to improve the training that students receive on RPT. AAPM has organized a specialty track at the 2022 AAPM Annual Meeting that includes nine scientific, educational, and professional sessions related to RPT and most of these sessions will be offering continuing education opportunities. RPTSC is also partnering with IROC and NCI to establish standards and metrics for RPT dosimetry with the goal of reducing variability in RPT dosimetry across sites.

ASTRO has regularly partnered with AAPM to advocate for and promote the delivery of high-quality, safe patient care. This can be seen through the Radiation Oncology – Incident Learning System (RO-ILS®) as well as the reliance on AAPM Task Group reports used in ASTRO's APEx – Accreditation Program for Excellence®. Importantly, it can also be seen through the joint advocacy from AAPM and ASTRO before the United States Nuclear Regulatory Commission ensuring access, safe delivery, and appropriate training and experience for radiopharmaceutical care. Guaranteeing standardized education in patient care, treatment planning, and delivery for RPT should also be included in that partnership. Both AAPM and ASTRO have taken a strong stance that the education and training of its members is imperative to ensure radiation can be delivered safely and effectively to patients. This stance should continue in the new era of RPT. ■

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SPECIAL INTEREST FEATURE: Women's Professional Subcommittee

#WEWHOCURIE GOES TO THE SMITHSONIAN

Jessica Fagerstrom, PhD, MEd | Northwest Medical Physics Center
JFagerstrom@nmpc.org | @PhysicsJess

The American Association for the Advancement of Science (AAAS) IF/THEN® Ambassadors program seeks to encourage more girls to pursue STEM fields by promoting real women in STEM as role models. Women in the program represent all types of professions, from entertainment to fashion, sports to academia. One major undertaking of IF/THEN® was to design and build the largest 3D-printing project of its kind, #IfThenSheCan – The Exhibit. This project was inspired by a 2016 study by the former Treasurer of the U.S. that found that the ten largest U.S. cities displayed fewer than a half-dozen statues of real women in public spaces. The #IfThenSheCan – The Exhibit features women within the IF/THEN® Ambassador program to change this narrative. Lyda Hill, founder of Lyda Hill Philanthropies, firmly believes that "*If* she can see it… *then* she can be it."

Seeing is believing: when a girl sees a woman successfully pursuing a STEM career (and having fun), she is more likely to imagine a STEM career for herself.

#WeWhoCurie was represented at the Smithsonian **Dr. Jessica Fagerstrom**. Dr. Fagerstrom was featured as one of 120 life-size 3D-printed statues, representing a wide-ranging coalition of women in science, technology, engineering, and mathematics (STEM). These statues are part of the "#IfThenSheCan – The Exhibit," which was on display in the Smithsonian gardens and in and around select Smithsonian museums March 5–27, 2022 in honor of Women's History Month. The exhibit is the largest collection of statues of women ever assembled and includes women from a variety of fields each holding a prop related to her career.

Jessica Fagerstrom was selected to join the IF/THEN Ambassadors as the medical physics representative in 2019. She had the opportunity to travel to Washington, DC in March to participate in the opening weekend engagement activities. She is active in AAPM groups focused on clinical and educational excellence and has enjoyed partnering with other medical physicists to develop original curricula introducing learners to careers in STEM (featuring, of course, medical physics as an example!).

Educators and other organizations hoping to incorporate more diverse STEM role models into their programming may be interested in the IF/THEN® Collection, a digital asset library of photos and custom content. The collection serves as a tool to increase the number of accurate and powerful images of real women and girls in STEM. The robust collection can be accessed by media, educators and non-profit institutions as they develop and share inspiring content and curricula.

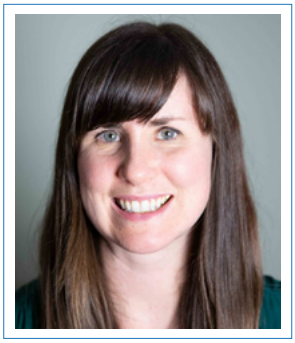
Clockwise from left: Medical physicist Jessica Fagerstrom, PhD, with her life-size 3D printed statue, each holding a radiotherapy treatment mask; A collection of statues before being placed in the Smithsonian gardens in Washington, DC Each woman is depicted holding a prop related to her career; At the opening weekend engagement activities March 5-6, 2022, visitors had the opportunity to talk to some of the women represented in the exhibit.

A complete list of Ambassadors can be found here. ■

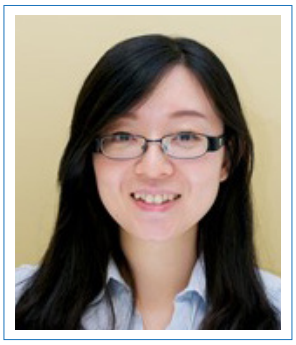
[1]https://empowerment2026.org/national-historic-american-women-statue-initiative/

FEATURED PHYSICIST: GRACE JIANAN GANG

Sandra Meyers, PhD | University of California, San Diego | smmeyers@health.ucsd.edu



S. Meyers



G. Jianan Gang

"I think for many women in STEM-related fields, there are sometimes voices of doubt from inside and outside. So trust yourself and trust that you can find many people who are there to support you and want to see you succeed."

Dr. Grace Jianan Gang *is an Assistant Research Professor in the field of medical imaging at Johns Hopkins University in Baltimore, Maryland. Her current research focuses on understanding deep learning algorithms for medical imaging to optimize their use in the clinic, designing a hybrid spectral CT system that can outperform current CT imaging, and standardizing radiomics features across imaging systems. She has been the recipient of numerous AAPM awards, including the John Laughlin Early-Career Scientist Award in 2022, Jack Fowler Young Investigator in 2018, Moses & Sylvia Greenfield Award in 2015, and Young Investigator Competition in 2013. Dr. Gang is the principal investigator on two R01 grants from the NIH and a Research Seed Funding grant from AAPM. She is originally from China, went to high school in Singapore, and received her Bachelor of Applied Sciences and PhD in Biomedical Engineering at the University of Toronto in Canada. She was a postdoctoral fellow and Research Associate at Johns Hopkins University before transitioning to full faculty there. She is an active member of AAPM, as a member of the Women's Professional Subcommittee, Task Group 238, a mentor in the DREAM program, and a prior SCAMP mentee.*

How did you decide to pursue a career in diagnostic medical physics?

It was actually kind of by accident. In my third year of undergrad, I was looking to find some summer research experience and there was a summer student program hosted by the Department of Medical Biophysics at the University of Toronto. I went to an information session and talked to some faculty, where I learned about this cool area called medical imaging. I spent the summer doing research which evaluated the performance of a prototype dual energy chest radiography system that was going through a clinical trial. It was a very fulfilling experience. I got to work with a team of really brilliant researchers and more importantly, I got to interact with patients, and that was really impactful for me. I went into biomedical engineering in the first place because I wanted to use my knowledge of physics and math to benefit patient care and seeing that happen in real life is just amazing.

You co-developed a unique undergraduate imaging course at Johns Hopkins with Dr. Webster Stayman. Can you tell me more about it?

The class is called "Build an Imager". Literally like the title suggests, the students get a kit with all the optical equipment they require to build a physical microscope. Then they can change different elements of it to see how it affects its imaging properties. During the pandemic, because in-person interactions were not possible, we developed this entire class around a remote-controlled microscope. Students could log in and use code to control different elements of an actual microscope, such as changing the aperture size. For this work, we received a teaching award called the Delta Award from the Provost Office at Johns Hopkins University to develop this technology further.

What aspects of your job do you find most rewarding?

As an engineer at heart, there's nothing more rewarding than getting something to work for the first time. I love solving problems and learning new things. People ask "What is your ideal career, if you didn't have to worry about making a living?" I think my answer to that is I just want to be a student and apply the knowledge I learn to do useful things! As a teacher, I get to witness a lot of "Eureka!" moments from students, and it's very rewarding to see the sparkle in their eyes when they understand something for the first time.

You were the recipient of numerous awards through AAPM – congratulations! If you had to describe the one or two single greatest things that contributed to your success in research, what would they be?

I genuinely enjoy doing research, but more importantly I have been very fortunate to work in many research groups with really great people. It's been a great work environment with a lot of exchange of ideas, fun day-to-day, and the level of creativity and motivation from faculty to students has just been incredibly inspiring and amazing. I would say that is the biggest contribution to my success in research, because research is a team sport. I don't think I could have done any of this by myself.

That leads nicely to my next question. Is there any mentor that played a key role in helping you become the scientist you are today?

There are many great mentors I have had throughout the years. My PhD advisor, **Dr. Jeff Siewerdsen**, who introduced me to medical imaging, is a great scientist and is extremely dedicated and passionate about research. My former postdoc advisor and now colleague, Dr. Webster Stayman, has a lot of great ideas and is really fun to work with. Watching him creating an environment where his students feel heard, feel like they're equal and supported, inspires me to do the same when I'm embarking on my professorship here. He is also very vocal about supporting diversity in imaging and academia in general. Another person I would like to mention is **Dr. Mike McNitt-Gray**, who I met through the AAPM SCAMP program. I was a mentee in the inaugural class of SCAMP and he was my mentor, and he was wonderful. Even though the official period of SCAMP is only one year, I asked him if he would continue to be my mentor if I bought him a beer at conferences. Come to think of it, I don't think I fulfilled my promise, so I probably owe him many beers!

If you could speak to your younger self (or any woman interested in pursuing a career in medical physics), what advice would you give?

Do it! Trust yourself! I think for many women in STEM-related fields, there are sometimes voices of doubt from inside and outside. So trust yourself and trust that you can find many people who are there to support you and want to see you succeed. I think medical physics is a really great community, and there are many smart, supportive and collaborative people to learn from and work with. I think it's a very rewarding, life-long career.

What do you like to do in your spare time, if you have any?

It's getting scarcer and scarcer for sure! I am a board game enthusiast, and I enjoy good food. Going to restaurants has been challenging, but I have been trying to cook more and try new recipes. I also like hiking. ■

WHAT BOOKS ARE WE READING?

Elisabeth Shanblatt, PhD | Siemens Healthineers | elisabeth.shanblatt@siemens-healthineers.com

Recommendations from the WPSC on books that have educated, inspired, and entertained us:

1. ***The Coach's Guide for Women Professors: Who Want a Successful Career and a Well-Balanced Life***
   by Rena Seltzer
   Recommended by Megan Lipford, PhD
   A mix of cited literature and real-world examples of how the advice was successfully followed, this book offers great strategies to overcome many challenges faced throughout any professional career.

2. ***Carbon Queen: The Remarkable Life of Nanoscience Pioneer Mildred Dresselhaus***
   by Maia Weinstock
   Recommended by Julianne Pollard-Larkin, PhD
   Description: for an excellent review of this book, check out the article in Nature.

3. ***A Promised Land***
   by Barack Obama
   Recommended by Julianne Pollard-Larkin, PhD
   Description: President Barack Obama's "A Promised Land" is a glimpse behind the scenes into his ascent as our first ever African American President of the United States. As someone who actually volunteered for his campaign in 2008 as an eager Biomedical Physics grad student at UCLA, this book is giving me life. His inner thoughts, motivations and each intricate detail of what he experienced as he took the highest office in the free world is laid bare in this expansive first volume of his memoirs. Enjoy it as a free behind the scenes glimpse of the White House and glean leadership skills too.

4. ***The Loudest Duck: Moving Beyond Diversity While Embracing Differences to Achieve Success at Work***
   by Laura Liswood
   Recommended by Marina (Ina) Sala MBA, PhD
   I enjoyed the simplicity of the book, yet it touches on very powerful tools that all of us should use to be inclusive and utilize inclusiveness as a powerful tool to improvement. My favorite quote is: "There's no such thing as a glass ceiling for women. It's just a thick layer of men"

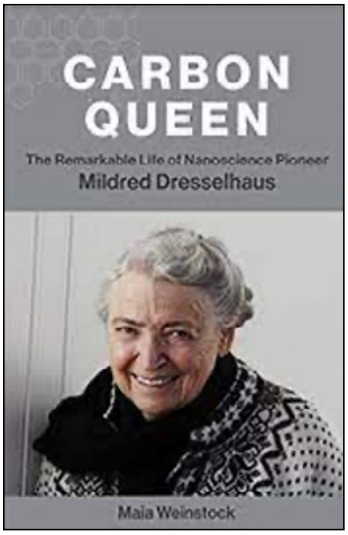
5. ***How You Say It***
   by Katherine D. Kinzler
   Recommended by Kristi Hendrickson PhD
   Fascinating look at bias and discrimination based on how you speak: your accent, comfort with the dominant language, etc. An important take away lesson for me was that hearing and listening skills are just as important as speaking skills in communication. We can all practice listening to different accents to become better at it.

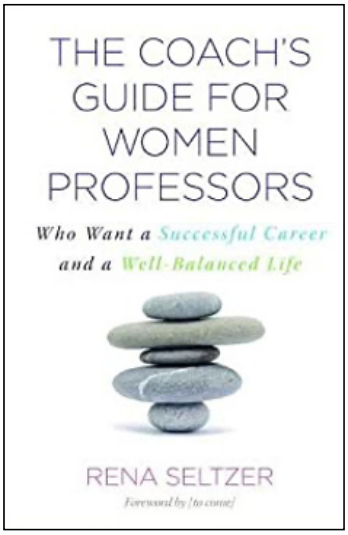
6. ***The Family Firm***
   by Emily Oster
   Recommended by Elisabeth Shanblatt, PhD
   Adding children into the mix of work-life balance brings immense joy, but also busyness, decision fatigue, and seemingly infinite logistical challenges. This book provides a helpful framework for making decisions and presents numerous data on important questions many parents face through the lens of economics and business.

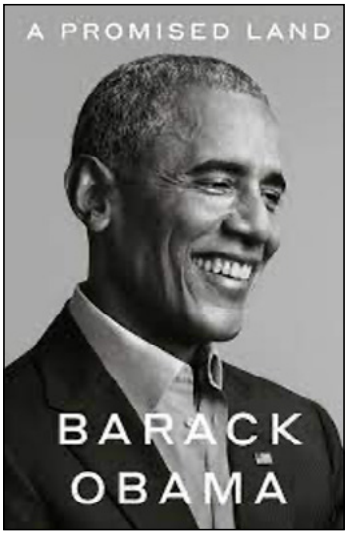
7. ***Educated***
   by Tara Westover
   Recommended by Irena Dragojevic, PhD
   "Everything I had worked for, all my years of study, had been to purchase for myself this one privilege: to see and experience more truths than those given to me by my father, and to use those truths to construct my own mind." This quote to me represents the essence of the book. Tara can't reconcile what she thinks about being a woman with what she had been taught women ought to be, being raised in an ultra-conservative household. She struggles with allowing herself to trust her own judgement and not feel any guilt about abandoning her upbringing.

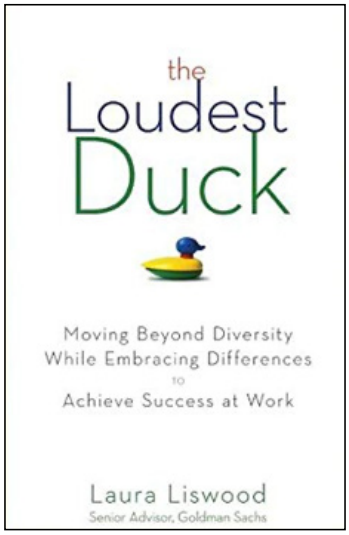
8. ***Born to Run***
   by Christopher McDougal
   Recommended by Irena Dragojevic, PhD
   "We've got a motto here-you're tougher than you think you are, and you can do more than you think you can." I loved this book because even though it's non-fiction it reads like an adventure! ■

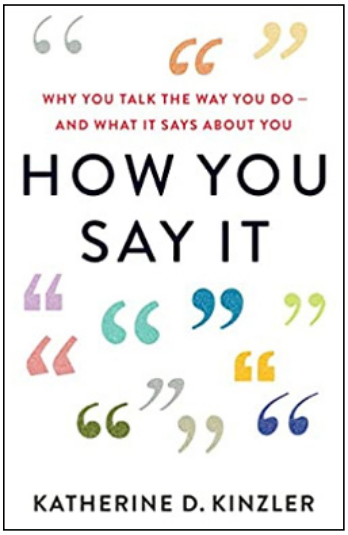
WHAT BOOKS ARE WE READING?, Cont.

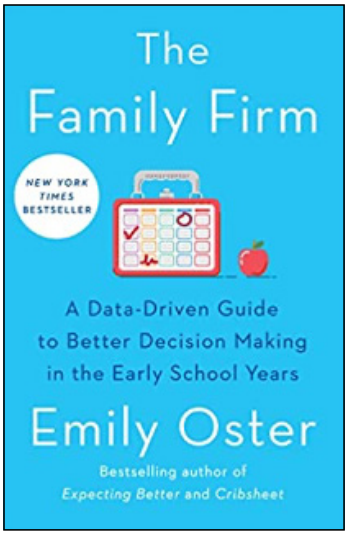


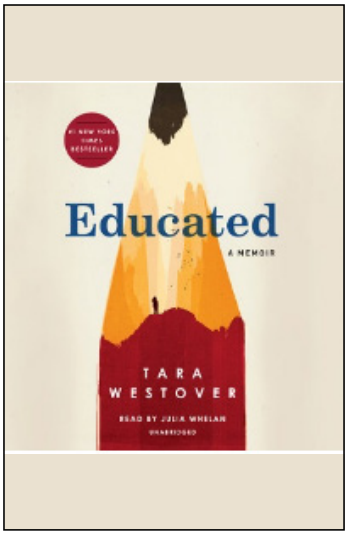


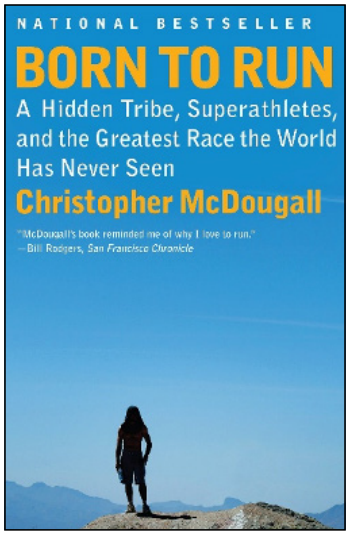












INTRODUCTION TO THE SEXUAL AND GENDER MINORITY SUBCOMMITTEE

Toni M. Roth, MS | Washington University School of Medicine in St. Louis
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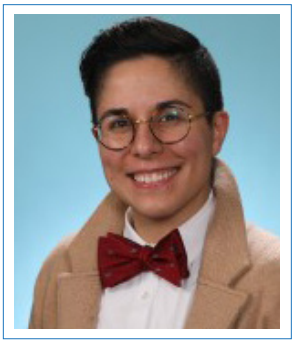

It is with tremendous pride that I have the honor to write about the newly formed Sexual and Gender Minority Subcommittee (SGMSC) of the American Association of Physicists in Medicine. As the inaugural Chair, I am humbled to be serving our medical physics community and fostering a sense of belonging for my fellow sexual and gender minority folks. Lending a voice to the needs of LGBTQIA+ people has always been of importance to me and yet I could not have imagined being in this position. I want to thank **Julianne Pollard-Larkin PhD** for her sponsorship and endless enthusiasm for Equity, Diversity, and Inclusion within AAPM. Without your sponsorship, I would not be the Chair of this subcommittee.

An appropriate introduction to the SGMSC requires an origin story. Ours begins back in 2019 at the Women's Luncheon of the AAPM Annual Meeting. It was towards the end of the Luncheon, where folks go the mic to ask questions, when **Jessica Vadas PhD** (She/Her) began to speak. She offered a raw and passionate portrayal of the struggles that the trans community faces in our society. As a member of the LGBTQIA+ community, I was deeply moved by her story and recognized that need to be heard and to feel seen. There are so many of us that have navigated our educational and professional lives wondering if our colleagues, mentors, or leadership would see us differently if we were allowed to express ourselves authentically. Whether it is our sexual orientation, gender identity, or gender expression, the fundamental freedom of expression and acceptance in the workplace affords us the greatest security and fulfillment of happiness. We cannot be our best selves in the workplace or provide the best care for our patients if we are not free to simply be who we are and be celebrated for it. After Jessica's brave speech, I was pulled to speak to her and let her know that she was not alone. That's when I had the pleasure of meeting **Toria S. Ainsworth MS** (she/they), and **Sunshine Osterman PhD** (she/her), who also rallied to support Jessica. It was there, at the Women's Luncheon, that we began to float ideas of an LGBTQIA+ group and felt this excitement and hope of new beginnings.

That ambition would lead us to hosting an AAPM After-Hours Social for LGBTQIA+ folks and allies in 2020 during the Annual Meeting. We went on to host an LGBTQIA+-centered AAPM SAMs session at the 2021 Annual Meeting, the first of its kind, and would create the Sexual and Gender Minority Subcommittee in November that year. It has been an honor and a privilege to work with Sunshine, Toria, and Jessica these past few years. We did it, fam!

I've put a lot of thought into writing this next portion and sharing aspects of my experience that have shaped who I am today and how I see the world. It's important to share because it should serve as an example of the impact we all can have in making the world a more equitable and inclusive space. I want to acknowledge that some of this may be hard to read and this is my trigger warning for those not ready or wanting to hear about suicide or suicidal ideation.

The statistics on the diminished mental health and wellbeing as well as the suicide rate for LGBTQIA+ children, adolescents, and adults as compared to their cisgender, heterosexual counterparts are striking. There's even greater disparity when factoring in socioeconomic status, race, and disability status. The way in which society views the LGBTQIA+ population and acts on these perceptions through the enactment of laws that limit the ability to equally participate in society, can create a toxic environment. When I was sixteen, I moved from south Florida to north Georgia and was getting ready for my junior year in high school. I had recently come out to my friends and family before moving and had thought it was safe to share that with someone I considered a friend, on my softball team. Unfortunately, this was not the case and I was ostracized from the team and at school. At the time, I didn't have the support I needed at home or adults in my corner at school. This went on for months and I fell into a depression. I wasn't accepted, I was constantly being told that I was "going to hell," and I started to believe I wasn't worthy of the long life that I hoped to live. I made a plan to end my life at the end of the week and I started to make arrangements for my departure. That same week, I met Sarah in gym class.

INTRODUCTION TO THE SEXUAL AND GENDER MINORITY SUBCOMMITTEE, Cont.

She was raised in a deeply religious household and I was the first gay person she had met. She showed me kindness when others wouldn't speak to me and we quickly became friends. She taught me that even in the most unlikely of places, there are good people who adjust their beliefs for what they know and understand to be right, to make room and space for the acceptance of others. Sarah saved my life almost sixteen years ago and she continues to be one of my very best friends today.

Everyone, regardless of race, sexual orientation, gender identity, disability status, etc. deserves to be accepted and included in society. For the allies of the LGBTQIA+ community, choose to be the Sarah of someone's story. You have the ability to make a tremendous, positive impact on our LGBTQIA+ students, trainees, colleagues, and patients. I challenge you to live and breathe in that advocacy. For my sexual and gender minority brothers, sisters, and siblings within AAPM, we see you and I promise you are worthy. The SGMSC is committed to making AAPM a safer, more informed, and inclusive space. It will take time and patience, but I promise we will get there. We are your community and we are not going anywhere. ■

"Sarah is second from the left. Sarah, thank you for our many years of friendship."

There are so many of us that have navigated our educational and professional lives wondering if our colleagues, mentors, or leadership would see us differently if we were allowed to express ourselves authentically. Whether it is our sexual orientation, gender identity, or gender expression, the fundamental freedom of expression and acceptance in the workplace affords us the greatest security and fulfillment of happiness. We cannot be our best selves in the workplace or provide the best care for our patients if we are not free to simply be who we are and be celebrated for it.

WOMEN: IT'S TIME TO LEAN IN!

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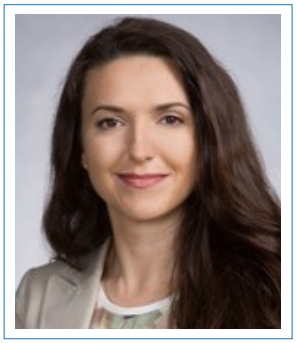

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AAPM physicist **Charlie Ma, PhD**, loves to quote the late John F. Kennedy, "in the Chinese language, the word 'crisis' is composed of two characters, one representing danger and the other, opportunity."[1] The current pandemic is indeed a crisis on several levels, but if addressed properly can be leveraged to be the perfect opportunity to lean in for employees of all backgrounds, especially women.

The pandemic has been devastating to our labor force: roughly 47.4 million Americans voluntarily left their jobs during the pandemic.[2] Many took part in what is being referred to as "The Great Resignation" in search of increased pay and benefits, flexibility, and more stability.[3] This period of resignation has been a crisis for women. At the start of 2022, there were 1.8 million fewer jobs for women compared to 2020.[4] According to the US Bureau of Labor Statistics' report, women lost 63% of jobs lost during the pandemic. [4]

A major reason why so many women have left work in droves is due to the pandemic's impact on reliable childcare and educational activities for families. Also, women are disproportionately working in roles that are more customer service related which were heavily affected by the pandemic. Notably, women in food service, hospitality and retail are still struggling to find work due to the significant number of layoffs in those sectors.[4] Not surprisingly, all these effects on joblessness were amplified for women of color and women with disabilities.

Despite all of this, there remains a silver lining. The current job market is rife with employers being more amenable to negotiations as they need to replace lost workers. The remaining women in the workforce see this pandemic as the perfect opportunity to advocate for themselves and negotiate the pay they feel they deserve. A Glassdoor survey shows that nearly 85% of working women believe they deserve a higher salary and 63% of working women in the survey feel that the Great Resignation is their time to negotiate their pay increase.[5]

This development is encouraging since, if carried out properly, it could help decrease the wage gap between men and women. Currently women earn about 82 cents to every dollar a White male earns; Black women earn 62 cents, Latina women earn 54 cents and Native American women earn 57 cents to each dollar a White man earns.[5]

The shortage of medical physicists has been a topic of discussion for a while now, even prior to the pandemic.[6] As cancer rates are increasing[7] there will be an increasing shortage of radiation oncologists and medical physicists. Research shows that 40% of women physicians go part-time or leave medicine within six years of completing their residencies. While there are various reasons for this including salary inequity, gender harassment, and gender bias, a large factor is work-family conflict early in women's careers and the challenges of re-entry into the workforce after having children.[8]

For a long time, social scientists have been warning about labor shortages due to declining birthrates, restrictive immigration policies, baby boomers retiring etc.[9] In addition, it is the quality of jobs not the quantity that is often the real issue: jobs with access to paid vacation, sick leave and family leave, reasonable pay, etc., are scarce.10 The pandemic has decreased the tolerance of workers for inadequate jobs and as a result, workers are demanding more and leaving when their expectations are not fulfilled. There is hope that this will result in an improvement for everyone in the workforce, and hopefully mitigate some of the factors that disproportionately affect women and minorities (e.g., access to affordable childcare, adequate family leave, etc.).

Predictions about labor shortages are no longer just theoretical. Just last month it was in the news that multiple medical physicists at Tom Baker Cancer Centre in Calgary suddenly resigned, which prompted multiple physicians to sound an alarm and question if the $1.4 billion dollar center will be able to open in 2023 as intended. The concern is that by losing several key physics personnel over a short time, critical institutional experience was lost and a decline

in the quality of patient care is predicted.[11]

Women medical physicists and employers need to take notice of this trend and act accordingly. All professional women reading this need to reassess their satisfaction with their position and consider what improvements they can negotiate and that would help them want to stay in their current role. Employers need to consider all the reasons why the Great Resignation resonates so well with Americans of all backgrounds and consider what effective changes they could implement into their workplaces.

Various surveys have shown that most workers who quit during the Great Resignation cited job flexibility and remote work as their top priorities. Workers also reported other side-benefits from working from home more: fewer instances of microaggressions and harassment, and more autonomy[12]. During the pandemic many physicists have been able to work at least part-time from home. In general, there has been more flexibility with how the job gets done. After experiencing this, many are reluctant to go back to pre-pandemic ways. Employers should consider being open to allowing greater flexibility and remote work to continue in the future, as these small changes would make the workplace more attractive to women (and everyone else) and help with their retention.

Another area of improvement is increasing career growth opportunities for women. Women in AAPM do not hold a percentage of leadership positions that reflect the share of their membership in AAPM.[13] It is probably not a large leap to conclude that the case is similar with the medical physics workforce in general. In addition, as AAPM salary surveys indicate, women on average do not get paid as well as men regardless of their degree or ABR certification status.[14] We need to see some changes in these areas if we are to motivate women to stay in medical physics. With the increased demand for medical physicists and a very limited supply, we must strive to retain women in our field.

Negotiation Tips!

Some tips of advice for women and employees feeling empowered to negotiate for increased salary and benefits due to the demand for medical physicists and highly skilled personnel:[15]

1. **Know your worth!**
   Research your industry's salaries
2. **Provide a range of salaries, not just one number.**
   Aim for 10–20% more than your current salary (adjust this value if you are aware that your current salary is below the market value, or if you are moving to a place that has a higher cost of living)
3. **Be persistent!**
   Ask to meet again to continue the conversation if you are turned down at the first meeting
4. **Look beyond money!**
   Negotiate for other benefits beyond pay (i.e., more flexible hours, equipment, research time, etc.)
5. **Check the climate!**
   a. Identify if the organization's work environment is supportive of you and your future advancement
   b. Pay attention to and note issues with equity, diversity and inclusion
   c. Determine through interviews and investigation if the climate of the work environment is right for you to thrive and if they have a track record of success for people from your background or people from an array of diverse backgrounds. ■

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AAPM'S WORKING GROUP FOR NON-CLINICAL PROFESSIONALS BRINGS TRAINEES AND PROFESSIONALS TOGETHER AT VIRTUAL CAREER EXPO (and Upcoming WGNC Events)

WORKING GROUP FOR NON-CLINICAL PROFESSIONALS REPORT

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On October 10, 2021 the AAPM Working Group for Non-Clinical Professionals (WGNC) held a virtual career expo featuring ten medical physics professionals working outside of the clinic to share their stories and career paths. Following opening remarks, these working professionals split off into five breakout rooms with the 30+ students and trainees in the session. Careers in regulatory science, academic research, industry research and development, as well as business administrators and entrepreneurs were all represented in the expo. As a graduate student participant, I enjoyed the opportunity to meet with medical physics professionals in diverse fields as well as other trainees preparing to transition into careers themselves. Amidst the Delta wave of the COVID-19 pandemic and uncertainty of future in-person professional networking events, the virtual expo was especially welcomed by all trainees involved. Below I summarize some lessons learned from various session breakout rooms.

Career Transitions are Possible

In my first breakout room I met **Young Lee**, Principal Medical Physicist at Elekta, and **Sharon Dye**, product manager at Elekta. Both physicists had past clinical experience and later transitioned to industry. They agreed that there is not a large barrier separating clinical and industry careers as the skills developed in clinical medical physics are broadly applicath inside the clinic and out.

Physicists Play Diverse roles in Medical Device Development

The next breakout room featured **Mark Holmes**, a quality assurance manager at Gammex Inc. Mark discussed his background as a PhD and experience in industry as a medical physicist. He explained the general design process of medical device development in industry and the role physicists play at each stage. While different companies formalize the process to different degrees, he found the general process applies to most organizations. The first stage of a new product starts with marketing level physicists who are closest to the clinic. These physicists combine their physics background to better articulate clinic requirements to downstream engineering teams. Before going to the design and production teams that implement the new product, intermediary engineer teams determine formal requirements including assessing the risk of the product to the patient and users, important for FDA clearance. The final stages of product development include customer support, where the

The Working Group for Non-Clinical Professionals is also hosting a professional session at the AAPM Annual Meeting in Washington, DC entitled "Excelling as a Medical Physicist Outside the Clinic." We have some great speakers lined up and more information will be available in the next newsletter. We will also be hosting a casual night out on Monday evening after the award ceremony. Contact a member of the WGNC for more details! We hope to see you at both!

customers are often physicists in the field. Mark's overview of the design process and opportunities for physicists to contribute was enlightening to me and the other students in the breakout room and led to lots of discussion.

Better Understanding the Business Behind Medical Device Startups

In the next room was Adam Uselmann, CTO and co-founder at Onlume, a company developing intra-procedural optical fluorescence imaging. Adam described the impact an entrepreneur bootcamp had on his career by better understanding the value of a sound business plan in the success of a medical device startup company. He then described his experiences applying for government Small Business Innovation Research (SBIR) grants which included sections on research strategy, problems to be addressed by the product, potential market size to benefit from the product, and how the technology is uniquely positioned to address the problems, including revenue potential.

Tools to support physicists

Meeting with Paul DeJean of Luca Medical Systems, which makes automated quality assurance hardware and software, he shared his passions in hardware and software and making the lives of medical physicists easier. He shared that working with medical physicists as customers is particularly rewarding because they are so knowledgeable of problems that need solving.

Starting a Company While Working as a Researcher

Brian Progue, professor and chair of Medical Physics at the University of Wisconsin and professor of engineering at Dartmouth, described his experiences of starting medical device companies (Quel Imaging and DoseOptics LLC) while keeping his job as an academic researcher through collaborations and pursuing SBIR grants. Different from the typical business world, scientists tend to invent interesting products and then find the niche market. SBIR grants enable scientists to keep their research positions while starting a company which can reduce some risk due to the unstable nature of early startups.

Research and Teaching at a Liberal Arts College

Another medical physics career path was introduced by **Heather Whitney**, a professor of physics at Wheaton College. In this session Heather described how she started a research program in computer-aided diagnosis at a small liberal arts college by joining a collaboration with the University of Chicago and an NIH R15 grant. The research program has been a success by combining access to clinical databases and colleagues at the University of Chicago to discuss ideas with. With these resources she and her undergraduate students can bring physics questions to investigate.

Regulatory Science at the FDA

Gabriela Rodal, a lead reviewer at the U.S. Food and Drug Administration's Division of Imaging, Diagnostics, and Software Reliability, reviews both pre-market and post-market radiation therapy devices and imaging software, including X-ray radiography, SPECT, and PET. Before being a lead reviewer, Gabriela did regulatory research at the FDA to better inform regulation of new medical devices including photon counting detectors and artificial intelligence applied to medical imaging.

Standards Research

Finally I met with **Malcolm McEwen** in the Ionizing Radiation Standards (IRS) Group at the Canadian National Research Council where he focused on developing measurement and dosimetry standards for ionizing radiation, therapy and protection. Malcolm advocated the large body of research in developing standards of measure and is well suited for researchers seeking to be more applied.

Conclusions

These were a few lessons gathered from breakout rooms I was able to take part in. I want to give a big thank you to all participants and organizers! Please follow the WGNC on Twitter (@AAPM_WGNC) and stay tuned for more events and opportunities to get involved! ■

PHOTON-COUNTING DETECTOR TECHNOLOGY ON THE VERGE OF REVOLUTIONIZING CT

RESEARCH SPOTLIGHT

Only eight years after the first scanner prototype arrived in the United States, photon-counting detector CT is poised to make a significant impact on medical imaging — so significant that some medical physicists believe it will become the standard for CT imaging within the next 10 to 20 years.

"All the major vendors are either already working on this or planning to work on this," says **Shuai Leng, PhD**, Professor of Medical Physics at Mayo Clinic in Rochester, MN. "In my opinion, it is going to gradually become the mainstream of CT imaging."

Dr. Leng has seen the development of photon-counting-detector CT (PCD-CT) firsthand. Siemens installed a prototype photon-counting detector CT scanner at Mayo in 2014, and Dr. Leng and colleagues Joel Fletcher, M.D., **Cynthia McCollough, PhD**, and others began scanning patients a year later. The technology advanced rapidly through algorithm development and improvements in electronics and detectors.

A second-generation scanner arrived at Mayo in 2020 and a third-generation scanner was installed in April 2021. On Sept. 30, 2021, the U.S. Food and Drug Administration (FDA) approved the third-generation version of the scanner, making it the first commercial PCD-CT available. In announcing the approval, Laurel Burk, PhD, assistant director of the Diagnostic X-ray Systems Team in the FDA's Center for Devices and Radiological Health, called NAEOTOM Alpha the first major new technology for CT imaging in nearly a decade. It's now available in more than 20 sites worldwide.

"It's exciting to see this take off," says Dr. Leng. "We are very lucky to be able to participate in the early stages of its development and watch it go from a prototype to a commercial product."

At first glance, a PCD-CT scanner resembles its conventional cousin, with a patient table set outside of a large ring. The key difference is found beneath the surface in the detectors. Conventional CT relies on a two-step conversion process in which a scintillator converts x-rays to visible light that a photodiode detects and converts to an electric signal. Photon-counting detectors, on the other hand, convert individual x-ray photons directly into an electric signal.[1]

"With photon-counting-detector CT, we've moved from scintillators to a direct detector," says Mats Danielsson, Professor and Head of the research division in medical imaging at KTH Royal Institute of Technology in Stockholm. "The semiconductor is basically a diode, which means you can decrease the pixel

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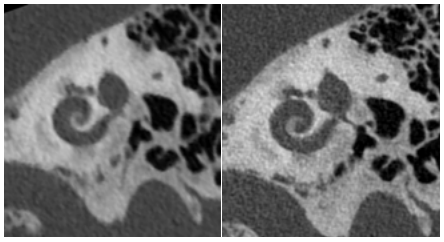
A photon-counting detector CT scanner (NAEOTON Alpha, Siemens Healthineers) installed in the CT Clinical Innovation Center at the Mayo Clinic in Rochester, MN.



Temporal images from the same patient show the spiral-shaped cochlea of the inner ear as depicted on a state-of-the-art CT scanner (left) and a photon-counting detector CT scanner (right).

size and increase the resolution, something that is difficult to do using scintillators."

This new detector technology enables improvements in spatial resolution by a factor of two or more, according to Dr. Leng. This enhancement allows visualization of much smaller structures in the human body, like the small blood vessels, bronchi of the lungs, the trabecular bones of the wrist and ankle, and the temporal bone of the skull.[2,3]

"When you put PCD-CT images side-by-side with those from a current scanner, the photon-counting images are so clear that the other images look very blurry," says Dr. Leng. "It's like comparing images from today's cellphone cameras with those from 10 years ago."

PCD-CT also offers better dose efficiency, meaning that image noise is lower at the same level of x-ray exposure than those of conventional CT scanners. Research on brain CT and low-dose lung cancer screening has shown advantages at a lower dose. A 2017 study comparing dose-reduced chest CT on 30 volunteers found that photon-counting CT had lower image noise, better diagnostic quality and better lung nodule contrast-to-noise ratio than conventional CT.[4]

"If you reduce radiation dose with conventional scanners, you reach a point where the images are just noise," says Dr. Danielsson. "With photon-counting CT, you can discriminate electronic noise and lower the radiation dose needed. There's even potential for super-low dose CT that would be useful for pediatric examinations and also for those examinations where the question can be answered with a low dose."

PCD-CT's ability to break down images to their constituent materials opens the possibility of using other contrast agents and reducing the amount of iodine contrast, an important consideration for imaging older patients with poor kidney function. Its energy-discriminating ability enables dual-energy or multi-energy acquisitions at a single x-ray tube potential.

"With multi-energy or spectral PCD-CT, the information from different energies is like a color TV instead of black and white," Dr. Leng said. "That helps us to differentiate things that look similar on regular CT.[5]"

PCD-CT also promises a decrease in artifacts like blooming and beam hardening that can compromise the images from a conventional CT scanner, especially in cardiac examinations. In a recent study from France, 14 participants underwent both coronary PCD-CT and conventional CT angiography. PCD-CT had diagnostic quality score improvement for all the coronary calcification cases and 92% of the stent cases. Radiologists observed dramatic image quality improvement of cardiac structures, like valves.[6]

With all these advantages, medical physicists expect PCD-CT to have a major impact in cardiology, musculoskeletal imaging, pediatrics, and oncology.

As clinical implementation ramps up, some significant questions remain. While Siemens' scanner relies on a cadmium telluride-based detector, GE Healthcare is developing a version with a detector that uses crystallized silicon similar to the material found in computer chips. The silicon-based detector can count hundreds of millions of CT photons per second, according to Dr. Danielsson, creating much sharper images than conventional CT.

"With silicon, we believe we're basically unlimited in terms of spatial resolution all the way down to 1 micrometer, which is the same as pathology today," he says.

A prototype of the scanner has been installed at the Karolinska University Hospital in Stockholm and several more are in the works. Dr. Danielsson and his colleagues are currently in the phase of finishing the software and acquiring clinical data to verify the scanner's functionality.

"Right now, it's a competition between those two materials, but it's only Siemens so far that has FDA approval," he says.

Regardless of which detector material ends up being favored, photon-counting-detector CT has arrived, with further industrialization expected to bring costs down and make the technology more accessible to providers and patients.

"As more of these scanners become available and images are being generated, there is more excitement," said Dr. Leng. "You only have to look at the pictures to see the benefit." ■

RESEARCH SPOTLIGHT, Cont.

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AAPM'S ONLINE REPOSITORY FOR TG-100 RESOURCES

UPDATE FROM THE WORK GROUP ON THE IMPLEMENTATION OF TG-100 (WG100)

Written on behalf of WG100

Are you aware that AAPM has a free online repository for TG-100 related resources? The Working Group on the Implementation of TG-100 (WG100) collaborated with AAPM's Information Services team to develop a system for submission, structured review, and moderated presentation of member-submitted content.

Access the TG-100 Repository here, which is the landing page for AAPM's Medical Physics Electronic Content. Once there, click on the "TG-100 Repository" link to enter.

Any AAPM member can submit any content they believe to be relevant and helpful for others in implementing the TG-100 recommendations for risk-informed quality management. The files should be in the native format for the intended use (eg. macro-enabled Excel templates, Word templates), but could also be illustrative information (eg. PDF documents or JPEG images). The system is built to facilitate and preserve any file format. After submission, a WG100 review panel will evaluate the submission for relevance and clarity, and may communicate with the submitter to ensure that the intended use is clear. We may suggest that a "How to use" document be uploaded, and/or a completed example to illustrate the intended use. Once the submission is approved, it will be posted on the Repository.

All posted content is accessible to everyone, including non-members. A simple categorization scheme should allow for easy navigation of posted content. The content will be accompanied by a brief description of its intended use. The submitter's identity will not be revealed to the users (to spare the submitter from potentially too many emails), but any user can post a question which will be reviewed by WG100 and we would facilitate a prompt response to the question, contacting the submitter offline as needed. Users may also post comments regarding any content, which will be visible to all users.

We hope that this Repository will help the medical physics community to share tools and tips for implementation of risk-informed quality management, and welcome your feedback. For general feedback about the Repository, please email the group at 2022.WG100@aapm.org, or contact me as WG100 Chair at Per.H.Halvorsen@Lahey.org. ■

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AAPM 2022
JULY 10–14 | WASHINGTON, DC
64TH ANNUAL MEETING & EXHIBITION

CELEBRATING MEDICAL PHYSICS
TRANSFORMING HUMAN HEALTH

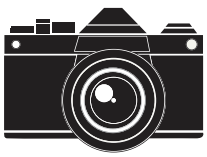
NEW MEMBER SYMPOSIUM

Tuesday, July 12, 2022 | 4:30–6:30 PM EDT
Room 102AB, Walter E. Washington Convention Center

As a new member of AAPM, it is easy to feel overwhelmed by the size and complexity of the association and to be unaware of the benefits and opportunities available to members. At this year's AAPM Annual Meeting in Washington, DC, we will host a New Member Symposium where you can learn more about the organization, member resources, opportunities to get involved, and about topics of particular interest to new professionals. We encourage you to take advantage of this great opportunity to learn valuable information and to grow your professional network.

Registered attendees will receive a raffle ticket. Enter to win a complimentary registration for the 2023 Annual Meeting in Houston, TX!

In addition, all new members who register for the Symposium will receive a drink ticket, good for one complimentary soda or beer served after the New Member Symposium during the social with committee chairs from four AAPM Councils: Science, Education, Professional and Administrative.



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aapm.me/annual

ELECTION TO FELLOWSHIP IN AAPM

REPORT FROM AWARDS AND HONORS

Written on behalf of the Awards and Honors Committee

Each year, AAPM announces the opportunity for the nomination of new AAPM Fellows. Fellowship in AAPM recognizes an individual's contributions through one or more of the following:

- Service to AAPM
- The advancement of medical physics knowledge based upon independent original research or product development
- Medical physics educational activities, especially regarding the education and training of medical physicists, medical students, medical residents, and allied health personnel
- Leadership in the practice of medical physics

The Award of Fellowship requires that a nominee has excelled in the category of service to AAPM and one or more of the other categories. As stated in the Rules of the Association, to be eligible for nomination:

- Individuals must have been Full or Emeritus Members of AAPM for at least ten years, including the two years immediately preceding their election to Fellow.
- There must have been no more than one interruption in membership.
- Members may be nominated one of two ways:
  - By any two Fellows, whose membership is in good standing. One Fellow will be considered the "nominator," and the other Fellow will be the "supporter."
  - By a Chapter of the Association, which requires the submission of a nomination letter signed by the President of the Chapter and a signed letter of support of the nomination by one Fellow whose membership is in good standing.

It should be noted that the length of membership is only one of several criteria considered by AAPM when selecting candidates for Fellowship. The Awards and Honors Committee (AH) carefully considers all of the nominee's accomplishments. It selects those who have reached an appropriate threshold based on a relative weighting and analysis of the candidates' proffered qualifications. The evaluation criteria and their relative importance are reviewed regularly and updated by the Committee to ensure that the weights assigned to different activities are appropriate and relevant. The Committee also assesses the proportion of Fellows among the entire membership and endeavors to maintain a consistent ratio with other professional societies. The Committee then forwards its recommendations to the AAPM Board of Directors for approval.

Gerald A. White, Jr., MS
Chair, Awards and Honors Committee
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REPORT FROM AWARDS AND HONORS, Cont.

The Committee reviews the nominations for Fellowship each year in the fall and selects candidates to receive this honor at the AAPM Annual Meeting the following summer. At the Awards Ceremony, each new Fellow is called to the stage and receives a plaque from the Association's President, while a brief description of their accomplishments is read. This honor is an important means of recognizing AAPM members who have distinguished themselves through their professional activities.

The individual Fellow or chapter making the nomination starts the process online, which creates a distinct web page for the nominee that is identified only by an ID number. The ID number is then used by the nominee and by members who are making or supporting the nomination. The Fellow or chapter making the nomination must submit a letter explaining why they believe the candidate should be considered for Fellowship. As described above, at least one other Fellow must submit a letter of recommendation. The letters should not reiterate the nominee's CV but should objectively explain how the nominee has distinguished themself and convincingly make a case for award of Fellowship by the Association.

Once a member has been nominated, the process requires that the nominee upload a CV and a brief biographical sketch. The nominee then will provide quite extensive information to support the nomination. The information falls into the categories mentioned above.

Under the heading of "Service to AAPM," the system will auto-populate current and past activities and positions from the nominees' AAPM profile that support the Association (including service to AAPM Chapters). Clearly, terms as an officer of the national organization or a chapter, a board member, or an annual meeting program director reflect a high degree of commitment to the Association. The AH Committee also considers individual appointments and membership or chairmanship of councils, committees, subcommittees, and task groups.

In the section for Research and Scholarly Contributions, the nominee describes service as PI of extramural grants, has published in peer-reviewed journals, has made oral or poster presentations, or has published proceedings papers, among other relevant activities.

The section on Teaching and Mentoring enables the nominee to describe the formal courses they've taught, lectures they've given at, for example, an AAPM Summer School, the number of PhD or MS students for whom they've served as supervisor, and served as a graduate or residency program director. Again, this is just a subset of the information that can be provided.

The application contains a section on Clinical Activities, enabling the nominee to describe exceptional accomplishments in the clinical practice of medical physics.

In a section labeled "Other," the nominee can describe their contributions to specialty certification boards, other societies relevant to medical physics, government advisory committees, and work in the commercial sector.

The biographical sketch and the letters making or supporting the nomination can provide further detail or explanation and describe the nominee's role in their clinical practice.

Election to Fellowship in AAPM signifies that the recipient has demonstrated excellence in leadership to the profession, service to the Association, research and scholarly works, or teaching and mentoring. Not all who are nominated in a given year will be selected for this honor. But members may be elected at a point in the future after they have added to their list of achievements. The award of Fellowship is a significant honor, and the AH Committee hopes that this article helps explain how the selections are made. ■

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

Congratulations

Congratulations to the Journal Paper Award Recipients for the year 2021!

JOURNAL OF APPLIED CLINICAL MEDICAL PHYSICS PAPER AWARD RECOMMENDATIONS

Edwin C. McCullough Award of Excellence for an Outstanding Medical Imaging Physics Article:

Toshimune Ito, Yohji Matsusaka, Masahisa Onoguchi, Hajime Ichikawa, Koichi Okuda, Takayuki Shibutani, Masaaki Shishido, and Kozo Sato

"Experimental evaluation of the GE NM/CT 870 CZT clinical SPECT system equipped with WEHR and MEHRS collimator." *J Appl Clin Med Phys* 2021; 22:2: 165–177.

George Starkschall Award of Excellence for an Outstanding Radiation Oncology Physics Article:

Amarjit Saini, Chris Tichacek, William Johansson, Gage Redler, Geoffrey Zhang, Eduardo G. Moros, Muqeem Qayyum, and Vladimir Feygelman

"Unlocking a closed system: dosimetric commissioning of a ring gantry linear accelerator in a multivendor environment."
J Appl Clin Med Phys 2021; 22:2: 21–34.

Peter R. Almond Award of Excellence for an Outstanding Radiation Measurements Article:

Luis Muñoz, Tomas Kron, Marco Petasecca, Joseph Bucci, Michael Jackson, Peter Metcalfe, Anatoly B. Rosenfeld, and Giordano Biasi

"Consistency of small-field dosimetry, on and off axis, in beam-matched linacs used for stereotactic radiosurgery." *J Appl Clin Med Phys* 2021; 22:2:185–193.

Michael D. Mills Editor in Chief Award of Excellence for an Outstanding General Medical Physics Article:

Kai Huang, Dong Joo Rhee, Rachel Ger, Rick Layman, Jinzhong Yang, Carlos E. Cardenas, and Laurence E. Court

"Impact of slice thickness, pixel size, and CT dose on the performance of automatic contouring algorithms." *J Appl Clin Med Phys* 2021; 22:5: 168–174.

MEDICAL PHYSICS JOURNAL PAPER AWARD RECOMMENDATIONS

Farrington Daniels Award *(awarded for an outstanding paper on radiation therapy dosimetry, planning or delivery)*

Athena Evalour Simbahon Paz, Kilian-Simon Baumann, Uli Andreas Weber, Matthias Witt, Klemens Zink, Marco Durante, and Christian Graeff

"Compensating for beam modulation due to microscopic lung heterogeneities in carbon ion therapy treatment planning." *Medical Physics* 2021; 48: 8052-8061.

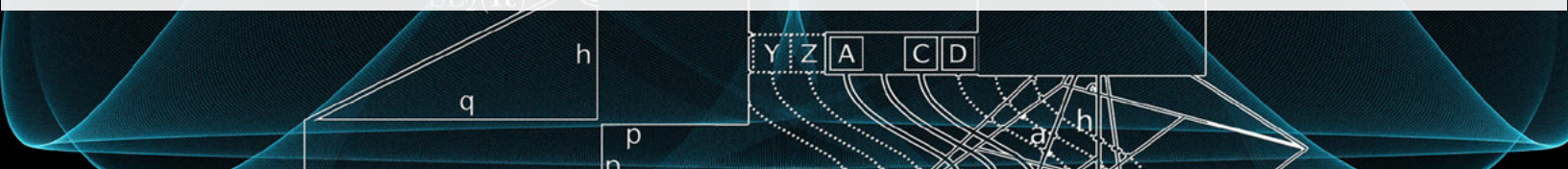
Moses & Sylvia Sorkin Greenfield Award *(awarded for an outstanding paper on imaging)*

Elias Eulig, Joscha Maier, Michael Knaup, N. Robert Bennett, Klaus Hörndler, Adam S. Wang, and Marc Kachelrieß

"Deep learning-based reconstruction of interventional tools and devices from four X-ray projections for tomographic interventional guidance." *Medical Physics* 2021; 48: 5837-5850.

JOURNAL OF APPLIED CLINICAL MEDICAL PHYSICS

MEDICAL PHYSICS
The International Journal of Medical Physics Research and Practice



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ROBERT PIZZUTIELLO NAMED AIC TREASURER

PERSON IN THE NEWS

The Intersocietal Accreditation Commission (IAC) is a nonprofit, nationally recognized accrediting organization with a mission to advance the appropriate utilization, standardization and quality of diagnostic imaging and intervention-based procedures. Founded by medical professionals, the IAC has a 30-year history of offering medical accreditation to facilities within the US and Canada, ranging from private offices to clinics and hospitals. The IAC is independent of any one membership organization and instead collaborates with many sponsoring organizations to enable each specialty to have input on the accreditation process. Representatives from these specialties provide their expertise as members of the IAC division board or by serving on the IAC Board of Directors.

The newly elected officers on the IAC Board of Directors recently started their terms, and AAPM is pleased to recognize AAPM representative **Robert Pizzutiello Jr., MS, FAAPM, FACR, FACMP** who was elected to serve as Treasurer on the IAC Board of Directors and is also the Immediate Past President on the IAC CT Board of Directors. Mr. Pizzutiello is a Licensed Professional Medical Physicist in New York State in diagnostic imaging, nuclear imaging, and medical health physics. He is the founder of Upstate Medical Physics, one of the largest private practice diagnostic medical physics groups in the Northeastern US. With more than 35 years of experience in the field, he has served as a consultant to major imaging manufacturers and contributed to many reports and committees within AAPM. To hear directly from Mr. Pizzutiello, check out his AAPM History Interview from 2016 in the AAPM History & Heritage library. AAPM congratulates Mr. Pizzutiello and thanks him for his substantial contributions to the IAC and in many other capacities! ■

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