AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

IMPROVING HEALTH
THROUGH MEDICAL PHYSICS

AAPM NEWSLETTER

July/August 2021 | Volume 46, No. 4

IN THIS ISSUE:

COVID-19 UPDATE

Notice as of Sunday, June 27, 2021, 9AM Eastern Time.

- COVID-19 Information for Medical Physicists
- Beginning August 1, AAPM will allow 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 be pre-approved by EXCOM and 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

Please e-mail submissions
(with pictures when possible) to:
newsletter@aapm.org
AAPM Headquarters
Attn: Nancy Vazquez

PUBLISHING SCHEDULE

The AAPM Newsletter is produced bi-monthly.
Next issue: September/October 2021
Submission Deadline: August 6, 2021
Posted Online: Week of August 30, 2021

CONNECT WITH US!

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.

AAPM 2021

JULY 25–29 | VIRTUAL

63RD ANNUAL MEETING & EXHIBITION

CREATIVE SCIENCE.
ADVANCING MEDICINE.

PRESIDENT'S SYMPOSIUM

The Importance of Creativity in Science

Monday, July 26 | 1:00–3:00 pm ET (GMT-4)

Join *AAPM President, James Dobbins*, for his President's Symposium that will explore the history of creativity in the sciences and the importance of cultivating this essential human endeavor as we craft the future of medical physics.

Our keynote speaker, ***Bruce Tromberg, PhD***, Director of the National Institute of Biomedical Imaging and Bioengineering (NIBIB) at NIH will then describe areas in which he sees the greatest need for creativity in the application of physics and engineering to medicine today. He will describe some of the key areas that NIH views as essential drivers of medical advances and where creativity is needed in our discipline of medical physics. We will conclude our Symposium with a panel discussion among several of our distinguished colleagues who have embodied the best of creativity in their careers to create new areas of biomedical science, and will explore how they cultivated creativity in their work. We will also ask them to address those things that we should be doing as a community to ensure that we promote the creativity that will be needed to create our future.

Where exactly will medical physics go in the coming decades? We can anticipate that it might involve new emphases on big data, machine learning, and molecular diagnostics and therapeutics, as examples, and will involve increasing collaboration with our colleagues in other disciplines. While we may not know the exact form this future will take, we can be assured that it will take creativity to get us there. It is our hope that you will leave this Symposium inspired to bring your creative spark to this important effort.

https://aapm.me/2021PresidentsSymposium

EXPLORING OUR FUTURE AT THE UPCOMING ANNUAL MEETING: "CREATIVE SCIENCE. ADVANCING MEDICINE."

PRESIDENT'S REPORT James T. Dobbins III, PhD | Duke University Medical Center

Summer is upon us. As we look forward to the longer days and warmer weather ahead, we can pause and think of the things that this new season represents. For those in educational programs, another year of study has come to a successful conclusion. Some of you have completed your study and moved on to residencies, PhD programs, or a new job. For our graduates, this time of year represents the excitement of new beginnings.

This new season also represents a glimmer of hope that the worst of the pandemic is behind us as an increasing number around the world are now fully vaccinated. This year has been difficult in many ways, with many of us facing the challenge of either clinical work in a stressful environment or the strange cadence and isolation of work-from-home with the need to handle virtual schooling for children as well as our jobs. And of course, many have experienced illness or have lost someone close to them, and this year has been immeasurably hard for them. This has been a tough year overall and I am thankful for the hope that we can perhaps return to a greater degree of normalcy this summer.

Summertime also means that the Annual Meeting will soon be here. I want to share a few exciting things that will take place at this summer's meeting.

The theme of this year's meeting is "Creative Science. Advancing Medicine." This theme was chosen to highlight the important role that we as physicists have played in inventing and developing much of modern medicine over the past decades, and also the challenge of finding the new ways in which physics will significantly impact medicine in the future. Medicine is undergoing significant changes as it becomes more personalized, prospective, molecular, and data-driven. These are all important and substantial changes, with exciting possibilities for improved diagnostics and therapeutics. It will be important for us to find the best way for physics to continue to lead in this new environment. Finding new areas of impact will require that we as a field embrace the creativity that has characterized us over the past century, though in new and expanding ways.

The theme of this year's President's Symposium is "The importance of creativity in science," which builds on this idea of finding our new path. **Bruce Tromberg, PhD**, Director of the National Institute of Biomedical Imaging and Bioengineering (NIBIB) will be our keynote speaker, and he will explore ways in which creativity will be needed in the era of new medicine, and will discuss areas in which NIH sees the greatest opportunity for creative science. We will

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PRESIDENT'S REPORT, Cont.

follow his keynote address with a panel discussion among six of our most innovative colleagues to explore how they have embraced creativity in their own careers. We will also have an evening workshop session open to AAPM members where you can come and brainstorm together about areas of science that you see as important to our future. I hope that you leave the Symposium this year inspired to use your own creativity in new and interesting ways.

The Annual Meeting Subcommittee has done extraordinary work in putting together a valuable program for this summer's meeting. We will again be completely virtual due to the pandemic, and while that means that we will again miss the chance to network in person, the virtual format will bring opportunities for a broader audience to attend our meeting. Likewise, the virtual nature of the meeting means that you can view sessions both in real time and asynchronously, enabling you to view multiple sessions that occur concurrently. There will be interactive ePoster sessions and numerous SAM sessions. The Ultrasound Specialty Track is back, and of course there will be the Early-Career Investigator Symposium, which is always popular. There will be timely sessions on equity, diversity, and inclusion, as well as a professional session on global outreach: "Increasing the Contribution of Radiology and Imaging Physics to Global Health Initiatives."

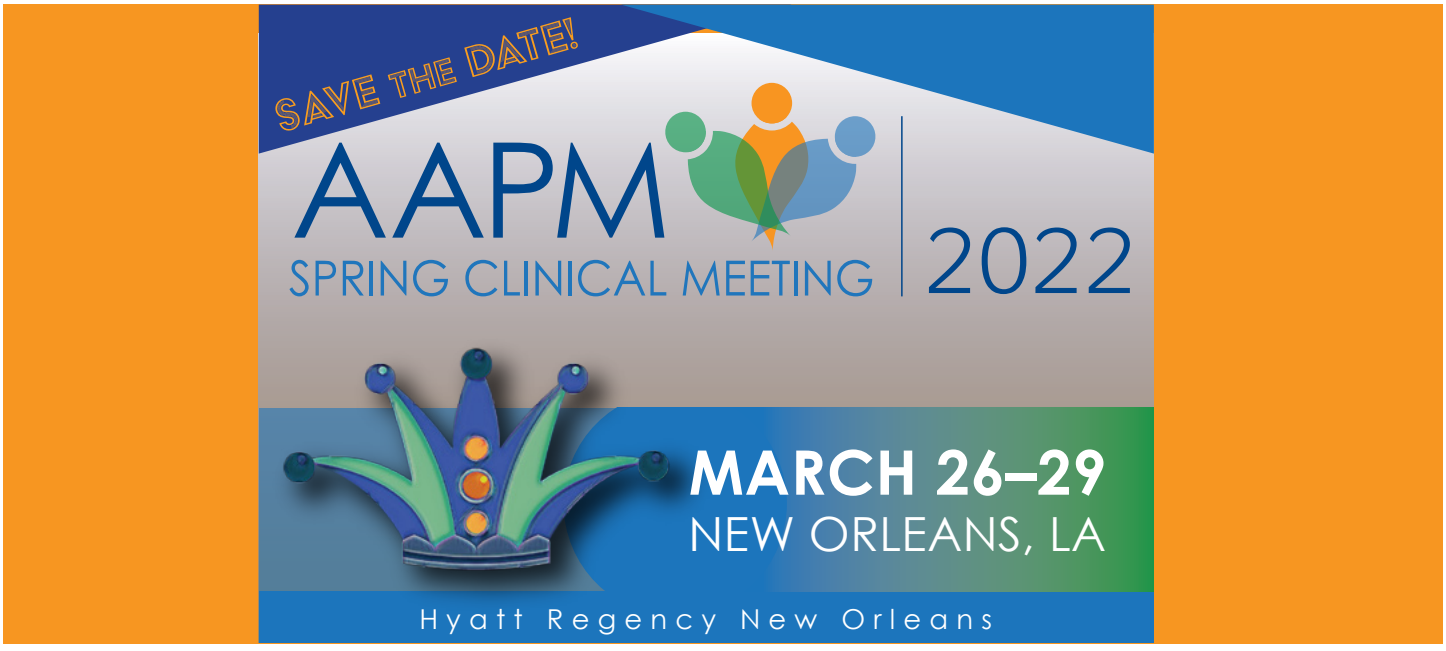
There will also be vendor showcase presentations in a dedicated track with content available on-demand. I encourage you to take advantage of these opportunities to engage with our many vendor partners to see the latest technology solutions.

While this year has been difficult in many ways, I am encouraged to see how many of you have risen to the challenge in the ways you have served your communities, both at work and in your private lives. We have many exciting opportunities ahead for us as medical physicists, especially as we embrace our scientific creativity, and I am eager to see how our members will create new and valuable arenas of medicine for our patients.

I hope that you will be able to enjoy a bit of downtime this summer as well, so that you can perhaps catch your breath, recharge, prepare for the year ahead, and reflect on the year just past. I look forward to seeing you — virtually — in a few weeks at our annual meeting, and hopefully in person in the not-too-distant future.

All the best,

Jim Dobbins
President ■



WHAT IS EXCESS BUDGET INCREASED EQUITY PORTFOLIO (EBIEP)?

TREASURER'S REPORT Mahadevappa Mahesh, PhD | Johns Hopkins University

In my last Newsletter report, I collaborated with AAPM's Audit Committee Chair **Sebastien Gros** to introduce you to Enterprise Risk Management (ERM).

When we hear the term Enterprise **Risk** Management, one immediately thinks of reducing or eliminating "bad" things from happening. For instance, we carry automobile insurance on our vehicles to mitigate our exposure if we are involved in an automobile accident. While we may not think of it this way, this is an example of applying ERM in our personal lives. We carry the insurance to lower the risk of paying a large amount of money to repair our vehicle, or someone else's in the event of an accident.

However, ERM is about eliminating or mitigating the chances of bad things happening and positioning oneself to take full advantage of available opportunities. For AAPM, that means identifying potential streams of revenue and maximizing existing streams of income within acceptable risk tolerance levels.

Shortly after becoming Treasurer of AAPM, I noticed that AAPM had a very solid yet conservative investment strategy. This strategy has served the association well in both good times and bad. While it hasn't provided AAPM with a 30% return, it has kept us from the -25% returns. While evaluating this strategy, I knew it wasn't time to recommend wholesale changes to this strategy. However, I wondered if we should take a slightly more aggressive approach while still maintaining our overall investment strategy.

The business world is full of stories of those who attempted to circumvent sound investment strategies by investing in questionable investment vehicles and paid the price. To be clear, my recommendation was very sound and was within the risk tolerance established by the Board of Directors.

In 2017, I made a recommendation to the Investment Advisory Committee that AAPM consider transferring $3M from our present investment reserves to another investment vehicle. After careful consideration, the Investment Advisory Committee recommended — and in the summer of 2019, the BRD approved — a transfer of $2M to an Excess Budget Increased Equity Portfolio (EBIEP) Fund.

AAPM's existing investment reserve portfolio maintains an equity/bond ratio of 60/40. The EBIEP fund, while supporting the same overall investment strategy, has a slightly higher equity ratio of 80/20.

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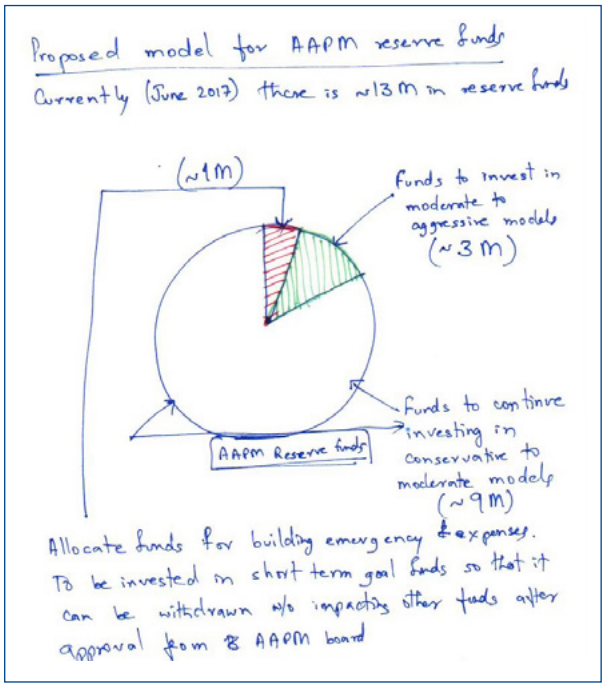
I would like to thank Robert McKoy **for his help with the subject matter. Please feel free to reach out to me (**email **me, call me at 410-955-5115, or** tweet **me) if you have any questions concerning this report.**



To properly evaluate the new fund, we need to allow for the proper passage of time. Short-term fluctuations in the market can skew results, so the funds need to sit in the account for at least five years. Secondly, funds in this account need to remain stable. In other words, transfers out of this fund should not be made unless necessary. Any required transfers for operations should be made from the Operating Reserves Fund.

After the BRD approved the transfer in July 2019, the transfer was made early in the fourth quarter of 2019.

Of course, shortly after making the transfer, a global pandemic strikes. We experienced perhaps one of the most significant market drops in the first quarter of 2020; despite the impact of this, early returns are very promising.

Recently, based upon these very positive early results, I recommended that the investment advisory committee consider an additional transfer to the EBIEP fund. After careful consideration, the investment advisory committee recommended, and the BRD approved, another $1.5M transfer in April 2021. ■

AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE

WORKING GROUP ON GRAND CHALLENGES

2021 Call for Grand Challenge Proposals

The AAPM Working Group on Grand Challenges (WGGC) is charged with promoting the conduct of Grand Challenges designed to assess or improve the use of medical imaging in diagnostic and/or therapeutic applications. The WGGC is now accepting proposals from groups that wish to host a Challenge in advance of the 2022 Annual Meeting. The WGGC will identify up to two proposals that merit sponsorship and assist the organizing groups to move forward with the Challenges. The timeline for a proposed Challenge should allow for the conduct and conclusion of the Challenge in time for presentation at the 2022 Annual Meeting. More information and the proposal application can be found here.

Please e-mail proposals to Emily Townley by 5:00 PM EDT on Friday, July 30, 2021.

#AAPM2021

EXECUTIVE DIRECTOR'S REPORT Angela R. Keyser | AAPM

#AAPM2021 — 63rd AAPM Annual Meeting and Technical Exhibition

Creative Science. Advancing Medicine.

Starting in 2021, meeting content will be available only to Meeting Registrants for one year following the meeting regardless of AAPM membership status.

Registrants

After the meeting, Registrants will continue to have post-meeting access to the meeting content via the AAPM website as a benefit of their meeting registration.

Earn your credits the easy way…..

For designated content, Registrants are eligible to receive continuing education credit (e.g., CAMPEP MPCEC hours, MDCB, and ASRT Category A credits) and self-assessment modules (SAM) during the meeting and for six weeks following via the meeting online evaluation system. The online evaluation system will close at 11:59 PM ET, Friday, September 10, 2021. Credits will be posted by September 16.

Registrants are strongly encouraged to use the online evaluation system process to greatly simplify earning your credits.

Continue to earn credits, but passing a quiz now required….

After six weeks, the content will move out of the meeting platform to the AAPM website. Registrants can then continue earning medical physics continuing education credits (MPCEC) and self-assessment modules (SAM).

During this phase, to successfully earn MPCEC or SA-CE, a registrant:

- must correctly answer quiz questions; 100% pass rate.
- cannot attempt the same quiz in the same 24-hour block; you must wait a day before attempting the same quiz.

Non-Registrants

Starting in 2021, Non-Registrants, regardless of AAPM membership status, will be able to access the meeting content after an interval of time via the AAPM website.

- AAPM members will gain access through the AAPM Virtual Library **one year** after the meeting.
- Non-members will gain access **two years** after the meeting.

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AAPM 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.

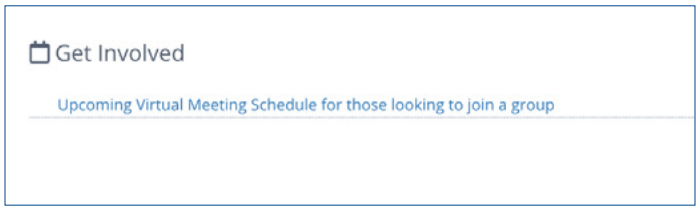
Want access to 2021 meeting content earlier?

Both AAPM members and non-members may purchase Post-Meeting Access six weeks following the meeting to access meeting content on the AAPM website.

With the purchase of Post-Meeting Access, both AAPM members and non-members are eligible to earn self-assessment modules (SAM) through successful quiz completion as described above.

AAPM Groups Continuing to do Good Work….Virtually

AAPM groups are meeting remotely, many of them on a regular basis. At a face-to-face meeting, we had a handy Committee Schedule that listed the dates, times, and locations of the groups meeting in conjunction with the event. Finding out when the virtual meetings are happening in the past was not easy to do. HQ has created an Upcoming Virtual Meeting Schedule that is posted



on the main webpage. Interested in joining an AAPM Group? Review the schedule, find something that you are interested in, and then plan to attend the group's meeting. It's also helpful to email the Chair of the group noting your interest and background. After the meeting, if you would like to know more, ask the Chair if you can be added as a guest. This will allow you to participate in online discussions and remote meetings.

2021 AAPM Annual Business Meeting

The **2021 Annual Business Meeting** will be held virtually on Wednesday, July 28, from 6:15 pm–7:30 pm ET. Historically, members could only participate in this event as part of the Annual Meeting each year. AAPM's President **James Dobbins** and Treasurer **Mahadevappa Mahesh** will report on the status of the organization. The meeting will be open to all AAPM members, not just those registered for the Annual Meeting. The meeting will be held using Zoom and will require a quick registration to attend. More details on how to register for this meeting will follow.

Staff News

I am pleased to announce the marriage of **Rachel Smiroldo**, AAPM's Exhibits Manager, to Brian York on May 22. In this world of uncertainty regarding events, it is so encouraging to know that people are able to celebrate such wonderful occasions. We wish Mr. and Mrs. York many years of wedded bliss!

The AAPM Meetings and Programs team will be undergoing a reorganization in the next six to seven months. It is with much emotion that I announce **Lisa Rose Sullivan**'s plans to retire at the end of 2021, after 28+ years of dedicated and stellar service to AAPM. Added to this loss, **Karen MacFarland** needs to reduce her work responsibilities beginning in August 2021. These changes will create quite a void on the team that will be a challenge to try to fill. The meetings and programs team has undoubtedly flourished under Lisa's leadership. Much of the team's success can also be attributed to Karen's exceptional skills, focused determination, and "can do" attitude when faced with any challenge over the past 18 years.

Reorganization Plan:

Beginning August 1, Karen MacFarland will move to a new "Meetings and Programs Manager" position, working on a reduced work schedule. In this new role, she will oversee the grants and fellowships programs, the Review Courses, organizing AAPM's growing webinar program, and providing meeting planning support for any specialty meetings not requiring on-site staff support/travel. I am very thankful to support Karen in this needed transition and retain Karen as a valuable member of the AAPM HQ team!

Mariana Gallo joined the team on June 21, transitioning in as the Director, Meetings, and Programs as Lisa Rose Sullivan prepares for retirement. Many of the team know Mariana well as she was our point of contact with IMN Solutions, our previous 3rd party consulting firm assisting with meeting site selection and contract negotiation. Mariana actually negotiated many of the existing meeting contracts during her IMN days! I am confident that she will be an excellent fit with the team! The thought of not having Lisa as part of the team is made "bearable" because of my confidence in Mariana.

EXECUTIVE DIRECTOR'S REPORT, Cont.

The silver lining in all this change is the exciting news for two of our team members. **Jordan Kehrt** was recently promoted to the position of "Meetings and Programs Manager" and will serve as point person for Annual Meeting and Summer School logistics as well as specialty meetings as assigned. And to round out the reorganization, on August 1, **Jackie Ogburn** will be promoted to "Senior Education Manager," serving as staff liaison providing increased support to the Education Council. I know that you join me in congratulating both Jordan and Jackie as they transition into these restructured positions.

When I announced this to the team, I ended by acknowledging that change is hard. And, we've all experienced so much change in both our professional and personal lives in the past 15+ months. But, I have every confidence that the AAPM volunteers and HQ team have what it takes! ■

Staff Recognition

I firmly believe that part of the success of AAPM HQ operations is our ability to attract and retain an excellent team of high-performing association management professionals. The resiliency of the team over the past 15+ months, working remotely, harder than ever, is just so impressive. The HQ Team remains dedicated to serving you, the AAPM membership. The following AAPM team members celebrated an AAPM anniversary in the first half of 2021. I want to thank the entire team and acknowledge these milestones publicly.

Nancy Vazquez	25 years of service	Melissa Liverpool	10 years of service
Zailu Gao	20 years of service	Rachel York	10 years of service
Jennifer Hudson	18 years of service	Richard Martin	7 years of service
Karen MacFarland	18 years of service	Robert McKoy	7 years of service
Lisa Schober	16 years of service	Jill Moton	4 years of service
Laurie Madden	14 years of service	Ashley Zhu	4 years of service
Viv Dennis	11 years of service	Erin Cox	1 year of service

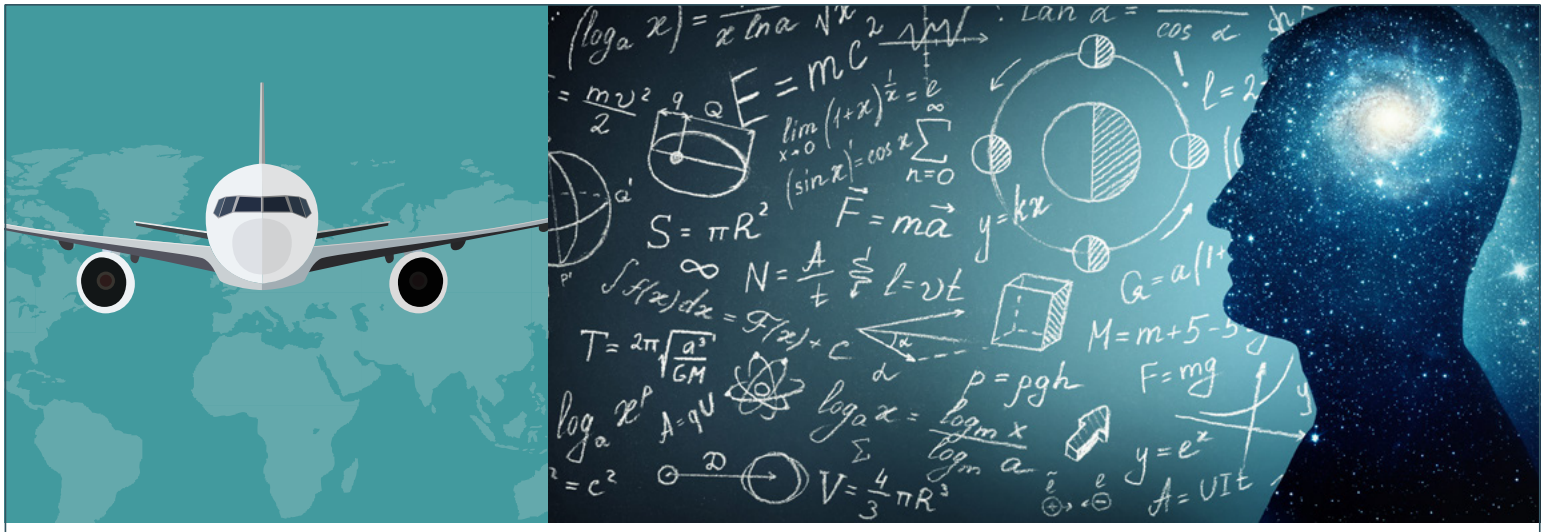
OUR CONDOLENCES

Daryoush Bagheri, PhD

Laszlo Berkovits, MS

Our deepest sympathies go out to the families. 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: 2021.aapm@aapm.org
(Please include supporting information so that we can take appropriate steps.)



Congratulations to the 2021 AAPM

EXPANDING HORIZONS TRAVEL GRANT AWARD WINNERS

2021 EXPANDING HORIZONS WINNERS ROUND 1

Nitish Chopra
Attending: Neural Information Processing Systems (NeurIPS)

Maduka M. Kaluarachchi
Attended: American Physical Society (APS) April Meeting

2020 EXPANDING HORIZONS ROUND 2

Opens: Monday, July 5, 2021
Closes: Monday, September 6, 2021
Selected Conference Must Fall Between June 1 - November 30, 2021

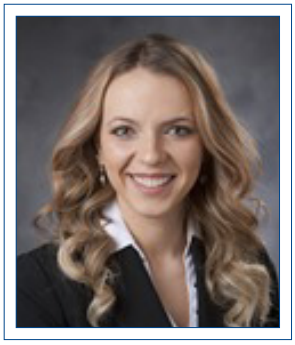
AMERICAN ASSOCIATION *of* PHYSICISTS IN MEDICINE

APPLY AT: gaf.aapm.org/#EXHG | DIRECT INQUIRIES: exhg@aapm.org

WHAT DOES FORMAL PROFESSIONALISM TRAINING FOR MEDICAL PHYSICS (MP) LOOK LIKE AROUND THE USA?

EDUCATION COUNCIL REPORT
Hania Al-Hallaq, PhD | University of Chicago
Irina Vergalasova, PhD | Rutgers Cancer Institute of New Jersey

H. Al-Hallaq



I. Vergalasova

Written on behalf of Medical Physics Residency Training and Promotion Subcommittee (MPRTP).

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irinav@cinj.rutgers.edu

Formalized curricula for professionalism training are being innovated across the country in order to train the next generation of medical physicists. To find out about these approaches, we interviewed several faculty including: **Joshua M. Wilson, PhD** at Duke University, **Jeremy Hoisak, PhD** at the University of California San Diego, **Wayne Newhauser, PhD** at Louisiana State University, and **Michael Price, PhD** at Vanderbilt University (now at Columbia University). We asked each faculty member the questions listed below and the information gathered was compiled to best represent the breadth of their answers. It appears that professionalism can and should be *nurtured* in medical physicists, beginning as early as graduate school and throughout residency!

1. **Describe your professionalism curriculum.**

   Although some institutions had developed formal courses for credits, while others took more of an orientation/workshop/seminar approach, there were common themes throughout the curricula:

   - Ethics, leadership philosophies, entrepreneurial skills, teamwork
   - Effective communication (e.g., email etiquette, how to approach faculty for research assistantships/collaborations, request for letters of recommendation)
   - Appropriate attire in the workplace
   - Self-awareness of personal strengths/weaknesses
   - Organizing job searches (including creating CVs, writing personal statements, mock interviews)
   - Service in professional societies and career advancement
   - Negotiating and budgeting (operational & capital), billing, vendor and administrator relationships, public relations
   - Work interactions including equity, diversity, and inclusion to address stereotyping/unconscious bias

The format of the instruction included:

- Didactic lectures from faculty medical physicists
- Case-based discussions and self-reflection exercises
- RSNA/AAPM ethics and professionalism modules
- Reading, homework and exams
- Peer-to-peer instruction (e.g., interview each other and provide feedback)

For graduate students, professionalism training started at orientation and then was expanded during formal lectures (e.g. 1 credit hour course/seminar). For residents, a monthly 1.5 – 2 hour class was organized with faculty participation.

2. What advantage do you believe this curriculum confers to trainees/your program/MP?

The interviewees unanimously agreed that the benefits of this kind of training are immense to the MP community. Some of their answers are highlighted:

- Medical physicists behave ethically
- Safeguards the privileges of the MP profession by adhering to the professional code of conduct
- Establishes a harmonious and collegial environment as a result of a shared values approach
- Faculty with leadership experience are able to share their experiences with trainees, who may be better prepared to lead when the opportunity arises
- Encourages pride in professional mentorship when students advance into management positions later in their careers
- MP-specific anecdotes/experiences may be more useful to trainees who may not be able to easily sift through the general professionalism content from corporate/business perspectives
- Relays the importance of professionalism skills to MPs early on in their careers
- Focuses on experiential learning, which assumes that professionalism is not innate but can be learned

3. Could trainees learn this material "on the job"?

While the answer to this question seems like an obvious "yes", given that most of us have learned this as we progressed through our careers via trial and error, the interviewees believed it would have been highly valuable to be prepared in advance with concentrated and structured learning. This sentiment is further supported by the following reasons from our interviewees:

- Yes, but we aim to "flatten the learning curve" related to leadership/management skills and administrative tasks (billing, budgets, etc.)
- Yes, but trainees may not seek out resources or feel that these skills are not valued if not included in formal curricula; variable views of professionalism could lead to mismatched expectations; on-the-job professionalism training may be more often punitive and "after-the-fact" rather than self-motivated development
- No, some skills that we teach will only become useful later in their careers (e.g., academic advancement, business, hiring practices)

4. What feedback have you received from alumni/staff/colleagues regarding this training?

- Positive reviews regarding student progress on a variety of fronts, such as supervisory committees, formal examinations, etc.
- Favorable feedback regarding our graduates' interview skills
- Alumni who graduated prior to this course offering have emailed to request the class material
- Faculty have suggested topics to add for professional behavior in the workplace (e.g., cultural differences in customs)
- Inquiries from prospective candidates during residency recruitment
- It was tough to negotiate a starting salary with one of our graduates whom we hired!

We encourage you to attend the session scheduled on Monday, July 26, 2021 at the 2021 AAPM Annual meeting entitled "Formalizing Professionalism Education: Shared Experiences with Medical Physics Trainees" to hear further details about these approaches and to ask questions and engage in more discussion with some of our interviewees! ■

ACMUI ADVANCES AGENDA

LEGISLATIVE & REGULATORY AFFAIRS REPORT Richard J. Martin, JD | AAPM

The US Nuclear Regulatory Commission (NRC) Advisory Committee on the Medical Uses of Isotopes (ACMUI) convened a public conference call on May 27.

At that virtual meeting, NRC staff presented a review of medical events for the most recent annual reporting period, citing 48 events. ACMUI members acknowledged that the number of medical events remains fairly consistent from year to year. They noted, as well, that the annual number represents a very low incidence of medical events, in light of the approximately 150,000 therapy procedures performed annually.

The ACMUI also addressed an ongoing issue of defining abnormal occurrences (AOs) in a way that does not distort or overrepresent medical use AOs in its annual reports to Congress. The NRC and ACMUI have repeatedly expressed concern that reported medical use AOs do not always reach the required "significant" standard and that inaccuracy may adversely impact policymakers' views of radiation medicine applications, relative to other NRC-regulated industries. At the May meeting, an ACMUI subcommittee presented its report on defining AOs. The report supported both the NRC prior proposals to limit the AO definition to medically significant incidents and the NRC's ongoing exploration of additional changes to the AO definition, including a possible requirement to show harm.

In addition, the ACMUI is moving forward with its broad review of training and experience (T&E) requirements for authorized users (AUs). The advisory committee established new subcommittees to look at T&E for the use of generators and elution procedures, as well as T&E for the administration of emerging radionuclide therapies. The subcommittees looking at these requirements will determine whether new training should be obtained for AUs and if so, how best to obtain it. The ACMUI previously addressed T&E requirements for radiopharmaceutical administrations. Subsequently, NRC staff presented NRC commissioners with a memorandum outlining several possible approaches for the NRC to adopt, and we are awaiting the commissioners' response to the staff memorandum. We are closely watching this dynamic situation and will report on any decisions made by the commissioners regarding T&E requirements for radiopharmaceutical administrations. ■

We continue to monitor ACMUI activities and will update you on any developments. If you have any questions or require additional information, please contact Richard Martin, JD, AAPM Government Relations Program Manager, at richard@aapm.org.

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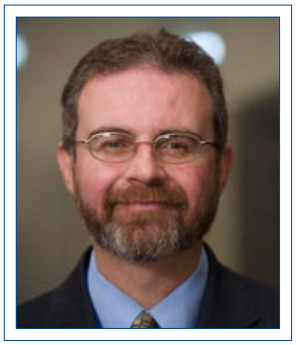
ABR UPDATE: THE FIRST FULL-SCALE REMOTE ORAL EXAMS FOR MEDICAL PHYSICISTS

ABR NEWS
Matthew B. Podgorsak, PhD | Roswell Park Cancer Institute
Kalpana M. Kanal, PhD | University of Washington • Robert A. Pooley, PhD | Mayo Clinic
J. Anthony Seibert, PhD | University of California at Davis
Geoffrey S. Ibbott, PhD | ABR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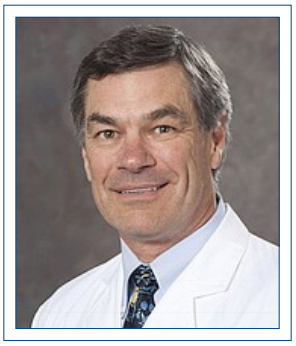
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G. Ibbott, ABR Associate Executive Director

The ABR held the first full remote oral exams for medical physicists during May 2021. Between May 1 and May 4, 285 candidates were examined by about 115 medical physicist examiners, and by all accounts, the exam event was viewed as a successful one by candidates and examiners alike. As reported in a previous newsletter, the ABR had conducted a Pilot oral exam in February 2021 with a small number of candidates. The Pilot exam was conducted successfully and gave the ABR the confidence that a full-scale exam could be carried out without any major concerns. Lessons learned from the pilot exam administration also gave the ABR the opportunity to make some minor software/process improvements before the May administration.

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- **285 candidates were examined by about 115 medical physicist examiners in early May.**
- **Lessons learned from the pilot exam administration also gave the ABR the opportunity to make some minor software/process improvements before the May administration.**
- **"Compared to previous years where this was done in person in a hotel room, I think the candidates seemed much more comfortable in their own homes."**
- **Some candidates who reported problems had not conducted the systems checks, underscoring the importance of these checks.**

Candidates and examiners received surveys shortly after the exams concluded, and responses were received from 56% of candidates and 60% of examiners. The remote platform was well-received, with majorities of both examiners and candidates reporting that they participated in the exam from home. Comments such as "Having the ability to remotely take the exam was very beneficial and cost effective" and "Overall I had a positive experience" were typical of many.

The responses to questions asking about the performance of the software were consistently positive, with 95% of examiners and 96% of candidates agreeing with the statement "It was easy for me to figure out how to use the exam interface."

Several examiners and candidates were interviewed by the ABR staff shortly after the exams. (To read the full interviews, please visit https://www.theabr.org/announcements/remote-exam-information.) One examiner commented that "It seemed like the candidates were as comfortable as they could possibly be, given the gravity and stress level associated with an oral exam. Compared to previous years where this was done in person in a hotel room, I think the candidates seemed much more comfortable in their own homes, which was nice to see."

A candidate for examination in therapeutic medical physics, **Xenia Ray, PhD**, was interviewed by **Tyler Blackwell, MS, DABR**, for his blog at radformation.com. Mr. Blackwell kindly gave the ABR permission to reproduce the interview, which also is available here. In response to one of Mr. Blackwell's questions, Dr. Ray volunteered that "My experience was overwhelmingly positive. There are a lot of advantages to the virtual platform in terms of time and cost savings. Not having to travel also decreased my stress from things outside of my control that might affect the exam. The virtual format does introduce new potentially stressful factors, particularly the worry that the internet connection may fail mid-exam. The ABR and Proctorio® did a lot to address [the potentially stressful factors] by:

- Having a pre-check of my computer system weeks before the actual exam and allowing a dry run of the exam software and interactive tools.
- Assigning a technical navigator to each examinee. There is always someone on the line, ready to handle any glitches.
- Including a backup examiner for each exam session if there's an issue with the primary examiner.
- Giving very clear steps about what to do if I were to lose connection."

Conducting the oral exam remotely had the additional benefit of addressing the concerns of some candidates and examiners in prior years who were uncomfortable with conducting the oral exam in a hotel room. Because the May remote exam was successful, it seems unlikely that the ABR will return to in-person exams in hotel rooms in the foreseeable future.

Given that this is the first year of remote exams, it should not be surprising that some aspects didn't work perfectly, and some examiners and candidates reported technological issues. The ABR had anticipated connection issues and conducted advance training of both examiners and candidates. The training and technology checks received generally positive reviews. There were still some instances of candidates or examiners having trouble connecting to the Proctorio software, the ABR exam platform, or WebEx. Again, the ABR had anticipated this in a number of ways: examiners worked in pairs (primary and secondary examiners) so that in the few instances that a primary examiner was unable to connect, the secondary examiner was able to take over. Ultimately, this occurred in 15 cases, out of ~1500 exam sessions for an event rate of about 1%. In each case, the secondary examiner stepped in promptly and the exam was conducted normally.

In additional cases, candidates were unable to connect properly, or had difficulties with the sign-in process. In the majority of these cases, the problems were resolved promptly, and in only a few instances was it necessary to extend the exam a few minutes into the extended break period provided between exam sessions to make up the time. In only a handful of cases, the exam was rescheduled into the "recovery period" at the end of the day. In every case, each candidate ultimately received the correct amount of time allocated for the exam.

In a few cases, the candidate's experience was hindered or interrupted by the firewalls erected by the institutions at which they were taking the remote exam. Most of these instances were detected when candidates performed the recommended systems check a week or two in advance of the exams. Some candidates who reported problems

had not conducted the systems checks, underscoring the importance of these checks. Several other candidates performed the systems checks but then chose a different location or computer hardware for their exams, negating the benefits of performing the checks.

Comments from candidates about technical difficulties were largely summarized by one candidate who wrote "Even though I experienced technical issues, they were handled well." Ultimately, respondents rated their overall experience as a candidate for the remote exam as 3.7 stars (out of 5).

Both candidates and examiners made helpful suggestions in responding to the surveys, and many of these suggestions will be incorporated into upcoming oral exams. Further changes have been introduced to make the exam experience more seamless for both candidates and examiners in the future. Overall, it appears that the first full-scale remote exams were conducted successfully, and that the majority of candidates and examiners had a positive experience. ■

HEY AAPM CHAIRS!

The Specialty Meeting Oversite Subcommittee (SMOSC) is implementing a new Call for Requests process.

Look for separate Calls for **Webinar/Webinar series applications** and **Specialty Meeting applications**

There will be two Annual Calls for Webinars/Webinar series.

- The first will be in January and will be for webinars to be held during July–December of the same year.
- The second will be in June/July and will be for webinars to be held during January–June of the following year.

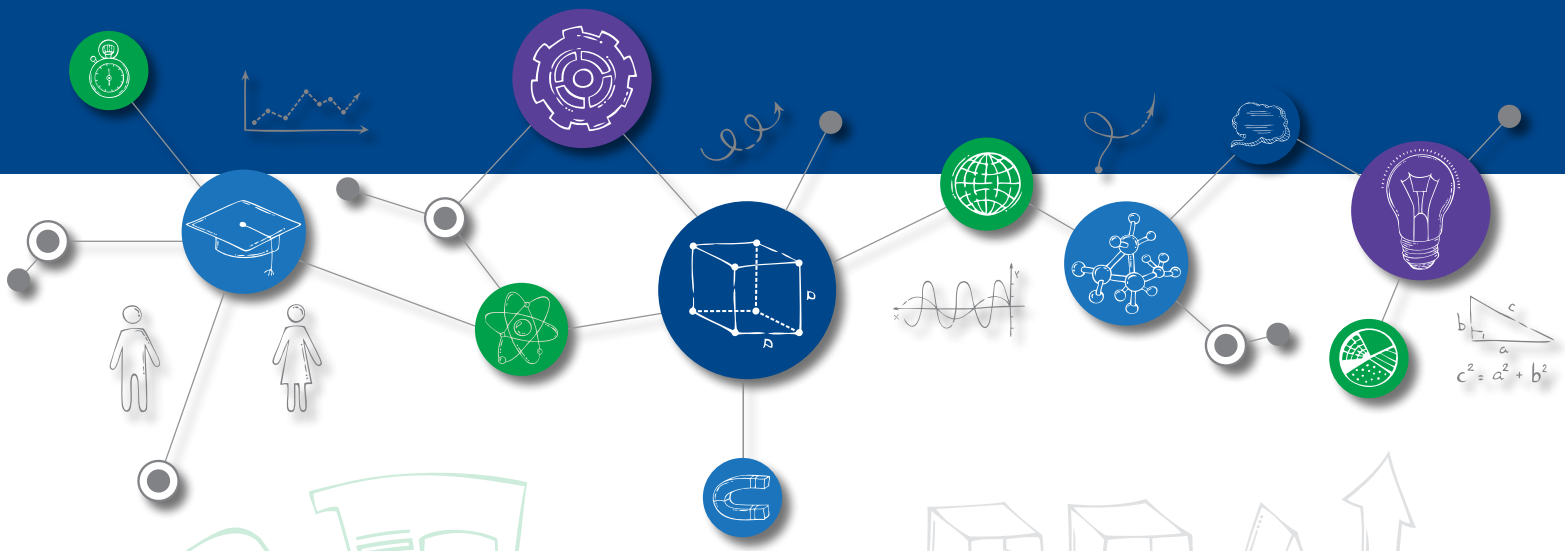
There will be one Annual Call for Specialty Meetings.

- The call will be in January and will be for specialty meetings to be held during the following calendar year.

The number of requests for AAPM webinars, webinar series, and specialty meetings has exploded this past year, posing a challenge in terms of HQ staff time and effort required to support these events. This new process is meant to provide more equal opportunity to applicants and to optimize available staff resources.

Robin Stern
Chair, SMOSC

AMERICAN ASSOCIATION *of* PHYSICISTS IN MEDICINE



AAPM EDUCATION & RESEARCH FUND

EDUCATION

For over 20 years, the AAPM Education & Research Fund has been a vital catalyst within medical physics in funding strategic programs such as seed grants for early-career researchers; matching support for clinical residency programs; and fellowships for PhD students. In addition, the Fund attracts undergraduates to the field and promotes diversity, and to-date has funded well over 100 grants, fellowships, and residencies.

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RESEARCH

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ACR ACCREDITATION & MORE: UPDATES FOR MEDICAL PHYSICISTS

ACR UPDATES Dustin A. Gress, MS | Senior Advisor for Medical Physics

Changes to ACRedit Website are Imminent!!!

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.

MFA

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.

Dashboard

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):

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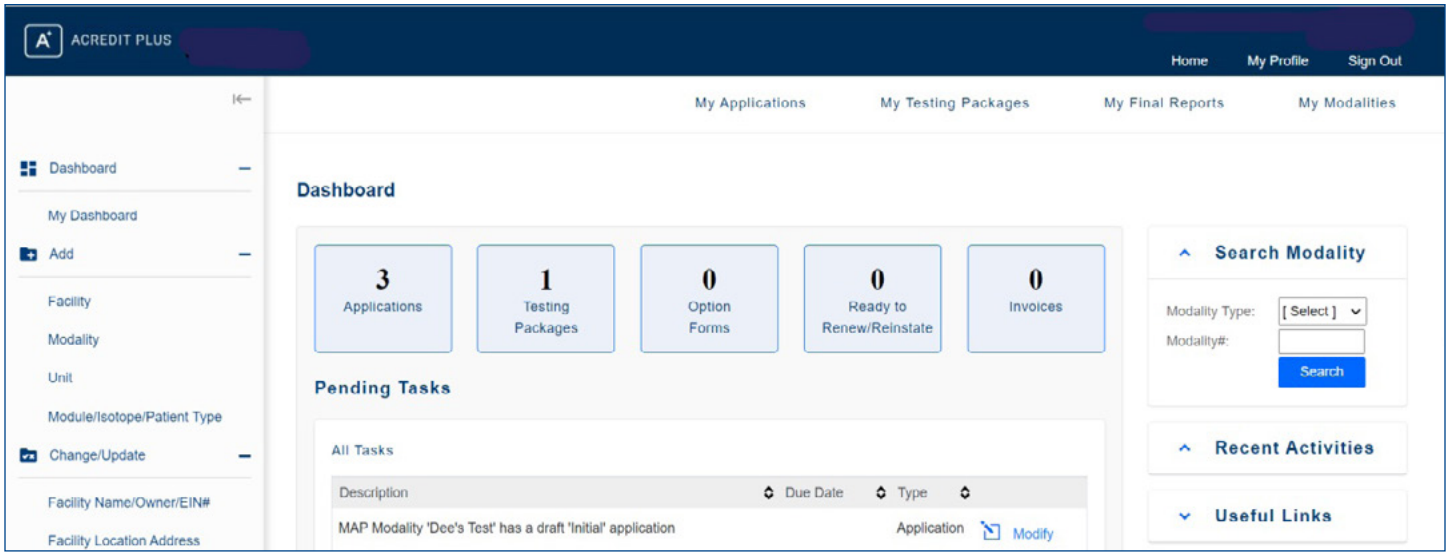
In each issue of this Newsletter, I will present information of particular importance or relevance for medical physicists. You may also check out the ACR's accreditation web site portal **for more accreditation information and QC forms. A big THANK YOU to all of the other staff that keep ACR programs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

On April 26, ACR proudly announced **the 2021 Richard L. Morin, PhD, Fellows in Medical Physics:** Krystal Kirby PhD**, of Mayo Clinic Rochester and** Jeremiah W. Sanders, PhD**, of MD Anderson Cancer Center. ACR again had an incredibly strong group of applicants; congratulations to Drs. Kirby and Sanders for distinguishing themselves and earning the Morin Fellowship!** ACR also recently announced **the awardees of its Medical Physics Graduate Student Scholarship,** Zahra Razi **of University of Florida, and** Suman Shrestha **of MD Anderson Cancer Center; congratulations, Zahra and Suman!**

ACR UPDATES, Cont.



Mammography

Initial FDA requirements for accrediting digital breast tomosynthesis (DBT) included that DBT be handled as a separate modality from full-field digital mammography (FFDM). As a result, facilities have for years been required to submit and pay for ACR accreditation for FFDM and DBT separately. FDA has recently approved a process whereby these imaging units may be accredited in a modular fashion, which facilitates streamlined handling of accreditation applications and a decrease in fees for facilities with DBT units. These changes will roll out with ACRedit Plus.

MRI Program Changes

Also with the rollout of ACRedit Plus will be a restructuring of the MRI Accreditation Program. Specifically, the Breast MRI Accreditation Program will no longer be a standalone program, instead it will become a module within the MRI Accreditation Program. This change will also result in streamlined handling of submitted accreditation materials and lower fees. The other change to the MRI Accreditation Program rolling out with ACRedit Plus is the new Prostate Cancer Designation. This new Designation will be available to sites who are ACR accredited in the body module and allows sites to distinguish themselves as providers of safe and effective care for prostate cancer patients. Clinical image submission and additional fees will be required.

Miscellaneous

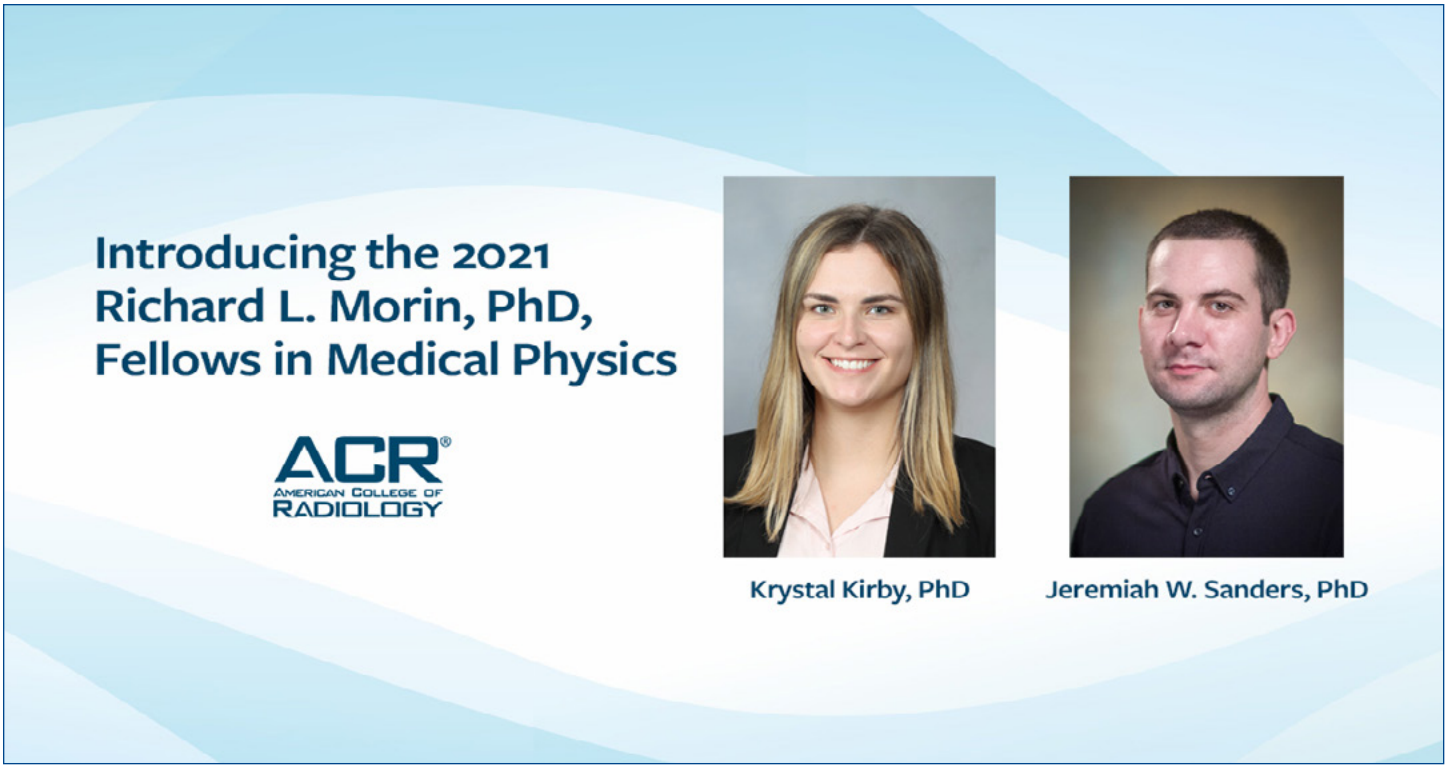
For each facility there will be a section called "Additional Personnel." Because ACRedit Plus will be an interface through which confidential information will be shared, only personnel listed as either primary facility contacts or in Additional Personnel will be able to receive information from ACR staff 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.

AAPM Annual Meeting

Please plan to attend the ACR Activities and Updates session at AAPM 2021, which will take place Wednesday, July 28, 1:00–3:00 pm. It's perhaps cliché at this point, but I can't wait to be in Washington, DC with you all in July 2022. ■

ACR UPDATES, Cont.



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KSMP & KAMPiNA Invite you to attend the Special Session on the State of the Art in Medical Physics

Sunday, July 25 and Monday, July 26 • 7:00–9:00 pm ET

The Korean Society of Medical Physicists (KSMP) and The Korean Association of Medical Physicists in North America (KAMPiNA) are hosting an inaugural Special Session on the State of the Art in Medical Physics. This event will celebrate the profession in Korea as well as review exciting technologies such as particle therapy, artificial intelligence, and MR-linac systems. Please join us to learn the latest research coming from Korea and the world.

To participate in this special session, you must be a registered attendee of the **AAPM 2021 Virtual 63rd Annual Meeting & Exhibition**. The virtual experience will offer great meeting content including SAM credits and MPCEC hours and engagement with vendors. See this year's enticing program here. Plan to attend – You won't want to miss it!

Register Now

Sunday, July 25

Session Chairs: Dr. Byung-Chul Cho; Dr. Sang-June Park

7:00 pm	Welcome Remarks from AAPM President, Dr. James Dobbins III, Professor Duke University Medical Center
7:05 pm	Welcome Remarks from AAPM Chair of the Board, Dr. Saiful Huq, Professor UPMC Hillman Cancer Center and University of Pittsburgh School of Medicine
7:10 pm	**Recent technological advances and current status of carbon ion radiotherapy, Seoul National University Hospital** Dr. Jong Min Park, Professor | Seoul National University Hospital
7:35 pm	**Techniques and workflows for adaptive proton therapy** Dr. Harald Paganetti, Professor | Massachusetts General Hospital
8:00 pm	**AI-Driven Research & Clinic in Radiation Therapy** Dr. Jinsung Kim, Associate Professor | Yonsei Cancer Center
8:25 pm	**How to Deal with the ART Part of the RT with AI?** Dr. Steve Jiang, Professor | UT Southwestern Medical Center
8:50 pm	Q&A

Monday, July 26, 2021

Session Chairs: Dr. Seungryong Cho; Dr. Choonik Lee

7:00 pm	Welcome and Organizational Intro from KSMP President Dr. Byung-Chul Cho, Professor | Asan Medical Center
7:05 pm	Welcome and Organizational Intro from KAMPiNA President Dr. Sang-June Park, Associate Professor | UCLA School of Medicine
7:10 pm	**Research on adaptive radiation therapy using deep learning models** Dr. Youngyih Han, Professor | Samsung Medical Center
7:35 pm	**The evolution, current state, and future prospect of the 1.5T MRI linac** Dr. Bas Raaymakers, Professor | University Medical Center Utrecht
8:00 pm	**The evolution, current state, and future prospect of the 0.35T MRI linac** Dr. James Dempsey, Inventor, Founder, and Chief Scientific Officer
8:25 pm	**Dose profile modulation of proton mini-beam for clinical application** Dr. Young Kyung Lim, Professor | Korea National Cancer Center
8:50 pm	Q&A

PARTICLE THERAPY COMING OF AGE, BUT OBSTACLES TO WIDESPREAD ADOPTION IN US REMAIN

RESEARCH SPOTLIGHT Richard S. Dargan | Contributing Writer, AAPM

More than 60 years after its first use, particle therapy — the use of protons or heavy ions to treat cancer — is coming of age. The last 20 years has seen a boom in proton therapy centers, and the first heavy ion center in the United States is under construction in Florida. But even with its important advantages over photon therapy, particle therapy's higher costs will likely limit its adoption in the US, experts say, at least until the research shows more conspicuous benefits for patients.

Particle therapy traces its roots back to 1946, when **Robert Wilson, PhD**, a physics professor at Harvard University, first proposed the use of proton beams against cancer. In his seminal paper, "Radiological use of fast protons," Dr. Wilson noted how a proton beam deposited a much larger amount of energy at the end of its path before completely stopping, a quality made it a promising tool for irradiating cancer cells.

"With protons or heavy ions, the beam stops in the patient, so there's no exit dose," says **Harald Paganetti, PhD**, Professor at Harvard Medical School and Director of Physics Research in the Department of Radiation Oncology at Massachusetts General Hospital (MGH) in Boston. "This means we can completely spare areas downstream of the target."

Particle therapy has an additional advantage over photon therapy in the form of higher linear energy transfer (LET), a measure of how much energy per unit distance travelled the charged particles deposit along their path. With their higher LET, only a few hundred protons need to go through the tumor cell nuclei in a typical treatment, compared with the several thousand in a photon treatment. The result is a more heterogenous energy deposition, with clusters of very high energy deposited in some areas of the DNA.

"Even though we may deliver the same dose with particle therapy and photons, the biological effect is different because that heterogeneous dose distribution on the cellular level causes more severe damage to the DNA," says Dr. Paganetti.

Proton therapy's unique qualities have made it a useful option for treating tumors near critical structures, like those found in head and neck cancers and cancers in the brain, eye and spine. It offers a lifesaving option for pediatric patients with brain tumors and a second chance for patients with radioresistant and/or anatomically complex tumors. Unlike photons, it largely spares the body's immune system, which makes it a promising complementary

treatment to immunotherapy, according to **Radhe Mohan, PhD**, Professor in the Department of Radiation Physics at the University of Texas MD Anderson Cancer Center (MD Anderson) in Houston, Texas.

"The success of immunotherapy after radiotherapy depends upon the health of the immune system," Dr. Mohan says. "If the immune system has been compromised by X-ray-based radiotherapy, then the survival benefit of immunotherapy will be poorer. Combining protons or other particles with immunotherapy may very well be much more successful for many types of cancers than what we are doing today."

Particle therapy's applications have helped drive a boom in proton therapy in the United States since 2000. A survey conducted by the National Association for Proton Therapy (NAPT) found that the number of centers in the United States offering proton therapy more than doubled from 2012 to 2016. During that time, the number of patients receiving proton therapy treatment increased by 70%.

The growth has helped boost research. Results from major randomized trials are beginning to appear, with many more on the horizon. There is a major clinical trial underway at various centers in the U.S. comparing photons and protons for breast cancer, and another looking at prostate cancer. Dr. Mohan co-led (with **Dr. Theodore Hong** of MGH) a project at MD Anderson in which researchers began six randomized trials, including two focusing on lung cancer.

While the research has yet to show significant benefits in outcomes, there is evidence that treatment with protons is better tolerated by patients.

"In the lung trial, we're finding that patients are less fatigued after proton therapy, with less instances of vomiting, and more patients can complete treatment without a break because they don't feel as bad as they did with photons," says Dr. Mohan.

Results for proton therapy could be even better, Dr. Mohan says, through optimization of a factor known as relative biological effectiveness (RBE). Physicists use RBE, defined as the ratio of the doses required by two radiation modalities to cause the same level of biological effect, to normalize for the difference in outcome between protons and photons.

For decades, proton therapy has been based on a generic RBE of 1.1, indicating a 10% higher biological effect than the one with photons. Therefore, the dose to the tumor would need to be reduced by 10% to equalize it to photons.

"In other words, if a patient who would be treated with 70 Gray photons is transferred to the proton clinic, then we would treat that patient with only 63 Gray to achieve the same biological effect," says Dr. Paganetti.

With more patients being treated with particle therapy, the use of a generic RBE has come under increasing scrutiny. Physicists like Dr. Paganetti and Dr. Mohan are eyeing a variable RBE based on factors like LET and the type of tissue being treated to improve the treatment's effectiveness.

"Current practices are suboptimal, and the outcomes are not as good as I think they can be," says Dr. Mohan. "We need to continue the research, continue the clinical trials, and try to find ways to reduce biologically-effective dose in normal tissues."

One possibility being explored is the preferential diverting of high LET protons at the end of the range away from critical normal tissue regions.

Along with a lack of what Dr. Mohan calls a lack of "slam dunk evidence" supporting proton therapy, other obstacles remain to wider use of particle therapy in the U.S. healthcare market. Proton machines are more expensive and have a bigger footprint than photon machines, and many insurance companies still consider the treatments to be experimental outside of the pediatric realm.

In one recent, highly publicized case, an insurer refused to cover a $95,000 bill for a patient in Boston, MA who underwent proton therapy after standard chemoradiotherapy had failed to contain her cervical cancer. The hospital and the patient's family pitched in to cover the cost.[1]

Reimbursement is complicated by restrictions on coverage for patients on clinical trials in the U.S., creating what Dr. Mohan referred to a "a Catch-22."

"In Germany, for instance, they require that if you want to treat a patient with protons or carbon, you have to have the patient on a clinical trial," he says. "In Texas, they say

that if a patient is on a clinical trial, then insurance won't pay for it. They won't pay for the patients who are on a clinical trial and yet they'll demand that you show them evidence."

Particle therapy with heavy ions, most commonly in the form of carbon-12, is a compelling treatment option that amplifies the advantages of particle therapy beyond proton therapy, in part because the LET and, consequently, the RBE of heavy ions are significantly higher than those of protons.

"It's a very sharp knife, if you will," says Dr. Paganetti. "You can shape the dose very accurately, even more so than with protons."

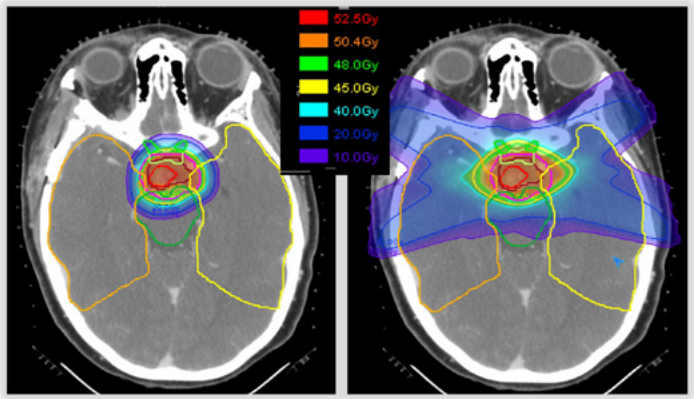
Whether that improves patient outcomes remains to be seen, Dr. Paganetti says. An extensive review of carbon-12 therapy found it safe and effective for a variety of tumors, but questions remain about dose and effects on normal tissue.[2] Any benefits would have to be considerable, as heavy ions are even more expensive than proton therapy. There currently are a total of 13 carbon centers in five countries worldwide, including Japan, Germany, China, Austria, and Italy. The first heavy ion center in the US is being built on the campus of Mayo Clinic in Jacksonville, FL., in collaboration with Hitachi. That center's arrival will likely increase interest from the National Cancer Institute in funding research, but penetration into the U.S. market still appears to be ways off.

"What happened with proton centers in the U.S. is probably not going to happen with carbon ions," says Dr. Paganetti.

"It's incredibly expensive, and in today's climate of cost consciousness, it doesn't make sense as a routine treatment option but for selected patients."

Still, the future isn't entirely gloomy for particle therapy. Costs will likely come down over time as the machinery gets cheaper and as more efficient ways of treating patients with heavier particles are developed, Dr. Mohan says, and better patient outcomes lead to additional savings. New technologies like FLASH radiotherapy (FLASH-RT), an ultra-high dose rate delivery, one fraction treatment currently under investigation, also figure to make treatments with particles more attractive.[3]

"Ultimately, protons and carbon ions may be no more expensive than other radiotherapy treatments, and still a lot cheaper than chemotherapy," says Dr. Mohan. ■



Comparison of photon dose distribution using five fields (right) with proton dose distribution using three fields (left) in a patient with chordoma, a bone cancer that typically affects the skull and spine, shows the reduction in normal tissue dose possible with protons. (Courtesy of Harald Paganetti, PhD)

1. *McCluskey, PD.* The Boston Globe. *2019 May 4.*

2. *Malouff TD., Mahajan A, Krishnan S, Beltran C, Seneviratne DS., Trifiletti DM. Carbon Ion Therapy: A Modern Review of an Emerging Technology.* Frontiers in Oncology. *2020 Feb 4; 10(82).*

3. *Diffenderfer ES., Verginadis II, Kim MM, Shoniyozov K, Velalopoulou A, Goia D, Putt M, Hagan S, Avery S, Teo K, Zou W, Lin A, Swisher-McClure S, Koch C, Kennedy AR, Minn A, Maity A, Busch TM, Dong L, Koumenis C, Metz J, Cengel KA. Design, Implementation, and in Vivo Validation of a Novel Proton FLASH Radiation Therapy System.* Int J Radiation Oncol Biol Phys. *2020; 106(2): 440-448*

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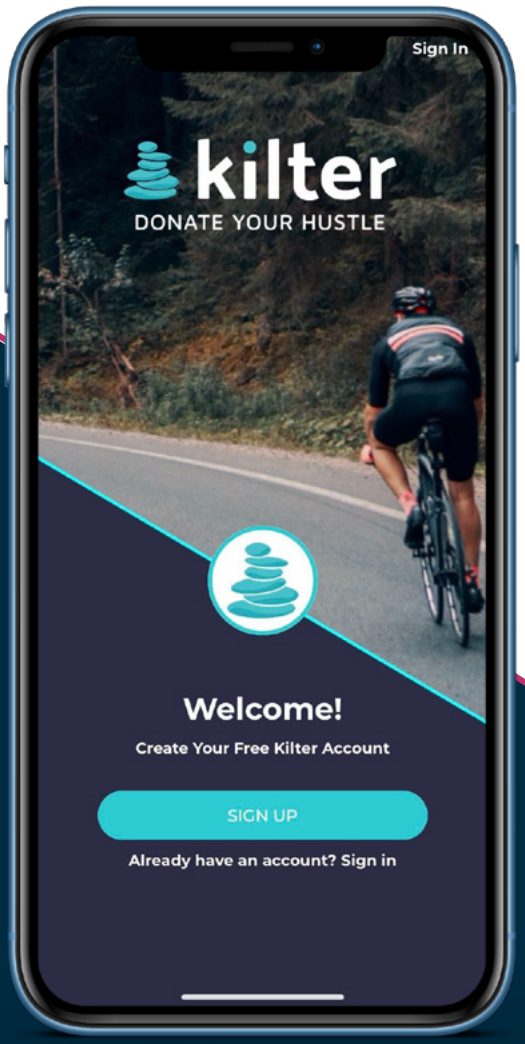

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2021 NORM BAILY AWARDS AND MEDPHYS SLAM

SOUTHERN CALIFORNIA CHAPTER OF AAPM (AAPM-SCC) REPORT

Margaret Barker, MS | Sansum Clinic

The Southern California Chapter of the AAPM held the 2021 Norm Baily Awards and MedPhys Slam on May 18, 2021 virtually via Zoom. Six entries were received in all for the research competition open to graduate students/post-doctoral researchers and residents from various schools around Southern California. Cash prizes were distributed to the first, second, and third place recipients with a separate category for the SLAM winner. The first-place winner was post-doc **Yufeng Cao, PhD** of University of Southern California with a presentation entitled "Automatic segmentation of the high-risk CTV for tandem and ovoid brachytherapy patients using a dual-path convolutional neural network". The second-place winner was resident **Daniela Branco, PhD** of University of California, San Diego with a presentation entitled "Ethos daily adaptive protocol for locally advanced cervical cancer: improved target coverage and reduced PTV margins in <20 minutes". Third place was a tie, so both were presented: graduate student **Catherine Meyer** of University of California, Los Angeles with a presentation entitled "Patient-specific absorbed doses in mCRPC patients treated with 177Lu-PSMA radionuclide therapy" as well as resident **Eric Morris, PhD** also of UCLA with a presentation entitled "Toward Ending the Manual QA: An Automated Dosimetric Quality Assurance Technique." The four award winners each gave a 10-minute presentation on their respective research efforts. Thank you to all our entrants!

Email: megcbarker@gmail.com

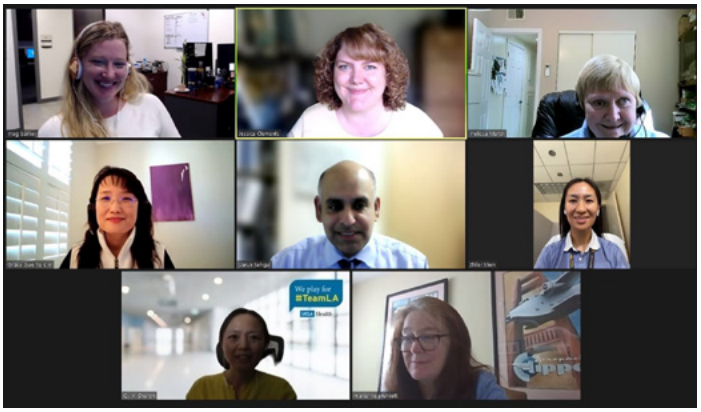
Congratulations to all the 2021 Norm Baily Award recipients, and good luck to Dr. Moazzezi as he represents AAPM-SCC at the MedPhys Slam in July!

The winners of the 2021 Norm Baily Awards, left to right: Yufeng Cao, Daniela Branco, Catherine Meyer, Eric Morris, and Mojtaba Moazzezi

AAPM-SCC REPORT, Cont.

The second part of the Awards Ceremony was dedicated to the MedPhys Slam. Post-doc **Mojtaba Moazzezi, PhD** of University of California, San Diego highlighted his research in a 3-minute presentation aimed at sharing the what, how, and why while simultaneously convincing the audience that the work is impactful and important. Dr. Moazzezi will present his research "Analysis of the Benefits of Daily Online Adaptive Radiotherapy via Ethos for Prostate Cancer" and represent the Southern California Chapter at the national MedPhys Slam competition to be held in July 2021 during the AAPM Virtual Annual Meeting.

The next chapter meeting (Fall Meeting) is tentatively scheduled to be held in person in October 2021 at the University of California, Los Angeles Campus. Program details will be posted on the Chapter website in the near future. ■

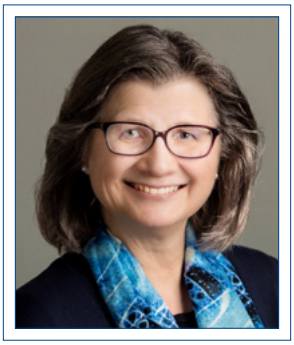


Screenshot of the Southern California Chapter Board meeting. Pictured, clockwise from top left: Secretary Margaret Barker, President-Elect Jessica Clements, Awards & Nomination Committee Co-Chair Melissa Martin, Treasurer Zhilei Shen, Education Committee Co-Chair Marianne Plunkett, Board Representative Sharon Qi, Awards & Nomination Co-Chair Grace Kim, and President Varun Sehgal. Not pictured, Education Co-Chair Steve Goetsch and Electronic Media Chair Nzhde Agazaryan.

REPORT FROM THE MEDICAL IMAGING AND DATA RESOURCE CENTER (MIDRC)

MIDRC SUBCOMMITTEE UPDATE

Maryellen Giger, PhD | University of Chicago
Paul Kinahan, PhD | University of Washington



M. Giger

P. Kinahan

The Medical Imaging and Data Resource Center (MIDRC) continues to receive strong support from the National Institute of Bioengineering and Biomedical Imaging (NIBIB) and the NIH Office of Data Science, and to forge fruitful collaborations among investigators from AAPM, the Radiological Society of North America (RSNA) and the American College of Radiology (ACR), among others. To date, MIDRC has published approximately 6,000 imaging studies and is currently processing data contributions from 10 academic institutions through the RSNA RICORD and ACR CIRR ingestion pipelines, with the goal of publishing 60,000 cases by September 2021.

One important aspect of MIDRC's current work is mitigating bias in the design and evaluation of AI algorithms. To that end, the MIDRC Bias & Diversity Working Group, led by RSNA's **Sanmi Koyej**o (University of Illinois Urbana-Champaign) and AAPM's **Karen Drukker** (University of Chicago), was formed and will perform a quantitative analysis of the diversity of imaging data within MIDRC, research that could ultimately help lead to a greater understanding of disparities in health outcomes. In the spirit of statistician Andrew Gelman's dictum "The most important aspect of statistical analysis is not what you do with the data, it's what data you use", we look to you, the AAPM membership, to aid in this vital mission by facilitating contributions of COVID-19 images and associated metadata from your community hospital, medical imaging facility, academic medical center, or private practice. Please visit MIDRC's website and fill out a data contribution inquiry (here is the link). Additionally, members of the MIDRC subcommittee are available to discuss your potential data stewardship and welcome your inquiries.

You can learn more about contributing data and the AI research progress of MIDRC during the next **MIDRC Town Hall Meeting for AI Researchers and Data Contributors** to be held **Thursday July 22 at 2:00 pm ET**. This meeting is open to the medical community at-large, and we encourage you to attend, if you're able! Please register using this link.

Email:
m-giger@uchicago.edu
kinahan@u.washington.edu

This multi-institutional initiative represents a partnership spearheaded by the medical imaging community aimed at accelerating the transfer of knowledge and innovation, including clinical problem identification, discovery, development, evaluation, translation, implementation, and dissemination. The first common goal of this coalition is to build data repositories to fuel COVID-19 machine intelligence research, coupled with optimal standardization, curation, and compliance with ethical responsibilities to honor patients' privacy. In order to leverage existing infrastructure, MIDRC will be a linked collection that coordinates access to data and harmonizes data management activities across all participating organizations at three critical stages: (1) intake, including curation, de-identification, abstraction, and quality assessment (2) annotation and labelling of images and other data using semi-automated approaches and (3) distributed access and query methods.

continued

MIDRC
MEDICAL IMAGING AND DATA RESOURCE CENTER

MIDRC SUBCOMMITTEE UPDATE, Cont.

MIDRC, cont.

These methods will yield a large data set that is in accordance with the FAIR principles (findable, accessible, interoperable and reusable). The public access 'front door' of MIDRC is hosted by the state-of-the art Gen3 Data Ecosystem housed at the University of Chicago and will be expanded to include and/or link to additional image and non-image data feeds from multiple registries and repositories. Through the MIDRC Data Commons Portal, images and data, as well as guidelines and recommendations, are disseminated to investigators to expedite research that provides solutions to the COVID-19 pandemic to ultimately maximize patient benefit. Please note that MIDRC is actively looking for clinical sites to contribute medical COVID-19-related images and associated data, emphasizing the importance of the inclusion of smaller sites such as community hospitals, in order to mitigate bias in the data collection. The second common goal of MIDRC is to foster machine intelligence research in the development of algorithms for the detection, diagnosis, monitoring, and prognosis of COVID-19. To this end, five Technology and Development Projects and 12 Collaborating Research Projects are part of MIDRC and are represented by a team of experts in their field. The hosting of scientific challenges will also be part of MIDRC, benefiting the research community at large.

Please direct inquiries to:
Maryellen Giger, PhD, **FAAPM,**
Paul Kinahan, PhD, **FAAPM, or**
AAPM MIDRC Program Manager,
Emily Townley

At the end of March, **Maryellen Giger** spoke at a highly-attended and well-received Congressional briefing entitled the *Medical Imaging and Data Resource Center: Accelerating Innovation for COVID-19 Response & Beyond* on the ability of machine learning and large imaging databases to transform health care. Joining her on the expert panel were NIBIB's Bruce Tromberg and Kris Kandarpa, RSNA's Curtis Langlotz and ACR's Etta Pisano. You can view the entire briefing by clicking on this link.

Look for MIDRC presentations at the AAPM Annual Meeting, including a presentation on the role of AAPM leadership in MIDRC at the Joint Council Symposium (session details are here) and a dedicated MIDRC SAMs Symposium (session details are here), both scheduled for Sunday, July 25, 2021.

More recent notable MIDRC progress includes:

- Finalization of the first versions of Standard Operating Procedures (SOPs) for the MIDRC Data Policy and Procedures Subcommittee (DPP) led by ACR's Mike Tilkin (formalizing data access, use and contribution policies), the MIDRC Data Standards and Information Technology Subcommittee (DSIT) led by RSNA's Christopher Carr (governing the technical aspects of MIDRC's IT systems, software and standards) and the MIDRC DICOM Data Quality and Harmonization Subcommittee (DQH) led by **Paul Kinahan** on behalf of AAPM (ensuring the integrity of data collected, advising on image acquisition protocols and quality assurance).
- Securing a MIDRC area for this year's upcoming in-person RSNA Annual Meeting in Chicago. More information on location and activities coming soon!
- Planning both RSNA and AAPM-sponsored MIDRC Grand Challenges to be announced at meetings later in the year.
- Exploring collaborative partnerships and/or data transfers with the UK's NHS National COVID-19 Chest Imaging Database (NCCID), The Cancer Imaging Archives (TCIA), the Academy for Radiology & Biomedical Imaging (the Academy), the American Society of Neuroradiology (ASNR), the international society for optics and photonics (SPIE), NIH's BioData Catalyst, and NIH's National COVID Cohort Collaborative (N3C).
- Further accomplishments of the AAPM-led MIDRC research groups include authoring white papers for submission to Medical Physics, the creation of a metrics recommendation tool for data users, and the development of sequestration algorithms for a certain percentage of data inclusion in the MIDRC Sequestered Data Commons.

Please visit the MIDRC website at www.midrc.org to follow even more of the latest developments, or sign up to receive the quarterly MIDRC newsletter by clicking on this link. ■

MIDRC

MEDICAL IMAGING AND DATA RESOURCE CENTER.

SAVE THE DATE!

Town Hall

JULY 22, 2021 | 1:00 – 2:00 PM CT

The Medical Imaging and Data Resource Center (MIDRC) is a large-scale de-identified dataset of medical images of COVID-19 patients, and includes support for research projects that capitalize on the valuable dataset it creates.

The MIDRC data portal is now live and accepting your data contributions!

Please visit www.midrc.org/donate.

Free meeting registration here

Learn how to CONTRIBUTE DATA to MIDRC, and hear about our exciting research progress!
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MIDRC is funded by the National Institute of Biomedical Imaging and Bioengineering (NIBIB), is hosted by the University of Chicago, and is jointly developed by representatives of the American College of Radiology® (ACR®), the Radiological Society of North America (RSNA), and the American Association of Physicists in Medicine (AAPM) for rapid and flexible collection, artificial intelligence analysis, and dissemination of imaging and associated data.

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MPLA: PROVIDING MEMBERS WITH RESOURCES TO DEVELOP THEIR LEADERSHIP SKILLS AND ASSESS PROGRESS

MPLA SPOTLIGHT

Samantha Simiele, PhD | University of Texas MD Anderson Cancer Center

Written on behalf of the Medical Physics Leadership Academy Marketing and Publicity Subcommittee with contributions from ***Colleen Foote, MS, Jennifer Johnson, PhD, Anuj Kapadia, PhD****, and* ***Patricia Sansourekidou, PhD****.*

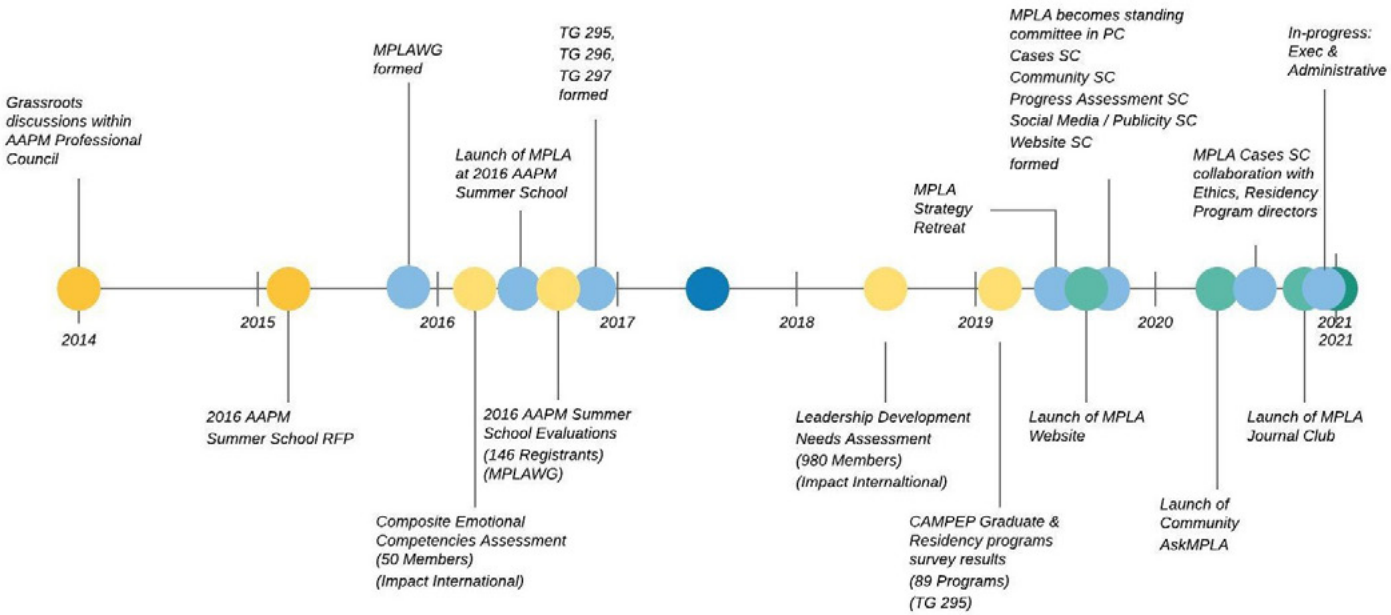
The Medical Physics Leadership Academy (MPLA) wants to achieve two goals: to provide relevant material for medical physicists and to facilitate practice of the relevant knowledge and skills. MPLA spent two years assessing members' leadership needs and determining the curriculum (**Figure 1**). In 2019 at the MPLA strategy retreat, committee volunteers determined the structure needed to foster the development, access, and practice of the material.

MPLA Progress Assessment, Website, and Community Subcommittees are three of five subcommittees under the MPLA Committee umbrella. The Progress Assessment SC is charged with developing progress assessment tools in the areas of business administration and leadership development.

Email: sjsimiele@mdanderson.org

Mingle at the MPLA Mixer **on Monday, July 26 at the 2021 AAPM Annual Meeting.**

Figure 1: *AAPM Medical Physics Leadership Academy Timeline and History*



MPLA SPOTLIGHT, Cont.

The Website SC is charged with developing training content and incorporating this content and the progress assessment tools into the MPLA website. The Community SC is charged with generating a network with multiple levels for medical physicists to develop business administration and leadership skills.

AAPM members can navigate to the MPLA website by clicking on Medical Physicist in the banner on the AAPM homepage and selecting the Medical Physicist Leadership Academy (MPLA) option. They may also access it using AAPM's Short Links MPLA at the bottom of the AAPM website. Currently, the MPLA website homepage provides a summary of what and for whom is the MPLA. MPLA is one part of AAPM's leadership development program where the focus is on the individual's growth from a leadership perspective (**Figure 2a**).

From this landing page the user can find additional information on the history of the formation of MPLA under the MPLA History link. Users are most likely to navigate to the educational tools available through the MPLA Curriculum and MPLA Community links.

The content under the Community link provides users with access to the Journal Club homepage and "Ask MPLA." The MPLA Journal Club was described more fully in the January/February 2021 AAPM Newsletter. Currently on a summer hiatus, the Journal Club will resume in September 2021. Additionally, MPLA Community is going to host its first cohort this fall. Look for more information on the website over the summer.

The Curriculum link provides resources categorized into personal and interpersonal, professional and developmental, and executive and administrative. Each category has both a core and a complementary curriculum (**Table 1**). Current resources consist of presentations from the AAPM Virtual library organized by topic. Additional material will be added soon, such as recent AAPM Virtual Library presentations and external content.

Figure 2: *AAPM's leadership development programs: Medical Physics Leadership Academy (MPLA) and Medical Physics 3.0 (MP3.0).*
(a) MPLA is for personal leadership and business skill development, i.e., individual potential;
(b) MP3.0 is to advance excellence in medical physics in the practice, research, and educational realms.

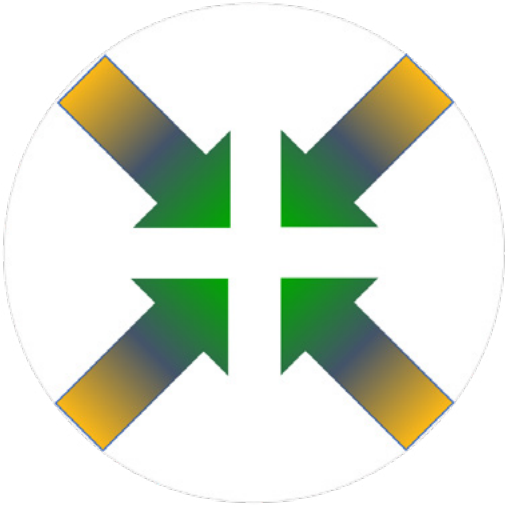


Figure 2a. *Medical Physics Leadership Academy is to advance individual potential*

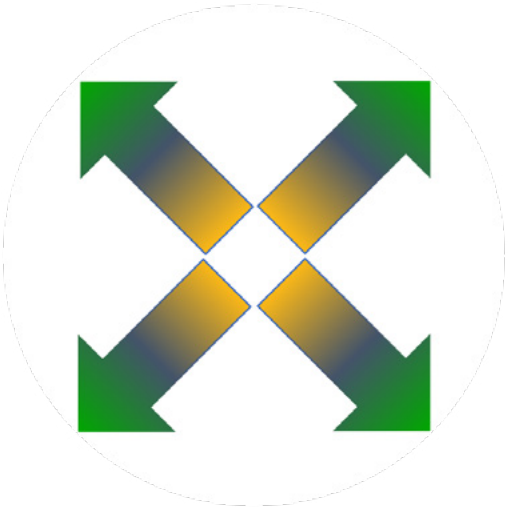


Figure 2b. *Medical Physics 3.0 is to advance excellence in medical physics*

MPLA SPOTLIGHT, Cont.

MPLA recommends individuals start with the core curriculum, which includes knowledge and skills that are difficult to attain naturally as part of one's career progression. The committee recommends focusing on key subjects within the three broader categories based on career stage and recommends becoming oriented with additional concepts that will become more important as individuals advance in their career. For example, graduate students and trainees should focus on personal and interpersonal skills, communication, and some basic executive and administrative skills that are pertinent for their career stage; MPLA encourages learning fundamental knowledge about delegation (even as a delegate) and finance, all as a way to become familiar with the concepts by the time these skills are needed in one's career (**Table 2**). **Izabella Barreto** shares more information on the MPLA Curriculum at the 2021 Annual Meeting during the MPLA session.

The MPLA website is undergoing continual enhancements with the goal of providing users with an interactive experience that both guides the user through the leadership course material and gives them the tools to assess their own progress. MPLA supports incorporating a Learning Management System (LMS; to be developed and incorporated in the future), which will allow the user to track their progress as they navigate through the available course materials. We encourage you to visit the website both now and in the coming months and hope that the resources available will facilitate your mission to empower, lead, and inspire.

Table 1: *Overview of AAPM's Medical Physics Leadership Academy curriculum core and complementary categories*

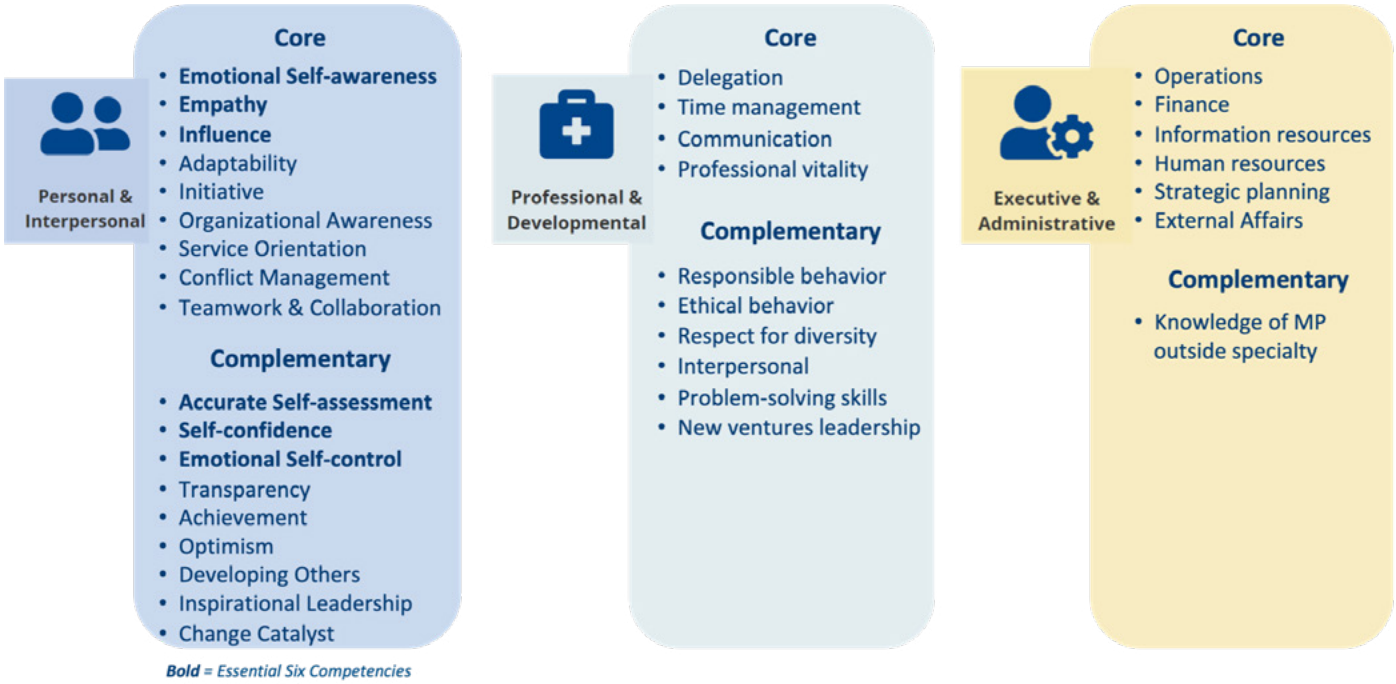


Table 2: *Medical Physics Leadership Academy core curriculum recommendations for medical physics graduate students and trainees*

	Personal & Interpersonal	Professional & Developmental	Executive & Administration
Focus on	• Empathy • Emotional-Self Awareness • Conflict Management • Teamwork & Collaboration • Initiative • Adaptability	• Communication	• Operations • Information Resources • Knowledge of MP Outside Specialty
Learn about/ begin to practice		• MP Value & advocacy • Delegation	• Finance

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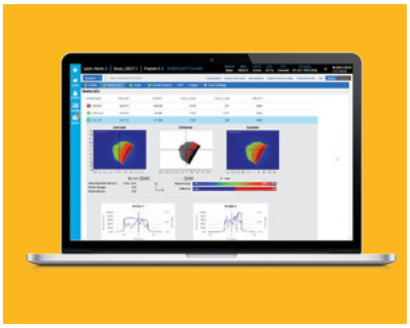

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2021 VIRTUAL EDITION OF THE INTERNATIONAL CONFERENCE ON 3D AND ADVANCED DOSIMETRY (IC3DDOSE021)

3D DOSIMETRY CONFERENCE Luc Beaulieu | Université Laval, Quebec City
Louis Archambault | Université Laval, Quebec City
L. John Schreiner | Queen's University, Kingston

L. Beaulieu

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- **The biennial IC3Ddose conference was held virtually in May, 2021.**
- **93 participants representing 13 countries attended.**
- **A "Rising Star" competition was held, with 7 outstanding entries.**
- **SpatialChat successfully supported poster sessions, vendor booths, and informal discussions.**

This report was published in almost identical form in Canada's COMP Newsletter InterActions (Vol 67:3). The authors have permission from the Editor of InterActions to submit this report to the AAPM Newsletter.

The 11th edition of the International Conference on 3D and Advanced Dosimetry, IC3Ddose, was scheduled to meet in Quebec City in 2020. The conference, initiated originally in Kentucky in 1999 and then continued roughly every two years since in venues across the globe, was set for a Canadian venue, in part to recognize the long history of Canadian medical physics leadership within the IC3Ddose community. By late February the organizers had received over 60 submissions for proffered presentations to the conference and had recruited a strong cohort of 16 invited speakers. All was ready for a very successful meeting in June 2020, and then all life as usual stopped in March of that year.

The IC3Ddose meetings have never been large meetings by any measures, but they have had the distinctive feature of gathering many international experts on 3D and advanced dosimetry. Over the years, the meetings have covered topics from film dosimetry, 3D dosimetry with chemical systems, EPID dosimetry, scintillation and Cherenkov based techniques, challenges of clinical dose delivery validation with dynamic techniques and small radiation fields, end-to-end QA, and much more. The meeting proceedings include 125 invited pedagogical review articles and 585 proffered papers; since 2004 all in the open access journal, *J .Phys:Conf.Series*. Over the years, numerous technical, technological and methodological firsts were presented at this meeting that found their way into commercial products and regular clinical usage.

The wide breadth of expertise in advanced radiation dosimetry was always presented in an intimate forum (IC3Ddose meetings typically had 80 to 125

3D DOSIMETRY CONFERENCE, Cont.

attendees) which enabled an incredible level of in-depth discussions and knowledge sharing. For many participating students and young scientists, IC3Ddose constituted a unique opportunity of one-on-one exchanges with senior researchers, as well as a chance to build a strong network of contact. The students and early researchers from the initial meetings became the experts and mentors at the more recent conferences.

When it became clear that it would not be possible to just postpone the 2020 meeting to 2021, it was decided to turn IC3Ddose021 into a virtual meeting. This enabled those who had submitted work for the conference to still present their research, albeit remotely, and also to have the submitted papers (which had all undergone peer review) to be published in an upcoming *J.Phys:Conf. Series* proceeding. Some of the original submissions were withdrawn since they had been published in the interim in other journals, but ~40 papers were resubmitted after revisions. So, a small-scale virtual meeting was scheduled from May 10th to 13th this year, each day accommodating a 90-minute scientific session with oral presentations for three days and a poster session on the last day. The sessions were scheduled to accommodate participants across 17 time-zones.

The oral sessions over the three days were given over the Zoom remote platform that everyone has become proficient with in the last year. To replicate the relaxed personal interactions long fostered by IC3Ddose, interactive sessions after each day's oral presentation with poster viewing, vendor exhibits and informal gathering rooms for open discussion were moved to an interactive virtual platform called *Spatial.Chat*. There were 6 poster rooms, each with three posters that participants could gather around for free discussion with the presenters; the *Spatial.Chat* software is designed so that each cluster of participants only heard the discussion in their areas of the space.

Five commercial vendors each had two rooms in the virtual conference space, one for a booth and one to show videos highlighting their products and services. The *Spatial. Chat* venue enabled the conference attendees to visit the vendor spaces and talk with these industry partners much as they would be able to in an exhibit hall during a live meeting (see Figure 2). We thank these partners for their support: Elekta, GeVero Co, MedScint, Modus QA, and RTsafe. The feedback received suggests the vendors enjoyed the meeting.

The meeting was a wonderful success with 93 participants from 13 countries. There were 21 oral presentations over three days and 17 posters were presented in a final poster presentation on Thursday. One of the oral sessions was dedicated to young investigators through a Rising Star Competition with judging coordinated by Boyd McCurdy (Winnipeg) and Andrew Jirasek (Kelowna). All the talks in the competition were excellent and the top three presenters were:

- 3rd position: *Dose-response stability of deformed radiochromic dosimeters during spot scanning proton therapy* by **Simon V. Jensen** from Aarhus University Hospital, Denmark.
- 2nd Position: *Development of dosimetric procedures for ultra-high dose rate FLASH irradiation at a clinical linear accelerator*, by Elise Konradsson from Lund University, Sweden.

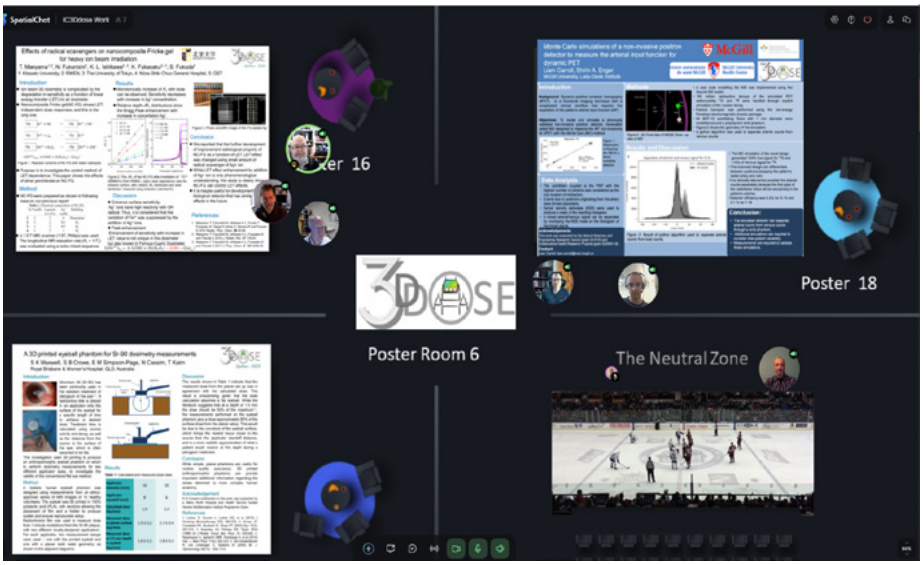

Fig 1: Poster Room 6 from the IC3Ddose021 virtual meeting with participants in the room viewing different posters.

3D DOSIMETRY CONFERENCE, Cont.

Fig 2: The virtual vendor spaces for the two Canadian companies that participated in the IC3Ddose021 meeting. On the left is a screenshot of some of the meeting participants in discussion at the Modus QA booth (left) and on the right is one view of the MedScint theatre that had a continuous showing of a commercial video that would start for participants when they entered the theatre.

- 1st position: *On the feasibility of using an optical fiber Bragg grating array for multi-point dose measurements in radiation therapy* by **Marie-Anne Lebel-Cormier**, Université Laval, Canada

As the local organizing committee, we would like to thank all the participants for the very interesting discussion during the networking sessions as well as our sponsors for making this virtual meeting a reality. It was encouraging to see many attendees in the discussion spaces long after the presentations had finished. The *Spatial.Chat* space simulated well the interactive feel of a more conventional live meeting.

We are looking forward to the June 2022 meeting in full 3D! ■

Fig 3: The winners of the IC3Ddose021 Rising Star competition.

AAPM 2021

JULY 25–29 | VIRTUAL

63RD ANNUAL MEETING & EXHIBITION

CREATIVE SCIENCE.
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- Game Night with the Students and Trainees Subcommittee
- Non-Clinical Professionals Happy Hour
- Get WIRED Networking Event — AAPM Women in Research, Education, and Development
- BINGO and Mingle with AAPM Leaders!
- TOPAS - Monte Carlo for Medical Physics
- Radiopharmaceuticals at AAPM
- Best in Physics + Junior Winner – Posters
- NIH Research Funding Symposium
- Are you ready for a cyberattack?
- Fostering Diversity and Inclusion Through Courageous Conversations
- Medical Physics Trivia Challenge
- Mingle at the MPLA Mixer
- Dimensions of Mentoring Practice
- Physicist Leaders: Let's Talk About the Challenges
- Free Discussion and Chatting on Everything in Brachytherapy Physics
- Ask Me Anything - Residency Director UC Davis
- Global Mentoring: Now More Than Ever (Follow-up)
- Connecting Medical Physicists Globally
- Women's Professional Subcommittee After-Hours Session
- ABR Update; Experiences with Recent Remote Exams
- Networking Social: SCAMP (Science Council Associates Mentor Program)
- Workshop: Brainstorming Session with AAPM Members on Future Directions in Science
  Host: James Dobbins, AAPM President

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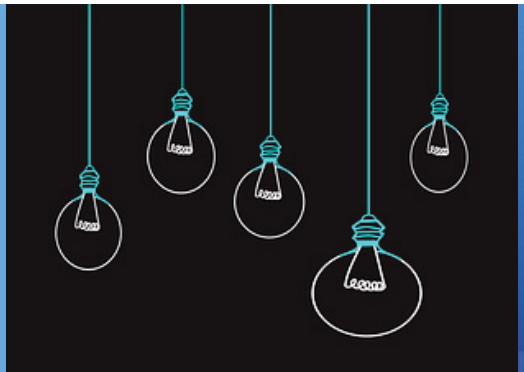

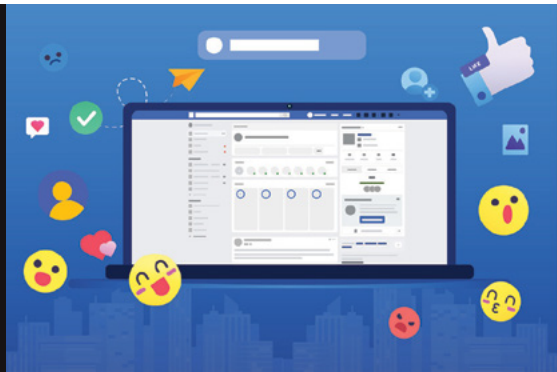

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