2022 ALUMNI NEWSLETTER

The Official Newsletter of the Duke Medical Physics Alumni Association (DUMPAA)

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Matthew Goss, MS, DABR, '07 DUMPAA President



Alumni from the first entering class of 2005 reuniting at the AAPM Alumni Dinner



A group of Duke Medical Physics alumni enjoying a dinner together during the AAPM Alumni Dinner

<u>A Message from the</u> <u>Association President</u>

To the Medical Physics Alumni Association-

In years past I began my end-of-year message with genuine thanks to my fellow alumni, students, faculty, and staff. As our alumni association and academic program grow and change in their own ways, it's important to mention each of these groups, who, over the last few years, have begun to work more closely and collaboratively. For this I couldn't be more thankful or proud. But this past year made me step back a bit and look at where we've come from, where we are, and where we're headed as one unified organization. And while each of the previous groups has played an integral role in that journey, I'd like to mention one in particular.

(Continued on next page...)

Want to get involved with the newsletter?

Be featured as an alumni or research spotlight?

Contact DUMPAA Communications Co-Chairs: <u>Cielle Collins</u>, MS, '19 <u>James Spencer</u>, MS, '17

2022 DUKE MEDICAL PHYSICS ALUMNI NEWSLETTER

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A Message from the DUMPAA President | Matthew Goss (2)

2022 brought us a bit closer to social normalcy, and many of you were able to attend ASTRO or AAPM. Our social committee came through repeatedly to organize events at each of the conferences, and, as many of you know, our first on-campus Alumni reunion event this past August. This event brought association members from all over the country back to Durham to visit the campus, attend social events, and catch up in person. At each event it felt incredible to spend in-person time with friends, colleagues, and mentors. And while enjoying a pint with my former advisor-turned-Director of the Graduate Program was fantastic (albeit still a bit intimidating), the most unexpected and pleasurable interactions I had at each of these events were the ones I had with current students.

Originally the Alumni Association focused on organizing ourselves independently and establishing priorities for and by members of the association itself, with little input or collaboration with the academic program. However, the last three years we've pivoted to actively engaging the program to enhance their agenda as well as that of the Alumni Association. This is a point of pride for the current board administration, and we owe every involved group a debt of gratitude for that. But specifically the engagement I've seen from current students has changed my perspective on the role they do and will play in our growth moving forward. For instance, we initiated the Voices of Alumni program, which responds to direct student feedback asking for honest, direct engagement with practitioners in our field. Initially Alumni-led, the true driving force and maintenance of this program now comes from student representatives with an alumni coordinator adding support. Also, during and after my time on campus and at AAPM, I was approached proactively by several current students and residents who are passionately interested in how they can become more involved with global health and outreach in medical physics. It's clear to me that the students matriculating now are the ones who will be shaping the initiatives the alumni association champions in the coming years. As they graduate and either continue on as staff or faculty, or practice within or outside our field as alumni members, I have confidence they will engage in ways we couldn't imagine now let alone a few years ago. I hope as current students take the time to read these words, they start to think of ways they can contribute; please know that you don't have to wait until after graduation to make a difference and get involved. Your input is what will make this organization grow and thrive.

I'm humbled and proud as always to serve as the DUMPAA president, and 2022 was a landmark year for program development and involvement. None of this could happen without support and engagement from you all, and for that I want to genuinely thank you. Cheers to an inspiring 2023.

Matthew D. Goss

Class of 2007

President, Duke University Medical Physics Alumni Association

DUMPAA Committee Roles and Opening Positions (1)

Each board member's term is for 2 years, and each person may hold a position for no more than 2 consecutive terms. At the end of 2023, each position will be up for election, with some members fully vacating their position after their 4 years of service, and the election period occurs in late August. We wanted to include a section to not only introduce ourselves but also advertise our positions and prepare for the transition to new leadership. If any alumni are interested in holding a DUMPAA Executive or Committee Chair position or have questions about the position's responsibilities, please email the respective position holder.



Matthew Goss, MS, '07 President

President – Matthew Goss, MS, '07:

As for my presidential responsibilities, I'd just say it's more oversight, setting overall agenda, and being a face to the DUMPAA and liaison to the program. I play emcee to various projects and keeping committees and individuals on track, keeping up momentum, etc.

Email: goss.matthew@gmail.com

Secretary –

Wendy Harris, PhD, '18:

My main roles are scheduling meetings, taking meeting minutes, and general communication with the alumni association and DUMPAA board members.

Email: wbh2525@gmail.com

Treasurer –

LaToya Clark, MS, '09:

My roles are to maintain alumni associations financial records and file appropriate financial tax forms for non-profit organizations annually. As our financial needs and abilities grow, the duties of Treasurer will expand also. Email: latoya.g.clark@gmail.com



Wendy Harris, PhD, '18 Secretary



LaToya Clark, MS, '09 Treasurer

DUMPAA Committee Roles and Opening Positions (2)

Digital Communications Coordinator – Michelle Rokni, MS, '18:

Responsibilities include but are not limited to: creating, maintaining, and updating all social media accounts (e.g. Facebook and LinkedIn currently); facilitating any fundraising or money-transfer purchases online or through social media channels in coordination with the Treasurer and Fundraising Committee Chair; and, coordinating timing on release of information, media, (photos, videos, newsletter), and announcements to the Association in coordination with the Activities and Events Committee Chair. Email: roknimichelle@gmail.com



Michelle Rokni, MS, '18 Digital Communications Coordinator

Professional Development Chair – Isabella Duarte, PhD, '20:

This position oversees the DUMPAA Mentorship Program, which recently sent out a call for mentors and mentees. We look forward to matching our students and alumni to further expand our Duke network and connections. Additional activities and responsibilities may form as the Chair sees fit and/or to meet the requests of the Alumni members.

Email: iduarte92@hotmail.com



Isabella Duarte, PhD, '20 Professional Development Chair

Graduate Program Relations Committee Chair – Ericka Chorniak, MS, '21:

The Duke University Medical Physics Graduate Program relations committee shall be responsible for promoting engagement between the Association and the Graduate Program. The committee shall formulate programs to assist current Graduate Program students on career related matters. The committee shall provide feedback to Graduate Program directors. The primary initiative currently in action is the Voices of Alumni initiative. Email: <u>echorniak@marybird.com</u>



Ericka Chorniak, MS, '21 Graduate Program Relations Committee Chair

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DUMPAA Committee Roles and Opening Positions (3)

Activities and Events Committee Chair – Kristy Perez, PhD, '11:

The Activities and Events Committee Chair heads up all the fun. This position is responsible for planning the Duke Med Phys Alumni meet up during the AAPM Annual meeting and also any other activities that the committee would like to plan. The Chair can be as active as our Alumni would like.

Email: kristy.l.perez@gmail.com



Kristy Perez, PhD, '11 Activities and Events Committee Chair

Communications Co-chairs – Cielle Collins, MS, '19 James Spencer, MS, '17:

addition to distributing In important announcements or correspondents widely to the alumni membership, our main responsibility is creating the annual newsletter, released in January each year. We have also begun working to maintain a directory of alumni contact information and work closely with the Social Media Chair to promote events and incorporate pictures. Email: ciellecollins10@gmail.com

james.r.spencer23@gmail.com



Cielle Collins, MS, '19 Communications Committee Co-Chair



James Spencer, MS, '17 Communications Committee Co-Chair

Fundraising Committee Chair –

Liwei Zhang, MS, '07:

The Fundraising Committee is responsible for organizing and developing efforts for all aspects of fundraising as related directly to the Association and/or indirectly to the Graduate Program. As DUMPAA grows and in order to facilitate larger events and reunions, fundraising will become an important endeavor for the Association.

Email: liweizhang@yahoo.com



Liwei Zhang, MS, '07 Fundraising Committee Chair

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Duke Medical Physics Alumni Association Facts & Figures

The Alumni Association has not formally or structurally existed until around 2015 or so, but with the Graduate Program starting in 2005, and the first class of graduates reaching all the way back in 2007, this year marks the 15th year of Duke Medical Physics Alumni exiting the Program and entering into the post-graduate world! At currently almost 300 members strong, the Duke Medical Physics Alumni Association (DUMPAA) has certainly grown over these 15 years, and below are some figures illustrating how our alumni breakdown across some surface level categories.

This data information was aathered mostlv from the Program's available alumni (https://medicalphysics.duke.edu/alumni), and is only accurate up to that self reported data. Additionally, when looking at how our alumni break out across career fields, "Academic" and "Clinical" lines blur for those primarily clinical medical physicists who work at academic institutions/hospitals and likely also do research and academic work. Assumptions were made from job titles, and the actual results would likely lower Clinical and raise Academic numbers. The breakdown by MS vs PhD takes into account those who graduated the Program with both degrees and only bases percentages on the final degree earned. Though not pictured in the region map for spatial size purposes, the 8.3% western US region also includes any alumni currently reporting to live in Alaska or Hawaii.

















Durham Reunion and AAPM 2022 (1)

Alumni Reunion Weekend, August 26-28, 2022

Kristy Perez, PhD, '11: In August, we had a Reunion weekend in Durham. So many changes in Bull City! For those of us who moved away 5 or even 10 years ago, you would be surprised at how much the downtown area has changed. We were able to have meet ups at a few bars and restaurants where current students and alumni interacted and chatted. It was really nice to see friends and hang out in a casual environment not connected to a conference or work.

Looking forward to having a casual meet up in February 2024 in Durham for anyone who can attend!





Cielle Collins, MS, '19: We had an excellent first Duke Medical Physics Alumni Reunion Weekend! The weekend began with a Friday night group dinner at Tobacco Road to watch the Durham Bulls game with postgame fireworks. Current students joined alumni to chat, compare stories of Duke-now and Duke-then, and enjoy a taco bar. We even had a home-run hit into our section! We all had the feeling that our program is a tight-knit community that stays connected even with years of distance between us.

After the game a large group of us went to some of our old favorite Durham spots, namely The Federal and Devines. We laughed, told stories, talked about our latest medical physics ventures and the current students' future career excitement, and had some classic Durham favorites (Fed wings and fries, of course).





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Durham Reunion and AAPM 2022 (2)

On Saturday we started the day informally at Ponysaurus and then all met up at Bull McCabes that evening to kick off the pub crawl. The current students took alumni to the new Boxcar Bar and Arcade, we all enjoyed a festive crawl to Motorco, and then went to many other new and old favorite Duke hang-outs.

Overall it was a wonderful weekend. It felt like small groups of us couldn't go anywhere in town without bumping into other Duke Med Phys alumni, and we loved it. It was just like being at Duke again. I know we're all looking forward to future alumni weekends to come, and encourage those who couldn't join this time to book tickets early for the next reunion; it will be a great time!

Alumni Dinner at 64th Annual AAPM Meeting

At the AAPM meeting in Washington, DC, the alumni held our annual dinner meetup on the first night of the conference. Because of the COVID-19 pandemic, AAPM had not met in person for 2020 or 2021, so it had been a few years since alumni were able to gather and meet. It was a treat to see fellow alumni and Program current students and faculty meeting together outside Durham again.





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Durham Reunion and AAPM 2022 (3)











Conference Dates

Meetings and conferences from national organizations often serve as meet-up and reunion opportunities for us Alumni. Sometimes, like at AAPM, there are more official and planned dinners or times to meet, but most events rely on casual and word-of-mouth planning, especially as the conference or meeting involves more specialized subspecialties. Below is a yearly outline of more common events, though certainly not an exhaustive list by any means. Mark these on your calendar now, and let fellow Alumni know which conferences you will be attending. Be sure to visit our <u>Facebook</u> and <u>LinkedIn</u> groups to share any photos or feel free to <u>email our Digital Communications Coordinator</u>, Michelle Rokni, MS, '18.

DATE:	ORGANIZATION:	LOCATION:
February 2-4, 2023	SEAAPM Annual Meeting*	Huntsville, AL
February 19-23, 2023	SPIE Medical Imaging	San Diego, CA
March 23-35, 2023	RSS Scientific Meeting	Orlando, FL
April 1-4, 2023	AAPM Spring Clinical	Orlando, FL
June 2-7, 2023	AAPM Summer School	Minneapolis, MN
June 3-8, 2023	ISMRM/ISMRT Annual Meeting	Toronto, Canada
July 23-27, 2023	AAPM 65th Annual Meeting	Houston, TX
October 1-4, 2023	ASTRO Annual Meeting	San Diego, CA
November 26-30, 2023	RSNA Annual Meeting	Chicago, IL

*Other AAPM Chapter meetings were not yet listed at time of publication; find them here: www.aapm.org/meetings/default.asp



Social Injustice and Bias Awareness Committee (SIBAC) (1)

We are in search of a new Committee Chair for SIBAC. This committee can be as active or passive as the Committee and Alumni would like. The purpose is to keep our Alumni informed of social injustice and bias as it relates to our field and work. The aim is to amplify voices to provide awareness of opportunities to learn and understand how we work together to improve lives of cancer patients and our community.

If you are interested in getting involved with the SIBAC, please reach out to Kristy Perez at <u>kristy.l.perez@gmail.com</u>

Both ASTRO and AAPM have a focus on Equity, Diversity, and Inclusion (EDI). Our national organizations recognize the importance of fostering an environment where we can all thrive for the benefit of our communities and patients.

The 2022 ASTRO Annual Meeting featured keynote speaker, Ruha Benjamin, PhD. Her talk entitled, "Race to the Future? Reimagining the Default Settings of Technology and Society" included a discussion of her book Race After Technology. similar presentation can found А be on youtube: https://www.youtube.com/watch?v=8IJKA8ciZCg She discusses the social dimensions of data science, discriminatory design in technology, and how digital tools can replicate existing hierarchies and propagate racist policies. The field of Medical Physics is moving towards integrating Artificial Intelligence (AI) into work flows. Dr. Benjamin's work has some interesting points to consider as we adopt AI into our practices.

Additionally, AAPM has formed many subcommittees who are looking for Members or Guests to volunteer. For a list of all EDI Committees within AAPM, please visit here: <u>https://www.aapm.org/org/structure/default.asp?committee_code=EDIC</u>

Accessibility Subcommittee (ASC)

- Role: <u>Guest</u>, Number of Positions: 1-50; Role: <u>Member</u>; Number of Positions: 5-30
- **Description:** Students and trainees from the disabled and neurodivergent communities are highly encouraged to join to create a network of professional support and mentorship. The goals of this group are the following: 1) Identify and address the needs facing disabled and neurodivergent medical physicists and trainees. 2) Promote awareness and provide resources to support EDI initiatives relating to the disabled and neurodivergent communities. 3) Increase representation and visibility through recruitment and mentorship efforts at various levels in training/education. And 4) Inform the EDI committee of the concerns and needs of the disabled and neurodivergent communities with respect to any of their proposed equity, diversity and inclusion efforts.
- **Required Qualifications:** Self-identification as part of the disability and/or neurodiverse communities. Enthusiastic to support, engage, and celebrate your disabled and/or neurodiverse colleagues in medical physics. You must have updated your Conflicts of Interest (COI) via your AAPM Member Profile in order to be added to our roster!

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Social Injustice and Bias Awareness Committee (SIBAC) (2)

Black and African American Medical Physics Subcomittee (BAASC)

- Role: <u>Guest</u>, Number of Positions: 5-30; Role: <u>Member</u>; Number of Positions: 5-30
- Description: Students and trainees are encouraged to apply as well for guest membership by emailing jmpollard@mdanderson.org. AAPM members from the Black, African, and African American community are highly encouraged to join to create a network of professional support and mentorship. The goals of this group are the following: 1) Identify and address the needs facing Black, African American, and African medical physicists and trainees. 2) Promote awareness and provide resources to support EDI initiatives relating to the Black, African American, and African community. 3) Increase representation and visibility through recruitment and mentorship efforts at various levels in training/education. And 4) Inform the Equity, Diversity and Inclusion committee of the concerns and needs of the Black, African American and African and African and African community with respect to any of their proposed equity, diversity and inclusion efforts.
- Required Qualifications: None stated

Hispanic and Latin-x Medical Physics Subcommittee (HLMPSC)

- Role: <u>Guest</u>, Number of Positions: 1-100; Role: <u>Member</u>; Number of Positions: 2-100
- Description: We are seeking AAPM members who self-identify as Latin-X or Hispanic to join our newly formed AAPM Affinity Group and Subcommittee. We seek to celebrate our heritage, grow personal connections, and provide a safe space for discussion and debate where every individual has a voice and can feel empowered to speak within a supportive, judgment-free environment. This affinity group represents a place to share experiences and advice, to compile personal and professional success stories, and a platform to provide recognition and bring attention to individual achievements by community members. This is also a place for actionable mentorship by direct engagement with peer or senior members. We seek participants from every point throughout the medical physics training and education pipeline, as well as established professionals who are available and enthusiastic to serve in any mentorship capacity, including e.g., with respect to professional decision support, presentation skills, interview skills and preparation, difficult conversations, or ABR oral board practice and preparation. Finally, we have every ambition to proactively engage and collaborate on outreach initiatives to bring awareness and accessibility to the Latin-X and Hispanic community regarding this dynamic and profoundly rewarding profession.
- **Required Qualifications:** Self-identification as Latin-X or Hispanic. Enthusiastic to support, engage, and celebrate your Latin-X and Hispanic colleagues in medical physics.

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Social Injustice and Bias Awareness Committee (SIBAC) (3)

Sexual and Gender Minority Subcommittee (SGMSC)

- Role: Guest, Number of Positions: 1-100
- Description: Sexual and Gender Minority Subcommittee is looking for guest members (students/trainees/residents and LGBTQIA+ Allies) to join the 2023 roster. The service term is for 1 year with the possibility of renewal. The charges of the Sexual and Gender Minority Subcommittee (SGMSC) are: 1) Identify and address needs facing LGBTQIA+ medical physicists and trainees. 2) Promote awareness and provide resources to support EDI initiatives relating to the LGBTQIA+ community. 3) Engage with other under-represented minority groups within the AAPM to foster and promote intersectionality. And 4) Increase representation and visibility through recruitment and mentorship efforts at various levels in training/education. This will be an important year for major activities of the SGMSC. We are looking for individuals who have the time to commit to participating in one or more of the charges noted above. A commitment to fostering a safe space for SGMSC members through engaging in constructive and respectful conversations is essential. There will also be interaction of this subcommittee with other AAPM efforts related to EDI. We welcome all applicants, especially those who are members of the LGBTQIA+ community. Having your voices on this subcommittee will be an essential part of its success.
- **Required Qualifications:** Please upload your curriculum vitae or resume and list your primary specialty area(s), AAPM volunteer service history and any other information you would like to share for consideration.

The American College of Radiology (ACR) practices its own "EDI" as Excellence Through Diversity and Inclusion, and the organization has established a <u>Commission for Women and Diversity</u>. For a description of the Commission's mission, please see this video: <u>https://www.youtube.com/watch?v=7742stUKdRY</u>. Additionally, more resources can be found on their <u>ACR Diversity page</u>, including some articles about <u>improving health equities</u> through clinical research and <u>reducing screening disparities</u> among underrepresented patient populations.

Alumni Association Mentorship Program

The Duke Medical Physics Alumni Association Mentorship Program is beginning its next round in the 2023 year. The program launched in December 2020 and has continued to provide matches for prospective mentors and mentees. Mentees are given the option either to be matched to a mentor or to reach out to potential mentors on their own. The matching process for this cycle is underway with more information to come for those who have signed up. Each matched mentorship term will last 3-12 months based on the needs of each mentoring partnership. Alumni can be both mentors to current student mentees or other alumni, or they can be mentees themselves, seeking advice in careers or other professional topics from early-to-long term goals. New and older alumni can all benefit from this program depending on what you are looking for. You can sign up to be both at the same time as well.

This program is a great professional development opportunity for both mentors and mentees and a great way to connect with other members of the Duke Medical Physics community. We will be doing another push for a new round of signups in the fall.

Areas of professional guidance and support can include:

- ABR exam preparation
- Residency applications
- Professional skills development
 - Education
 - Research
 - Clinical care
 - Involvement in professional organizations
 - Leadership
- Career planning and development
 - Strategies for achieving long- and short-term career goals
 - Job searching (including CV/resumes, applications, and interviewing)
 - Switching careers, fields, or specialities
- Equity, diversity, and inclusion (EDI) in the workplace
- Work/life balance

For questions about the program, or if you're looking to be a mentor or mentee, please email Isabella Duarte at <u>iduarte92@hotmail.com</u>



DUMPAA Mentorship Program: Mentor Volunteer

Thank you for your interest in mentoring Duke Medical Physics students and/or alumni! Please fill out the information below to be included in our mentor database.

Voices of Alumni

Voices of Alumni (VoA) began last year, and this year the initiative has continued to expand and has maintained its monthly frequency for sessions to cover a wide array of subject matter for the Program's current students. VoA has three evolving goals:

- 1) Empower and prepare students by hosting events based on their current interests and ensuring the events are largely Q&A based.
- 2) Foster a relationship between current students and alumni.
- 3) Eventually promote a program culture of inclusion and belonging by showcasing the diversity of the program through various alumni involvement.

Topics for each month's session are chosen primarily from student requests and interests, gathered from surveys given after and in between sessions. Alumni availability can affect the timings and scope of the topics chosen, but VoA strives to meet the needs of students. When topics arise where Duke alumni are not available or additional speakers are desired, then the chosen speakers or Alumni Association members find others within their jobs or contacts to join the discussions. So while students see a mostly Duke Alumni perspective, they can also gain perspectives from other professionals in various career fields and build a network that way, too. Below is a schedule of previous and upcoming sessions planned so far.

VoA Schedule and C	urrently Scheduled	Speakers:

Septembe Cli Cli Cli	er (9/23/22): General Clinical Topics inical DI: James Spencer, MS, '17 inical NM: Joe Steiner (LSU) inical RT: David Sterling, MS, '08	January (1/20/23): Academic Medical Physics Jessica Nute, PhD, '09 Titania Juang, PhD, '15 Irina Vergalasova, PhD, '13	
October ((10/28/22): Residency Panel: Applications/	February(2/17/23): Engineering, Consulting,	
Interviews	S	Startups	
Cu DI	Physicist: Krystal Kirby (LSU)	Speakers IBA	
Re	esidency Director: Garrett Pitcher (LSU)	March (3/17/23): Philanthropy in Medical Physics Speakers TBA	
Novembe	er (11/18/22): Industry		
Le: Da	ad Scientist: Jordan Houri, MS, '21 ata Scientist: Jeff Nawrocki, MS, '15	April (4/21/23): Medical Physics but not Medical Physics	
		Patent Agent: Kathryn Albanese, MS, '16	
December (12/16/22): Interview Specifics			
Za Teo	nch Gude, MS, '21 ddy Arsenault, MS, '20	May (5/19/23): TBD pending survey results	

Please note dates are subject to change, and times are usually confirmed close to each session. The seminars are hosted in the Hock Classroom space via Zoom, and all alumni are welcome to attend. Be on the lookout for emails from Alumni Association and/or the Program for information to join!

Please contact <u>echorniak@marybird.com</u> if you are interested in speaking in any upcoming sessions.

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Alumni Spotlight | Matt Japzon (1)



Matt Japzon, MS, '19 is a Radiation Health Officer in the United States Navy. He is assigned to the Nuclear Regional Maintenance Department in Kings Bay, Georgia and serves as the Navy's Southeastern Regional Diagnostic Imaging Medical Physicist.

My journey towards medical physics is fairly unconventional. After graduating from the United States Naval Academy, I fully expected my naval career to follow the traditional path of a "warfighter". My career as a naval officer began when I commissioned into the submarine community. I studied nuclear power and had some exposure (pun intended) to radiation safety and the biological effects of ionizing radiation, but those subjects often took a back seat to nuclear engineering and submarine warfighting tactics as I managed the nuclear plant and conned the USS GEORGIA (SSGN 729), my first submarine tour.

It wasn't until my shore duty where I taught Reactor Physics as a lead instructor to incoming submarine officers that I was introduced to a Radiation Health Officer serving in a clinical role at our medical facility in Charleston, South Carolina. She asked if I had heard of medical physics or health physics and encouraged me to look at these fields of study after she found out that I had an interest in medicine and physics. I was so encouraged and excited about medical physics that when my instructor tour ended I petitioned the Navy to allow me to transfer communities knowing that the Radiation Health Officer community was my only chance at becoming a medical physicst.

After changing communities my first tour as a Radiation Health Officer was onboard an aircraft carrier, the USS George Washington (CVN-73). We took the carrier from Yokosuka, Japan to Norfolk, Virginia with some incredible stops along the way: Australia, San Diego, Peru, Chile, and Rio de Janeiro. While onboard, I managed the radiation exposure of the crew and served in a Health Physics capacity, but I also leveraged my former ship-driving experience and convinced my command to allow me to qualify and drive the carrier, which was both challenging and rewarding.



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Alumni Spotlight | Matt Japzon (2)

Following this tour, I had my first opportunity to really pursue medical physics, and I petitioned the Navy, once again, to send me to Duke University to study medical physics. While I was studying at Duke, the Navy created its own diagnostic imaging medical physics residency program in Portsmouth, VA, which gained CAMPEP accreditation shortly before I graduated. Upon the completion of my master's program at Duke, I was able to matriculate into the Navy's residency program and complete it after two years.

My medical physics certifications and background don't often play a role in the assignments I've had following graduation, but the Navy often leverages these skills when they ask me to conduct site visits at Naval hospitals in my geographic region in order to help them meet Joint Commission and FDA requirements. I really enjoy traveling to different cities and working with commands' Radiology Departments on developing best practices and protocols. Probably the best part of working as one of the navy's only medical physicists is that there are so many officer, enlisted, and civilian personnel eager to learn what it is that a medical physicist does. I've had the privilege of teaching and qualifying many of them on how to survey some of their own equipment under my supervision.

My naval career has provided me with so many opportunities. My family and I have been to some incredible places. I'm excited to see where the Navy takes me and I'm forever grateful for the training and life-long friendships I made at Duke!











Alumni Research Spotlight | Jordan Houri (1)



Jordan Houri, MS, '19 is the lead scientist for space exploration at StemRad Inc., a Tampa-based startup that develops wearable radiation protection solutions for first responders, interventional radiologists, and astronauts. Jordan earned his Master's Degree in Medical Physics at Duke University under the supervision of Anuj Kapadia, PhD and Ehsan Samei, PhD.

Jordan Houri is the lead scientist for space exploration at StemRad, having first heard of the company through a Duke Medical School news article about Dr. Ehsan Samei's and Dr. Paul Segars's collaboration with NASA. Using their highly-detailed XCAT digital human body phantoms, Dr. Samei and Dr. Segars helped define the internal organ geometry for the twin dosimetry phantoms, Helga and Zohar, which have recently completed their journey around the moon in an uncrewed Orion spacecraft on NASA's Artemis 1 mission as part of the Matroshka AstroRad Radiation Experiment (MARE). MARE is the first experiment to precisely map the 3-dimensional distribution of deep space radiation dose throughout a female astronaut's body, and will soon provide the first experimental validation of the protective benefits of StemRad's AstroRad vest, by comparing data from Helga, who was unshielded, and Zohar, who wore an AstroRad vest.

Fascinated by the potential to apply medical physics concepts in outer space, Jordan joined Dr. Anuj Kapadia's lab at Duke in 2019 and began work on developing a Monte Carlo simulation framework to predict astronaut radiation exposure at any location in the solar system, using XCAT digital phantoms. This work led directly to Jordan's eventual recruitment by StemRad, where he now leads R&D on the AstroRad vest.

The AstroRad vest is optimized to protect astronauts from the harsh proton spectra of a solar particle event, such as a solar flare or a coronal mass ejection. Such solar storms can last for several hours, so the vest would allow astronauts to continue to perform critical tasks rather than spend all of their time cooped up in their spacecraft's

radiation 'storm shelter'. The vest is composed of high-density polyethylene (HDPE), which is a hydrogenous compound (with a high ratio of electrons to neutrons) optimized for shielding against charged particle radiation like solar protons, according to the Bethe-Bloch formula.



Figure 1: (Top) The CIRS ATOM 702 Helga and Zohar phantom with internal organ geometry modeled using Duke XCAT digital phantoms. (Bottom) Slices of the Helga and Zohar phantoms showing a regular grid of TLD sensors distributed throughout the body.

(Continued on next page...)

Alumni Research Spotlight | Jordan Houri (2)



Figure 2: Selective shielding design of the AstroRad vest with differential thickness providing additional protection to the most critical and sensitive organs.

However, the main innovation of the vest is the patented 'selective-shielding' design method. In order to optimize between mass (which is important due to launch constraints) and shielding effectiveness, the vest increases in thickness closer to critical and more radiosensitive tissues and organs.



Jordan is now leading StemRad's involvement in the MARE project, an international collaboration between the German Aerospace Center (DLR), NASA, Lockheed Martin, the Israel Space Agency (ISA), and StemRad. In January 2023, Jordan will assist the DLR and Lockheed teams onsite at NASA Kennedy Space Center with recovering the phantoms Helga and Zohar from the Orion capsule and reading out the dosimeter data. Following this, Jordan's focus will be on creating 3-dimensional maps of the dose distribution in Helga and Zohar from the Orion capsule and reading out the dosimeter data. Following this, Jordan's focus will be on creating 3-dimensional maps of the dose distribution in Helga and Zohar to precisely quantify the protection provided by the AstroRad vest. This data will also allow for validation of Monte Carlo simulations, enabling more accurate predictions of the vest's effectiveness in different space radiation environments and conditions.



Figure 3: (Top) NASA Astronaut Jessica Watkins evaluating range of motion for the AstroRad vest on the International Space Station as part of the CHARGE study, with overlain 2D body keypoints. (Bottom) Estimated 3D body keypoints for quantitative range of motion and ergonomics analysis

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Alumni Research Spotlight | Jordan Houri (3)



Figure 4: (Top left) Jordan (third from the left) and the MARE team at Kennedy Space Center after closing out the payload for Artemis 1. (Top Right) A mockup AstroRad vest in front of the SLS rocket prior to the launch of Artemis 1. (Bottom Left) Simulation results showing the expected 3D radiation dose distribution to a female astronaut exposed to a severe solar storm, both with and without the protection of the AstroRad vest. (Bottom Right) 3D distribution of percent dose reduction provided by the AstroRad vest, with red bone marrow (RBM) outlined. RBM sparing is particularly important for increasing survival probability following acute radiation poisoning.

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2022 DUKE MEDICAL PHYSICS ALUMNI NEWSLETTER

Body Surface Bone Marrow

Alumni Research Spotlight | Jordan Houri (4)

Another major ongoing project is the Comfort and Human factors AstroRad Radiation Garment Evaluation (CHARGE), for which a prototype vest was launched to the International Space Station (ISS) in 2019. By using an AI-based pose detection algorithm followed 3-dimensional by а reconstruction method to videos taken by five astronauts while wearing the vest in microgravity conditions on the ISS, quantitative data on the effect of wearing the vest on range of motion has been extracted. These results, together with the data from MARE, will help inform upgrades to the AstroRad vest that improve its ergonomics without compromising radiation protection.

Finally, Jordan is leading StemRad's participation in a collaboration with Redwire Space on a project aiming to 3D print AstroRad vest shielding panels using recycled plastic waste in space. This will require modifying the shielding material, as pure HDPE is extremely difficult to 3D print, and performing extensive radiation testing on sample recycled materials in Earth-based accelerator facilities, such NASA's Radiation as Space Laboratory.



Figure 5: (Left) 3D printed AstroRad vest components on the International Space Station using low-density polyethylene (LDPE) polymer. (Right) Proton beam radiation testing at ProNova Solutions in Knoxville, TN.

Graduate Program Updates (1)







Program Leadership: (Left) Mark Oldham, PhD, Program Director; (Middle) Joseph Lo, PhD, Associate Program Director; (Right) Dean Darnell, PhD, '15, Director of Graduate Studies

There are far too many activities happening in the Medical Physics Program and even more outstanding achievements from faculty, staff, and students to fully list here, but below are some highlights and information of interest provided by the Program.

AAPM leadership has recently and is currently comprised of Program former Directors and faculty. James Dobbins III, PhD, founding Director of the Program, served as President of AAPM in 2021 and was the Chairman of the Board of Directors last year. Ehsan Samei, PhD, the most recent past Program Director, is the current AAPM President and will rotate to the Chairman position next year for the 2024 term. Jackie Wu, PhD, is a Medical Physics faculty member, and is currently serving as a Board-Member-At-Large.







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Program Faculty in AAPM Leadership: (Left) James Dobbins III, PhD; (Middle) Ehsan Samei, PhD; (Right) Jackie Wu, PhD

Speaking of Dr. Wu, she is the current chair of the Faculty Affairs Committee (FAC). One new initiative spearheaded by the FAC is a seed funding effort to support innovative and new interdisciplinary projects for faculty to enrich student MS and PhD opportunities.

There is continued, active effort to encourage diversity in the Program's applicant pool. Dr. Darnell continues to lead these efforts with active recruitment talks and outreach. In 2021 the Program reported that the entering class was majority female for the first time in the Program's history! The Program is also nominating a PhD applicant for one of Duke University's Dean's Graduate Fellowship for Diversity this year.

(Continued on next page...)

Graduate Program Updates (2)

The COVID-19 pandemic forced Program activities and student social events to be virtual, socially-distanced affairs. This year marked the return of many of those events back to in-person format. The students once again held a beach retreat, though there was a concern for hurricane weather at the time. MPAC – the Medical Physics Administrative Council – was able to hold their annual retreat for the first time in some years. Though at different points in the calendar, like the students' weather concerns, part of the MPAC retreat was held in the JB Duke hotel basement for safety during a tornado in Durham at the time! A major topic during the MPAC retreat was how the Program could add flexibility for students to choose more custom curriculum less tied down to the traditional tracks. The Christmas party was held in Sarah Duke Gardens, and the event consisted of a person-wrapping contest, a raffle, and a large donation and haul of gifts sent to the Durham Rescue Mission, organized by students Izzi Montero and Patrick Sansone.

The weekly Seminar Series has now continued for the Program. There are occasional opportunities for Alumni to be invited and join in, so please look out for announcements from the Program for those chances. The Program also hosted some high profile external speakers at other engagements throughout the year. One such prestigious guest was Steve Jiang, PhD, who is the Chief of the Medical Physics and Engineering Division of UT Southwestern Medical Center's Radiation Oncology Department. Dr. Jiang spoke at the Samulski Lecture, which is a memorial lecture honoring the memory of Thaddeus V. Samulski, PhD, who would eventually become the Chief Physicist of Duke University's Radiation Oncology Department. The Seminar Series was restarted by Program faculty Anna Rodrigues, PhD, '16 and Timothy Turkington, PhD.

A staple member of the Health Physics and Radiation Safety aspects of the Program, Terry Yoshizumi, PhD has retired from the Program. The longtime Director of Radiation Safety and Radiation Safety Officer (RSO) for Duke's Occupational and Environmental Safety Office, Dr. Yoshizumi will certainly be missed, and we wish him well in his retirement. Chu Wang, PhD, '15, has assumed both of Dr. Yoshizumi's former roles.





Retirement and Changing of RSO: (Left) Dr. Terry Yoshizumi; (Right) Dr. Chu Wang, '15

Research facilitated by Program faculty and alumni is reaching new heights, literally out of this world. Artemis I, a NASA rocket recently launched to the moon will be carrying phantoms developed by Program faculty and students out of the Carl E. Ravin Advanced Imaging Laboratories (RAI Labs) and from within the newly developed Center for Virtual Imaging Trials. The collaborative efforts between those entities, NASA, the German Aerospace Center, the Israeli Space Agency, industry company CIRS/Sun Nuclear, and others hopes to investigate the magnitude and effect of radiation experienced by astronauts during space missions and travel. (See Alumni Research Spotlight Section on pages 18-21)

https://today.duke.edu/2022/11/artemis-launches-two-duke-experiments; https://cvit.duke.edu/

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Graduate Program Updates (3)

A few new or reinvigorated courses have been added to the Program curriculum that began this year.

– Chunhao Wang, PhD, '16 started teaching a 1 credit hour advance treatment planning Radiation Therapy (RT) course for 1st year students that began in Spring of 2022.

– Trong-Kha Truong, PhD is teaching a 3 credit hour Diagnostic Imaging (DI) course on Advanced MRI Topics which is given in the spring for all 2nd year students and students who pursue PhD at a later date.

– Chu Wang, PhD, '15, also the new Track Director for Health Physics (HP), is co-conducting a new 1 credit hour HP elective course entitled Shielding Design for Medical X-ray Imaging Facilities with Lorna Omenya, MS, a Health Physicist in Duke's Radiation Safety Division and the X-Ray and Laser Safety Program Manager. This class is given in the spring semester and is taught to 2nd year students and students who pursue PhD at a later date.

Joseph Lo, PhD is the Chair of the External Liaison Committee (ELC). This committee helps with Program aspects that involve Duke Kunshan University (DKU), the University of North Carolina (UNC), and external entities. In recent years DKU students have spent a summer and semester at Duke conducting research and taking classes for their curriculum requirements. There is now a major change of this arrangement. There will now be two "plans" for their degree pathway: a Durham and a non-Durham-China plan (these are descriptions of the plans, not necessarily official names). The idea is DKU students can now choose to stay at DKU in China the entire time to fulfill their degree requirements, or they can optionally choose to still spend time abroad and visit Durham in the "traditional" pathway. This is beneficial to both programs so that DKU's program can continue to expand while allowing the support from faculty and staff in Durham to stay manageable and effective for the students that study abroad. It is exciting to see our Program interact with and help shape Medical Physics education internationally!



Each year at AAPM, there are several awards, grants, fellowships, etc given to both students and faculty across the country and globe. This past year at the 64th annual meeting for AAPM, there were seven recipients of the AAPM/RSNA Doctoral and Masters Graduate Fellowship award: four PhD students and three MS students. The \$10,000 award is used for tuition and professional and research development. One of the MS award winners this year was Duke Medical Physics's very own Jingtong Zhao (MS) of the entering class of 2021! Congratulations, Jingtong!

Remembering James E. Bowsher, PhD (1)

For those alumni who may not be aware, Dr. James (Jim) Bowsher, one of the faculty members for the Medical Physics Graduate Program and most recently the Director of Graduate Studies for the Medical Physics Program at Duke Kunshan University (DKU) in China, sadly passed away in December 2022. Please find below a tribute to Dr. Bowsher written by the Duke Medical Physics Graduate Program's founding Director, James Dobbins III, PhD.

A tribute to James E. Bowsher, PhD

Jim Bowsher was a faculty member of Duke University School of Medicine and Duke Kunshan University for over 30 years. Originally from Augusta, GA, he received his B.S. in Physics in 1980 from Davidson College and completed a PhD in Physics from the University of North Carolina at Chapel Hill in 1989. He transitioned the majority of his faculty effort from Duke University to Duke Kunshan University in 2015, where he was Associate Professor of Medical Physics at the time of his death.

Jim started at Duke in 1989 as a research associate in the Department of Radiology. He was affiliated with the laboratories of Carey Floyd, PhD and Ronald Jaszczak, PhD, which were two of the pre-eminent laboratories in the world in the area of nuclear medicine. Jim's expertise was in reconstruction algorithms that were used to generate nuclear medicine images, which became an important contributor to the advent of molecular medicine. Jim became Assistant Research Professor in 1993 and briefly joined the Center for In Vivo Microcopy, under the direction of G. Allan Johnson, PhD, in 2004-05.



After several years as a faculty member in radiology, Jim transitioned to a faculty appointment in the Department of Radiation Oncology, where he continued his work in the mathematics and science of nuclear medicine reconstruction. He worked with Fang-Fang Yin, PhD, director of radiation oncology physics, to design a robotic nuclear medicine system that could be used to target radiation therapy treatments based on functional information about the location and size of an active tumor. He was co-PI on a grant from the National Cancer Institute to develop this robotic SPECT system for radiation oncology, which is a great example of cross-disciplinary work in medical physics that I have mentioned numerous times in lectures on cutting edge work in medical physics.

Jim was an active member of the faculty of our Medical Physics Graduate Program at Duke, which launched in 2005 and is now one of the top three graduate programs in the U.S. in our field.

When Duke started a new Medical Physics Graduate Program at DKU in 2014, under the directorship of Fang-Fang Yin, we needed someone to serve as director of graduate studies. Jim volunteered for that role, and has served expertly as one of the chief leaders of our program in Kunshan, along with David Huang, PhD and Fang-Fang Yin. Jim taught many of the classes to our DKU medical physics students and was a wise, thoughtful, and caring mentor. He served as research advisor for 3 PhD students and 11 Masters students in the medical physics graduate programs at Duke and DKU, and on 61 thesis/dissertation committees.

(Continued on next page...)

Remembering James E. Bowsher, PhD (2)

Jim was recognized for his scientific work by a 100 Talents award from Jiangsu Province in 2015 and served on numerous faculty committees at both Duke and DKU. He taught many of the courses in the DKU graduate program and was greatly appreciated by our students. He won the Excellence in Teaching Award at DKU five times from 2016-2021. Jim would return each summer to Durham to attend to the DKU medical physics graduate students who came for a semester at Duke in their second year.

Jim was an essential leader of our graduate programs at Duke and DKU and will be deeply missed. Jim had a humble, quiet, and gentle manner, and was tremendously effective in his leadership of our program at DKU.

I will miss Jim tremendously as a colleague, and I know that the students will deeply miss his expert and caring guidance.

Sincerely,

James T. Dobbins III, PhD, FAAPM FSPIE

Associate Vice Provost Emeritus Professor Emeritus of Radiology, Biomedical Engineering, and Physics Founding Director Emeritus, Medical Physics Graduate Program Duke University

Chair, Board of Directors and Past-President | American Association of Physicists in Medicine Secretary Emeritus (ex officio member) | Duke Kunshan University Board of Trustees Co-founder and Past-President | Society of Directors of Academic Medical Physics Programs, Inc



Dr. Bowsher (2nd from the left) teaching at the DKU campus

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Remembering James E. Bowsher, PhD (3)

Alumnus Yushi Chang, PhD, '21, a student of Dr. Bowsher's, who started her medical physics education at DKU and went on to receive her PhD from Duke University's Medical Physics Program, knew Dr. Bowsher well. With her permission we have included her social media post tribute to him and accompanying pictures.

"This might be the 1000th time that I have edited this post, and I know I will never be satisfied. No words can express my eternal regret of losing you. From Dr. Bowsher to Jim, you were my teacher, mentor, but fundamentally such a special person to me. Thanks for showing up in my life. You will be remembered forever. ""



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Current Student Spotlight & Activities | Isabel Montero (1)



Isabel (Izzi) Montero (MS) is a second year MS student with the entering class of 2021 from Dahlonega, Georgia. She is a member of the Student Leadership and Advisory Council and president of the Women of Medical Physics group, as well as an intern for the Clinical Imaging Physics Group. She is conducting her thesis research under the guidance of Ehsan Abadi, PhD in the realm of virtual imaging.

Introduction:

Well, here we are winding down another great year for the Duke Medical Physics (DMP) program. While last year was the rekindling of many pre-COVID traditions for the program, this year has seen many of these traditions return at full tilt. Between research, presentations, conferences, classes, social events, volunteer opportunities and more, it has been a very busy and successful year for the DMP program. The theme of 2022 was embracing growth, which this program and the individuals who comprise it have done in stride- we have a feeling that the focus of 2023 will be to embrace prosperity! Our community has been blessed with good health and good company in 2022, and we are looking forward to all of the endeavors that 2023 has to offer us!

Student Leadership and Advisory Council:

This year, the Student Leadership and Advisory Council (SLAC) has again been working hard to be a resource for the students of the DMP program. We started off the Fall semester strong by pairing our first and second year students for our student program! have mentorship We also been experiencing a period of expansion with the proposition of a new Digital Media Coordinator position and Equity, Diversity, and Inclusion (EDI) representative. Our Digital Media Coordinator position has been entrusted to first year MS student, Evangelina Wong. Evangelina has been working to revamp the DMP's social media presence to keep former, current and future DMP members involved in our program up to date! Meanwhile, Olivia Dickinson has been trailblazing as our EDI representative. In this position, she has been attending workshops and providing education opportunities for studentsincluding writing diversity statements. We have loved seeing this growth and are in the process of incorporating these positions into SLAC leadership through changes of our bylaws.



SLAC Leadership is made up of a mix of current students from the entering classes of 2021 and 2022: Top, from left to right: Breylon Riley (PhD), Trevor McKeown (PhD), Markus Sprenger (MS), Patrick Sansone (MS); Bottom, from left to right: Zachary Gude (PhD), Olivia Dickinson (PhD), Carolyn Eckrich (MS), and Isabel (Izzi) Montero (MS). Not pictured: Kevin Filip (MS), Lana Wang (MS), Tyler Kay (MS), Evangelina Wong (MS), and Mercedeh Khazaieli (MS)

(Continued on next page...)

Current Student Spotlight & Activities | Isabel Montero (2)

Voices of Alumni:

This year, Voices of Alumni (VoA) has still been providing current students with opportunities to hear about non-traditional routes taken by graduates of the DMP program. The feedback for this series has been overwhelmingly positive, with many students requesting additional alumni talks for tips and resources outside of non-traditional paths after graduation. This series has been well-attended by our current students and faculty, and we look forward to many more segments in the upcoming year!

Women of Medical Physics:

Our very own Women of Medical Physics (WoMP) group has also flourished this year! The group experienced a changing of the guard this Fall and is currently led by Isabel (Izzi) Montero, Carolyn Eckrich, Charlotte Read, and Olivia Dickinson. This year, the group disseminated EDI information to the DMP program via our monthly newsletter, the WoMP Street Journal, and organized many inclusive events to promote diversity in medical physics. Some of the most notable educational and social events include a cultural potluck to celebrate national 'eat with a friend' day and a 'picnic and pictures' in Sarah P. Duke Gardens to provide students with free, professional headshots. Our most impactful event occurred during this year's Fall Retreat. Students anonymously answered a yes/no questionnaire about their thoughts/feelings/experiences on mental health during their time with DMP. The event proved to be a wonderful bonding and educational experience for the attendees! We look forward to this event in future retreats to develop deeper, more thoughtful connections with our classmates! (Continued on next page...)



Left, Women in Medical Physics Leadership Team made up of current students from the entering class of 2021. From left to right: Olivia Dickinson (PhD), Charlotte Read (MS), Carolyn Eckrich (MS), and Isabel (Izzi) Montero (MS).

Below, headshots taken from the event in Sarah P. Duke Gardens. Pictured are a mix of students from the entering classes of 2021 and 2022. Bottom left: Jessica Dominici (MS); middle: Carolyn Eckrich (MS), Kah Kee Ng (MS), Evangelina Wong (MS), and Lana Wang (MS); bottom right: Breylon Riley (PhD), Trevor McKeown (PhD), and Zachary Gude (PhD).



Current Student Spotlight & Activities | Isabel Montero (3)

Outreach activities:

With the relaxation of many COVID restrictions, our program has been able to volunteer more for the Durham community. Our Outreach Coordinator, Patrick Sansone, has been diligent in his efforts to find great opportunities for us to serve our local community. Patrick connected many of our students with Root Causes, in which students take their early Saturday mornings to deliver groceries to those in need- both near and far. Our students were also able to volunteer with Habitat for Humanity and the Durham Food Bank this Fall, and we are anticipating partnering with these groups again in 2023! At this year's annual Medical Physics holiday party, we also conducted a toy drive for Durham Rescue Mission. Our students, faculty, and loved ones showed incredible generosity with their donations for the drive, and Durham Rescue Mission was incredibly thankful for the donations made on behalf of the program. To kick-start our volunteer opportunities in the Spring, our students will be assembling winter go-bags to deliver to individuals-in-need in Durham during the upcoming months. (Continued on next page...)







Current Duke Medical Physics students at the Habitat for Humanity and Durham Food Bank outreach events this year. The following students are pictured throughout the photos: Lindsey Bloom, Julianna Detrick, Olivia Dickinson, Carolyn Eckrich, Spencer Lynch, Cindy McCabe, Casey Miller, Isabel Montero, Beth Reed, Patrick Sansone, Markus Sprenger, Zachary Whipps, Kyle Williams, and Evangelina Wong.

Current Student Spotlight & Activities | Isabel Montero (4)

Social activities:

Though COVID put a damper on social events in the recent past, this year has offered our students an abundance of social experiences. Our previous Social Coordinator, Breylon Riley, organized an amazing gala during the Spring semester- the first in many years! Students were able to dance their hearts out and celebrate the end of the academic year while dressed to the nines. With the election of a new SLAC, our current Social Coordinator, Isabel (Izzi) Montero, stepped into the role of planning and organizing the program's social events. Though many of our open house events were hosted virtually, this was not the case for all our socials! This year, our group was lucky to head back to the beach for our annual Fall Retreat. The retreat emphasized connection between classmates through events hosted by WoMP and SLAC and was a great weekend away for the attendees. Faculty and students were also blessed to have a beautiful holiday party in Sarah P. Duke Gardens this December. The night was filled with good food, good company, and lots of laughs at students and faculty during some of our festive games. Outside of our large program get-togethers, our students have been very active in Duke sporting events; from football tailgates to basketball games, the DMP has had a strong showing at all these outings. Our very own Zachary Gude is fulfilling the position of Duke Basketball Head Usher and keeps us apprised of all things Duke basketball!









Current Duke Medical Physics students at the Fall Retreat, Student Spring Gala, and Duke Basketball events. The following students are pictured throughout the photos: Kayli Buchli, Teddy Criscuolo, Olivia Dickinson, Jessica Dominici, Carolyn Eckrich, Nicholas Felice, Kevin Filip, Michael Garcia Alcoser, Zachary Gude, Casey Heirman, Tyler Kay, Mercedeh Khazaieli, Trevor McKeown, Isabel Montero, Charlotte Read, Scott Reid, Breylon Riley, Patrick Sansone, Jafr-Tayar Shabazz, Jack Stevens, and Millicent Tysinger.

Women of Medical Physics (WoMP)| Olivia Dickinson (1)

<u>Update for Women of Medical Physics (WoMP)</u> by Olivia Dickinson (PhD) a current student from the entering class of 2021





Women of Medical Physics Year End Review

The Duke Women of Medical Physics (WoMP) group, formed in 2020 by Ericka Chorniak, MS, '21, celebrates its one-year anniversary of being an officially recognized student organization by the Medical Physics Graduate Program and The Graduate School this past fall. WoMP's mission is to encourage our student body to promote diversity, equity, and inclusion within the medical physics community at Duke and beyond. We do this by hosting events and discussions that bring awareness and make room for conversation around the challenges that minority groups within Medical Physics and the STEM world at large face daily at work and in society. WoMP was started by women, but it is a group that makes space for everyone. We encourage participation from our peers regardless of how they may identify and, in fact, encourage diversity because that is the most powerful way to make progress and make space for fruitful dialogue that continues beyond the events we host. WoMP hopes that by promoting continued discussion, our members will take effective action to heighten awareness of the societal norms that pose challenges for marginalized groups while supporting those who are facing inclusivity challenges.

This semester our two main focuses were equitable communities and mental health. We kickstarted our mission by hosting events that discussed these topics during our annual Duke Medical Physics Fall Retreat. The WoMP council had executive meetings where we spent time brainstorming activities that would bring awareness to these two ideas.



WoMP hosts morning meditation and yoga at the annual Duke Medical Physics Fall Retreat.

We came up with an activity called Mental Health and Mindfulness (M&M for short). We generated a list of statements, and some examples of these statements included: "The Duke Medical Physics Program promotes mental health resources", "There's an unhealthy spirit of competition in this program", and "I have an unseen disability which can make it difficult for me to interact with my community." Each participant was given a numbered sheet of paper, and as the statements were read aloud, if the statement was true for that person they put a checkmark, and if the statement was false, they put an X. After the entire list of statements was read, a WoMP member collected all the sheets and then redistributed them. The statements were then read aloud again, and if there was a checkmark on a participant's new sheet they stood up for that statement.

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Women of Medical Physics (WoMP)| Olivia Dickinson (2)





Medical Physics students gathered together at the annual Duke Medical Physics Fall Retreat for a Mental Health and Mindfulness event (M&M) hosted by WoMP.

The visual component of watching our peers stand up to represent how many people felt a certain way or have experienced a certain event made this part of the activity powerful. We took a risk to host a more serious event during a retreat where everyone was energized and excited to be at the beach, but we started off with a compassion-focused mindfulness activity led by one of our WoMP executive members, Carolyn Eckrich, and that set the tone for everyone to get into a state to take the M&M activity seriously. We were thrilled with the positive response from our peers and gained a lot of insight into some areas we need to work on as a community. By making sure our own community is strong, we can then feel confident our members have the skillset and attitude to continue to make a difference beyond our program.

WoMP's October event called "Headshots in the Park" was a great success allowing individuals to have the freedom to express themselves and their unique identities in their headshot photos taken in the Sarah P. Gardens. These headshots can be used for personal websites, LinkedIn, etc. A special shoutout to two of our executive members, Carolyn Eckrich and Izzi Montero, for snapping these photos.

WoMP's November event was called "Eat with a Friend Day." Everyone brought a dish that was significant to them to share with everyone. We designed special cards that attendees would fill out where they could write the name of the dish they made and any important dietary information they felt was important to disclose.

It was a very successful event and attendees made dishes that were signature dishes of their ethnic heritage, dishes their family always made and bonded over, or simply the only dish they felt comfortable making for other people. We had a great turnout, and everyone enjoyed sharing a meal together and learning more about different people's backgrounds and traditions around meals. It was a great way to focus on strengthening our own community and learning more about some of the diversity that exists within it.

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Women of Medical Physics (WoMP)| Olivia Dickinson (3)

In 2023, WoMP plans to host a panel discussion with Cielle Collins, MS, '19; BillieAnn Radcliffe, MS, '22; Julie Raffi, PhD; Anna Rodrigues, PhD, '16; and Oana Craciunescu, PhD to talk about the research article, "Gender-based Discrimination and Sexual Harassment in Medical Physics". The planned date to host the event is Wednesday, February 8th from 5:00-6:30 PM EST. Reach out to me (email listed below) if you would like to stay connected so you can attend the event via zoom or in person!

WoMP has plans to continue hosting events next semester with additional volunteer opportunities, socials, and equity-promoting discussions. Following our panel discussion in January we plan to host a fun Galantines event in February, a group self-defense class in March, an EquiTEA and panel discussion in April, and an engaging community field day in May. In addition, we will continue with our new initiative of sending monthly newsletters, named the WoMP Street Journal, which features famous women in STEM, highlights WoMP events, and brings awareness to current events we find important to update our members on. WoMP is super grateful for the support and encouragement from the Duke Medical Physics Faculty & Staff, Students, and Alumni. Thank you all so much!

Alumni interested in getting involved with WOMP can email Olivia Dickinson at <u>olivia.dickinson@duke.edu</u>.



WoMP Executive Council composed of entering class of 2021 current students. Left to right: Charlotte Read (MS), Carolyn Echrich (MS), Izzi Montero (MS), and Olivia Jo Dickinson (PhD)

Zachary Dean Shrock Memorial Scholarship | Kyle Ferguson (1)



Kyle Ferguson (MS) is a 2nd-year master's student in the Duke Medical Physics Graduate Program from the entering class of 2021. Kyle earned his bachelor's degree in biophysics from Bucknell University in 2021 with research experiences focused on plasma wave instabilities in space and nonlinear dynamics of microparticles in complex fluid flows. Advised by Dr. Joel Greenberg, Kyle now performs research in the Laboratory for Engineering Non-Traditional Sensors at Duke. His thesis focuses on the theoretical exploration of in-vivo breast imaging using novel X-ray diffraction technology. In his spare time, Kyle enjoys exploring Durham's food and drink scene and spending time with friends.

I am incredibly thankful and humbled to be the 2022 recipient of the Zachary Dean Shrock Memorial Scholarship. Zachary's commitment to honesty, inclusivity, leadership, and service, both to the Medical Physics Graduate Program and to all aspects of his personal life, is something I often strive to achieve. Zachary's impression on the graduate program will have a long-lasting effect in shaping fellow students to become the best versions of themselves.

Thanks to the Zachary Dean Shrock Memorial Scholarship, I was fortunate enough to fund my trip to Washington, D.C. for the 2022 AAPM annual meeting. This grant not only allowed me to give an oral presentation but also provided resources for me to stay an extra two days to attend talks I was interested in hearing. Through the various events held by AAPM, I was able to meet Duke Medical Physics alumni, attend impressive keynote talks, network with future colleagues and mentors, and explore the city.

With guidance from Dr. Joel Greenberg, I have been working to simulate how different factors – such as tumor location and breast composition – affect the measurement capabilities of X-ray diffraction for in-vivo breast imaging. Among women, breast cancer is currently the most common form of cancer in the United States. Concerningly, over a 10-year period of routine mammography scanning, it is estimated that 50% of patients will experience at least one false-positive recall, 17% will experience a false-positive short-interval follow-up, and 11% will receive false biopsy recommendations. These statistics are due to limitations in current mammography technology. In order to evaluate X-ray diffraction imaging as a potential solution to these statistics, I first need to conduct a fundamental study to understand how different anatomic features like those mentioned previously impact X-ray diffraction's ability to measure a useful signal.

Traditional mammography screening exams are conventional transmission-based based on radiographs, which obtain image contrast by discerning a tissue's ability to attenuate X-rays, also radiological density. A material's known as radiological density comprises its density and atomic number. While this is not an inherent problem for manv applications, conventional x-ray transmission-based X-ray imaging is ill-suited for mammography due to the widely varying spectrum of breast tissue composition, resulting in many tissues sharing similar characteristics of radiological density (Figure 1).



Figure1 Breast composition can vary widely. As breast density increases (a = least dense, d = most dense) it becomes more difficult to differentiate healthy tissue from cancerous nodes. [1]

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Zachary Dean Shrock Memorial Scholarship | Kyle Ferguson (2)

X-ray attenuation coefficients for different breast tissues show that while the difference between fatty (adipose) tissue and cancerous breast tissue is roughly 49%, the difference between fibrous (dense) and cancerous breast tissue is roughly 5%. Excitingly, in the context of breast cancer, it has been shown that X-ray diffraction provides unique signatures for relevant breast tissues, including adipose, fibroglandular, and cancerous tissue (Figure 2). Different tissues will thus produce unique diffraction patterns with peak locations and spectral widths as defining characteristics. As a result, I look to quantify and exploit differences in these unique signatures to explore the opportunity of X-ray diffraction imaging as a checkpoint for inconclusive mammography results.





It is my hope that the work we are conducting and the manner in which we are doing it makes Zachary proud. This scholarship has both proven to be a significant financial resource as well as acted as a catalyst to thought-provoking conversations; it has served as a humbling guide on how to be not only a better scientist but also a better person and friend. Thank you to all the donors of Zachary's memorial scholarship. It has been a really meaningful experience.

[1] Boyd, Norman F., et al. "Mammographic breast density as an intermediate phenotype for breast cancer." *The lancet oncology* 6.10 (2005): 798-808.

Award Background

This scholarship was created to honor the memory of Zachary Shrock, who graduated with his MS in 2017. During his time at Duke, Zach was an integral part of the Medical Physics program. He participated formally in leadership roles (as the student representative to the Medical Physics Advisory Council and Open House volunteer) and informally as a mentor, colleague, and friend to his peers. As a student in excellent academic standing, Zach also maintained a high-quality research portfolio and published a technical note in Medical Physics. After graduation, Zach would go on to clinical training at the radiation therapy residency at Baylor. He is remembered lovingly as a model student, and a colleague who was committed to doing right by others, even when doing so might inconvenience him. He was dedicated, selfless, and ever willing to help his fellow classmates, embodying his very own prophetic words: "Virtually every goal serves one of two purposes: to make life more enjoyable, or to establish a legacy.... My most cherished goal in life is to make the greatest impact I can on the world by making it a better place for the people who remain after me."

The scholarship fund will be used to support MS students in the Medical Physics Graduate Program at Duke University. Contributions may be submitted at <u>www.gifts.duke.edu</u>, and search for Zachary Dean Shrock Memorial Scholarship in the "search for an area" option.

Graduating Class of 2022 and Current Student Rosters



2022 DUKE MEDICAL PHYSICS ALUMNI NEWSLETTER

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Alumni News & Updates (1)

David Erickson, MS, '15: Hello fellow Dukies! Big events for me here in Ohio: 1. I promoted to the rank of Maj in the Air Force in June 2022 and I am still stationed at Wright-Patterson AFB (been here for 3.5 years at this point!). 2. New baby! Morris Charles Erickson was born on 14Nov22 -6lbs 13oz - 21 inches long. Baby and mom are doing well!

The Erickson Family is now a family of 5! Myra - 7 yo, Millie - 3 yo, Morris - 0 yo, Karsey, and David



Jessica Stephens's new puppy

Wendy Harris, PhD, '18: Following up from last year's update of their engagement, Wendy got married to Brendan Cunnigham in Philadelphia, PA this year.



David Erickson and family

Jessica Stephens, MS, '07: We're excited for the newest fur-member of the family. He's ours in a couple of weeks! I'm beginning a new chapter with Varian as a Sr. clinical transition and implementation physicist.



Wendy Harris and husband Brendan

Alumni News & Updates (2)



Xinyi Li's new place and plants

Xinyi Li, MS, '19, current PhD student: I moved into a new place by myself, and I have finally kept some plants alive for the first time since I came here. One of them is a green onion that will eventually get eaten, but they are still lovely plants that I can enjoy until then.





Irina Vergalasova's son Grant

Irina Vergalasova, PhD, '13: Irina gave birth to her son Grant Matthew Carbonaro in May 2022. Grant gave a wonderful newborn photoshoot!

Alumni News & Updates (3)

Thomas Cullom, MS, '20: Thomas Cullom got married earlier this year. Other members of the Graduating Class of 2020 were present also. In the group photo there is pictured Kiran Pant, MS, '20; Andrew Fuquay, MS, '20; Teddy Arsenault, MS, '20; Ala Amini, MS, '20; and Jeff Xiao, MS, '20.



Thomas Cullom on his wedding day



Members of 2020 class at Thomas's wedding



Sabrina Campelo MS, '20: Sabrina Campelo got engaged back in June

Sabrina (left) on her engagement day

Alumni News & Updates (4)

Deon Dick, MS, '12: After 20 years of friendship, Dwayne and Deon finally tied the knot at an intimate ceremony on Sept 22, 2022 in Montego Bay, Jamaica!

And after 3 months in, still happier than ever 🤎



Deon and her husband



Deon on her wedding day

Irene Boll, MS, '15: My husband and I welcomed our first child Adeline Virginia Boll on May 16, 2022 at 3:14 am (future physicist in the making??). Mom, Dad, and Moose love her so much already.



Irene and her family



Irene's baby and family dog

Alumni News & Updates (5)

Isabella Duarte, PhD, '20: Following last year's update of their engagement, Isabella and Christian got married this year in Cancún in December. Celebrating with them were fellow Duke MP alumni Wendy Harris, PhD,'18; Michelle Rokni, MS, '18; James Spencer, MS, '17; and Mike Trager, MS, '17.



Isabella on her wedding day



Fellow alumni with Isabella on her wedding weekend

Maryann Ayoade, MS, '09: Here are our Christmas pictures from 2022. We are still a family of 4. Nothing too exciting, just happy to be able to get some good pictures with our kids at this age (5 years and 2 years old). HA! I continue to work with the U.S. Nuclear Regulatory Commission's (U.S. NRC) Medical Radiation Safety Team, but I am currently on a rotation/detail as a Technical Assistant for our Office of Nuclear Material Safety and Safeguards. I continue to work remotely (full-time) out of home in Texas, for our NRC headquarters office in Rockville, MD.



Maryann's children



Maryann and her family