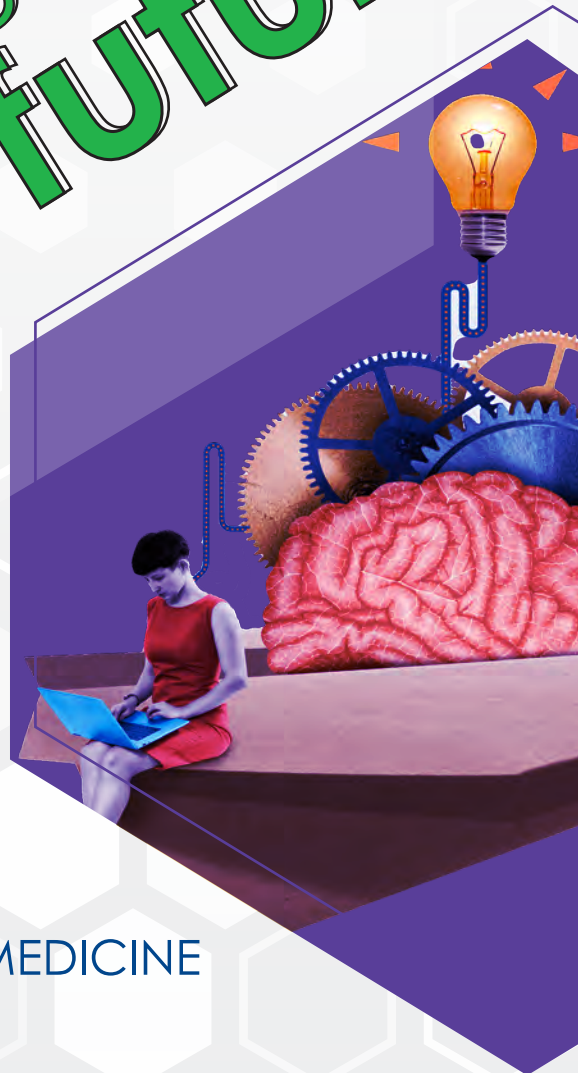


focus on
OUR future

2023 Annual Report

AMERICAN ASSOCIATION *of* PHYSICISTS IN MEDICINE



2023 Annual Report

The AAPM Education & Research (E&R) Fund, established in 1990, supports the development of our vital medical physics profession by funding strategic education and research programs and awards. Research support includes seed grants for early-career researchers, a mentorship program, and travel grants. It also recognizes exceptional research through funding best paper awards for our AAPM journals.

Education support includes matching grants for clinical residency programs, fellowships for graduate students, and travel and tuition awards. It also funds an innovation in education award and distinguished lectureships. Of great significance, the Fund is used to attract undergraduates to medical physics and to promote diversity by supporting the Summer Undergraduate Fellowship Program (SUFF) and the Diversity Recruitment through Education and Mentoring (DREAM) Program.

The Education & Research Fund receives revenues primarily from member donations, donations from our local chapters and related organizations, investment earnings, and the transfer of funds from the AAPM operations budget. As always, AAPM is extremely grateful for these generous gifts. Member donations, which are an essential component and provide the catalyst for other revenue sources, contribute to multiple purposed funds within the E&R Fund's portfolio of funds, many being named or memorial funds. In 2023, the AAPM E&R Fund supported approximately \$490,000 in programs and awards.

This report recognizes recipients of grants, fellowships, and awards funded by the E&R Fund in 2023:

- **Research Seed Grants**

Science Council, through its Research Committee, funded four \$25,000 research seed grants for new researchers in medical physics.

- **ASTRO-AAPM Physics Resident/ Post-Doctoral Fellow Seed Grant**

In 2023, American Society of Radiation Oncology (ASTRO) and AAPM jointly awarded two \$25,000 grants to radiation oncology physics residents to support advancing radiation oncology through physics-related research.

- **AAPM/RSNA Imaging Physics Residency Grants**

In 2019, to extend the previous Imaging Physics Residency Program Grants, the AAPM Board of Directors approved \$420,000 and the Radiological Society of North America provided \$210,000 to support together nine two-year residencies in imaging physics. Awarded in 2019, 2020, 2021, and 2022 each of two programs received \$35,000 per year in matching funds for one resident commencing in the following two years. For 2023, one program was awarded.

- **Summer Undergraduate and DREAM Fellowships**

Education Council, through its Education & Training of Medical Physicists Committee (ETC), used \$96,000 to fund 16 undergraduate fellowships in the Summer Undergraduate Fellowship Program (SUFF) and another \$42,000 to fund

seven undergraduate fellowships in the Diversity Recruitment Through Education and Mentoring (DREAM) Program.

- **Journal Publication Awards**

Endowed funds supported the 2023 annual *Medical Physics* awards for best papers in 2022 in the areas of radiation therapy and imaging physics, the Farrington Daniels Award and the Moses and Sylvia Greenfield Award, respectively. Endowed funds also supported the 2023 annual *Journal of Applied Clinical Medical Physics* awards for outstanding articles in 2022 in four areas of medical physics in honor of its first four editors, Michael D. Mills, Peter R. Almond, George Starkschall, and Edwin C. McCullough.

- **Distinguished Lectureships**

The AAPM Annual Meeting benefitted from two distinguished lectureships supported annually by endowed funds. These are the Carson/Zagzebski Distinguished Lecture on Medical Ultrasound and the Anne and Donald Herbert Distinguished Lectureship in Modern Statistical Modeling.

- **Annual Meeting Awards**

Research awards made at our 2023 AAPM Annual Meeting include the Jack Fowler Junior Investigator Award, the Jack Krohmer Junior Investigator Award, the Arthur Boyer Award for Innovation in Medical Physics Education, and the John R. Cameron-John R. Cunningham Young Investigators Symposium awards.

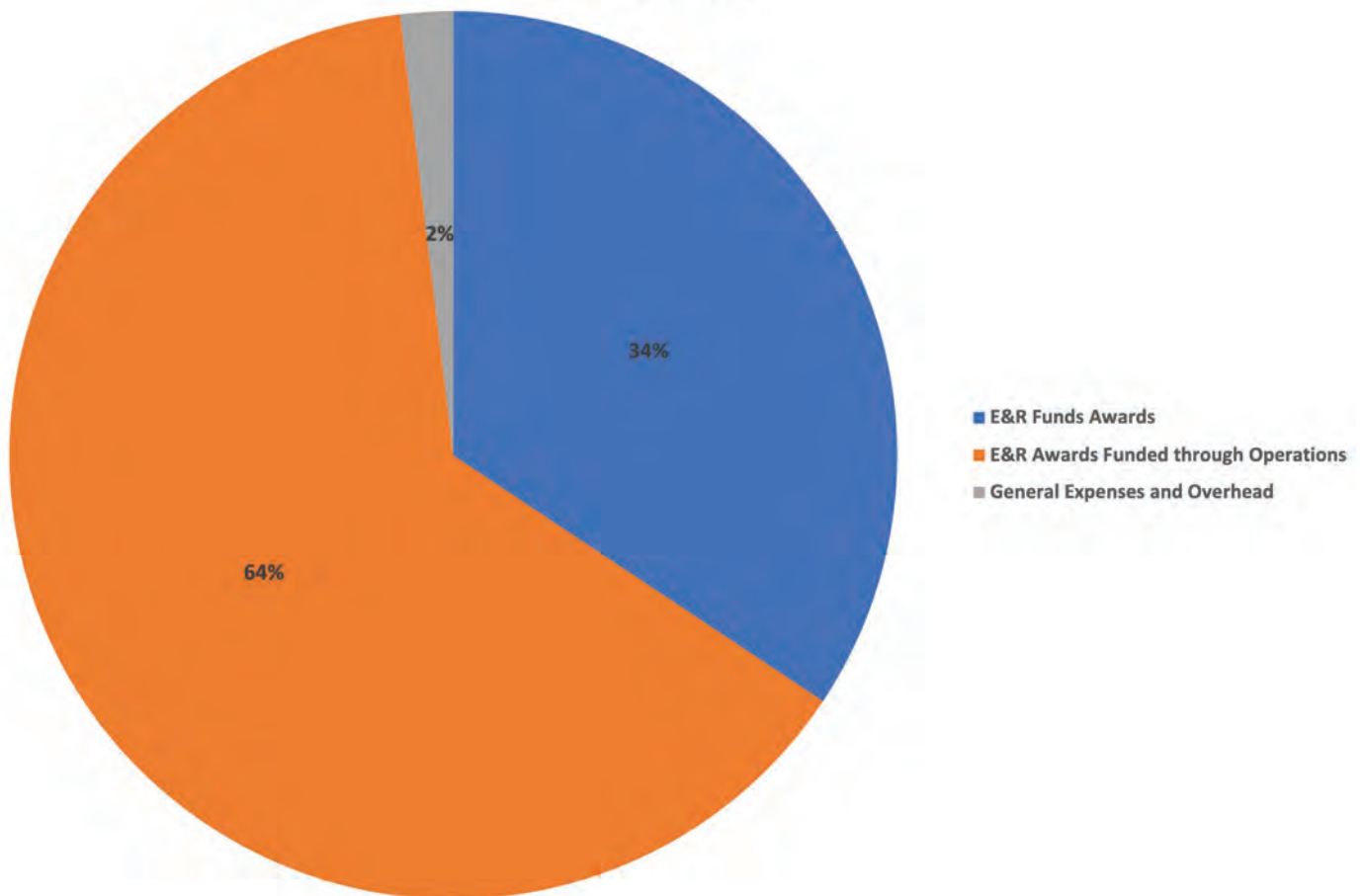
- **Other Awards**

Other awards aimed at cultivating junior medical physics researchers and providing medical physics education include AAPM Expanding Horizons Travel Grants, AAPM Science Council Associates Mentorship Program, AAPM Summer School Tuition Scholarships, and the Team Best/AAPM Travel Awards.

The pages that follow detail 2023 award recipients and testimonials, demonstrating the enormous value the recipients place on this support. These programs impact the medical physics profession by attracting bright people to our profession, encouraging development of quality graduate and resident medical physics education programs, helping develop outstanding research scientists, and

recognizing outstanding research and education accomplishments of many, ***all starting with your contributions to our AAPM E&R Fund.***

2023 E&R Fund Expenses
Total = \$498,803





Wenbo Gu

University of Pennsylvania,
Department of Radiation Oncology

Three Dimensional Printing of Modular Heterogeneous Density Devices for Range Modulation in Particle Therapy

In FLASH proton therapy, beam modulation devices are important accessories for enabling ultra-fast dose delivery based on the clinically available accelerator systems. The current ridge filter design typically consists of uniform density spikes with varying height, to transform a mono-energetic proton pencil to spread-out Bragg peak (SOBP) for volumetric delivery. Its limitations include restricted structural stability, geometrical distortion and less modulation flexibility. The project aims to develop a new class of heterogeneous density range modulators based on a novel PixelPrint technology. By continuously varying the ratio of filament to air, PixelPrint technology is capable of 3D printing phantoms with voxel-wise heterogeneous density. The new device is promising to provide robust structural integrity and high degree of freedom modulation. Our preliminary results of measurement showed the feasibility of creating SOBP from mono-energy proton beam with the first printed heterogeneous device. I will develop methods to optimize density structures for both universal and patient-specific range modulation, and experimentally validate for FLASH applications. With the support from the AAPM seed grant, we will gain valuable experience in algorithm development and experiments to explore the characteristic of the new device. This will further provide more preliminary data for NIH grant application.

Syamantak Khan

Stanford University,
Department of Radiation Oncology

Investigating the risk of tumor sparing in FLASH radiotherapy

The mechanism of FLASH sparing has remained elusive to date. Although several hypotheses have tried explaining the tissue sparing at a higher dose rate, the most pressing question remains: Why does FLASH kill tumors effectively if it spares the healthy tissue? As human studies of FLASH RT are already in preparation, there is a critical need to identify if FLASH can pose a risk of tumor sparing in patients, at least in any specific tumor type where radiation is the first line of treatment. Non-small cell lung cancer (NSCLC) is one of the cancer types where locoregional recurrence is very high after radiotherapy. Mutations in KEAP1 and NFE2L2 are the dominant biological drivers of this radiation resistance. These mutations allow tumor survival mainly by hijacking the cellular machinery of free-radical defense. This seed grant aims to establish FLASH's efficiency in killing KEAP1/ NFE2L2 mutated tumors *in vivo*. Aim-1 will determine if FLASH spares A549 tumors in immunocompromised athymic nude mice, and Aim-2 will investigate if glutaminase inhibition therapy can improve tumor control with FLASH IR. This project will advance our understanding regarding the effectiveness of tumor killing with FLASH IR, especially for KEAP1/ NFE2L2 mutated radioresistant tumors. Finally, this seed grant will create scope to develop future studies to fully understand tissue sparing at ultra-high dose rates and help develop a prospective NIH-funded research program by the principal investigator.



The Research Seed Funding Grant

Four \$25,000 grants were awarded to provide funds to develop exciting investigator-initiated concepts, which will hopefully lead to successful longer term project funding from the NIH or equivalent funding sources. Funding for the 12-month grant period began July 2023. Research results are submitted for presentation at future AAPM meetings.

Sponsored by the AAPM Science Council through the AAPM Education & Research Fund. (See AAPM website for more details, including eligibility requirements.)





Shu Xing

Memorial Sloan Kettering Cancer Center/Brigham and Women's Hospital and Dana Farber Cancer Institute, Department of Medical Physics

Characterization of theranostic nanoparticle concentration in

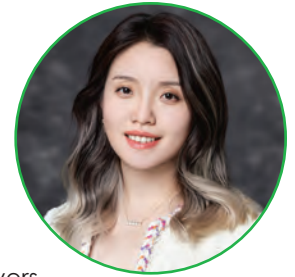
patients with multiple brain metastases during Phase II Clinical Trial

Stereotactic radiosurgery is an established non-invasive ablative therapy for patients with brain metastases. Despite substantial technological advances in radiosurgery, the median survival time of these patients is still less than six months, providing a compelling rationale for novel therapies. The development of a gadolinium-based, theranostic nanoparticle, AGuIX offers promising opportunities to improve treatment outcome as a radiosensitizer for patients with multiple brain metastases. The Phase I clinical trial of AGuIX combined with whole-brain radiotherapy in 15 patients with brain metastases demonstrated a positive correlation between progression-free survival time and AGuIX uptake. Our center is pioneering the first randomized phase II clinical trial of brain-directed stereotactic radiotherapy with AGuIX in a larger patient cohort to further evaluate its efficacy. In this trial, considerable inter- and intra-tumor variability in AGuIX uptake was observed. However, the underlying cause of this variability remains unclear. We hypothesize that the heterogeneity in tumor tissue composition and blood perfusion contributes to the variability in AGuIX uptake. The overall aim of this project is to identify the imaging signatures representative of tumor heterogeneity using multiparametric MRI acquired prior to the AGuIX injection, and to study their correlations with AGuIX uptake in brain metastases.

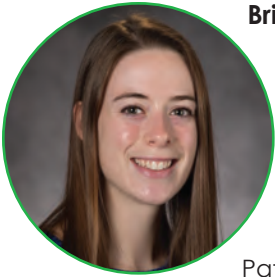
Zi Yang

Stanford University, Department of Radiation Oncology

Enabling Precise Quantification of FLASH Biological Effects with Artificial Intelligence



FLASH radiotherapy (FLASH-RT) delivers ultra-high dose rates over 40 Gy/s and is a potential game-changer in cancer treatment. It's been found to minimize normal tissue damage versus conventional (CONV) irradiation while retaining anti-cancer efficacy. Accurately assessing the FLASH effect is crucial for understanding its biological mechanisms and enhancing FLASH-RT. Yet, this research area is insufficiently explored. We aim to develop a computational platform to convert FLASH doses to iso-effective CONV doses, equating to CONV treatment doses that yield similar outcomes. Current iso-effective dose estimation, based on manual scoring of post-irradiation histology images, is laborious and subjective while ignoring surrounding tissue context. Leveraging artificial intelligence (AI) advancements, we propose an AI-powered platform for FLASH dose estimation, introducing an AI-Detector for streamlined classic scoring and an AI-Estimator with an AI-Interpreter for more comprehensive iso-effective dose conversion. Offering dual conversion techniques: an AI-aided scoring for surrogate endpoint analysis and a novel AI paradigm analyzing entire image for iso-effective dose estimation, our method aims to quantify FLASH effects and enhance our understanding within the current limited radiobiological knowledge. This AAPM seed funding grant will further my journey to becoming an independent researcher.



Brigid McDonald

MD Anderson Cancer Center,
Department of Radiation Oncology

In Vivo Validation of Apparent Diffusion Coefficient as a Quantitative Imaging Biomarker for MR-Guided Adaptive Radiation Therapy for Head and Neck Squamous Cell Carcinoma

Patients with head and neck cancers (HNC) undergoing radiation therapy (RT) face significant side effects due to damage to healthy tissues. Adaptive RT offers promise in minimizing these effects by dynamically adjusting radiation doses based on tumor changes. MR-linac devices enable real-time imaging for on-table adaptation during treatment setup. However, current anatomical imaging lacks insight into physiological changes within tumors. Incorporating diffusion-weighted imaging (DWI), a technique revealing tumor cellularity changes through the apparent diffusion coefficient (ADC), could further personalize treatments. This proposal aims to develop a DWI-based adaptive RT workflow for HNC. In Aim 1, we will perform a test-retest study to measure the variability in ADC to identify meaningful biological changes. In Aim 2, we will analyze weekly ADC kinetics and investigate correlations between ADC and treatment response for HNSCC patients. Aim 3 focuses on creating a workflow and software infrastructure for DWI-based adaptation and demonstrating its efficacy in *in silico* treatment planning. This approach represents a novel treatment paradigm, offering personalized RT while reducing side effects. This grant will provide opportunities to discuss my research with experts in my field at conferences and attend additional training courses to expand my knowledge and advance my career.

Ryan Oglesby

Johns Hopkins Medicine,
Department of Radiation Oncology and Molecular
Radiation Sciences

Relationship between white matter injury and cognition in pediatric brain tumor patients who have undergone treatment with surgery, chemotherapy and/or radiation therapy.

The overall five-year survival of pediatric central nervous system tumors has increased from 57% in 1975 to 77% in 2015. Despite these improvements, survivors are at risk for cognitive sequelae resulting from disease and treatment. To better understand the mechanisms of treatment-induced neurocognitive impairment, the white matter integrity of neuroanatomical substructures related to cognition ought to be evaluated before and after treatment. The goal of our work is to evaluate the correlations between neurocognitive outcomes and substructure white matter integrity using diffusion tensor imaging (DTI) in 61 pediatric brain tumor patients. Neurocognitive assessment included full scale intelligence quotient (IQ), working memory index (WMI), and processing speed index (PSI). Scalar DTI metrics included axial diffusivity ($\lambda_{||}$), radial diffusivity (λ_{\perp}), mean diffusivity (MD), and fractional anisotropy (FA). Preliminary results suggest moderate correlations between MD in the middle cerebellar peduncle and WMI, between $\lambda_{||}$ in the corpus callosum and PSI, and between FA in the inferior cerebellar peduncle and IQ. The research made possible by this seed grant will promote the development of Dr. Oglesby's career as an independent principal investigator in the field of pediatric neuro-oncology and quantitative MRI while simultaneously pursuing a career in therapeutic medical physics.



ASTRO-AAPM Physics Resident/Post-Doctoral Fellow Seed Grant

Two \$25,000 grants were jointly awarded by AAPM and the American Society of Radiation Oncology (ASTRO) with the goal of advancing the field of radiation oncology in novel ways through the support of early-career scientists involved in radiation oncology physics-related research.

Sponsored by the AAPM Science Council through the AAPM Education & Research Fund and the American Society of Radiation Oncology (ASTRO). (See AAPM website for more details, including eligibility requirements.)



AAPM/RSNA Imaging Physics Residency Grants

The AAPM Board of Directors approved \$420,000 in support over six years (\$70,000/year starting in 2020) to co-fund six positions in existing or new imaging physics residency programs, and in support, the Radiological Society of North America (RSNA) Board of Directors approved \$210,000 for an additional three positions. The intent of these funds is that after the period of the award is over, the awardee institution(s) will continue to fully support these imaging physics residency positions. With this funding, the awardee's institution will receive \$35,000 per year for two years as matching support (50/50) for one imaging physics resident. This provides matching funds for nine imaging physics residents over the next six years. (See AAPM website for more details.)

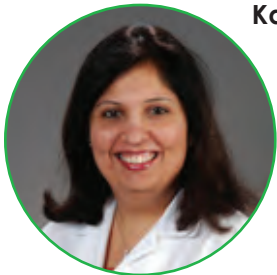
Awarded 2023
1st Year Funding 2024
2nd Year Funding 2025



E. Russell Ritenour, PhD

Diagnostic Radiology Medical
Physics Residency Program,
Medical University of South
Carolina

Awarded 2022
1st Year Funding 2023
2nd Year Funding 2024



Kalpana Kanal, PhD

Department of Radiology
University of Washington |
Director, Imaging Medical Physics
Residency Program

Awarded 2021
1st Year Funding 2022
2nd Year Funding 2023



Scott L. Cupp, MS,

Department of Radiology,
University of Pennsylvania/Penn
Medicine | Director, Imaging
Physics Residency Program



Jie Zhang, PhD

Department of Radiology
University of Kentucky |
Director, Diagnostic Imaging
Physics Residency Program



Mi-Ae Park, PhD

Department of Radiology,
University of Texas
Southwestern | Director,
Medical Imaging Physics
Residency Program

2023 Review | Graduate Student Fellowships

Doctoral Recipients



Zhuoran Jiang
Second Year or Higher
Duke University



Meghan Koo
Second Year or Higher
Toronto Metropolitan
University



Lian Duan
First Year
MD Anderson Cancer
Center



Dongrong Yang
First Year
Duke University Medical
Center

Masters Recipients



Mario Gallardo
University of
Pennsylvania



Elissa Khoudary
University of
Pennsylvania



Joseph Speth
Purdue University

The AAPM/RSNA Doctoral and Masters Graduate Fellowships

are comprised of four Doctoral awards (PhD or DMP) and three Masters awards each in the amount of \$10,000. Additionally, one each of the Masters and Doctoral awards is reserved for under-represented applicants. Awardees are outstanding students based on their academic record, recommendations, curriculum vitae, and self statement of how an award would benefit their graduate studies.

Sponsored by the AAPM Education & Research General Fund. (See AAPM website for more details, including eligibility requirements.)

2023 Review | Summer Undergraduate Fellowship Program

The Summer Undergraduate Fellowship Program (SUFFP)

is a 10-week (40 hours per week) summer program designed to provide opportunities for undergraduate university students to gain experience in medical physics by performing research in a medical physics laboratory or assisting with clinical service at a clinical facility. The mentor and fellow determine the exact 10-week schedule (May-September). In this program, AAPM matches exceptional students with exceptional medical physicists, many whom are faculty at leading research centers. Students participating in the program are placed into summer positions that are consistent with their interest. Selected for the program on a competitive basis, summer fellows receive a \$6,000 stipend from AAPM.

Sponsored by the AAPM Education Council through the AAPM Education & Research Fund with an additional fellowship provided by the AAPM Southwest Chapter. (See AAPM website for more details, including eligibility requirements.)



Charlotte (Lulu) Bimson

Case Western Reserve University
Junior, Engineering Physics

*Mentor: Åse Ballangrud-Popovic, PhD
Memorial Sloan Kettering Cancer Center,
Department of Medical Physics*

Effectiveness of No Margin Treatment for Breast Primary Brain Metastases

At MSKCC, I worked with Dr. Åse Ballangrud-Popovic on analyzing SRS effectiveness for breast primary brain metastases (BM) based on treatment margins. We performed longitudinal tracking of lesions post-SRS treatment for treatments with 0, 0.1, and 0.2 mm margins. Using METastasis Tracking with Repeated Observations (METRO), an AI tool developed at MSKCC for automated detection of brain metastases, 348 lesions were tracked and plotted as a function of their percent growth against time between treatments. These graphs indicate that no-margin treatment is equally effective as the larger treatment margins. I continue to work on this project with MSKCC. We have sent preliminary data to the resident bio-statistician for further analysis. This fellowship introduced me to the field of clinical research in medical physics, sparking my passion for cancer research.

Matthew Georgesen

South Dakota School of Mines and Technology
Senior, Physics

*Mentor: Hyejoo Kang, PhD
Loyola University, Department of Radiation Oncology*



Iterative Reconstruction Techniques for DE-CBCT Scans

Last summer I had the opportunity to work with my mentor Dr. Hyejoo Kang and group mate Dr. Andrew Keeler. They did an incredible job of introducing me to various QA methods, as well as clinical procedures. My research project investigated the use of iterative reconstruction on dose reduced CBCT. To address the challenges associated with deteriorated image quality of low-dose CBCT scans, we are employing iterative reconstruction algorithms in the open source MATLAB library, TIGRE, to improve various image quality metrics of low-dose DE-CBCT scans. Additionally, the focus on low-projection scans further underscores the need for advanced reconstruction methods to compensate for the missing image projections. My specific contribution involved developing scripts to analyze specific image quality metrics, as well as choosing and optimizing various reconstruction parameters. Through this investigation, we aim to contribute to the advancement of medical imaging technology, particularly in the context of minimizing radiation dose while maintaining clinical relevance in CBCT imaging. I have been able to continue this research as I return to my last year of undergraduate studies thanks to the generosity of my mentor and groupmates. Overall, I made many useful connections and gained invaluable knowledge of the field and exposure to research. This would not be possible without the generous support of the AAPM Fellowship program.



Mitchell Halajian

The University of British Columbia
Senior, Honours Physics

*Mentor: Dr. Samantha Lloyd
BC Cancer,
Department of Medical Physics*

Development of quality assurance techniques to assess skin tone effects in surface-guided radiation therapy

My project focused on investigating image quality differences on surface guided radiation therapy (SGRT) units for different skin tones, with a focus on signal problems with darker skin tones. My group worked on this in order to check whether individuals of darker skin tones would be harder to or take longer to set up on SGRT systems, an area of study that lacks in-depth research. I created different coloured phantoms corresponding to the Monk Skin Tone (MST) scale in order to test for differences across the scale, with an initial focus on producing phantoms that closely resembled the darker skin tones MST 9 and 10. I succeeded in making small phantoms not just close to these darker MST values, but also of most of the MST scale. In addition to this I succeeded in making two larger full face phantoms in both a darker skin tone and a lighter skin tone, which were used in testing SGRT systems and found some imaging discrepancies between two different systems. The results of this fellowship helped me understand different imaging modalities that can be used in treatment in addition to the fact that you cannot treat every case in the exact same way, but instead need to properly account for the characteristics of your patient in order to give them the best treatment you can.



Daniel Hoffman

Pennsylvania State University
Senior, Computational Physics

*Mentor: Olga Maria Dona Lemus,
PhD
University of Rochester,
Department of Radiation Oncology*

AI-assisted Prostate Bed segmentation for CBCT-guided Adaptive Radiation Therapy

Over the summer I had the opportunity to work with Dr. Olga Maria Dona Lemus and the radiation oncology department at the University of Rochester. During my ten weeks, I was able to observe the medical physics team perform monthly QAs as well as a yearly QA on the linear accelerators, and watched as they fixed technical issues

with the machines in order to treat patients. I was also able to contribute to Dr. Lemus's ongoing research project, which is dedicated towards solving a known issue with prostate bed segmentation specifically while using lower resolution CBCT images. Due to the bed being a mass of tissue that is mainly defined by the constantly changing shapes of the nearby organs, it is difficult for the auto-segmentation software to recognize it and contour a shape that accurately defines it, often leading to a physician needing to contour it themselves during treatment. To solve this issue, I worked to aid Dr. Lemus in adapting a Python code which has proved effective while using higher resolution CT images. It works by using data from a large set of bladders, rectums, and the original physician defined prostate beds to generate a model that can be applied to a new CBCT image to auto-contour its prostate bed. While working on this project, I was able to solidify my interest in medical physics as well as gain valuable technical and practical skills relating to Python, 3DSlicer, image processing, and deep learning networks.

Adia Holtman

The Ohio State University
Senior, Biomedical Engineering

*Mentor: Ashley Cetnar, PhD
The Ohio State University James
Cancer Hospital,
Department of Radiation Oncology*



Brachytherapy Applicator Digitization FMEA and Time Comparison

My project quantified the differences between two methods of ring and tandem (R&T) digitization during brachytherapy procedures. This comparison was performed through Failure Modes and Effects Analyses (FMEA) and a time study. Brachytherapy is a unique treatment in the field of radiation oncology due to the real-time planning by physicists and physicians. Because of this, it is of the utmost importance for HDR procedures that we minimize patient risk without compromising efficient plan creation. I began this project by observing and timing clinical R&T cases this summer. After understanding the currently used method of digitization, I experimented with the implementation of solid applicators. A protocol was created for this solid applicator method, followed by process maps and FMEAs for each method. Next, qualified medical physicists were asked to fill out each FMEA and to perform solid applicator digitization on past patients. These efforts contributed to an oral presentation that I gave at the James Cancer Hospital Physics Education Conference and the start of a manuscript. This fellowship has exposed me to many facets

of medical physics from research to duties in clinic. This exposure has cemented my interest in medical physics and has prompted me to apply to graduate programs.



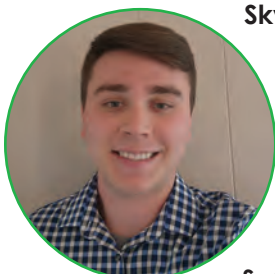
Benjamin Kohler

Michigan State University
Junior, Physics

*Mentor: Gabriel Sawakuchi, PhD
MD Anderson Cancer Center,
Department of Radiation Physics*

Design and Development of an Alpha-Particle Irradiator for Enhanced In Vitro Experiments

During my fellowship, I had the privilege of working in the Sawakuchi/Shaitelman Lab, where my primary focus was advancing research related to alpha-particle exposure and its impact on cancer cells in vitro. Specifically, my summer project centered around the continuous refinement of an alpha-particle irradiator designed for controlled exposure of cancer cells in vitro. The irradiator utilized a thin sheet of Americium-241 as the source of alpha particles, allowing us to direct these particles toward cancer cells that adhered to a thin mylar sheet close to the source. To further enhance the precision and dosimetric accuracy, I developed a shutter system that effectively regulated the exposure time by moving a thin 3D-printed shade over the source to block particles, ensuring that cancer cells received the exact amount of alpha-particle radiation desired for experiments. This project's significance lies in its potential to advance our understanding of alpha-particle radiation's therapeutic applications in cancer treatment. Through this fellowship, I collaborated across disciplines, broadening my knowledge and gaining a deep appreciation for the practical side of medical research. I am extremely grateful to have been given this opportunity and for the mentorship of Dr. Sawakuchi and the radiation physics team at MD Anderson.



Skylar McLerran

Abilene Christian University
Senior, Physics

*Mentor: Joshua Niedzielski, PhD
MD Anderson Cancer Center,
Department of Radiation Physics*

Pancreatic Cancer Multiomic Survival Analysis

Hi, my name is Skylar Gage McLerran and I am a Senior Physics Major attending Abilene Christian University. The AAPM Summer Undergraduate Fellowship Program allowed

me to conduct research with The University of Texas MD Anderson Cancer Center and really opened my eyes to what Medical Physics really is, and how it impacts people's lives. My research titled 'Pancreatic Cancer Multiomic Survival Analysis' allowed me to further advance my skills in Python and data analysis. This research was important because it searched to identify any correlation between pancreatic cancer patient's CT scan data and their overall survival. This correlation could be potentially used to guide future patients' treatment planning in a clinical setting. Overall this Fellowship guided and motivated me to hopefully become a Medical Physicist who can help and mentor others someday.

Maximilian Meineke

Ohio University
Junior, Physics

*Mentor: Hyeri Lee, PhD
The Ohio State University James
Cancer Hospital,
Department of Radiation Oncology*



ProBeam 360 Acceptance Testing

My project this summer was to assist with the acceptance testing of two ProBeam 360 rotating gantries. I documented this process, and directly assisted with tests when possible. At the end of the summer, I gave a presentation reviewing the acceptance process both to the Radiation Oncology department at the Ohio State University James Cancer Hospital, and to colleagues from Oslo University Hospital and Haukeland University Hospital in Norway, who are also in the process of installing a ProBeam 360 system. The testing confirmed that the safety, imaging, couch, and beam systems were all functioning within established tolerances. When the acceptance and commissioning process is complete, it will allow the Ohio State University James Cancer Hospital to begin cancer treatments using proton therapy. This has a range of benefits, and will be especially useful for pediatric cases. Working on this project, I learned an incredible amount about medical physics and proton therapy from lessons with my mentor, being involved in the acceptance tests, observing other clinical work at the hospital, and talking with everyone I worked with. After this experience, I'm confident that I want to go into this field as a career. In fact, I'm already working to get involved in more research next summer! This was an amazing experience, and I'm very grateful to everyone along the way.



Erik Oas

Abilene Christian University
Senior, Medical Physics
Mentor: Luis Perles, PhD
MD Anderson Cancer Center,
Department of Radiation Physics

Analysis of NBTXR3 Nanoparticle Volume Throughout Radiation Treatment

My summer project at MD Anderson was to analyze the biodistribution of NBTXR3 nanoparticles throughout the course of radiation treatment. NBTXR3 is a hafnium oxide nanoparticle that gets injected into the tumor site and taken up by cells to increase the biological effect of the radiation. This is significant because it can help broaden the therapeutic window for various cancers that it is injected near. In my case, I helped analyze a set of pancreatic cancer patients to see if the nanoparticles remained in the same location and in the same quantity throughout the course of radiation treatment. I primarily used two software platforms: Microsoft Excel to organize my data, and Velocity AI for CT image registration, fusion, and data collection. We found that features such as the volume and brightness (in HU) remained the same throughout the course of treatment, demonstrating NBTXR3's ability to remain in the pancreatic tumor throughout treatment. This fellowship has shown me what the diverse field of medical physics has to offer through talking to professors and students at MD Anderson, participating in directly applicable research, and attending this year's AAPM conference. It has been an experience that I will carry with me for the rest of my life.

understand the feasibility of using external electrodes to monitor radiation dose and current within a phantom. Concurrently, we calculated expected results using the Shockely-Ramo theorem for mirror charges and ran Monte Carlo simulations to compare with our experimental data. In addition, I read, organized, and summarized papers for a literature review on how electric fields can be used to diagnose and treat cancer. While I did not fully complete any projects during my time in the AAPM Summer Undergraduate Fellowship Program, I look forward to monitoring how this technology evolves. I hope to see my contributions, along with those of the Dana Farber team, in a published paper soon.

Jonathan Percy

University of Iowa
Senior, Applied Physics
Mentor: Dan Ruan, PhD
University of California, Los Angeles,
Department of Radiation Oncology



MR-Guided Radiation Therapy Utilizing Contrast Enhanced Vascular Imaging

This past summer, I was very fortunate to work under the guidance of Dr. Dan Ruan and several other talented physicists at the University of California-Los Angeles. There, I explored MR-guided radiation therapy utilizing contrast-enhanced vascular imaging, specifically investigating the use of Ferumoxytol rather than the standard gadolinium-based contrast agents. Ferumoxytol offers a safe alternative for patients with impaired kidney function and unique metabolic and imaging properties that make it alluring for magnetic resonance imaging. Over the summer, I established an understanding of current and potential imaging applications, relaxometry, and sequence design associated with Ferumoxytol in magnetic resonance imaging and magnetic resonance-guided radiation therapy. Along with the research experience I obtained, the Medical Physics residents graciously allowed me to observe quality assurance procedures on several different technologies and treatment modalities within the Radiation Oncology department providing me with a formal introduction to physics in the clinic. I am immensely grateful for this tremendous opportunity provided by the American Association of Physicists in Medicine, and to Dr. Dan Ruan and the staff within Radiation Oncology for their guidance and support this summer.

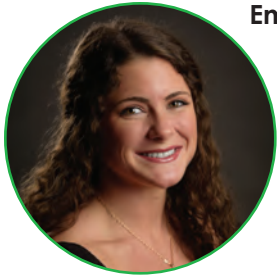


Coral Outwater

Carleton College
Junior, Chemistry
Mentor: Piotr Zygmanski PhD
Brigham and Women's Hospital,
Department of Radiation
Oncology

Remote Sensing of High Energy Particle Currents

In the 10 weeks I spent working with Professor Piotr Zygmanski at Dana Farber Cancer Institute and Brigham and Women's Hospital, I contributed to several different projects, getting experience in a breadth of medical physics research. We conducted experiments with medical linear accelerators and handmade electrode arrays to



Emma Sargent

SUNY Brockport
Senior, Physics

*Mentor: Ozgur Ates, PhD
St. Jude Children's Hospital,
Department of Radiation
Oncology*

Quality Assurance of Auto-Segmentation

My project focused on the quality assurance of auto-segmentation techniques. Under the guidance of Dr. Ozgur Ates in the St. Jude Children's Hospital Radiation Oncology Department, we first conducted a thorough comparison of two auto-segmentation methods using 13 metrics on the contours of 16 specific organs. The sample population for the comparison consisted of 100 previous St. Jude patients who underwent craniospinal irradiation (CSI). Since CSI patient treatment plans require many organs to be contoured, the process is time consuming and leaves ample room for human error. Hence, our project's goal was to develop a tool to improve the efficiency and remove human error in organ-contouring. We designed a novel quality assurance tool that compared the HU kernel density profiles of each organ contour to the organ contour standard and calculated percent agreement scores. This tool can serve as a technique to assess how well artificial intelligence auto-contouring systems perform. I am very thankful to have been given the opportunity to work alongside talented medical physicists and other professionals at such a special place like St. Jude. I learned so much about the field and more about myself through this experience. Because of this summer, I am able to see myself contributing to the medical physics field in the future and I am eager to do so!



Kaden Vasquez

Abilene Christian University
Senior, Physics

*Mentor: You Zhang, PhD
UT Southwestern Medical Center,
Department of Radiation
Oncology*

3D Printed Anthropomorphic MR/CT Medical Imaging Phantom

This summer, I worked at UT Southwestern Medical Center to research and develop an anthropomorphic medical phantom for MR/CT images. The goal was to create

patient-specific medical phantoms that would simulate the motion of a patient's breathing patterns in an MR-linac. This would help to better understand how patient breathing motion affects treatment accuracy. To do this, we used patient data to create scale 3D models of organs. These organs could then be fabricated into a phantom using custom 3D-printed parts and molds. I spent much of the summer understanding the properties of Polyvinyl Alcohol (PVA), which served as the primary material to simulate the motion of the liver. This experience allowed me to have a much better understanding of the world of Medical Physics. My mentors at UT Southwestern were incredibly supportive of my education, allowing me to attend lectures and shadow other researchers across the hospital. AAPM was also actively engaged in my success, quickly responding to any issues that I faced. I was especially grateful to be invited to the AAPM Annual Meeting in Houston, TX. This week allowed me to engage with an even wider range of research and industry that I otherwise would not have known about. I am incredibly grateful for the opportunity to have participated in this research thanks to the AAPM Summer Undergraduate Fellowship Program.

Michael Ziegenfus

Radford University
Junior, Physics

*Mentor: Hao Zhang PhD
Memorial Sloan Kettering Cancer
Center,
Department of Medical Physics*



Deep learning enabled fast gated CBCT imaging for free-breathing lung SBRT

This summer I worked with my mentor, Dr. Hao Zhang, to aid in his current research which involves patient imaging during a CBCT scan. This research looked into optimizing the current technique of CBCT scans, in order to lower overall dosage and shorten the time the patient must sit still. I helped on two fronts, the first was animation. I developed realistic animations demonstrating both current techniques, and the proposed, optimized techniques that Dr. Zhang continues to research. The goal of developing this animation was to help him better demonstrate to vendors and other researchers the difference between the two techniques. An unplanned benefit of these models is that MSK now possesses animations that they can show to their patients to explain the process or alleviate treatment anxiety. The second part of the fellowship involved creating breathing patterns for a dynamic thoracic phantom. This allowed for realistic scans of various breathing patterns,

without real patients to compare techniques. This fellowship was a valuable experience, as it allowed me to get a good idea of the day-to-day workings of medical physicists and their coworkers from the other departments they work closely with. I am thankful I got to experience this glance into the life of a medical physicist, and it will be helpful in my decision to continue my education after undergraduate graduation.

Theodore Gifford

University of Maryland
Junior, Physics

*Mentor: Madan M. Rehani, PhD
Massachusetts General Hospital, Department of Radiology*

Jack Terry

Auburn University
Senior, Physics

*Mentor: Alejandro Bertolet, PhD
Massachusetts General Hospital, Department of Radiation
Oncology*



Diversity Recruitment through Education and Mentoring Program (DREAM)

is a ten-week (40-hours per week) summer program designed to increase the number of underrepresented groups in medical physics by creating new opportunities, outreach, and mentoring geared towards diversity recruitment of undergraduate students in the field of medical physics. Students participating in the program are placed into summer positions that are consistent with their interest. Selected for the program on a competitive basis, DREAM fellows receive a \$6,000 stipend from AAPM.

Sponsored by the AAPM Education Council through the AAPM Education & Research Fund with an additional fellowship provided by the AAPM Southeast Chapter. (See AAPM website for more details, including eligibility requirements.)



Vivian Felso

Agnes Scott College
Senior, Physics

*Mentor: Teh Lin, PhD
Fox Chase Cancer Center,
Department of Radiation Oncology*

Impact of Versa HD linac beam type on radiotherapy treatment time

This summer I had the pleasure of working under Dr. Teh Lin at the Fox Chase Cancer Center. I was able to gain a broad understanding of the work of medical physicists while also conducting research of my own. Understanding all the aspects of treatment that physicists are involved in proved to be much more than I had imagined. I gained experience with QAs, simulations, dosimetry, and radiotherapy both through shadowing and hands-on experience. I also gained hands-on research experience collecting and evaluating data. The research I conducted was on the treatment delivery time of different beam plans on Fox Chase's Versa HD Elekta linac. The beams I compared were the 6X, 10X, and 6FFF beams. I transferred and anonymized patient plans from Eclipse to MOSAIQ and delivered them to a MatriXX phantom while timing the treatment. The research demonstrated a significant drop in treatment time with the 6FFF beam compared to the others. Looking back on the summer fellowship, I am very grateful to have participated. Through all of my experiences, I gained valuable insight into the role clinical medical physicists carry out in cancer treatment.

Miranda Harkess

University of Massachusetts-Boston
Senior, Physics

*Mentor: Jiyeon Park, PhD
University of Florida-Health Proton Therapy Institute,
Department of Medical Physics*



The Proton Dosimetric Effect of a Mandibular Reconstruction Plate in Head and Neck Cancer Treatment

During my fellowship, I worked on evaluating the proton dose due to a mandibular reconstruction plate (MRP) used in head and neck cancer cases. We first scanned the MRP in water and a head phantom and then assessed to see if there were any discrepancies of the Hounsfield Unit (HU) in computed tomography (CT) images. I worked with Dr. Park on evaluating changes in fundamental beam properties such as range, spot size and, scattering when the MRP is placed in water and air. I participated in the planning and execution of an experiment aimed at exploring how modifications in both the beam's energy and the orientation of the MRP could influence alterations in the beam's characteristics. This was achieved by analyzing the pristine Bragg peaks and we obtained preliminary results. Since the UFHPTI houses a range of gantry machines that deliver varying spot sizes, it was crucial to conduct the identical experiment on these gantries. As this project is still ongoing, understanding the dosimetric effect in the characteristics of the proton beam is crucial, given that proton therapy is an advanced and precise form of radiation therapy.

Such understanding can provide valuable insights for developing a more robust and precise treatment plan. This fellowship solidified my decision to pursue a PhD in medical physics as I hope to continue my research into helping improve treatment techniques, ensuring patient safety and enhancing the overall effectiveness of radiation therapy.



Gabriela Roque Oliveira Nomura

The University of Texas at Austin
Junior, Biomedical Engineering

*Mentor: Edward Castillo, PhD
The University of Texas at Austin,
Department of Biomedical
Engineering*

DIR-Free CT-Ventilation using a Deep Convolution Neural Network for Automated Lobe Segmentation

Relocating from Brazil to the United States during my early adolescence marked a transformative chapter in my life. Since then, my journey in the U.S. has been filled with opportunities to delve into my passions, particularly in the realm of cancer research—a field I aspire to pursue professionally. This past summer, under the mentorship of Dr. Edward Castillo at the University of Texas at Austin, I had the chance to learn more about AI applications in radiation oncology. During this period, I acquired skills in constructing, training, and validating various deep-learning segmentation networks, including a 3D Dense-Net and the classic U-NET model. My immersive experience extended to two weeks of clinical exposure, shadowing medical physicist, Austin Wilkinson, and radiation oncologist, Dr. Karen Cohen. Culminating the summer, I presented my research as a Blue Ribbon Poster at the AAPM Annual Meeting in Houston, TX, focusing on the validation of a Dense-Net model for lung segmentation using ventilation calculations. As a recipient of the AAPM DREAM fellowship, the entire summer proved invaluable, contributing significantly to my growth as a researcher and my aspirations to become a future oncologist.



Sabrina Ripsman

University of Pennsylvania
Junior, Physics

*Mentor: Atchar Sudhyadhom, PhD
Dana Farber Cancer Institute/
Harvard Medical School,
Department of Radiation Oncology*

0.35 T MR-based multimodal method for calculation of proton stopping power ratio

Throughout the summer, I worked on calculating the stopping power ratios (SPR) of different tissues using a 0.35T MR-based process. This method of determining SPR values was originally developed using a 3T MRI, but had not been tested with a low-field MRI. The calculation of SPR values is vital in proton therapy, as it is used to direct the proton beam to deliver the correct amount of radiation to the correct location in the body, accurately targeting the tumor and minimizing the radiation delivered to the rest of the body. My project consisted of building tissue-mimicking phantoms, scanning them using CT, 3T and 0.35T MRIs, calculating the SPR values based on the scans and comparing the 0.35T SPR values with the 3T SPR values as well as the predetermined 'ground truth' values for each type of tissue. If SPR values can be accurately determined using low-field MRI, this technology could eventually be used in the efforts to create MR-guided proton therapy. Overall, this internship exposed me to a fascinating field that combines my interests perfectly, and strengthened my passion for research. Thank you to Dr. Sudhyadhom and AAPM for this incredible opportunity!

Nicole Strecker

University of Florida
Senior, Physics and Mathematics

*Mentor: Tsuicheng Chiu, PhD
University of Texas Southwestern
Medical Center,
Department of Radiation Oncology*



Feasibility Study of MR-guided Adaptive Stereotactic Partial Breast Irradiation (A-SPBI) Using a Vacuum Immobilization Breast Cup and a Supine Setup

Over this past summer, I got to work with Dr. David Chiu at the University of Texas Southwestern Medical Center. I was able to explore a medical physicist's role in radiation therapy through shadowing, participating in a SBRT course, helping with GammaPod acceptance testing, and learning how to do MRI/CT fusions and treatment plans. The research component of this fellowship allowed me to create a new immobilization device for breast for use on the MR-Linac and CyberKnife, which is based on GammaPod's immobilization system for use of SBRT on breast cancer. This device will allow for the patient to be in the supine position and receive partial breast irradiation, improving treatment of breast cancer on MR-guided machines. I also hope for this device to offer more affordability to hospitals that cannot afford to buy a GammaPod machine. This device

was designed on 3D modeling software and printed using 3D resin printers. By the end of the fellowship, I made a full-sized prototype, and it is planned to be tested for dosimetry benefits and impacts. Overall, this experience and the AAPM has made me fall in love with medical physics and I'm excited to be applying to graduate school programs in the coming months.



Jolie Wang

Rice University
Junior, Electrical and Computer Engineering
*Mentor: Jessica E. Scholey, PhD
UCSF,
Department of Radiation Oncology*

Clinical Side of AI-Targeted Prostate Radiotherapy

My project involved mostly work to assist on the clinical side to prepare data for an AI model, which involved co-registering imaging spaces between MRI, CT, and contours and learning about the applications of machine learning to MRI images for radiation oncology treatment planning. Using AI in the medical field is important because it can increase efficiency of locating high risk prostate cancer since all the planning right now is done by medical physicists and radiation oncologists per patient. The MIM software and RaySearch are all clinical systems, which have different environments compared to research deep learning models that use python, so I worked on the pipeline between clinical and research systems. I worked closely with my mentor, Dr. Jessica Scholey, through weekly meetings and consistent, constant communication. Through the fellowship, I learned more about performing research on the computational side of radiation oncology and what it was like to be a medical physicist through shadowing, panels, and the AAPM Annual Meeting. Now, I am excited to consider and pursue a career as a medical physicist in the future.

Jayla Wheeler

Davidson College
Senior, Physics

*Mentor: Michele Dougherty PhD
Mayo Clinic,
Department of Radiation
Oncology*



DREAM Fellow at the Mayo Clinic

During the Summer of 2023, I was given the opportunity to shadow the Radiation Oncology Department at the Mayo Clinic in Jacksonville, Florida. During my time at Mayo, I spent the majority of my time learning about the role and responsibilities of a Therapeutic Medical Physicist. My mentor was extremely supportive and pushed me to get a full experience of the department. I observed initial imaging of patients in CT, treatment of patients on the LINAC and GammaKnife, as well as quality assurance testing on various modalities. While the main goal was to learn about the role of a medical physicist, I was also able to do a small research project to better understand what research looks like in this field. The goal of my project was to evaluate the effectiveness of functional lung imaging by comparing dose distributions of an original treatment plan created for a patient and a 4D composite plan that we created. This was a great introduction to what research in this field looks like and gave me the opportunity to use software that is commonly used by medical physicists. This fellowship was eye opening for me because it confirmed my interest in medical physics. I was able to see the daily workday for a medical physicist and do some hands-on work. I really enjoyed my time and am very grateful for the opportunity. Because of my experience with my mentor and the Mayo Clinic, I decided to pursue a career in medical physics and applied to graduate schools.

Medical Physics Journal Best Paper Awards



Farrington Daniels Award

(Funded by the endowed Farrington Daniels Fund)

This award is for an outstanding paper on radiation therapy dosimetry, planning, or delivery published in *Medical Physics* in 2022. Presented in 2023, the

awardees were **Brendan Whelan,**

Stefania Trovati, Jinghui Wang, Rebecca Fahrig, Peter G. Maxim, Adi Hanuka, Muhammad Shumail, Sami Tantawi, Julian Merrick, Joseph Perl, Paul Keall, and Billy W. Loo Jr. for their paper entitled "Bayesian optimization to design a novel x-ray shaping device," *Med. Phys.*, (2022) 49: 7623-7637. <https://doi.org/10.1002/mp.15887>.

Moses and Sylvia Greenfield Award

(Funded by the endowed Moses and Sylvia Greenfield Fund)

This award is for an outstanding paper on imaging, published in *Medical Physics* in 2022. Presented in 2023, the awardees were **Laura Klein, Chang Liu, Jörg Steidel, Lucia**

Enzmann, Michael Knaup, Stefan Sawall, Andreas Maier,

Michael Lell, Joscha Maier, and Marc Kachelriess for their paper entitled "Patient-specific radiation risk-based tube current modulation for diagnostic CT," *Med Phys.*, (2022) 49: 4391-4403. <https://doi.org/10.1002/mp.15673>.



Journal of Applied Clinical Medical Physics (JACMP) Best Paper Awards

(Funded by the endowed JACMP Editors' Fund)



Michael D. Mills Editor In Chief Award

This Award of Excellence is for an outstanding general medical physics article published in *JACMP* in 2022. Presented in 2023, the awardees were **Matthew Hoerner, Kevin Grizzard, Jennifer**

Moroz for their paper entitled "Method

of determining technique from weight and height to achieve targeted detector exposures in portable chest and abdominal digital radiography," *J Appl Clin Med Phys.*, 2022; 23:e13582. <https://doi.org/10.1002/acm2.13582>.

Peter R. Almond Award

The Peter R. Almond Award of Excellence is for an outstanding radiation measurements article published in *JACMP* in 2022. Presented in 2023, the awardees

were **Dustin J. Jacqmin, Jessica R. Miller, Brendan A. Barraclough, and**

Zacariah E. Labby for their paper entitled

"Commissioning an Exradin W2 plastic scintillation detector for clinical use in small radiation fields," *J Appl Clin Med Phys* 2022; 23:e13728. <https://doi.org/10.1002/acm2.13728> Epub 2022 Jul 21. PMID: 35861648; PMCID: PMC9359019.



George Starkschall Award

This Award of Excellence is for an outstanding radiation oncology physics article published in the *JACMP* in 2022. Presented in 2023, the awardees were **Lam M. Lay, Kai-Cheng Chuang, Yuyao Wu,**

William Giles, and Justus Adamson

for the paper entitled "Unlocking a closed system: dosimetric commissioning of a ring gantry linear accelerator in a multivendor environment," *J Appl Clin Med Phys.*, 2022; 23:e13639. <https://doi.org/10.1002/acm2.13639>.

Edwin C. McCullough Award

The Edwin C. McCullough Award of Excellence is for an outstanding medical imaging physics article published in the *JACMP* in 2022. Presented in 2023, the awardees

were **Mitchell Polizzi, Siyong Kim, and Mihaela Rosu-Bubulac,**

for their paper entitled "A comprehensive quality assurance procedure for 4D CT commissioning and periodic QA," *J Appl Clin Med Phys.*, 2022; 23:e13764. <https://doi.org/10.1002/acm2.13764>.



2023 Review | Presentation Awards

Jack Fowler Early-Career Investigator Award

(Funded by the Jack Fowler Award Fund)



This award was established in honor of Jack Fowler, PhD, Emeritus Professor of Human Oncology and Medical Physics, University of Wisconsin.

The award was presented to **Rachael Hachadorian, PhD**, Massachusetts General Hospital and Harvard Medical School, for the top scoring abstract submitted

by Early-Career Investigators who entered the competition, entitled "Voxel-Wise Calculation of Dose Rates in Patients Receiving Pencil Beam Scanning Proton Radiotherapy."

Jack Krohmer Early-Career Investigator Award

(Sponsored by the AAPM Science Council and Krohmer Memorial Fund through the AAPM Education & Research Fund)



This award was established in honor of Jack Krohmer, PhD, a pioneer in the medical physics community.

The award was presented to **Hieu Nguyen, PhD**, Stanford University, for the best abstract submitted by Early-Career Investigators to the Scientific Program of the AAPM

Annual Meeting, judged according to criteria of significance, innovation, and the potential for major scientific impact in an area of cutting-edge interest in medical physics. The abstract was entitled "Tracking Multiple FDG Labeled Single Cells In Vivo with a Gaussian-Mixture-Based Model."

Arthur Boyer Award for Innovation in Medical Physics Education

(Funded by the Boyer Innovation in Medical Physics Education Fund)



This award is given for the best presentation at an Education Council session concerning innovative programs in medical physics education of physicists, physicians, ancillary personnel, and the public. Presentations can be concerned with scientific research, novel teaching strategies (team teaching or adult learning efforts), or novel educational materials (lectures, websites, or other innovations). This year's award went to **Sarah Quirk, PhD**, Brigham and Women's Hospital; Harvard Medical School, for a presentation entitled, "A Pan-Canadian Initiative to Apply a Competency-Based Simulation Enhanced Education Framework for Medical Physics Learners in the Clinical Implications and Measurement of Absolute Dosimetry."

Carson/Zagzebski Distinguished Lecture On Medical Ultrasound

(Funded by the endowed Carson/Zagzebski Fund)



On Monday, July 24 at the 2023 AAPM Annual Meeting, invited lecturer **James Wiskin, PhD**, QT Imaging, delivered his lecture, "Whole Body Low Frequency 3D Ultrasound Tomography/Volography."

The Anne and Donald Herbert Distinguished Lectureship in Modern Statistical Modeling

(Funded by the endowed Anne and Donald Herbert Fund)



On Monday, July 24 at the 2023 AAPM Annual Meeting, invited lecturer **Kyle J. Myers, PhD**, Puente Solutions LLC, delivered her lecture, "Advances in the Assessment and Mitigation of Bias and Uncertainty in Performance Estimates for AI-Enabled Medical Imaging Systems."

John R. Cameron Early-Career Investigators Symposium Award

(Funded by the endowed John Cameron Fund)

The Early-Career Investigators Symposium is a competition in honor of University of Wisconsin Professor Emeritus John R. Cameron, PhD and John R. Cunningham, PhD, from Princess Margaret Hospital, and subsequently from the University of Alberta. The 10 highest scored abstracts submitted for the Symposium are selected for presentation, from which the top three presentations receive awards. 2023 winners were:

1st Place

Claire Keun Sun Park, PhD

Western University, PhD Candidate, Department of Medical Biophysics, Robarts Research Institute
"Dedicated 3D Automated Breast Ultrasound with High-Resolution Complementary Imaging for Point-of-Care Breast



Cancer Screening in Increased-Risk Populations"

2nd Place

Savannah Marie Decker

Dartmouth College, PhD Candidate, Engineering Thayer School

"Expanding the Inclusivity of Cherenkov Surface Dosimetry By Quantifying the Effects of Skin Tone in a Multi-Institutional Human Study"



3rd Place

David P. Adam, PhD

Johns Hopkins University, Physics Resident, Department of Radiation Oncology and Molecular Radiation Sciences

"Creation of Waterproof, Tld Probes for Absorbed Dose Measurements to Validate Image-



Based Radiopharmaceutical Therapy Dosimetry Workflow"

AAPM Science Council Associates Mentorship Program

has been established to recognize and cultivate outstanding researchers at an early stage in their careers with the goal of promoting a long-term commitment to science within AAPM. The program uses the process of “shadowing” to integrate the Associates into the scientific activities of the organization. Science Council Associates participate in the program for one year and are funded up to \$4,000 per Associate (to cover travel costs including flight, hotel, and meeting registration) to attend two consecutive AAPM Annual Meetings, including the pre-meeting activities associated with each Committee.

Sponsored by the AAPM Science Council through the AAPM Education & Research Fund (See AAPM website for more details, including eligibility requirements.)

AAPM Expanding Horizons Travel Grants

are awarded twice annually. As many as ten grants, each up to \$1,250, are given for the purpose of providing additional support for student and trainee travel to conferences that are not specifically geared toward medical physics. The travel grant is designed to provide an opportunity to broaden the scope of scientific meetings attended in order to introduce students and trainees to new topics which may be of relevance to medical physics research and which may subsequently be incorporated into future research in order to progress the field in new directions.

Sponsored by the AAPM Science Council through the AAPM Education & Research Fund (See AAPM website for more details, including eligibility requirements.)

Science Council Associates Mentorship Program Recipients

- **David Adam, PhD**
Physics Resident
Johns Hopkins University
Department of Radiation Oncology and Molecular Radiation Sciences
Mentor: Martha M. Matuszak, PhD
Laurie Snow Research Professor, Associate Chair and Division Director of Physics
University of Michigan
- **Stephanie Bennett, PhD**
Medical Physics Resident
Harvard Medical School, Mass General Radiation Oncology Physics Division
Mentor: Stephen Bowen, PhD
Professor, Radiation Oncology and Radiology
University of Washington, School of Medicine
- **Xiuxiu He, PhD**
Medical Physics Resident
Memorial Sloan Kettering Cancer Center
Mentor: Dandan Zheng, PhD
Professor, Director of Medical Physics
University of Rochester
- **Jun Hong, PhD**
Medical Physics Fellow
MD Anderson Cancer Center
Department of Imaging Physics
Mentor: David Jordan, PhD
Chief Medical Physicist
University Hospitals Cleveland Medical Center
- **Stewart “Mac” Mein, PhD**
Radiation Oncology Physics Resident
Medical Physics Residency Program at University of Pennsylvania
Mentor: Xiaoying Liang, PhD
Associate Professor
Mayo Clinic
- **Jessica “Jess” Scholey, PhD**
Assistant Professor
University of California San Francisco
Department of Radiation Oncology
Mentor: Kristi Brock, PhD
Professor, Imaging Physics
MD Anderson Cancer Center
- **Suman Shrestha, PhD**
Medical Physics Resident
MD Anderson Cancer Center, Department of Radiation Physics
Mentor: Stephen Avery, PhD
Associate Professor
University of Pennsylvania
- **Cayla Wood, PhD**
Medical Physics Fellow
MD Anderson Cancer Center, Department of Imaging Physics
Mentor: Zheng Feng Lu, PhD
Professor
University of Chicago

AAPM Expanding Horizons Travel Grant Awardees

Round 1

- **Peng Chen**
Purdue University
AACR
- **Yeseul Kim**
Catholic University of Korea
SNMMI
- **Leening Liu**
University of Pennsylvania
SIR

AAPM Expanding Horizons Travel Grant Awardees (cont.)

Round 2

- **Morgan Daly**
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MICCAI
- **Robert Dawson**
University of Florida
ICRP
- **Shixian Du**
University of California - San Francisco
BMES
- **Seohan Kim**
Catholic University of Korea
NSSMIC

Summer School Tuition Scholarship Recipients

- **David Adam, PhD**
Johns Hopkins University, Department of Radiation Oncology and Molecular Radiation Sciences
- **Ian Marsh, PhD**
Johns Hopkins University, Department of Radiation Oncology and Molecular Radiation Sciences
- **Xingyu Nie, PhD**
University of Kentucky, Department of Radiology
- **Alok Shankar, PhD**
The Ohio State University, Department of Radiology
- **Trung Tran, PhD**
Indiana University, Department of Radiology and Imaging Sciences
- **Lydia Wilson, PhD**
Thomas Jefferson University, Department of Radiation Oncology

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- **Kevin Treb, PhD**
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- **Shu (Stella) Xing, PhD**
Memorial Sloan Kettering Cancer Center, Department of Radiation Oncology
- **Dae-Myoung Yang, PhD**
Fox Chase Cancer Center, Department of Radiation Oncology
- **Zi Yang, PhD**
Stanford University, Department of Radiation Oncology

Summer School Tuition Scholarships

are in the form of a full waiver of tuition fees for the entire AAPM 2023 Summer School. This award is available to applicants who are in the first five years of their careers in medical physics.

Sponsored by the AAPM Administrative Council through the AAPM Education & Research Fund (See AAPM website for more details, including eligibility requirements)

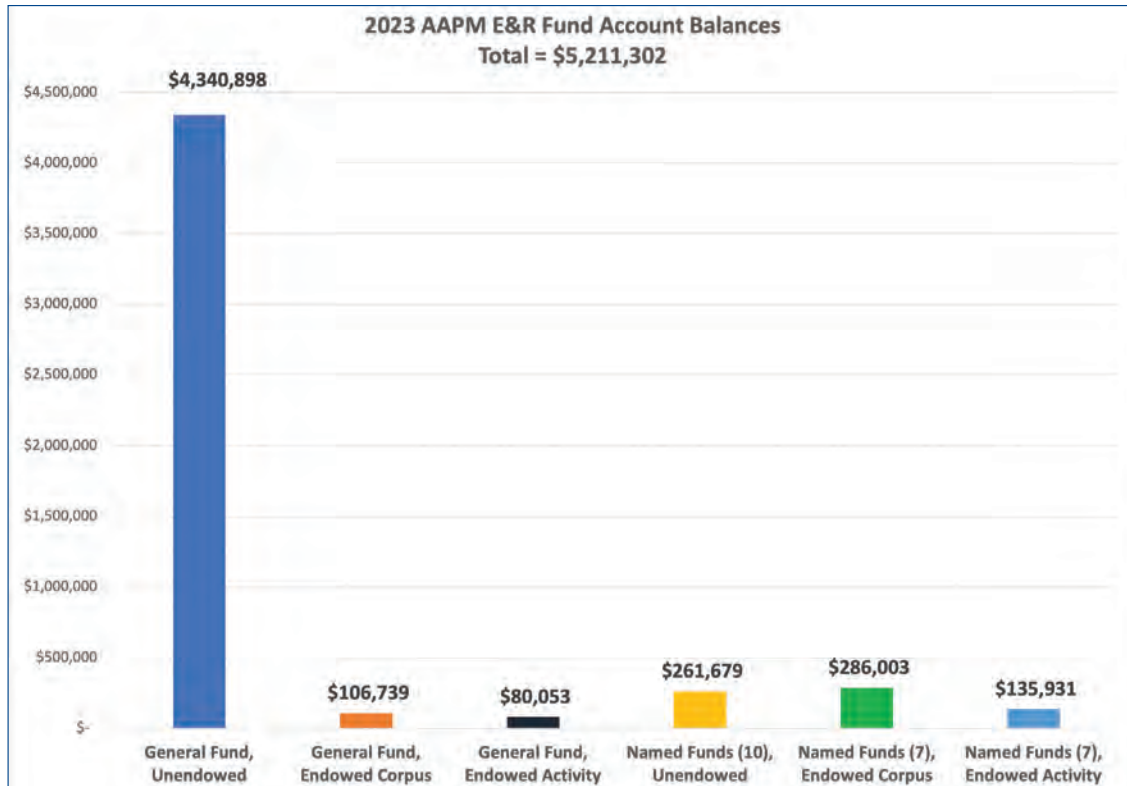


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TeamBest® provides funding for 10 fellowships in the amount of \$500 each, to be used for travel, food and lodging expenses to attend the Annual Meeting. AAPM provides complimentary Annual Meeting registration for each recipient, including social functions.

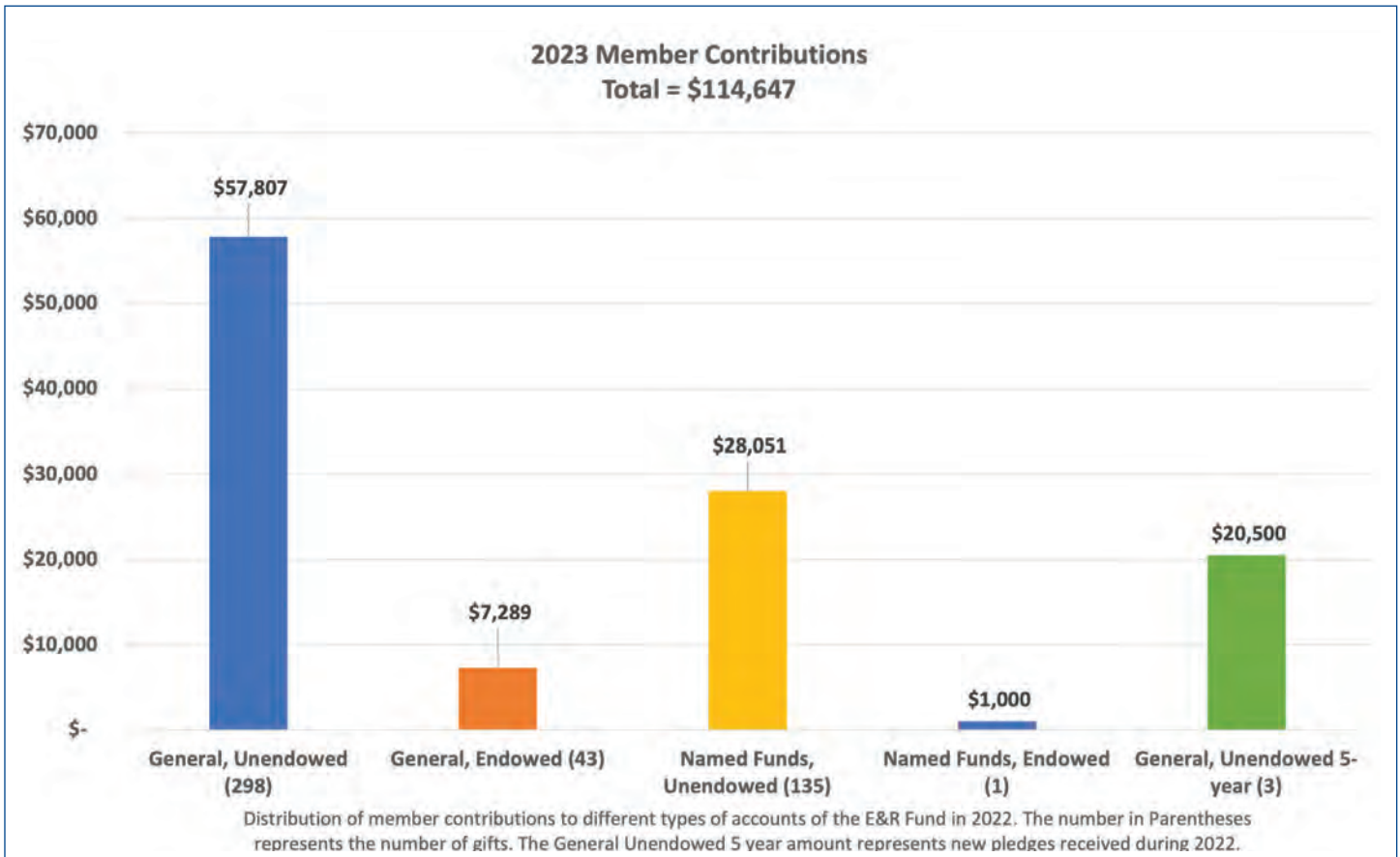
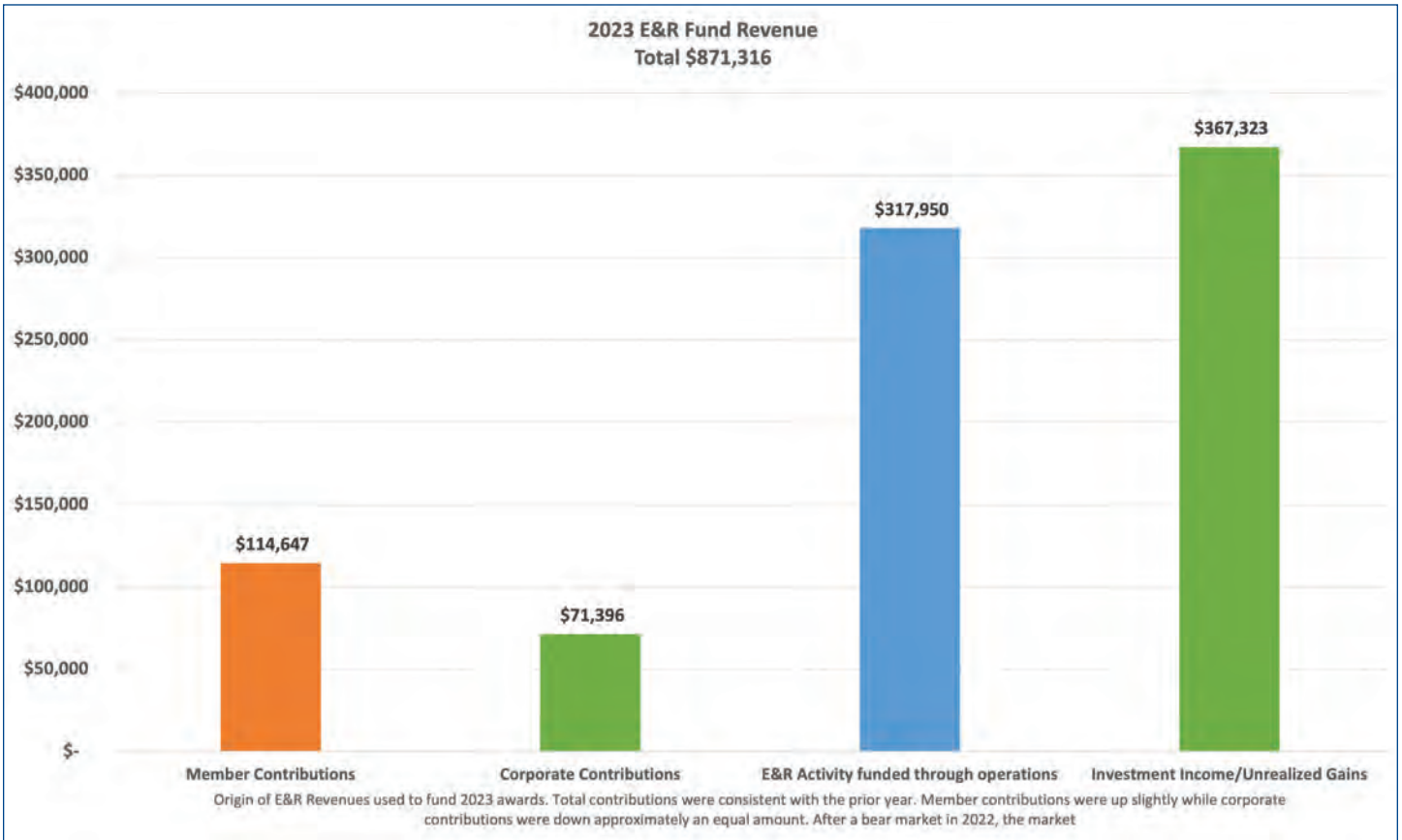
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