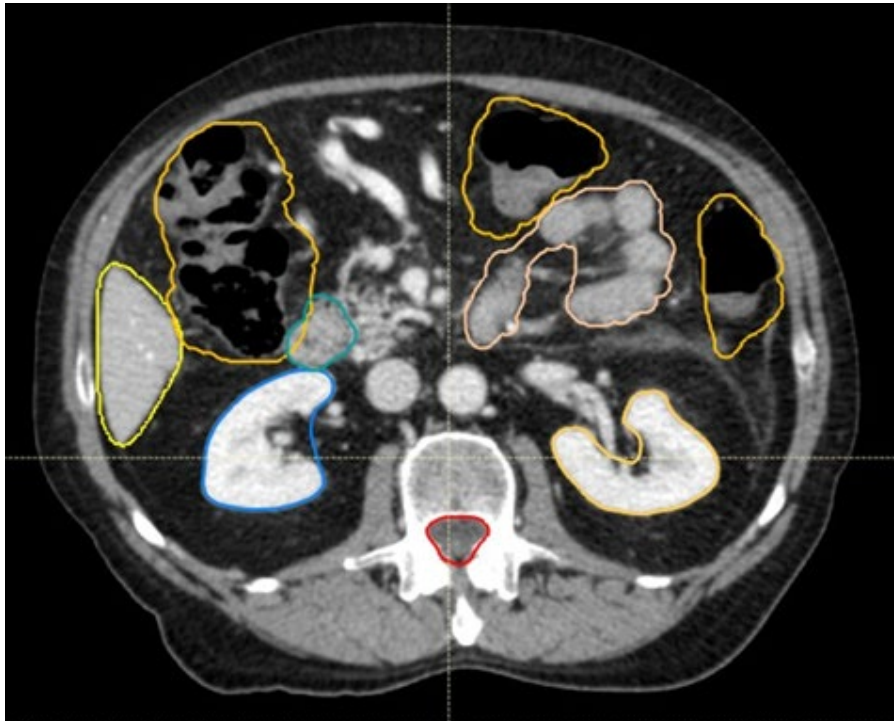


Newsletter

SUMMER 2022



Human



Machine

The days of manual contouring are numbered- this figure compares automatically generated and manual contours for the upper abdomen (Courtesy of Cenji Yu)

PROGRAM DIRECTOR'S REPORT

Instruction and Curriculum

The Program underwent a curriculum revision in 2017 and upon the review of its results implemented some fine-tuning in 2021. The Introduction to Clinical Medical Physics course was found to be premature and has been eliminated. In its place are new elective courses in Clinical Experience in Therapy Physics and Clinical Experience in Imaging Physics that are streamlined versions of the old clinical rotation courses that many of our alumni remember. The growth of radiation therapy necessitated the creation of a second therapy physics course in order to teach the breadth of modern methods in sufficient depth. A new imaging physics course moved MRI and ultrasound from other courses in order to create a course on non-ionizing imaging modalities and to allow their former courses to expand upon the remaining topics.

The Graduate School has encouraged a return to the classroom, so while we still support remote attendance at lectures for those who require it, in-person attendance is preferred. A challenge that remains to be addressed is the number of labs that could not be taught in person during the pandemic. Some labs were converted to remote demonstrations and analyses of previously acquired measurement data, but we have a cohort of students who have not had any hands-on experience of some of the aspects of what they have studied.

One benefit of the pandemic was that many courses recorded the lectures within Zoom. The students have found these recordings to be a valuable resource for studying and review.

Student Success

That our students are fabulously successful is no secret to our alumni, our faculty and our friends in the medical physics community. We are extremely proud of them. This newsletter is a testament to their achievements. Lest this seem immodest, consider the aphorism that has been variously attributed to Dizzy Dean and Walt Whitman, "it ain't bragging if you done it."

We had three PhD students, Brigid McDonald, Emily Thompson, and Ben Lopez, defend their dissertations this year. Summaries of their work begin on page 30. All three will enter combined residency and post-doctoral research programs here at MD Anderson. We also had two certificate students, Drs. Lucia Martini and Hem Bahadur Moktan Tamang, finish their programs.

I would draw your attention to the many awards that our students and recent alumni have received this past year. The list begins on page 25. Our students' mentors deserve recognition for their indispensable role in this success.

Admissions

Dr. Laurence Court led the Program's admissions process again this year. He and his committee reviewed 68 applications. We interviewed 16 applicants to the PhD program and 3 applicants to the SMS program. We made 9 PhD offers of which 7 were accepted and 3 SMS offers of which 2 were accepted. More details about the Entering Class of 2022 are on page 23. We also admitted a post-doctoral fellow to our certificate program. We had more very well qualified applicants than we have funded positions to offer. We continue to be a very selective program that enjoys a higher rate of acceptance of our offers of admission than does the Graduate School overall.

While the SMS program has shrunken over the past two decades to just one or two new students a year, it still offers a vital opportunity to students who seek a streamlined pathway to a clinical career, to students who view the SMS as a stepping stone to a PhD program, and to students who are retraining and want a more extensive curriculum than that which is offered in our certificate program.

Student Support and Philanthropy

Our main source of student support is the faculty whose research grants and sponsored research agreements pay for the stipends, tuition and fees of our students once they have chosen their advisors. The

Graduate School funds the first 16 months of most of the PhD students, but the number of these positions has been limited to five a year for the past few years. The two physics departments at MD Anderson have each supported an additional first year student, which has enabled us to enroll more of the excellent applicants who wish to study medical physics in our program.

When I joined MD Anderson and the Medical Physics Program in 1996, there was robust funding for several students each year through corporate donations and the tuition payments for the short courses that were offered by Radiation Physics and later by Imaging Physics. In addition, the Shalek Fellowships were supported by the donations of alumni, faculty members and friends of the program. The changing times have eliminated corporate support and short course revenue and so we rely solely upon the generosity of donors to support SMS students. A more detailed report of the Shalek Fellowship Appeal is on page 40. I cannot repeat too often how grateful we are to the donors to the Shalek Fellowships.

While the Shalek Fellowship donations are spent as they are received, we also have two endowed funds at the Graduate School that each produces about a thousand dollars a year in income. One is the Blanchard Award, which was established in the memory of our late student, Aaron Blanchard, by his family. The other is the Jackson Fund, which was created by the Graduate School to honor Dr. Ed Jackson when he left Houston to assume the chairmanship of Medical Physics at the University of Wisconsin – Madison. The Blanchard Award provides a prize to the best Medical Physics thesis or dissertation each year in the field of cancer research. A detailed report of the Blanchard Award is on page 32. The Jackson Fund received several memorial gifts when Ed died two years ago which have helped to grow its original endowment. Ed's desire when the fund was established was that its income be used for the direct benefit of students. Since then, we have elected to offer a Jackson Award to incoming SMS students in order to supplement the available funds from Shalek donations.

As I approach retirement and get more serious about estate planning, I have considered whether it is better to make many smaller bequests to the numerous

worthy causes that interest me or to make larger gifts to fewer recipients. I have concluded that the latter would be the more impactful approach. From the perspective of the Medical Physics Program, sizeable gifts could make a great difference in the long-term resources of the program. Right now, endowments that are managed by the UT System, such as the two mentioned above, earn about 8% a year, of which half is re-invested and half is distributed for the purposes of the endowment. Thus, to be able to fund just one student at an annual total cost of \$55,000 from an endowment, we would need a principal of \$1,400,000. To assemble such an amount might require the pooling of support from several of us. If you are considering supporting the program in your estate planning, please discuss that with the Program or the GSBS Development Office.

Acknowledgements

The Program relies upon our Program Manager, Jeannette McGee, and our Program Co-Ordinator, Trenae Kyles, to handle a huge number of essential and complicated administrative matters such as ensuring that our students get paid on time and scheduling classrooms and seminars. Trenae should be commended in particular for her diligent work on this newsletter. The impression that I have drawn from other program's directors is that we are uniquely fortunate to have such strong administrative support.

Sometimes I am asked by other program directors how we do this or that thing, such as organizing social activities and review sessions, and my answer is that I do not know. We invest our students with considerable autonomy, and they make a lot of things happen on their own initiatives and by their own efforts. The details of what they have been up to this year begin on page 17. The Student Council has been instrumental in easing the burden of the pandemic upon our student body. I would commend in particular Barbara Marquez, our Student-Faculty Liaison, for her deep commitment to the Program and our students, and for her tireless work on their behalf.

Succession

This summer concludes my third three-year term as the Program Director. Dr. Rebecca Howell has been elected by the Program's faculty to direct the Program starting in the fall. Her many years of work in graduate education both within our Program and, through CAMPEP, in the wider medical physics community, as well as her leadership service to the Program in admissions and as the Deputy Director augur well for our future. Please give her the same support henceforth that I have enjoyed for the past nine years.

Bud

Richard E. Wendt III, Ph.D.
Program Director

Please Donate to the Shalek Fellowship Fund

All gifts to the Robert J. Shalek Fellowship Fund will be used specifically for the support of the medical physics educational programs and will support current fellowships.

To donate online go to gifts.mdanderson.org. Choose a gift amount. Check the box "I'd like to choose where my donation will go", from the menu, choose other and enter Robert J. Shalek Fellowship (this annotation is essential to ensuring that your gift is directed as you intend)

To donate by check, mail donations/pledges to:

Shalek Fellowships
Department of Imaging Physics
Attn: Jeannette McGee, Program Manager
1515 Holcombe Blvd, Unit 1472
Houston, TX 77030

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Articles and photos may be reprinted with permission. Feedback from alumni is always welcomed by the Program. Please send your suggestions or comments to medicalphysicsprogram@mdanderson.org

Program Website: <https://gsbs.uth.edu/medphys/>

OUR NEXT PROGRAM DIRECTOR

REBECCA M. HOWELL, PH.D.

I am honored to serve in the role of Director of the MD Anderson UT Health Medical Physics Graduate Program. My primary goals will be to continue to recruit the best students and to work with our faculty to ensure that our students receive the necessary education and training to become the next generation of leaders in medical physics. In collaboration with our exceptional faculty we will ensure that our program expands and pivots with the dynamic and rapidly evolving field of medical physics. Additionally, I hope to further engage our alumni to enrich the professional development and expand the networks of our current students.

I completed my doctorate degree in Medical Physics at the University of Texas Health Science Center in San Antonio and have more than 20 years of clinical and research experience. I began my career at Emory University and joined the Radiation Physics Department faculty at MD Anderson Cancer Center in 2007. I was recently promoted to tenured Professor. I am the Director of the MD Anderson Late Effects Research Group, which focuses on radiotherapy-related late effects in long-term cancer survivors. I am also the Director of the Radiation Dosimetry Services, which provides independent peer review of radiotherapy machine calibrations. More details about my academic experience are available in my full faculty biography ([faculty biography](#)). Lastly, I'll comment that during my 15 years at MD Anderson, I have actively contributed to nearly every aspect of our graduate program, serving as the Deputy Director, Director of Admissions, as well as being a member of numerous governance committees, serving on students' committees in the roles of primary research mentor and advisory committee member, serving on and chairing candidacy examination committees, and directing and lecturing in courses.

On a personal note, I share with you that education and mentorship are the most rewarding aspects of my career.

I am honored to be serving in the role previously held by educators that I deeply admire and with whom I've had the opportunity work with and to learn from including Kenneth "Ken" Hogstrom, Edward "Ed" Jackson, and Richard "Bud" Wendt. I am aware of the gravity of this position, the hard work and dedication that this role will require, and I firmly committed to providing the leadership and effort that will be required of me.

Sincerely,
Rebecca M. Howell, Ph.D.



OUR NEXT DEPUTY DIRECTOR

A. KYLE JONES, PH.D.



A. Kyle Jones, Ph.D., is a Professor in the Department of Imaging Physics at the University of Texas MD Anderson Cancer Center. After earning his Ph.D. in Medical Physics from the University of Florida, he began his professional career at MD Anderson in the Radiological Physics Section, providing support to the radiography and fluoroscopy clinical operations. In 2008 he transitioned to supporting interventional radiology and interventional cardiology operations.

Dr. Jones has published over 60 peer-reviewed articles, the majority as first author. In 2013 he won the American Association of Physicists in Medicine's Farrington Daniels Award for the best paper on dosimetry published in *Medical Physics*, the journal of the association. He served as president of the Southwest Chapter of the American Association of Physicists in Medicine in 2012.

Dr. Jones regularly lectures at national and international conferences, has organized several conferences, served as faculty for hands-on workshops, and written several book chapters. He has mentored numerous clinical residents and fellows. He has worked as a collaborator on several grants funded by professional societies and industry, and is currently a collaborator on an NIH R01 titled "Anatomical Modeling to Improve the Precision of Image Guided Liver Ablation."

His research at the University of Florida involved the design and construction of a tomographic newborn phantom from tissue-equivalent materials designed to mimic pediatric soft, bone, and lung tissues. The phantom was constructed using CT images of a newborn cadaver. Average organ and effective doses delivered to the phantom were measured for a variety of projection radiography and computed tomography exams. Both MOSFET dosimeters and prototype fiber optic-coupled (FOC) dosimeters were used for dose assessment. FOC dosimeters are a new type of Cu 1+-doped quartz dosimeter developed at the U.S. Naval Research Laboratory. A system was designed in conjunction with NRL using a CCD to read 25 dosimeters simultaneously, and he wrote LabView software to interface with the dosimetry system. Image quality assessment for CT exams was performed using a commercially available phantom and Matlab code I wrote to automatically score phantom images based on threshold contrast-to-noise ratios (CNR) determined via radiologists' scoring of images. He hopes to continue this work at UTMDACC, as well as characterize image quality performance for new photostimulable phosphor plates (computed radiography, CR) and direct-capture (DR) radiography systems.

OUR NEW PROGRAM COORDINATOR

TRÉNAE KYLES, AS, BS, MHA

Trenae Kyles is a native of Montgomery, AL. In her pursuit to serve in healthcare administration setting, Trenae has been honored to serve in The Department of Imaging Physics for 4 years. In her previous role, she worked closely with faculty, administration, and staff for all procurement and research administrative support. Prior to moving to the Houston area, Trenae worked in pediatrics full time and eventually moved to part time while teaching 6th grade Earth Science. She obtained three degrees during her tenure in college while also being involved in many campus extra curriculum activities. In her free time, she enjoys cooking, working out, cycling, reading, going to church, spending time with family, trying new places, and any outdoor activity. She is a major advocate for health and fitness, teaching Zumba, Bootcamp, and Aqua Fitness for fun. She greatly enjoys coordinating and working with everyone for all your professional and educational endeavors here at MD Anderson



Trenae Kyles, MHA
713-745-5504 | 832-837-9378
tkyles@mdanderson.org

THANK YOU TO THE EDUCATION TEAM ADMIN SUPPORT, MARGARET COPELAND



The Education Program thanks Margaret Copeland who has been serving as administrative support and educational coordination from October 2021- January 2022 during a period of transition.

Margaret's continuous support of the education program with her work ethic and encouragement will never go unnoticed. With our completed education team and her support, the future of our program will continue to strive.

Program Highlights

As this school year has transitioned from virtual, to hybrid, and then to in-person interactions, the Medical Physics Program held an in-person Holiday Party at Cyclone Anaya's. This occurred during the lull in the pandemic just before the Omicron surge. Current students were able to gather and, in some cases meet each other and members of the faculty in person for the first time.



Brandon Reber, Collin Harlan, and Hayden Scott enjoy dining during the Holiday Party



Brigid McDonald, Soleil Hernandez, Mary Gronberg, and Kelly Nealon (l to r) work their way down the buffet line.



Faculty and staff were also invited to the party, interacting with the students for the first time since 2020. Bill Erwin is pictured socializing with current GSBS Medical Physic Students.



Dr. Richard Wendt makes some remarks to the group including thanking Jeannette McGee and Trenae Kyles for organizing the luncheon.

GSBS Medical Physics students celebrate the holidays as many see each other for the first time in over a year and a half.



The Education Program Staff began initiatives called “Let’s Talk About It”, for professional development and “Let’s Get Together” for social gatherings.

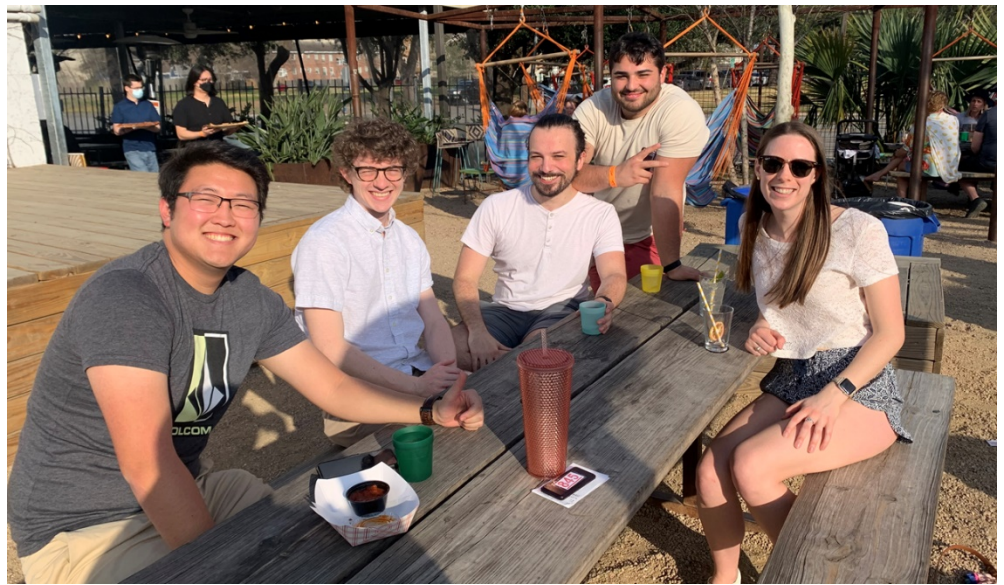
“Let’s Get Together” – Pizza Party

The students gathered at Axelrad Beer Garden on a beautiful spring day for a post-Omicron surge pizza party. They got a chance to socialize with each other and to get to know Trenaé Kyles better as she had recently joined the program as the Program Coordinator



Left to Right: Benjamin Insley, Joseph DeCunah, and Brigid McDonald

Left to Right: David Martinus, Hayden Scott, Joseph Decunah, Benjamin Insley, and Brigid McDonald enjoy the spring weather as they await their pizzas and mozzarella sticks.



GSBS Medical Physics Candidate In-Person Visits

After the applicants to the entering class of 2022 had been interviewed via Zoom, those who received offers of admission were invited by the GSBS to visit Houston and the school in person. Their visit included presentations by potential research mentors, lunch with Program faculty members, a tour of some of the medical physics research facilities (although the clinical areas were still off-limits to visitors) and dinner with the Program's students.



Admitted Applicant Luncheon at Hungry's with Staff and Faculty



Dr. Wendt welcomes the admitted applicants to the Medical Physics Program and poses with some of the applicants before boarding the transportation to lunch with the faculty and then on to tours of some of the research facilities.



Current students share their experiences with the admitted applicants and have a night out with drinks and great food at Cyclone Anaya.

Professional Development “Let’s Talk About It”

Every few years, MD Anderson assesses the how everyone in the institution, including GSBS students, is doing in a variety of areas using an instrument called the Big Survey. In the most recent Big Survey, which came after a year of pandemic restrictions, the students expressed a desire to interact more with the program. To meet the needs of the students, the education team began a series of workshops on professional topics such as the effective use of Email.




Trénae Kyles, MHA reviews events and communication efforts and provides support to all students and trainees at the first “Let’s Talk About It”.



Benjamin Insley was awarded goodies for being the first student to arrive to our first workshop.

Imaging Physics Education Team Presents
Let’s Talk About It
Campus Safety Presentation



Monday, March 21, 2022
2 p.m.
Register to Join Via Zoom

As we are hoping to have more in person interaction, the Education Team would like to be sure all parties in the program are aware of Campus Safety. Manuel Leston, UTPH Community Outreach Officer, will present to us all that we need to know for Campus Safety.


Register
https://mdacc.zoom.us/webinar/register/WN_u7GEiUjRiObLRu4eYiXKA

Be sure to register and the zoom link will be sent to upon completion.

THE UNIVERSITY OF TEXAS
MDAnderson
Cancer Center
Making Cancer History®

For more information, contact
tkyles@mdanderson.org
or 713-745-5504

Imaging Physics Education Team Presents
Let’s Talk About It
Professional Development E-Mail Management



Wednesday, April 20, 2022
3 p.m.
Virtual via Zoom

Join us on our virtual platform for developing self in you professional endeavors where you will receive insight on email management from MDA- Janice Simon, M.A.,CPO®, a Leadership Practitioner in the Leadership Institute, Human Resources at The University of Texas MD Anderson Cancer Center. She formerly was a Project Director in Faculty & Academic Development. She has a MA degree from the University of Houston-Clear Lake, Ms. Simon has worked as a newspaper journalist in Oklahoma and Texas and as a media coordinator for Galveston I.S.D. before joining M.D. Anderson. She is a Certified Professional Organizer and a member of the National Association of Productivity and Organizing Professionals.

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MDAnderson
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Treanae Kyles- Program Coordinator
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Jeannette McGee- Program Manager
jmcgee@mdanderson.org or 713-563-2548

Zoom has proven to be an important tool in our ability to offer hybrid settings for program events so that students can participate remotely as well as in person.



GSBS Medical Physics Student-Directors Spring Meeting

The Program Directors meet twice a year with the students in order to discuss program matters and concerns that the students might have. In normal times, these have been luncheon meetings. The Spring 2022 meeting was the first opportunity in a couple of years to be held in person with lunch





Dr. Wendt moderates an open discussion during the Spring Student-Directors'



Students and Trainees gather at Settegast Park as they enjoy food and games during the “Let’s Get Together- Picnic and Vibes Social” hosted by the Education Program Faculty and Staff.



Program Highlights

First-Year Student Liaison Virtual Events

First Semester Buddy System and Match: Paired each of the incoming students with a more senior student to help in acclimatizing to Houston and the Program.

Transition in Communication- Worked with the students who had experience working under the MD Anderson pandemic restrictions to establish Microsoft Teams for the first-year students. This served as a comprehensive virtual environment prior to the students' being allowed to return to campus.

Review for Finals: Ben Insley held study sessions for Med Phys II in preparation for finals week.

Updated the student-maintained housing information database for the most recent year to provide to interviewing students.

Established both an email chain and a chat for the 2022 incoming students to have an easy means to communicate among themselves. In addition, the 2022 incoming students were added to a chat with the current students so that we can answer their questions as they prepare for their transition into Graduate School.

2021-2022 GRADUATES



Brigid McDonald, Ph.D.

Advisor: Clifton David Fuller, M.D., Ph.D.

Radiation Oncology Graduate Research Assistant
MD Anderson Cancer Center UTHealth GSBS



Benjamin Lopez, Ph.D.

Advisor: Cheenu Kappadath, Ph.D.

Imaging Physics Graduate Research Assistant
MD Anderson Cancer Center UTHealth GSBS



Emily Thompson, Ph.D.

Advisor: Eric N.K. Cressman, Ph.D., M.D..

Interventional Radiology
MD Anderson Cancer Center UTHealth GSBS

2022 COMMENCEMENT



Dave Fuller, Ph.D. and 2022 graduate, Brigid McDonald, Ph.D. are spotted at the 2022 Commencement at Minute Maid Baseball Stadium

Richard Bouchard, Ph.D. and 2021 graduate Cayla Zandbergen, Ph.D. participated in the 2022 Commencement as COVID restrictions were in place during 2021 Commencement



Medical Physics GSBS Graduates of 2021 and 2022, (l to r) DJ Rhee, PhD, Cayla Zandbergen, PhD, Benjamin Lopez, PhD, Brigid McDonald, PhD, and Emily Thompson, PhD.

A Message From the 2021-22 Student- Faculty Liaison Barbara Marquez

The 2021-2022 academic year at GSBS medical physics saw the rise of a new normal, a “hybrid” operation that blends elements of the pre- and post-pandemic world. For the first time since COVID-19 protocols were placed, students and faculty were able to resume classes in Pickens Tower; course labs in the clinic; and travel both domestically and internationally for professional conferences.

Our medical physics students took full advantage of these opportunities and represented our program to their best extent. Soleil Hernandez, Kai Huang, and Mary Gronberg travelled to New Orleans, Louisiana for the AAPM Spring Clinical Meeting. Fre’Etta Brooks, Sharbacha Edward, and Constance Owens travelled across the pond to Copenhagen, Denmark for ESTRO 2022. There, Sharbacha was awarded the ESTRO-Jack Fowler University of Wisconsin Award for her presentation on ‘Sources of errors in radiotherapy as assessed with IROC lung, H&N and spine phantoms.’

Though SWAAPM remained virtual this year, our students did not hesitate to sweep the competition away. Brigid McDonald- competed in the Young Investigator Symposium (YIS) within 20 minutes of defending her PhD thesis that same Friday afternoon. Kai Huang, Kevin Liu, Suman Shrestha, and Yulun He showcased their research in the poster session, taking home the two available “best poster” awards.

Kenji Yu, Kai Huang, Mary Gronberg, and Soleil Hernandez also competed in YIS and swept the scoreboard. Soleil, Mary, and Brigid took home 1st, 2nd, and 3rd place!

There were many more exciting appointments, fellowships, and defenses this year that we are very proud of.

Student Council was able to enjoy the opening of program funds for in-person activities again. In conjunction with the Program Office, we successfully hosted the 2022 accepted students to visit Houston post-interviews, tour the GSBS Medical Physics aspects of MD Anderson, and enjoy a dinner with current medical physics students at Cyclone Anaya’s in Rice Village. The current student body enjoyed sponsored programming like pumpkin carving at Buffalo Bayou and Picnic socials at Hermann Park, while still participating in online options like trivia nights and happy hours on Zoom.

Professionally, our students benefitted from several Student Council-led sessions hosted by both internal and external professionals. We held a Professional Twitter session with Molly Adams, Senior Communications Specialist at MDA, inspired by several students and faculty who have found great success in sharing their publications and finding mentors through the social media platform. We were also fortunate to be virtually visited by Dr. Alison Roth (Barrow Neurological Institute, Purdue University) and Dr. Ashley Cetnar (Ohio State University Medical Center) to lead sessions called “Courageous Conversations,” which work to strengthen interpersonal interactions as a medical physicist in the workplace. Finally, as a continuation of previous years, we held semester-long sessions for ABR and candidacy exam preparation, as well as our signature peer mentorship program in which first-years are paired with older students to navigate the social and academic aspects of the program.

We are looking forward to organizing and holding our first student summer research retreat in two years this summer.

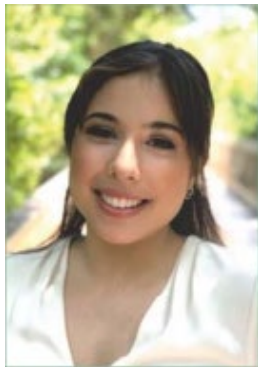
As always, we are eternally grateful for the support of our wonderful alumni who provide opportunity and mentorship for students to participate in our master's and PhD curriculum. Our alumni are what make this program so special!

On behalf of the student council, it has been an honor to serve during a year of revitalization of our

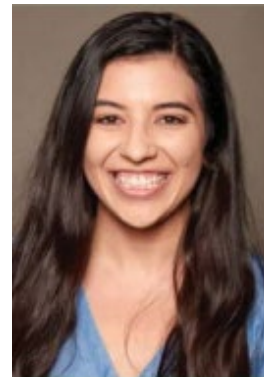
program post- [the worst of] COVID-19 and lay the groundwork for a new normal. We look forward to meeting everyone at AAPM Annual Meeting 2022 in Washington, D.C. As Dr. Wendt would say, "bye for now!"

Barbara Marquez
Student-Faculty Liaison

The Graduate Program in Medical Physics 2021-2022 Student Council



Barbara Marquez
Student-Faculty Liaison



Soleil Hernandez
Education Representative



Hayden Scott
First Year Liaison



Benjamin Insley
Social Chair

The Incoming Class of 2022

MEDICAL PHYSICS ADMISSIONS

68
Applications
Received

19
Applicants
Interviewed

19
Interview
Conducted
Through Zoom

8

12
Offers Made

Matriculating

Average Scores of
Matriculating Students

UNDERGRADUATE GPA	3.59
GRADUATE GPA	3.72
VERBAL GRE	154
QUANTITATIVE GRE	160
ANALYTICAL GRE	4.13

Doctor of Philosophy Program



Rebecca Lim

Washington University
B.A. Physics



Natalie West

Loyola University of Chicago
B.A. Biophysics



Taylor Meyers

California State Polytechnic University-
Pomona
B.S Medical Physics

University of Oklahoma Health Science Center
M.S. Medical Physics



Henry Meyer

Carthage College
B.A. Physics



Zaphanelene (Zeph) Kaffey

DePaul University
B.S. Physics

Fisk University
M.S. Physics



Lucas McCullum

University of Maryland
B.S. Mechanical Engineering



Zonsheng Hu

Wuhan University
B.S. Physics

Duke University
M.S. Medical Physics

Specialized Master of Science Program



Alan Lopez Hernandez

University of Texas at El Paso
B.S. Physics



Brian Kelley

Texas A&M University
B.S. Radiological Health Engineering

Student Awards

MORIN FELLOWSHIP 2021

Jeremiah Sanders, Ph.D.
Mentor: Steven Frank, M.D.

ACR MEDICAL PHYSICS GRADUATE STUDENT SCHOLARSHIP

Suman Shrestha, Med Phys GSBS
Mentor: Rebecca Howell, Ph.D.

AAPM - OUTSTANDING GENERAL MEDICAL PHYSICS ARTICLE

Kai Huang, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

2021 ALFRED G. KNUDSON JR. OUTSTANDING DISSERTATION AWARD

Brian Anderson, Ph.D.
Mentor: Kristy Brock, Ph.D.

2021-2022 ELLEN TAYLOR GOLDIN LEGACY SCHOLARSHIP

Yulun He, Med Phys GSBS
Mentor: Kristy Brock, Ph.D.

2021 LINDA M. WELLS GSBS OUTREACH AWARD

Mary Gronberg, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

GSBS PRESIDENTS RESEARCH SCHOLARSHIP FOR 2021

Brigid McDonald, Ph.D.
Mentor: Clifton Fuller, M.D., Ph.D.

DR. JOHN J. KOPCHICK FELLOWSHIP

Shannon Hartzell, Med Phys GSBS
Mentor: Stephen Kry, Ph.D.

Soleil Hernandez, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

Yasaman Barekatin, Med Phys GSBS
Mentor: Raghu Kalluri, M.D., Ph.D.

2021-2022 JESSE B. HEATH, JR. FAMILY LEGACY AWARD

Suman Shrestha, Med Phys GSBS
Mentor: Rebecca Howell, Ph.D.

2021-2022 RAY MEYN SCHOLARSHIP FOR CANCER RESEARCH

Kevin Liu, Med Phys GSBS
Mentor: Emil Schueler, Ph.D.

ESTRO- JACK FOWLER UNIVERSITY OF WISCONSIN AWARD

Sharbacha Edward, Med Phys GSBS
Mentor: Stephen Kry, Ph.D.

GSBS TRAVEL AWARDS

Benjamin Insley, Med Phys GSBS
Mentor: Mohammad Salehpour, Ph.D.

Daniel El Basha, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

Suman Shrestha, Med Phys GSBS
Mentor: Rebecca Howell, Ph.D.

GSBS TRAVEL AWARDS (cont'd)

Hana Baroudi, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

Mary Grongberg, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

Shannon Hartzell, Med Phys GSBS
Mentor: Stephen Kry, Ph.D.

Collin Harlan, Med Phys GSBS
Mentor: James Bankson, Ph.D.

Yulun He, Med Phys GSBS
Mentor: Kristy Brock, Ph.D.

Kai Huang, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

Barbara Marquez, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

Kelly Nealon, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

Yao Zhao, Med Phys GSBS
Mentor: Jinzhong Yang, Ph.D.

INNOVATION IN CANCER PREVENTION RESEARCH FELLOWSHIP

Joseph DeCunha, Med Phys GSBS
Mentor: Radhe Mohan, Ph.D.

SWAAPM YOUNG INVESTIGATORS COMPETITION

Soleil Hernandez, Med Phys GSBS
Mentor: Laurence Court, Ph.D.

Brigid McDonald, Ph.D.
Mentor: Clifton Fuller, M.D., Ph.D.

AMERICAN LEGION AUXILIARY FELLOWSHIP IN CANCER RESEARCH

Emily Thompson, Ph.D.
Mentor: Erik Cressman, Ph.D., M.D.

Shannon Hartzell, Med Phys GSBS
Mentor: Stephen Kry, Ph.D.

Hunter Mehrens, Med Phys GSBS
Mentor: Stephen Kry, Ph.D.

WALTRIP IMPERIAL GUARD ALUMNAE SCHOLARSHIP

Emily Thompson, Ph.D.
Mentor: Erik Cressman, Ph.D., M.D.

FEDERATION OF HOUSTON PROFESSIONAL WOMEN SCHOLARSHIP

Emily Thompson, Ph.D.
Mentor: Erik Cressman, Ph.D., M.D.

SUN NUCLEAR CORPORATION DIAGNOSTIC QA POSTER COMPETITION

Emily Thompson, Ph.D.
Mentor: Erik Cressman, Ph.D., M.D.

AAPM SCIENCE COUNCIL ASSOCIATE MENTORSHIP PROGRAM (SCAMP)

Suman Shrestha, Med Phys GSBS
Mentor: Rebecca Howell, Ph.D.

2022-2023 DADE W. MOELLER SCHOLARSHIP AWARD

Suman Shrestha, Med Phys GSBS
Mentor: Rebecca Howell, Ph.D.

2021-2023 AAPM/RSNA FELLOWSHIP FOR GRADUATE STUDY IN MEDICAL PHYSICS

Skylar Gay, Med Phys GSBS
First Year Student

AAPM SCIENCE COUNCIL ASSOCIATE MENTORSHIP PROGRAM (2023 COHORT)

Suman Shrestha, Med Phys GSBS
Mentor: Rebecca Howell, Ph.D.

2022 AAPM/RSNA DOCTORAL AND MASTERS GRADUATE FELLOWSHIP

Kevin Liu, Med Phys GSBS
Mentor: Emil Schueler, Ph.D.

2021 ALFRED G. KNUDSON, JR., OUTSTANDING DISSERTATION AWARD

Brian Anderson, Ph.D.
Mentor: Kristy Brock, Ph.D.

AACR TRAVEL AWARD

Yasaman Barektain, Med Phys GSBS
Mentor: Raghu Kalluri, M.D., Ph.D.

ELLEN TAYLOR GOLDIN LEGACY SCHOLARSHIP

Yulun He, Med Phys GSBS
Mentor: Kristy Brock, Ph.D.

JESSE B. HEALTH JR. FAMILY LEGACY AWARD

Suman Shrestha, Med Phys GSBS
Mentor: Rebecca Howell, Ph.D.

TRAVEL GRANT- HPS ANNUAL MEETING 2023

Suman Shrestha, Med Phys GSBS
Mentor: Rebecca Howell, Ph.D.

ELEVATOR SPEECH COMPETITION

Congratulations!

Two of our Medical Physics Students received 1st place in two categories during this year's University of Texas GSBS Elevator Speech Competition.

Barbara Marquez

Mentor: Laurence Court, Ph.D.

Competition: Pre-Candidacy Elevator Speech

Title: Automating Peer Review of Contours for Radiation Therapy

Ever played a game of bowling? Where you pointed a ball at the center of 10 pins but only hit the middle one?

Me neither. Now imagine that was your job, but instead of a bowling ball, you had a laser full of radiation to point towards the tumor of a cancer patient. You see, delivering radiation therapy is like bowling. We send off several laser zaps full of little particles that collide like bowling balls fatally with tumor cells but much like a game of bowling, there will always be nearby pins that fall as collateral. Around where you aim your ball, in our case, these other pins can be healthy cells of nearby organs that we want to avoid. The big machine is responsible for sending radiation bowling balls., knows where to point based a smart software connected to the machine. Where we have a picture all the patient's internal organs and the tumor, called a CT scan.

So we outline the tumor to tell the machine, THERE'S YOUR TARGET! But we also outline the borders of all the nearby organs to tell the machine this is NOT your target. It is too often that doctors around the world. inaccurately draw these outlines, called contours. And bringing way too many healthy cells into the line of damage that shouldn't be there. Thus why I, Barbara Marquez, with the guidance of my amazing Court lab, have designed a decision-making system that gives a CT scan of a cancer patient. And the contour that a doctor drew for them can determine if those organ and tumor outlines are drawn. In the most accurate and optimal way to close the line of radiation, know where to land that special strike on tumor cells and avoid as much collateral damage as possible!



ELEVATOR SPEECH COMPETITION



Henry Mehrens, M.S.

Mentor: Stephen Kry, Ph.D.

Competition: MS Oral Presentation Skills

Title: Understanding the Role of Anthropomorphic Phantoms in Radiation Therapy Using Artificial Intelligence

Background/objective: Phantoms in radiation therapy provide clinics with an end-to-end quality assurance test to assess their complete process of planning and executing treatment to a patient for different anatomical sites. The objective of this research is to predict phantom performance using AI based on plan complexity and treatment parameters.

Methods: Three phantom data sets (brain, head and neck, lung) were abstracted. Treatment parameters, phantom performance, and plan complexity were recorded for each phantom and analyzed through univariate and multivariate analysis, including AI, specifically random forest modeling. Prediction accuracy of phantom performance and the associated important variables were identified.

Results: Accuracy of random forest modeling has been $90.9\pm 0.3\%$, $90.2\pm 1.1\%$, and $91.6\pm 1.2\%$ for the brain, head and neck, and lung phantom, respectively. For the brain phantom the most important variable for predicating outcome was field size, while for the head and neck phantom the complexity of the aperture was the most important variable. Finally, the lung phantom's most important variables for predicting outcome were extent of coverage in the direction of the motion and motion management technique used by the clinic during treatment.

Conclusions: With treatment parameters and plan complexity, phantom performance can be accurately predicted ($\geq 90\%$) for several different anatomical sites. This insight provides valuable information for clinics to know what parameters are important when planning and executing treatment plans. In addition, this can lead to a reduction of economic burden on clinics and increase patient safety.

Future Work: While phantoms allow for clinics to mimic clinical plan workflow, accurate assessment of clinical treatment plans is the desired goal of this research project. Towards this end, this current work will contribute to the development of a new quality assurance tool to evaluate plan acceptability and quality.

Dissertation Abstracts of the 2021-2022 Graduates

Benjamin Lopez, Ph.D.

Absolute Quantification of Tc-99m Activity Distribution Using A Planar Molecular Breast Imaging Commercial System

Molecular breast imaging (MBI) uses two dedicated-breast semiconductor detectors to visualize the preferential uptake of technetium-99m-sestamibi (^{99m}Tc -sestamibi) by breast cancer cells relative to surrounding benign breast tissues. Clinically, MBI is used primarily as a supplementary tool to standard-of-care mammography because of its improved detection of breast cancers, especially in women with mammographically-dense breasts. Because of a lack of image corrections, MBI applications are currently limited to qualitative evaluations of relative pixel intensities between image regions with suspected lesions and normal tissue.

The objective of this dissertation was to use Monte Carlo simulations to better characterize the MBI imaging process in order to develop data analysis techniques to accurately and absolutely quantify information on tumor ^{99m}Tc uptake using clinical MBI images. Using a wide range of simulated tumors in breast tissue with varying ^{99m}Tc uptake clinical levels, techniques were developed that are capable of quantifying tumor uptake diameters with an accuracy of 0.2 ± 1.9 mm (mean \pm standard deviation) and tumor uptake total activities with an accuracy of $0.5\% \pm 11.1\%$ (mean \pm standard deviation). Throughout the development and



testing of these techniques, particular care was taken to understand and mitigate possible sources of error to better estimate the performance of the techniques in future clinical applications. The dissertation concludes by demonstrating the feasibility, benefits, and challenges of implementing the proposed techniques in patient data as well as future applications of quantitative MBI measurements.

Advisory Committee:

Cheenu Kappadath Ph.D.

David Fuentes, Ph.D.

James Long, Ph.D.

Gaiane Rauch, M.D., Ph.D.

Tinsu Pan, Ph.D.

Dr. Lopez will be
joining the
Diagnostic
Imaging Physics
Residency
Program at MD
Anderson

Brigid McDonald, Ph.D.

Development of Advanced MR-Guided Adaptive Radiation Therapy Workflows for Head & Neck Cancers on the 1.5T MR-Linac



The 1.5T hybrid MRI/linear accelerator (MR-linac) has recently been introduced into clinical practice and used for the treatment of head and neck cancers (HNC). This device enables on-line adaptive radiation therapy (ART) based on anatomical changes throughout treatment and variations in patient position. This novel technology also has the potential for advanced ART strategies such as dose-optimized ART, in which the treatment plan is optimized based on the accumulated dose over previous fractions, or biological image-guided ART, in which the plan is adapted based on individual tumor response as measured through quantitative imaging techniques such as diffusion-weighted imaging (DWI). The aims of this dissertation are to validate the existing adaptive workflows for HNC on the MR-linac and perform technological validation of preliminary steps for these advanced ART strategies.

First, we measured the dose distribution caused by the electron return effect at the interface of high- and low-density materials using gel dosimetry. The second project focused on validating our clinical workflow for the first ten HNC patients treated on the MR-linac. We demonstrated that we could create quality adaptive treatment plans for HNC but that the poor autosegmentation performance is a major bottleneck of the on-line Adapt to Shape workflow.

Next, with the goal of creating a dose accumulation tool for MR-linac treatments, we developed a method for reconstructing the delivered dose from Adapt to Position plans. Because these doses are calculated on the

reference image rather than the setup image to save time in the on-line workflow, doses can be recalculated on the setup image off-line after tumor and OAR segmentation to determine the true delivered dose. We evaluated the performance of various auto segmentation algorithms on the MR-linac setup images and investigated how the segmentation accuracy impacts the dose calculation.

The last component of this project was optimization and technical validation of DWI sequences on the MR-linac. We optimized turbo spin echo (TSE) and split acquisition of fast spin echo signals (SPLICE) using both quantitative and qualitative metrics. Finally, we compared these sequences to echo planar imaging (EPI) on the MR-linac and three DWI sequences on a 1.5T MR simulator by measuring *in vivo* repeatability, ADC bias, and signal-to-noise ratio.

In conclusion, these projects validate the clinical feasibility of treating HNC on the MR-linac and pave the way for advanced adaptive strategies such as dose accumulation and biological image-guided ART to personalize radiation therapy for HNC patients.

Advisory Committee:

Clifton David Fuller, M.D., Ph.D.
Kristy Brock, Ph.D.
Geoffrey Ibbott, Ph.D.
Mary Martel, Ph.D.
Jihong Wang, Ph.D.
Ying Yuan, Ph.D.

Dr. McDonald will be continuing her training at MD Anderson in the Radiation Physics Advanced Fellowship Program, which involves two years of post-doctoral research followed by two years of radiation physics residency.

Emily Thompson, Ph.D.



Hepatocellular Carcinoma (HCC) Image-Guided Intervention: Quantitative Characterization of Thermochemical Ablation

Thermochemical ablation (TCA) is a minimally invasive therapy under development for hepatocellular carcinoma (HCC), a leading cause of cancer death worldwide. TCA utilizes acid-base chemistry delivered simultaneously to induce local ablation when administered. When delivered via a mixing catheter placed directly into the tumor, acid (e.g. AcOH) and base (e.g. NaOH) react to completion at the catheter tip, producing the acetate salt, water, and releasing heat ($\Delta > 50^\circ\text{C}$) in sufficient quantities to induce lethal osmotic and thermal stress in tumor cells. However, these two reagents are not distinguishable from tissues with noninvasive imaging modalities, which makes monitoring the delivery of TCA difficult. This research seeks to address this issue by developing novel theranostic agents that provide both imaging and therapeutic capabilities for image-guided TCA intervention. Image-guided delivery of TCA can help ensure complete ablation of the tumor and margins for assessment of therapeutic response.

Fluorine-19 magnetic resonance imaging (^{19}F -MRI) is investigated as a potential method for image guidance in TCA, made possible with the inclusion of trifluoroacetic acid (TFA). TFA is an ideal theranostic agent for chemical ablation due to the strong acid properties capable of inducing severe tissue damage and enabling detection with ^{19}F -MRI. This approach was demonstrated in *ex vivo* porcine liver experiments where severe tissue damage was confirmed with histopathology. ^{19}F -MRI pulse sequence optimization resulted in two sequences achieving reasonable SNR with relatively short scan times: rapid relaxation with relaxation enhancement (RARE) and balanced steady-state free precession (bSSFP). Optimization of the sequences enabled a cine approach for real-time image-guided delivery of TFA into tissue. In this application with TFA as the acid reagent in TCA, the fluorinated salt product can be used for ^{19}F -MRI image guidance. In this study, ^{19}F -MRI of TCA was established as a method for real-time injection tracking of chemical ablation and TFA was demonstrated as an effective, imageable therapeutic agent for the ablation of solid tissue.

Quantitative dual-energy computed tomography (DECT) imaging with cationic cesium (Cs^+) as a theranostic was also evaluated for TCA image guidance. DECT high- and low-energy data was acquired of Cs^+ standards in a commercial phantom to determine the dual-energy ratio (DER) on two systems with different dual-energy technologies: a dual-source system and split-filter system. A calibration curve defining the relationship between Cs^+ concentration and CT signal showed excellent linear agreement for concentrations between 0 – 250 mM for both scanners. The limit-of-detection (LOD) was 1.36 mM and 6.11 mM cesium hydroxide (CsOH) for the dual-source and split-filter system, respectively. This approach to quantitative assessment was tested and validated in a gelatin

phantom with standards of known Cs^+ concentration. Following the establishment of upper and lower detection limits in phantoms, an *ex vivo* model was applied to Cs^+ based TCA with DECT image guidance for validation. 250 mM CsOH was mixed with the base reagent NaOH and directly injected into the *ex vivo* tissue model. A line profile was applied to the ablated area to quantify the Cs^+ concentration at different locations in the ablation zone. These experiments demonstrate an alternative method for image-guided interventions for tracking delivery of the theranostic agent with DECT and a quantitative approach to ensure therapeutic effect.

The end goal for this work was the development of imaging tools that enable *in vivo* characterization of TCA. The validated quantitative DECT method was selected for image-guided delivery of TCA in a rabbit flank VX2 tumor model. Three treatment groups included an untreated control, 5 M AcOH/NaOH, and 10 M AcOH/NaOH. All AcOH/NaOH solutions were spiked with 250 mM CsOH and injected directly into the flank tumor using ultrasound imaging. Following delivery, DECT was performed to confirm complete delivery of Cs^+ to all flank tumors. Application of line profiles to the treated area confirmed delivery and the Cs^+ concentration necessary for therapeutic ablation. Histopathology showed that tissue sections from the 10 M treatment group exhibited significantly more damage than tissue sections from the 5 M treatment group ($P = 0.0005$, 95% CI: -23.43 to -6.053).

In summary, inclusion of theranostic TFA or Cs^+ in the acid or base reagent of TCA enabled successful image guidance with ^{19}F -MRI or quantitative DECT, respectively

Advisory Committee:

- Erik N.K. Cressman, Ph.D.
- Mark Pagel, Ph.D.
- James Bankson, Ph.D.
- Michael Gusting, Ph.D.
- Rick Layman, Ph.D.
- R. Jason Stafford, Ph.D.

Aaron M. Blanchard Research Award

The Aaron Blanchard Research Award was established as a memorial to Aaron Blanchard, a graduate student in the Medical Physics Program, who succumbed to cancer before earning his degree.

The Award was created by Aaron's family and is sustained by their generosity and by other donations to the GSBS. It recognizes a medical physics graduate (M.S. or Ph.D.) for completion of an outstanding thesis or dissertation that is judged to make a significant contribution to cancer therapy or diagnosis. The recipient of the award is selected by a subcommittee reporting to the Medical Physics Graduate Program's Steering Committee. The award consists of a certificate and monetary award. Additionally, the graduate's name is engraved on the Aaron Blanchard Research Award in Medical Physics plaque that is displayed in the classroom.

1999-2020

Award Recipients

2020	Drew Mitchell, Ph.D.	2009	Jonas Fontenot, Ph.D.
2019	Megan Jacobsen, Ph.D.	2008	Stephen Kry, Ph.D.
2018	Xenia Fave, Ph.D.	2007	Jennifer O'Daniel, Ph.D.
2017	Justin Mikell, Ph.D.	2006	Jason Shoales, M.S.
2016	Daniel Robertson, Ph.D.	2005	Kent Gifford, Ph.D.
2015	John Eley, Ph.D.	2004	Stephen Kry, M.S.
2015	Luke Hunter, M.S.	2003	Jennifer O'Daniel, M.S.
2014	Christopher Peeler, Ph.D.	2002	R. Jason Stafford, Ph.D.
2013	Kevin Casey, M.S.	2001	Brent Parker, M.S.
2012	Richard Castillo, Ph.D.	2000	Steven McCullough, Ph.D.
2011	Brian Taylor, Ph.D.	1999	Teresa Fischer, M.S.
2010	Malcolm Heard, Ph.D.		

2021 RECIPIENT

Travis Salzillo, Ph.D.



Salzillo received this award in recognition of his Ph.D. dissertation entitled:

"The Use of Magnetic Resonance Imaging and Spectroscopy to Interrogate the Metabolism of Brain Cancer and Associated Immune Cells throughout the Course of Tumor Progression"

His research concluded that hyperpolarized MRI can help address clinical challenges such as identifying malignant disease prior to aggressive growth, differentiating pseudoprogression from true progression, and predicting relapse in glioblastoma patients.

RADIATION PHYSICS

Residency
Program

Incoming Fellows
& Residents

Adam Melancon, Ph.D.
Program Director



Lawrence Bronk, Ph.D.
MD Anderson UTHealth GSBS
Houston, Texas



Camilo Correa, Ph.D.
University of Florida
Gainesville, Florida



David Flint, Ph.D.
MD Anderson UTHealth GSBS
Houston, Texas

RADIATION PHYSICS

Residency
Program

Incoming Fellows
& Residents

Adam Melancon, Ph.D.
Program Director



Travis Salzillo, Ph.D.
MD Anderson UTHealth GSBS
Houston, Texas



Brigid McDonald, Ph.D.
MD Anderson UTHealth GSBS
Houston, Texas

IMAGING PHYSICS

Fellowship Program

Incoming Fellows

Ho-Ling Anthony Liu, Ph.D.
Program Director



Benjamin Lopez, Ph.D.
MD Anderson UTHealth GSBS
Houston, Texas



Emily Thompson, Ph.D.
MD Anderson UTHealth GSBS
Houston, Texas

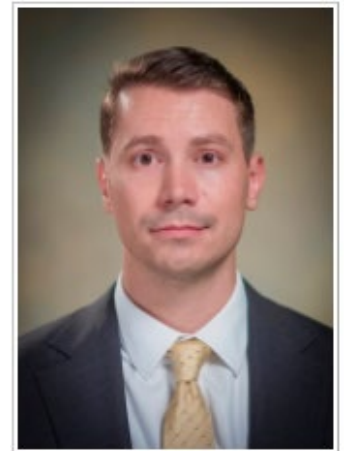
CURRENT FELLOWS

IMAGING PHYSICS

Fellowship Program



Jun Hong, Ph.D.
Research Mentor:
Kristy K. Brock, Ph.D.



Keith A. Michel, Ph.D.
Research Mentor:
James Bankson, Ph.D.



2021-2022 Chief Resident
Drew P. Mitchell, Ph.D.
Research Mentor:
Caroline Chung, M.D.



Jeremiah W. Sanders, Ph.D.
Research Mentor:
Steven Frank, M.D.

Ho-Ling Anthony Liu, Ph.D.
Program Director

CURRENT FELLOWS

IMAGING PHYSICS

Fellowship Program

Ho-Ling Anthony Liu, Ph.D.
Program Director



M. Peng Sun, Ph.D.

Research Mentor:
Tinsu Pan, Ph.D.



M. Allan Thomas, Ph.D.

Research Mentor:
Tinsu Pan, Ph.D.



Cayla Wood Zandbergen, Ph.D.

Research Mentor:
Richard Bouchard, Ph.D.

NEW AAPM FELLOWS IN THE CLASS OF 2022

Five medical physicists with ties to Medical Physics Program will be recognized as Fellows of the AAPM at the 2022 Annual Meeting

Congratulations!



Rick Layman, Ph.D.
Associate Professor
Department of Imaging Physics



Dustin Gress, M.S.
Former Senior Medical Physicist
Department of Imaging Physics



Katie Hulme, M.S.
2009 GSBS Medical Physics
Program Alumna



Heng Li, Ph.D.,
Former Associate Professor
Department of Radiation Physics

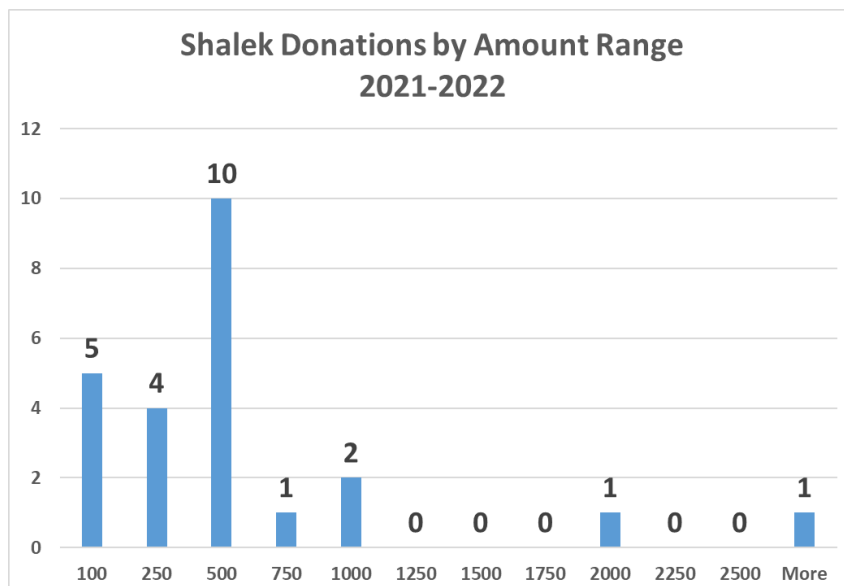
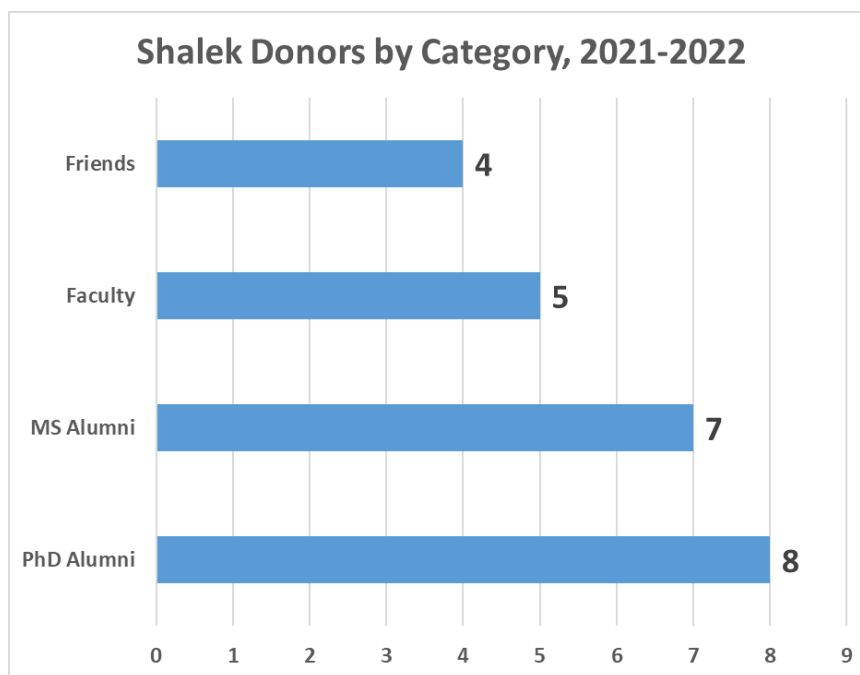


David Zamora, M.S.
2010 GSBS Medical Physics
Program Alumnus

SHALEK FELLOWSHIP FUND REPORT AND APPEAL

Twenty-four donors have supported the Shalek Fellowship Fund so far in the 2021-2022 school year. Eight of them are PhD alumni, seven are master’s alumni, five are faculty members, and four are friends of the program. Several donors fall into more than one category but have been counted only once. Their gifts total \$15,777. The smallest was \$100, the largest was \$5000, the median and mode were \$500, and the average was \$648. Three of our donors have set up monthly contributions. These gifts, combined with residual funds from past appeals have enabled us to support our incoming SMS student, Alan Lopez Hernandez, for his first year of studying in the program.

The program thanks our donors for their indispensable support of the program and the education of future medical physicists.



Robert J. Shalek Fellowship Fund



The Robert J. Shalek Fellowship is used specifically for the support of the Medical Physics Educational Programs. Donations to the fund also support the long-term goal of providing continuous funding for fellowships.

2021

Rachel Glenn

2020

Hayden Scott

2019

Rebecca DiTusa

2017

Shannon Hartzell
Brandon Luckett

2016

Mary Peters Gronberg

2015

Brian Anderson
Laura Bennett
Benjamin Musall

2014

Daniela Branco
Harlee Harrison
Joseph Weygand

2013

Matte McInnis
Olivia Popnoe

2012

Ming Jung Hsieh
Jennifer Sierra Irwin
Dana Lewis
Justin Mikell

2011

Shuaping Ge
Annelise Giebeler
Olivia Huang
Elizabeth McKenzie
James Neihart
Matthew Wait

2010

Jennelle Bergene
Kevin Casey
Jared Ohrt
Kevin Vredevoogd

2009

Sarah Joy
Emily Neubauer
Paige Summers
Jackie Tonigan Faught

2008

Joseph Dick
James Kerns
Kelly Kisling
David Zamora

2007

Triston Dougall
Georgi Georgiev
Ryan G. Lafratta
Malcom Heard
Katie West

2006

Maria Bellon
Jimmy Jones
Nathan Pung
Yevgeney Vinogradskiy

2005

Renee Dickinson
Susannah Lazar
Alanna McDermott
Paige Nitsch

2004

Michael Bligh
Ryan Hecox
Hilary Voss

2003

Blake Cannon
Scott Davidson

2002

Earl Gates
Kenneth Homann
Hilary Voss
Claire Nerbun

2001

Melinda Chi
Gary Fisher
Jackeline Santiago

2000

Michael Beach

1999

Laura Butler
Amanda Davis
Nicholas Koch
Jennifer O' Daniel
Nicholas Zacharopoulos
Matthew Vossler

1998

Shannon Bragg-Sitton
Christopher Cherry
Dee-Ann Radford

1997

Christopher Baird
Aaron Blanchard
Michael Lemacks
Luke McLemore

1996

Michael Bieda
Tamara Duckworth
Gwendolyn Myron

1995

Jonathan Dugan
Teresa Fischer
Russell Tarver

1994

Victor Howard
Usman Qazi
Donna Reeve
Steve Thompson
Matthew Vossler

1993

Kyle Antes
Sarah Danielson
Dena McCowan
Donna Reeve
Matthew Vossler

1992

Peter Balter
Katy Jones

1991

John Bayouth
Robert Praeder
Twyla Willoughby

1990

Maria Graves
John Wallace

1989

Mike Gazda
Scott Jones

DONATION/PLEDGE FORM

ROBERT J. SHALEK FELLOWSHIPS IN MEDICAL PHYSICS

Name _____ Title _____

Address _____

Email _____ Telephone _____

Total Donation/Pledge: *(all contributions are fully tax deductible)*

\$100 \$200 \$500 \$1,000 Other \$____

Payment Enclosed: _____

Amount Pledged: _____ by _____

Does your (or your spouse's) institution/company have a matching gift program?

Yes No

Would you consider making a legacy donation as part of your estate planning?

Yes No

If so, may we contact you to discuss?

Yes No

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Checks should be made payable to: MD Anderson Cancer Center

Mail all donations and pledges to:

Shalek Fellowships

Department of Imaging Physics

Attn: Jeannette McGee, Program Manager

1515 Holcombe Blvd., Unit 1472

Houston, TX 77030

TO DONATE ONLINE:

- Go to: gifts.mdanderson.org
- Proceed by filling in the online donation form
- Check the box for "I would like to choose where my donation will go." From the drop down menu, choose **Other** and enter **Robert J. Shalek Fellowship** (this annotation is essential to ensuring that your gift is directed as you intend)

Please send an Email message or forward a copy of your Email donation receipt to Jeannette McGee at jmcgee@mdanderson.org to inform the Program of your gift so that we can thank you as promptly as possible.