

Medical Physics

Department of Radiology – College of Medicine – University of Florida



As Vice Chair of Medical Physics in the Department of Radiology with the College of Medicine at the University of Florida, I am honored to lead the Division of Clinical Radiological Physics and humbled by the many accomplishments of our team, whose passion and commitment to excellence is unparalleled.

Technological advancements, including the incorporation of artificial intelligence, are taking place at rapid speed and are already impacting our daily practices. We are positioned to embrace this evolution, which will forever change our horizon.

As the sun rises on another decade, bringing unprecedented global challenges due to the COVID-19 pandemic, the Division and its programs will rise up to those challenges. There will be no limit to what we can accomplish.

Manuel M Arreola, PhD
Vice Chair, Medical Physics



Clinical Radiological Physics

Medical Physics Graduate Program

Diagnostic Imaging Medical Physics Residency Program

 Clinical Support
Research
Education



Medical Physics

academic
IMAGING
Patient Safety
KNOWLEDGE
SPECIFICATION
ACCEPTANCE
MEDICAL DEVICES
CALIBRATION
RADIOLOGY
QUALITY
INSTRUMENTATION
EVIDENCE
MAINTENANCE
scientific
prevention
Development
research
DOSIMETRY
TEAMWORK
modalities
Consultant
clinical
Optimization
PHYSICISTS
Selection
Exposure
dose
healthcare
RADIATION
Protection
technology
Commissioning
MEASUREMENT
protocols
management
Techniques
leadership

Clinical Radiological Physics

The Division of Clinical Radiological Physics has shown substantial growth and development over the last several years in all areas, including clinical support, research, and education.

In addition to a stellar group of clinical faculty, the division is comprised of diagnostic imaging medical physics residents, medical physics graduate assistants, and undergraduate interns.

All of us have dedicated ourselves to improving the health of others through the advancement of the science of Medical Physics.



Clinical Radiological Physics

2019-2020



Manuel M Arreola, PhD
Faculty



Izabella Barreto, PhD
Faculty



David Gilland, PhD
Faculty



Stephanie Leon, PhD
Faculty



Lynn N Rill, PhD
Faculty



BC Schwarz, PhD
Faculty



Edmond Olguin, PhD
Resident



Alok Shankar, PhD
Resident



Dan Ciareglio
Graduate Assistant



Nathalie Correa
Graduate Assistant



Megan Glassell
Graduate Assistant



Ana Heshmat
Graduate Assistant



Catherine Olguin
Graduate Assistant



Nathan Quails
Graduate Assistant



Zahra Razi
Graduate Assistant



Colin Schaeffer
Graduate Assistant



Jessica Dominici
Undergraduate Intern



Cheima Hicheri
Undergraduate Intern



Lianna Mulet
Undergraduate Intern



Cindy McCabe
Undergraduate Intern

Medical Physicists

The Division of Clinical Radiological Physics is comprised of six faculty members, each of whom specializes in a clinical modality.

In addition to their clinical duties, our faculty manage our education programs, are actively engaged in a multitude of research endeavors; have numerous teaching responsibilities; supervise graduate assistants; advise multiple graduate students; and serve on PhD committees.

Manuel Arreola, PhD

As Vice Chair, Dr Arreola oversees all aspects of Medical Physics as it pertains to clinical support, research and education. As Division Chief and Assistant Professor, he ensures that the comprehensive principles of medical physics are consistently and appropriately applied throughout UF Health to ensure optimal treatment for our patients, all with an unrelenting emphasis on safety and minimal use concepts. As director of the graduate program, he oversees a multi-disciplinary core group of faculty and an increasingly growing group of students. Dr Arreola is dedicated to improving, advancing, and developing the science of medical physics, with a commitment to diversity, inclusiveness and equality.



Izabella Barreto, PhD

Dr Barreto, Assistant Professor, devotes much of her time overseeing clinical projects focused on improving patient care in Radiology and conducting clinical research. She has successfully secured external funding for several of these projects. Her primary research interests correspond to clinical dual energy CT systems (functionality, current applications, future directions). Dr Barreto also serves as faculty for both the graduate and residency programs. In addition to teaching several courses, she also serves on student committees, oversees student research, and mentors multiple students.



David Gilland, PhD

Dr Gilland, Senior Lecturer, teaches courses in the graduate program and is active on multiple graduate student supervisory committees. His area of expertise includes radiological imaging theory, tomographic reconstruction methods, and nuclear medicine instrumentation. His research interests involve the design of novel gamma cameras, and he is currently collaborating with a commercial manufacturer of a molecular breast imaging system. He is also an active faculty member in the residency program.



Stephanie Leon, PhD

Dr Leon, Assistant Professor, is a UF graduate who returned to UF to join the Radiology faculty in 2016. She is the assistant program director for both the graduate program and the residency program. Her primary clinical responsibilities include nuclear medicine and mammography. She directs the residency rotations in those areas, as well as in radiation shielding and CT. She is also involved in research related to dual energy CT and image quality analysis. Dr Leon teaches several courses, serves on PhD committees, and advises MS and PhD students.



Lynn Rill, PhD

Dr Rill, Assistant Professor, is a UF Medical Physics program graduate who never left (Go Gators!). She is the program director of the residency program and serves as faculty for both the graduate and residency programs. Dr Rill's research and clinical interests overlap in the area of patient skin dose measurements and peak skin dose estimations for fluoroscopically-guided interventional procedures, patient dose tracking, and hospital policy development. She teaches several graduate courses and advises graduate student research.



BC Schwarz, PhD

Dr Schwarz, Assistant Professor, is our most recent addition to the faculty. His primary clinical and research interests are focused on cardiology/interventional fluoroscopy. He is also involved in collaborative research involving NexoDose, a skin dose mapping software, as it pertains to peak skin dose estimates for neurosurgery-related fluoroscopic intervention. Dr Schwarz also serves as faculty for both the graduate and residency programs. In addition to teaching several courses, he also serves on student committees, oversees student research, and mentors multiple students.



ABR Certification

Congratulations to Dr BC Schwarz, who was awarded American Board of Radiology (ABR) board certification after successfully passing the oral exam (Part 3) in Tucson, Arizona in early May 2019.



Dr Schwarz' achievement is a wonderful reflection of his hard work and dedication to the medical physics specialty. It is also a fantastic testament to the academic vigor and vitality of the University of Florida, considering that he was awarded his undergraduate degree, graduate degree, and completed residency here at the University of Florida. Go Gators!

AAW Appointment

Please join us in congratulating Dr Izabella Barreto on her appointment as the 2019-2020 President of the Association for Academic Women (AAW) at the University of Florida.



The AAW is comprised of extraordinary women in faculty, administrative, and professional roles across campus for the purposes of networking and sharing meaningful information and experiences that are beneficial to women of the University of Florida.

FLAAPM Officer

Congratulations to Dr Stephanie Leon, who began her term as President of the Florida chapter of the American Association of Physicists in Medicine (FLAAPM) on February 29, 2020.



Prior to her current appointment, Dr Leon served as President-Elect, during which she organized the Fall 2019 and Spring 2020 meetings.

Board Appointments

Congratulations to Dr Manuel Arreola, who was nominated to the American Association of Physicists in Medicine (AAPM) Board of Directors.



Dr Arreola was also elected as a Board Representative to the Florida Chapter of the American Association of Physicists in Medicine (FLAAPM). His term started January 1, 2020.

2019 Graduate Assistants

The Division of Medical Physics currently offers assistantships to eight graduate students from the Medical Physics Graduate Program.

In addition to being full-time students, our graduate assistants aid in various research initiatives and are responsible for a vast array of equipment testing. This includes testing mobile radiography and mobile fluoroscopy units such as c-arms and mini c-arms. These units are typically used in operating rooms, emergency departments, and are used for special procedures such as gastrointestinal imaging and extremity imaging.

By testing mobile fluoroscopy units and mobile radiography units, graduate assistants are able to refine their diagnostic imaging skills while also facilitating the workload of the division. In 2019, this assistance was crucial since new Joint Commission regulations were put in place that requires annual testing of these units. It also greatly benefits our graduate students, as testing is an important step in aiding their development as future medical physicists.



Imaging Facilities

The imaging facilities that comprise UF Health's Hospitals and Clinics offer a wide range of state-of-the-art clinical imaging equipment, including:

- Fourteen Canon Aquilion CT scanners (five of them with 320-slice capabilities; three with dual-energy capabilities); UF Health is a Canon CT Luminary Site.
- Three 3 Tesla and seven 1.5 Tesla MRI scanners; UF Health is a Siemens MRI Site.
- Siemens PET/CT, General Electric SPECT and SPECT/CT scanners, and three solid-state Digirad Ergo mobile gamma cameras, among other nuclear medicine systems.
- Nineteen interventional fluoroscopy systems in the Radiology, Cardiology, Neurosurgery and Vascular Surgery departments.
- Hologic full-field digital mammography and breast tomosynthesis systems.
- Multiple AGFA and Siemens digital radiography systems in all hospitals and clinics.
- A wide variety of ultrasound equipment, including Doppler.

Technologist Training

The Division of Medical Physics teaches three courses for the School of Radiologic Technology at UF Jacksonville.

Under the leadership of Freenae Williams, Program Director, and Tony Hofmann, Clinical Coordinator, the School offers a professional radiography program structured academically and clinically to give student optimum preparation for a rewarding career in radiography.

Courses taught by the Division include:

- **RT 110**
Radiation Protection
- **RT 240**
Intro to Radiologic Physics & Radiobiology
- **RT 250**
Radiologic Physics & Electrical Circuitry



Resident Teaching

The Division is also actively engaged in resident teaching. This includes not only teaching diagnostic imaging residents at UF and at UF Jacksonville, but also dentistry and veterinary medicine residents.

Radiological Physics and Radiation Biology lectures are led by faculty who each specialize in the modality that they are teaching.

The course is taught on an annual basis from September to May.



FLAAPM Spring Meetings

The Spring 2019 FLAAPM Meeting was held from February 28 to March 1, 2019, in beautiful Daytona Beach Shores.

The keynote speaker was Saiful Huq, President-Elect of AAPM, who spoke about technologies of the future. Donald Frey, Associate Executive Director of the ABR, spoke about changes to the ABR MOC process.

From UF, Drs Gilland, Schwarz, and Leon also gave talks, in addition to ten other speakers who discussed a variety of topics in therapy and diagnostic medical physics.

The Student Presentations Session featured four UF students: Haitham Alahmad, Karl Mund, Cameron Kofler, and Trung Tran.

The Spring 2020 FLAAPM Meeting was held from February 27 to February 29, 2020, in Orlando.

The keynote speaker was Dr Jim Dobbins, III, who spoke about exciting innovations in imaging and updated the membership about AAPM activities.

From UF, Drs Arreola, Su, Leon, Barreto and Olguin gave talks. Four UF students (Karl Mund, Catherine Olguin, Colin Schaeffer, Steven Thompson) gave oral presentations and three more (Nathalie Correa, Ana Heshmat, and Han Liu) presented posters.

FLAAPM Fall Meeting

The FLAAPM Fall Meeting was held from September 26-27, 2019, in St Petersburg.

Four out of the eleven speakers represented UF: Dr O'Dell (Radiation Therapy), Dr Rill (Radiology), Dr Huh (Proton Therapy Institute), and Sofia Ioannidou (Radiation Safety).

In addition to excellent educational opportunities, the FLAAPM also offers wonderful networking opportunities with medical physicists throughout Florida, including FLAAPM President Omar Zeidan.



AAPM Summer School

Drs Arreola and Leon traveled to Burlington, Vermont (with Radiology faculty Drs Chris Sistrom and Joe Grajo, and with graduate students Colin Schaeffer and Zahra Razi) to attend 2019 AAPM Summer School! The week-long session focused on practical medical image analysis, including segmentation, registration, and feature extraction. Both traditional and machine learning (including deep learning) methods were covered. Basic theory was discussed, but the focus was on implementation and assessment. Material included both lectures and guided hands-on application of algorithms.

In addition to learning more about practical medical image analysis, the UF team was able to reconnect with several UF Medical Physics alumni including Dr Laura Padilla (PhD, 2012); Dr Deanna Pafundi (PhD 2009), Dr Matthew Maynard (PhD 2013) and Dr Badal Juneja (2014). It was great to reconnect with our former students in Vermont!



2019 AAPM Annual Meeting

The 2019 American Association of Physicists in Medicine (AAPM) annual meeting in San Antonio, Texas, was well attended by UF faculty, students, and alumni!

The AAPM Meeting is held every year in July or August. With approximately 4,000 participants, it is the largest program of scientific, educational, and professional presentations; technical exhibits; and social programs, that specifically targets the medical physics community.

Similar to 2018's impressive turnout in Nashville, the Medical Physics Gator Nation came together in San Antonio for good food and fun times. The 2019 meetup took place at the San Antonio Bier Garten on the Riverwalk. It was a great opportunity for networking and reminiscing about UF.



2020 UF MP Alumni Meetup

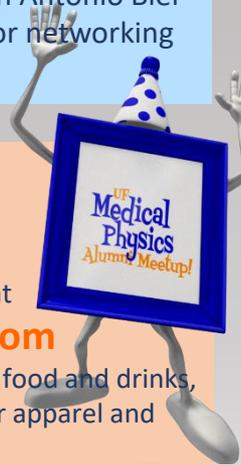
The 2020 UF Medical Physics Alumni Meetup is scheduled at

6:00PM Monday, July 13 via Zoom

(to coincide with the annual AAPM meeting)! You bring the food and drinks, and we'll supply the fun! You are encouraged to wear Gator apparel and utilize a Gator themed Zoom background!

The 2018 UF Alumni Meetup in Nashville and the 2019 UF Alumni Meetup in San Antonio were both a huge success and we hope that even more of you will be able to join us via Zoom! **Please note that you do not have to be registered for the AAPM meeting to attend the UF Alumni Meetup!**

Event information will be emailed to all alumni. We're looking forward to reminiscing about the UF Medical Physics Program! We want to emphasize again that you do not need to be registered for the AAPM meeting to attend the UF Alumni Meetup!



RSNA

The 105th Scientific Assembly and Annual Meeting of the Radiological Society of North America (RSNA) in Chicago, Illinois, December 1-6, 2019, was well attended by the Medical Physics Gator Nation! It was great to see many familiar faces brave the cold and windy weather!

UF Medical Physics Faculty (Drs Arreola, Barreto, Leon, and Rill) attended the meeting along with current DIMPR resident Dr Edmond Olguin, and PhD Student Catherine Olguin.

After the meeting, they were able to reconnect with many alumni, including Drs Ryan Fisher, Lindsay DeWeese, Thomas Griglock, Michelle Sands, Emily Marshall, Nelia Long, Daniel Long, Elliott Stepusin, and Kayla Ficarrota.



Undergraduate Internship Program

Under the direction of Dr Izabella Barreto, Assistant Professor, the Medical Physics Undergraduate Internship Program (MPUI) provides current UF undergraduate students with a one-semester unpaid internship opportunity to maximize their exposure to Medical Physics.



Throughout the semester, students will engage in a multitude of activities, to include assisting faculty and graduate assistants with clinical duties and research projects. Opportunities include:

- **Medical Physics Quality Control Shadowing**
- **Radiological Clinical Exam Observations**
- **Medical Physics Research Endeavors**

Interns will log their activities (4-6 hours required each week) and submit monthly reports, which will be reviewed during one-on-one meetings with the program director.

The internship has been temporarily postponed during the Summer 2020 semester due to the current status of COVID-19. Please check our website for updates on whether the program will resume in Fall 2020 or Spring 2021. For more information, please email Dr Barreto.

Spring 2020 Undergraduate Interns

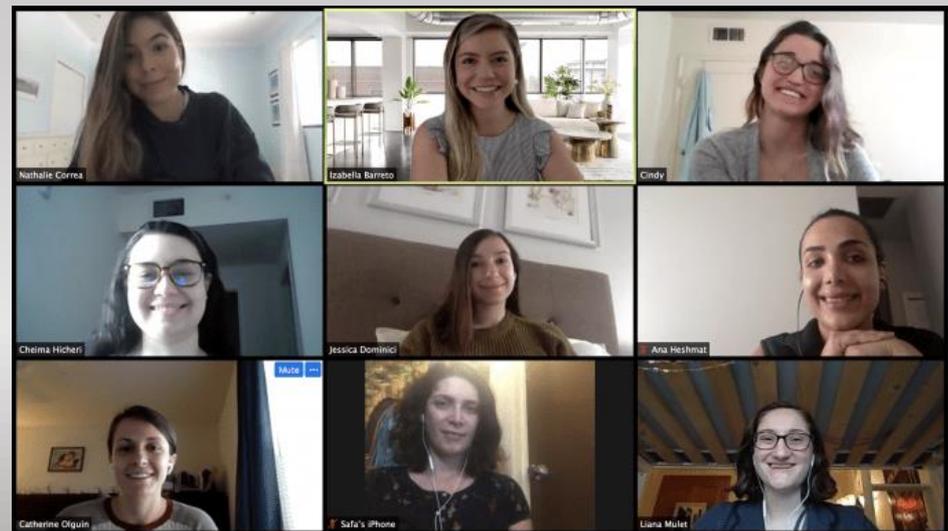
Please join us in celebrating the completion of the first semester of the Medical Physics Undergraduate Internship Program!

Spring 2020 Undergraduate Interns

Jessica Dominici Cheima Hicheri Lianna Mulet Cindy McCabe

Under the leadership of Dr Izabella Barreto, Assistant Professor, the interns were able to gain an understanding of the role of a medical physicist and the importance of QC in a hospital setting. To conclude the semester, each intern gave a ten minute presentation to share their clinical observations. These outstanding presentations included background on the physics behind the modalities, interesting things learned from shadowing researchers, physicians, and technologists, as well as observations in radiation safety and protection. The interns also noted that the internship helped put their current classes into perspective. Special thanks to the PhD mentors (Nathalie Correa, Ana Heshmat, Catherine Olguin, Zahra Razi) and to the technologists, who were all very friendly, helpful, and educational!

We look forward to the future success of our first group of interns and are confident that they will excel in their academic careers.



Website Upgrades

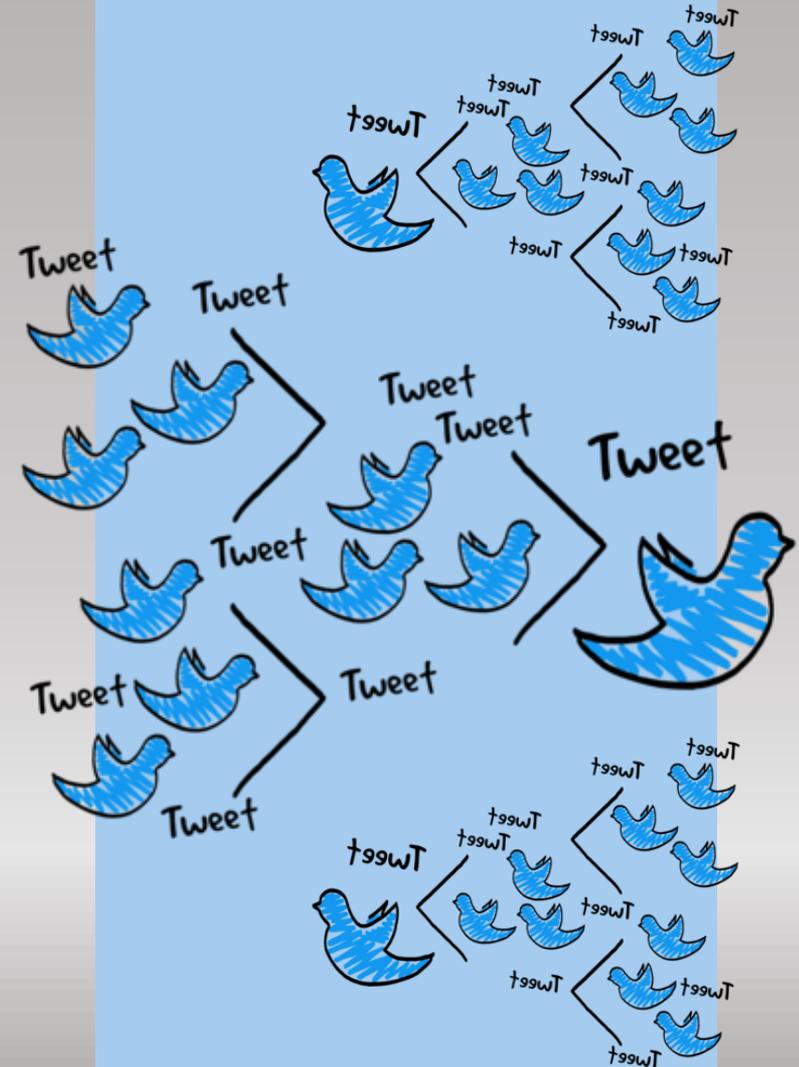
We recently made major changes to our website, which now encompasses all aspects of Medical Physics, including the Division, the Residency Program, and the Graduate Program. Additional enhancements are ongoing. Stop by regularly for updates:

MedPhysics.med.ufl.edu

The screenshot shows the website header with the UF Medical Physics logo and a search bar. The navigation menu includes 'Division of Medical Physics', 'Diagnostic Imaging Medical Physics Residency Program', and 'Medical Physics Graduate Program'. The main content area features a large image of the University of Florida building with the text 'UF MEDICAL PHYSICS' and a mission statement: 'Dedicated to improving the health and well-being of others through the advancement of the science of Medical Physics by implementing principles, methods, and techniques (in practice and in research) for the prevention, diagnosis, and treatment of human diseases.' Below this are three columns of featured content: 'Division of Medical Physics', 'Diagnostic Imaging Medical Physics Residency Program', and 'Medical Physics Graduate Program', each with a photo and a 'Learn More' link.

Social Media Network

In addition to our new website, we will soon be launching our social media initiative via Twitter. This will enable us to provide you with up-to-date news and information about UF Medical Physics. Stay tuned for more information!



Graduate Program

EXCELLENCE
COMMITMENT
OUTSTANDING
DISSENTATION
INNOVATION
international
STUDENTS
EXAMMS
RECRUITMENT
BRIGHTEST
COLLABORATION
professional
non
regis
tration
PhD
MISSION
QUIZES
courses
advisors
DEGREE
GPA
EXCITEMENT
TRANSCRIPTS
grades

DEADLINES
CREATIVITY
vision
teaching assistants
DYNAMIC
DIVERSITY
LIBRARIES
CAREER
integrity
HONESTY
COMMUNICATION
Values
masters
development
classes

Medical Physics Graduate Program

The UF Medical Physics Graduate Program is one of the oldest medical physics programs in the US (originating in 1961) and is accredited for graduate degrees (MS & PhD) by the Commission on Accreditation of Medical Physics Education Programs (CAMPEP).

In 2017, the program was both academically and administratively transitioned to the College of Medicine. In its new home in the College of Medicine, as a concentration under Medical Sciences, it has developed into an academic program that provides an excellent balance of clinical and research experience to our graduates.



Medical Physics Graduate Program

Faculty



Manuel Arreola, PhD



Izabella Barreto, PhD



Wesley Bolch, PhD



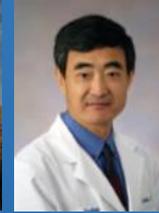
Frank Bova, PhD



David Gilland, PhD



Stephanie Leon, PhD



Jonathan Li, PhD



Chihray Liu, PhD



Bo Lu, PhD



Walter O'Dell, PhD



William Properzio, PhD



Lynn Rill, PhD



Sanjiv Samant, PhD



Bryan Schwarz, PhD



Zhong Su, PhD



Guanghua Yan, PhD

Medical Physics Graduate Program

PhD Students



Justin Brown



Camilo Correa



Nathalie Correa



Sean Domal



Ana Heshmat



Amanda Jackson



Cameron Koffler



Karl Mund



Catherine Olguin



Nathan Quails



Zahra Razi



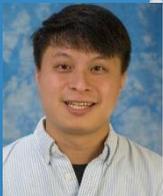
Edward Stafford



Brandon Terracino



Trung Tran



Wen-Chih Tseng

MS Students



Dan Ciarleglio



Ghayath Dakkouri



Megan Glassell



Rosette Gonzalez



Benjamin Heggie



TJ Moretti



Zachary Mullaghy



James Perez-Sanchez



Bonnie President



Jacob Ricci



Colin Schaeffer



Steven Thompson



Orlando Trejo

Award Winner

Please join us in congratulating Dr Wes Bolch, Professor, Department of Biomedical Engineering, who is a UF Graduate School 2019-2020 Doctoral Dissertation Advisor/Mentoring Award winner.

Dr Bolch will receive a \$3,000 cash award plus \$1,500 to support his graduate students!

The UF Graduate School's annual award encourages and rewards excellence, innovation, and effectiveness in mentoring doctoral students through their final dissertation. Nominations for the award come from current graduate students, graduate alumni, faculty members, graduate coordinators, department chairs, school directors, college deans, and higher-level administrators.



Award Winner

Please join us in congratulating Dr Frank Bova, Professor, Department of Neurosurgery, who was the recipient of two recent awards:

In July 2018, Dr Bova was awarded the Edith Quimby Lifetime Achievement Award by the American Association of Physicists in Medicine (AAPM) for his lifetime of outstanding contributions to Medical Physics.

The award was presented at the AAPM annual meeting in Nashville, Tennessee.

In October 2019, Dr Bova was named a UF College of Medicine University Term Professor. The Term Professorship Program recognizes and awards significant faculty academic achievements. Each three-year term professorship includes a \$5,000 annual salary supplement and a \$3,000 grant to support research.



NIH Grant

Congratulations to Dr Wes Bolch, Professor, Department of Biomedical Engineering, and collaborators at the Memorial Sloan Kettering Cancer Center in New York, on being awarded an NIH grant to develop a new generation of nuclear medicine and CT patient dosimetry code. The grant is titled "MIRDcalc – A Community Tool for Deriving and Reporting Patient Organ Doses in Nuclear Medicine, Computed Tomography, and Hybrid Imaging".

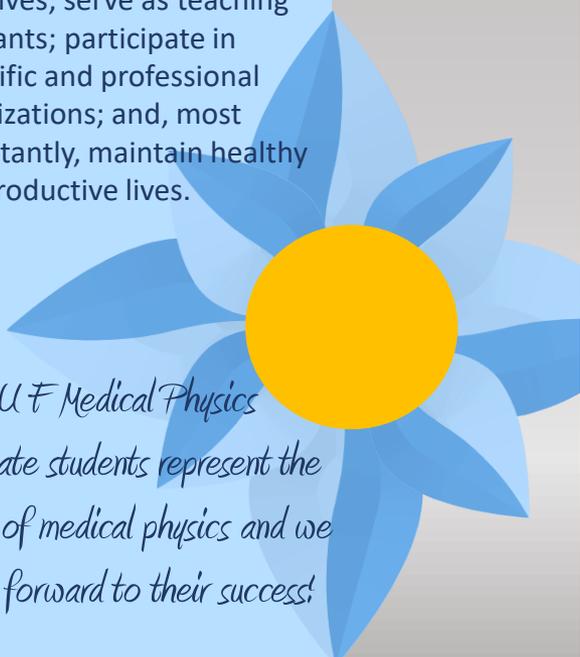
The collaboration between the UF and Memorial Sloan Kettering will develop a new generation of nuclear medicine patient dosimetry code to be released at no cost to the imaging and clinical community. The code (MIRDcalc) is built upon the universally available Microsoft Excel platform and can be used with an easy interactive interface or automated disk operating system command line. The database powering MIRDcalc stores all necessary information for implementing biodistribution-to-dosimetry calculations using the MIRD composition.

The MIRDcalc software will be a free tool providing dosimetry that meets current standards, and a platform for further innovations as well as a central framework for supporting a dosimetry user community. The team's planned innovations address issues of personalization, uncertainty calculation, documentation, and other key considerations. A key feature of this partnership, is the addition of CT organ dosimetry to MIRDcalc, which presently does not exist in any current nuclear medicine software code despite the universal adoption of combination PET-CT and the ever-increasing penetration of SPECT-CT scanners in diagnostic radiology and nuclear medicine.

Graduate Students

Our graduate students begin the program with strong academic backgrounds in Physics, Engineering, and Mathematics from top colleges and universities that span the globe.

In addition to their academic success, our students actively support our faculty's research initiatives; serve as teaching assistants; participate in scientific and professional organizations; and, most importantly, maintain healthy and productive lives.



UF Medical Physics graduate students represent the future of medical physics and we look forward to their success!

Justin

Brown

PhD Candidate



Justin is a PhD candidate in the Advanced Laboratory of Radiation Dosimetry Studies (ALRADS). His research is primarily in Monte Carlo dosimetry and its application to diagnostic imaging.

For diagnostic dosimetry, his current projects include CT, tomosynthesis, nuclear medicine, and fluoroscopic dosimetry. The goal of his research is to provide personalized dosimetry for each modality. This research is accomplished by simulating quantum particles in computational human models. Justin also is interested in computational geometry where he develops algorithms to accelerate Monte Carlo based radiation therapy treatment planning.

In his free time, Justin enjoys going to Disney World and playing video games.

Dan

Ciarleglio

MS Student



Dan is a MS student whose journey into Medical Physics began as an undergraduate student when he discovered a passion for physics. While investigating career opportunities, he discovered the field of Medical Physics and was especially intrigued by the applied opportunities it presents.

Dan's research is currently focused on evaluating image quality in novel wide-volume CT scanning applications.

Dan has recently discovered that he really enjoys giving presentations and interacting with others, perhaps leading him to a future in academics.

Recently married, Dan loves to cook for his new wife Jessica. He is especially known for his delicious risotto. He also loves watching old episodes of Cheers, because "Making your way in the world today takes everything you got!"

Camilo

Correa

PhD Student



Camilo is a PhD student researching the development of tissue-equivalent materials for clinical applications in Proton Therapy. In this research, Camilo is focused on studying if these equivalent materials have similar dose depositions and scattering properties as the real human tissues.

Camilo is also working on developing a computational anthropomorphic pediatric phantom, based on CT images of a physical phantom made of proton tissue-equivalent materials. Upcoming work involves the use of Monte Carlo to simulate real proton therapy treatment, to compute absorbed doses at organs near and out of the treatment field and validate the simulations by measuring doses at same organs during proton irradiations of the physical anthropomorphic phantom.

Camilo enjoys outdoor activities and exploring new places. Originally from Cuba, he loves dancing Salsa and enjoys spending time with family and friends.

Nathalie

Correa

PhD Student



Nathalie is a PhD student who is conducting research using Two Broad Beam Multi-Detector Computed Tomography (CT) scanners and determining the methodology to characterize the shape and attenuation characteristics of bowtie filters. She will subsequently identify the energy spectrum to be able to characterize optically luminescent dosimeters (OSLDs) and acquire proper correction factors and measure the radiation dose of the system.

Nathalie was drawn to medical physics as a result of her strong desire to help others and her keen interest in science, physics, and mathematics.

Originally from Bolivia, Nathalie hopes to one day teach medical physics in an academic setting, especially to students in South America.

Nathalie enjoys yoga, bike rides, and going for runs. She also enjoys hanging out with friends and going to the movies.

Ghayath

Dakkouri

MS Student



Ghayath is one of our new incoming MS students. He has bachelor degrees in Physics from Damascus University in Syria and Middle Tennessee State University in Murfreesboro. He recently graduated with a master's degree in Nanotechnology from the University of Central Florida in Orlando.

While completing his master's degree, Ghayath worked as a graduate teaching assistant for various undergraduate physics labs. He was also conducting research to investigate Perovskite luminescent nanomaterials, which can be used in scintillators.

In his free time, Ghayath enjoys playing tennis, and watching movies with his wife.

Sean

Domal

PhD Student



Sean is a PhD student working on the development of an extensive library of pregnant female hybrid computational phantoms. These phantoms will be utilized for computational dosimetry and will better quantify fetal dose as a function of maternal size and fetal depth. This work will yield the first pregnant female library of phantoms of its kind, allowing better selection of a phantom based on patient size for computational dosimetry in a multitude of exposure scenarios where the fetus is potentially exposed.

Applications of this work are currently being utilized in dose reconstruction efforts of pregnant female atomic bomb survivors as well as pregnant women receiving computed tomography (CT) exams.

Sean is a fitness enthusiast who enjoys running, cycling and weight lifting. When he is not engaged in research or fitness pursuits, Sean enjoys sporting events of all kinds and traveling abroad.

Megan

Glassell

MS Student



Megan is a MS student working on the development of a detailed peak skin dose calculator for utilization in interventional fluoroscopy, cardiac catheterization, and hybrid fluoroscopic-operating rooms. In-room measurements (including table/pad attenuation, backscatter factors, etc) for each room in the hospital system, combined with processing scripts for parsing information from actual patient exams, will yield detailed estimates of patient peak skin dose.

With the recent installation of a third-party dose-tracking software, the overall goal of the work is to utilize the calculated peak skin dose to compare to displayed peak skin doses from the hospital dose tracking system to quantify the accuracy of the dose tracking software for future applications.

Both of Megan's parents served in the US Air Force and as a result, she has lived all over the world, including Japan, Germany, and Hawaii.

Megan loves to cross-stitch, a relaxing hobby she learned from her mom. She also enjoys playing trivia and going to the movies, especially scary ones!

Rosette

Gonzalez

MS Student



Rosette is a MS student who became interested in Medical Physics after several family members faced health-care challenges.

Particularly interested in Therapeutic Medical Physics, Rosette hopes to engage in research that is focused on the brain and proton therapy.

Rosette loves to sing and perform solos. In high school, her chorus team competed at the Orlando Music Fest held at Walt Disney World and won first place. Rosette also enjoys going to the beach and traveling, especially cruising.

Benjamin

Heggie

MS Student



Benjamin is a MS student who decided to make a change in profession after completing his BS at UF - from engineering to medicine.

His interest in medical physics started while pursuing a graduate certificate studying human anatomy through x-rays, CTs, & MRIs. He looks forward to a career as a diagnostic physicist.

Currently, Benjamin also works full time for Educational Technologies at the UF Health Science Center.

Outside work and studying, Benjamin enjoys cooking, and hiking trails in Gainesville. During football season, he watches his brother (UF offensive lineman, Brett Heggie) on the football field every Saturday. Go Gators!

Ana

Heshmat

PhD Student



Ana is a PhD student who originally became interested in Medical Physics after shadowing Dr Arreola as an undergraduate student. She soon discovered that Medical Physics was a perfect fit and quickly changed her major.

A recent MS graduate, Ana's final project was titled "Comparing Image Quality in a CT Phantom with a Commercially-Available Harder X-Ray Beam Spectra". Her current research is focused on computed tomography image quality and dose measurements.

Ana enjoys yoga, dancing, cooking, traveling, and spending time with family.

Amanda

Jackson

PhD Student



Amanda is a PhD student researching how the total dose delivered in a radiation therapy treatment may vary with patient setup or anatomical changes.

She is retrospectively analyzing patient treatment alignment images to evaluate how this data can be used to predict the most optimal time and way to adapt a patient's treatment plan. Effective total dose will be determined and patient outcome results will be evaluated to determine if there is a correlation.

Amanda's interests outside of work and school are varied. She enjoys the arts and the outdoors, and is currently rehearsing for a musical theatre performance and training for the Bike MS. Amanda has studied many forms of dance, but especially loves and excels at tap dancing. Her sense of adventure takes her hiking, mountaineering, SCUBA diving, and more.

Cameron

Kofler

PhD Student



Cameron is a PhD student whose research is focused on the radiation dose that patients (specifically children and infants) receive while undergoing diagnostic computed tomography (CT) examinations.

This research is accomplished by using the UF/NCI phantom library to simulate CT scans in Monte Carlo N-Particle transport code and create a CT dose library that can then be used to estimate organ doses to a patient. Cameron is currently working with a cohort of hospitals to estimate organ doses for millions of pediatric and adult patients across the US and Canada for an epidemiology study funded by the National Institutes of Health (NIH), with the short title *Radiation Induced Cancers*.

Cameron enjoys socializing with friends, going to the gym, cooking, and travelling.

TJ

Moretti

MS Student



TJ is one of our new incoming MS students. He became interested in medical physics after taking a radiation physics course as an undergraduate elective and shadowing a therapy physicist in his last summer as an undergraduate student. His undergraduate research was in non-linear dynamics - specifically, simulation and analysis of an electrolyte flow.

While he enjoyed his undergraduate studies, TJ has a strong desire to gain medical physics knowledge in order to help people. Although still early in his medical physics studies, he is particularly interested in imaging, especially CT.

TJ enjoys literature - both the classics and more modern works. His favorite authors are Ernest Hemingway and Ayn Rand. He also enjoys competing in trivia nights!

Zachary

Mullaghy

MS Student



Zach is one of our new incoming MS students. He became interested in Medical Physics because he wanted to be in a challenging environment and in a field where his research would have human impact. Medical Physics was the perfect fit!

Zach laughs a lot and treats others as he'd want to be treated. He cherishes inquisitive people who ask insightful questions. His positive attitude and happy demeanor are infectious! He has made some really great friends at UF and is "really happy to be where I am in spacetime".

A lover of music, Zach especially enjoys listening to Radiohead, the Red Hot Chili Peppers and Jovi. A little Rock, a little Hip Hop!

Karl

Mund

PhD Student



Karl is a PhD student whose research is dedicated to the Application of Machine Learning in Clinical Quality Assurance, with an ultimate goal to improve the quality and efficiency of clinical quality assurance.

This includes a Neural Network based photon beam deconvolution to correct for the volume averaging effect; reconstruction of high resolution photon beam profiles measured with a flat panel detector using machine learning; and planar dose prediction for radiotherapy fields using deep learning.

Karl enjoys playing co-op video games. He especially loves to play any game with (not against) his friends! He also enjoys taking advantage of the Gainesville food and bar scene. And he likes to head down to Orlando whenever possible to *wake skate* (similar to wake boarding).

Catherine

Olguin

PhD Student



Catherine is a PhD student researching the application of Dual Energy CT in stroke imaging, as well as characterizing the dual energy application of a fleet of CT scanners.

Dual energy CT is capable of differentiating materials based on the photoelectric and Compton Effect interactions that occur at two different energies. By imaging the patient at two energies, material-specific images can be created, such as contrast maps (iodine maps) and virtual non-contrast (VNC) images. Iodine maps suppress blood and enhance residual iodine that may accrue in the brain parenchyma. The virtual non-contrast images suppress iodine content and enhance bleeds that may occur due to ruptured vessels. However, artifacts may present and affect these advanced reconstructions. Catherine's PhD work will discover how these artifacts affect material differentiation, as well as identifying the limiting iodine concentration and blood content that iodine maps and VNC images respectively detect.

Catherine and her husband Edmond enjoy playing soccer and tennis. You will find them at the dog park with Astro every weekend. Catherine loves arts and crafts as well as going to the springs and traveling.

James

Perez-Sanchez

MS Student



James is one of our new incoming MS students. After interning at an intellectual property law firm, he became interested in patents, which led him back to school for a science degree. Physics was the obvious choice of study, since it was his favorite subject in high school.

James' undergraduate research focused on the preliminary analysis of Jefferson Lab (GlueX) data in search of cross sections for the photoproduction of a photon and a rho-meson ($\gamma + p \rightarrow \gamma' + p' + \rho$).

While completing his undergraduate degree, James worked at Sun Nuclear Corporation as a product support specialist/implementation specialist, where he learned about the industry side of quality assurance for radiation therapy.

James is interested in therapeutic medical physics. He is especially interested in industry improvements, as they pertain to imaging modalities for diagnosis, treatment planning, image guidance, dosimetry, artificial intelligence, radiopharmaceuticals, and proton FLASH therapy.

In his free time, James enjoys skateboarding, playing soccer & basketball, off-roading, song writing, attending live performances, and he especially enjoys completing small DIY projects.

Bonnie

President

MS Student



Bonnie is a MS student researching alpha particle doses to the lacrimal glands and the various sub-regions of the brain.

Bonnie became interested in Medical Physics during her Sophomore year in college when choosing an engineering discipline as part of a dual-degree program between UF and the University of the Virgin Islands (UVI).

Medical Physics allows Bonnie to pursue a career in the diagnosis and treatment of cancer in both pediatric and adult patients. Research done in this field could pave the way for safer and more efficient radiative procedures in the future.

Originally from St Lucia, where the cancer mortality is very high and treatment resources are sparse, Bonnie plans to create an avenue for future generations to minimize this medical deficiency.

An avid book reader, Bonnie also enjoys travelling.

Nathan

Quails

PhD Candidate



Nathan is a PhD candidate researching the radiation dose that patients receive to the skin of the head and lens of the eye during fluoroscopically guided neuro-interventions.

This research is accomplished by directly measuring the radiation dose using optically stimulated luminescence dosimeters (OSLD).

Nathan and his committee have developed a novel means of holding the OSLDs to the patient's skull to improve the accuracy of patient dose monitoring and thus, improve the diagnostic quality of information available to the physician for decision making with regard to patient care for deterministic radiation dose effects.

Nathan is the drummer of "*Tamayo*", a multi-genre jam band that plays mostly in the Gainesville area. He is also a polyglot and enjoys conversing with others in various languages including German, Spanish and French.

Zahra

Razi

PhD Student



Zahra is PhD student who recently completed her MS here at the University of Florida. Although Zahra originally joined the program with a non-engineering background, her passion for Medical Physics prevailed.

Her MS research was focused on evaluating the performance of a remote and automated image quality control tool for digital radiography x-ray systems.

Her PhD research will focus on developing MRI sequences for easier evaluations of brain lesions. This research is particularly important to Zahra as it may benefit Alzheimer patients, including her beloved grandma.

In her free time, Zahra enjoys spending time with her husband and their sweet baby girl, Sophia. She also likes to workout, and spend time with family and friends. She also enjoys traveling, and reading in both Farsi and English.

Jacob

Ricci
MS Student



Jake is a MS student who first became interested in Medical Physics while interning at the Northwestern Medicine Chicago Proton Center.

At the Chicago Proton Center, Jake researched proton radiography, specifically, writing a program that could calculate Water Equivalent Thicknesses based on patient DICOM data.

Currently, Jake works at both the UF Davis Cancer Center in Gainesville, and at the UF Health Proton Therapy Institute in Jacksonville, where he is responsible for patient specific quality assurance. His research is looking at factors that produce low passing rates in patient quality assurance as well as some clinical outcome studies.

Jake enjoys going to the boxing gym as well as camping and going to concerts around Florida.

Colin

Schaeffer
MS Student



Colin is a MS student whose research interests include image quality of iterative reconstructed images; evaluation and clinical applications of effective atomic number and electron density measuring; software in dual energy CT, and applications of machine learning in diagnostic radiography.

When he's not conducting research, Colin enjoys cooking Asian foods, watching college football (especially the Florida Gators), and taking his dog Bailey to the park.

Edward

Stafford
PhD Student



Ed Stafford is a PhD student whose research is focused on working with the Veterinary Medicine and Aerospace Engineering teams to create a robotic imaging system for large animals. This system aims to improve current image quality and reduce dose to imaging staff.

Ed's undergraduate research was focused on biophysics and included studying how the G-quadruplex formation unfolds in chromosome tails. His MS research was focused on a tool for motion evaluation in the frequency space, aptly named "MoTRAK".

Ed especially enjoys the patient care/interaction aspect of medical physics and looks forward to helping mold future generations of medical physicists.

Ed enjoys watching Gator football, spending time with his dogs, and discovering new and interesting local restaurants and bars in Gainesville.

Brandon

Terracino

PhD Student



Brandon is a PhD student whose research involves a retrospective analysis of lung cancer patients treated at the UF Proton Therapy Institute. The analysis will investigate whether gender plays a role in the severity of radiation induced lung injury through the use of in-house imaging analysis software. The levels of known blood biomarkers will also be correlated with the image findings. In addition, the impact of using an average breath phase CT in treatment planning, versus a single phase, on perceived dose to normal tissues surrounding the lung tumor will also be assessed.

Brandon enjoys music, soccer, and weightlifting, which helps keep his body healthy and provides a distraction from work.

Steven

Thompson

MS Student



Steven is a MS student researching the feasibility of proton portal imaging using the spallation neutrons produced in vivo by the incident proton beam. These secondary neutrons are captured in a LiF scintillation detector, whose emitted light is then used to produce an in-situ image of the treatment area. This allows the assurance of proper beam placement with respect to patient anatomy.

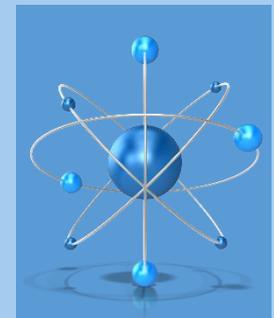
MCNP is being used to optimize the position of the scintillator with respect to the patient to get the optimal spatial resolution, as well as the optimal thickness and composition of the detector.

Steven enjoys reading military history and theology, as well as playing chess. His favorite pastime, however, is playing with his daughter and spending time with his wife.

Trung

Tran

PhD Student



Trung is a PhD student developing computational tools to quantify radiation dose from radiological imaging and interventional procedures.

His current research generates organ-dose coefficients for patients undergoing frequently implemented radiographic examinations by employing the UF library of anthropomorphic computational phantoms to mimic clinical posture in Monte Carlo simulation. The cohort of investigation comprises pediatric patients and premature infants from several clinical sites across the United States and Canada under a collective radiation epidemiology grant from the National Institutes of Health.

Trung's research prospects also include dose reconstruction of fluoroscopy-guided interventions for both patients and clinicians, and he is a key contributor to a budding project to develop a library of mesh-type anthropomorphic computational phantoms.

Orlando

Trejo

MS Student



Orlando is an incoming MS student who recently earned a BS in Physics and Mathematics. His undergraduate research was focused on magnetism, specifically understanding the magnetic interactions in one-dimensional spin chains.

Orlando's interest in medical physics originated from his curiosity for math and science, and his hope to use these skills in a practical setting, like a medical environment.

Originally from Hood River, Oregon, Orlando moved to Gainesville in 2005. He spends his free time refining his photography skills and he practices Jiu Jitsu, which enables him to have a good work-life balance.

WenChih

Tseng

PhD Student

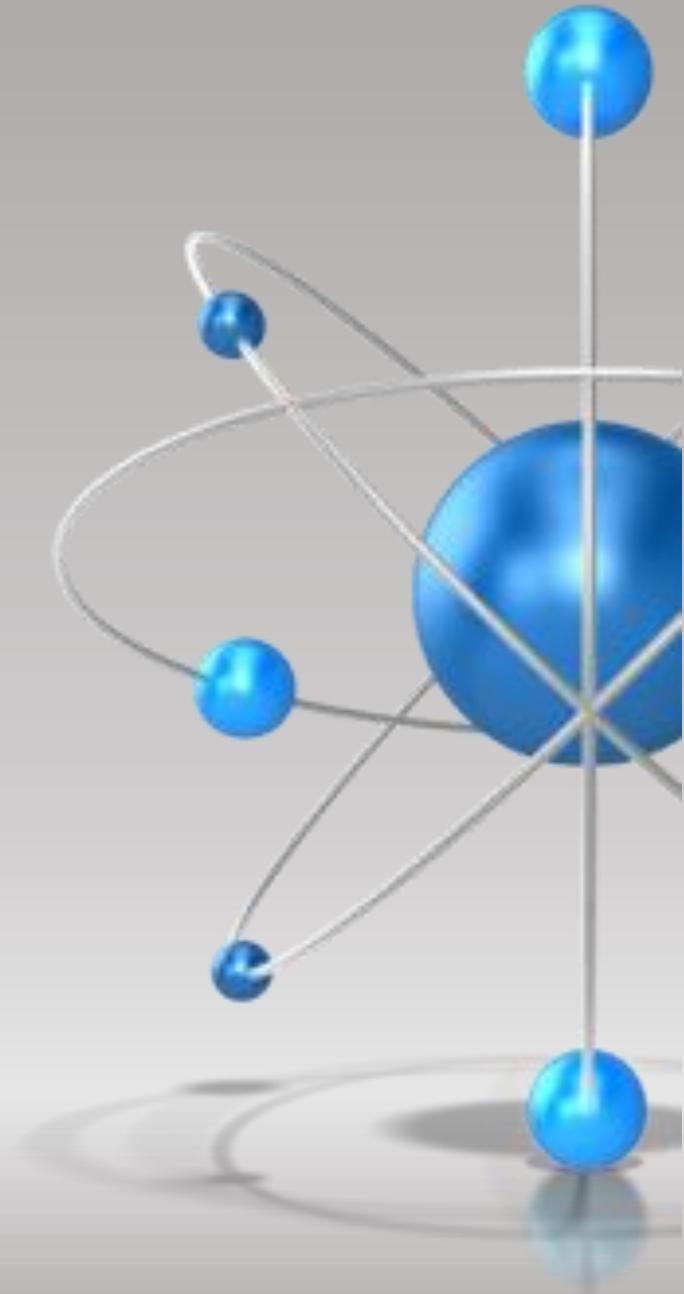


WenChih is a new incoming PhD student whose research involves dose reconstruction for Volumetric Modulated Arc Therapy (VMAT), using the Monte Carlo method.

His MS research, at Duke University, focused on the Monte Carlo simulation for Total Skin Irradiation (TSI) techniques using EGSnrc based codes and cloud-based VirtualLinac.

WenChih enjoys jogging, watching documentary movies, and playing jazz and folk-pop music on his acoustic guitar.

WenChih maintains a good work-life balance by taking a walk outside or going grocery shopping to clear his mind.



Research Labs

Under the direction of Dr Manuel Arreola, Vice Chair of Medical Physics, the Diagnostic Imaging Medical Physics Research Lab in the Department of Radiology, is actively engaged in a multitude of research endeavors.



Several of the Division's current research projects are funded by grants sponsored by Canon Medical Systems America. This includes:

- **Evaluation of the Canon Vitality XT CT Protocol Management System**
03/01/20-02/28/21; \$27,500
Led by Drs Arreola & Barreto
- **Evaluation of OLEA CT Perfusion System**
04/01/20-10/31/21; \$20,000
Led by Drs Peters & Arreola
- **Evaluation of Dual-Energy CT**
05/01/20-10/31/21; \$240,000
Led by Drs Arreola, Barreto & Leon

Diagnostic Imaging Medical Physics

Computed Tomography (CT)

CT protocol optimization, management, and review (as well as evaluating novel CT imaging technologies for optimal integration and continued utilization in the clinic) is being led by Dr Barreto.

Clinical and phantom-based image quality assessments of different iterative reconstruction algorithms and dual-energy CT reconstructions are being led by Dr Leon.

Evaluations of the accuracy, sensitivity, and material differentiation properties of dual energy CT reconstructions are being led by Drs Leon and Barreto.

Interventional Radiology and Fluoroscopy

Work in assessment of skin doses from interventional procedures is being led by Drs Rill and Schwarz.

A particularly unique project on direct measurement of skin and lens of the eye dose resulting from interventional neurosurgical procedures is being led by Drs Rill and Arreola, in collaboration with Dr Chris Fox in Neurosurgery.

Magnetic Resonance Imaging

Novel work in the determination of protein concentrations using MR imaging is being coordinated by Drs Arreola and Schwarz.

In addition to the current research projects funded by grants sponsored by Canon, the Division has also secured additional industry grants, with details currently being finalized. This includes:

- **Investigation of Spectral CT and Applications** (Canon)
+/- August 2020; 2-year grant/\$80,000; Led by Drs Arreola, Barreto & Leon
- **Evaluation of a Smart DR and a Tomosynthesis DR System** (AGFA)
+/- July 2020; 1-year grant/\$59,000; Led by Drs Rill, Schwarz & Arreola
- **Post-doctoral Program in CT and Interventional Radiology for Industry-Oriented Careers in Medical Physics** (Canon)
+/- Fall 2020; 2-year grant/\$250,000; Led by Drs Arreola & Rill

Research Labs

Under the direction of Dr Chihray Liu, the Therapeutic Medical Physics lab in the Department of Radiation



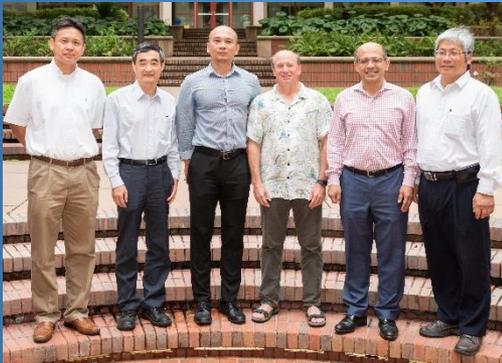
Oncology is engaged in a variety of research projects that are focused on cancer treatment using radiation.

These treatment techniques include:

- High energy (MV) external photon beams
- Low energy (OV) external photon beams
- Heavy charged particle (Proton) external beams
- Light charge particle (Electron) external beams
- Brachy-therapy (Isotope or Micro-X-Ray Tube)

Clinical Workflow Optimization

The main mission of a therapeutic physicist is to provide a safe treatment environment and high quality of care for cancer patients. Workflow optimization includes (1) providing an accurate and efficient system of communication between different teams in the radiation oncology department that will result in the best possible quality of patient care; and (2) streamlining quality assurance procedures for patient treatment devices such as the linear accelerator. Development of these workflow procedures is of tantamount importance in providing a highly sophisticated, streamlined radiation oncology department.



Therapeutic Medical Physics

Prototype Detector Development and Imaging Applications

Imaging is a critical component of image-guided radiation therapy. While much work in IGRT has focused on image reconstruction algorithms and applications in adaptive therapy, much work in the development of suitable detectors remains. In collaboration with UF Nuclear Engineering, current activities include development of proton portal imaging detector based on exit dose imaging. Our prototype system involves a CCD camera system using $6\text{LiF}/\text{ZnS}$ scintillation screen. New scintillation materials are being investigated for improved imaging signal performance. As well, a Monte Carlo model is being developed to optimize detector geometry and performance limits in a high neutron scatter environment in proton therapy. The goal is to provide accurate visualization of proton collimation for QA and in vivo beam delivery. An ancillary project is the development and testing of He4 and Cs2LiYCl6 (CLYC) scintillation detectors capable of neutron dose and spectra measurement. These detectors can be used for measurements at proton therapy and nuclear facilities for more accurate radiation protection calculations.

Image Registration Strategies

The department is in the process of installing a state-of-the-art MR simulator, exclusively for radiation therapy patients. Research in MR image registration strategies are led by Drs. Samant and Wu, in collaboration with Philips. 3D MR data is registered with 2D MR cine imaging to determine patient internal organ movements during registration. 4D motion modeling and artificial neural network are used to build a fast, accurate, and robust image registration framework that is used to track abdominal targets for the gating of irradiation.

Application of Machine Learning in Radiotherapy

Machine learning has great promise for applications in radiotherapy, ranging from diagnosis, image analysis, treatment design to follow-up. The current goal of the physics team's research in this area is to leverage the power of ML to address challenging issues in radiotherapy treatment design and quality assurance. The team's effort focuses on ML research that can impact our current practice and improve patient treatment quality and outcome.

IGRT/SBRT Clinical Implementation

Advanced image-guided radiation therapy systems provide the technical platform to deliver extremely precise, intense doses of radiation to tumors using the technique known as stereotactic body radiation therapy (SBRT). Our goal is to leverage on-going advancements in IGRT, organ motion management, and beam delivery technologies to enhance SBRT treatment outcomes and to explore the promise and potential of SBRT as a paradigm of curative treatment and local tumor control for various disease sites, including the lungs, spine, and liver.

Dose Calculation/Plan Optimization

Intensity-modulated radiation therapy and volumetric-modulated radiation therapy (VMAT) represent one of the most significant technical advances in radiation therapy since the advent of the medical linear accelerator. It allows the clinical implementation of highly conformal nonconvex dose distributions. However, these advances do not come without a risk. IMRT is not just an add-on to the current radiation therapy process; it represents a new paradigm that requires the knowledge of multimodality imaging, setup uncertainties and internal organ motion, tumor control probabilities, normal tissue complication probabilities, three-dimensional (3-D) dose calculation and optimization, and dynamic beam delivery of non-uniform beam intensities. Among all those factors, our group's research interests focus on how to improve the dose computation accuracy while maintain the computation efficiency during IMRT/VMAT planning process.

Quality Assurance

Quality assurance is essential in the safe and effective delivery of radiation treatment. Our group has collaborated with industry leaders in developing innovative ways to streamline the QA process. Both commercial products as well as in-house developed methods have been in use for periodic machine QA and patient-specific QA. We are constantly reviewing our QA programs to ensure safe radiation delivery and to increase QA efficiency.

Research Labs

Under the direction of Dr Wes Bolch, Professor, the Advanced Laboratory for Radiation Dosimetry Studies



(ALRADS) focuses on development of rapid and clinically accessible computational tools for use by radiologists and radiation oncologists to assess radiation organ dose and associated secondary cancer risks to patients following diagnostic imaging or radiation therapy. The lab has used computer animation software and real patient imaging data to create a 350-member library of pediatric and adult males and females that covers a broad range of subject heights, weights and body shapes. These anatomic models are now being used in all three areas of medical imaging: interventional fluoroscopy, nuclear medicine, and computed tomography. Therapy applications of the UF patient phantom series include assessment of secondary cancer risks in proton versus photon cancer radiotherapy, alpha emitter radiopharmaceutical therapy, and the use of kilovoltage stereotactic radiotherapy for halting the progression of age-related macular degeneration.

Advanced Laboratory for Radiation Dosimetry Studies

Computational Phantoms for Blood Dosimetry to Model the Impact of Radiotherapy on the Immune System

NCI funded study (R01 CA248901) with Massachusetts General Hospital to create whole-body virtual patient models to include intra-organ blood vasculature. These models will be used to assess radiation dose to circulating lymphocytes during proton and photon radiotherapy. Research hypothesis is that blood cells should be considered an organ-at-risk in external beam treatment planning as patients with severe lymphopenia have lower post-therapy clinical outcomes.

MIRDcalc – A Community Tool for Reporting Patient Organ Doses in Nuclear Medicine, CT, and Hybrid Imaging

NIBIB funded study (U01 EB028234) with Memorial Sloan-Kettering Cancer Center to develop a robust, user-friendly, and modular tool for both nuclear medicine and computed tomography. The system is based on the ICRP series of computational reference phantoms for nuclear medicine and the UF/NCI library of adult and pediatric phantoms for computed tomography. Additional features include error analysis, pregnancy/fetal dosimetry, and tumor dosimetry.

Implementation of the J45 Phantoms for RERF Survival Organ Dosimetry

Study funded by the Radiation Effects Research Foundation (RERF) to utilize a newly developed series of computational phantoms for adult, children, and pregnant females to reassess survivor organ doses during the 1945 atomic bombings at Hiroshima and Nagasaki. These revised organ doses will be used in re-examining current radiation cancer risk models, which have been the international standard to which all other radiation epidemiology studies are compared.

Microscale Tissue Models for Alpha Particle Dosimetry

NCI funded study (R43 CA224643) with Rapid Dosimetry, LLC to establish alpha-particle cellular-level dosimetry within organs at risk for toxicity in radiopharmaceutical cancer therapy. The project is a collaboration with the UF Department of Anatomy and Cell Biology, and utilizes a large collection of tissue histology slides for model construction.

Dose Reduction in Pediatric Molecular Imaging – Digital Phantoms and Organ Dosimetry

NIBIB funded study (R01 EB013558) with Johns Hopkins University and the Boston Children's Hospital. The objective of this study is to refine guidance on administered activity in pediatric diagnostic nuclear medicine, to take into consideration patient body morphometry beyond simple total body weight. Dosimetry is performed for several diagnostic radiopharmaceuticals used in children, coupled with biokinetic models and simulated SPECT/PET images.

Risk of Cancer in Children and Adolescence Associated with Medical Imaging

NCI funded study (R01 CA185687) with UC-San Francisco, UC-David, the Kaiser Permanente Health Network, and the Pediatric Oncology Group of Ontario. This is the nation's first broad-scale radiation epidemiology study of cancer risks and medical imaging in children. The ALRADS laboratory is providing the entire study with cohort member organ dosimetry across all modalities – CT, nuclear medicine, fluoroscopy, and radiography.

Research Labs

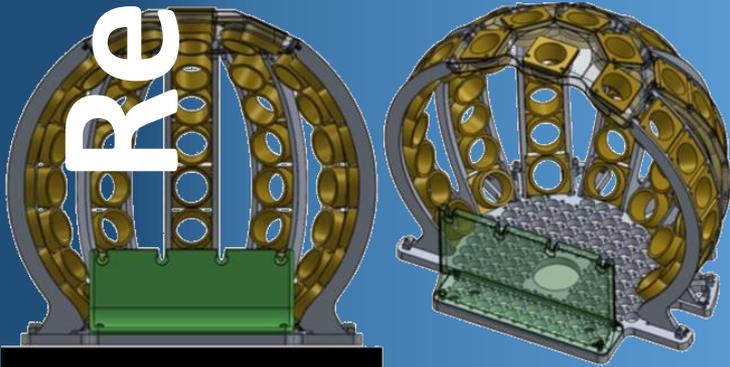
Under the direction of Dr Frank Bova, Professor, the Stereotactic Radiosurgery Lab in the Department of Neurosurgery at the McKnight



Brain Institute is equipped with:

- High-end work station computers
- Stereotactic equipment for frame as well as frameless image guided surgery
- Three-dimensional ultrasound imaging instrument
- Both additive and subtractive rapid prototyping printers
- Multiple mixed reality surgical simulators and other equipment

This enables the lab to support a variety of types of studies.



Stereotactic Radiosurgery Lab

Rapid Prototyping Equipment

Initiated by an NIH R01 grant to support research into an entirely new method of stereotactic guidance for surgery the lab has been developing just-in-time manufacturing methods for surgical implants. This method involves the use of “rapid prototyping equipment.” Preoperative cranial or spinal scans are transferred to the lab’s computer system and the lab’s proprietary software is used to select a surgical pathway for surgery. The rapid prototyping machine then manufacturers a special guide which, after sterilization, can be used in surgery to precisely identify the correct location of skin, bone, intra cranial structures during surgery. This support extends to the manufacture of custom cranioplasty for patient implantation.

Techniques and Equipment

The lab is conducting experiments to develop and evaluate techniques and equipment to be used in image-guided radiation therapy (CT, MRI and ultrasound), intensity-modulated radiation therapy, image-guided radiosurgery, image-guided surgery and stereotactic surgery, image guided large animal surgery, and mixed reality simulation.



The lab also collaborates with UF Neurosurgery faculty in the areas of vascular repair, development of new neurosurgical surgical instrumentation and laser initiated thermal therapy. The lab maintains long term collaborations with the College of Veterinary Medicine and the Department of Mechanical and Aerospace Engineering involving robotics and imaging.



Research Labs

Under the direction of Dr Walter O'Dell, Assistant Professor, the Medical Image and Computational Analysis Lab (MiaCaLab) in the Department of Radiation Oncology

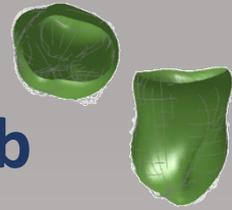


is interested in discovering and applying novel image analysis and image-based computational techniques for improved detection, follow-up, and treatment of cancer.

Much of the work is highly translational, with direct application to the treatment of patients within the Department of Radiation Oncology.



Medical Image and Computational Analysis Lab



Vascular Tree Structure/Function – Segmenting and Characterizing Pulmonary Vasculature Tree Structure

Involves analysis of pulmonary vascular development in human neonate with extreme pre-term gestation. Applying non-invasive assessment of pulmonary vascular structure to quantify (1) the response of the lung to radiation exposure in breast cancer patients (funded through a grant from the Florida Department of Health); (2) the development of lung vasculature in children born extremely prematurely; and (3) changes in vascular anatomy adults and in rat lungs with various vascular diseases.

Small Tumor Detection with 3D Template Matching – Imaging for Metastatic Breast Cancer Early Detection

Two surveillance imaging studies for high-risk breast cancer survivors. The first study is funded by the Ocala Royal Dames for Cancer Research. The second study is funded through the Florida Academic Cancer Center Alliance.

MR Cardiac Tagging – MR Cardiac Tagging for Quantitative Assessment of Heart Function

Using software for computer-assisted contouring of the heart, 3D heart surface modeling, and a new approach for tag-based motion reconstruction using a deformable image registration approach and virtual tagged images to quantify acute and chronic changes in myocardial function in breast cancer patients who receive RT to the chest wall.

Lung Radiation Dose Response

Applying quantitative analysis of follow-up CT chest scans of patients after targeted radiation treatment to correlate directly the progression of fibrosis with the amount of radiation dose delivered during treatment in an effort to validate and compare the effectiveness of agents used to protect normal tissues (and accelerate recovery) both in animal models and in human subjects.

FLAAPM Spring 2019 Meeting

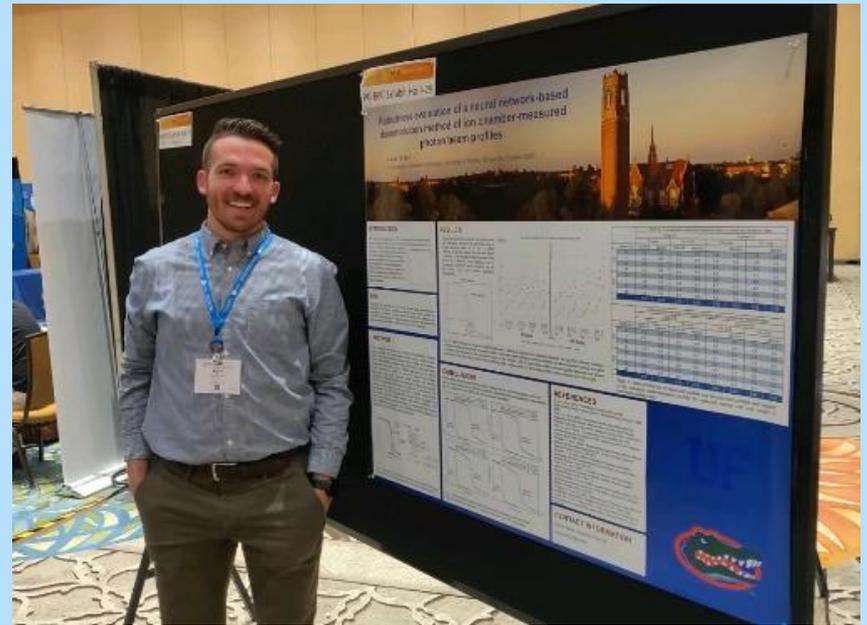
Three of our graduate students were recognized for their exemplary presentations at the February 2019 meeting of the Florida Chapter of the American Association of Physicists in Medicine (FLAAPM) in Daytona Beach.

Karl Mund, PhD Student

Given the Fitzgerald Award for best student presentation. Karl also represented the chapter at the MedPhys Slam completion at the 2019 Annual AAPM Meeting in San Antonio.

Trung Tran & Cameron Kofler, PhD Students

Awarded 3rd place in the student presentation competition.



FLAAPM Fall 2019 Meeting

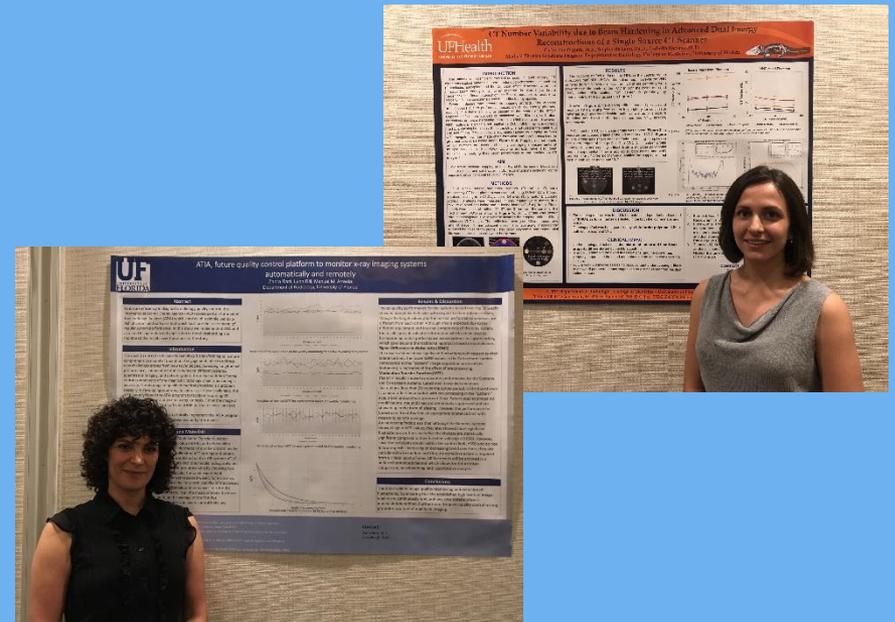
A poster session during the Night-In Social Event at the September 2019 meeting of the Florida Chapter of the American Association of Physicists in Medicine (FLAAPM) in St Petersburg featured contributions from five UF students and faculty, two of whom were recognized for their exemplary presentations:

Catherine Olguin, PhD Student

Tied for 1st place with her poster "CT Number Variability of Advanced Dual Energy Reconstructions of a Single Source CT Scanner."

Zahra Razi, PhD Student

Tied for 3rd place with her poster "ATIA, Future Quality Control Platform to Monitor X-Ray Imaging Systems Automatically and Remotely".



FLAAPM Spring 2020 Meeting

There were many excellent submissions (posters & presentations) by UF students at the Spring 2020 meeting of the American Association of Physicists in Medicine in Orlando (Feb 27-29).

Thanks to all the students who participated and for representing us so well!

The results of the FLAAPM Student Presentation competition were as follows:

1st place (Fitzgerald Award):
Karl Mund (UF PhD Student)

2nd place (tie):
Catherine Olguin (UF PhD Student)
Colin Schaeffer (UF MS Student)

3rd place:
Steven Thompson (UF MS Student)

FLAAPM awarded Karl a \$1000 scholarship. The 2nd and 3rd place winners also received cash prizes.

Congratulations to the winners!



MS Graduates

Since the Medical Physics Graduate Program's transfer to Medical Sciences in the College of Medicine in 2017, we have had a number of MS graduates.

Many of our MS graduates continue on to PhD positions. Others accept positions in the medical physics industry, and some continue directly to residency positions.

Recent MS destinations include:

- **University of Florida**
Gainesville, Florida
- **University of Louisiana**
Baton Rouge, Louisiana
- **East Carolina University**
Greenville, North Carolina



2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Nathalie Correa
Summer 2019 MS Graduate

Subsequent to graduation, Nathalie will begin PhD Studies in Medical Physics at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Edward Stafford
Summer 2019 MS Graduate

Subsequent to graduation, Edward will begin PhD Studies in Medical Physics at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Camilo Correa
Summer 2019 MS Graduate

Subsequent to graduation, Camilo will begin PhD Studies in Medical Physics at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Sean Domal
Summer 2019 MS Graduate

Subsequent to graduation, Sean will begin PhD Studies in Medical Physics at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Ana Heshmat
Summer 2019 MS Graduate

Subsequent to graduation, Ana will begin PhD Studies in Medical Physics at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Andrew Spencer
Spring 2019 MS Graduate

Subsequent to graduation, Andrew will soon begin a career in Medical Physics

Medical Sciences - College of Medicine - University of Florida

2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Mada Bataayib
Spring 2019 MS Graduate

Subsequent to graduation, Mada will be returning to Saudi Arabia, where she will soon begin a career in Medical Physics

Medical Sciences - College of Medicine - University of Florida

2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Zahra Razi
Fall 2018 MS Graduate

Subsequent to graduation, Zahra will pursue PhD studies in Medical Sciences, with a concentration in Medical Physics, in the College of Medicine at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2017-2018
Medical Physics Graduate Program

Please join us in congratulating:
Catherine Carranza
Summer 2018 MS Graduate

Subsequent to graduation, Catherine will pursue PhD studies in Medical Sciences, with a concentration in Medical Physics, in the College of Medicine at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2017-2018
Medical Physics Graduate Program

Please join us in congratulating:
Trung Tran
Summer 2018 MS Graduate

Subsequent to graduation, Trung will pursue PhD studies in Medical Sciences, with a concentration in Medical Physics, in the College of Medicine at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2017-2018
Medical Physics Graduate Program

Please join us in congratulating:
Cameron Kofler
Summer 2018 MS Graduate

Subsequent to graduation, Cameron will pursue PhD studies in Medical Sciences, with a concentration in Medical Physics, in the College of Medicine at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2017-2018
Medical Physics Graduate Program

Please join us in congratulating:
Chia-Lung Chien
Summer 2018 MS Graduate

Subsequent to graduation, Chia-Lung will pursue PhD studies in Medical Physics in the Department of Physics & Astronomy with the College of Science at Louisiana State University in Baton Rouge

Medical Sciences - College of Medicine - University of Florida

2017-2018
Medical Physics Graduate Program

Please join us in congratulating:
Han Liu
Summer 2018 MS Graduate

Subsequent to graduation, Han will pursue PhD studies in Biomedical Engineering in the Department of Biomedical Engineering with the College of Engineering at the University of Florida

Medical Sciences - College of Medicine - University of Florida

2017-2018
Medical Physics Graduate Program

Please join us in congratulating:
Tristan Gaddis
Spring 2018 MS Graduate

Subsequent to graduation, Tristan will pursue PhD studies in Biomedical Physics in the Department of Physics at East Carolina University in Greenville, North Carolina

Medical Sciences - College of Medicine - University of Florida

PhD Graduates

Since the Medical Physics Graduate Program's transfer to Medical Sciences in the College of Medicine in 2017, we have also had a number of PhD graduates.

Most of our PhD graduates continue on to residency positions. Others accept positions in the medical physics industry.

Recent PhD destinations include:

- **University of Florida**
Gainesville, Florida
- **Medical University of South Carolina**
Charleston, South Carolina
- **Medical College of Wisconsin**
Milwaukee, Wisconsin
- **Banner MD Anderson Cancer Center**
Gilbert, Arizona
- **Washington University**
St Louis, Missouri
- **University of Iowa**
Iowa City, Iowa
- **New York Proton Center**
New York City, New York

2019-2020
Medical Physics Graduate Program

Please join us in congratulating:
Pingfang Tsai
Fall 2019 PhD Graduate

Subsequent to graduation, Pingfang will join the New York Proton Center in New York, New York, as a Therapeutic Medical Physicist

Medical Sciences - College of Medicine - University of Florida



2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Colin Paulbeck
Summer 2019 PhD Graduate

Subsequent to graduation, Colin will begin a Diagnostic Residency in Medical Physics at the Medical College of Wisconsin

Medical Sciences - College of Medicine - University of Florida



2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Michael Shang
Spring 2019 PhD Graduate

Subsequent to graduation, Michael will begin a Therapy Residency at Washington University in St Louis, Missouri

Medical Sciences - College of Medicine - University of Florida



2019-2020
Medical Physics Graduate Program

Please join us in congratulating:
Haitham Alahmad
Fall 2019 PhD Graduate

Subsequent to graduation, Haitham will be returning to Saudi Arabia, where he will soon begin a career in Medical Physics.

Medical Sciences - College of Medicine - University of Florida



2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Nick Potter
Spring 2019 PhD Graduate

Subsequent to graduation, Nick will begin a Therapy Residency at the University of Florida in Gainesville

Medical Sciences - College of Medicine - University of Florida

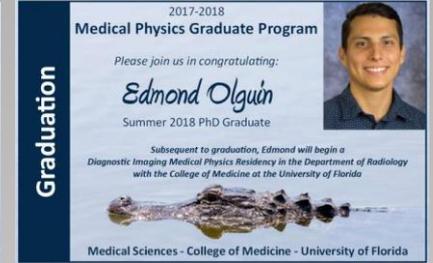


2017-2018
Medical Physics Graduate Program

Please join us in congratulating:
Edmond Olguin
Summer 2018 PhD Graduate

Subsequent to graduation, Edmond will begin a Diagnostic Imaging Medical Physics Residency in the Department of Radiology with the College of Medicine at the University of Florida

Medical Sciences - College of Medicine - University of Florida

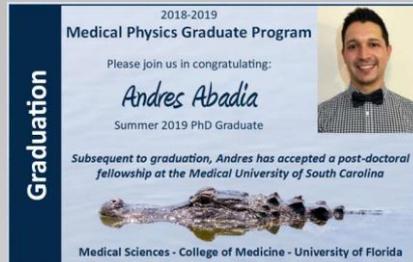


2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Andres Abadia
Summer 2019 PhD Graduate

Subsequent to graduation, Andres has accepted a post-doctoral fellowship at the Medical University of South Carolina

Medical Sciences - College of Medicine - University of Florida



2018-2019
Medical Physics Graduate Program

Please join us in congratulating:
Michael Hermansen
Spring 2019 PhD Graduate

Subsequent to graduation, Michael will begin a Therapy Residency at Banner MD Anderson Cancer Center in Arizona

Medical Sciences - College of Medicine - University of Florida

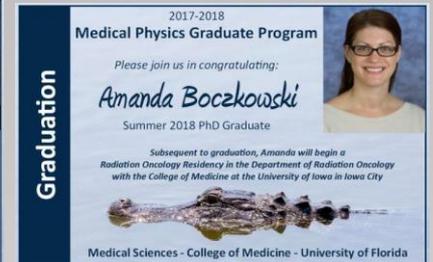


2017-2018
Medical Physics Graduate Program

Please join us in congratulating:
Amanda Boczkowski
Summer 2018 PhD Graduate

Subsequent to graduation, Amanda will begin a Radiation Oncology Residency in the Department of Radiation Oncology with the College of Medicine at the University of Iowa in Iowa City

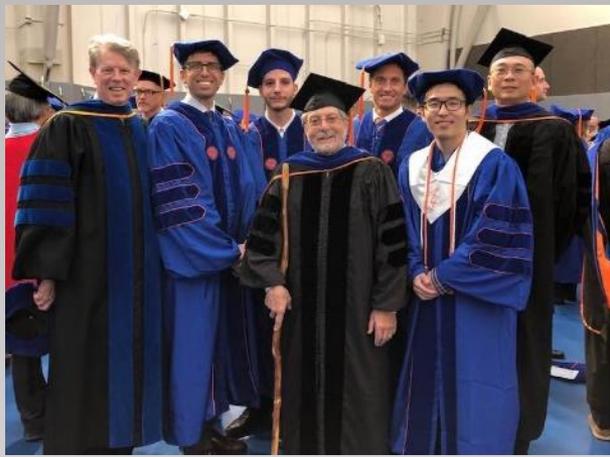
Medical Sciences - College of Medicine - University of Florida



HOST

Medical Physics students (MS & PhD) are eligible for the UF College of Medicine's Help Our Students Travel (HOST) program. The program matches students seeking residencies with alumni volunteers, who provide them with a free place to stay during interview trips.

Medical Physics students and alumni are encouraged to take advantage of the HOST program. For more information, please access the UF College of Medicine's Development & Alumni Affairs website (alumni.med.ufl.edu) or contact Alumni Affairs at drgator@health.ufl.edu



Society of Health & Medical Physics

Under the direction of Dr Wes Bolch, Professor (who serves as Faculty Advisor), the Society of Health and Medical Physics (SHMPS) at the University of Florida is an organization for students interested in radiation protection and the medical uses of radiation.



The organization's goal is to promote education in the field, inform members on the professional aspects of Medical Physics, plan social events, and create opportunities for community service involvement. The majority of SHMPS students are in the Medical Physics Graduate Program, but any UF student is welcome to join.

Primary Activities include:

- **Relay for Life:** Fundraising event for cancer research
- **Hope Lodge:** Service event for patients at Hope Lodge
- **Football Tailgate:** Social event for students & their families
- **Hurricane Relief:** Humanitarian efforts for those impacted by storms



2020-2021 SHMPS Officers



President
Bonnie President



Vice President
Megan Glassell



Treasurer
Colin Schaeffer



Alumni Relations
Nathalie Correa

Relay for Life

The 2020 SHMPS Relay for Life, benefiting the American Cancer Society, was unfortunately postponed due to Covid-19. Special thanks to our 2020 donors who not only helped us meet, but exceed, our goal of \$1000!

- Laurie Bennett
- Justin Brown
- David Gilland, PhD
- Kathleen Glassell
- Megan Glassell
- Sheryl Glassell
- Rosette Gonzalez
- Timothy Halton
- Qixing Han
- Joshua John
- Perry Johnson, PhD
- Jamar Liburd
- Keshad Malegam
- Matthew Marshman
- Karl Mund
- Catherine Olguin
- Bonnie President
- Nathan Quails
- Colin Schaeffer
- Francis O Smith
- Suresh Sookraj
- Robert Staton
- Brenda Tieden
- Wenchih Tseng
- Sharen Wallace
- Carly Williams
- Joseph Williams
- Mark & Eileen



Hope Lodge

Every Fall & Spring semester, SHMPS participates in a service event at the American Cancer Society Winn-Dixie Hope Lodge, where they prepare and serve a delicious dinner to patients and caregivers.

The American Cancer Society Winn-Dixie Hope Lodge in Gainesville, which opened in 1986, offers 46 guest rooms located near treatment centers in the area. The Hope Lodge staff are committed to providing a nurturing home away from home for their guests 24 hours a day, 7 days a week!

We are so proud of our medical physics students and their continued support of our community!

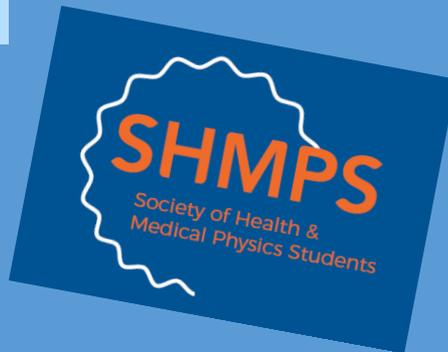
The Spring 2019 Hope Lodge Service Event took place in April 2019 and featured jambalaya, cornbread, salad, and bananas foster for dessert!

The Fall 2019 Hope Lodge Service Event took place in November 2019 and featured Korean stir fry, Asian salad, and passion fruit mousse for dessert.

The Spring 2020 Hope Lodge Service Event was unfortunately postponed due to Covid-19, but we look forward to returning to Hope Lodge soon!

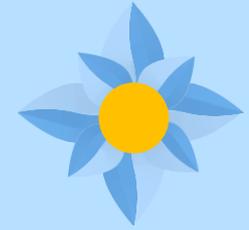
New SHMPS Logo

SHMPS is proud to reveal its new logo, designed by Caroline Bolch.



Student Milestones

School – work – life balance is an important aspect of our graduate program. We encourage all students to maintain a healthy lifestyle in which academics, employment, and personal activities are all nurtured and advanced. We enjoy celebrating our students' academic success, but we are especially delighted in celebrating their personal milestones.



Zahra Razi

Congratulations to Zahra Razi, Medical Physics Graduate Student, and her husband, on the birth of their beautiful baby girl!

Sophia June Amiri was born at 3:27PM on July 11, 2018.



Catherine & Edmond Olguin

Congratulations to Catherine Carranza, Medical Physics Graduate Student, and Edmond Olguin, Medical Physics Resident, on their wedding!

Catherine and Edmond wed on Friday, August 10, 2018, at the beautiful Baughman Center on the University of Florida campus in Gainesville.



Michael Shang

Congratulations to Michael Shang, Medical Physics Alumnus, and Lan La, on their wedding!

Michael and Lan wed on Saturday, September 22, 2019, in Palm Beach Gardens.

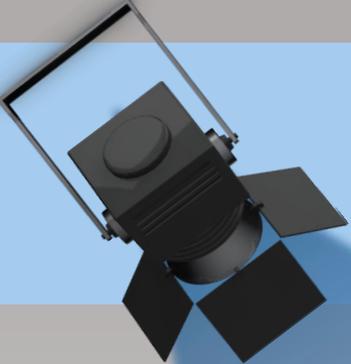


Dan Ciarleglio

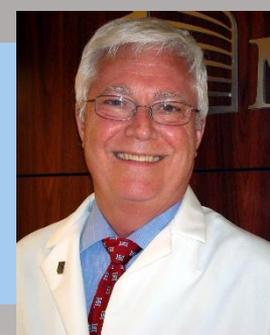
Congratulations to Dan Ciarleglio, Medical Physics Graduate Student, and Jessica Sanger on their wedding!

Dan & Jessica, who first met as Santa Fe College undergraduate students, wed on Saturday, February 29, 2020 at the Baughman Center on the University of Florida campus in Gainesville.





Lieutenant Colonel (USAF, Retired)
Kenneth N Vanek, PhD
Professor Emeritus, Medical University of South Carolina



UF PhD 1976

Graduate Student Alumni Spotlight

After an impressive career in Medical Physics, including twenty years of military service in the United States Air Force, we are honored to celebrate the retirement of Lieutenant Colonel Kenneth N Vanek, PhD (USAF, Retired) - Professor Emeritus at the Medical University of South Carolina (MUSC) in Charleston.

Dr Vanek officially retired from MUSC on September 3, 2019, where he had worked since 1998. During his time at MUSC, Dr Vanek held multiple faculty appointments and administrative positions, including his most recent position as Professor in the Departments of Neurosurgery and Radiation Oncology, and as the Director of Medical Physics and New Technology. Previous MUSC appointments include serving as Associate Chairman and as the Chief of Medical Physics.

At MUSC, Dr Vanek exceeded the expectations of a physicist in an academic setting, perfectly balancing his administrative duties, clinical obligations, research activities, and educational endeavors.

As a therapeutic physicist, Dr Vanek's clinical obligations originally encompassed providing all clinical physics support. He later became more focused on cranial SRS and spinal SRS, and subsequently on Gamma Knife.

Dr Vanek's research activities primarily focused on clinical medical physics technology and procedures, as well as being

a collaborator in various cellular and animal translational research, especially with glioblastomas. His work as an investigator, or significant contributor, on many lucrative contracts and grants, totaled more than 1.5 million.

Educational endeavors were vast and included serving as the Director of the Radiation Oncology Physics Residency Program. He mentored many MS and PhD students.

Prior to his position at MUSC, Dr Vanek worked for ten years at the H Clay Evans Johnson Cancer Treatment Center at Memorial Hospital in Chattanooga, Tennessee, where he worked as the Medical Physics Director. Prior to that, he admirably served his country for twenty years in the United States Air Force.

Dr Vanek holds American Board of Radiology (ABR) Certification in Therapeutic Radiological Physics and previously held American Board of Medical Physics Certification in Radiation Oncology Physics.

Professionally engaged, Dr Vanek was an active member of many professional societies and associations. He also served on numerous local, regional and national committees for various organizations including the Commission on the Accreditation of Academic Medical Physics Education Programs (CAMPEP), the American Association of Physicists in Medicine (AAPM), and the

American College of Medical Physics (ACMP).

Dr Vanek also maintained an active academic presence throughout his career. He gave dozens of presentations across the United States and authored/co-authored hundreds of peer-reviewed publications, non-peer-reviewed publications, and abstracts.

Well recognized for his achievements in Medical Physics, Dr Vanek was named in the 2015 and 2016 Marquis Who's Who in America. He was awarded the Jimmy Fenn Lifetime Achievement Award in 2014 by the AAPM Southeast Chapter, and the Edith H Quimby Award for Achievement in Medical Physics in 2012 by the AAPM. He was also inducted as a Fellow of the American College of Radiology (2004); the AAPM (2000), and the ACMP (1993). In addition to his emeritus status at MUSC, Dr Vanek also holds emeritus status with the AAPM, the American College of Radiology (ACR) and the American Society for Radiation Oncology (ASTRO).

Dr Vanek obtained his bachelor's degree in Zoology and his master's degree in Biophysics from Texas A&M University in College Station. He was awarded his PhD in 1976 from the University of Florida in Gainesville.

In his retirement, Dr Vanek's first priority was to take a well-deserved vacation with his beautiful wife of 51 years, Sheila. Dr and Ms Vanek spent two weeks on a small cruise ship which departed Quebec City in Canada,

travelled the St Lawrence River, around the coast of Main, and into Portland, Maine.

In the months and years to come, Dr Vanek looks forward to many more vacations with Sheila, spending time on his new boat, and to spending time with his family.

His daughter Tiffany (who was born while he was a PhD student in Gainesville) is getting married in April 2020 to a wonderful man with three sons. His son Adam, daughter-in-law Jennifer, and three grandchildren (Juliette, 11; Deacon, 5; and Ireland, 3) are expecting a new arrival in June 2020. Dr Vanek jokes that 2020 is the year his family explodes from 3 grandkids to 7!

We are extremely proud of Dr Vanek's lifetime achievements in Medical Physics and hope you will join us in recognizing his impact to the field of Medical Physics.



Q. How did you decide between therapeutic or diagnostic medical physics?

A. I love the direct clinical involvement with patients, plus the total clinical team (physicians, therapists, dosimetrists, physicists, and administration) effort that radiation oncology requires successful treatment of our patients, as well as implementing new clinical procedures. Effective communication and team work is imperative, but also very challenging. Dr Alex Turner (deceased) once told me that when he was asked to describe what a radiation oncology physicist does, he explained that they would see the patient, decide if they would benefit from radiation treatments, and if so, they defined the target volume, critical structures, prescribed the applicable dose, and approved the final radiation distribution plan. It was then up to the Medical Physicist to make certain that everything else happened precisely and the prescribed dose distributions were actually delivered to the patient. I love that challenge and I love it when a plan comes together.

Q. Why would you encourage an undergraduate student to go into Medical Physics?

A. I would most certainly encourage undergraduate students to go into Medical Physics! In fact, I have already successfully steered several undergraduates into the field. I love radiation oncology physics, with all of its constantly changing and advancing technology, and the interaction with patients.

Q. What advice would you give to a graduate student in Medical Physics?

A. One of the worst career mistakes that you can make is to become technologically obsolete. Another mistake is to delegate your clinical responsibilities to support personnel.

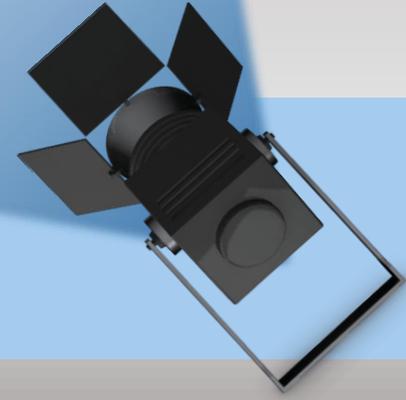
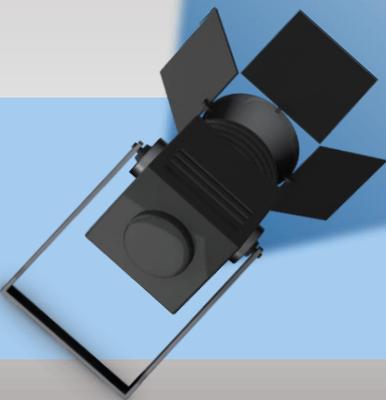
Medical Physics is a very unique, special, and rewarding profession. After graduating and becoming ABR certified, always remember that education is your responsibility and should be a part of your financial budget. It is very important to become professionally active in the AAPM, ACR, and hopefully ASTRO. Do not underestimate the value of medical physics being the ONLY 100% non-physician medical specialty that is recognized by the American Board of Medical Specialties. Thus, it is important to join and be an active member in professional organizations, and to contribute! Active participation in the AAPM should be a no-brainer. The AAPM is your primary professional organization, so be a part of its growth and development. Although I devoted numerous hours to the AAPM, it returned so much more to me through the professional friendships I made with physicists across the country, many of whom I served with on committees and socialized with at meetings.



MUSC Retirement Celebration

Q. What was the most fulfilling aspect of your career?

A. This is a very difficult question to answer. I enjoyed successfully introducing and implementing new technology and procedures into the clinic, as well as serving on the many AAPM and ACMP committees over my 43-year-career as a medical physicist. Receiving the Edith Quimby Lifetime Achievement Award and the SEAAPM Jimmy Fenn award were very special recognitions that I will always treasure.

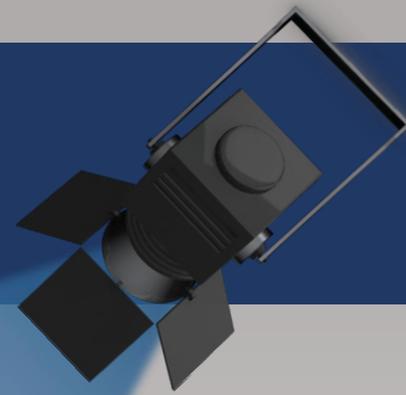


Lieutenant Colonel (USAF, Retired)
Kenneth N Vanek, PhD
Professor Emeritus, Medical University of South Carolina



Lindsey K Berkowitz, PhD

Director of Imaging Physics, Maine Medical Center



UF MS 2007
UF PhD 2009

Graduate Student Alumni Spotlight

Dr Lindsey Berkowitz (Lavoie) is a more recent UF graduate who has quickly become a well-known Medical Physicist in the New England region.

Dr Berkowitz obtained a BA (2004) in Physics from the College of the Holy Cross in Worcester, Massachusetts. She subsequently obtained her MS (2007) and PhD (2009) in Medical Physics from the University of Florida. During her time at UF, Dr Berkowitz also worked as a Medical Physics Graduate Assistant in the Department of Radiology, where she focused on CT research; tested diagnostic equipment; and was a member of the Radiology Practice Committee, where she was instrumental in updating protocols.

Subsequent to graduation, Dr Berkowitz was quickly offered a position as an Assistant Professor and Imaging Physicist in the Department of Radiology at Tufts Medical Center in Boston, Massachusetts. At Tufts, she provided oversight to equipment testing, evaluated equipment entering the medical center, started the CT Protocol Committee, and played an integral role in obtaining and sustaining the hospital's first ACR accreditation in CT.

In 2016, Dr Berkowitz relocated to Maine, where she is currently the Director of Imaging Physics and the Radiation Safety Officer at Maine Medical Center in Portland.

At Maine Medical Center, she directs a team responsible for both imaging physics and radiation safety, who provide support to all areas within the hospital system that utilize imaging equipment and radioactive materials.

In addition to her clinical responsibilities, Dr Berkowitz recognizes the importance of integrating herself into the health care system. She currently chairs the MRI Safety Committee at Maine Medical Center and is an active member of the Environment of Care Committee, Radiation Safety Committee, and CT Dose Committee. Dr Berkowitz's involvement not only increases her personal knowledge of hospital activities and initiatives, but also ensures that medical physics is appropriately integrated and utilized.

Dr Berkowitz also recognizes the importance of maintaining strong working relationships with her fellow physicists. She is a member of multiple professional societies, including the American Association of Physicists in Medicine (AAPM), the New England Chapter of the American Association of Physicists in Medicine (NEAAPM), and the American College of Radiology (ACR). She also currently chairs the NEAAPM's Commission on Accreditation of Medical Physics Education Program (CAMPEP) Coordination Committee, co-chairs the AAPM Spring Clinical Meeting

Mammography Track Subcommittee, and serves as a reviewer for the ACR CT Accreditation Program.

A true academian, Dr Berkowitz devotes much of her time to teaching and research. As a faculty member in the Department of Radiology at Maine Medical Center, her teaching responsibilities include providing physics lectures to both radiology residents and cardiology fellows seeking to gain competence in nuclear cardiology.

Dr Berkowitz's research is primarily focused on radiation dose in CT. She has authored refereed/peer-reviewed papers and scientific abstracts, has served as a peer-reviewer, and has given multiple presentations at international, national, regional, and local meetings.

Dr Berkowitz is certified in Diagnostic Medical Physics by the American Board of Radiology (ABR) and is certified as a Qualified Expert by the State of Maine Radiation Control Program.

Dr Berkowitz is happily married to her husband Jon. Together with their two goldendoodles, Maisy and Mabel, they enjoy all that Maine life in the Portland area has to offer: fresh seafood, local breweries, and the beautiful outdoors. An avid golfer, Dr Berkowitz enjoys spending time at the local

golf club. In her free time, she enjoys reading, hosting her neighborhood *non*-book club, learning about wine and whiskey, and bonfires and beach walks with her family.

We are honored to highlight Dr Berkowitz and look forward to her continued success!



Q&A with Dr Berkowitz

Q. How did you decide between therapeutic or diagnostic medical physics?

A. For me, it was very easy. My mom was an x-ray tech. On the first tour I took with Dr Arreola through the Radiology department, it felt so familiar to the times that I visited my mom at work. I knew that it was my path. And I'm thankful for it every day.

Q. Why would you encourage an undergraduate student to go into Medical Physics?

A. Three words: Work. Life. Balance. I've been very lucky to have flexible work hours that are mostly 8:00AM to 5:00PM Monday to Friday. Sometimes, that means hard, long days, but at the other end is the ability to take time off and truly enjoy life outside of work.

Q. What advice would you give to a graduate student in Medical Physics?

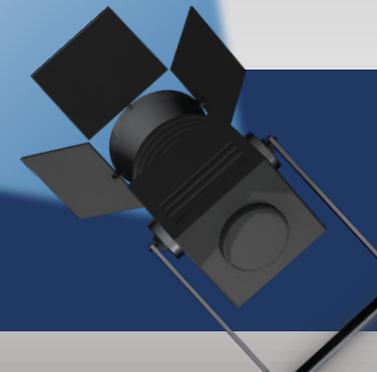
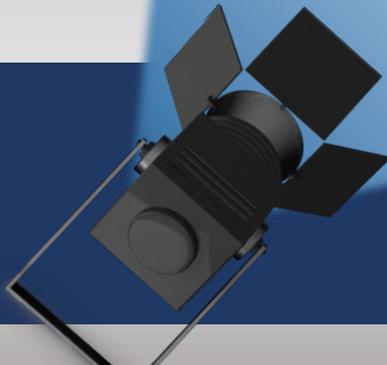
A. Don't shy away from anything. There is just as much value in being an expert in one or two modalities as knowing just enough about all of them. You'll always have colleagues within the UF family that you can lean on for advice!

Q. What is one of the most fulfilling aspect of your career?

A. I've been in the Medical Physics field for ten years and I still really enjoy talking to patients. It's rewarding to me to help them sort through real risks vs Dr Oz myths so they can feel comfortable getting the exam they need.



Lindsey K Berkowitz, PhD
Director of Imaging Physics, Maine Medical Center



Residency

ABR
mammography

angiography
radiography

achievements

ultrasound
DIDACTIC
ETHICS
ACCREDITATION
statistics
COMMITMENT

curriculum

conferences
INTEGRITY

communication
PATENTS

education
interventional
Computed Tomography

Scholarly activities
PROFESSIONALISM

LABS
ANATOMY
RADIATION
responsibilities
RESPECT

clinical training
physiology
FLUOROSCOPY
journals

PHANTOMS
HONESTY
steering committee
magnetic resonance
CAMPEP

Diagnostic Imaging Medical Physics Residency Program

The UF Diagnostic Imaging Medical Physics Residency Program (DIMPR) was one of the first imaging residency programs to be accredited (2013) by the Commission on Accreditation of Medical Physics Education Programs (CAMPEP).

The primary focus of our program is to provide a sufficiently structured environment of clinical training and educational activities during which residents develop their clinical and professional expertise to practice independently.



Diagnostic Imaging Medical Physics Residency Program

2019-2020



Lynn Rill, PhD
Faculty



Stephanie Leon, PhD
Faculty



Manuel Arreola, PhD
Faculty



Izabella Barreto, PhD
Faculty



Walter Drane, MD
Faculty



David Gilland, PhD
Faculty



Eric Thoburn, MD
Faculty



BC Schwarz, PhD
Faculty



Susan Stanford, MS
Faculty



Edmond Olguin, PhD
Resident



Alok Shankar, PhD
Resident

Program Growth

Under the leadership of Dr Lynn Rill, Program Director, and Dr Stephanie Leon, Assistant Program Director, the DIMPR program is flourishing!

In addition to adding an additional year of training to the residency, three new faculty have been added to the program. This includes Dr Izabella Barreto, Dr BC Schwarz, and Susan Stanford.

Dr Barreto is a recent graduate of the UF Medical Physics program who has developed extensive expertise in CT. She will provide in-depth training to the residents in CT testing and advanced applications of CT imaging.

Dr Schwarz is a recent graduate of the DIMPR program and is a true jack-of-all trades! He provides training to the residents in all modalities, with an emphasis on testing of fluoroscopy and MRI units.

Susan, the current UF Radiation Control Officer with Environmental Health and Safety, will devote part of her time and effort in teaching some of the nuclear medicine safety rotations during the third year.

These program additions will further develop and enhance an already stellar program!

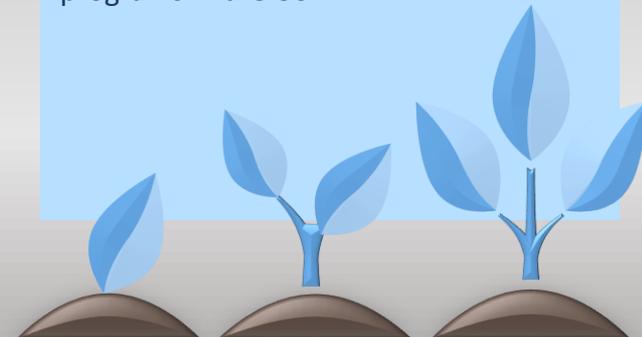


Transition to 3-Year Program

In February 2019, the UF Graduate Medical Education Committee (GMEC) approved our request to increase the duration of the DIMPR program.

Effective July 1, 2020, the program will add an additional year to the existing two-year program. The additional year will be dedicated to nuclear medicine physics and will enable the program to train residents to become eligible for dual-board certification in both diagnostic medical physics and nuclear medical physics.

The new three year program will be one of a very few medical physics residency programs in the country to offer nuclear medical physics training. This will position the program to be one of the top programs in the nation. In fact, UF will become one of only ten accredited nuclear medicine physics training programs in the US.



2019 Graduate

Congratulations to Dr Zhongwei Zhang, our 2019 Medical Physics Graduate.



Dr Zhang has accepted a position as an Assistant Professor with Mallinckrodt Institute of Radiology in the School of Medicine at Washington University in St Louis, Missouri. He will have teaching, research and service duties.

Dr Zhang also serves as the clinical medical physicist at St Louis Children's Hospital (SLCH) and the Children's Hospital Specialty Care Center (CSCC).

2020 Incoming Resident

The DIMPR program is excited to announce that we have matched with Justin Brown, our 2020 incoming resident. He will begin the program on July 1.



Justin is a current PhD candidate in the UF Medical Physics Graduate Program. Under the direction of Dr Wes Bolch, Justin works in the Advanced Laboratory of Radiation Dosimetry Studies (ALRADS). His research is primarily focused on Monte Carlo dosimetry and its application to diagnostic imaging.

Justin is also a UF Medical Physics MS graduate. His undergraduate studies were completed at the University of Idaho.



DIMPR Funding by Dr Brateman

It is with great honor to announce that the Residency program has been bequeathed generous funding by Dr Libby Brateman, who passed away on May 5, 2018.

Dr Brateman began the DIMPR program in 2011 and served as the Director until her retirement in 2016. Her commitment and dedication to the program, both in life and in death, is unsurpassed and invaluable to its inevitable long-term success.

The funding will be used to support non-salaried resident activities (clinically-relevant research and conferences). This will ensure that her legacy lives on in future generations of residents.

We are greatly appreciative of Dr Brateman's past direction and guidance. She dedicated her life to advancing medical physics knowledge and education. We are truly humbled by her continued support.



2019-2020 Residents

Dr Edmond Olguin is in his second year of residency training and will be our first resident to complete the additional year of nuclear medicine training. He is joined by our newest resident, Dr Alok Shankar. Dr Shankar, who began the program in July, was recently awarded his PhD in Medical Physics from the State University of New York at Buffalo.

In addition to their clinical responsibilities, our residents also engage in various research initiatives:

Dr Olguin is focusing on the development of a novel imaging algorithm for fluoroscopic procedures known as Statistical Pixel Angiograph (SPA). This algorithm is an alternative to digital subtraction angiography (DSA), with improved contrast and a potential for dose reduction. His other efforts center around evaluating a new CT model-based iterative reconstruction algorithm using the modulation transfer function. Dr Olguin's PhD work included pediatric CT dosimetry, nuclear medicine dosimetry, and the development of novel proton tissue-equivalent materials. In his free time, Dr Olguin enjoys watching basketball, motorsports, and stand-up comedy. He also loves going on long runs with his wife and Australian shepherd.

Dr Shankar is focusing on CT organ dose calculations and detector metrics. Dr Shankar's PhD work centered on characterization and applications of Photon Counting Detectors including dual energy material separation, rapid sequence angiography and rapid CBCT. In his spare time, Alok enjoys reading Saramago/Murakami, playing badminton, watching Jeopardy, and wearing out his wife's patience.



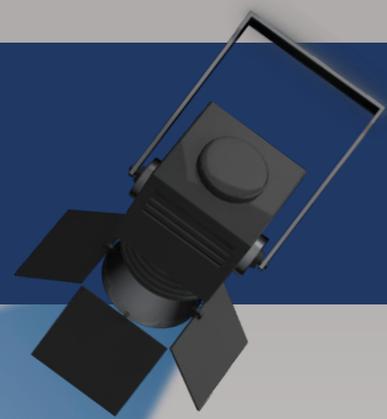


Ryan F Fisher, PhD

Diagnostic Medical Physicist, MetroHealth

Resident Alumni Spotlight

**UF MS 2006; UF PhD 2010
UF Resident 2013**



Dr Ryan Fisher is a UF graduate who has the official distinction of being the first UF Diagnostic Imaging Medical Physics Residency Program graduate. Centered in the Midwest, he is a well-known Medical Physicist.

Dr Fisher obtained a BS in Biomedical Engineering from the Georgia Institute of Technology in Atlanta in 2004. He subsequently obtained his MS (2006) and his PhD (2010) in Medical Physics under Dr David Hintenlang at the University of Florida. While obtaining his MS and PhD degrees at UF, Dr Fisher also worked as a Medical Physics Graduate Assistant in the Department of Radiology, where he worked on multiple projects. These projects included: performing testing on a variety of diagnostic imaging equipment; developing a dose calculator for estimating peak skin dose from interventional procedures; developing techniques and materials to construct anthropomorphic physical phantoms; building and characterizing a fiber optic coupled dosimetry system; and performing CT organ dose measurements.

Subsequent to graduation, Dr Fisher became the first UF physics resident and laid the foundation for the nine residents that have followed in his footsteps. As a resident, he engaged in a multitude of clinical activities, including: quality control and acceptance testing; developing and implementing a

patient dose tracking policy for interventional radiology; participating in successful ACR accreditation of multiple MRI and CT scanners; participating in testing of equipment leading to an ACR Breast Imaging Center of Excellence designation; various teaching endeavors; and participation in multiple courses and workshops pertaining to radiation.

After completing residency, Dr Fisher quickly secured a position as a Staff Medical Physicist at Cleveland Clinic in Ohio. During his six years at Cleveland Clinic, Dr Fisher effectively managed a vast array of medical physics related responsibilities, including: serving as the Certified Radiation Expert for multiple hospitals; developing and overseeing maintenance of radiation quality assurance programs, developing a state-mandated fluoroscopy training program; serving as a fluoroscopic modality expert and directing a transition to an online-based patient fluoroscopic dose monitoring system; optimizing protocols and equipment use for pediatric imaging; streamlining and standardizing quality control policies; serving as a mentor for residency rotations; performing shielding designs and barrier surveys; and giving lectures and teaching labs to medical physicists, residents, and fellows.

While working at Cleveland Clinic, Dr Fisher was also appointed as a Clinical Assistant

Professor at the Cleveland Clinic Lerner College of Medicine, where he taught fellows, residents, and technologists. In addition, he was appointed as an Adjunct Professor at Cleveland State University, where he oversaw graduate research projects for Medical Physics graduate students, managed annual survey observations and labs, and gave lectures on Medical Physics topics.

In January 2019, Dr Fisher accepted a new position at MetroHealth in Cleveland, Ohio. As a Diagnostic Imaging Medical Physicist, his duties are vast. He participates in annual testing for all imaging modalities (which includes streamlining and standardizing annual testing procedures) and oversees protocol review for the CT imaging program. He also oversees the hospital-wide radiation occupational dose program. Recent projects include assisting with the development a hospital wide MRI safety training program and a hospital-wide cardiac implanted electronic device management policy for MRI.

Dr Fisher is currently appointed as a Clinical Assistant Professor at Case Western Reserve University in Cleveland, Ohio. In this role, he primarily teaches principles of medical physics and radiation safety to radiology residents and technologists.

As an academic physicist, Dr Fisher dedicates

much of his time to research. His current research focuses on Gadolinium deposition from contrast MR imaging and differences in clinical practice and image reject rates between CR and DR imaging. He has also given many presentations at regional and national meetings, and has collaborated on many publications.

In addition to his clinical responsibilities and research endeavors, Dr Fisher has integrated himself into the medical physics community. He is an active member of the American Association of Physicists in Medicine (AAPM), the American Board of Radiology (ABR), and the American College of Radiology (ACR).

Dr Fisher is certified in Diagnostic Medical Physics by the American Board of Radiology. He is also certified as a Radiation Expert for Diagnostic Radiology and Mammography by the State of Ohio. In addition, he is recognized as a MR Safety Expert (MRSE) by the American Board of Magnetic Resonance Safety (ABMRS) and is MQSA certified.

Outside of physics, he enjoys spending time traveling, biking, and generally being outdoors with his wife, Kelly, and children, Wren (6) and Mo (2.5).

We are honored to highlight Dr Fisher and look forward to his continued success!

Q&A with Dr Fisher

Q. Why would you encourage an undergraduate student to go into Medical Physics and why would you encourage graduate students to continue to residency?

A. It's an interesting and rewarding career in medicine (minus all the debt that comes from med school) where you get to work with a variety of people and technologies to help make healthcare better. Most grad students at this point will need to do a residency in order to get ABR certified and work clinically. At the time, I didn't have to do a residency, but chose to in order to get a well rounded experience across all modalities, which could be difficult to get "on the job" depending on where you end up.

Q. How did the University of Florida prepare you for a career in Medical Physics and how did the residency benefit you?

A. Between the graduate coursework and the residency, I feel like I got a solid background in the fundamentals of imaging across all modalities. Through work as a GA, and in the residency, I got to tackle a lot of real world, day-to-day problems in the clinic - which is a great way to learn.

Q. What do you know now that you wish you had known as a graduate student and as a resident?

A. The best way to learn something is to jump in and get your hands dirty. You're not going to figure out how to drive a stick-shift just by reading about it.

Q. What advice would you give to graduate students and residents in Medical Physics?

A. Work hard, ask questions, never stop learning, and "I'm not sure, let me look into that and get back to you" is a completely acceptable answer (though probably not on a test in grad school).

Q. How did you decide between therapeutic or diagnostic medical physics?

A. I liked the variety of working with the different modalities in diagnostic imaging and also working with the imaging faculty at UF. The fact that mistakes are way less likely to end in catastrophe is a plus too (not that I ever make mistakes).

Q. What is one of the most fulfilling aspects of your career?

A. I really like the wide variety of people I get to work with, including technologists, radiologists, residents, administrators, nurses, and engineers. Keeping up with the ever and quickly evolving technology is also a good way to keep on your toes.



Ryan F Fisher, PhD
Diagnostic Medical Physicist, MetroHealth

Where Are They Now?



Ryan Fisher, PhD
MetroHealth System
Cleveland, OH

2013



Zemei Liu, PhD
West Physics
Atlanta, GA

2015



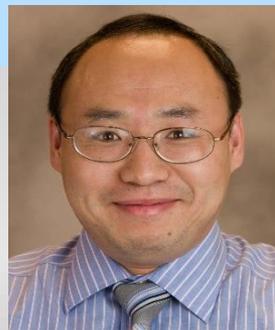
Matt Hoerner, PhD
Yale University
New Haven, CT

2016



BC Schwarz
University of Florida
Gainesville, FL

2018



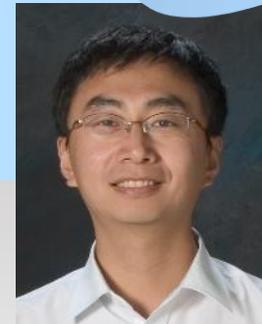
Weiyuan Wang, PhD
University of Oklahoma
Norman, OK

2013



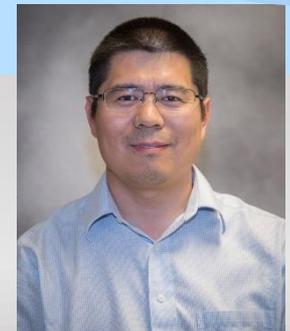
Michael Wayson, PhD
Baylor University
Dallas, TX

2014



Donglai Huo, PhD
University of Colorado
Denver, CO

2017



Zhongwei Zhang, MD, PhD
Washington University
St Louis, MO

2019



Epilogue

We would be remiss to not mention the current pandemic that is impacting our world.

During these very difficult and challenging times, we want you to know that the Medical Physics Gator Nation is in our thoughts.

We hope that each and every one of you and your loved ones are healthy and doing well.

We wish you and your families only the best!

Stay strong, be vigilant! Together, in unity, we will get through this!

Manuel M Arreola, PhD
Vice Chair, Medical Physics



*Warm wishes from the
Division of Medical Physics
in the College of Medicine at the
University of Florida!*

MEDICAL PHYSICS

Glassell Thompson Gonzalez Ricci Schaeffer Moretti President Mullaghy Moretti
Trejo Koenigs Tzvetanov Moore Parker Wagner Thomas Vanek Slopeema BECK Wang Paige Noriega
RILL BERKOWITZ BROWN BOLCH ALAEI
ATHERTON PETROCCIA AL-BASHEER PADILLA BARRACLOUGH
FISHER BOVA DEWEESE MORIN HUNG
HARTMANN ANDREOZZI ALLISON STUDENSKI
AYDOGAN KIELAR Whalen Kofler LEIPNER-GOMES BRINDLE HYMAN EWALD BAILEY BARRETO
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JOHNSON HANLON DUBOSE McCord Wolfe DELORENZO Knapp FLYER
HOWLEY GRUSE Stephenson TRIMBLE DOMAL LGHITTA
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Brenda Tieden

Administrative, Graduate & Residency Coordinator

PO Box 100374; Gainesville, FL 32610

352.265.0293

<http://www.medphysics.med.ufl.edu>

tiedeb@radiology.ufl.edu