

Director's Message

Dear Alumni, Students, Staff, Colleagues, and Friends:

On behalf of the entire program, I am pleased to share with you this edition of the newsletter of the Medical Physics and Health Physics Program. The past year has been remarkable one, in many ways. Overall, the program sustained its momentum in education and research. Our current students continued to meet their milestones towards graduation. As ever, our graduates are highly sought after and successful in an extremely competitive postgraduate employment market. From colleagues who hire our former students, we continue to hear that our program prepared them well. Our doctoral program, first accredited in 2012, graduated several outstanding young scientists this year.

The continued success of the program was the result of sustained teamwork by our faculty, students, staff, administration, and sponsors. Evidence of this teamwork abounds. For example, this year the graduate student body grew to reach 31 students and our number of publication reached 32; both all-time records for our program. The excellence of our faculty and students was recognized via numerous awards, honors, international collaborations, and extramural funding. These accomplishments are truly remarkable considering the ubiquitous challenges of the declining levels of federal and state funding and changes in personnel.

Besides teaching, learning, and research, the activities of program were characterized by engagement at the local, national, and global scale. Our students and faculty are involved in research that has a direct and positive impact on cancer patients, but this past year saw our program's reach stretch far beyond the clinic. Our students participated in multiple community outreach events, educating youngsters and their parents about radiation; we supported future medical and health physicists with a prestigious undergraduate scholarship; many of our more senior students presented their research at national conferences; we had several students participate in research collaborations elsewhere in the United States and abroad; and one of our projects sparked a small social-media frenzy, getting picked up by news outlets around the world. All of these activities establish the Medical Physics and Health Physics Program as a player on the world stage.

Inclusion of underrepresented groups is a major topic in the US workforce today. We are proud of our diverse students, staff, and faculty. Women comprise approximately one of every three of our students, which is remarkable given that the pool available to us to recruit from (*e.g.*, holders of a BS in physics) contains only one in five. Our program continues to engage in a variety of outreach and recruiting efforts to increase inclusion.

This newsletter highlights many of the achievements of our team. On behalf of the whole team, we thank you for all you do for the program and we look forward to staying in touch with you in the future.

Sincerely,

Wayne Newhauser



Contents

1. Welcome New Faculty	3
2. Trainee Milestones	3
<i>2.3 Matriculations</i>	3
<i>2.1 Certifications</i>	4
<i>2.2 Graduations and Placements</i>	5
3. Featured Stories	6
<i>3.1 Undergraduate Students Receive NRC Scholarship in Health Physics</i>	6
<i>3.2 Student 3D Prints First Full “Human” for Radiotherapy Research</i>	6
<i>3.3 Dr. Newhauser Named AAAS Fellow</i>	9
<i>3.8 Dr. Mark Lane Williams Passes</i>	9
<i>3.4 Students Volunteer at Boy Scout Merit Badge Workshop</i>	9
<i>3.5 Dr. Fontenot Receives ASTRO Policy Fellowship</i>	10
<i>3.6 Student Researches Radiation Contamination at ORAU</i>	11
<i>3.7 Dr. Newhauser Presents “Your Health in 3D Printing” at LSU Science Café</i>	13
<i>3.9 Medical Physics Open House at Mary Bird Perkins Cancer Center</i>	13
<i>3.10 Winter Holiday Open House</i>	14
<i>3.11 Student Works to Improve Patient Health</i>	15
<i>3.12 Graduate Students Attend SWAAPM</i>	17
<i>3.13 Bella Bowman Foundation and LSU</i>	18
4. Grants	18
5. Honors and Awards	19
6. Medical and Health Physics Program in the News	19
7. Selected Publications	20
8. Seminars and Presentations	23

1. Welcome New Faculty

We are pleased to welcome [Dr. Jeffery Chancellor](#) to the program. Dr. Chancellor received his PhD degree from Texas A&M University. His research interests are applications of how heavy ion radiation interacts with soft and condensed matter for ground-based analogs, manned spaceflight vehicle structure, shielding, and clinical healthcare. Utilization of high-performance, multi-core computers and sophisticated numerical techniques for studying complex dynamics that are otherwise difficult to mimic in a laboratory setting. Monte Carlo modeling of heavy charged nuclei and materials and the angular discrepancy in off-axis fragments produced by inelastic nuclear interactions in particle transport code.







- Heavy ion interactions with soft and condensed matter
- Radiation transport modeling (PHITS,FLUKA)
- Spacecraft shielding development
- Simulation of radiation environments in space
- Nuclear fission products
- Radiobiology
- Space radiation dosimetry

2. Trainee Milestones

2.3 Matriculations

The program welcomed 8 outstanding new medical-physics students, who entered the program in the fall of 2018.

 <p>Megan Chesal MS-Medical Physics BS/2018 Louisiana State University</p>	 <p>Chia-Lung Chien PhD - Medical Physics BS/2010/National Tsing Hua University MS/2018/University of Florida</p>	 <p>Ana Dieguez MS - Medical Physics BS/2017 University del Valle de Guatemala</p>	 <p>Ivan Hidrovo-Giler MS-Medical Physics BS/2018 Louisiana State University</p>
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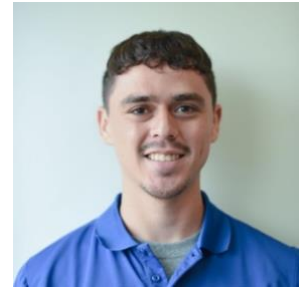
Maryam Naseri
 BS/2011 University of Isfahan
 MS/2016 Tarbiat Modares
 University



Joseph Scotto
 MS-Medical Physics
 BS/2018 Portland State
 University



Michael Stock
 MS-Medical Physics
 BS/2017/University of Oregon



Jared Taylor
 PhD-Medical Physics
 BS/2018/Pacific Union College

2.1 Certifications

Congratulations to all students who have made progress toward certification.



Bethany Broekhoven
 MS - medical physics
 Passed Part I of the ABR
 Exam



Erika Kollitz
 PhD - Medical Physics
 Passed Part I of the ABR
 Exam



Hanif Soysal
 MS - Medical Physics
 Passed Part I of the ABR
 Exam



Cameron Sprowls
 MS-Medical Physics
 Passed Part I of the ABR
 Exam



Andrew McGuffey
 MS-Medical Physics
 Passed the Ph.D.
 Qualifying Exam

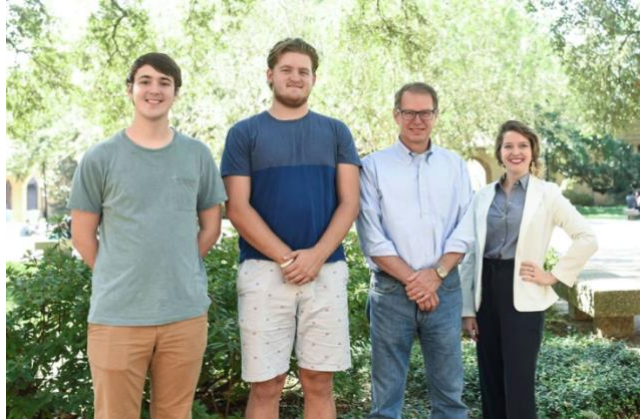


Payton Bruckmeier
 PhD - Medical Physics
 Passed the Ph.D.
 Qualifying Exam

2.2 Graduations and Placements

1. May 9, 2018, Joseph Robert Steiner, "[Endorectal Digital Prostate Tomosynthesis](#)" Advisor: Dr. Kenneth Matthews and Dr. Guang Jia. Joe will be doing his residency at Henry Ford Health System.
2. May 29, 2018, John Chapman defended his dissertation, "[Development of a Slab-based Monte Carlo Proton Dose Algorithm with a Robust Material-dependent Nuclear Halo Model](#)" Advisor: Dr. Jonas Fontenot. John started his residency at Washington University in St. Louis.
3. June 21, 2018, Elizabeth Hilliard passed her thesis defense, "[Verification and Evaluation of a Passive Intensity Modulation Device for Bolus Conformal Therapy](#)" Advisor: Dr. Robert Carver and Dr. Kenneth Hogstrom. Elizabeth started her residency at Medical University of South Carolina in Charleston.
4. July 25, 2018, Addie Barron passed her thesis defense, "[Investigation of Stereotactic Body Radiation Therapy Delivery Accuracy on an Elekta Linear Accelerator](#)" Advisor: Dr. Jonas Fontenot. Addie started her residency at Mary Bird Cancer Center.
5. August 3, 2018, Narayan Bhusal passed his thesis defense, "[Third Generation Gamma Camera SPECT System](#)" (2018). Narayan is continuing his PhD study at LSU physics department.
6. August 3, 2018, Suman Shrestha passed his thesis defense, "[Analytical Models of Neutron Spectral Fluence, Kerma and Absorbed-Dose for Proton Therapy](#)" Advisor: Dr. Wayne Newhauser. Suman is pursuing his PhD degree at MD Anderson Cancer Center in Houston.
7. Maggi, Paul Ethan received his PhD degree on May 11, 2018, "[Development and Applications of a Real-time Magnetic Electron Energy Spectrometer for Use with Medical Linear Accelerators](#)" Advisor: Dr. Kenneth Matthews. Paul is a postdoc at with the Department of Radiation Oncology at the University of Maryland School of Medicine in Baltimore, Maryland.
8. February 27, 2019, Amin Hamideh defended his thesis titled, "[Determination of Conversion Factors for Various Calibration Geometries Using ¹³³Ba as a Surrogate for Gaseous ¹³¹I in a Silver Zeolite Cartridge](#)." Advisor: Dr. Wei_Hsung Wang. Hamideh will continue his work as a radiation specialist at LSU radiation safety office.
9. March 14, 2019, Cameron Sprowls defended his thesis titled, "[Evaluation of Ventilation Assistance for Improving Respiratory . Reproducibility in Radiation Therapy](#)." Advisor: Dr. Jonas Fontenot. Sprowls will started his residency at University of Florida Health Cancer Center, Orlando.
10. April 22, 2019, Lydia Wilson defended her dissertation titled, "[Framework for Algorithmically Optimizing Longitudinal Health Outcomes: Examples in Cancer Radiotherapy and Occupational Radiation Protection](#)." Advisor: Dr. Wayne Newhauser. Wilson will begin a post-doctoral fellowship at St. Jude's Children's Hospital in Memphis, Tennessee.
11. May 3, 2019, Hanif Soysal defended his thesis titled, "[Scintillation Event Localization in Novel Hemi-Ellipsoid Detector for SPECT Using Geant4](#)." Advisor: Dr. Joyoni Dey. Soysal will begin his residency at The University of Mississippi Medical Center in Jackson, MS.
12. May 6, 2019, Bethany Broekhoven defended her thesis titled, "[Determination of Scatter Fractions, Albedos, and TVLs for Shielding of Synchrotron Beamline Hutches](#)." Advisor: Dr. Kenneth Matthews. Broekhoven will begin her residency at Medical University of South Carolina in Charleston.
13. May 23, 2019, William Donahue defended his dissertation titled, "[Computational Feasibility of Stimulating Whole-Organ Vascular Networks and Their Response to Injury](#)." Advisor: Dr. Wayne Newhauser. Donahue will begin a residency training fellowship at Yale in New Haven, Connecticut.
14. May 24, 2019, Christopher Schneider defended his dissertation titled, "[Stray Radiation Dose from X-ray and Proton Beam Radiation Therapies](#)." Advisor: Dr. Wayne Newhauser. Schneider will begin his residency at Mary Bird Perkins Cancer Center, here in Baton Rouge.
15. June 19, 2019, Garrett Otis defended his thesis titled, "[Assessment of Excess Thyroid Cancer Risk Following a Hypothetical Radiological Incident in Louisiana and Best-Case Risk Reduction Achieved by a Thyroid Blockade](#)." Advisor: Dr. Wei Hsung Wang. Garrett accepted an offer as a health physicist from Yale-New Haven Hospital in New Haven, Connecticut.

3. Featured Stories



3.1 Undergraduate Students Receive NRC Scholarship in Health Physics

A total 10 students received an LSU Health Physics Scholarship! Congratulations to Joshua Campbell, Margaret Carey, Rebecca DiTusa, Breona Leonard, Hunter Meyer, Meagan Moore, Sven Newhauser, Hayden Scott, Bryce Smith, and Hali Triche! These students were selected to receive a prestigious NRC Health Physics Scholarship, which includes a cash award for each recipient!

3.2 Student 3D Prints First Full “Human” for Radiotherapy Research

By Libby Haydel. December 12, 2018

At just 1 year old, she is 5 feet 1 inch tall and weighs 15 pounds. She can hold 36 gallons of water for up to eight hours. She has a detachable head but remains faceless. Her name is Marie, and no, this is not her online profile.



For the past year, LSU Biological and Agricultural Engineering senior Meagan Moore of Baton Rouge has been working to 3D print the first actual-size “human body” for radiation therapy research. The Phantom Project, also known as Marie, will help test radiation exposure on a real-size human to figure out the best angle for dose distribution.

“Phantoms have been used in medical and health physics for decades as surrogates for human tissue,” Moore said. “The issue is that most dosimetric models are currently made from a standard when people of all

body types get cancer. No personalized full-body phantoms currently exist.”

While current phantoms cost \$40,000, have no limbs, and don’t represent every body type, Marie represents an entire human body that is more realistic and only costs \$500 to create. Using 3D scans of five real women. that were procured from the Pennington Biomedical Research Center, Moore developed a lifelike female phantom made of bioplastic that can be filled with water to establish varying density similar to a patient.

“I specifically wanted to work with a woman because, in science, women typically aren’t studied because they’re considered complex due to a variety of reasons,” Moore said. “I want a person with the most complex geometry.”

It took 136 hours to print Marie in four sections on the BigRep printer in LSU’s Atkinson Hall. To connect the sections, Moore used a combination of soldering, friction stir welding, and sandblasting. She even used a hammer and chisel at times to take off chunks of plastic without damaging Marie. The main trouble was figuring out where to put the pipe for dose measurements. It ended up going down the midline from her head to her pelvic floor.

In order to test the phantom on multi-million-dollar equipment, multiple water tests first had to be conducted. During each test, 36 gallons of water were poured into Marie to see if she could hold that weight for 4 1/2 hours. Moore then improvised by using a PVC pipe to catch the “dribbles” that were coming out of some areas.

“This process always makes me nervous, but I know it won’t burst because it has roofing sealant covering it,” Moore said. “The way Marie is shaped also helps.”

Prior to the water testing, Marie was coated with liquid latex and purple roofing sealant for protection. Why purple sealant?

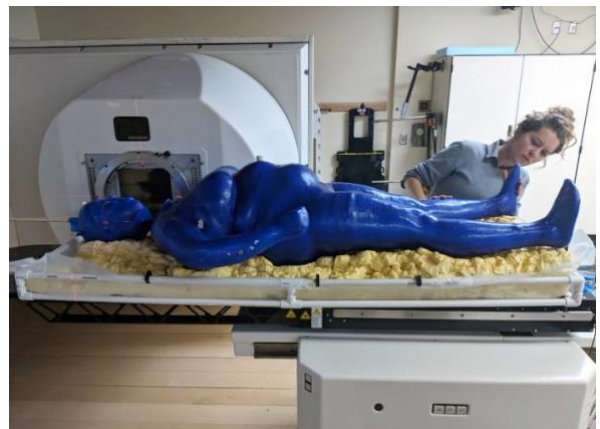
“Purple was on sale,” Moore said. “Turns out the color matches LSU and the University of Washington. She also wears her anti-skid LSU socks.”

This past October, Moore brought Marie to the UW Medical Cyclotron Facility in Seattle, where researchers were interested in testing fast neutron therapy on her. This type of therapy—a specialized and powerful form of external beam radiation therapy—is often used to treat certain tumors that are radio-resistant, meaning they are extremely hard to kill using X-ray radiation therapy.

“UW and Oregon Health and Science University came onto the project very recently,” Moore said. “I built a coffin for Marie to get shipped in. I gave workers and handlers a thorough write-up on how to take care of her.” Marie’s trip was brought about by LSU Medical Physics

Program Director and Professor Wayne Newhauser, who not only served as Moore’s mentor on the Phantom Project, but also knew researchers on the West Coast who would be interested in the project.

“The initial idea for the whole project wasn’t completely my idea,” Moore said. “Dr. Becky Carmichael [LSU Communication Across the Curriculum science coordinator and TEDxLSU speaker coach] told Dr. Newhauser that he should talk to me. I met him at his TED Talk, where he did a presentation on 3D printing



and how it's interfacing with science. Since I had just started doing 3D modeling of my own, I showed him my 3D prints. This project took off from his work with breast cancer and computational modeling.

"One reason I like working with Dr. Newhauser is he is good at finding the yes's," Moore added. "That's what pushes each project into existence. Not just having an idea, but the action behind the idea. That's the kind of environment I like working in, where we can make something happen."

Art and Science

Moore enrolled at LSU as a BAE student this past fall because she felt the discipline was a platform where she could combine art and science.

"This project started from the art perspective, then became science," said Moore, who initially wanted to double major in art and science before discovering BAE. "I love talking about the interface between art and engineering because I think it's really important for how I exist in the realm of science in a lot of ways."

Moore's love of science began at a young age, studying fish otoliths with an LSU graduate student while she was in the seventh grade and obsessively attending science fairs.

"I always knew I wanted to do science," she said. "I was making art with some of the science I was doing and eventually realized I was just tap-dancing around doing engineering. The biomedical engineering environment just kind of came together, and I thought, 'This is what I'm already doing. This is what I'm supposed to do in life.'

"I created an interdisciplinary role for myself by taking a little bit longer to work on my degree," she continued. "I'm able to work in a lot of different programs and use a lot of tools. I would love to get a degree and move on, but I learn differently, and if I can share in the process while I'm learning, that's kind of an incredible setup."

As for Marie, whose name is a combination of Marie Curie (radiation researcher), Marie Antoinette (detachable head), and Marie Laveau (purple symbolism), Moore hopes personalized replicas of her will be created and used in the medical field to more precisely treat cancer patients.

"What I'd like to see for this project is the research to be used as foundational work to personalize cancer treatments for people with more complex treatments," Moore said. "Children and breast cancer patients have really differing morphology that is usually very difficult to treat. I find that the more we learn about anybody, the more complex it's going to be. We're still getting medicine wrong on a lot of levels. We have a lot to learn."

3.3 Dr. Newhauser Named AAAS Fellow

Wayne D. Newhauser, the Dr. Charles M. Smith Chair of Medical Physics, professor and director of LSU Medical and Health Physics, has been elected for his distinguished contributions to the field of medical physics, particularly for theoretical modeling and predictions of radiation exposures and outcomes following advanced radiation therapies. Dr. Newhauser was presented with an official certificate and a gold and blue rosette pin on Saturday, Feb. 16, at the AAAS Fellows Forum during the 2019 AAAS Annual Meeting in Washington, D.C.

<https://www.lsu.edu/mediacenter/news/2018/11/27aaas2018.php>



3.8 Dr. Mark Lane Williams Passes

It is with great sadness that we learned of the death of Dr. Mark Williams. Dr. Williams's long and illustrious career in radiation physics includes 20 years at LSU, where he worked until retirement, including as Professor of Nuclear Science, Professor of Physics, and Director of the Nuclear Science Center and Medical Physics Program. During his time at LSU, he patented a radiation emitter for cancer therapy and taught more than ten undergraduate and graduate courses. Dr. Williams was elected as a Fellow of the American Nuclear Society in 2012 and received the prestigious Eugene Wigner Reactor Physicist Award in 2016. Throughout his career he published over 200 papers. Dr. Williams's contributions to LSU comprise an enduring legacy. Our thoughts and prayers are with his family.



The obituary for Dr. Williams may be found at <https://obits.theadvocate.com/ob.../theadvocate/obituary.aspx...>

3.4 Students Volunteer at Boy Scout Merit Badge Workshop

By Bethany Broekhoven, Oct. 6, 2018

Bethany Broekhoven, Anthony Davila, and Andrew Hastings, students of LSU's Medical Physics and Health Physics Graduate Program, managed a workshop teaching the Boy Scouts about Van de Graff generators and cloud chambers at the River Bend Nuclear Power Plant on Oct. 6, 2018. These students lectured to over 100 scouts and their parents during the day and helped roughly 70 scouts earn their atomic energy merit badge.

Andrew instructed the scouts on the basics of how a Van de Graff generator works to produce an electric charge. He then used the Van de Graff generator demo provided by LSU to show the principles in action. After the Van de Graff was turned on, it created a negative electric charge. Andrew demonstrated this charge by bringing a thin copper sheet into contact with the electric field generated by the Van de Graff. When in contact with the electric field, the thin copper sheet was repelled away from the generator. He also demonstrated the

electric field by placing his hand on the generator, which depending on the amount of charge built up caused Andrew to be shocked or the hair on his head to stand up. He then invited the scouts and their parents to try the demo out for themselves.

Bethany and Anthony instructed the scouts on the basic principles of a cloud chamber, which was provided by Dr. T. G. Guzik of LSU's Physics and Astronomy Department. Using high voltage, dry ice, and ethanol, the cloud chamber allows viewers to see tracks left by radiation particles interacting with the vapors inside the chamber. Bethany and Anthony explained what types of tracks could be seen in the cloud chamber and what these tracks looked like. They then invited the scouts and their parents to approach the cloud chamber and view the tracks for themselves.

After everyone was able to participate in both demos, the graduate students asked various questions to the scouts to reinforce the principles of each demo. The scouts impressed the students as they always knew the answers to the questions that were asked; it turned out to be a very positive experience for all.

3.5 Dr. Fontenot Receives ASTRO Policy Fellowship

October 15, 2018

Mary Bird Perkins Cancer Center announced their chief operating officer and chief of physics is the first medical physicist selected by the American Society for Radiation Oncology (ASTRO) to receive the ASTRO Health Policy Fellowship designation.

Jonas Fontenot, PhD, MS, is one of two participants nationwide chosen to participate in the program. This year-long program trains leaders in radiation oncology health policy issues, and engagement in reimbursement, coding and payment reform projects.

“Distinguished thought leaders like Dr. Fontenot are key to the Cancer Center’s mission and reflect the team’s constant pursuit to advance cancer care and create innovative solutions,” said Todd Stevens, president and chief operating officer, Mary Bird Perkins Cancer Center.

“At our core, we are focused on each patient’s care, and we are invested in transforming how the entire healthcare system works for those affected by cancer. We congratulate Dr. Fontenot on this tremendous achievement.”

Dr. Fontenot has been actively involved in healthcare economics for the last ten years.

“The opportunities provided by this fellowship will deepen my understanding and influence on the economics of healthcare in our country, ensuring that cancer patients and their caregivers continue to have a voice within the healthcare policymaking landscape,” said Dr. Fontenot, who currently serves on ASTRO’s Code Development and Valuation Subcommittee.



Fellows will participate in the American Medical Association's Relative Value Scale Update Committee and Current Procedural Terminology Editorial Panel, and will gain experience with issues related to Medicare and third-party payer reimbursement, as well as alternative payment models.

Dr. Fontenot received a Bachelor of Science in physics from the University of Louisiana-Lafayette, and both a Master of Science and doctorate in medical physics from the University of Texas M.D. Anderson Cancer Center. He is board-certified in therapeutic medical physics by the American Board of Radiology.

Dr. Fontenot has published more than 50 articles in peer-reviewed publications, and has received more than \$1 million in research funding from industry and government sponsors. A leader of Mary Bird Perkins' nationally acclaimed Medical Physics partnership with Louisiana State University, he serves as an adjunct faculty member in the LSU Department of Physics and Astronomy, teaching two courses and supervising graduate student research. Dr. Fontenot played a key role in bringing the Gamma Knife Icon, a breakthrough, noninvasive treatment for brain tumors and central nervous system conditions to Mary Bird Perkins – Our Lady of the Lake Cancer Center.

To learn more about medical physics at Mary Bird Perkins Cancer Center, visit marybird.org/physics.

3.6 Student Researches Radiation Contamination at ORAU

Kristi L Nelson, Knoxville News Sentinel, Aug. 18, 2018

OAK RIDGE — Louisiana State University graduate student Anthony Davila spent this summer deep in research that he'll likely see used almost immediately.

As an intern with Oak Ridge Associated Universities' Visiting Faculty Research Program, Davila helped develop a way for medical professionals to more quickly and accurately determine the depth of nuclear contamination in wounds – possibly salvaging tissue that would otherwise be cut out in an abundance of caution.

Davila's research specifically applies to people being treated for puncture wounds that are contaminated with nuclear material. That's a rarity in most U.S. emergency departments but can be a weekly occurrence in Oak Ridge, where government employees and contractors are working with nuclear material on a daily basis in numerous ways, said Jason Davis, ORAU's "subject matter expert" who oversaw Davila's project.

Davis is a health physicist with the Department of Energy's REAC/TS: Radiation Emergency Assistance Center/Training Site, which ORAU manages. The internationally known program responds to radiation accidents 24-7 — both in Oak Ridge and anywhere else experts are called to. In addition, it trains medical personnel around the world to respond to radiation emergencies.

That's why it's likely Davila – who returned to LSU recently to analyze his data before issuing a report – will see the fruits of his summer labor more quickly than some researchers do.

“Honestly, it will probably be used almost right away,” Davis said. Currently, the depth of radiation in a wound can be measured with the same equipment used to measure the depth of contamination in the ground — but the equipment is expensive, large and not portable, so it's not a practical method for medical providers to use. And while there have been advances in treating those who become contaminated from inhaling nuclear material, there's been less movement in those who become contaminated by having it injected under their skin, Davila said.



LSU graduate student in physics Anthony Davila handles a sample of substitute tissue after using it to determine a new method for medical facilities to measure the depth of radiation contamination in a wound. Davila hopes his research, done at the REAC/TS DOE center managed by Oak Ridge Associated Universities, can translate into medical care right away. *(Photo by Jonathan Giles, ORAU)*

Davila aimed to develop a standardized method to measure how deep the radiation goes in a wound, using portable, inexpensive equipment readily available in most medical centers. To do this, he injected nuclear material into a substitute for human tissue, a plastic-gelatin combination that behaves the same and is used in both research and teaching. Then he used a radiation detector to measure how deeply embedded the nuclear material was into the tissue, looking for a way to quickly and accurately determine the exact depth of contamination using the smaller, less expensive equipment.

Infection and continued exposure to radiation are the biggest risks of such a wound. Davis said the actual amount of radiation that could get into the bloodstream from a contaminated puncture wound is negligible, “but a lot of radionuclides are also heavy metals, so there’s the potential for kidney or liver damage” if the contaminated material stays in the body long-term.

Right now, doctors treating someone wounded with contaminated metal, for example, would remove deeper and deeper tissue samples around the wound, measuring radiation levels in the tissue they removed until the samples showed no evidence of contamination.

Though removing more and deeper layers of tissue usually means longer healing, in fattier parts of the body with tissue to spare, that wouldn’t affect a person’s ability to function long-term, as long as the opening healed.

But if a puncture wound is on a hand, for example, having to sequentially remove deeper and deeper tissue samples raises the risk of damaging delicate nerves and muscles.

That's where Davila's research could improve the standard of care. By having a more accurate way to measure the depth of contamination at the beginning of treatment, doctors could preserve as much non-contaminated tissue as possible.

And that's why his research might be used, at least in Oak Ridge, even before it's published: It's the same basic process that's been used to measure depth of contamination, just more refined.

"It should translate almost directly" from the lab to the operating room, Davis said.

ORAU isn't a school but a consortium of more than 120 colleges and universities that collaborate on research. Founded in 1942 as the Oak Ridge Institute for Nuclear Studies, it's been a Department of Energy contractor for decades and now does work for a number of governmental departments and agencies. It funds the Visiting Faculty Research Program to support the mission of the Oak Ridge Institute for Science and Education, bringing faculty and interns from consortium partners to Oak Ridge to work on original research projects.

3.7 Dr. Newhauser Presents "Your Health in 3D Printing" at LSU Science Café

Dr. Newhauser talked about "Your Health in 3D printing" at LSU Science Café at The Varsity Theatre on September 25, 2019. Students Margaret Carey and Meagan Moore demonstrated the 3D printed models. The audience was so interested in its application in the medical field.



3.9 Medical Physics Open House at Mary Bird Perkins Cancer Center

On Nov. 10, Will Donahue and Philip Wall organized a Medical Physics Open House at Mary Bird Perkins Cancer Center to invite first year graduate students in the department to visit the cancer center to learn about and see what we do. Two current students, Cameron Sprowls and Krystal Kirby, gave a short seminar on their research projects. Following this, attendees received a tour of the cancer center.



3.10 Winter Holiday Open House

December 8, 2018

It was a time of food, fun, and fellowship at our medical physics winter holiday open house at Dr. Newhauser's home. It is our program tradition!



3.11 Student Works to Improve Patient Health

05/03/2019, Rachel Holland. LSU Media Relations

BATON ROUGE - While earning her master's degree and Ph.D. at LSU, Lydia Wilson combined her love for physics and medicine. Her research has taken her around the world and she hopes to improve the quality of healthcare for every person. Below she shares her love of problem solving and collaboration.

Where are you from?

I grew up just outside of Chicago, Ill., but have been a bit of a gypsy since I graduated high school in 2005.

Why did you attend LSU for both your masters and Ph.D.?

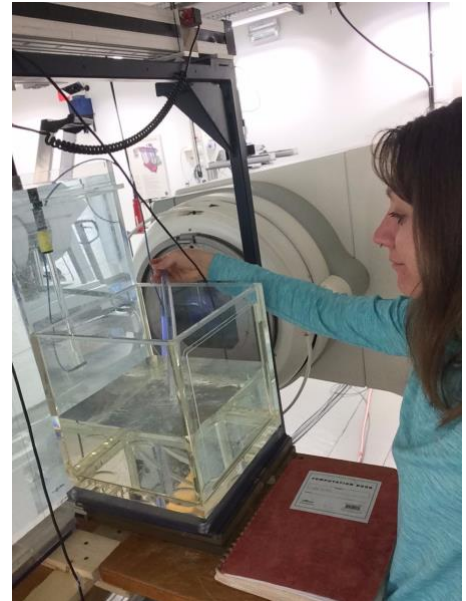
Well, I decided to come to LSU for my master's program because the medical physics master's program is arguably one of the best in the country. I really liked that it is a three-year master's that includes didactic coursework, clinical training, and a research project, which gave me a firm basis for a variety of different careers moving forward. I fell in love with research during my master's thesis and went on to do an independent project as a Fulbright Fellow. It was during that year that I decided to come back to LSU to pursue my doctoral training and I came back to LSU 100% for the research I was able to participate in here. I feel very passionately about my advisor's research program and he was willing to work with me to tailor my doctoral experience around the exact skills and experiences I wanted to gain to help me achieve my long-term career goals.

Why did you choose to major in medical physics?

To be honest, I feel like the field of medical physics was made just for me! I always wanted to be a medical doctor when I was younger. In fact, my dream job in high school was as a pediatrician at St. Jude Children's Research Hospital. I also fell in love with physics in high school and went on to earn a bachelor's degree in physics. When I finished the bachelor's degree, I knew I did not want to pursue astrophysics, which had been the main focus of my undergrad university, and remembered my previous interest in medicine, so I actually started preparing to apply to nursing school. I quickly realized that what I really loved about physics was the analytical problem solving, which was entirely missing from nursing, so I knew I wouldn't be fulfilled there. After spending some time at a loss as to what I should do, feeling totally torn between my love for physics and my desire to make a real difference in the lives of those who need it most, the terminally ill, I stumbled upon medical physics on some university's website. I was dumbfounded that this field that was exactly the combination of medicine and physics that I had been searching for even existed, and somehow, I had never come across it through four years of undergrad!

Was there a faculty advisor who had an impact on your studies and time at LSU?

So many of the faculty have had a huge impact on me throughout the course of my graduate studies here. I'm worked the most extensively and closely with my thesis advisor, Dr. Wayne Newhauser, who supervised both my master's and doctoral projects. That being said, the program as a whole is incredibly collaborative. All of the faculty work together to ensure all of the students have all of the tools they need to become good medical



physicists, so I don't think there is a single faculty member who hasn't contributed to my development in an important way.

What are you researching? What do you hope to accomplish?

My doctoral project was about developing a framework to combine all of the various effects of a medical intervention (beneficial and detrimental, fatal and non-fatal, long- and short-term) in a way that enables the direct optimization of the patient's projected health outcome. I hope that this research is implemented into clinical practice someday so that it can enable a more objective and holistic approach to medicine where treatments are decided upon in consideration of all of the various effects and how they relate to the patient's personal preferences, not just the probability of cure.

Why did you want to participate in research?

I love the wide-open frontier aspect of research. I don't think I'd ever be happy just dealing with the status quo. I'm driven by the excitement of identifying a problem or need and then attacking that problem head on. Research gives me a space in which to be a big kid: I get to be creative, make mistakes, and get my hands dirty, all towards actually making the world a better place!

Where has your research taken you? Why was it important for you to travel, teaching others?

My drive to make a difference has taken me all over Croatia and Mexico (so far ...), and my passion for collaboration has taken me to Germany. I think it's important to travel because everyone's perspective is unique and important, and I firmly believe that learning about those unique perspectives will propel us to better, more effective solutions to the biggest problems facing the world today. I think it's just as important to teach others about my unique perspective as it is to learn about theirs from them. The talks I've given in other countries have produced some of the most interesting, fruitful conversations that really challenged me to look at my research and field in a different way, and I think have made me a better researcher.

What is next for you?

Next I'll be working as a Postdoctoral Research Fellow at St. Jude Children's Research Hospital in Memphis, Tenn.

What do you ultimately hope to do?

Save the world? Be happy? Make a difference in somebody's life, somewhere, sometime. I feel like that sums up what I ultimately want to do. What I will do to achieve that is still changing and morphing and solidifying as I continue down my career path.

How has LSU helped you on your path?

LSU has totally and completely rocked my world. Growing up in Chicago, then living in California and Australia, I never in a million years expected to find myself living in Louisiana (and for nearly 10 years)! The faculty at LSU have given me more than I ever could have asked/hoped/expected to help make me a better medical physicist and researcher. And greater Baton Rouge community has shown me the acceptance, support, and compassion necessary to get through this wild ride we call graduate school.

Why should others attend LSU?

Honestly? Because you'll find a crazy combination of advanced resources, cutting-edge research, mind-blowing experts, and a massive dose of southern hospitality that I just don't think you'll find anywhere else in the world.

3.12 Graduate Students Attend SWAAPM

Current LSU graduate students, Bethany Broekhoven, Payton Bruckmeier, Audrey Copeland, Andrew McGuffey Phillip Wall, and Stephanie Wang, attended the 2019 Annual SWAAPM meeting in Little Rock, AR from April 11th – 13th.

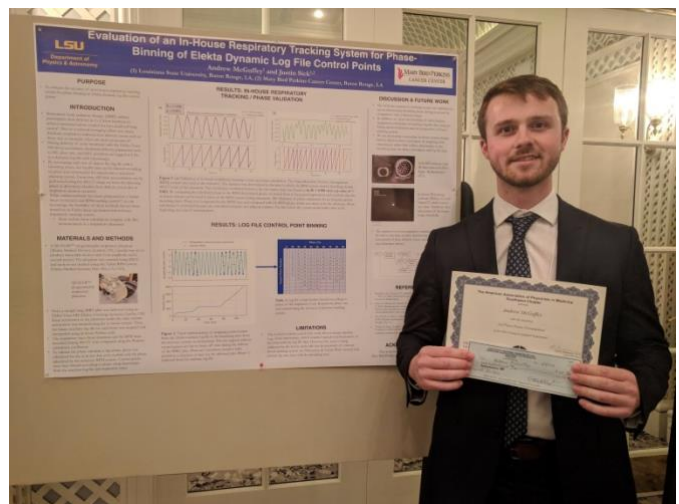
Bethany, Andrew, and Phillip each displayed a poster and gave an oral presentation on their research projects. Bethany Broekhoven’s presentation was titled “Determination of TVLs, Albedos, and Scatter Fractions for Shielding of Synchrotron Beamline Hutches”;

Andrew McGuffey’s presentation was titled “Evaluation of an in-house respiratory tracking system for phase-binning of Elekta machine log file control points”;

Phillip Wall’s presentation was titled “VMAT plan complexity feature analysis for predicting quality assurance outcomes using forests of extremely randomized decision trees.”

Andrew McGuffey and Stephanie Wang also participated in the Medphys slam, in which they each gave a three-minute elevator pitch on their research projects using everyday language.

Andrew’s slam presentation was titled the same as his oral presentation and Stephanie’s presentation was titled “Improving Electron Beams for Post-Mastectomy Radiotherapy.” Andrew received 1st place for his poster while Bethany and Phillip placed 3rd and 1st, respectively for their oral presentations; each award was presented as a certificate along with a check from the SWAAPM chapter officers!



3.13 Bella Bowman Foundation and LSU

Mr. and Mrs. Bowman, the founders of Bella Bowman Foundation (BBF), visited our program on May 2. The foundation's commitment to research led to a collaboration with Dr. Wayne Newhauser, Professor and Director of LSU Medical Physics and Health Physics Program. The major focus of Newhauser's laboratory is to improve long-term outcomes for pediatric and adult cancer patients. The BBF generously provided \$75,000 to support several cancer research projects that seek to reduce radiation side effects.

The funding from BBF provided supported, in part, several students in Dr. Newhauser's laboratory, including Will Donahue, Lydia Wilson, and Chris Schneider, each of whom is completing their doctoral degree this year. After graduating, Donahue will begin a residency training fellowship at



Yale in New Haven, Connecticut, Wilson will begin a post-doctoral fellowship at St. Jude's Children's Hospital in Memphis, Tennessee, and Schneider will begin a residency training fellowship at Mary Bird Perkins Cancer Center, here in Baton Rouge. The students presented their research results to the couple.

4. Grants

1. Meagan Moore received a LSU Discover Fall Research grant
2. Wayne Newhauser received NRC Faculty Development Grant, \$450k awarded
3. Dr. Dey receives Louisiana Board of Regents Proof of Concept grant of \$39,959, (matched by LSU for \$15,395 for a total of \$55,354) to carry out investigations on special gratings which makes analyzer-less interferometry possible in the clinic. Dr. Dey and team has a patent pending on the invention.

4. Dr. Carmichael co-PI with Lydia Bazzano received funding \$3545225 from National Institutes of Health–R01(2019-2023). \$1,446,036 subaward to MBPCC.
5. Dr. Carver received \$30,625 from .Decimal, Inc. for evaluation of .decimal Technology Skin Collimation and COMEY-plan.

5. Honors and Awards

1. Lydia Wilson, GSA Travel Award for attending AAPM meeting.
2. Lydia Wilson, DAAD Grant Submitted Nov. 4th, awarded.
3. Chris Schneider, Chateaubriand Travel Fellowship (7200 Euro) awarded.
4. Margaret Carey received the Tiger Athletic Foundation Undergraduate Scholarship, supporting thesis research in the Ogden Honors College. She also received "Undergraduate Research Award" and "Department Service Award" from Physics Department.
5. Meagan Moore won 1st place at the LSU Discover Day for her poster on 'The Purple Lady'.
6. Rebecca DiTusa won 1st place at the LSU Undergraduate Research Conference.
7. Philip Wall was accepted for a member position on the AAPM Students and Trainees Subcommittee.
8. Philip Wall received 1st Place from Young Investigator Symposium at AAPM Southwest Chapter Annual Meeting.
9. Andrew McGuffey received 1st place for his poster in 2019 Annual SWAPPM meeting in Little Rock, AR.
10. Bethany Broekhoven received 3rd Place from Young Investigator Symposium at AAPM Southwest Chapter Annual Meeting.
11. Dr. Newhauser has been re-elected as a Council Member of the National Council on Radiation Protection and Measurements, an advisory body chartered by the US Congress, to a second six-year term.

6. Medical and Health Physics Program in the News

- (LSU Researchers Help Apply 3D Printing to Cancer Treatments. (See section 6.1)
- LSU Student 3D Prints Full Size Human Phantom for Testing Radiation Therapy (All3DP). See section 6.2)
- 3dprintingindustry.com – "The Authority on 3D Printing" <https://3dprintingindustry.com/news/louisiana-state-university-3d-prints-full-body-human-for-radiotherapy-145559/>
- First Whole "Human" 3D Print from Moore for Radiotherapy Research. See section 6.3)
- 3Druck: <https://3druck.com/forschung/ersten-ganzen-mensch-3d-druck-von-moore-fuer-die-strahlentherapieforchung-3978352/>

- Marie, the First Woman in Life-Size Printed in 3D, is Supposed to Help with Cancer Treatment. (see section 6.4) <https://www.f3nws.com/news/marie-is-the-first-life-sized-3d-printed-human-body-6c901833eeb>
- LSU Engineering Student Uses 3D Printing to Create Radiation Therapy Tool. https://www.theadvocate.com/baton_rouge/news/communities/mid_city/article_d07da874-ffd7-11e8-b2d4-f77e47487b95.html
- LSU student out to print 3D print human for cancer research (see section 6.6)
- Baton Rouge Business Report: <https://www.businessreport.com/article/lsu-student-working-to-3d-print-cheaper-human-figures-for-cancer-research>
- Louisiana State University 3D Prints Full-Body ‘Human’ for Radiotherapy (see section 6.7)
- 3D Printing Industry: <https://3dprintingindustry.com/news/louisiana-state-university-3d-prints-full-body-human-for-radiotherapy-145559/>
- Maegan and Dr. Newhauser’s Collaboration in Action. This faculty-student duo are working to make radiation treatment more personalized by merging their backgrounds in art, engineering and medical physics. Watch Maegan and Dr. Newhauser's collaboration in action in this video. <https://campaigns.omniupdate.com/t/d-1-nuidhjk-jdydxdlkt-t/> (see section 6.8)
- Going to space probably won't give you cancer, research suggests (via LSU In the News). Cosmos: <https://cosmosmagazine.com/space/going-to-space-probably-won-t-give-you-cancer-research-suggests>
- Mouse Study Raises Concerns About Human Brain Function During Space Travel: Inside Science: <https://www.insidescience.org/news/mouse-study-raises-concerns-about-human-brain-function-during-space-travel>

7. Selected Publications

1. Taddei, Phillip J., Nabil Khater, Bassem Youssef, Rebecca M. Howell, Wassim Jalbout, Rui Zhang, Fady B. Geara et al. "[Low-and middle-income countries can reduce risks of subsequent neoplasms by referring pediatric craniospinal cases to centralized proton treatment centers.](#)" Biomedical Physics & Engineering Express 4, no. 2 (2018): 025029. 2018
2. Williams, J. P., & Newhauser, W. (2018). "[Normal tissue damage: its importance, history and challenges for the future](#)". The British Journal of Radiology 2019 92:1093 2018
3. Schneider, U., Walsh, L. & Newhauser, W. "[Tumour size can have an impact on the outcomes of epidemiological studies on second cancers after radiotherapy](#)" Radiat Environ Biophys (2018) 57: 311. 2018
4. Dabaja, B. S., Hoppe, B. S., Plastaras, J. P., Newhauser, W., Rosolova, K., Flampouri, S., Mohan, R., Mikhaeel, N. G., Kirova, Y., Specht, L., & Yahalom, J. (2018). "[Proton therapy for adults with mediastinal lymphomas: the International Lymphoma Radiation Oncology Group guidelines.](#)" Blood, 132(16), 1635-1646.
5. Yoon, J., Xie, Y., Zhang, R. (2018). "[Evaluation of surface and shallow depth dose reductions using a Superflab bolus during conventional and advanced external beam radiation therapy](#)", Journal of Applied Clinical Medical Physics, 19(2), 137-143. 2018

6. Yoon, J., Xie, Y., Heins, D., Zhang, R. (2018). "[Modeling of the metallic port in breast tissue expanders for photon radio therapy](#)", *Journal of Applied Clinical Medical Physics*, 19(3): 205-214. 2018
7. Guo, B., Zhang, R. (2018). "[Statistical Methods for Clinical Trial Designs in the New Era of Cancer Treatment](#)", *Biostatistics and Biometrics Open Access Journal*,5(3), 1-3. 2018
8. Espeland MA, Dutton GR, Neiberg R, Carmichael O, Hayden KM, Johnson K, Jeffery RW, Baker LD, Cook DR, Kitzman D, Rapp S, Action for Health in Diabetes Research Group. "Impact of a Multidomain Intensive Lifestyle Intervention on Complaints about Memory, Problem Solving, and Decision-Making Abilities: The Action for Health in Diabetes Randomized Controlled Clinical Trial." *J Gerontol A Biol Sci Med Sci*. 2018; 73(11):1560-1567.
9. McDougal DH, Darpolor MM, DuVall MA, Sutton EF, Morrison CD, Gadde KM, Redman LM, Carmichael OT. "[Glial acetate metabolism is increased following a 72-hour fast in metabolically healthy men and correlates with susceptibility to hypoglycemia. Acta Diabetologica](#)". 2018 Jun 22. doi: 10.1007/s00592-018-1180-5. [Epub ahead of print]. PMID: 29931424. 2018
10. Carmichael O, Pillai S, Shankapal P, McLellan A, Kay DG, Keller JN. "[A combination of essential fatty acids, panax ginseng extract, and green tea catechins modifies brain fMRI signals in healthy older adults](#)". *Journal of Nutrition, Health & Aging*. In press. doi: 10.1007/s12603-018-1028-2. 2018
11. King JL, Fearnbach SN, Ramakrishnapillai S, Shankpal P, Geiselman PJ, Martin CK, Murray KB, Hicks JL, McClernon FJ, Apolzan JW, Carmichael OT. "[Perceptual Characterization of the Macronutrient Picture System \(MaPS\) for Food Image fMRI](#)". *Frontiers in Psychology-Eating Behavior*. 2018; 9:17. PMID: PMC5790788 PMID: 29434559. 2018
12. Carmichael O, Schwarz AJ, Chatham CH, Scott D, Turner JA, Upadhyay J, Coimbra A, Goodman JA, Baumgartner R, English BA, Apolzan JW, Shankapal P, Hawkins KR. "[The role of fMRI in drug development](#)". *Drug Discovery Today*. 2018 Feb; 23:333-348. PMID: 29154758.
13. McLaughlin D, Hogstrom K, Neck D, Gibbons J. "[Comparison of measured electron energy for six matched, radiotherapy accelerators](#)." *J Appl Clin Med Phys*. 2018 May;19(3):183-192
14. Pitcher G, Hogstrom K, Carver R. "[Evaluation of prototype of improved electron collimation system for Elekta linear accelerators](#)." *J Appl Clin Med Phys*. 2018 Jul; 19(4): 75–86. doi: 10.1002/acm2.12342
15. Sick J, Fontenot J. "[The Air Out There: Treatment Planning When Target Volumes Extend Beyond the Skin](#)." *Int J Radiat Oncol Biol Phys*. 2018 Aug 1;101(5):1025-1026. doi: 10.1016/j.ijrobp.2018.03.019.
16. Wall PDH, Carver RL, Fontenot JD. "[Impact of database quality in knowledge-based treatment planning for prostate cancer](#)." *Pract Radiat Oncol*. 2018 Nov - Dec;8(6):437-444. doi: 10.1016
17. Wall Philip D H, Carver RL, Fontenot JD. "[An improved distance-to-dose correlation for predicting bladder and rectum dose-volumes in knowledge-based VMAT planning for prostate cancer](#)." *Phys Med Biol*. 2018 Jan 5;63(1):015035.
18. Espeland MA, Carmichael O, Yasar S, Hugenschmidt C, Hazzard W, Hayden KM, Rapp SR, Neiberg R, Johnson KC, Hoscheidt S, Mielke MM, Action for Health in Diabetes Research Group. "Sex-related differences in the prevalence of cognitive impairment among overweight and obese adults with type 2 diabetes." *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*. 2018;14:1184

19. Mark A. Espeland, Jose A. Luchsinger, Rebecca H. Neiberg, Owen Carmichael, etc. “Long Term Impact of Intensive Lifestyle Intervention on Cerebral Blood Flow.” *J Am Geriatr Soc.* 2018 January ; 66(1): 120–126.
20. Fiford CM, Ridgway GR, Cash DM, Modat M, Nicholas J, Manning EN, Malone IB, Biessels GJ, Ourselin S, Carmichael OT, Cardoso MJ, Barnes J. “Patterns of progressive atrophy vary with age in Alzheimer’s disease patients.” *Neurobiology of Aging.* 2018 Mar; 63:22-32. PMC5805840. PMID:29220823
21. Zhan L, Jenkins LM, Zhang A, Conte G, Forbes A, Harvey D, Angkustsiri K, Goodrich-Hunsaker NJ, Durdle C, Lee A, Schumann C, Carmichael O, Kalish K, Leow AD, Simon TJ. “Baseline connectome modular abnormalities in the childhood phase of a longitudinal study on individuals with chromosome 22q11 .2 deletion syndrome.” *Human Brain Mapping.* 2018 Jan; 39:232-248. PMICD: pmc5757536. PMID:28990258
22. Bourgeois B, Watts K, Thomas DM, Carmichael O, Hu FB, Heo M, Hall JE, Heymsfield SB. “Associations between height and blood pressure in the United States population.” *Medicine.* 2017 Dec; 96:e9233. PMID: 29390353
23. Calamia M, De Vito A, Bernstein JPK, Weitzner DS, Carmichael OT, Keller JN. “Pedometer-Assessed Steps Per Day as a Predictor of Cognitive Performance in Older Adults.” *Neuropsychology.* 2018;32(8):941-949.
24. Dadar M, Maranzano J, Ducharme S, Carmichael OT, DeCarli C, Collins L, Alzheimer’s Disease Neuroimaging Initiative. “Validation of T1w-based segmentations of white matter hyperintensity volumes in large-scale datasets of aging.” *Human Brain Mapping.* 2018 Mar; 39:1093-1107. PMID:29181872.
25. Wood BM, Jia G, Carmichael O, McKlveen K, Homberger DG. “3D MRI modeling of thin and spatially complex soft tissue structures without shrinkage: Lamprey Myosepta as an example.” *Anatomical Record.* 2018; 301:1745-1763. PMID:29752863.
26. Yan H, Carmichael O, Paul D, Peng J. “Alzheimer’s Disease Neuroimaging Initiative. Estimating fiber orientation distribution from diffusion MRI with spherical needlets.” *Medical Image Analysis.* 2018; 46:57-72. PMID:29502033.
27. Zhang, R., *Heins, D., Sanders, M., Guo, B., Hogstrom, K. (2018). “[Evaluation of a mixed beam therapy for post-mastectomy breast cancer patients: bolus electron conformal therapy combined with intensity modulated photon radiotherapy and volumetric modulated arc photon therapy](#)”, *Medical Physics*, Epub ahead of print. 2018.
28. Espeland MA, Carmichael O, Hayden K, Neiberg RH, Newman AB, Kellar JN, Wadden TA, Rapp SR, Hill JO, Horton ES, Johnson KC, Wagenknecht L, Wing RR, Action for Health in Diabetes Brain Magnetic Resonance Imaging, Action for Health Movement, Memory Ancillary Study Research Groups. “Long-term Impact of Weight Loss Intervention on Changes in Cognitive Function: Exploratory Analyses from the Action for Health in Diabetes Randomized Controlled Clinical Trial”. *Journals of Gerontology Series A: Biomedical Sciences and Medical Sciences.* 2018 Mar; 73:484-491. PMCID: PMC5861893 PMID:28958022.
29. N. Bhusal, J. Dey, J. Xu, K. Kalluri, A. Konik, J. M. Mukherjee, P. H. Pretorius, “[Performance Analysis of a High-Sensitivity Multi-Pinhole Cardiac SPECT System](#)”, *Medical Physics* 46 1 116-126, 2019.
30. [Lydia J. Wilson](#) , [Wayne D. Newhauser](#) [Christopher W. Schneider](#). “[An objective method to evaluate radiation dose distributions varying by three orders of magnitude](#)” *Med. Phys.* 46 (4), April 2019
31. [Steve Braunstein](#); [Li Wang](#); [Wayne Newhauser](#) ; [Todd Tenenholz](#); [Yi Rong](#); [Albert van der Kogel](#); [Michael Dominello](#); [Michael C. Joiner](#); [Jay Burmeister](#). “[Three discipline collaborative radiation therapy \(3DCRT\) special debate: The United States should build additional proton therapy facilities.](#)” *J. Appl Clin Med Phys* 2019; 20:2: 7-12.

32. Blue RS, Chancellor JC, Antonsen EL, Bayuse TM, Daniels, VR, Wotring, VE, Limitations in Predicting Radiation-Induced Pharmaceutical Instability during Long-Duration Spaceflight. *Nature Microgravity*, Jun;5(1) (2019)

8. Seminars and Presentations

1. Wilson, Schneider, and Newhauser: "A generalization of gamma-index-analysis methods to evaluate the agreement of radiation dose distributions varying by three or more orders of magnitude." AAPM 2018 Accepted as E-Poster
2. Hastings, A. "Evaluating Skyshine Contributions During Electron Synchrotron Injection with CERN's FLUKA Code"
3. Wall and Fontenot: "Knowledge-based treatment planning increases complexity and reduces delivery accuracy of VMAT plans for prostate cancer."
4. Wall and Wood: "Construction and validation of tissue-matching phantom for optimizing image quality in MR-guided cervical cancer brachytherapy"
5. Xie and Zhang: "Advanced post-mastectomy radiotherapy for node-positive left-sided breast cancer patients."
6. Yoon, Xie, and Zhang: "Evaluation of dose reduction by using superflab boluses at out-of-field regions."
7. Carver, Chambers, Hillard, Erhart, and Hogstrom: "Use of passive intensity modulation for bolus electron conformal therapy"
8. Smith, K: "Tools available to make your team adept at applying risk management techniques in the clinic." 2018 ASTRO annual meeting, oral presentation.
9. A.M. Hamideh and W-H Wang. Investigation of counting variations for point and planar radioactive sources inside a silver zeolite cartridge. The 30th Annual Meeting of the Air Monitoring Users Group, October 15-16, Las Vegas, Nev., 2018
10. Amin M. Hamideh gave an oral presentation on "Using Ba-133 as a calibration surrogate for simulation of gaseous I-131 in a silver zeolite cartridge" at the 63rd Annual Meeting of the Health Physics Society in Cleveland, Ohio.
11. C.A. Wilson IV, K.R. Hendrickson, A.M. Hamideh, K.L. Matthews II, W-H Wang. "Visualizing high-order decay after disequilibria." *Health Physics* 115:791-796; 2018.
12. Kirby, K., Carmichael, O., Van Gemmert, A. Bilateral Transfer of Motor Skills and Brain Activation Patterns: A First Step to Determine Whether Rehabilitation Protocols using Transfer Are Appropriate for Older Individuals." Presented at the LSU Biomedical Collaborative Research Program Annual Symposium, New Orleans, LA, October 2018.
13. Kirby, K., Carmichael, O., Van Gemmert, A. "Brain activation changes as a result of bilateral transfer of a visuomotor task." Presented as an oral blitz presentation at the Pennington Biomedical Scientific Retreat, Baton Rouge, LA, May 2018. Phillip DH Wall and Jonas D Fontenot. VMAT plan complexity feature analysis for predicting quality assurance outcomes using forests of extremely randomized decision trees. AAPM Annual Meeting, 2019.
14. Kirby, K., Van Gemmert, A., Pillai, S., Brouillette, R., Keller, J., & Carmichael, O., "Dual Tasking of a Rhythmic Motor and Cognitive Task Deteriorates Performance of Both Tasks in Older Adults." Presented at the Psychonomics Society Annual Meeting, New Orleans, LA, November 2018.

15. Kirby, K., Carmichael, O. "Enhanced detection of brown adipose tissue utilizing intermolecular multiple quantum coherence MRI." Presented at Southwest Chapter of the American Association of Physicists in Medicine annual meeting, Houston, TX, April 2018.
16. J. Xu*, J. Dey, K Ham, N. Bhusal*, L. Butler, "Two-dimensional single grating phase contrast system", Proc. SPIE 10573, Medical Imaging 2018: Physics of Medical Imaging, 1057323 (9 March 2018); doi: 10.1117/12.2292829 (oral presentation).
17. Phillip DH Wall and Jonas D Fontenot. VMAT plan complexity feature analysis for predicting quality assurance outcomes using forests of extremely randomized decision trees. AAPM Annual Meeting, 2019.
18. Chancellor, JC. "The Operational Space Radiation Environment and Mitigation Strategies." Department of Defense (DoD) Radiation Working Group, Defense Health Headquarters, Washington, D.C. June 2019
19. Chancellor, JC. "The Operational Space Radiation Environment." NASA Exploration Medical Capabilities (ExMC) Technical Interchange Meeting. Johnson Space Center, Houston, TX. June 2019
20. Chancellor, JC. "Radiation is Hard: Challenges of Pathogenesis and Translation into Clinical Outcomes." Principles of Aerospace Medicine Short Course, University of Texas Medical Branch, Galveston, TX. June 2019