



# Department of Medical Physics Newsletter

Summer 2018



**WISCONSIN**  
UNIVERSITY OF WISCONSIN-MADISON

## Special points of interest:

...Meet the new imaging physics residents

...Find out which of our incoming graduate students has climbed an 800' cliff

...Recognize faculty and student achievements

...Meet new administrative staff

...Learn why there's construction going on in WIMR

...And more

## Inside this issue:

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## Greetings from the Chair



To all our Alumni, Former Faculty and Staff, and Current Faculty, Staff, Students and Residents:

On behalf of the entire department, I am pleased to provide the most recent edition of the *Department of Medical Physics Newsletter*. The past year has been a very busy one, with continued faculty and staff transitions, a new entering class, a new group of program graduates, and numerous research and education initiatives. With regard to education, a major educational program initiative that began during the past year is a comprehensive graduate program "Curriculum Transformation" project. This is a very exciting initiative and one that I am convinced will have a major impact on graduate medical physics education well beyond UW-Madison. My thanks to all the faculty, staff, and students who are now, or will soon be, involved in this initiative. During the past year, the department also expanded its international graduate education presence by partnering with the Ministry of Health of the People's Republic of China to offer a set of three UW-Madison graduate courses to medical physicists in China. Four faculty traveled to Tianjin University to present lectures and labs in person, and three faculty presented lecture materials remotely. Guang-Hong Chen was instrumental in the development and implementation of this education initiative, with strong support from the UW-Madison Visiting International Student Program and multiple UW-Madison Campus and School of Medicine and Public Health leaders.

The department's research programs also continue to thrive and expand, thanks to the dedicated and innovative efforts of medical physics and collaborative faculty and very strong contributions of academic and administrative staff, post-doctoral fellows, graduate students, and medical physics residents. These efforts have led to research revenues and expenditures that have continued to increase over the past five years despite low funding levels and intense competition. Kudos to all those involved in a wide range of highly innovative and impactful UW-Madison medical physics research contributions!

In other news, we are continuing the "History of the Department" project and plan to publish a book dedicated to the department, the people who made it what it is, and its contributions to research, education, clinical practice, and society. Many emeritus and current faculty are involved in this exciting project. If you are interested or have photos, documents, or information to share, please contact Lyddia Ruch-Doll ([ruchdoll@wisc.edu](mailto:ruchdoll@wisc.edu)).

As always, we are eager to hear from our program graduates and former faculty and staff. Please send any informational updates and changes of address to JoAnn Kronberg ([jmkronberg@wisc.edu](mailto:jmkronberg@wisc.edu)). If your travels bring you to or near Madison, please let us know, as we would be very pleased to schedule a visit to the department!

I want to sincerely thank all alumni and present and former faculty and staff for donations that were contributed during the past year. Such donations are critically important to continued success of the department in addressing initiatives in each of its mission areas. I encourage you to review the information on the last page of this year's newsletter to find more information on recent gifts and opportunities for each of you to contribute to the continued successes of the department.

Finally, my sincere thanks to all active and past faculty, staff, students, post-doctoral fellows, and scientists who established, and maintain, the reputation of the Department of Medical Physics as a leader in innovative research, education, and service. It is a deep honor and privilege to serve as chair of such a phenomenal department. While I and all involved with the department are immensely proud of past and current achievements, I firmly believe the future is even brighter. On Wisconsin, and Go Badgers!

Sincerely, Ed Jackson

## Women in Medical Physics

Graduate students Catherine Steffel and Amy Weisman wrapped up a busy year increasing awareness of women in Medical Physics careers. In 2017, they received a grant from the Women in Science & Engineering Leadership Institute to support this initiative.

During the 2017-2018 academic year, three outstanding women visited the department. Kristy Brock, Professor at MD Anderson Cancer Center, Kolleen Kennedy, President of Varian Oncology Systems, and Rachel McKinsey, UW-Madison alum and medical physicist at e+CancerCare, took part in conversations about life as women in medical physics professions at lunches, lectures, and meetings. Students, faculty and staff attended the events.

Weisman says, "We've had a lot of positive feedback from both women and men in the program, which has reaffirmed our goals and encouraged us to expand the program for future students."

Steffel and Weisman will be presenting an abstract discussing their efforts at the upcoming AAPM Annual Meeting in Nashville, Tennessee. Carri Glide-Hurst, PhD, of Wayne State University and the Henry Ford Health System will be visiting as part of the program this fall.

Contact Catherine Steffel ([csteffel@wisc.edu](mailto:csteffel@wisc.edu)) or Amy Weisman ([aweisman3@wisc.edu](mailto:aweisman3@wisc.edu)) to learn more.



**W I S E L I**  
Women in Science & Engineering Leadership Institute  
University of Wisconsin-Madison

Amy Weisman (*top left*) and Catherine Steffel (*top right*) worked to increase awareness of women in Medical Physics careers. A Women in Science & Engineering Leadership Institute grant supported the program.

## Outreach Opportunities

The Medical Physics Graduate Student Outreach Program aims to increase the visibility of medical physics by teaching community members about the role of, and careers in, physics in medicine through hands-on activities.

Since October 2016, 18 medical physics graduate students have engaged with approximately 1,000 community members. Outreach events with medical physics demos and career opportunities include activity booths in science fairs, visits to youth community centers, career panels at colleges, and guest presentations at public middle and high schools. The first "home" event welcomed 18 high school students to the department in April 2018. As a result, 88% of the students were inspired to pursue STEM courses and 65% indicated they were interested in a physics-based career.

The Outreach Program was selected as a finalist for "Innovation in Education" at the upcoming AAPM Annual Meeting. To learn more, please contact Christie Lin ([clin232@wisc.edu](mailto:clin232@wisc.edu)) or Andrew Santoso ([apsantoso@wisc.edu](mailto:apsantoso@wisc.edu)).

Thank you to everyone who responded to our calls for information, photos, and articles!

Have something you'd like to see in the next newsletter? Contact JoAnn Kronberg ([jmkronberg@wisc.edu](mailto:jmkronberg@wisc.edu)) or Catherine Steffel ([csteffel@wisc.edu](mailto:csteffel@wisc.edu)).

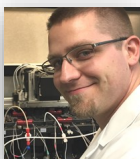


The Graduate Student Outreach Program hosts Madison area high school students in the Wisconsin Institutes for Medical Research (*top*). Learners look for abnormalities in a tissue-mimicking phantom with a portable ultrasound scanner (*bottom*).

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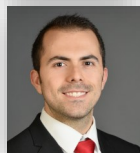
**Manik Aima**  
**Radiation Oncology Residency**  
 MD Anderson Cancer Center  
 University of Texas, Houston, TX



**Tobey Betthauser**  
**Post-doctoral Researcher**  
 Department of Medicine  
 University of Wisconsin, Madison, WI



**Benjamin Cox**  
**Post-doctoral Fellow**  
 Morgridge Institute for Research  
 University of Wisconsin, Madison, WI



**Daniel Gomez-Cardona**  
**Medical Physics Imaging Residency**  
 Department of Radiology  
 Mayo Clinic, Rochester, MN



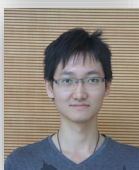
**Quinton Guerrero**  
**Research Associate**  
 Department of Anesthesiology  
 University of Wisconsin, Madison, WI



**Jon Hansen**  
**Therapy Residency**  
 Radiation Oncology  
 University of Wisconsin, Madison, WI



**Jorge Jimenez**  
**Diagnostic Imaging Residency**  
 MD Anderson Cancer Center  
 University of Texas, Houston, TX



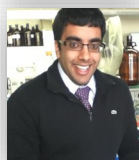
**Yinsheng Li**  
**Scientist**  
 Department of Medical Physics  
 University of Wisconsin, Madison, WI



**Kai Ludwig**  
**Post-doctoral Associate**  
 Center for Magnetic Resonance Research  
 University of Minnesota, Minneapolis, MN



**Andrew Shepard**  
**Therapy Residency**  
 Radiation Oncology  
 University of Wisconsin, Madison, WI



**Sameer Taneja**  
**Medical Physics Resident**  
 Department of Medical Physics  
 New York University, New York, NY

Congratulations, Graduates!

### Good Luck to these Imaging Physics Residency Program Graduates

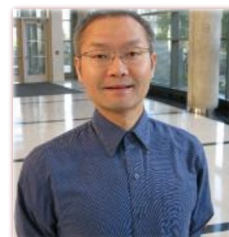
The Imaging Physics Residency is a 2-year, CAMPEP-accredited program designed for individuals who seek in depth education and training in clinical medical imaging physics. Graduates are prepared for ABR board certification exams and for professional careers as qualified medical physicists in clinical imaging facilities, in imaging physics consulting groups, or in the medical imaging device industry.

**Director:** Frank Ranallo, PhD, DABR

**Associate Director:** John Vetter, PhD, DABR



**Christina Brunnquell, PhD**  
**Acting Assistant Professor in Diagnostic Physics**  
 University of Washington  
 Department of Radiology  
 Seattle, Washington



**Zhimin Li, PhD**  
**Medical Physicist**  
 Massachusetts General Hospital  
 Department of Radiology  
 Boston, MA



### Get to Know Incoming Imaging Resident: Megan Johnson, PhD

During my search for MRI-related jobs, I quickly found that I needed more training to fulfill my dream to work as a diagnostic medical physicist. I chose Wake Forest for my graduate work in Biomedical Engineering because the research labs work closely with the clinic. My graduate research focused on improving Arterial Spin Labeling (ASL) MRI methods. I contributed to several clinical ASL projects during graduate school, including vascular

territory mapping, and I developed a new cerebral blood volume method for brain tumor imaging.

As a post-doctoral fellow, I have developed and implemented a new protocol and automatic quantitative analysis for daily clinical MRI QA to better predict machine issues before they interrupt clinical productivity. I feel these and other hands-on experiences have prepared me for the duties of an imaging physics resident.

With my knowledge of MRI physics and image processing, I often take the opportunity to teach the basics to others. I have given several lectures to audiences ranging from middle school students to undergraduates and retired engineers. Currently I have the opportunity to work with a neighboring university to assist faculty who are starting out in MRI research, including one-on-one advice for their projects, coil testing, and bi-weekly seminars on various MRI topics.



"I have given several lectures to audiences ranging from middle school students to undergraduates and retired engineers."

### Get to Know Incoming Imaging Resident: Sean Rose, PhD

My first experience with medical physics was as an AAPM summer fellow in 2012 working in radiation oncology at Pennsylvania Hospital. I enjoyed being a part of the clinical team and knowing that my work contributed directly to the treatment of patients, but I found myself curious as to how all the images used in treatment planning were acquired and formed. This stoked my interest in pursuing a PhD in medical physics. I met Dr. Xiaochuan Pan while interviewing at the University of Chicago, and, after learning

more about his lab's contributions to medical imaging, decided it would be a good fit for my graduate studies.

While the primary focus of my PhD thesis is the optimization of image reconstruction in digital breast tomosynthesis (DBT), over the last five years I have been involved in research and industry collaborations dealing with data processing, image reconstruction, and image quality evaluation. This work has given me the unique opportunity to see and program almost every step involved in

turning raw data into a reconstructed image in multiple imaging modalities. From these experiences, I have learned that direct involvement with clinical personnel and procedures is important in identifying key areas for which research can potentially have a direct and immediate impact on clinical efficacy, and it has become apparent that a career involving both the clinical and research aspects of medical physics is best suited to my interests.



"I have learned that direct involvement with clinical personnel and procedures is important in identifying key areas for which research can potentially have a direct and immediate impact on clinical efficacy...."



**Timothy Allen**  
University of Utah  
Salt Lake City, UT  
**Degree:** Physics/Applied Math  
**Advisor:** Frank Korosec



**Reed Kolany**  
Central Michigan University  
Mount Pleasant, MI  
**Degree:** Physics  
**Advisor:** Wes Culberson



**Andrew Bertinetti**  
Vanderbilt University  
Nashville, TN  
**Degree:** Medical Physics, MS  
**Advisor:** Rotation



**Robert Moskwa**  
University of Wisconsin  
Madison, WI  
**Degree:** Applied Mathematics, Engineering, Physics  
**Advisor:** Walter Block



**Collin Buelo**  
University of Wisconsin  
Madison, WI  
**Degree:** Physics  
**Advisor:** Diego Hernando



**Nicholas Nelson**  
University of Wisconsin  
Madison, WI  
**Degree:** Nuclear Engineering  
**Advisor:** Rotation



**Daniel Bushe**  
Rensselaer Polytechnic Institute  
Troy, NY  
**Degree:** Physics  
**Advisor:** Guang-Hong Chen



**Ethan Nikolau**  
University of Wisconsin  
Madison, WI  
**Degree:** Astronomy/Physics  
**Advisor:** Michael Speidel



**Victor Fernandes**  
University of São Paulo  
Sao Paulo, Brazil  
**Degree:** Physics  
**Advisor:** Robert Jeraj



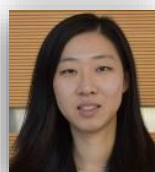
**Tan Phan**  
Davidson College  
Davidson, NC  
**Degree:** Physics  
**Advisor:** Ronald Wakai



**Mattison Flakus**  
University of Rochester  
Rochester, NY  
**Degree:** Physics/Applied Math  
**Advisor:** John Bayouth



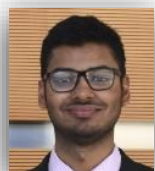
**Kaelyn Seeley**  
University of Pittsburgh  
Pittsburgh, PA  
**Degree:** Physics  
**Advisor:** Jonathan Engle



**Riuqi Geng**  
Duke University  
Durham, NC  
**Degree:** Medical Physics, MS  
**Advisor:** Diego Hernando



**Daniel Seiter**  
Grove City College  
Grove City, PA  
**Degree:** Physics  
**Advisor:** Oliver Wieben



**Ahtesham Khan**  
Hamilton College  
Clinton, NY  
**Degree:** Physics  
**Advisor:** Larry DeWerd



**Nadeem Shaheen**  
Oregon State University  
Corvallis, Oregon  
**Degree:** Radiation Health Physics  
**Advisor:** Tomy Varghese



**Alexander Kaeck**  
Embry-Riddle Aeronautical University  
Daytona Beach, Florida  
**Degree:** Aerospace Engineering  
**Advisor:** Tomy Varghese



**Chenwei Tang**  
Xi'an Jiaotong University  
Xi'an, Shaanxi, China  
**Degree:** Physics  
**Advisor:** Ronald Wakai



**Kevin Treb**  
Gustavus Adolphus College  
Saint Peter, MN  
**Degree:** Physics  
**Advisor:** Ke Li



**Tyler Tullis**  
University of Colorado  
Boulder, CO  
**Degree:** Physics  
**Advisor:** Brad Christian



**Eric Wallat**  
University of Wisconsin  
Madison, WI  
**Degree:** Physics  
**Advisor:** John Bayouth



**Joseph Whitehead**  
Purdue University  
West Lafayette, IN  
**Degree:** Physics  
**Advisor:** Michael Speidel



**Antonia Wuschner**  
University of Michigan  
Ann Arbor, MI  
**Degree:** Engineering  
**Advisor:** John Bayouth

### Perspectives & Activities

Mattison Flakus' hobbies include wakeboarding, traveling to different cities and trying new foods & playing card/board games.

Ahtesham Khan finds inspiration from Rumi – "You were born with wings, why prefer to crawl through life."

Nicholas Nelson is 50% French Canadian and holds dual-citizenship in the United States & Canada.

Daniel Seiter enjoys rock climbing. He's climbed an 800 foot cliff in the Adirondacks!

Chenwei Tang's favorite quote is, "No time like the present."

Kevin Treb plays jazz guitar. "Do not fear mistakes, there are none." – Miles Davis



Welcome to UW-Madison!

## Radiological Sciences Training Program

The Radiological Sciences Training Program (T32) prepares pre-doctoral graduate students and post-doctoral researchers for careers in the application of physics to medical diagnosis and treatment of cancer. Mentors maintain a broad spectrum of research collaborations with clinical and basic science researchers. Trainees are intimate participants in the research process and, after their training period, individuals are well-prepared to assume leadership positions as researchers and academicians. The grant is in its 39th year, and a competing renewal will be submitted in September 2018.

**Director:** Tim Hall, PhD (*below*)

**Current trainees, Effective June 1, 2018:**



### **Pre-doctoral (Faculty mentor):**

Kai Ludwig (Fain)  
Sabrina Hoffman (Bednarz, Thomadsen)  
Carson Hoffman (Wieben)  
Andrew Santoso (Hall)  
Andrew Shepard (Bednarz)  
Emily Ehlerding (Cai)  
Alex Antolak (Jackson)  
Leonard Che Fru (DeWerd)

### **Post-doctoral (Faculty mentor):**

Timothy Colgan (Reeder)  
Annelise Malkus (Fain)  
Camille Garcia-Ramos (Meyerand)



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**Faculty***Travel Awards*

Jonathan Engle, Office of the Vice Chancellor for Research and Graduate Education and the Wisconsin Alumni Research Foundation, 2018 TERA-CHEM Symposium

Wesley Culberson, Early Career Investigator Travel Award

*Publication Awards*

Bryan Bednarz co-chaired AAPM report TG 158 that was among the top 10 most-downloaded papers in Medical Physics for 2017

Wesley Culberson and John Micka, American Society of Colon and Rectal Surgeons Best Paper Award, 2017 ASCRS

*Fellows & Fellowship Awards*

Weibo Cai, American Institute for Medical and Biological Engineering College of Fellows

Walter Block and Andrew Alexander, Fellows of the International Society for Magnetic Resonance in Medicine

Jennifer Smilowitz and Guang-Hong Chen, Fellows of the AAPM

*Other Accomplishments, Honors & Awards*

Frank Ranallo, Associate Editor, Medical Physics

Andrew Alexander, 2018 UW-Madison Post-doctoral Mentor Award

Larry DeWerd, Marquise Who's Who Worldwide Lifetime Achievement Award

Andrew Alexander and Bradley Christian, Co-Directors of the Waisman Laboratory for Brain Imaging and Behavior

**Students***Travel Awards*

Charlie Matrosic and Catherine Steffel, UW Student Research Competition, AAPM Annual Meeting

Andrew Santoso and Blake Smith, 9<sup>th</sup> Annual Standard Imaging Travel Awards, AAPM Annual Meeting

Kai Ludwig, Ante Zhu and Philip Corrado, ISMRM Workshop on MRI of the Placenta

Gengyan Zhao received a trainee stipend for the ISMRM workshop on Machine Learning

*Abstract & Presentation Awards*

Gengyan Zhao, ISMRM Merit Award, Magna Cum Laude, "Bayesian Deep Learning for Uncertainty Generation in MR Image Segmentation"

Andrew Santoso, Christie Lin, Catherine Steffel, Amy Weisman, finalist, Innovation in Medical Physics Education Symposium Competition. Senior author Edward Jackson. More information page 2

*Fellowship Awards*

Carter Griest (advised by Sean Fain), 2018-9 Wisconsin Hilldale Undergraduate/Faculty Research Fellowship

Philip Corrado, ICTR TL1 Fellowship

Student Pre-doctoral Fellowships, page 8

*Other Accomplishments, Honors & Awards*

Sydney Jupitz, WISCIENCE Public Service Fellows Program

Catherine Steffel, Catalyzing Advocacy in Science and Engineering Workshop in Washington, D.C.

Ian Marsh, 2017 Ride Student Scholar Award

Catherine Steffel and Amy Weisman, WISELI Celebrating Women in Science and Engineering Grant. More information page 2

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Only includes grants awarded through  
the Department of Medical Physics



### Student Pre-doctoral F31 Grants

Principal Investigator	Sponsor	Title
Jorge Jimenez, advised by Walter Block, PhD	National Institutes of Health	Abbreviated MRI Breast Screening Protocol
Jeannette Metzger, advised by Marina E. Emborg, MD, PhD	National Institutes of Health	ncRNAs and PPAR $\gamma$ -Induced Sympathetic Neuroprotection in an NHP Model of Cardiac Neurodegeneration
Catherine Steffel, advised by Tomy Varghese, PhD & Carol Mitchell, PhD	National Institutes of Health	In vivo Quantitative Ultrasound Imaging of Carotid Plaque Validated with 3D Reconstructed Histopathology Sections

### Faculty Grants

Principal Investigator	Sponsor	Title
Bryan Bednarz, PhD	Discovery to Product (D2P) State Economic Engagement & Development (SEED) Grant	RAPID: An Extremely Fast Monte Carlo Dose Computing Software for Nuclear Medicine
Sean Fain, PhD	National Institutes of Health	Coupling MRI-Derived Ventilation with Computational Models to Assess Inhale Aerosol Treatment Feasibility in Severe Asthmatic Adults
Diego Hernando, PhD	National Institutes of Health	MRI-based Quantitative Susceptibility Mapping of Hepatic Iron Overload
Kevin Johnson, PhD and Diego Hernando, PhD	Institute for Clinical and Translational Research	Translational Basic and Clinical Pilot
Michael Speidel, PhD	National Institutes of Health	Dual-Energy Subtraction Anisotropy for Transcatheter Interventions
Ronald Wakai, PhD	National Institutes of Health	Optimized Measurement and Signal Processing of Fetal MCG (A year-19 competitive renewal!)

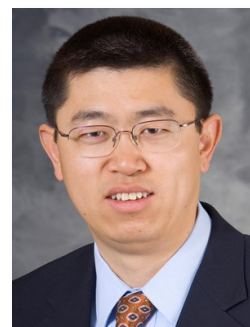


## Promotions

**Marina Emborg**, MD, PhD, was promoted to Professor with Tenure in the Department of Medical Physics, effective July 1, 2018. You can find a recent paper from her [lab](#) discussing the use of PET tracers for tracking cardiac pathology characteristic of Parkinson's disease in the journal *Nature Parkinson's Disease* later this year! Read more about Dr. Emborg [here](#).



**Weibo Cai**, PhD, was inducted into the American Institute for Medical and Biological Engineering (AIMBE) College of Fellows, in honor of his "pioneering work in radio-nanomedicine and outstanding contributions to molecular imaging and cancer nanotechnology," in April 2018. Dr. Cai was also promoted to Full Professor with Tenure in the Department of Radiology at the University of Wisconsin-Madison. During the last year, the Cai [lab](#) has published more than 30 peer-reviewed articles, many in top-tier journals including *Chemical Society Reviews* and *Trends in Cancer*. Read more about Dr. Cai [here](#).



**Jennifer Smilowitz**, PhD, was promoted to Clinical Professor in the Department of Human Oncology. Earning her PhD in Medical Physics from UW-Madison in 2002, Dr. Smilowitz now mentors several graduate students who contribute to her research and to Quality Assurance (QA) procedures in the radiation therapy clinic. As a 2017 UW Ride Scholar, she received funding for her TomoTherapy Radixact research [projects](#). Recently, Dr. Smilowitz submitted an article to *Medical Physics* about clinical validation of Accuray's TomoTherapy® motion management strategy of jaw and MLC tracking. Dr. Smilowitz is "In the Spotlight" [here](#).



**Michael Speidel**, PhD, recently was promoted to Associate Professor with Tenure in the Department of Medical Physics. Dr. Speidel has spent his academic career at UW-Madison, starting with a bachelor's degree in physics from the university. Currently, Dr. Speidel and his [lab](#) are researching novel image guidance and diagnostic methods for interventional cardiology and radiology. Dr. Speidel is "In the Spotlight" [here](#).



## Retirements

**O**nofre DeJesus was recruited to UW-Madison as an Assistant Professor in 1987 and was promoted to Tenured Professor of Medical Physics in 2002. His work focused on the development and translation of novel molecular imaging techniques. Multiple interdisciplinary collaborations were made possible through his work. DeJesus has served on the editorial board for several journals. In addition to his research and related activities, DeJesus has been a Visiting Professor or Invited Lecturer at prominent domestic and international institutions, including several in Europe and Southeast Asia. Read more about Dr. DeJesus [here](#).



**W**alter Peppler first arrived at UW-Madison as an undergraduate. After receiving his BS in Physics in 1974, he earned his MS and PhD degrees in Medical Physics and subsequently completed a post-doctoral fellowship. Peppler was promoted to Professor in 1995. He has been involved in a number of pioneering research efforts, including bone mineral densitometry (which led to a spinoff company) and digital subtraction angiography. In the early 2000s, his focus shifted to the implementation of PACS. Peppler plans to be involved in teaching, research, and mentoring roles during his retirement. Read more about Dr. Peppler [here](#).



**M**ark Ritter began his UW-Madison career in 1988 as an Assistant Professor in Human Oncology. In 2008, he was promoted to Tenured Professor. His research focused on the integration of advanced imaging with radiation oncology, radiation hypofractionation, and genitourinary and gastrointestinal oncology. Among his service activities, Ritter served as Vice Chair of the Department of Human Oncology and co-leader of the UW Carbone Cancer Center and Radiation Sciences Program. He has taught a radiation biology course to graduate students and residents for over 24 years. Read more about Dr. Ritter [here](#).



**B**ruce Thomadsen began his UW-Madison career in 1977 as a Clinical Instructor in Human Oncology. In 1989, he earned his PhD in Medical Physics from UW-Madison. He rose through the academic ranks and was promoted to Tenured Professor in 2009. Among his numerous service and leadership roles, perhaps the most prestigious is serving as the AAPM President in 2018. In 2019, he will serve as Chair of the AAPM Board of Directors. Apart from these roles, Thomadsen, like many of his colleagues, has remained committed to training and educating medical physics graduate students and other health profession learners. Dr. Thomadsen is "In the Spotlight" [here](#).



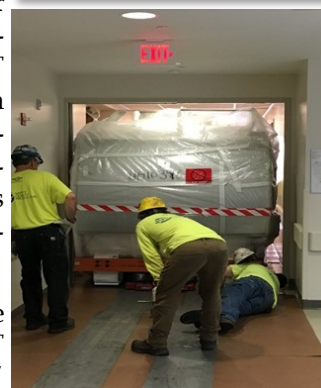
### Equipment Highlight: Medical Imaging

During the past year, the Departments of Radiology and Medical Physics have acquired several new imaging technologies. For the past few years, the departments have collaborated with GE Healthcare to develop its “latest and greatest” 3T MRI system, the **GE SIGNA Premier 3T MRI**. A prototype was installed in UW Health University Hospital in January 2017, and a two-phase trial evaluated system and clinical performance. After GE received FDA clearance for the system in late 2017, the UW prototype system was upgraded to become the first clinical SIGNA Premier installation in the world. Significant features of the system include the strongest gradients available in a commercial clinical wide-bore 70cm system (80 mT/m, 200 T/m/s), up to 146 receiver channels, a selection of high channel count receiver coils, and GE’s latest imaging applications. Lightweight receiver coils will be delivered later this year.

The Departments of Radiology and Medical Physics purchased a **GE SIGNA Premier 3T MRI** system following its successes in the hospital. The WIMR installation, scheduled to be completed during the first week of July 2018, replaces a 1.5T system. The 3T system will be well suited for neurological research applications, including studies on Alzheimer’s Disease and the Epilepsy and Alzheimer’s Connectome projects. The scanner has a 70 cm bore, which will be well suited for bariatric studies and studies involving pregnant women. The GE SIGNA Premier 3T MRI systems join other MRI systems owned by UW SMPH, including the GE Optima MR450W 1.5T MRI system in the hospital and the GE Discovery MR750 3T MRI system and the PET/MR system in WIMR.

Installation of the **GE Discovery MI PET/CT system** was completed in May 2018. The system is located in WIMR in space that previously housed the GE Discovery VCT PET/CT system, which was relocated to a UW Health clinic. The Discovery MI PET/CT system is an evolution in PET/CT with its new SiPM digital PET detectors. The system also includes specialized MAR (Metal Artifact Reduction) software to decrease the artifacts that typically are produced on CT images due to metal materials, such as hip implants.

The Departments of Radiology and Medical Physics received GE Healthcare’s most advanced CT scanner, the **GE Revolution CT** system in 2016. This past year, the system was updated and moved from the UW Health Sports Medicine Clinic to the UW Health University Hospital to be better integrated into clinical practice.



Delivery of GE SIGNA Premier 3T MRI to WIMR.

### Research and Service Update

The Department of Medical Physics engages in diverse, interdisciplinary research in nearly every major area of the application of physics to medicine. While the majority of research efforts are accomplished in WIMR Tower 1, research is conducted at multiple sites and institutions. Medical Physics has strong partnerships with UW Health as well as the Department of Biomedical Engineering, LOCI, the Waisman Center, and

Morgridge Institute for Research. Research is supported by approximately \$10.0 million annually in extramural grants and contracts. Over half of that comes from the NIH, DOD, and DOE (see page 8 for grants awarded in the past year to our faculty and students). Two-year priorities for research and service include:

- Continuing strong department traditions: con-

ducting innovative and impactful basic and translational research, and developing and translating to practice methods and devices that benefit patients in Wisconsin and worldwide.

- Initiate actions that will enable opportunities for additional, novel and impactful interdisciplinary research. Re-evaluate the department’s research portfolio and recent in-

vestments across campus, and invest in new faculty as needed to align with identified research opportunities.

- Provide medical physics services by working with UW Health patient care providers and associated hospitals/clinics to assure excellent patient care with state-of-the-art diagnostic and therapeutic equipment and techniques.



## Updates

This past year has been an exciting one, with staffing changes and new initiatives motivating challenges for the years ahead. Some of the highlights from the past year include:

- Improving invoicing & accounts receivable processes, creating transparency & accountability.
- Implementing monthly PI financial fund account balance reports, allowing faculty to make sound financial decisions.

- Developing standardized on-boarding & off-boarding processes to welcome incoming students, faculty, and staff.

- Developing and improving department policies.

- Providing funding to faculty, where appropriate, to continue supporting the missions of UW-Madison, the School of Medicine & Public Health, and the Department of Medical Physics.

## Retirement

Deb Torgerson retired in January 2018 following 38 years of university service. Deb's contributions to the Department of Medical Physics as Graduate Student Coordinator were instrumental. She helped support innumerable changes within both the university and the department, including supporting the graduate program during a significant increase

in enrollment (from approximately 40 to over 100 students). Thank you to Deb for her many dedicated years of service!



## New Staff

Carol Aspinwall, MS, joined the department as Educational Programs Coordinator in December 2018. Carol supports the Graduate Program, Medical Physics Imaging Residency Program, and Radiological Sciences Training Grant. Prior to joining Medical Physics, Carol worked as Graduate Programs Coordinator in the School of Nursing, as Assistant Director for Operations and Technology Management in the School of Business MBA program, and as Student Services Coordinator in the School of Engineering. These experiences have provided her with the tools to handle the nuances of student recruitment, advising, and academic services. Carol is passionate about higher education and is eager to serve as a resource for our graduate students. Carol is "In the Spotlight" [here](#).



Devyn Prielipp joined the Department of Medical Physics and the School of Medicine and Public Health HR Shared Services as the Medical Physics HR Business Partner in early June 2018. Devyn has previous HR experience with QTI, the Department of Corrections, and Degen Berglund. Initially, she will focus on training and learning the UW System, both with the Dean's Office on campus, to prepare her for her role with Medical Physics. Devyn fills the position vacated by Kayla Gomez-Cardona, who provided outstanding support until her relocation to Rochester, MN with Daniel (page 3).



Leif Lervik, our new machinist, joins us after working as Tool and Die Maker and Designer for 25 years at Madison Kipp Corporation. Leif is experienced in programming computer numerical controlled (CNC) machine tools to produce parts used in inspection labs, molds, fixtures, and repair parts. He is also skilled in the use of various manual machines and has experience in working with a variety of tools, from steels to plastics. He also has extensive experience teaching best machine shop practices.



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## Philanthropy: Making an Impact

As demonstrated by the brief summaries of activities in this newsletter, the Department of Medical Physics continues to be a clear leader in medical physics education, training, and research. The faculty continue to be leaders in the fields of radiation metrology, radiation therapy, imaging (CT, MR, ultrasound, PET), and biomagnetism. The graduate program is the largest in North America and was one of the first programs accredited by CAMPEP, and the students who matriculate each year are consistently among the best applicants. The medical physics residency program in Radiation Therapy Physics is CAMPEP-accredited and the Imaging Physics Residency Program was accredited by CAMPEP in April 2017. Graduates of our graduate, post-doctoral, and residency programs have gone on to highly successful careers in academia, industry, hospitals and clinics, consulting groups, entrepreneurship, *etc.* We seek to continue to provide this level of UW-Madison leadership into the future, in spite of particularly competitive and limited funding availability for research grants and decreasing state budgets. To accomplish this goal, the extensive network of UW-Madison Medical Physics Alumni can help through tax-deductible donations, of any amount, to the John. R. Cameron Memorial Fund, the Herb Attix Fund, or the Medical Physics Fund.

Contributions to the **John R. Cameron Memorial Fund** are used solely in support of research and education missions of the Department of Medical Physics. Contributions to the Herb Attix Fund are used to support graduate students selected by the faculty as **Herb Attix Fellows**. Contributions to the **Medical Physics Fund** are used for general support of the department's education and research missions, and such contributions represent the most general fund option.

To contribute, please go to <http://www.medphysics.wisc.edu/aboutus/donation/> and select the fund or funds to which you wish to make a donation. Again, all donations are tax deductible to the extent allowed by law.

Other contributors may wish to provide larger donations that are targeted in support of a specific goal. For example, in the past year the department was the recipient of a generous gift from Bill and Beverly Zarnstorff to establish a fund dedicated to providing financial support of incoming medical physics graduate program students with financial need. Department and the UW Foundation leaders would, of course, be willing to discuss any such opportunity.

Thank you for your support thus far, and for your consideration of future contributions! Any level of support will be greatly appreciated by the department's faculty, staff, students, and residents.

## Upcoming Events



### 2018 Annual Alumni Reception

**Where:** BB King's Blues Club, 152 2nd Avenue North, Nashville, TN, 38201

**When:** Monday, July 30, 2018, 8:00-10:00pm

**Register:** <https://www.medphysics.wisc.edu/events/2018/aapmreception.php>

### 24th Annual UW Medical Physics Golf Scramble

**Where:** [University Ridge Golf Course](#), Madison, WI

**When:** Thursday, Aug. 16, 2018

**Contact:** Ian Marsh ([imarsh@wisc.edu](mailto:imarsh@wisc.edu))



### Annual Department Picnic

**Where:** [Oscar Rennebohm Park](#), Madison, WI

**When:** Thursday, Sept. 6, 2018, 4:00-9:00pm

**Contact:** Lyddia Ruch-Doll (608 265-6116; [ruchdoll@wisc.edu](mailto:ruchdoll@wisc.edu)) or Mary Paskey (608 262-8795; [mpaskey@wisc.edu](mailto:mpaskey@wisc.edu))



### The Ride 2018: A Bicycle Benefit for Cancer Research

**Where:** Sun Prairie, WI (east of Madison)

**When:** Sunday, Sept. 23, 2018

For additional information, please visit: <https://theridewi.org>

