

MEDICAL PHYSICS, PH.D.

One of the basic science departments of the UW–Madison School of Medicine and Public Health, the Department of Medical Physics offers comprehensive training in diagnostic and therapeutic medical physics and in health physics. Achievement of the Ph.D. degree in this department reflects strong scholarship and research skills in one of the top medical physics programs in North America. Graduates are prepared for teaching and/or research positions in universities, national laboratories, or in the medical and nuclear technology industries. Graduates are also prepared for admission into medical physics residency programs to become board eligible for clinical medical physics positions.

Medical physicists may participate professionally in the treatment of patients, in advanced medical imaging and diagnostic procedures, or in related areas of research and teaching. Health physicists may operate radiation protection programs at nuclear industrial facilities, hospitals, or laboratories, or may perform research on methods of measuring ionizing radiations (i.e., dosimetry).

A unique quality of the medical physics program is the broad range of expertise and research interests of the faculty. Students receive training in diagnostic x-ray physics, x-ray computerized tomography (CT), magnetic resonance imaging (MRI) and spectroscopy, nuclear medicine and positron emission tomography (PET) imaging, biomagnetism, medical ultrasound, elastography, radiation dosimetry, radiation treatment planning, and radiobiology.

The department also houses the Medical Radiation Research Center and the Accredited Dosimetry Calibration Laboratory, one of four in the US accredited by the American Association of Physicists in Medicine. In addition, the department provides clinical support services to the radiology and human oncology departments. It also operates a PET radiotracer production facility (with two cyclotrons available), a medical image analysis laboratory, and a small bore MRI scanner and photoacoustic ultrasound system in the Small Animal Imaging Facility. Each of these facilities provides unique training and support opportunities for graduate students. Access to state-of-the-art x-ray angiography, CT, MRI, and PET/CT and PET/MR systems is readily available.

The Ph.D. degree is primarily a research degree that extends the student's depth of knowledge in one of the specialty areas. Faculty positions at universities, research positions, and an increasing number of clinical physics positions require the Ph.D. degree. Medical physics faculty maintain close collaborative ties with faculty in other departments, including human oncology, radiology, cardiology, medicine, psychiatry, pharmacology, and biomedical engineering, broadening the scope of research opportunities open to medical physics students and providing access to sophisticated clinical facilities.