PHYSICS: QUANTUM COMPUTING, M.S.

DEPARTMENT OVERVIEW

The Department of Physics has a strong tradition of graduate study and research in astrophysics; atomic, molecular, and optical physics; condensed matter physics; high energy and particle physics; plasma physics; quantum computing; and string theory. There are many facilities for carrying out world-class research. We have a large professional staff: 45 full-time faculty members; 11 faculty members holding joint appointments with other departments; 34 assistant, associate, and senior scientists; and 46 postdocs. The Department of Physics has a diverse group of graduate students who come from many countries around the world. There are typically 150–200 graduate students in the department. More information is available on the department website.

The department occupies all of Chamberlin Hall and a portion of Sterling Hall, located in the central campus area. The Physics Library, in Chamberlin Hall, is large and convenient to use. It has complete electronic access to databases and, of course, copy machines and comfortable chairs. The department maintains a fine instrument and machine shop and an electronics shop staffed by skilled electronics technicians. There is, in addition, a student-staff machine shop open to graduate students and supervised by an experienced machinist who assists and instructs shop users. Several computers are available for general computing, and a number of smaller machines are used for on-line control of experiments and for data collection. The Division of Information Technology (DoIT) has a large professional staff which assists users, provides contract programming services and offers a wide variety of computing courses. Researchers have free access to large scientific computing resources. Many research programs in physics use the Physical Sciences Laboratory (PSL).

M.S. IN PHYSICS – QUANTUM COMPUTING

In addition to the M.S. degree in Physics, there is also a M.S. named option in Quantum Computing. The M.S. in Physics-Quantum Computing is an intensive professional master's degree and is designed to be completed in one calendar year. The program provides students with a thorough grounding in the new discipline of quantum information and quantum computing. This begins with a study of the relevant parts of quantum theory, and proceeds to quantum gates, measurements, algorithms, quantum error correction and decoherence. Quantum communication theory and the secure transmission of information are also covered. The supporting areas of statistical mechanics, solid-state physics and atomic physics form part of the classroom training. Just as important, the program gives students a mastery of the advanced lab skills involved in quantum computation. Students who graduate from this program will have the tools to succeed as researchers or program managers in a quantum computing or quantum technologies enterprise. They may also use the program as a springboard to Ph.D. programs in physics or related areas.

The tuition for this program is $1,600/credit hour. Students in this program cannot accept research assistantships, teaching assistantships, project assistantships or other university appointments that grant waivers of tuition and/or academic fees.

PEOPLE

M.S. in Physics - Quantum Computing

Faculty:

Professors Coopersmith, Eriksson, Loffe, Joynt, Kolkowitz, Levchenko, McDermott, Saffman, Vavilov, Walker, and Yavuz are core faculty in the area of quantum computing.

Administration:

The MSPQC Program Director is Professor Robert Joynt. The MSPQC Committee Members are Robert Joynt (Chair), Mark Saffman, Mark Eriksson, Robert McDermott, Deniz Yavuz (Chair of the Graduate Program Committee), Stas Boldyrev (Chair of the Admissions Committee), Michelle Holland (Graduate Program Coordinator).

Contacts:

Please contact the Physics Graduate Program Coordinator Michelle Holland (michelle.holland@wisc.edu) for general inquiries about the department’s graduate programs, and Prof. Robert Joynt (rjjoynt@wisc.edu) with inquiries specific to the M.S.-Quantum Computing.