

Directed Energy Microwaves**PROGRAM COURSES****Math 466** Mathematical Methods in Science and Engineering**EECE 460/560** Microwave Engineering (with lab)**EECE 469/569** Antennas and Propagation**EECE 534** Plasma Physics I**EECE 535** Plasma Physics II**EECE 553L** Experimental Techniques in Plasma Science**EECE 555** Gaseous Electronics**EECE 557** Pulsed Power and Charged Particle
Acceleration**EECE 558** Charged Particle Beams and High Power
Microwaves**EECE 561** Electrodynamics**EECE 563** Computational Electromagnetics**EECE 580** Advanced Plasma Physics**EECE 661** Advanced Topics in Applied
Electromagnetics**RECENT PUBLICATION***Advances in High Power Microwave
Sources and Technologies*, Edited by
R.J. Barker and E. Schamiloglu, IEEE
Press, 2001.**CONTACT INFO****Edl Schamiloglu**

Program Director

University of New Mexico

Electrical & Computer Engineering Department

EECE Bldg. Rm. 125

Albuquerque, NM 87131

(505) 277-4423



research & education
in
Directed Energy Microwaves

Program Director: Edl Schamiloglu
<http://www.eece.unm.edu>



The University of New Mexico

Directed Energy Microwaves

Directed Energy Microwaves, also known as High Power Microwaves (HPM), comprises two technologies. One is narrowband HPM, and the other is ultra-wideband HPM. Narrowband HPM, which we simply refer to as “HPM,” utilizes pulsed power to drive an electron beam diode or similar load, that ultimately converts electron kinetic energy into coherent electromagnetic radiation. Narrowband HPM sources deliver over 1 GW of power in short bursts. Ultra-wideband (UWB) HPM utilizes fast switching techniques to drive an impulse generator. The frequency content of the output pulse can be spread over several decades in frequency.

The Directed Energy Microwaves Research and Education Program at the University of New Mexico prepares graduate students to contribute to both of these critical areas. The curriculum, leading to M.S. and Ph.D. degrees, prepares students in pulsed power, charged particle beam acceleration, plasma physics, advanced electromagnetics, microwave engineering, and several other areas important to Directed Energy Microwaves. The curriculum is strengthened by hands-on laboratory courses that complement the theoretical and engineering fundamentals. The University of New Mexico was instrumental in developing the world's first High Power Microwave source designed for graduate student education: the Educational Reltron, which was built by Titan/PSI. With three HPM sources located in the Pulsed Power, Beams, and Microwaves Laboratory, one of the country's best-equipped university research laboratory facilities in this field, and computer modeling capabilities to support both HPM and UWB HPM research, the University of New Mexico is a leader in Directed Energy Microwaves.

If your interests include Directed Energy Lasers, consider an M.S. degree through the Department of Electrical and Computer Engineering in Optical Science and Engineering: www.optics.unm.edu

Visit the EECE website at www.eece.unm.edu



Program Faculty

Jerald Buchenauer - Research Professor, Ph.D. Cornell University: High power ultra-wideband sources and antennas, pulsed power, and plasma physics.

Christos G. Christodoulou - Professor and Chair, Ph.D. North Carolina State University: modeling of electromagnetic systems, antennas, applications of neural networks in electromagnetics.

Mikhail I. Fuks - Research Professor, Ph.D. State University, Gorky, Russia: High power microwave sources and radars, high power microwave components.

John Gaudet - Research Professor, Ph.D. Air Force Institute of Technology: High power microwave sources and effects, compact pulsed power.

Mark Gilmore - Assistant Professor, Ph.D. UCLA: plasma physics, plasma diagnostics, microwave engineering.

Art H. Guenther - Research Professor, Ph.D. Pennsylvania State University: lasers, high voltage, pulsed power technology and dielectrics, technical education, defense, R&D policy and economic development.

Stanley Humphries, Jr. - Professor Emeritus, Ph.D. University of California at Berkeley: numerical electromagnetism, accelerator technology, plasma physics.

Edl Schamiloglu - Gardner-Zemke Professor and Director, Pulsed Power, Beams, and Microwaves Laboratory, Ph.D. Cornell University: physics and technology of charged particle beam generation and propagation, high power microwaves, plasma physics and diagnostics, electromagnetic wave propagation.

J. Scott Tyo - Assistant Professor, Ph.D. University of Pennsylvania: High power ultra-wideband sources and antennas, polarimetric imaging.

In addition, UNM has close interactions with scientists at the AFRL/Phillips Research Site Directed Energy Directorate.

