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University of Miami, Physics Department Colloquium

Date: Wednesday, Apr 09, 2025
Time: 4:00 pm – 5:00 pm
Location: Wilder Auditorium – Rm 112, Knight Physics Building

Metamaterials for Extreme Optics

Dr. Eric Mazur

Harvard University

Abstract

Nanotechnology has enabled the development of nanostructured composite materials (metamaterials) with exotic optical properties not found in nature. In the most extreme case, we can create materials which support light waves that propagate with infinite phase velocity, corresponding to a refractive index of zero, and materials where waves stop propagating, yielding extreme localization of light. In this lecture we will (interactively!) explore some of these unusual phenomena.

Biography

Eric Mazur is the Balkanski Professor of Physics and Applied Physics at Harvard University and Member of the Faculty of Education at the Harvard Graduate School of Education. He served as Area Chair and Area Dean of Applied Physics at the Harvard John A. Paulson School of Engineering and Applied Sciences from 2010 until 2021 and Academic Dean from 2021 until 2024. Mazur is Chair of the Optica Foundation, a philanthropic organization supporting students and early-career professionals in the field of optics and photonics, and Past President of Optica (formerly the Optical Society).

Mazur is a prominent physicist known for his contributions in nanophotonics, an internationally recognized educational innovator, and a sought-after speaker. In education he is widely known for his work on Peer Instruction, an interactive teaching method aimed at engaging students in the classroom and beyond. In 2014 Mazur became the inaugural recipient of the Minerva Prize for Advancements in Higher Education. He has received many awards for his work in physics and in education, and has founded several successful companies. Mazur has widely published in peer-reviewed journals and holds numerous patents. He has also written extensively on education and is the author of Peer Instruction: A User's Manual (Prentice Hall, 1997), a book that explains how to teach large lecture classes interactively, and of the Principles and Practice of Physics (Pearson, 2015), a book that presents a groundbreaking new approach to teaching introductory calculus-based physics.