Physics Colloquium

Professor Bonggu Shim

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"How can we visualize nonlinear interactions of ultrashort high-intensity laser pulses with matter?"

Since the invention of the laser 60 years ago, laser technology has progressed tremendously such that relatively inexpensive commercial lasers can easily generate various nonlinear interactions with matter and the resulting phenomena demonstrate a lot of exciting new physics.

In this presentation, I will talk about the experimental study of high-intensity laser matter interactions such as laser filamentation (self-guidance of a high intensity laser pulse), high-order harmonic generation (table-top UV and soft x-ray generation), and laser micromachining performed in my laboratory. In our experiments, we use state-of-the-art time-resolved diagnostic techniques such as single-shot frequency domain holography and time-resolved interferometry to spatio-temporally visualize optical nonlinearities and thus to understand the underlying dynamics of laser matter interactions. Furthermore, we perform our own numerical simulations by solving the nonlinear Schrödinger-type equation to be benchmarked against experiments.

Bonggu Shim, an associate professor of Physics, Applied Physics and Astronomy of Binghamton University, State University of New York, specializes in laser nonlinear optics and plasma physics. He received his B.S. in physics from Seoul National University, South Korea in 1997 and received his Ph.D. in Physics from the University of Texas at Austin in 2006 after working on terawatt, femtosecond Ti:Sapphire laser construction and high-order harmonic generation which can produce tabletop ultraviolet and soft x-ray light using high-power ultrashort lasers. Before he joined Binghamton University in August 2012, he was a postdoctoral researcher and research associate at Cornell University where he worked on experimental and theoretical studies of nonlinear optics.

Thursday, October 14, in LL 316 at 4:25 PM

For Zoom participation, please see information below:
Meeting ID: 972 1274 7894
Passcode: 631869