Beams and Applications Seminar Series

This ANL seminar series is a CARA activity and focuses on the physics, technology and applications of particle and photon beams. It is sponsored jointly by the ASD Division, the AWA group of the HEP Division, and the ATLAS group of the PHY Division.

Bldg. 401, Room B2100
Friday, March 7
1:30 PM

Gennady Shvets (IIT/FNAL)

Novel Accelerating Structures -- Photonic Approach to Near-Field Acceleration

Host: Wei Gai

The quest for higher accelerating gradients produced a new sub-field of accelerator physics -- advanced accelerating concepts. Novel structures and drivers have been developed to address the challenging needs of the field: breakdown, slippage, radiation coupling into the structures, and wakefield suppression. Plasma-based schemes (some of which will be reviewed in this talk) not only have established themselves as viable contenders for the role of future accelerators, but have also taught us new physics which goes beyond plasmas. I will describe some recent ideas for developing photonic surface waves accelerators which borrow heavily from our experience with plasma accelerators. Two frequency regimes will be reviewed: microwaves and the infrared. Lower-frequency surface wave accelerators rely on three-dimensional wire-mesh structures. I will present 3-D simulations demonstrating that such structures emulate electromagnetic properties of the plasma. The high-frequency surface wave accelerator utilizes polar dielectric materials (such as SiC or ZnSe) exhibiting "reststrahlen" -- frequency band with negative dielectric permittivity. Estimates of the wakefield properties and achievable peak gradients will be given.

For more information visit

http://www.aps.anl.gov/asd/physics/seminar.html

Visitors from off-site please contact John Power
(jp@anl.gov, 630-252-3191) to arrange for a gate pass.