PURDUE QUANTUM CENTER

Looking through a sphere: walks with Mie theory along classical optics, plasmonics and nanooptics

Boris Luk'yanchuk (Data Storage Institute, Agency for Science, Technology and Research, Singapore)

About the lecture:

The vast majority of the physics involved can be described with the help of the exact, analytical solution of Maxwell's equations for spherical particles (the so called Mie theory). This theory yields basic understanding of a number of physical effects in classical optics, plasmonics and nanooptics. Here we discuss some effects in plasmonics: inverse hierarchy of optical resonances, Fano resonances and optical vortices. Other effects are related to transparent materials with relatively small refractive indices (n < 2): photonic nanojets, magnetic nanojets and super resolution nanoscopy. Finally we discuss effects in high refractive index materials: magnetic light, directional scattering and nonradiating anapole modes.

About the speaker:

Boris Luk'yanchuk is vastly regarded as one of the leading experts in the area of plasmonics and nanooptics. His broad scientific interests cover interaction of laser radiation with matter including ablation, nonlinear phenomena, chemical processing, cleaning and polymer photomodification with lasers, but also self-organization, theory of nanocluster formation and plasmonics. He authored 6 monographs and over 280 scientific papers. Boris Luk'yanchuk is Professor and Principal Scientist at the Data Storage Institute, which is part of Singapore's Agency for Science, Technology and Research. He is also Adjunct Professor at the School of Physical & Mathematical Sciences, Nanyang Technological University in Singapore. He holds the title of Honorary Professor at Johannes Kepler University, Linz, Austria. Boris Luk'yanchuk is Fellow of the Optical Society of America

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PURDUE UNIVERSITY Discovery Park

for questions email Simeon Bogdanov: sbogdan@purdue.edu