## SPIE/OSA Student Chapter Seminar Series

# Igor Meglinski

## (Aston University)

# Potential of Structured Vortex Laser Beams in Tissue Diagnosis

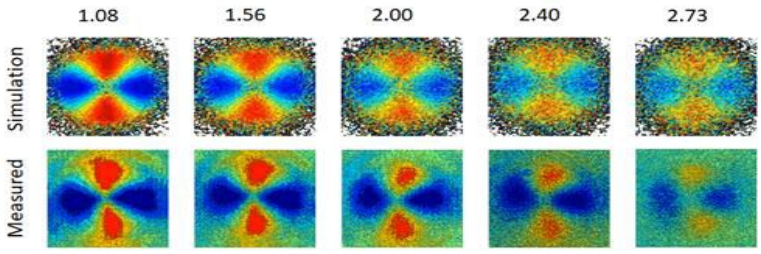
**Tuesday, August 18th, 2020**

**11:00 am ~ 12:00 pm (CDT)**

**17:00 ~ 18:00 (UK TIME)**

**ZOOM ID: 985 5335 8756**

**Abstract**: In turbid tissue-like scattering medium the conventional polarized light, scattered multiple number of times, is depolarized, and the depolarization rate depends strongly on the size and shape of scattering particles, as well as on the number of scattering events. When the structured vortex laser beams, such as cylindrical vector beam (CVB) and/or Laguerre-Gaussian (LG) beams, propagates through a turbid tissue-like scattering medium, either anisotropic or inhomogeneous, the spin or angular momentum are changed that leads to spin-orbit interaction. The spin-orbit interaction leads to the mutual influence of the polarization and the trajectory of light propagation. We investigate the applicability of using CVB and LG beams for characterization of biological tissues and their structural malformations associated with various dangerous diseases, including cancer. We demonstrate that visibility contrast becomes at least twice higher by applying CVB and/or LG beams in comparison to the conventional tissue polarimetry approach utilizing Gaussian beams. Both experimental and theoretical results suggest that there is a high potential in application of structured light beams in tissue diagnosis. In fact, the potential of structured vortex laser beams for medical applications is far from being fully explored.




**Bio**: Igor Meglinski is Professor in Biophotonics and Biomedical Engineering at Aston University. His research interests lie at the interface between physics, biomedical engineering, medicine and life sciences, focusing on the development of new non-invasive imaging/diagnostic techniques. He is author and co-author over 350 research papers in peer-reviewed scientific journals, proceedings of international conferences and book chapters, one book and over 720 presentations at the major international conferences and symposia, including over 300 invited lectures, keynote and plenary talks. He is the Node Leader in Biophotonics4Life Worldwide Consortium (BP4L), Senior Member of IEEE, Chartered Physicist (CPhys), Chartered Engineer (CEng), Fellow of Institute of Physics and Fellow of SPIE.

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