



CEITEC
BRNO UNIVERSITY
OF TECHNOLOGY

UPCOMING

ADVANCED MATERIALS AND NANOTECHNOLOGY

SEMINAR SERIES

Dr. PIERRE MARQUET

CERVO, Brain Research Center in Mental Health, Québec, Québec, Canada;

Exploring cell structure, dynamics and homeostasis with quantitative phase digital holographic microscopy: towards identifying specific cell phenotypes

OCTOBER, 23

Tuesday, 13:00

Seminar room S2.02 CEITEC BUT,
Purkynova 123

Invited by:

Radim Chmelík

Among the different techniques in the growing field of quantitative phase imaging (QPI), Quantitative Phase Digital Holographic Microscopy (QP-DHM) is particularly well suited to explore, with a nanometric axial sensitivity, cell structure and dynamics, by providing quantitative phase signal (QPS). QPS depends on both the thickness and the intracellular refractive index of the observed cells and brings thus information about both cell morphology and cell contents. Thanks to the development of different experimental procedures, relevant biophysical cell parameters can be successfully calculated from QPS, including cell shape, absolute volume, intracellular protein concentration, organelle distribution, nanoscale membrane fluctuations, membrane mechanical properties and water permeability, as well as transmembrane water movements. Simultaneous dynamic imaging of transmembrane water movements and cell volume is likely to assess the cell capacity to maintain or not homeostasis and consequently to identify early biomarkers of cell viability and cytotoxicity.