

Institute Lecture



Prof. Olivier J F Martin

Swiss Federal Institute of Technology Lausanne (EPFL)

Plasmonics: From materials to metasurfaces and pure magnetic light

@ 6:15 pm | March 18, 2019

Venue: L16, LHC



About the talk:

I will present our recent, on-going research in plasmonics: the optics of metallic nanostructures. Plasmonic effects can be realized in appropriate coinage metals over the entire visible spectrum and arise from the extremely high electron density. Progress in nanotechnology has enabled the controlled fabrication of plasmonic nanostructures down to a few nanometres, thus making possible the a-priori design of nanostructures with well-controlled optical responses. Due to the strong optical resonances, silver and aluminium have advantages for use in plasmonics, although they are difficult to work with. Cleanroom recipes developed for structuring and stabilization of nanostructures of these metals will be explained. Plasmon resonances have been utilized by us for surface-enhanced Raman spectroscopy and fluorescence, to build metasurfaces

to produce novel optical functions that are not possible with gratings or conventional optical elements and Fano resonant structures for colour routing to send selected optical wavelengths into specific directions. Finally, I will present recent counterintuitive optical experiments in plasmonic nanostructures where the electric response is totally suppressed such that only magnetic effects remain.

About the Speaker:

Prof. Olivier J.F. Martin, currently the Director of the Nanophotonics and Metrology Laboratory and Director of the Microengineering Section (approx. 1'000 students) at EPFL, conducts a comprehensive research that combines the development of numerical techniques for the solution of Maxwell's equations with advanced nanofabrication and experiments on plasmonic systems. Applications of his research include optical antennas, metasurfaces, nonlinear optics, biosensing, heterogeneous catalysis, security features and optical forces at the nanoscale. Prof.. Martin has authored over 250 journal articles and holds a handful of patents and invention disclosures. He received in 2016 an Advanced Grant from the European Research Council on the utilization of plasmonic forces to fabricate nanostructures; he is a Fellow of the Optical Society of America.

All are invited to attend
Dean of Research and Development