Autumn 2023

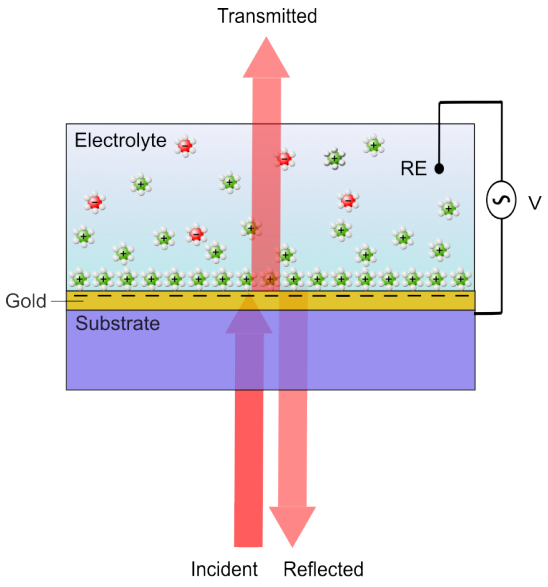
Optics & Photonics Group Lunchtime Seminar Series

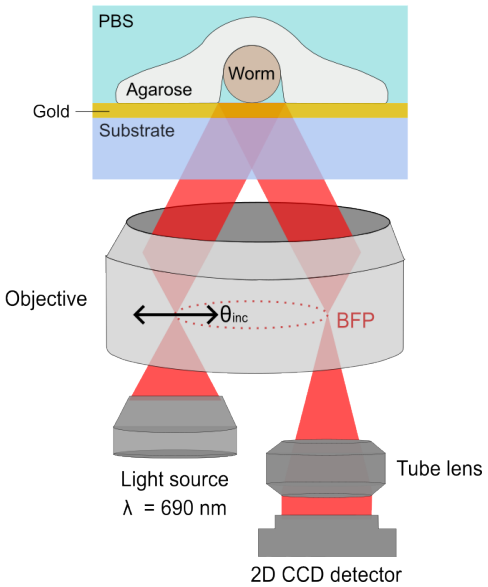
University of Nottingham

Voltage-Dependent Optical Properties: Implications for Impedance Microscopy and SPR Imaging

Karen Regules Medel

University of Nottingham





13:30 Wednesday 8 November 2023

Life Sciences Building - B3

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Karen
Regules
Medel

Voltage-Dependent Optical Properties: Implications for Impedance Microscopy and SPR Imaging

I will present recent progress on two research projects that I worked on during the first year of my PhD. The first is concerned with the development of a novel voltage sensing method based on metal-thin film for use in optical impedance microscopy. Focused on the interaction of light with metal-electrolyte interfaces under variable voltage conditions, this research closely examines the voltage-induced variations in refractive index within a thin film of gold and its implications on light behaviour in reflection and transmission modes. Using Fresnel equations combined with physical chemistry models of metal electrolyte interfaces, I have provided a deeper understanding of the voltage-dependent light transmission through gold thin films. The second project applies Surface Plasmon Resonance (SPR) techniques to study living C. elegans specimens and see how this method can help in future for non-harmful ways to study a whole living organism. A model has been developed to simulate the effect of the geometric and refractive index factors on the spatial distribution of SPR angle of the nematode sensor interface. The results of the model show a good agreement with the experimentally obtained results.

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All are welcome

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