

Wednesday, 30<sup>th</sup> June, 9.30am, Online

*Host: Prof. Luis M. Liz-Marzán*

## Cross-grating phase microscopy for nanophotonics and biology

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Quantitative phase imaging (QPI) has been a burgeoning field of research this last decade, with the developments of many different approaches, most of them applied in biology for cell imaging. QPI techniques enable the label-free investigation of live cells, and represent an effective route to replace the more invasive approach of fluorescence microscopy for some applications.

This presentation focuses on one QPI technique called quadriwave lateral shearing interferometry, more simply renamed cross-grating (CG) phase microscopy. After explaining how CG microscopy can image the phase light in a very simpler manner, we will review what has been done in bioimaging using this technique, namely for the quantitative characterization of mammalian cells, mitochondria, microtubules, neurites or bacteria, with a particular focus on its benefits in terms of high spatial resolution (down to the diffraction limit) and high sensitivity (0.3 nm/VHz in optical path difference) compared with the other QPI techniques. The last part will also explain how these benefits enabled CG microscopy to demonstrate how QPI can also strongly benefit the field of nanophotonics, by investigating systems such as nanoparticles, 2D materials, and metasurfaces.