



**UNIVERSITÉ
DE GENÈVE**

FACULTÉ DES SCIENCES

Genève, le 5 mai 2023

**LE DEPARTEMENT DE PHYSIQUE APPLIQUEE
ET
LE DEPARTEMENT DE CHIMIE PHYSIQUE**

ont le plaisir de vous inviter à la

CONFERENCE

intitulée

**SHEDDING NEW LIGHT ON CELLS WITH
COHERENT OPTICAL NANOSCOPY**

donnée par

Prof. Paola BORRI
SCHOOL OF BIOSCIENCES
CARDIFF UNIVERSITY (UK)

1e VENDREDI 12 MAI 2023 à 10h05

**SALLE 1S081
Sciences III**

30 quai Ernest-Ansermet ou 4 bld d'Yvoy

Responsable : Prof. Takuji ADACHI

Shedding new light on cells with coherent optical nanoscopy

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Optical microscopy is an indispensable tool that is driving progress in biology and is still the only practical means of obtaining spatial and temporal resolution within living cells and tissues. Staining samples with fluorescent labels provides a highly specific method of visualizing biomolecules. However, this has various limitations including sample manipulation and staining artifacts, fluorophore photobleaching and associated phototoxicity. Therefore, much effort has been devoted to developing non-fluorescent optical microscopy techniques which are non-perturbing, photostable, and in turn offer quantitative capabilities unavailable with fluorescent methods.

Our laboratory has been developing optical microscopy set-ups featuring innovative excitation/detection schemes which exploit coherent light-matter interaction effects, with application ranging from synthetic lipid membranes [1] and nanoparticle materials [2-4] to living cells [5]. Specifically, we have demonstrated four-wave mixing (FWM) imaging featuring localisation precision of gold nanoparticles at the nanoscale inside cells [2-4], and label-free chemically-specific coherent Raman scattering (CRS) microscopy [5-8]. I will present our latest progress with these techniques and their applications to bioimaging.

[1] Anal. Chem. 92, 14657 (2020).

[2] Phys. Rev. X 7, 41022 (2017).

[3] Nanoscale 12, 4622 (2020).

[4] Light: Science and Applications 12, 80 (2023).

[5] Analyst 146, 2277 (2021).

[6] Nat. Nanotechnol. 9, 940 (2014).

[7] Anal. Chem. 91, 2813 (2019).

[8] APL Photonics 3, 092402 (2018).