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seminar

Thursday, 14th July, 12.00pm

Seminar Room

Host: Prof. Luis M. Liz-Marzán

Harnessing Machine Learning for Nanomaterial-based Surface-Enhanced Raman Scattering (SERS) Sensing and Diagnostics

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Surface-enhanced Raman scattering (SERS) is a molecule-specific spectroscopic technique with diverse applications in (bio)chemistry, clinical diagnosis and toxin sensing. It leverages on intense electromagnetic (EM) fields from localized surface plasmon resonance (LSPR) in plasmonic nanoparticles to enhance molecular detection. In this talk, I will discuss my group's effort in using molecular enhancement strategies and machine learning algorithms to bolster SERS performance for various sensing applications. First, I will discuss various SERS sensor modification strategies to bestow desirable chemoselectivity and increase target analyte/biomarker affinity to achieve higher detection sensitivity and selectivity. I will also evaluate how chemometrics and machine learning algorithms can transform the assimilation and interpretation of complex spectral data in biological samples by discerning more patterns hidden within the data, to achieve high throughput data analysis, sensitivity, and disease prediction. I hope these insights can stimulate the development of innovative and hybrid detection methods across the entire analytical discipline to resolve longstanding challenges in biomarker and analyte sensing and detection.
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