

Light Scattering Methods for Polymers

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Light scattering techniques are widely used for the characterisation of polymers and colloids in solution. In this short course, we will introduce fundamentals of light scattering technology and their broad applications for polymeric and biomacromolecular characterisation. Static light scattering (Rayleigh-Gans-Debye scattering) can be used to quantify polymer molecular weight, radius of gyration and second virial coefficient in solution. Dynamic light scattering (Quasi-elastic light scattering) could provide information on hydrodynamic diameters, and zeta-potentials of polymers and colloids can be characterised using electrophoretic light scattering techniques. On the other hand, inelastic scattering (Raman scattering) and its applications in polymers will be introduced, and applications of surface enhanced Raman scattering (SERS) of polymers/macromolecules in modern biological sensing/imaging will be discussed in detail.

Speaker Bio

Sheng Dai is currently a chair professor in chemical engineering and the head of school of chemical and process engineering at University of Leeds. He received his bachelor degree from Zhejiang University, masters and PhD degrees from Nanyang Technological University. He then worked as a postdoc fellow at McMaster University, University of Alberta and University of Toronto. After eight years' working at the University of Adelaide as a senior lecturer and associate professor in the school of chemical engineering, he took the post of professor in chemical engineering, deputy head of school of engineering and head of biosystems group at Newcastle University. Later, he joined Brunel University London as the founding head of department of chemical engineering in 2018, and relocated to the University of Leeds from 2022. His research interest is to develop diverse applications of polymers, nanomaterials and interfaces in healthcare, water and clean energy. He has secured various research grants from Canada, Australia, UK, and published 160 papers.