SPEAKER

NAME
Prof. William W. Sampson, Professor of Materials Modelling

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BIOGRAPHY
Bill Sampson is Professor of Materials Modelling in the Department of Materials at the University of Manchester. Bill graduated from UMIST with a BSc (1989) and a PhD (1992) in Paper Science, after which he joined the Faculty as a Lecturer, becoming Senior Lecturer in 2004 and Professor in 2013. From 2015 to 2019, Bill was Head of the School of Materials at Manchester; since 2020, he has worked as Chief Scientific Officer for the Graphene Engineering Innovation Centre at the University of Manchester.

Bill's research involves the application of scientific methods to the modelling and characterization of heterogeneous materials, with emphasis on their structure and its influence on properties. Bill has worked extensively on the properties of paper, nonwoven textiles and composites and the structure of electrospun polymer fibre networks. Current work considers the structure and damage tolerance of silver nanowire networks for transparent displays, and the influence of nanoparticle morphology and clustering on percolation and transport properties of nanoparticulate polymer composites.

Bill is a Trustee and Director of the Pulp and Paper Fundamental Research Society and was Programme Chair for the four-yearly Pulp and Paper Fundamental Research Symposia in 2005, 2009 and 2013. He is a member of PAPTAC and TAPPI and a Fellow of the Institute of Materials, Minerals and Mining.

KEYNOTE

Theoretical insights into paper roughness: Dependence on sheet properties and fibre morphology

The structure of paper has been the focus of considerable experimental and theoretical research for over 60 years, providing a rich literature. Models for formation, pore size distribution and the extent of inter-fibre contact are well established and have yielded considerable insights into the dependence of physical properties on fibre dimensions and sheet grammage and density. Until recently, a comparable model for roughness has been intractable. Here, we will briefly review models for paper structure in their simplest forms and progress to establish a simple theoretical framework to give standard roughness parameters in terms of fibre dimensions and density. We will conclude with a comparison to experimental data and discussion of the insights provided by theory into the well-established interdependence of structural properties of paper.