James S Wilkinson

Professor of Optoelectronics
Optoelectronics Research Centre
University of Southampton
Highfield, Southampton, SO17 1BJ, UK

Biography

James Wilkinson received the BSc (Eng.) degree in Electronics in 1977 and the Ph.D. degree in Optoelectronics in 1985, both from the Department of Electronic and Electrical Engineering, University College London. He is currently a professor in the Optoelectronics Research Centre and the Department of Electronics and Computer Science at the University of Southampton, UK. He has published more than 150 journal papers. His research interests include integrated photonics, lasers, optofluidics and biosensors.

Integrated photonic sensors for water pollution monitoring

Photonic technologies are set to revolutionise acquisition of chemical and biochemical information, driven by the demand for fast, low-cost, automated chemical analysis in a multiplicity of applications from point-of-care diagnostics to water quality monitoring. The integration, low cost and robustness of the microfabrication approaches which have made consumer electronics possible are enabling mass-produced chemical and bioanalytical microsystems. Optical techniques play a major role in quantitative chemical analysis and remain the mainstay of detection in "lab-on-chip" systems, but the degree of optical functionality integrated within these systems remains limited, and they have yet to benefit fully from the massive growth in optical telecommunications technologies in recent decades. Biosensor and lab-on-chip research and commercialisation have also been hampered by the lack of integrated photonic platforms which can operate over the mid-infrared (MIR) region from 2μm to 15μm, which would enable new opportunities for sensitive, selective, label-free biochemical analysis. Progress on new materials and approaches for high-sensitivity integrated photonic sensors for application in water and other aqueous media will be described.