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Julian Jones
Brian Culshaw
Wolfgang Ecke
José Miguel López-Higuera
Reinhardt Willsch
Editors

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Editors' Note

All contributed papers in their entirety (i.e. not merely an abstract or extract) were peer reviewed for their significance, innovation, and quality by independent members of the Technical Program Committee, and then rated.

Introduction

The International Conference on Optical Fibre Sensors (OFS) was first held in London, in 1983. Since then it has become established as the leading forum for all research into optical fibre and guided wave optical systems for instrumentation, sensing and imaging, and their applications in physical, chemical and biological measurement. The conference is held approximately every eighteen months, rotating between the Americas, Europe, and Asia and the Pacific. OFS returned to the United Kingdom with OFS-20, last held in Glasgow in 1994, and returns again now in 2009 in Edinburgh. The conference will be held in association with the Optics and Photonics Division of the Institute of Physics and in cooperation with SPIE. For the first time, the Institute of Physics's conference on Sensors and their Applications is co-located with OFS.

The conference has now passed its first quarter-century and shows every sign of growing in popularity. Over 250 papers from nearly 40 countries will be presented at OFS-20.

It is interesting to reflect on the factors that give OFS its enduring appeal. There is no doubt that the continuing rapid and exciting evolution of the underlying technological base is one component in continuing to stimulate the research community. In 1983, the only well-developed fibres, optical sources, and detectors were those needed to satisfy the demands of the telecommunications industry of the day, with transmission bandwidths orders of magnitude less than those commonplace now. Today's OFS community has access to optical fibres covering a far greater range of wavelength and with precisely controlled dispersion characteristics; micro-structured components provide even greater versatility and control, for example, through the many forms of available gratings, or entirely different types of 'photonic crystal' fibres. In particular, the Bragg grating has proved to be a remarkably effective and versatile component, and it is now ubiquitous as an easily fabricated and discrete sensing element, ideally suited to wavelength division multiplexing. Sources at almost any wavelength and bandwidth are available, and optical signals are easily amplified within fibres. The potential advantages cited 25 years ago for fibre sensors have now become an engineering reality: most notably sensitivity and specificity, dense multiplexing, and safety and reliability—in fact, multiplexing and long-term reliability are emerging as probably the most important attributes of all. A special feature of optical fibre sensors is their ability to provide distributed sensing, which represents the most extreme case of multiplexing, with some projecting that distributed systems will represent the majority of the market.

Despite the stimulus of new technology, arguably the major reason for the continuing significance and popularity of our subject is its relevance to the important problems of the world today: energy; environment; sustainability; and

health. Even a cursory glance at the contents of the Proceedings of this and recent OFS conferences shows how the community is contributing to the solution of these critical issues: fibre sensors are actively deployed in the search for new energy supplies, in the generation and distribution of electricity, in energy storage, in efficient use of energy, in monitoring our environment whether natural or engineered, in maintaining the civil infrastructure, in transport systems, and in improving the efficiency of manufacturing. Perhaps some of the most exciting developments are at the interface with the life sciences, where optical fibre sensors are an essential component of the new subject of 'bio-photonics' as a vital tool in research in biochemistry and medicine.

The OFS community is exceptionally heterogeneous. It is not 'owned' by a particular scientific or engineering society, but is stewarded by its own International Steering Committee. Conference participants are highly diverse, and come from a wide range of disciplines in engineering and the physical sciences, and to an increasing extent from life sciences as well. Perhaps it is, above all, the intrinsic interdisciplinarity that keeps the conference relevant and active. After all, none of the really important problems in the world today have solutions lying within a single academic discipline, and thus the highly interdisciplinary community that is OFS is uniquely positioned to contribute.

OFS is only ever as good as the quality of the papers presented, and we are grateful to all of our authors for their excellent contributions. However, we would particularly like to thank our Technical Programme Committee, who over the years has undertaken the onerous task of carefully reading and assessing all the submissions, and has been consistently diligent and reliable in providing the advice on which the programme is built. In the preparation of these Proceedings, we have again benefitted from the capable support of the SPIE, their staff have played a major part in the quality of these volumes.

This is the first occasion on which OFS has been organised by the Institute of Physics. We are grateful to all of the conference office team for their hard work and enthusiasm, and in particular we would like to thank Jenny Bremner for her indefatigable dedication.

Whatever your reasons for joining OFS-20, we are delighted to welcome you to the conference, and to the city of Edinburgh.

Julian Jones
Brian Culshaw
Wolfgang Ecke
José Miguel López-Higuera
Reinhardt Willsch