1. Record Nr. UNINA9910826718203321

Titolo	Optofluidics, sensors and actuators in microstructured optical fibres / / edited by Stavros Pissadakis and Stefano Selleri
Pubbl/distr/stampa	Cambridge, England : , : Woodhead Publishing, , 2015 ©2015
Edizione	[1st edition]
Descrizione fisica	1 online resource (313 p.)
Collana	Woodhead Publishing Series in Electronic and Optical Materials ; ; Number 79
Disciplina	621.3692
Soggetti	Fiber optics Fiber optics - Reliability
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front Cover; Related titles; Optofluidics, Sensors and Actuators in Microstructured Optical FibersWoodhead Publishing Series in Electronic and Optical M ...; Copyright; Contents; List of contributors; Woodhead Publishing Series in Electronic and Optical Materials; Preface; Part 1 - Materials and fabrication of microstructured optical fibres; 1 - Microfluidics flow and heat transfer in microstructured fibers of circular and elliptical geometry; 1.1 Introduction; 1.2 Governing equations of flows along a microchannel; 1.3 Numerical results; 1.4 Conclusions; Acknowledgments; References 2 - Drawn metamaterials2.1 Introduction; 2.2 Fibre-based metamaterials; 2.3 Drawn wire array metamaterials; 2.4 Drawn magnetic metamaterials; 2.5 Applications; 2.6 Future directions-challenges and opportunities; 2.7 Conclusions; References; 3 - Liquid crystal-infiltrated photonic crystal fibres for switching applications; 3.1 Introduction; 3.2 LCs in cylindrical capillaries; 3.3 Light guidance in LC-infiltrated PCFs; 3.4 Switching components based on LC-infiltrated PCFs; 3.5 Concluding remarks; Acknowledgements; References; 4 - Microstructured optical fiber filled with carbon nanotubes 4.1 Introduction4.2 Carbon nanotubes as advanced materials for environmental monitoring; 4.3 Carbon nanotubes integration techniques with optical fibers; 4.4 Sensing probes fabrication; 4.5

Experimental results; 4.6 Conclusions; References; 5 - Molten glass-infiltrated photonic crystal fibers; 5.1 Glassy materials: and why glass-infiltrated photonic crystal fibers (PCFs)?; 5.2 Glass-infiltrated PCFs: state of the art and fabrication techniques; 5.3 PBG guidance characteristics of composite all-glass PCFs; 5.4 Prospects and future directions; 5.5 Conclusions and final remarks; Acknowledgments ReferencesPart 2 - Sensing and optofluidic applications; 6 - Microstructured optical fibre-based sensors for structural health monitoring applications; 6.1 Introduction to structural health monitoring applications and fibre Bragg grating sensors; 6.2 Microstructured optical fibres for temperature-insensitive pressure and transverse strain sensing; 6.3 Structural health monitoring-related applications of the butterfly microstructured optical fibres; 6.4 Conclusion and trends; Acknowledgements; References
7 - Liquid crystals infiltrated photonic crystal fibers (PCFs) for electromagnetic field sensing7.1 Introduction-state of the art: photonic liquid crystal fibers for electromagnetic field sensing; 7.2 LCs infiltrated microstructured optical fibers; 7.3 Electric field-induced effects; 7.4 Optical field-induced effects; 7.5 Conclusions and research directions; Acknowledgments; References; 8 - Polymer micro and microstructured fiber Bragg gratings: recent advancements and applications; 8.1 Introduction; 8.2 Polymer optical fibers; 8.3 Polymer fiber Bragg gratings
8.4 Applications of polymer fiber Bragg grating sensors

Sommario/riassunto

Combining the positive characteristics of microfluidics and optics, microstructured optical fibres (MOFs) have revolutionized the field of optoelectronics. Tailored guiding, diffractive structures and photonic band-gap effects are used to produce fibres with highly specialised, complex structures, facilitating the development of novel kinds of optical fibre sensors and actuators.   Part One outlines the key materials and fabrication techniques used for microstructured optical fibres. Microfluidics and heat flows, MOF-based metamaterials, novel and liquid crystal infiltrated photonic crystal f