

Fiber Optic Sensing Nano-Optoelectronics



Overview

In this book, more than ten research papers were collected and studied on the optical micro/nanofiber devices and related integrated systems, covering the high-performance optical micro/nanofiber sensors, fine characterization technologies for optical. In this book, more than ten research papers were collected and studied on the optical micro/nanofiber devices and related integrated systems, covering the high-performance optical micro/nanofiber sensors, fine characterization technologies for optical. Metallic nano-optoelectrode arrays can simultaneously serve as nanoelectrodes to increase the electrochemical surface-to-volume ratio for high-performance electrical recording and optical nanoantennas to achieve nanoscale light concentrations for ultrasensitive optical sensing. These sensors utilize the transmission of light through optical fibers to detect and measure various physical, chemical, or environmental changes such as temperature, pressure. Fiber-based neural probes are produced by thermal drawing process, which is the manufacturing approach used in optical fiber fabrication. This technology allows straightforward incorporation of multiple functional components into microstructured fibers at the level of their macroscale models.



Article Content

Mar 28, 2026

Fiber Optic Sensors Based on Nano-Films

The combination of fiber optics with sensitive nano-films offers great potential for the realization of novel sensing concepts. Miniatured optical fiber sensors with thin films as sensitive

Oct 25, 2025

Micro-/Nano-Fiber Sensors and Optical Integration Devices

Because of their strong surface evanescent field, micro-/nanofibers have been used to develop optical sensors and modulation devices with a high performance and integration [...]

Sep 30, 2025

Fiber Optic Sensors: Short Review and Applications

Developments fiber optic sensor technology has been a major user of technology associated with the optoelectronic and fiber optic communication industry. Since the past decades,

Nov 25, 2025

Nanophotonics and optical fibers: New avenues for sensing and active ...

In the field of optical fiber technology integrated with nanophotonics emerged new avenues for applications in remote sensing and optical detection, designing of integrated circuits and

Jan 26, 2026

Review of Optical Fiber Sensors: Principles,

Optical fiber sensors (OFSs) have emerged as essential tools in the monitoring of physical, chemical, and bio-medical parameters in harsh situations

Jul 27, 2025

Micro-/Nanofiber Optics: Merging Photonics and Material Science on ...

Micro-/nanofibers (MNFs) are optical fibers with diameters close to or below the wavelength of the guided light. These tiny fibers can offer engineerable waveguiding properties

Oct 27, 2025

Topic Editorial on Fiber-Optic Sensors

Over the past few years, Micromachines MDPI has published a wealth of innovative and groundbreaking research on fiber-optic sensors, highlighting their versatility and transformative

Oct 07, 2025

Micro-/Nano-Fiber Sensors and Optical Integration Devices

On the one hand, the sensing and optical properties of micro/-nanofiber devices can be optimized by introducing different micro/nanostructures through micro/nano-processing technology (femtosecond ...

Aug 01, 2025

Fibre optics and optical communications

This work introduces an in-situ nano-displacement measurement system via a multimode fiber probe with superoscillatory speckles and deep learning.

Aug 09, 2025

Nano-optomechanical fiber-tip sensing

In this work, we present a fiber-coupled nano-optomechanical sensor that requires no coupling optics. This is achieved by directly placing a nano-optomechanical structure, a double...

Jul 05, 2025

Hybrid electronic-photonic sensors on a fibre tip

In this Article, we present a hybrid nano-electronic-photonic sensor that can be interrogated in an entirely optical manner, by the intimate integration of the electrical and optical...

Feb 15, 2026

Fiber-Optic Pressure Sensors: Recent Advances in

Fiber-optic sensing (FOS) technology has emerged as a cutting-edge research focus in the sensor field due to its miniaturized structure, high sensitivity,

Jun 18, 2026

Laboratory for Nano-photonic Structures and Integrated Devices on Fiber ...

This chapter focuses on the technical and methodological approaches for fabricating metal, dielectric, and semiconductor micro- and nano-photonic structures on fiber tips, the physical properties of the

Feb 13, 2026

The rise of AI optoelectronic sensors: From nanomaterial synthesis ...

Functional optoelectronic devices play a key role in AI optoelectronic sensing technology and are constructed of a variety of materials, including semiconductors , organic optoelectronic

Mar 28, 2026

Deep learning and superoscillatory speckles empowered multimode fiber ...

This work introduces an in-situ nano-displacement measurement system via a multimode fiber probe with superoscillatory speckles and deep learning.

Feb 27, 2026

Micro-nano fiber-assisted active photoacoustic spectroscopy for gas sensing

The sensing dynamic range was determined to be more than five orders. This spectroscopic technique combines fiber laser, photoacoustic spectroscopy, and fiber evanescent

Oct 28, 2025

Nano-optoelectrodes integrated with flexible multifunctional fiber ...

Here, we report that flexible nano-optoelectrodes integrated multifunctional fiber probes can have hybrid optical-electrical sensing multimodalities, including optical refractive-index sensing, surface

Sep 07, 2025

Micro/Nanofibre Optical Sensors: Challenges and

Meanwhile, the mesoporous matrix and small diameter of a polymer MNF, make it an excellent host fibre for functional materials for fast-response

Apr 01, 2026

Micro/Nano-structured Optical Fiber Gas Sensor

Micro- and nano-structured optical fibers enable compact gas sensors with enhanced sensitivity. This paper overviews recent development in all-fiber gas sensors based on direct absorption,

Oct 25, 2025

Laboratory for Nano-photonic Structures and Integrated Devices on

One of the challenging technical problems in this research field is how to fabricate nano-photonic structures on the end surface of an optical fiber. This is a prerequisite and foundation for subsequent

Feb 28, 2026

Micro-/Nanofiber Optics: Merging Photonics and Material Science on ...

In this review, we first introduce the basics of MNF optics and MNF optical sensors from physical and chemical to biological applications and review the progress and current status of this field.

Jun 16, 2026

Nano-optoelectrodes integrated with flexible multifunctional fiber ...

In this work, we demonstrate the integration of dense nano-optoelectrode arrays onto the tips of multifunctional optoelectrical fibers by high-throughput scalable fabrication.

Apr 10, 2026

Flexible fiber-based optoelectronics for neural interfaces

Here we will introduce the multimaterial fiber technology, its applications in engineering fields, and its adoption for the design of multifunctional and flexible

Sep 14, 2025

Micro-/Nano-Fiber Sensors and Optical Integration Devices

4. High Integration Optical Fiber Assisted-Sensing System The optical fiber can be conveniently connected to the high-performance optical system to achieve the efficient transmission and collection

Feb 04, 2026

Micro-/Nano-Fiber Sensors and Optical Integration Devices

On the one hand, the sensing and optical properties of micro/-nanofiber devices can be optimized by introducing different micro/nanostr

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://www.elagage-lorrain.fr>

Email: sales@elagage-lorrain.fr

Phone: +33 6 47 82 19 35

Address: 15 Rue de la République, 69002 Lyon, France

This document is for informational purposes only. Specifications subject to change without notice.

