

Photonic Crystal Fiber Gas Sensing



Overview

Here, we focus on the review of HC-PCF gas sensing, including the light-guiding mechanisms of HC-PCFs, various sensing configurations, microfabrication approaches, and recent research advances including the mid-infrared gas sensors via hollow core anti-resonant fibers. In various specialty fibers, hollow-core photonic crystal fibers (HC-PCFs) can overcome the fundamental limits of solid fibers and have attracted intense interest recently. Many scientists have already reported the use of PCFs as a gas sensor. In this review article, the work done by other scientists using PCFs as a gas sensor is applied for a wide range of industrial applications. The capacity of the multichannel sensing network is expanded by time division multiplexing and wavelength division multiplexing technology.



Article Content

Hot

Design of single mode spiral photonic crystal fiber for gas sensing ...

In this paper, a spiral shape photonic crystal fiber (S-PCF) has been suggested as a gas sensor for detecting toxic or colorless gases as well as monitoring the air pollution by metering gas

Aug 31, 2025 Hot

Photonic crystal fiber sensor for the detection of hazardous gases

Three different Photonic Crystal Fiber (PCF) gas sensors are designed to detect five different gases for a wide range of wavelengths. The three unique configurations are designed based

Apr 27, 2026 Hot

Photonic crystal fibers and its applications in gas

One of the many applications of photonic crystal fibers is the sensing of gas and consequently it could be used as a gas sensor. Many scientists have

Nov 23, 2025 Hot

Full article: Dirac-vortex topological photonic crystal fiber

In recent years, this concept has been successfully introduced into fiber optics, giving rise to topological photonic crystal fibers (TPCFs). The Dirac-vortex TPCFs, based on the Jackiw-Rossi

Oct 06, 2025 Hot

Hollow-core Fibers – photonic bandgap fibers, air

Hollow-core fibers have a hole on the fiber axis, achieving optical guidance with photonic bandgap effects.

Oct 21, 2025 Hot

Photonic crystal fibers and its applications in gas sensing-a review ...

These types of fibers are fabricated and designed on the scale of optical wavelength, a fraction of a micrometer or less. One of the many applications of photonic crystal fibers is the sensing of gas and

Dec 29, 2025 Hot

Photonic crystal fibers and its applications in gas sensing-a review

Photonic crystal fibers and its applications in gas sensing-a review To cite this article:
Suman Mukherjee and P S Ashish Chouhan 2020 J. Phys.: Conf. Ser. 1531 012038
View the article online for updates

May 18, 2026 Hot

Development and Applications of Photonic Crystal Fibers

Through doping liquid crystals into the core region, we propose a kind of seven-core photonic crystal fiber (PCF) which can achieve mode shaping and temperature sensing

Jul 10, 2025 Hot

3D-Nanoprinted Antiresonant Hollow-Core Microgap ...

3D-Nanoprinted Antiresonant Hollow-Core Microgap Waveguide: An on-Chip Platform for Integrated Photonic Devices and Sensors Johannes Burger,* Vera Schalles, Jisoo Kim, Bumjoon Jang, Matthias ...

Mar 09, 2026 Hot

When Glass Is Not Enough: Sapphire Photonic Crystal Fibers for

The Wall at 1000°C This publication has spent considerable time on photonic crystal fibers — their hollow-core variants guiding light through air with near-zero loss, their anti-resonant designs

Aug 06, 2025 Hot

Characteristic Analysis and Structural Design of

Abstract and Figures A total internal reflection photonic crystal fiber (PCF) based on hexagonal core is proposed for gas sensing in a specific

Aug 19, 2025 Hot

Thorlabs, profile with contact details and 55 photonics

Information of Thorlabs Appears on the Following Pages Company profile (this page)
Pages with Suppliers of Products autocorrelators, chirped mirrors, chromatic

Nov 20, 2025 Hot

Photonics – optical and laser technology, harnessing

Photonics is the science and technology of light, with applications in IT, healthcare, metrology, sensing, manufacturing, lighting, environmental protection ...

Mar 23, 2026 Hot

Photonics21 – A Key Enabling Technology for Europe

The European Technology Platform Photonics²¹ represents the photonics community of industry and research organisations.

Apr 17, 2026 Hot

HC Photonics Corp.

The product portfolio includes bulk crystals, waveguides, and integrated fiber-coupled mixers, available as commercial off-the-shelf or custom solutions for

Feb 17, 2026 Hot

What is Photonics?

Optical fibre, glasses, crystals, lenses coatings, gratings, plasmonics, photonic crystals, metamaterials, waveplates, polarisers, interference, filters, linear & non

Oct 22, 2025 Hot

Vertical Cavity Surface-emitting Lasers

Vertical cavity surface-emitting lasers (VCSELs) are a monolithic kind of semiconductor lasers with beam emission perpendicular to the wafer surface.

Oct 19, 2025 Hot

Hollow-Core Photonic Crystal Fiber Gas Sensing

Fiber gas sensing techniques have been applied for a wide range of industrial applications. In this paper, the basic fiber gas sensing principles and the development of different

Jan 27, 2026 Hot

(PDF) Hollow-Core Photonic Crystal Fiber Gas Sensing

In various specialty fibers, hollow-core photonic crystal fibers (HC-PCFs) can overcome the fundamental limits of solid fibers and have attracted

Dec 11, 2025 Hot

Review Hollow-Core Photonic Crystal Fiber Gas Sensing

development of different fibers have been introduced. In various specialty fibers, hollow-core photonic crystal fibers (HC-PCFs) can overcome the fundamental limits of soli.

Jan 29, 2026 Hot

Hollow-Core Photonic Crystal Fiber Gas Sensing

Here, we focus on the review of HC-PCF gas sensing, including the light-guiding mechanisms of HC-PCFs, various sensing configurations, microfabrication approaches, and recent

Dec 22, 2025 Hot

Highly sensitive photonic crystal fiber gas sensor

A novel design of circular photonic crystal fiber (C-PCF) gas sensor is presented and analyzed by full vectorial finite element method. The suggested structure has a spiral porous Core

May 17, 2026 Hot

Photonics

Photonic crystals are now of great interest for basic physical properties related to the control of light propagation, radiation-matter interaction and quantum electrodynamic effects, localization and

May 10, 2026 Hot

Multiplexed Photonic Crystal Fiber Gas-Sensing

A highly sensitive hollow-core photonic crystal fiber (HC-PCF) gas-sensing network based on intracavity absorption is designed and experimentally

Dec 29, 2025 Hot

Hollow-core Photonic Crystal Fiber technology

GLOphotonics designs and produces gas-phase photonic components based on an innovative hollow-core micro-structured optical fiber technology.

Jul 05, 2025

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