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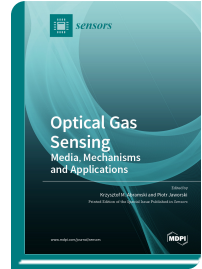
*Special Issue Reprint*

## **Optical Gas Sensing: Media, Mechanisms and Applications**

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Optical gas sensing is one of the fastest developing research areas in laser spectroscopy. Continuous development of new coherent light sources operating especially in the Mid-IR spectral band (QCL—Quantum Cascade Lasers, ICL—Interband Cascade Lasers, OPO—Optical Parametric Oscillator, DFG—Difference Frequency Generation, optical frequency combs, etc.) stimulates new, sophisticated methods and technological solutions in this area.

The development of clever techniques in gas detection based on new mechanisms of sensing (photoacoustic, photothermal, dispersion, etc.) supported by advanced applied electronics and huge progress in signal processing allows us to introduce more sensitive, broader-band and miniaturized optical sensors. Additionally, the substantial development of fast and sensitive photodetectors in MIR and FIR is of great support to progress in gas sensing. Recent material and technological progress in the development of hollow-core optical fibers allowing low-loss transmission of light in both Near- and Mid-IR has opened a new route for obtaining the low-volume, long optical paths that are so strongly required in laser-based gas sensors, leading to the development of a novel branch of laser-based gas detectors. This Special Issue summarizes the most recent progress in the development of optical sensors utilizing novel materials and laser-based gas sensing techniques.



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