

Pengcheng Zhao, PhD

✉ pczhao@leibniz-ipht.de 👤 pczhao.cn ☎ +49 15563590790
📍 Room 057, Leibniz-IPHT, Albert-Einstein-Straße 9, 07745 Jena, Germany

About me

📌 I am currently a Humboldt Fellow at Leibniz Institute of Photonic Technology (Leibniz-IPHT) in Germany, working in the Department of Fiber Photonics led by [Prof. Markus Schmidt](#). Before that, I was a Postdoctoral Fellow at the Hong Kong Polytechnic University (PolyU), collaborating with [Prof. Jin Wei](#) and [Prof. Zhang Aping](#).

My research interests focus on laser spectroscopy, fiber-optic sensors and devices. I've participated in 4 research grants, published 10 peer-reviewed journal papers such as *Nature Communications*, *Laser & Photonics Reviews* (2023, 2024), *Photoacoustics*, *Journal of Lightwave Technology*, and *Optics Letters*, and co-authored 2 national patents. I also serve as a reviewer for international journals such as *Optics & Laser Technology*, *Sensors and Actuators A: Physical*.

Throughout my academic career, I was the recipient of numerous national scholarships and awards, including [Humboldt Research Fellowship for Postdocs](#), "[China's Top 10 Optical Breakthrough in 2020](#)", the **Best Oral Presentation Awards** in the 12th Optical Fiber Sensors Conference China (OFS-China 2024), and the **Excellent Doctoral Thesis Award** of Beijing in 2023.

Employment History

04/2025 – now 📌 **Humboldt Fellow** at Department of Fiber Photonics, **Leibniz-IPHT**, Jena, Germany.

04/2022 – 03/2025 📌 **Postdoctoral Fellow** at Department of Electrical and Electronic Engineering, **PolyU**, Hong Kong, China.

Academic Qualifications

09/2015 – 01/2022 📌 **PhD** in Engineering (after 09/2017) & Master study in Engineering (before 09/2017) (Supervisor: Prof. Shangchun Fan), School of Instrumentation and Optoelectronic Engineering, **Beihang University (BUAA)**, China.
Thesis title: *Investigation on fiber-optic photothermal interferometry for high sensitivity gas detection*.

07/2017 – 01/2021 📌 **Visiting scholar** (PhD co-supervisor : Prof. Jin Wei), Department of Electrical Engineering, **PolyU**, Hong Kong, China.

09/2011 – 07/2015 📌 **Bachelor** of Engineering (Supervisor: Prof. Zhihong Wang), College of Instrumentation & Electrical Engineering, **Jilin University (JLU)**, China.

Research Publications

Journal Articles

- 1 **P. Zhao**, Y. Zhao, H. Bao, H. L. Ho, W. Jin*, S. Fan*, S. Gao, Y. Wang, and P. Wang, "Mode-phase-difference photothermal spectroscopy for gas detection with an anti-resonant hollow-core optical fiber," *Nature communications*, vol. 11, no. 1, pp. 1–8, 2020.
- 2 **P. Zhao**†, K. V. Krishnaiah†, L. Guo, T. Li, H. L. Ho, A. P. Zhang*, and W. Jin*, "Ultraminiature optical fiber-tip 3d-microprinted photothermal interferometric gas sensors," *Laser & Photonics Reviews*, vol. 18, no. 9, p. 2301285, 2024.
- 3 **P. Zhao***, H. L. Ho, S. Fan, and W. Jin*, "Evanescent wave lab-on-fiber for high sensitivity gas spectroscopy with wide dynamic range and long-term stability," *Laser & Photonics Reviews*, vol. 17, no. 5, p. 2200972, 2023.







- 4 T. Li†, **P. Zhao**†, P. Wang, K. V. Krishnaiah, W. Jin*, and A. P. Zhang*, “Miniature optical fiber photoacoustic spectroscopy gas sensor based on a 3d micro-printed planar-spiral spring optomechanical resonator,” *Photoacoustics*, vol. 40, p. 100 657, 2024.
- 5 J. Wu, **P. Zhao***, H. Bao, H. L. Ho, and W. Jin*, “Hollow-core fiber fabry-pérot photothermal gas sensor: Temperature-dependent behavior,” *Journal of Lightwave Technology*, pp. 1–7, 2025.
- 6 L. Guo, **P. Zhao***, H. L. Ho, S. Jiang, H. Bao, S. Gao, Y. Wang, and W. Jin*, “Pump-probe-alternating photothermal interferometry for two-component gas sensing,” *Optics Letters*, vol. 48, no. 24, pp. 6440–6443, 2023.
- 7 **P. Zhao**, H. L. Ho, W. Jin*, S. Fan*, S. Gao, and Y. Wang, “Hollow-core fiber photothermal methane sensor with temperature compensation,” *Optics Letters*, vol. 46, no. 11, pp. 2762–2765, 2021.
- 8 **P. Zhao**, H. L. Ho, W. Jin*, S. Fan*, S. Gao, Y. Wang, and P. Wang, “Gas sensing with mode-phase-difference photothermal spectroscopy assisted by a long period grating in a dual-mode negative-curvature hollow-core optical fiber,” *Optics Letters*, vol. 45, no. 20, pp. 5660–5663, 2020.
- 9 P. Wang, T. Li, H. Lin, **P. Zhao**, S. Liu, H.-Y. Tam, and A. P. Zhang*, “Miniature optical fiber accelerometer based on an in-situ 3d micro-printed ferrule-top fabrypérot microinterferometer,” *Light: Advanced Manufacturing*, vol. 6, no. 18, 2025.
- 10 L. Guo, H. Bao, F. Chen, **P. Zhao**, S. Jiang, H. L. Ho, and W. Jin, “Ultra-compact optical fiber gas sensor with high sensitivity, fast response and large dynamic range,” *Journal of Lightwave Technology*, vol. 42, no. 7, pp. 2617–2624, 2023.
- 11 W. Jin*, H. Bao, **P. Zhao**, Y. Zhao, Y. Qi, C. Wang, and H. L. Ho, “Recent advances in spectroscopic gas sensing with micro/nano-structured optical fibers,” *Photonic Sensors*, vol. 11, pp. 141–157, 2021.
- 12 W. Jin*, H. Bao*, Y. Qi, Y. Zhao, **P. Zhao**, S. Gao, and H. L. Ho, “Micro/nano-structured optical fiber laser spectroscopy,” *Acta Optica Sinica*, vol. 41, no. 1, p. 0 130 002, 2021.

Conference Proceedings

- 1 **P. Zhao**, H. L. Ho, S. Zhao, and W. Jin, “Polarization-mode-phase-difference photothermal gas sensing with an optical microfiber coupler,” in *Optical Fiber Sensors*, SPIE, vol. 13639, 2025, pp. 893–896.
- 2 J. Wu, **P. Zhao**, H. Bao, H. L. Ho, and W. Jin, “Hollow-core fiber fabry-pérot photothermal gas sensing characteristics over the temperature range of 256–354 k,” in *Optical Fiber Sensors*, SPIE, vol. 13639, 2025, pp. 357–360.
- 3 L. Guo, **P. Zhao**, H. Bao, J. Wu, S. Gao, Y. Wang, H. L. Ho, S. Jiang, and W. Jin, “Fiber-enhanced fourier-transform photothermal spectroscopy for multi-component gas sensing,” in *Optical Fiber Sensors*, SPIE, vol. 13639, 2025, pp. 713–716.
- 4 **P. Zhao**†, K. V. Krishnaiah†, L. Guo, T. Li, H. L. Ho, A. P. Zhang*, and W. Jin*, “High-sensitivity fiber-tip photothermal gas sensor based on a 3d μ -printed fabry-pérot microcavity,” in *Optical Fiber Sensors*, Optica Publishing Group, 2023, Th5–2.
- 5 L. Guo, **P. Zhao***, H. L. Ho, S. Jiang, H. Bao, S. Gao, Y. Wang, and W. Jin*, “Two-component photothermal gas sensor with a pump-probe-alternating technique,” in *Optical Fiber Sensors*, Optica Publishing Group, 2023, Tu3–16.
- 6 **P. Zhao**, S. Fan, H. L. Ho, and W. Jin*, “Microfiber evanescent-wave photothermal methane sensor with sub-ppm sensitivity,” in *Optical Fiber Sensors*, Optica Publishing Group, 2022, Th3–5.
- 7 **P. Zhao***, H. L. Ho, W. Jin, S. Fan, S. Gao, Y. Wang, and P. Wang, “Lp01-lp11 mode conversion in a negative curvature hollow-core fiber by use of a long-period grating,” in *Asia Communications and Photonics Conference*, Optica Publishing Group, 2020, M4A–118.
- 8 **P. Zhao***, Y. Zhao, H. Bao, H. L. Ho, W. Jin, S. Fan, S. Gao, Y. Wang, and P. Wang, “Ultrasensitive photothermal gas sensor with a dual-mode anti-resonant hollow-core fiber,” in *Optical Fiber Sensors*, Optica Publishing Group, 2020, W3–7.

- 9 T. Li, K. V. Krishnaiah, **P. Zhao**, and A. P. Zhang, "Optical fiber ferrule-top spirally-suspended optomechanical microresonators for photoacoustic spectroscopic gas sensing," in *The European Conference on Lasers and Electro-Optic(CLEO/Europe 2023)*, Optica Publishing Group, 2023, ch_14_4.
- 10 W. Jin*, H. Bao, **P. Zhao**, Y. Qi, and H. L. Ho, "High sensitivity gas detection with microstructured optical fibres," in *2020 22nd International Conference on Transparent Optical Networks (ICTON)*, IEEE, 2020, pp. 1-4.




Project Experiences

- 04/2025 to present  **Humboldt Research Fellowship Programme for Postdocs** National Alexander von Humboldt Foundation (Host:Leibniz-IPHT).
- 12/2024 to 03/2025  **Study of gassing dynamics in rechargeable batteries with embedded optical fiber sensors** PolyU Academy for Interdisciplinary Research (PAIR) (1-CDJ6) (Participation).
- 04/2022 to 12/2024  **Optical Fiber Biomedical Sensing and Imaging Technologies** National Natural Science Foundation of China (NSFC) (K-ZGAV) (Participation).
- 04/2022 to 04/2024  **PolyU Postdoc Matching Fund (PDF) Scheme** PolyU(1-W23B) (Technical Leader).
- 01/2019 to 12/2023  **Microstructured hollow-core optical fiber multi-component trace gas analyzer** NSFC National Major Project for Research Instrument Development(61827820), HK\$7m (Participation).
- 07/2017 to 10/2018  **Research on Optical Fiber Angle Sensor Based on Graphene Diaphragm** Joint Supervision Scheme with the Chinese Mainland, Taiwan and Macao Universities(1-ZVG4), HK\$180,600 (Technical Leader).




Awards and Achievements

- 2024  **Best Oral Presentation Awards**, OFS-China 2024, Chinese Society for Optical Engineering
-  **Humboldt Research Fellowship for Postdocs**, Alexander von Humboldt-Stiftung, Germany
- 2023  **Best Doctoral Thesis Award of Beijing**, Beijing Municipal Education Commission
-  **Best Doctoral Thesis Award of BUAA**, Beihang University
- 2021  **China's Top 10 Optical Breakthroughs**, Chinese Laser Press
-  **Top 10 Outstanding Graduate Students**, Beihang University
- 2020  **National scholarship for postgraduate student**, Ministry of Education of China

Conference Talks

- 09/2024  **12th Optical Fiber Sensors Conference China (OFS-China 2024)**, Chongqing, China
- 11/2023  **28th International Conference on Optical Fiber Sensors (OFS)**, Hamamatsu, Japan
- 08/2022  **27th OFS**, Virginia, United States (Online)

Teaching Experiences

- 2024  **New sensing technology**, Undergraduate course, Online
Lecturer, Chapter 10.3 [Laser Photothermal Interferometric Fiber-optic Gas Sensing Technology](#), BUAA.
- 2023  **Sensor technology and applications**, Undergraduate course, Online
Lecturer, Chapter 6.11 [Microstructure optical fiber gas sensor](#), BUAA.
- 2018 - 2020  **Applied Electromagnetics**, Undergraduate course, PolyU
Teaching Assistant

Services

- Journal Reviewer  Optics & Laser Technology, Sensors and Actuators A: Physical