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📍 HJ805, The Hong Kong Polytechnic University, Hong Kong

About me

📌 I am currently 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 9 peer-reviewed journal papers such as *Nature Communications*, *Laser & Photonics Reviews*, and *Optics Letters*, and co-authored 3 national patents. I also serve as a reviewer for international journals such as *Sensors and Actuators A: Physical*. Throughout my academic career, I was the recipient of numerous national scholarships and awards, including "China's Top 10 Optical Breakthrough in 2020", and the Excellent Doctoral Thesis Award of Beijing as well as BUAA in 2023.

Employment History

- 04/2022 – now 📌 **Postdoctoral Fellow** at Department of Electrical and Electronic Engineering, **PolyU**, Hong Kong, China.
- 07/2017 – 01/2021 📌 **Research Assistant** in Prof. Jin Wei group (PhD Joint Supervision) at Department of Electrical Engineering, **PolyU**, Hong Kong, China.

Education

- 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, **BUAA**, China.
Thesis title: *Investigation on fiber-optic photothermal interferometry for high sensitivity gas detection*.
- 09/2011 – 07/2015 📌 **Bachelor** of Engineering, College of Instrumentation & Electrical Engineering, **Jilin University**, China.

Research Publications (Selected)

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*, p. 202301285, 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*, p. 2200972, 2023.
- 4 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.
- 5 **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.

- 6 **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.
- 7 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*, 2023.
- 8 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*, pp. 1–17, 2021.
- 9 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, pp. 1–18, 2021.

Conference Proceedings

- 1 **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.
- 2 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.
- 3 **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.
- 4 **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.
- 5 **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.
- 6 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.
- 7 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

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| 04/2022 to present | ■ 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

- 2023
 - 📌 **The Excellent Doctoral Thesis Award of Beijing**, Beijing Municipal Education Commission
 - 📌 **The Best Doctoral Thesis Award of BUAA**, Beihang University
- 2022
 - 📌 **The Best Doctoral Thesis Nomination Award of CSAA**, Chinese Society of Aeronautics and Astronautics
- 2021
 - 📌 **China's Top 10 Optical Breakthroughs**, Chinese Laser Press
 - 📌 **Top 10 Outstanding Graduate Students**, Beihang University
 - 📌 **Top 10 Outstanding Paper Award**, Beihang University
 - 📌 **CASC Scholarship**, China Aerospace Science and Technology Corporation
- 2020
 - 📌 **National scholarship for postgraduate student**, Ministry of Education and Finance of the People's Republic of China
 - 📌 **First prize for "Tanghui Electronics" inspirational scholarship**, China Instrument and Control Society
 - 📌 **Merit Student**, Beihang University
 - 📌 **Second prize for AVIC scholarship**, Aviation Industry Corporation of China
- 2018
 - 📌 **First prize for China Innovation & Entrepreneurship International Competition**, China Instrument and Control Society

Conference Talks

- 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
Teaching Assistant
- 2016 - 2017
 - 📌 **Sensor technology and applications**, Undergraduate/postgraduate courses
Teaching Assistant

Skills

- Languages
 - 📌 Strong reading, writing and speaking competencies for English, Mandarin Chinese.
- Coding
 - 📌 C, Verilog, VHDL, Python, L^AT_EX
- Software
 - 📌 COMSOL, Matlab, Labview, Mathematica