Pengcheng Zhao, PhD (Beihang University, BUAA)

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About me

I am currently a postdoctoral fellow at the Hong Kong Polytechnic University (PolyU). My research interests focus on laser spectroscopy, fiber-optic sensors and devices. I've participated in 4 research grants, published 10 peer-reviewed papers such as *Nature Comm.*, *Laser Photonics Rev.*, and *Opt. Lett.*, and co-authored 3 national patents. Throughout my academic career, I was the recipient of numerous national scholarships and awards, including "China's Top 10 Optical Breakthrough in 2020".

Employment History

04/2022 – now — **Postdoctoral Fellow** in collaboration with Prof. Jin Wei and Prof. A. Ping Zhang at Department of Electrical 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**†, K. V. Krishnaiah†, L. Guo, *et al.*, "Ultraminiature optical fiber-tip 3d-microprinted photothermal interferometric gas sensors," *Advanced Photonics*, Submitted, 2023.
2. L. Guo, **P. Zhao***, H. L. Ho, *et al.*, "Pump-probe-alternating photothermal interferometry for two-component gas sensing," *Optics Letters*, Accepted, 2023.
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. 2 200 972, 2023.
4. **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.
5. **P. Zhao**, H. L. Ho, W. Jin*, *et al.*, "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.
6. **P. Zhao**, Y. Zhao, H. Bao, *et al.*, "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.

Conference Proceedings

1. L. Guo, **P. Zhao***, H. L. Ho, *et al.*, "Two-component photothermal gas sensor with a pump-probe-alternating technique," in *Optical Fiber Sensors*, Optica Publishing Group, 2023, (Poster, Accepted).
2. **P. Zhao**†, K. V. Krishnaiah†, L. Guo, *et al.*, "High-sensitivity fiber-tip photothermal gas sensor based on a 3d μ-printed fabry-pérot microcavity," in *Optical Fiber Sensors*, Optica Publishing Group, 2023, (Oral, Accepted).
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, *et al.*, "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, *et al.*, "Ultrasensitive photothermal gas sensor with a dual-mode anti-resonant hollow-core fiber," in *Optical Fiber Sensors*, Optica Publishing Group, 2020, W3–7.

Project Experiences

01/2019 to 12/2023 — **Microstructured hollow-core optical fiber multi-component trace gas analyzer** National Natural Science Foundation of China (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 (Leader).

Awards and Achievements

2023 — **The Best Doctoral Thesis Award of BUAA**, Beihang University

2022 — **The Best Doctoral Thesis Award of CSAA, The Nomination Award**, Chinese Society of Aeronautics and Astronautics

2021 — **China's Top 10 Optical Breakthroughs**, Chinese Laser Press

2021 — **Top 10 Outstanding Graduate Students**, Beihang University

2021 — **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

2020 — **First prize for "Tanghui Electronics" inspirational scholarship**, China Instrument and Control Society

2018 — **First prize for China Innovation & Entrepreneurship International Competition**, China Instrument and Control Society

Skills

Languages — Strong reading, writing and speaking competencies for English, Mandarin Chinese.

Coding — C, Verilog, VHDL, Python, LaTeX

Software — COMSOL, Matlab, Labview, Mathamatica