

Rongyang Xu

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Summary

- Highly motivated researcher with a passion for discovery and a strong background in photonics.
- Very interested in research with practical applications, such as silicon photonics and neuromorphic computing.

Experience

Heidelberg University	Postdoc (Humboldt)	Host: Prof. Dr. Wolfram Pernice (Leibniz Prize laureate)	2024.02 – present
Heidelberg University	Postdoc	Supervisor: Prof. Dr. Wolfram Pernice	2023.01 – 2024.01
Osaka University	Visiting researcher	Supervisor: Prof. Junichi Takahara	2022.10 – 2023.01

Education

Osaka University	2019.10 – 2022.09
Ph.D. Course of Applied Physics	Supervisor: Prof. Junichi Takahara
Ruhr-University Bochum	2016.10 – 2018.11
M.Sc. Lasers and Photonics	Supervisor: Dr. Nathan Jukam & Prof. Dr. Martin Hofmann
Institute of Technology, Tallaght (now Technological University Dublin)	2012.09 – 2016.06
B. Eng. (Honours) Mechanical Engineering	
Nanjing Tech University	2012.09 – 2016.06
B. Eng. Mechanical Engineering and Automation	

Skills

Laboratory skills	Skills related to computer
Electron Beam Lithography, Photolithography, Focused Ion Beam device, Electron Beam Evaporation, Reactive Ion Etching, Profilometer, Fourier Transform Infrared Spectroscopy (FTIR), RF Sputtering, Optical Microscopy, Filmetrics, Ellipsometry, Scanning Electron Microscopy (SEM), Terahertz Time-Domain Spectroscopy.	Lumerical FDTD, Lumerical MODE, Python, Matlab, Blender, COMSOL, WecaS, Klayout, Lumerical Interconnect

Fellowships and Award

The Japan Society of Applied Physics (JSAP) Young Scientist Award	2024
Humboldt Research Fellowship for Postdocs	2024
Support for Pioneering Research Initiated by the Next Generation, Japan Science and Technology Agency (JST)	2022

Papers

First author:

1. [R. Xu](#), S. Taheriniya, A. Varri, M. Ulanov, I. Konyshov, L. Krämer, L. McRae, F.L. Ebert, J.R. Bankwitz, X. Ma, S. Ferrari, H. Bhaskaran, and W. H. P. Pernice, "Mode Conversion Trimming in Asymmetric Directional Couplers Enabled by Silicon Ion Implantation," *Nano Lett.*, 24, 10813-10819 (2024).
2. [R. Xu](#), D. Chen, and J. Takahara, "Perfect absorption of violet light enabled by rotated Mie resonators," *J. Appl. Phys.*, 135, 243109 (2024).
3. [R. Xu](#) and J. Takahara, "Hollow Mie resonators based on toroidal magnetic dipole mode with enhanced sensitivity in refractometric sensing," *Appl. Phys. Express*, 17, 012005 (2024).
4. **(editor's pick)** [R. Xu](#), S. Taheriniya, A. Ovvyann, R. Bankwitz, L. McRae, E. Jung, F. Brückerohoff-Plückelmann, I. Bente, F. Lenzini, H. Bhaskaran, W. H. P. Pernice, "Hybrid photonic integrated circuits for neuromorphic computing [invited]," *Opt. Mater. Express*, 13(12), 3553-3606 (2023).
5. [R. Xu](#), T. Morimoto, and J. Takahara, "Vertical photon sorting by stacking silicon and germanium nanopillars for broadband absorbers," *Nanophotonics*, 12(13), 2461-2469 (2023).
6. [R. Xu](#), J. Fujikata, and J. Takahara, "Graphene perfect absorber based on degenerate critical coupling of toroidal mode," *Opt. Lett.* 48(6), 1490-1493 (2023).
7. [R. Xu](#) and J. Takahara, "Stacked all-dielectric absorber based on degenerate critical coupling for visible to near-infrared light," *Appl. Phys. Express*, 15, 122006 (2022).
8. **(Spotlights 2022 & Highlights of 2022)** [R. Xu](#) and J. Takahara, "Angle-insensitive Huygens' metasurfaces of quadrupole modes," *Appl. Phys. Express*, 15, 122003 (2022).
9. [R. Xu](#) and J. Takahara, "Highly sensitive and robust refractometric sensing by magnetic dipole of Si nanodisks," *Appl. Phys. Lett.*, 120, 201104 (2022).
10. **(editor's pick)** [R. Xu](#) and J. Takahara, "All-dielectric perfect absorber based on quadrupole modes," *Opt. Lett.* 46(15), 3596-3599 (2021).
11. [R. Xu](#) and J. Takahara, "Radiative loss control of an embedded silicon perfect absorber in the visible region," *Opt. Lett.* 46(4), 805-808 (2021).
12. [R. Xu](#), Z. Zhang, A.D. Wieck, and N. Jukam, "Terahertz Fano resonances induced by combining metamaterial modes of the same symmetry," *Opt. Express*, 28(3), 3932-3941(2020).

Conferences:

First author:

1. [R. Xu](#), S. Taheriniya, A. Varri, W. Pernice, "Trimming asymmetric directional couplers for efficient mode conversion using silicon ion." In 3rd International Conference on Physical Computing (ICOPC), Heidelberg, Aug. 26, 2024. (Oral)
2. [R. Xu](#), S. Taheriniya, A. Varri, F. Brückerohoff-Plückelmann, and W. Pernice, "Performance Optimization of Photonic Accelerators in Neuromorphic Computing via Structure Trimming." In 24th International Conference on Transparent Optical Networks (ICTON), Bari, Jul. 16, 2024. (Oral, invited)
3. [R. Xu](#), I. Konyshov, W. Pernice, "Exploit higher-order modes in nanophotonic circuits for neuromorphic computing." in 2nd International Conference on Physical Computing (ICOPC), Heidelberg, Sept. 11, 2023. (Poster)
4. [R. Xu](#) and J. Takahara, "High-Sensitivity Silicon Mie Resonators for Refractometric Sensing." In The 83rd JSAP Autumn Meeting, The Japan Society of Applied Physics, Sendai, Sept. 20, 2022. (Oral)
5. [R. Xu](#) and J. Takahara, "Assembly of All-Dielectric Broadband Perfect Absorbers Based on Degenerate Critical Coupling." In 2022 Conference on Lasers and Electro-Optics Pacific Rim (CLEOPR), Sapporo, Aug. 2, 2022. (Oral)
6. [R. Xu](#) and J. Takahara, "Wideband Silicon Perfect Absorber based on Degenerate Critical Coupling." In Optics & Photonics International Congress (OPIC), Yokohama, Apr. 18, 2022. (Oral)
7. [R. Xu](#), R. Sakai, and J. Takahara, "Perfect Absorption in Hybrid Silicon Metasurfaces." In The 69th JSAP Spring Meeting, The Japan Society of Applied Physics, Mar. 24, 2022, online. (Oral)
8. [R. Xu](#) and J. Takahara, "Perfect absorbing silicon nanopillar metasurfaces enabled by degenerate critical coupling." In Core-to-Core Symposium, Global Nanophotonics, Osaka, Mar. 14, 2022. (Poster)
9. [R. Xu](#) and J. Takahara, "All-Dielectric Perfect Absorber of Quadrupole Modes by using Cross-Shaped Mie Resonators." In 26th Microoptics Conference (MOC), IEEE, Sept. 28, 2021, online. (Poster)
10. [R. Xu](#) and J. Takahara, "Silicon Perfect Absorber of Quadrupole Modes within the visible light range." In JSAP-OSA Joint Symposia, Optical Society of America, Sept. 10, 2021, online. (Oral)
11. [R. Xu](#) and J. Takahara, "Si Perfect Absorber by Degenerate Critical Coupling in Visible Region." In Optics & Photonics International Congress (OPIC), Apr. 19, 2021, online. (Oral)
12. [R. Xu](#), T. Liu, and J. Takahara, "Field Enhancement by Thin Dielectric Nanodisks as Mie resonator." In JSAP-OSA Joint Symposia, Optical Society of America, Sept. 9, 2020, online. (Oral)
13. [R. Xu](#), A.D. Wieck, and N. Jukam., "Fano line shapes created in metamaterials by integrating different modes of the same symmetry in composite structures." 2019 44th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz). IEEE, Paris, 2019. (Poster)