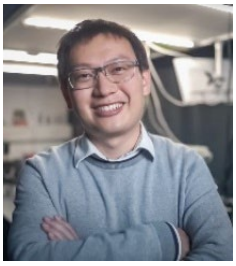
Curriculum vitae



Dr Haoran Ren

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RESEARCH MOTIVATION

Our nanophotonics research exploits the full potential (multi-dimensions) of light and its enabled light-matter interactions at nanoscale, creating new nanotechnology platforms for impactful applications.

CAREER HISTORY

2022 – ARC DECRA Fellow (Lecturer) at Monash University.

The group research focuses on the development of integrated meta-optic systems for advanced light shaping, classic and quantum imaging processing, optical sensing, and nonlinear photonics.

2020 – 2022 MQ Research Fellow at Macquarie University (mentor: Prof. Judith Dawes).

2019 – 2020 Humboldt Research Fellow at LMU Munich (advisor: Prof. Stefan Maier).

2016 – 2018 Postdoctoral Fellow at RMIT University (advisor: Prof. Min Gu).

ACADEMIC QUALIFICATIONS

February 2017 PhD, Centre for Micro-Photonics, Swinburne University of Technology.

Supervisor: Prof. Min Gu. Thesis title: *"Nanophotonic manipulation of angular momentum of light for information optics"*

July 2012 Master of Science, Ocean University of China.

July 2010 Bachelor of Science, Ocean University of China.

COMPETITIVE RESEARCH FUNDING AND FELLOWSHIPS

2022 Monash Uplift grant (Lead Chief Investigator, $20k)

2022 Macquarie Acceleration Scheme (co-Chief Investigator, >$50k).

2022 ARC DP (Lead Chief Investigator, >$350k).

2022/2020 MQ Research Infrastructure Schemes (co-Chief Investigator, >$400k).

2022 ARC DECRA (Chief Investigator, >$400k).

2021 Macquarie University Research Fellowship (Chief Investigator, >$350k).

2020 Centre for NanoScience seed funding at LMU Munich (co-Chief Investigator, >$20k).

2019 Humboldt Research Fellowship (Chief Investigator, >$200k).

AWARDS AND RESEARCH HIGHLIGHTS

2022 Emerging Leaders 2022 – Journal of Optics.

2022 ANZOS Geoff Opat Early Career Researcher Prize.

2022 MQ Research Spotlight.

2018 World Technology Awards – Winner of Communications Technology.

2017 Victoria Fellowship.

2016 Chinese Government Prize for Outstanding Self-financed Students Abroad (Special Prize).

2015 OSA Robert S. Hilbert Student Travel Grant.

SPECIAL RECOGNITIONS

2022-2023 Associated Investigator, The ARC TMOS Centre of Excellence.

2021-2022, Secretary at The OPTICA (formerly OSA) Sydney Local Section.

2022-2027 Honorary Research Fellow, Macquarie University.

PROFESSIONAL ENGAGEMENT

EDITORIAL

2022- *APL Photonics* Early Career Editorial Advisory Board.

2021 Guest Editor, special issue on "Advances in Metasurfaces for Photonic Devices" in *Frontiers in Nanotechnology*.

CONFERENCE/WORKSHOP ORGANISING COMMITTEE

2023 Optica Advanced Photonics Congress (subcommittee in novel materials).

2022 Panelist in iCANX Talks.

2022 Workshop on 3D Printing of Photonics Materials (AIP Conference).

2022 The OPTICA (formerly OSA) Latin America Optics and Photonics Conference.

2021 WILEY Photonics & Advanced Intelligent Systems International Conference.

2021 The OPTICA (formerly OSA) Sydney Local Section Seminars.

2021/2022 MQ Photonics Seminars.

2021 ANZCOP Conference.

2018 The CUDOS Workshop on Frontiers in Nanoplasmonics.

2017 The Selby Public Lecture at RMIT University.

REGULAR REVIEW

Reviewer for the Australian Research Council Discovery Grants.

Reviewer for top tier international journals including *Nature, Science Advances, Nature Photonics, Nature Nanotechnology, Nature Communications, Nature Electronics, Light Science & Applications, Communications Physics, eLight, Optica, Optics Letters, Optics Express, Nano Letters, ACS Photonics, ACS Applied Nano Materials, APL Photonics* and *Nanophotonics.*

MEMBERSHIP

Member of OPTICA (formerly OSA), SPIE, Elected Secretary of the OPTICA Sydney Local Section (2021), Elected event officer in the executive committee of the OSA Photonics Metamaterials Technical Group (2020).

SUPERVISION AND MENTORING

2023 School of Physics and Astronomy, Monash University
1 postdoctoral research fellow, 2 masters by research, 1 undergraduate.

2022 School of Mathematical and Physical Sciences, Macquarie University
1 undergraduate /summer vocational scholarship holder.

2019-2022 Chair in Hybrid Nanosystems – Hybrid Nanophotonics & Plasmonic Chemistry
Co-supervising 1 PhD, 2 masters by research, and 1 PhD visiting students.

2017-2018 School of Science, RMIT University
Mentoring multiple PhD students and 1 PhD visiting student.

OUTREACH

2021 *Macquarie University ECR Showcase* – "Metafibre optics".

2020 *Behind the paper* – "Twisted light for a metasurface holographic video display", Nature Research Ecology & Evolution Community.

2020 *Podcasts* – "Holographische Videos: bald nicht mehr nur bei Star Wars".

PATENTS

J. M. Dawes and H. Ren, "Orbital angular momentum multiplexer and demultiplexer", AU2021902309 (2022).

M. Gu, Y. Cao, Z. Gan, X. Li, B. Mashford, H. Ren and Q. Zhang, "Media, systems and methods for optical data storage" PCT/CN2016/100832 (2016).

SCIENTIFIC OUTPUTS

36 peer reviewed journal publications with over **2600** citations (Google Scholar).

High-impact journal publications include *Science/Nature* and family journals, *Physical Review Letters, Chemical Reviews, Nano Letters, Advanced Materials, ACS Nano, ACS Photonics, Advances in Optics and Photonics* etc.

Invited commentaries/perspectives:

- Aigner, J. Dawes, S. A. Maier, and H. Ren, "Nanophotonics shines light on hyperbolic metamaterials", *Light: Sci. & Appl.* (2022).
- H. Ren, "A light-programmable metasurface", *Nat. Electron.* (2020).

54 conference proceedings, **14** invited conference talks at major international conferences. **13** invited seminars and lectureship presentations at various universities.

SELECTED PUBLICATIONS **(**†Corresponding author(s); ‡Equal contributions**):**

1. C. He, Z. Tang, L. Liu, S. A. Maier, †X. Wang, †H. Ren, †A. Pan, Spin- and orbital-angular-momentum nonlinear optical selectivity of single-mode nanolasers, arxiv. (2023).
2. C. Li, T. Wieduwilt, F. J. Wendisch, A. Márquez, L. de S. Menezes, †S. A. Maier, †M. A. Schmidt, †H. Ren, Metafiber transforming arbitrarily structured light, https://arxiv.org/abs/2302.13010 (2023).
3. ‡†C. Li, ‡J. Jang, ‡T. Badloe, T. Yang, J. Kim, J. Kim, M. Nguyen, S. A. Maier, †J. Rho, †H. Ren, I. Aharonovich, Arbitrary structured quantum emission with a multifunctional imaging metalens, https://arxiv.org/abs/2209.04571 (2023).
4. †C. Liu, S. Zhang, S. A. Maier, and †H. Ren, Disorder-induced topological phase transition in the optical skyrmions family, ***Phys. Rev. Lett.,*** 129, 267401 (2022).
5. †A. Aigner, A. Tittl, J. Wang, T. Weber, Y. Kivshar, †S. A. Maier, and †H. Ren, Plasmonic bound states in the continuum to tailor light-matter coupling, ***Sci. Adv.***, 8, 49 (2022).
6. T. Dinter, C. Li, L. Kühner, T. Weber, A. Tittl, †S. A. Maier, †J. M. Dawes, and †H. Ren, Metasurface measuring twisted light in turbulence, ***ACS Photonics*** 9, 9, 3043–3051 (2022).
7. L. Kühner, L. Sortino, R. Berté, J. Wang, H. Ren, S. A. Maier, Y. S. Kivshar, and †A. Tittl, Radial bound states in the continuum for polarization-invariant nanophotonics, ***Nat. Commun.***, 13, 4992 (2022).
8. †, ‡H. Ren, ‡J. Jang, ‡C. Li, A. Aigner, M. Plidschun, J. Kim, †J. Rho, †M. A. Schmidt, and †S. A. Maier, An achromatic metafiber for focusing and imaging across the entire telecommunication range, ***Nat. Commun.***, 13, 4183 (2022).
9. †,‡E. Cortes, ‡F. J. Wendisch, ‡L. Sortino, A. Mancini, S. Ezendam, S. Saris, L. D. S. Menezes, A. Tittl, H. Ren, †S. A. Maier, Metasurfaces for energy conversion, ***Chem. Rev.*** 122, 19, 15082–15176 (2022).
10. †H. Ren, and †S. A. Maier, Nanophotonic materials for twisted-light manipulation, ***Adv. Mater.*** 2106692 (2022).
11. X. Fang, H. Ren, K. Li, H. Luan, Y. Hua, Q. Zhang, X. Chen, and †M. Gu, Nanophotonic manipulation of optical angular momentum for high-dimensional information optics, invited review in ***Adv. Opt. Photonics*** 13, 772-833 (2021).
12. †, ‡H. Ren, ‡X. Wang, C. Li, C. He, Y. Wang, †A. Pan, and †S. A. Maier, An orbital angular momentum-controlled hybrid nanowire circuit, ***Nano Lett.*** 21, 6220-6227 (2021).
13. †, ‡H. Ren**,** ‡X. Fang, ‡J. Jang, J. Burger, †J. Rho, and †S. A. Maier, Complex-amplitude metasurface-based orbital angular momentum holography in momentum space, ***Nat. Nanotechnol.*** 15, 948-955 (2020).
14. H. Ren, W. Shao, Y. Li, F. Salim, and †M. Gu, Three-dimensional vectorial holography based on machine learning inverse design, ***Sci. Adv.*** 6, eaaz4261 (2020).
15. ‡X. Fang, ‡H. Ren, and †M. Gu, Orbital angular momentum holography for high-security encryption, ***Nat. Photonics*** 14, 102-108 (2020).
16. Y. Xie, P. Ni, Q. Wang, †Q. Kan, G. Briere, P. Chen, Z. Zhao, A. Delga, H. Ren, H. Chen, †C. Xu, and †P. Genevet, Metasurface-integrated vertical cavity surface-emitting lasers for programmable directional lasing emissions, ***Nat. Nanotechnol.*** 15, 125-130 (2020).
17. †H. Ren, G. Briere, X. Fang, P. Ni, R. Sawant, S. Heron, S. Chenot, S. Vezian, B. Damilano, V. Brandli, S. A. Maier, and †P. Genevet, ***Nat. Commun.*** 10, 2986 (2019).
18. ‡Z. Yue, ‡H. Ren, S. Wie, J. Lin, and †M. Gu, Angular-momentum nanometrology in an ultrathin plasmonic topological insulator film, ***Nat. Commun.*** 9, 4413 (2018).
19. H. Ren, and †M. Gu, Angular momentum-reversible near-unity bisignate circular dichroism, ***Laser Photonics Rev.*** 12, 1700255 (2018).
20. H. Ren**,** X. Li, Q. Zhang, and †M. Gu, On-chip noninterference angular momentum multiplexing of broadband light, ***Science*** 352, 805-809 (2016).