

Joe Wan

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Employment and Education

- 06/2026– **Independent Postdoctoral Fellow, Institute of Biology, University of Graz**
- 10/2023–06/2026 **Postdoctoral Scholar, Institute of Ecology and Evolutionary Biology, National Taiwan University**
Supervisor: Po-Ju Ke
- 09/2018–04/2023 **Doctorate, Department of Environmental Systems Science, ETH Zürich**
Advisor: Thomas Crowther
Thesis: Uniting community and ecosystem ecology to understand the global carbon cycle
- 02/2018–08/2018 **Research Assistant (plant pathogen ecology) Department of Biology, Stanford University**
Supervisor: Erin Mordecai
- 07/2016–09/2017 **Lab Technician (microbial ecology) Department of Biology, Stanford University**
Supervisor: Kabir Peay
- 09/2012–06/2016 **Bachelor of Science in Computer Science and Biology, Stanford University (with Honors in Computer Science; with Distinction)**
Honors Thesis: Learning evolutionary and functional aspects of plant–fungal mutualism from public genomic data

Fellowships and Competitive Funding

- 2026–2029 **ESPRIT Postdoctoral Fellowship, Austrian Science Fund (FWF)**
A unified theory of community structure and function (10.55776/ESP4321625)
- 2026 (awarded) **Maria Skłodowska-Curie Postdoctoral Fellowship, European Commission [declined in favor of ESPRIT Fellowship]**
COMMSTRUCT: A unified theory of community structure
- 2025 (awarded) **Climate Change Graz Postdoctoral Fellowship, University of Graz [declined in favor of ESPRIT Fellowship]**
Harnessing coexistence theory to predict dune ecosystem resilience
- 2025 **NTU Directives for Postdoctoral Researcher Subsidies**
Plant community structure under plant–soil legacies (114L4000-1)
- 2024 **Postdoctoral Fellowship, National Science and Technology Council, Taiwan**
Nonlinear and multispecies dynamics in the plant soil feedback system (113-2811-B-002-118)

Publications

as first author or equal contribution ()*:

(§ indicates mentored trainees)

- C.-L. Huang[§], **J. Wan**^{*}, S. Wei, C.-H. Chang-Yang, and P.-J. Ke (2026). "Plant–soil feedback persists beyond host death to shape density-dependent plant competition". *Plant and Soil*. DOI: 10.1007/s11104-026-08731-0.
- J. Wan**, P.-J. Ke, I. Hordijk, L. Bialic-Murphy, and T. W. Crowther (2025). "Functional co-existence theory: Identifying mechanisms linking biodiversity and ecosystem function". *Ecological Monographs* 95.3. DOI: 10.1002/ecm.70033.
- P.-J. Ke^{*} and **J. Wan**^{*} (2023). "A general approach for quantifying microbial effects on plant competition". *Plant and Soil* 485.1. DOI: 10.1007/s11104-022-05744-3.
- J. Wan** and T. W. Crowther (2022). "Uniting the scales of microbial biogeochemistry with trait-based modelling". *Functional Ecology* 36.6. DOI: 10.1111/1365-2435.14035.
- P.-J. Ke^{*} and **J. Wan**^{*} (2020). "Effects of soil microbes on plant competition: a perspective from modern coexistence theory". *Ecological Monographs* 90.1. DOI: 10.1002/ecm.1391.
- G. R. Smith^{*} and **J. Wan**^{*} (2019). "Resource-ratio theory predicts mycorrhizal control of litter decomposition". *New Phytologist* 223.3. DOI: 10.1111/nph.15884.
- J. Wan**, M. Qu, X. Hao, R. Motha, and J. Qu (2015). "Assessing the impact of year 2012 drought on corn yield in the US Corn Belt using precipitation data". *Journal of Earth Science and Engineering* 5. DOI: 10.17265/2159-581X/2015.06.001.

other publications:

- Y. Zou, G. R. Smith, T. Lauber, **J. Wan**, H. Ma, N. Gorelick, C. M. Zohner, and T. W. Crowther (2026). "Larger forest patches have greater per-area productivity". *Nature Ecology & Evolution* 10.7. DOI: 10.1038/s41559-026-03075-5.
- P.-J. Ke, G. S. Kandlikar, S. X. Ou, G.-C. Hsu, **J. Wan**, and M. Krishnadas (2025). "Time will tell: The temporal and demographic contexts of plant–soil microbe interactions". *Ecological Monographs* 95.3. DOI: 10.1002/ecm.70032.
- C. E. Willing, **J. Wan**, J. J. Yeaman, A. M. Cessna, and K. G. Peay (2024). "Arbuscular mycorrhizal fungi equalize differences in plant fitness and facilitate plant species coexistence through niche differentiation". *Nature Ecology & Evolution* 8.11. DOI: 10.1038/s41559-024-02526-1.
- M. E. Van Nuland, P.-J. Ke, **J. Wan**, and K. G. Peay (2023). "Mycorrhizal nutrient acquisition strategies shape tree competition and coexistence dynamics". *Journal of Ecology* 111.3. DOI: 10.1111/1365-2745.14040.

- J. Maschler, L. Bialic-Murphy, **J. Wan**, L. C. Andresen, C. M. Zohner, P. B. Reich, A. Lüscher, M. K. Schneider, C. Müller, G. Moser, J. S. Dukes, I. K. Schmidt, M. C. Bilton, K. Zhu, and T. W. Crowther (2022). "Links across ecological scales: Plant biomass responses to elevated CO₂". *Global Change Biology* 28.21. DOI: 10.1111/gcb.16351.
- T. Větrovský, P. Kohout, M. Kopecký, A. Machac, M. Man, B. D. Bahnmann, V. Brabcová, J. Choi, L. Meszárošová, Z. R. Human, C. Lepinay, S. Lladó, R. López-Mondéjar, T. Martinović, T. Mašínová, D. Morais, D. Navrátilová, I. Odriozola, M. Štursová, K. Švec, V. Tláškal, M. Urbanová, **J. Wan**, L. Žifčáková, A. Howe, J. Ladau, K. G. Peay, D. Storch, J. Wild, and P. Baldrian (2019). "A meta-analysis of global fungal distribution reveals climate-driven patterns". *Nature Communications* 10.1 (1). DOI: 10.1038/s41467-019-13164-8.
- T. W. Crowther, J. van den Hoogen, **J. Wan**, M. A. Mayes, A. D. Keiser, L. Mo, C. Averill, and D. S. Maynard (2019). "The global soil community and its influence on biogeochemistry". *Science* 365.6455. DOI: 10.1126/science.aav0550.
- M. Duhamel, **J. Wan**, L. M. Bogar, R. M. Segnitz, N. C. Duncritts, and K. G. Peay (2019). "Plant selection initiates alternative successional trajectories in the soil microbial community after disturbance". *Ecological Monographs* 89.3. DOI: 10.1002/ecm.1367.
- N. Weber, D. Liou, J. Dommer, P. MacMenamin, M. Quiñones, I. Misner, A. J. Oler, **J. Wan**, L. Kim, M. Coakley McCarthy, S. Ezeji, K. Noble, and D. E. Hurt (2018). "Nephele: a cloud platform for simplified, standardized and reproducible microbiome data analysis". *Bioinformatics* 34.8. DOI: 10.1093/bioinformatics/btx617.
- A. Schuler, V. Liu, **J. Wan**, A. Callahan, M. Udell, D. E. Stark, and N. H. Shah (2016). "Discovering patient phenotypes using generalized low rank models". *Biocomputing 2016: Proceedings of the Pacific Symposium*. World Scientific. DOI: 10.1142/9789814749411_0014.
- M. Qu, **J. Wan**, and X. Hao (2014). "Analysis of diurnal air temperature range change in the continental United States". *Weather and Climate Extremes* 4. DOI: 10.1016/j.wace.2014.05.002.

Teaching, Mentorship, and Service

2024	Community Ecology (National Taiwan University, EEB5103) Guest Lecture: <i>Biodiversity–Ecosystem Function</i>
2018, 2019, 2020	Ecology and Evolution: Term Paper (ETH Zürich, 701-1460-00L) Ecology and Evolution: Seminar (ETH Zürich, 701-1460-00L) Mentored Papers and Presentations: <i>Do plants share resources through networks of mutualist fungi?</i> , <i>Do more diverse natural communities protect people from disease?</i> , <i>A new ecology of positive species interactions</i>
2019–2020	M.Sc. Research Project (ETH Zürich, 551-1801-00L) Student: Simon Hepner (<i>Volatile production mediates higher-order interactions in wood decay fungi</i>)
2020	Architectural Design V-IX (ETH Zürich, 052-1120-20L)

Guest Lecture: *How to think like an ecologist*

2018–2019 **Organizer, Zurich Interaction Seminar**, ETH Zürich & UZH

2018 **Committee on Doctoral Supervision**, ETH Zürich

2017 **Bioinformatics Seminars**, Stanford Ecology & Evolution

Topics: *Basic Git for Versioning Scientific Analyses, Unix Command Line for the Molecular Ecologist, Introduction to Metabarcoding, Introduction to Genome Assembly*

Peer Review

American Naturalist (2×; editor recognition for “exceptional peer review” in 2020), *Ecology Letters* (4×), *PNAS*, *Nature Communications*, *New Phytologist*, *Journal of Ecology* (2×), *Ecology*, *ISME Communications*, *Oikos*, *Theoretical Ecology* *Environmental Microbiology*

Invited Talks

2025 **University of Graz**, Department of Biology Seminar Series

Seminar: *Modeling microbial hyperdiversity: a tractable approach from coexistence theory*

07/2025 **Asian Conference for Mathematical Biology/Japan Society for Mathematical Biology**, Special Symposium: “Emerging Mathematical and Modeling Approaches in Community and Ecosystem Ecology” (Kyoto, Japan)

Invited Contribution: *Coexistence theory for species pools: tractable insight from the cavity method*

07/2025 **PopBio on the Dark Side** [Pan-Asia/Pacific Virtual Speaker Series]

Virtual Seminar: *A unified theory of community structure*

Language Proficiency

English *native language*

German *fluent*

Chinese *fluent*