# Jiawei Bao

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## EMPLOYMENT

2023 - now **Institute of Science and Technology Austria (ISTA), Austria**
Marie Curie postdoctoral fellow, host: Prof. Caroline Muller

2019 - 2023 **Max Planck Institute for Meteorology, Germany**
Postdoctoral research scientist, advisor: Prof. Bjorn Stevens

## EDUCATION

2015 - 2019 **University of New South Wales, Australia**
Ph.D. in Climate Science, advisor: Prof. Steven Sherwood

2012 - 2015 **Beijing Normal University, China**
M.Sc. in Climate Science, advisor: Prof. Jinming Feng

2008 - 2012 **Nanjing University of Information Science and Technology, China**
B.Sc in Atmospheric Science

## AWARDS AND HONOURS

2023-2025 **Marie Curie postdoctoral fellowship** (IST-bridge)
Institute of Science and Technology Austria

2022 **Award for outstanding early career presentation**
GEWEX 3rd Pan-Gass meeting

2020 **Uwe Radok Award** for Best PhD thesis
Australian Meteorological & Oceangraphic Society (AMOS)

2019 **Chinese government award** for outstanding students abroad (300 globally across all the disciplines)

2018 **Award for best published paper** by a student
ARC centre of excellence for climate extremes

2017 **AGU editor's highlight**
The robust relationship between extreme precipitation and convective organization in idealized numerical modeling simulations.

2015 **TFS PhD scholarship, CCRC top-up PhD scholarship**
University of New South Wales

2015 **Laureate Fellowship top-up PhD scholarship**
University of New South Wales

## PUBLICATIONS

In preparation

- Risi, C. & co-authors including **Bao J.** Temperature lapse rate in the tropical and subtropical troposphere and along mountain slopes: present, past, future

In review

- Yoon, A., Hohenegger C., **Bao, J.** & Brunner, L. Threats on Amazon after deforestation: beyond annual precipitation
- Wang, J., Tett, S. **Bao, J.**, Sun Y., Wang, X. & Ge, Q. Anthropogenically inequitable risks of sequential extreme precipitation-humid heat events between tropical and extratropical regions
- Takasuka, D.*, Becker, T.* & **Bao, J**.* Characteristics of precipitation and moisture-convection relationships in global km-scale simulations (*equal first authors)

Published or accepted

19. **Bao, J**., Bony, S., Takasuka, D. & Muller, C. (2025) Tropics-wide intra-seasonal oscillations. *Proceedings of the National Academy of Sciences.* https://doi.org/10.1073/pnas.2511549122
18. Segura, H. & co-authors including **Bao, J**. (2025) nextGEMS: entering the era of kilometer-scale Earth system modeling. *Geoscientific Model Development.* https://doi.org/10.5194/gmd-18-7735-2025 (journal highlight paper)
17. Gnanaraj A., **Bao, J.** & Schmidt H. (2025) The impact of the rotation rate on an aquaplanet's radiant energy budget: Insights from experiments varying the Coriolis parameter. *Weather and Climate Dynamics.* https://doi.org/10.5194/wcd-6-489-2025
16. Schmidt, H. & co-authors including **Bao, J**. (2024) Effects of vertical grid spacing on the climate simulated in a global storm-resolving model. *Geoscientific Model Development.* https://doi.org/10.5194/gmd-17-1563-2024
15. **Bao, J.**, Stevens B., Kluft, L., & Muller, C. (2024) Intensification of tropical precipitation extremes from more organized convection. *Science Advances*. https://doi.org/10.1126/sciadv.adj6801
14. Hu, Y., Lin Y., Deng Y., & **Bao, J.** (2023) Summer Extreme Rainfall over the Middle and Lower Reaches of Yangtze River: Role of Synoptic Patterns in Historical Changes and Future Projection. *Journal of Geophysical Research: Atmospheres.* 128, e2023JD039608. https://doi.org/10.1029/2023JD039608
13. Hohenegger, C. & co-authors including **Bao J.** (2023) ICON-Sapphire: simulating the components of the Earth System and their interactions at kilometer and

subkilometer scales. *Geoscientific Model Development.* https://doi.org/10.5194/gmd-16-779-2023

12. Windmiller, J., **Bao, J.**, Sherwood, S. C., & Schanzer, T. (2023) Predicting convective downdrafts from updrafts and environmental conditions in a global storm resolving simulation. *Journal of Advances in Modeling Earth Systems.* https://doi.org/10.1029/2022MS003048

11. **Bao, J.**, Dixit, V., Sherwood, S. C. (2022) Zonal temperature gradients in the tropical free troposphere. *Journal of Climate.* https://doi.org/10.1175/JCLI-D-22-0145.1

10. **Bao, J.**, Stevens, B. Kluft, L. & Jimenez-de-la-Cuesta, D. (2021) Changes in the tropical lapse rate due to entrainment and their impact on climate sensitivity. *Geophysical Research Letters.* https://doi.org/10.1029/2021GL094969

9. Keil, P., Schmidt, H, Stevens, B. & **Bao, J**. (2021) Variations of tropical lapse rates in climate models and their implications for the upper tropospheric warming. *Journal of Climate*. https://doi.org/10.1175/JCLI-D-21-0196.1

8. **Bao, J.** & Stevens, B. (2021) The elements of the thermodynamic structure of the tropical atmosphere. *Journal of the meteorological society of Japan* . https://doi.org/10.2151/jmsj.2021-072

7. **Bao, J.** & Windmiller, J. M. (2021) Impact of microphysics on tropical precipitation extremes in a global storm-resolving model. *Geophysical Research Letters*. https://doi.org/10.1029/2021GL094206

6. **Bao, J.** & Sherwood, S. C. (2019). The role of convective self-aggregation in extreme instantaneous vs. daily precipitation. *Journal of Advances in Modeling Earth Systems*. https://doi.org/10.1029/2018MS001503

5. **Bao, J.**, Sherwood, S. C., Alexander, L. V., & Evans, J. P. (2018). Comments on 'Temperature-extreme precipitation scaling: a two-way causality?' *International Journal of Climatology.* https://doi.org/10.1002/joc.5665

4. **Bao, J.**, Sherwood, S. C., Colin, M., & Dixit, V. (2017). The robust relationship between extreme precipitation and convective organization in idealized numerical modeling simulations. *Journal of Advances in Modeling Earth Systems*, 9, 2291–2303. https://doi.org/ 10.1002/2017MS001125 (chosen to be editor's highlight)

3. **Bao, J.**, Sherwood, S. C., Alexander, L. V., & Evans, J. P. (2017). Future increases in extreme precipitation exceed observed scaling rates. *Nature Climate Change*, *7*, 128-132. https://doi.org/10.1038/nclimate3201.

2. **Bao, J.**, & Feng, J. (2016). Intercomparison of CMIP5 simulations of summer precipitation, evaporation, and water vapor transport over Yellow and Yangtze River basins. *Theoretical and applied climatology*, *123*(3-4), 437-452.

1. **Bao, J.**, Feng, J., & Wang, Y. (2015). Dynamical downscaling simulation and future projection of precipitation over China. *Journal of Geophysical Research: Atmospheres*, *120*(16), 8227-8243.

## TEACHING

| | |
|---|---|
| 09/2024 | Participant in 2-day workshop on basics in Didactics: Teaching & Learning in Higher Education |
| 2024 | **Lecturer** and **coordinator** for a graduate course in University of Vienna: Journal club about Climate modeling<br>Main lecturers: Jiawei Bao and Blaz Gasparini |
| 2023 | **Guest lecturer** for a graduate course in University of Hamburg: Tropical clouds and convection<br>Main lecturer: Raphaela Vogel |
| 2020-2021 | **Teaching assistant** for a graduate course in University of Hamburg: The trade winds<br>Main lecturer: Bjorn Stevens |

## SUPERVISION

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| PhD | Abisha Ganaraj (10/2021-10/2025)<br>PhD in University of Hamburg/IMPRS<br>Topic: Impact of earth's rotation on radiation, circulation and climate sensitivity<br>Co-supervise with Dr. Hauke Schmidt |
| PhD intern | Haruki Hagiwara (01/2024-02/2024)<br>Six-week rotation program at ISTA<br>Topic: Understanding the precipitation diurnal cycle over tropical island<br>Supervise with Prof. Caroline Muller |
| Master intern | Leo Demaine (03/2024-07/2024)<br>Five-month master intern program at ENS Lyon & ISTA<br>Topic: Understanding the relationship between precipitation extremes and MCS in RCEMIP simulations<br>Co-supervise with Prof. Caroline Muller |
| Master intern | Khushi Dani (09/2023-now)<br>Master intern at IIT Bombay<br>Topic: Understanding the link between convective organisation and Indian monsoon<br>Co-supervise with Prof. Vishal Dixit |
| Master intern | Laura Hasbini<br>Six-month master intern program at ENSTA Paris & MPI-M<br>Topic: Relative humidity distribution in CMIP6 simulations<br>Co-supervise with Dr. Hauke Schmidt |

## PROFESSIONAL ACTIVITIES

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|---|---|
| 2024-now | **Member** of WCRP APARC project: Atmospheric Temperature Changes and their Drivers (ATC) |
| 2024-now | **Coordinator** for joint meetings between climate dynamics group at University of Vienna and convection group at ISTA |
| 2024/2025 | **Judge** of EGU OSPP (Outstanding Student and PhD candidate Presentation) |
| 2016-now | **Reviewer** (20+ papers) for *Nature Geosciences, Science Advances, Journal of Advances in Modeling Earth Systems, Journal of Climate, Geophysical Research Letters, Weather and Climate Extremes, International Journal of Climatology, Weather and Climate Dynamics, Journal of Geophysical Research-Atmosphere, Journal of the Atmospheric Sciences* |
| 2019-2023 | **Internal reviewer** at MPI-M |
| 2019-2020 | **Coordinator** for MPI atmospheric department internal seminar |

## INVITED PRESENTATIONS

2025

- **University of Wisconsin–Madison,** department seminar (online)
  *Tropics-wide intraseasonal oscillations (TWISO)*

- **ETH Zurich,** IAC institute colloquium
  *Tropics-wide intraseasonal oscillations (TWISO)*

- **GEOMAR Helmholtz Centre for Ocean Research Kiel,** department seminar
  *Understanding the dynamics of mesoscale processes in the atmosphere*

- **Imperial College London,** department seminar
  *Understanding the dynamics of mesoscale processes in the atmosphere*

2024

- **Stockholm University,** department seminar
  *Understanding the dynamics of mesoscale processes in the atmosphere*

- **University of Vienna**, department colloquium
  *Intensification of tropical daily precipitation extremes from more organised convection*

- **Peking University**, department seminar
  *Intensification of tropical daily precipitation extremes from more organised convection*

2023

- **Tropical lapse rate workshop, Sorbonne University**, talk
*The thermal structure of tropical troposphere*

2022
- **University of California Los Angeles,** seminar (online)
*The thermal structure of tropical troposphere*

- **Europe Geoscience Union General Assembly**, talk
*Zonal temperature gradients in the tropical free-troposphere*

2021
- **University of Texas at Austin**, seminar (online)

2020
- **Climate Change Summer Institute, University of Washington Seattle**, talk (online)

2018
- **Monash University**, department seminar

## CONFERENCES SEMINARS AND WORKSHOPS

2025
- Europe Geoscience Union General Assembly, talk
*Links between atmospheric temperature, surface temperature and convective organisation*

2024
- GEWEX Open Science conference, talk
*Intensification of tropical daily precipitation extremes from more organised convection*

- Europe Geoscience Union General Assembly, talk
*Intensification of daily tropical precipitation extremes from more organised convection*

2023
- 3rd workshop on spatial organization of convection, clouds and precipitation, talk
*Intensification of tropical precipitation extremes from more organized convection.*

- CFMIP-GASS, poster
Tropical-wide oscillations: RCE or MJO?

2022
- 3rd GEWEX Pan-Gass meeting, talk

*Intensification of tropical precipitation extremes from more organized convection*

- CFMIP, talk

*Zonal temperature gradients in the tropical free-troposphere*

2021

- MPI-Meteorology, seminar
- CFMIP, poster
- 1st Workshop on spatial organization of convection, clouds and precipitation, poster

2019

- 2nd ICTP Summer School on Theory, Mechanisms and Hierarchical Modelling of Climate Dynamics

2018

- CFMIP, poster
- The 2nd GEWEX Pan-Gass meeting, poster

2016

- Convection permitting modeling workshop, poster