Dr. Chao Li

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Date and place of birth

07 November 1981, LuoTian, Hubei Province, China

Curriculum vitae

Professional Experience and Education

Present– Jan. 2024	Distinguished Guest Professor , at Institute of Atmospheric Physics (IAP), the Chinese Academy of Sciences (CAS)
Present– Jan. 2019	Research Scientist , at Max Planck Institute for Meteorology, Hamburg, Germany
	Research topic: climate-economic interactions and future mitigation scenarios Project: the Cluster of Excellence "Climate, Climatic Change, and Society" (CLICCS), funded by German Research Foundation (DFG)
Dec. 2018 – Jan. 2015	Research Scientist , at Max Planck Institute for Meteorology, Hamburg, Germany
	Research topic: optimal future mitigation scenarios to limit global climate change Project: the Cluster of Excellence "Integrated Climate System Analysis and Predic- tion" (CliSAP), funded by German Research Foundation (DFG)
Dec. 2014 – Jan. 2013	PostDoc , at the University of Hamburg and Max Planck Institute for Meteorology, Hamburg, Germany Research topic: conceptual climate modelling and integrated assessment modelling Mentor: Prof. Dr. Jochem Marotzke and Prof. Dr. Hermann Held
	Project: the Cluster of Excellence "Integrated Climate System Analysis and Predic- tion" (CliSAP), funded by German Research Foundation (DFG)
Dec. 2012 –	PostDoc , at Max Planck Institute for Meteorology, Hamburg, Germany
Jul. 2012	Mentor: Prof. Dr. Jochem Marotzke

Page	2
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Jun. 2012 – Mar. 2008	Doctoral Candidate, at Max Planck Institute for Meteorology and University of Hamburg, Hamburg, Germany Dissertation title: Long-term stability and adjustment toward equilibrium in a future warm climate Mentor: Prof. Dr. Jochem Marotzke and Prof. Dr. Jin-Song von Storch Funding: doctoral fellowship of the International Max Planck Research School on Earth System Modelling (IMPRS-ESM), funded by Max Planck Society (MPG)
Feb. 2008 – May. 2006	Visiting scholar and research assistant , at LASG, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China <i>Topics: tropical air-sea interaction and ocean general circulation modelling Mentor: Prof. Dr. Yongqiang Yu</i>
Jul. 2007 – Sep. 2004	Master student, at South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou, China topic: Seasonal variation of Eastern-Hemisphere warm pool and its mixed layer heat budget Mentor: Prof. Dr. Dongxiao Wang and Prof. Dr. Yongqiang Yu Funding: graduate student scholarship of the Chinese Academy of Sciences
Jun. 2004 – Aug. 2000	 Bachelor of Nature Science at Sun Yat-Sen University, Guangzhou, China Thesis title: A semi-Lagrangian and semi-implicit scheme for zonal-wind diagnosed equations Mentor: Prof. Dr. Zhuojian Yuan Note: High Distinction of the National Entrance Examination for Postgraduate
Jul. 2000 – Aug. 1997	<pre>student at Luotian No.1 High-School, Hubei, China Note: High Distinction of the National College Entrance Examination (also known as "Gaokao")</pre>

Research leadership and expeditions

- 2023-2026 **Project Leader** of WorldTrans: Transparent Assessments for Real People Note: WorldTrans is a 5 million EUR Horizon Europe-funded project led by the Norwegian Meteorological Institute and supported by 10 partners across Europe. I jointly wrote the proposal.
- 2020-2024 **Project coordinator** of Monsoon-2.0 Note: Monsoon-2.0 is a one million BMBF-funded project led by the Max Planck Institute for Meteorology and supported by 3 partners across Germany. I jointly wrote the proposal.

2023 **Convener of** of the Berlin Summit for Earth Virtualization Engine Note: The Berlin Summit will bring together invited participants from across the world to develop a vision or blueprint for EVE, as a coordinated global effort to tap into the potential of technology and human ingenuity to meet best the challenges identified and those yet to come. I am one of the co-authors of the EVE white paper.

Post-Docs supervised

Jan. 2021 –	Mentor of Dr.	Mingna Wu
Apr. 2023 – Dec. 2025	Mentor of Dr.	Joise Aruhasi

Apr. 2023 – **Mentor** of Dr. Lennart Ramme Mar. 2026

Teaching and student tutoring experience

Mar. 2018	Lecture of Climate uncertainty and climate policy at the training workshop on Multi-scale Modelling of Atmospheric Processes, Beijing, China
March 2024 – May 2024	Advisor of guest doctoral student Xiuwen Guo
Feb 2023 – Feb 2024	Advisor of guest doctoral student Tianyan Li
May 2022 –	Co-Advisor of doctoral student Felix Schaumann
Jun. 2019 – Apr. 2016	Co-advisor of doctoral student Laura Suarez-Gutierrez
2016 - 2015	Co-advisor of Master student Laura Suarez-Gutierrez

Scholarships and Awards

2024 Max Planck Institute Bonus Given for an exceptional contribution to promote international cooperation of Max Planck Institute for Meteorology with the Institute of Atmospheric Physics, Chinese Academy of Sciences, and contribution to CLICCS II proposal writing

C. V. of Chao Li, November 15, 2024

2018	Max Planck Institute Bonus Given for an exceptional contribution to promote international cooperation of Max Planck Institute for Meteorology with the China Meteorological Administration and the Institute of Atmospheric Physics, Chinese Academy of Sciences
2004	The Chinese Academy of Science Graduate Student ScholarshipFor the high distinction of the National Entrance Examination for Postgraduate
2002	The Sun Yat-Sen University Student Scholarship For the high distinction of annual examination
2001	The Sun Yat-Sen University Student Scholarship For the high distinction of annual examination

Publications

In preparation

Li, C., 2024: The impact of climate internal variability on regional and global economic damage, *in preparation*.

Li, C., H. Li, and J. Marotzke, 2024: The stability of Atlantic meridional overturning circulation and its impact on climate reversibility in a future warm climate, *In preparation*.

Hasi Aru, D. Olonscheck, J. Marotzke, and C. Li, 2024: Observed fingerprint of global warming, *To be submitted.*

Refereed Publications

33 Wu, M., C. Li, M. Collins, H. Li, X. Chen, T. Zhou, Z. Zhang, 2024: Early emergence and determinants of human-induced Walker circulation weakening. Nature Communications, 15, 9161. https://doi.org/10.1038/s41467-024-53509-6.

32 Wu, M., C. Li, Z. Zhang, 2024: Recalibrated projections of the Hadley circulation under global warming. Environ. Res. Lett., 19,104041, DOI 10.1088/1748-9326/ad751f

31 Song J., F. Song, Z. Feng, L. R. Leung, C. Li, L. Wu, 2024: Realistic precipitation diurnal cycle in global convection-permitting models by resolving mesoscale convective systems. Geophysical Research Letters, https://doi.org/10.1029/2024GL109945.

30 Wu, M., T. Zhou, C. Li, B. Wu, J. Jiang, 2024: Unraveling the role of the Interdecadal Pacific Oscillation in recent tropical expansion via large-ensemble simulations. JGR-Atmosphere, https://doi.org/10.1029/2023JD040294

29 Liu, W., S. Li , C. Li, M. Rubenstein, A. Thomas, 2024: Contrasting fast and slow ITCZ migrations linked to delayed Southern Ocean warming. Nature Climate Change, 14, 732-739 (2024). https://doi.org/10.1038/s41558-024-02034-x

28 Zhang, W., R. Clark, T. Zhou, L. Li, C. Li, J. Rivera, L. Zhang, K. Gui, T. Zhang, L. Li, R. Pan, Y. Chen, S. Tang, X. Huang, and S. Hu, 2024: 2023: Weather and climate extremes hitting the globe with emerging features. Adv. Atmos. Sci., https://doi.org/10.1007/s00376-024-4080-3

27 Stevens, B., and co-authors (including **C. Li**), 2024. Earth Virtualization Engines (EVE). Earth System Science Data. doi:10.5194/essd-2023-376

26 Jiang, J., T. Zhou, Q. Yu, C. Li, F. Song, H. Li, X. Chen, W. Zhang, Z. Chen, 2023: Precipitation regime changes in High Mountain Asia driven by cleaner air. Nature, 623, 544-549 (2023). https://doi.org/10.1038/s41586-023-06619-y

25 Li, P. , F. Song, H. Chen, J. Li, A. F. Prein, W. Zhang, T. Zhou, M. Zhuang, K. Furtado, M. Muetzelfeldt, R. Schiemann, and **C. Li**, 2023: Intensification of mesoscale convective systems in the East Asian rainband over the past two decades. Geophysical Research Letters, 50 (16). e2023GL103595.

24 Zhou, T., W. Zhang, D. Chen, X. Zhang, C. Li, M. Zuo, and X. Chen, 2022: Understanding and building upon pioneering work of Nobel Prize in Physics 2021 laureates Syukuro Manabe and Klaus Hasselmann: From greenhouse effect to Earth system science and beyond. Science China Earth Sciences, 65, 589-600. doi:10.1007/s11430-022-9906-4

23 Wu, M., T. Zhou, C. Li, H. Li, X. Chen, B. Wu, W. Zhang, and L. Zhang, 2021: A very likely weakening of Pacific Walker Circulation in constrained near-future projections. Nature Communications, 12, 6502. https://doi.org/10.1038/s41467-021-26693-y.

22 Suarez-Gutierrez, L., W. Müller, W., **Li**, **C**. and J. Marotzke, 2020: Dynamical and thermodynamical drivers of variability in European summer heat extremes. Climate Dynamics, 54, 4351-4366. doi:10.1007/s00382-020-05233-2.

21 Suarez-Gutierrez, L., W. Müller, **C. Li**, and J. Marotzke, 2020: Hotspots of extreme heat under global warming. Climate Dynamics, 55, 429-447. doi:10.1007/s00382-020-05263-w.

20. Li, C., H. Held, S. Hokamp, and J. Marotzke, 2020: Optimal temperature overshoot profile found by limiting global sea-level rise as a lower-cost climate target, *Science Advances*, 6: eaaw9490. doi:10.1126/sciadv.aaw9490. (Highlighted by *Science Advances* as a cover article and highlighted by the chief editor of *Science Advances*)

19. Huang, X., Zhou T., Dai A., Li H., **Li**, **C**., Chen X., Lu J., von Stroch J.-S. and Wu B.,(2020). South Asian summer monsoon projections constrained by the Interdecadal Pacific Oscillation, *Science Advances*, 6: eaay6546. doi:10.1126/sciadv.aay6546.

 Rugenstein, M., J. Bloch-Johnson, J. Gregory, T. Andrews, T. Mauritsen, C. Li, T. Frölicher,
 D. Paynter, G. Danabasoglu, S. Yang, J. Dufresne, L. Cao, G. A. Schmidt. Abe-Ouchi, O. Geoffroy, and R. Knutti, 2020: Equilibrium climate sensitivity estimated by equilibrating climate models. *Geophysical Research Letters*, 47: e2019GL083898. doi:10.1029/2019GL083898.

17. Zhou, T., J. Luterbacher, S. Wu, C. Li, Q. Chao, X. Cheng, Y. Duan, J. Li, B. Stevens, S. Voigt, Y. Zhang, X. Zheng, and L. Zou, 2019: A new era of China-Germany joint research exploring the climate mystery of Earth. *Science Bulletin*, 64, 1733-1736.

16. Rugenstein M., J. Bloch-Johnson, A. Abe-Ouchi, T. Andrews, U. Beyerle, L. Cao, G. Danabasoglu, J. Dufresne, L. Duan, M. Foujols, T. Frölicher, O, Geoffroy, J. Gregory, R. Knutti, C. Li, A. Marzocchi, T. Mauritsen, M. Menary, E. Moyer, L. Nazarenko, D. Paynter, D. Saint-Martin, G. Schmidt, A. Yamamoto, S. Yang, 2019: LongRunMIP - motivation and design for a large collection of millennial long AO-GCM simulations, *Bulletin of the American Meteorological Society*, 100, 2551-2570. doi:10.1175/BAMS-D-19-0068.1.

15. Maher, N., S. Milinski, L. Suarez-Gutierrez, M. Botzet, L. Kornblueh, Y. Takano, J. Kröger, R. Ghosh, C. Hedemann, C. Li, H. Li, E. Manzini, D. Notz, D. Putrasahan, L. Boysen, M. Claussen, T. Ilyina, D. Olonscheck, T. Raddatz, B. Stevens, and J. Marotzke, 2019: The Max Planck Institute Grand Ensemble - Enabling the Exploration of Climate System Variability, *Journal of Advances in Modeling Earth Systems*, 11, 2050-2069. doi:10.1029/2019MS001639.

14. Wu, B., T. Zhou, C. Li, W. A. Muller, J. Lin, 2019: Improved decadal prediction of Northern-Hemisphere summer land temperature. *Climate Dynamics*. https://doi.org/10.1007/s00382-019-04658-8

13. Suárez-Gutiérrez, L., C. Li, W. Mueller, and J. Marotzke, 2018: Internal variability in European summer temperatures at 1.5° C and $2^{\circ}C$ of global warming, *Envirmental Research Letters*, DOI:10.1088/1748-9326/aaba58.

12. Suárez-Gutiérrez, L., C. Li, P. Thorne, and J. Marotzke, 2017: Internal variability in simulated and observed tropical tropospheric temperature trends, *Geophysical Research Letters*, 44, DOI:10.1002/2017GL073798.

11. Liu, L., Z. Li, X. Yang. H. Gong, C. Li, and A. Xiong 2016: The long-term trend in the diurnal temperature range over Asia and its natural and anthropogenic causes. *J. Geophys. Res. Atmos.*, DOI: 10.002/2015JD024549.

10. Li, C., B. Stevens, and J. Marotzke, 2015: Eurasian winter cooling in the warming hiatus of 1998–2012. *Geophysical Research Letters*, DOI:10.1002/2015GL065327.

9. Li, C., D. Notz, S. Tietsche, and J. Marotzke, 2013: The transient versus the equilibrium response of sea ice to global warming, *Journal of Climate*, 26, 5624-5636.

8. Li, C., J.-S. v. Storch, and J. Marotzke, 2013: Deep-ocean heat uptake and equilibrium climate response. *Climate Dynamics*, DOI: 10.1007/s00382-012-1350-z.

7. Wang W., D. Wang, W. Zhou, Q. Liu, Y. Yu, and C. Li, 2011: Impact of the South China Sea throughflow on the Pacific low-latitude western boundary current: A numerical study for seasonal and interannual time scales, *Advanced in Atmospheric Sciences*, DOI: 10.1007/s00376-011-0142-4.

6. Yu, Y., **C. Li**, D. Wang, H. Liu, 2011: Numeric simulation of seasonal cycle in the warm pool and its sensitivity to surface heat flux and momentum forcing, *Journal of Tropical Oceanography*, **30**(1), 1-10 (in Chinese with English abstract).

5. Lin, P., H. Liu, C. Li, and X. Zhang, 2010: Spring cold bias of SST and minimal wind mixing in the equatorial pacific cold tongue, *Atmospheric and Oceanic Science Letters*, **3**(6), 342-346.

4. Wang, W, Y. Yu, C. Li, W. Zhou, Q. Liu. and D. Wang, 2010: An investigation of the South China Sea throughflow and its impact on upper layer heat content of the South China Sea using LICOM. *Acta Oceanologica Sinica*, **32**(2), 1-11 (in Chinese with English abstract).

3. Li, H., T. Zhou, and C. Li, 2009: Decreasing trend in global land monsoon precipitation over the past 50 years simulated by a coupled climate model, *Advanced in Atmospheric Sciences*, DOI: 10.1007/s00376-009-8173-9.

2. Yu, Y., H. Zhi, B. Wang, H. Wan, C. Li, H. Liu, W. Li, W. Zheng, and T. Zhou, 2008: Coupled model simulations of climate changes in the 20th century and beyond, *Advanced in Atmospheric Sciences*, DOI: 10.1007/s00376-008-0641-0.

1. Li, C, Y. Zhang, D. Wang, 2006: Impact of cold surges on sea surface temperature in South China Sea in autumn of 2004, *Journal of Tropical Oceanography*, 25(2), 1-10 (in Chinese with English abstract).

Book contributions

C. Li, E. Yang, Z. Liu, (2023). Klima, Klimawandel und zunehmende Extremereignisse. In Sina Hardaker and Peter Dannenberg Hrsg. (Eds), China - Geographien einer Weltmacht. Springer.

Marotzke, J., D. Notz, C. Li, (2023). Physical process assessments - Atlantic Meridional Overturning Circulation (AMOC) instability. In Engels, A., Marotzke, J., Goncalves Gresse, E., López-Rivera, A., Pagnone, A., and Wilkens, J. (Eds.), Hamburg Climate Futures Outlook 2023: The plausibility of a 1.5°C limit to global warming - social drivers and physical processes (pp.150-151). Hamburg: Cluster of Excellence Climate, Climatic Change, and Society (CLICCS).

Notz, D., C. Li, J. Marotzke, A. López-Rivera, (2023). Physical process assessments - Arctic seaice decline: the underrated power of linear change. In Engels, A., Marotzke, J., Goncalves Gresse, E., López-Rivera, A., Pagnone, A. and Wilkens, J. (Eds.), Hamburg Climate Futures Outlook 2023: The plausibility of a 1.5°C limit to global warming - social drivers and physical processes (pp.144-147). Hamburg: Cluster of Excellence Climate, Climatic Change, and Society (CLICCS).

Notz, D., C. Li, J. Marotzke, C. Fröhlich, (2023). Physical process assessments - Polar ice-sheet melt: on the verge of tipping. In Engels, A., Marotzke, J., Goncalves Gresse, E., López-Rivera, A., Pagnone, A. and Wilkens, J. (Eds.), Hamburg Climate Futures Outlook 2023: The plausibility of a 1.5°C limit to global warming - social drivers and physical processes (pp.147-149). Hamburg: Cluster of Excellence Climate, Climatic Change, and Society (CLICCS).

Held, H., S. Aykut, C. Hedemann, C. Li, J. Marotzke, J. Petzold, U. Schneider, (2021). Plausibility of model-based emissions scenarios. In Stammer, D., Engels, A., Marotzke, J., Gresse, E., Hedemann, C. and Petzold, J. (Eds.), Hamburg Climate Futures Outlook 2021: Assessing the plausibility of deep decarbonization by 2050 (pp.21-26). Hamburg: Cluster of Excellence Climate, Climatic Change, and Society (CLICCS).

Other Publications

Li,C., 2012: Long-term stability and adjustment toward equilibrium in a future warm climate, Ph.D thesis, University of Hamburg, Hamburg, Reports on Earth System Science, 119pp.

Li, C., 2007: Seasonal variation of Eastern-Hemisphere warm pool and its mixed layer heat budget, M. Sc. thesis, *Graduate University of Chinese Academy of Science, Beijing*, 79pp (in Chinese with English abstract).

Li, C., 2004: A semi-Lagrangian and semi-implicit scheme for zonal-wind diagnosed equations, B. Sc. thesis, *Sun Yat-Sen University, Guangzhou* (in Chinese).

Invited Presentations

2023	LASG/IAP Seminar, Beijing Assessing the complexities: uncertainty and economic costs of climate change
2023	Chufeng Colloquium, China University of Geoscience, Wuhan Economic impacts of internal variability and patterns in the climate system
2019	The Sun Yat-Sen University Zhuhai Seminar Exploring plausible mitigation scenarios to limit global climate change
2019	The first international workshop on GMMIP, Beijing Incorporating climate internal variability into policy decision-making framework
2017	The LASG/IAP Seminar Climate targets to limit climate change
2017	The CAMS/CMA Seminar Climate targets to limit climate change

C. V. of Chao Li, November 15, 2024

2017	The Sun Yat-Sen University Zhuhai Seminar Climate targets to limit global sea-level rise
2016	the Climate Symposium 2014, Darmstadt, Germany The transient versus the equilibrium response of sea ice to global warming
2014	The GFDL Seminar
2012	The LASG/IAP SeminarLong-term stability and adjustment toward equilibrium in a future warm climate
2012	The BCC/CMA SeminarLong-term stability and adjustment toward equilibrium in a future warm climate
2012	The GEOMAR Seminar Long-term stability and adjustment toward equilibrium in a future warm climate

Conference Presentations

Li, C., 2023: The stability of Atlantic meridional overturning circulation and its impact on climate reversibility in a future warm climate, WCRP Open Science Conference, Kigali, Rwanda, 21-27 Oct.

Li, C., 2023: The stability of Atlantic meridional overturning circulation and its impact on climate reversibility in a future warm climate, TEWEX-CLIMA, Shangri-La China, 07-11 Aug.

Li, C., 2023: Assessing the complexities: uncertainty and economic costs of climate change, The Max Planck Climate Conference for a Sustainable Anthropocene, Berlin, 11-12 July.

Li, C., H. Held, S. Hokamp, and J. Marotzke, 2020: Using global sea-level rise targets to find optimal temperature overshoot profile, European Geosciences Union, Virtual meeting, 4-8 May.

Li, C., H. Held, S. Hokamp, and J. Marotzke, 2019: Limiting global sea-level rise as a lower cost climate target, the AGU Fall meeting, San Francisco, 9-13 Dec.

Li, C., H. Held, S. Hokamp, and J. Marotzke, 2017: Climate targets to limit global sea-level rise, oral presentation given at Fourth International Conference on Earth System Modelling, Hamburg, Germany, 28 Aug - 1 Sep.

Li, C., B. Stevens, and J. Marotzke, 2016: Eurasian winter cooling in the warming hiatus of 1998-2012, oral presentation given at 2016 Ocean Science Meeting, New Orleans, Louisiana, USA, 21-26 February.

Li, C., B. Stevens, and J. Marotzke, 2015: Eurasian winter cooling in the warming hiatus of 1998-2012, oral presentation given at Our Common Future Under Climate Change, Paris, France, 7-10 July 2015.

Li, C., C. Timmreck, W. Mueller, H. Schmidt, B. Stevens, H. Held, and J. Marotzke, 2014: The hiatus in global surface warming over 1998-2012, oral Presentation given at Stratospheretroposphere Processes And their Role in Climate 2014 General Assembly, Queenstown, New Zealand, 12-17 January 2014.

Li, C., D. Notz, S. Tietsche, and J. Marotzke, 2011: CO_2 as a driver of sea ice tipping points, oral presentation given at the European Geosciences Union General Assembly, Vienna, Austria, 3-8 April 2011.

Li, C., J.-S. v. Storch, and J. Marotzke, 2009: Climate sensitivity, ocean heat uptake and timedependent climate change, oral presentation given at the European Geosciences Union General Assembly, Vienna, Austria, 2-7 May 2010.

Advanced professional training workshops

2019	3rd Fulbright-Cottrell Junior Faculty Professional Development Workshop
2019	Leadership skills
2017	Max Planck Society advanced training workshops on "Effective Proposal Writing"
2016	Max Planck Society advanced training workshops on "Presentation Skills for Post-Docs"
2016	Max Planck Society advanced training workshops on "Projects Management"
2016	Max Planck Society advanced training workshops on "Leadership in Science and Research fro PostDoc"
2016	Max Planck Society advanced training workshops on "Improved Reading"

Professional activities

- Serve as reviewer for peer-reviewed journals: Geophysical Research Letters, Journal of Climate, Climatic Change, Climate Dynamics, Journal of Geophysical Research-Atmosphere, Scientific Reports, Advanced Atmospheric Sciences, Science Bulletin, International Journal of Climatology, Journal of Hydrometeorology
- Serve as one of the delegations of German Federal Ministry of Education and Research to visit the Ministry of Science and Technology (MOST) of China, and to promote the bilateral intergovernmental cooperation on climate change.
- Elected scientific staff representative of Max Planck Institute for Meteorology