Curriculum Vitæ

Hao Chen

Assistant Professor, Priv.-Doz. Dr. rer. nat. habil.

Institute of Mathematical Sciences,
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Language Chinese (native), English (fluent), French (fluent), German (very good command).

Family status Married, 1 child (b. 2017).

Research Interest

Complex Analysis & Differential Geometry: Minimal surfaces and constant mean curvature surfaces

Discrete Geometry: Sphere packings, polytopes, codes, graphs

Material Sciences: Bicontinuous structures in softmatters

Education

Dr. rer. nat. on Discrete geometry, 2011–2014, Freie Universität Berlin, Germany
Advisor: Prof. Günter M. Ziegler
Dissertation: Ball Packings and Lorentzian Discrete Geometry

Master on Quantum physics, 2010–2011, Ecole Normale Supérieure (joint program), France

Diplôme de l'X on Mathematics, 2007–2011, Ecole Polytechnique, France

Bachelor of Science on Applied physics, 2003–2007, Shanghai Jiao Tong University, China.
Including one semester in exchange at Hong Kong University.

Research Experience

Sep 2022 — Now — Assistant Professor
ShanghaiTech University, Institute of Mathematical Sciences

Jun 2021 — Habilitation
Universität Göttingen
Thesis: Triply Periodic Minimal Surfaces of Genus 3

Jun 2018 – Mar 2022 — PostDoc
Institut für Numerische und Angewandte Mathematik, Universität Göttingen
Host: Prof. Max Wardetzky

Jun 2016 – May 2018 — Visiting positions
Max Planck Institute for Dynamics and Self-Organization
Mathematical Sciences Research Institute (Research semester "Geometric and Topological Combinatorics")
University of Luxemburg, Mathematics Research Unit
University of St Andrews, School of Mathematics and Statistics

Aug 2015 – May 2016 — Postdoctoral researcher
Technische Universiteit Eindhoven, Departement of Maths & CS
Host: Prof. Jan Draisma

Sep 2014–Jul 2015 — Postdoctoral researcher
Freie Universität Berlin, Institut für Mathematik, Arbeitsgruppe Diskrete Geometrie.
Host: Prof. Günter M. Ziegler

Apr–Jul 2010 — Research internship
MPI for Mathematics in the Sciences
Advisor: Prof. Jürgen Jost

Fundings

Jul 2025 –
Natural Science Foundation of Shanghai, General Project "Construction of Minimal Surfaces of Infinite Genus" (project number 25ZR1401249).

Jun 2018 – Jul 2021
DFG Individual Grant "Defects in Triply Periodic Minimal Surfaces" Projektnummer 398759432.

Publication List

[1] Hao Chen, Yunhua Wu. Gluing doubly periodic Scherk surfaces into minimal surfaces. Preprint, arXiv:2507.12859.

[2] Hao Chen, Anu Dhochak, Pradip Kumar, and Sai Rasmi Ranjan. Singularities on maxfaces constructed by node-opening. Preprint, arXiv:2402.11965.

[3] Yanhong Zhang, Junming Zhang, Xiaotian Chen, Weidong Yang, Hao Chen, Shunai Che, Lu Han. Mechanical Properties of 3D-Printed Polymeric Cellular Structures Based on Bifurcating Triply Periodic Minimal Surfaces *Advanced Engineering Materials*, 27(9):240257, 2025. https://doi.org/10.1002/adem.202402507.

[4] Hao Chen. Gluing Karcher-Scherk saddle towers II: Singly periodic minimal surfaces. *Communications in Analysis and Geometry*, 32(9):2583–2615, 2024. https://doi.org/10.4310/CAG.241212035049.

[5] Shuqi Wang, Hao Chen, Tianyu Zhong, Quanzheng Deng, Shaobo Yang, Yuanyuan Cao, Yongsheng Li, and Lu Han. Tetragonal gyroid structure from symmetry manipulation — a brand-new member of gyroid surface family. *Chem*, 10(5):1406–1424, 2024. https://doi.org/10.1016/j.chempr.2023.12.017.

[6] Hao Chen and Martin Traizet. Gluing Karcher-Scherk saddle towers I: Triply periodic minimal surfaces. *Journal für die reine und angewandte Mathematik*, 808:1–47, 2024. https://doi.org/10.1515/crelle-2023-0086.

[7] Hao Chen, Peter Connor and Kevin Li. Catenoid limits of saddle towers. *Pacific Journal of Mathematics* 325(1):11–46, 2023. http://doi.org/10.2140/pjm.2023.325.11.

[8] Hao Chen and Daniel Freese. Helicoids and vortices. *Proceedings of the Royal Society A* 478:20220431. https://doi.org/10.1098/rspa.2022.0431.

[9] Hao Chen and Jean-Marc Schlenker. Weakly inscribed polyhedra. *Transactions of the American Mathematical Society, Series B*, 9:415–449, 2022. http://doi.org/10.1090/btran/59.

[10] Hao Chen. Existence of the tetragonal and rhombohedral deformation families of the gyroid. *Indiana University Mathematics Journal*, 70(4):1543–1576, 2021. https://doi.org/10.1512/iumj.2021.70.8505.

[11] Qingqing Sheng, Hao Chen, Wenting Mao, Congcong Cui, Shunai Che, and Lu Han. Self-Assembly of Single Diamond Surface Networks. *Angewandte Chemie International Edition*, 60(28): 15236–15242, 2021. https://doi.org/10.1002/anie.202102056.

[12] Chao Bao, Hao Chen, Shunai Che, and Lu Han Direct imaging of the structural transition and interconversion of macroporous bicontinuous diamond-surface structure. *Microporous and Mesoporous Materials*, 320: 111084, 2021. http://doi.org/10.1016/j.micromeso.2021.111084.

[13] Hao Chen and Martin Traizet. Stacking disorder in periodic minimal surfaces. *SIAM Journal on Mathematical Analysis*, 53(1):855–887, 2021. https://doi.org/10.1137/20M1312137.

[14] Hao Chen and Matthias Weber. An orthorhombic deformation family of Schwarz' H surfaces. *Transactions of the American Mathematical Society*, 374(3):2057–2078, 2021. https://doi.org/10.1090/tran/8275.

[15] Hao Chen and Matthias Weber. A new deformation family of Schwarz' D surface. *Transactions of the American Mathematical Society*, 374(4):2785–2803, 2021. https://doi.org/10.1090/tran/8274.

[16] Lu Han, Nobuhisa Fujita, Hao Chen, Chenyu Jin, Osamu Terasaki, and Shunai Che. Crystal twinning of bicontinuous cubic structures. *IUCrJ*, 7(2), 2020. https://doi.org/10.1107/S2052252519017287.

[17] Hao Chen. Minimal twin surfaces. *Experimental Mathematics*, 28(4):404–419, 2019. https://doi.org/10.1080/10586458.2017.1413455.

[18] Hao Chen and Chenyu Jin. Competition brings out the best: Modeling the frustration between curvature energy and chain packing energy. *Interface Focus*, 7(4):20160114, 2017. https://doi.org/10.1098/rsfs.2016.0114.

[19] Hao Chen and Jean-Philippe Labbé. Limit directions for Lorentzian Coxeter systems. *Groups, Geometry and Dynamics*, 11(2):469–498, 2017. https://doi.org/10.4171/GGD/404.

[20] Hao Chen and Arnau Padrol. Scribability problems for polytopes. *European Journal of Combinatorics*, 64:1–26, 2017. https://doi.org/10.1016/j.ejc.2017.02.006.

[21] Aart Blokhuis and Hao Chen. Selectively balancing unit vectors. *Combinatorica*, 28:67–74, 2018. https://doi.org/10.1007/10.1007/s00493-016-3635-z.

[22] Hao Chen. Ball packings with high chromatic numbers from strongly regular graphs. *Discrete Mathematics*, 340(7):1645–1648, 2017. https://doi.org/10.1016/j.disc.2017.03.006.

[23] Hao Chen. Even more infinite ball packings from Lorentzian root systems. *Electronic Journal of Combinatorics*, Paper #P3.16, 2016. https://doi.org/10.37236/4989.

[24] Hao Chen. Apollonian ball packings and stacked polytopes. *Discrete & Computational Geometry*, 55(4):801–826, 2016. https://doi.org/10.1007/s00454-016-9777-3.

[25] Hao Chen. Distance geometry for kissing spheres. *Linear Algebra and its Applications*, 479:185–201, 2015. https://doi.org/10.1016/j.laa.2015.04.012.

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[27] Hao Chen and Jürgen Jost. Minimum vertex covers and the spectrum of the normalized Laplacian on trees. *Linear Algebra and its Applications*, 437(4):1089–1101, 2012. https://doi.org/10.1016/j.laa.2012.04.005.

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Google Scholar: https://scholar.google.com/citations?user=SdY1GDkAAAAJ