

## Curriculum Vitæ

# Hao Chen

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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

## 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

**2022** — Assistant Professor (planned)  
ShanghaiTech University, Institute of Mathematical Sciences

**Jun 2021** — Habilitation at 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

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

## Professional Activities

### Teaching

WS 21–22 — Lecturer for “Introduction to Geometric Processing” at Göttingen, Germany.  
 WS 19–20 — Lecturer for “Triply Periodic Minimal Surfaces: An interdisciplinary course” at Göttingen, Germany.  
 SS 2019 — Tutor & Lecturer for “Introduction to graph theory” at Göttingen, Germany.  
 WS 18–19 — Lecturer for “Introduction to polytope theory” at Göttingen, Germany.  
 WS 15–16 — Tutor for Calculus at Eindhoven, Netherlands.

### Service

Referee for: Geometriae Dedicata, Discrete Mathematics, European Journal of Combinatorics, Discrete and Combinatorial Geometry, Electronic Journal of Combinatorics, Experimental Mathematics,

### Recent invited talks

2022 — Mathematical Colloquium at TU Darmstadt  
 Title: Triply Periodic Minimal Surfaces  
 2021 — Discretization in Geometry and Dynamics (SFB/TRR 109) seminar  
 Title: Triply Periodic Minimal Surfaces  
 2021 — 3rd Geometric Analysis Festival  
 Title: Gluing Karcher–Scherk Saddle Towers  
 2021 — Geometry & Analysis Seminar at Rice University  
 Title: Triply Periodic Minimal Surfaces: How defects and disorders helped perfection.  
 2019 — TU Darmstadt  
 Title: New triply periodic minimal surfaces of genus 3.  
 2018 — Minimal Surfaces: Integrable Systems and Visualization, Summer 2018 Workshop at TU Munich  
 Title: New TPMS of genus 3, and where to find them.  
 2017 — Geometry Seminar at Stanford University  
 Title: Defects in Periodic Minimal Surfaces.

## Publication List

- [1] Hao Chen and Daniel Freese. Helicoids and vortices. 2022. Preprint available at [arXiv:2201.13091](https://arxiv.org/abs/2201.13091).
- [2] Hao Chen. Gluing Karcher-Scherk saddle towers II: Singly periodic minimal surfaces. 2021. Preprint available at [arXiv:2107.06957](https://arxiv.org/abs/2107.06957).
- [3] Hao Chen and Martin Traizet. Gluing Karcher-Scherk saddle towers I: Triply periodic minimal surfaces. 2021. Preprint available at [arXiv:2103.15676](https://arxiv.org/abs/2103.15676).
- [4] Hao Chen and Jean-Marc Schlenker. Weakly inscribed polyhedra. To appear in *Transactions of the American Mathematical Society, Series B*. Preprint available at [arXiv:1709.10389](https://arxiv.org/abs/1709.10389).
- [5] 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>.
- [6] 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>.
- [7] 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>.
- [8] 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>.
- [9] 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>.
- [10] 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>.
- [11] 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>.
- [12] Hao Chen. Minimal twin surfaces. *Experimental Mathematics*, 28(4):404–419, 2019. <https://doi.org/10.1080/10586458.2017.1413455>.
- [13] 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>.

- [14] 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>.
- [15] 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>.
- [16] Aart Blokhuis and Hao Chen. Selectively balancing unit vectors. *Combinatorica*, 28:67–74, 2018. <https://doi.org/10.1007/s00493-016-3635-z>.
- [17] 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>.
- [18] 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>.
- [19] 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>.
- [20] 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>.
- [21] Hao Chen and Jean-Philippe Labbé. Lorentzian Coxeter systems and Boyd–Maxwell ball packings. *Geometriae Dedicata*, 174(1):43–73, 2014. <https://doi.org/10.1007/s10711-014-0004-1>.
- [22] 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>.
- [23] Lijuan Zhang, Hao Chen, Zhaoxia Li, Haiping Fang, and Jun Hu. Long lifetime of nanobubbles due to high inner density. *Science in China Series G: Physics, Mechanics and Astronomy*, 51(2):219–224, 2008. <https://doi.org/10.1007/s11433-008-0026-5>.

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