Curriculum Vitæ

Hao Chen

Priv.-Doz. Dr. rer. nat. habil.

Georg-August-University Göttingen
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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

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

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

Professional Activities

Teaching

WS 19–20 — Lecturer for "Triply Periodic Minimal Surfaces: An interdisciplinary course" at Georg-August-Universität Göttingen, Germany.

SS 2019 — Tutor & Lecturer for "Introduction to graph theory" at Georg-August-Universität Göttingen, Germany.

WS 18–19 — Lecturer for "Introduction to polytope theory" at Georg-August-Universität Göttingen, Germany.

WS 15–16 — Tutor for Calculus at Technische Universiteit 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

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.

2017 — Discrete Geometry and Combinatorics Seminar at UC Santa Barbara
Title: Infinite ball packings from hyperbolic reflection groups.

2017 — PhD Seminar at Ghent University
Title Combinatorial problems from ball packings.

2015 — Oberseminar Geometrie at Université de Fribourg
Title: Infinite ball packings from hyperbolic reflection groups.

Publication List

[1] Hao Chen. Gluing Karcher-Scherk saddle towers II: Singly periodic minimal surfaces. 2021. Preprint available at arXiv:2107.06957.

[2] Hao Chen and Martin Traizet. Gluing Karcher-Scherk saddle towers I: Triply periodic minimal surfaces. 2021. Preprint available at arXiv:2103.15676.

[3] Hao Chen. Existence of the tetragonal and rhombohedral deformation families of the gyroid. To appear in *Indiana University Mathematics Journal*. Preprint available at arXiv:1901.04006.

[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.

[5] Qingqing Sheng, Hao Chen, Wenting Mao, Congcong Cui, Shunai Che, and Lu Han. Self-Assembly of Single Diamond Surface Networks. *Angewandte Chemie International Edition*, accepted article. doi.org/10.1002/anie.202102056.

[6] 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. doi.org/10.1002/anie.202102056.

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

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

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

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

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

[12] 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. doi:10.1098/rsfs.2016.0114.

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

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

[15] Aart Blokhuis and Hao Chen. Selectively balancing unit vectors. *Combinatorica*, 28:67–74, 2018. doi:10.1007/s00454-016-9777-3.

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

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

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

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

[20] Hao Chen and Jean-Philippe Labbé. Lorentzian Coxeter systems and Boyd–Maxwell ball packings. *Geometriae Dedicata*, 174(1):43–73, 2014. doi:10.1007/s10711-014-0004-1.

[21] 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. doi:10.1016/j.laa.2012.04.005.

[22] 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.