

Hal Schenck

**College positions:**

Visiting Fellow

Subject:

Mathematics

Department/institution:

Auburn University

Contact details:

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Professor Hal Schenck

Hal Schenck is a Professor and Rosemary Kopel Brown Eminent Scholars Chair at Auburn University

Hal began his undergraduate studies at Carnegie-Mellon as a philosophy major, spent one summer working as a diver on a nautical archaeology expedition in Port Royal, Jamaica, and finished with a degree in applied maths and computer science. Following graduation, he served four years as an Army officer, then returned to graduate school to study maths, earning his PhD from Cornell in 1997. After a National Science Foundation Postdoctoral Research Fellowship at Harvard and Northeastern, he was a professor at Texas A&M University from 2001-2008, at University of Illinois from 2007-2017, and department chair at Iowa State University from 2017-2019. Since 2019 he has been a professor at Auburn University; academic visits include a Leverhulme Professorship at Oxford, and a Fulbright Professorship at Buenos Aires.

Hal's research is at the interface of algebra, geometry, and computation, with a focus on applied problems. Two recent projects are work on dynamical systems and oscillators (why do certain swarms of fireflies sometimes begin flashing in unison?) and on connections between geometry and physics (work on supersymmetric extensions of the standard model of particle physics). Both projects involve studying applied problems using tools from computational algebra. He has earned teaching awards from Cornell and Illinois, and awards for departmental leadership and outreach to student veterans from Iowa State. Outside of mathematics, he enjoys hiking, climbing, skiing, and triathlons, as well as (good) books, conversation, and wine.

Select publications

BOOKS

- "Algebraic foundations for applied topology and data analysis", 224 pages, Springer Verlag, 2022.
- "Toric varieties", (with David Cox and John Little) 841 pages, AMS Graduate Studies in Mathematics, 2011.
- "Computational Algebraic Geometry", 193 pages, Cambridge University Press, 2003.

RECENT PAPERS

- "Kuramoto Oscillators: Algebra and Topology", (with Heather Harrington, Mike Stillman), preprint, 2023.
- "Nets in the projective plane and Alexander Duality", (with Nancy Abdallah), Discrete and Computational Geometry, 70 (2023), 1840-1861.
- "Algebraic properties of Hermitian sums of squares", (with Jennifer Brooks, Dusty Grundmeier), Proceedings of the A.M.S., 150 (2022), 347-3476.
- "Calabi-Yau threefolds in P^n and Gorenstein rings", (with Mike Stillman, Beihui Yuan), Advances in Theoretical and Mathematical Physics, 26, (2022), 764-792.
- "The Hessian polynomial and the Jacobian ideal of a reduced hypersurface in projective space", (with Laurent Buse, Alexandru Dimca, Gabriel Sticlaru), Advances in Mathematics, 392, (2021), 22pp.

Select Awards

- Leverhulme Visiting Professorship, Oxford, 2023
- Fellow of the American Mathematical Society, 2020
- Provost's Award for Outstanding Departmental Leadership, Iowa State University, 2019
- Fulbright Visiting Professorship, Buenos Aires, 2014