AUSTIN CONNER

aconner.vu@gmail.com, https://adconner.github.io

Employment

Harvard University, Cambridge, MA, NSF Postdoctoral Fellow under the supervision of Joe Harris, (2020-2022, 2023-2025)

Universität Konstanz, Germany, Postdoc under the supervision of Mateusz Michałek, (2022-2023)

Education

2020 Ph.D. in Mathematics, Texas A&M University, College Station, TX.
Advisor: J.M. Landsberg

2013 B.S. in Computer Science and Mathematics, Vanderbilt University, Nashville, TN.

Research Interests Complexity and invariants of tensors, particularly with applications to theoretical computer science.

Publications

1. **Sullivant-Talaska ideal of the cyclic Gaussian Graphical Model**, ***A. Conner****, K. Han and M. Michałek* (2026) arXiv:2308.05561, To be published in Advances in Applied Mathematics.
2. **Polynomial systems admitting a simultaneous solution**, ***A. Conner****, M. Michałek, M. Schindler, and B. Szendroi* (2025) J. Algebra, 667, 412-424.
3. **New lower bounds for matrix multiplication and the 3×3 determinant**, ***A. Conner****, A. Harper and J.M. Landsberg* (2023) Forum Math. Pi, 11, E17.
4. **Bad and Good news for Strassen's laser method: Border rank of the 3×3 permanent and strict submultiplicativity**, ***A. Conner****, H. Huang and J.M. Landsberg* (2022) Found. Comput. Math, 23, 2049-2087.
5. **Rank and border rank of Kronecker powers of tensors and Strassen's laser method**, ***A. Conner****, F. Gesmundo, J.M. Landsberg, and E. Ventura* (2021) Comput. Complex, 31, no. 1.
6. **New Results in the Complexity of Matrix Multiplication**, ***A. Conner*** (2020) Thesis.
7. **Towards a Geometric Approach to Strassen's Asymptotic Rank Conjecture**, ***A. Conner****, F. Gesmundo, J.M. Landsberg, E. Ventura, and Y. Wang* (2020) Collect. Math, 72, 63-86.
8. **Tensors not subject to barriers for Strassen's laser method**, *J.M. Landsberg,* ***A. Conner****, F. Gesmundo, and E. Ventura* (2020) Innovations in Theoretical Computer Science (ITCS), Seattle, WA.
9. **A rank 18 Waring decomposition of $sM_{\langle 3 \rangle}$ with 432 symmetries**, ***A. Conner*** (2019) Exp. Math, 30, 383-385.

Preprints

1. **Characteristic numbers and chromatic polynomial of a tensor**, ***A. Conner*** *and M. Michałek* arXiv:2111.00809.
2. **Tensors with maximal symmetries**, ***A. Conner****, F. Gesmundo, J.M. Landsberg, and E. Ventura)* arXiv:1909.09518.

Conference presentations and seminar talks

Simons Institute Matrix Multiplication workshop (10/25)

Simons Institute Complexity and Linear Algebra bootcamp (9/25)

University of Texas Geometry Seminar (10/24)

Northeastern University Algebraic Geometry Seminar (9/24)

Duke University Algebraic Geometry Seminar (8/24)

Auburn University Algebra Seminar (8/24)

Texas A&M University Algebraic Geometry Seminar (8/24)

Tensors: Algebra-Geometry-Applications, Fort Collins (6/24)

Tensor Invariants in Geometry and Compexity Theory, Auburn (5/24)

Georgia Institute of Technology Algebra Seminar (11/23)

Konstanz Geometry Seminar (6/23)

Secant vs Cactus workshop, Toulouse (5/23)

AGATES, Warsaw (11/22)

MEGA 2022, Kraków (6/22)

Texas A&M working group seminar (12/21)

Quivers, Tensors, and their Applications, AMS Sectional meeting, virtual (5/21)

Harvard University CS Theory Seminar (3/21)

Harvard-MIT Algebraic Geometry Seminar (11/20)

Texas A&M Algebraic Geometry Seminar (2/19)

University of Wisconsin-Madison Algebra and Algebraic Geometry Seminar (11/18)

Texas A&M University Algebraic Geometry Seminar (9/18)

Harvard-MIT Algebraic Geometry Seminar (9/18)

University of Michigan Commutative Algebra Seminar (9/18)

Texas A&M University Algebraic Geometry Seminar (9/17)

Activities

Co-organizer of *Tensor Invariants in Geometry and Compexity Theory*, Auburn (5/24)

Undergraduate research supervision: L. Alcock (8/22-8/24)

Undergraduate research supervision: K. Hou (5/21-8/21)

Co-organizer of *Computational methods working group, Tensors and Complexity Theory workshop*, Toulouse (4/22)

Awards

National Science Foundation MSPRF Postdoctoral Fellowship (2020)

Texas A&M Guseman Prize for excellence in mathematics research (2019)

Vanderbilt University Richard J. Larsen Award for achievement in undergraduate mathematics (2013)

Teaching

Spring 2025, Mathematics in the World (problem solving and applications class), Instructor, Harvard University

Spring 2025, Multivariable Calculus, Instructor, Harvard University

Fall 2024, Geometry and Complexity Theory, Instructor, Harvard University

Fall 2024, Calculus, Series, Differential Equations, Instructor, Harvard University

Spring 2024, Algebraic geometry, Instructor, Harvard University

Fall 2023, Calculus, Series, Differential Equations, Instructor, Harvard University

Spring 2023, Linear Algebra II, Teaching Assistant, Universität Konstanz

Fall 2022, Linear Algebra I, Teaching Assistant, Universität Konstanz

Spring 2022, Geometry and Complexity Theory, Instructor, Harvard University

Fall 2021, Linear Algebra, Instructor, Harvard University

Spring 2020, Engineering Calculus I, Teaching Assistant, Texas A&M

Spring 2019, Engineering Calculus I, Teaching Assistant, Texas A&M

Fall 2018, Business Mathematics, Instructor, Texas A&M

Spring 2018, Engineering Calculus I, Teaching Assistant, Texas A&M

Spring 2017, Engineering Calculus I, Teaching Assistant, Texas A&M

Fall 2016, Engineering Calculus I, Teaching Assistant, Texas A&M

Spring 2016, Engineering Calculus I, Teaching Assistant, Texas A&M

Fall 2015, Engineering Calculus I, Teaching Assistant, Texas A&M

Spring 2014, Calculus III for Computer Science, Teaching Assistant, Georgia Institute of Technology

Fall 2013, Calculus III, Teaching Assistant, Georgia Institute of Technology