MATTHEW J. KUKLA

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EDUCATION

University of Maryland awarded May 2022
Mathematics, BSc. *College Park, Maryland, USA*

· Selected for First-Year Innovation and Research Experience (FIRE)

PROFESSIONAL EXPERIENCE

BlueHalo Labs June 2022 - present
Research Engineer *Rockville, Maryland, USA*

· Researcher in mathematics, focused on applications to automated reasoning, scientific computing.

- Design, implement, and deploy novel graph clustering algorithms. Optimize with high-performance linear algebra libraries.
- Build tools for reasoning across relational structures
- Develop and evaluate topological, geometric methods for data classification

· Write research articles, technical reports for delivery to government, academic, and private-sector customers

The Math Citadel March 2019 - present
Researcher

· Conduct original research in pure and applied mathematics, including:

- Fuzzy sets and algebras
- Graphical probabilistic models

· Develop software packages:

- Build digital signal processing software
- Optimize numerical methods

· Contribute to technical articles, professional lectures, and notes

Patton Electronics Summer 2016
Software Engineering Intern *Gaithersburg, Maryland, USA*

· Developed a Linux-based operating system for prototype VDSL router
· Wrote, patched hardware-specific kernel modules

SKILLS

Programming Languages	C, OCaml, Python, Fortran, Julia, Prolog, Java, MATLAB
Operating Systems	Linux, UNIX (BSD and Solaris), MS-DOS
Tools, Libraries	Shell scripting, sed/AWK, Git, LaTeX, NumPy, SciPy, BLAS
Web, Cloud	HTML, CSS, Gopher, OpenSearch, Solr

PUBLICATIONS AND PREPRINTS

Logical Limit Laws for Layered Permutations and Related Structures
Joint with Samuel Braunfeld.
Published, Enumerative Combinatorics and Applications. 2 no. 4. (2021)

Colored Convex Linear Orders and Logical Limit Laws
Preprint. (2021)

Rings of Typed Ordered Fuzzy Numbers
Joint with Rachel Traylor.
Preprint, arXiv:2010.07764. (2020)

SELECTED TALKS

First-Order Logical Limit Laws, Ordered Structures, and Permutation Classes
Computability & Complexity Seminar — George Washington University (2025)

Double Factorization Systems and Double Fibrations
7th International Conference on Applied Category Theory (2024)

Double Categorical Limits
The Adjoint School (2024)

Logical Limit Laws for Layered Permutations and Related Structures
University of Maryland Logic Seminar (2022)

Categorical Mirror Symmetry of Elliptic Curves (two lecture series)
University of Maryland Geometry and Physics Seminar (2018)

Generalized Calabi-Yau Manifolds
University of Maryland Geometry and Physics Seminar (2018)

CONFERENCES AND WORKSHOPS ATTENDED

7th International Conference on Applied Category Theory
University of Oxford (2024)

The Adjoint School
University of Oxford (2024)

6th International Conference on Applied Category Theory
University of Maryland (August 2023)

University of Maryland Geometry Festival
University of Maryland (May 2019)

Witt Vectors, Deformations, and Absolute Geometry
University of Vermont (June 2018)