

Elliot Kienzle

CONTACT INFORMATION	ekienzle@berkeley.edu (240)534-8406	104 S Brook Lane Bethesda, MD, 20814
EDUCATION	University of California, Berkeley Ph.D in Mathematics, 2022-Present	
	University of Maryland, College Park (UMD) B.A. with high honors in Mathematics and Physics, graduated May 2022	
PUBLICATIONS	E. Kienzle and S. Rayan, <i>Hyperbolic Band Theory through Higgs Bundles</i> . Published in <i>Advances in Mathematics</i> , Volume 409, Part B, 2022, 108664	
RESEARCH TALKS	<i>From Hyperbolic Crystals to Stable Bundles: Moduli spaces in spectral theory</i> MSRI gauge theory graduate student seminar. Video (October 2022) <i>Hyperbolic Band Theory through Higgs Bundles</i> AMS Contributed Paper Session on Applied Topics - Quantum Theory, Mechanics, and Fluids, Joint Mathematics Meeting (April 2022) Geometry and Mathematical Physics Seminar at University of Saskatchewan (September 2021)	
EXPOSITORY TALKS	<i>Hyperbolic String Art</i> , Berkeley Many Cheerful Facts seminar (September 2022) Showed a new way of visualizing Mobius transformations and hyperbolic geometry using string art <i>A unified picture of BPS states</i> , UMD research interaction team (RIT) in Geometry and Physics (April 2022) I unified the many manifestations of BPS objects using variations of Hodge structure <i>The Seiberg-Witten solution</i> , UMD RIT in Geometry and Physics (April 2022) Outlined in detail the Seiberg-Witten solution, which computes the effective field theory of N=2 supersymmetric yang mills, using geometry of the moduli space of vacua. <i>Why is everything called BPS?</i> , UMD RIT in Geometry and Physics (February 2022) Introduced supersymmetric BPS states and BPS monopoles, then showed their equivalence following a paper by Olive and Witten <i>“A tale of supersymmetry: The dark magic of integrable systems</i> , UMD RIT in Geometry and Physics (January 2022) Motivated by N=2 supersymmetry, I toured through the many interconnected aspects of integrable systems. <i>Topological Recursion, for Fun and Profit</i> , UMD RIT in Geometry and Physics (Fall 2021)	

Discussed topological recursion in the context of JT gravity and random matrix theories, then the general version of Eynard and Orantin.

Mirror Symmetry of Higgs Bundles and the Geometric Langlands Conjecture, UMD RIT in Geometry and Physics (Spring 2021)

Summarized Kapustin and Witten's gauge theoretic approach to the geometric Langlands conjecture.

A & B models; the Story of Mirror Symmetry, UMD RIT in Geometry and Physics (Fall 2020)

Described enumerative aspects of mirror symmetry. On the A-side, Gromov-Witten invariants and Frobenius manifolds. On the B-side, Landau-Ginzburg models through singularity theory, and the associated variation of Hodge structure.

HONORS AND AWARDS	2022	John and Sabrina Kontner Endowed Scholarship Merit scholarship, University of Maryland Math department
	2021	Higginbotham scholarship Awarded to one outstanding junior Mathematics major University of Maryland
	2020	Strauss scholarship Awarded to one outstanding Mathematics major University of Maryland
	2019, 2021	Angelo Bardasis Memorial Scholar Award Merit scholarship, University of Maryland Physics department
	2018-2021	President's scholar, University of Maryland
	2018-2021	Dean's list, University of Maryland
	2018-2021	National merit scholarship
TEACHING AND OUTREACH	Summer 2021	Interpreter at National Museum of Mathematics (MoMath) Worked as museum floor staff, explaining mathematical concepts to members of the general public
	Fall 2022	Graduate student instructor (UC Berkeley) MATH 53: Multivariable calculus
	Fall 2022	Directed Reading Program Mentor (UC Berkeley) Topics: Mirror symmetry, aspects of symplectic and complex geometry
	Summer 2021	PCMI graduate summer school on illustrating mathematics
	Fall 2021	Designed and taught UMD course <i>Geometry in Physics</i> Covered Maxwell's equations via differential forms and classical mechanics via symplectic geometry, at undergraduate level.
MATHEMATICAL PHYSICS BACKGROUND		

Summer 2022	Attended Geometric structures (Re-)United, a conference/workshop on Higgs bundles and geometric structures
Summer 2021	2 nd PIMS summer school on algebraic geometry in high-energy physics
Spring 2021	Reading course on Bott periodicity and spin geometry With UMD Prof. Jonathan Rosenberg Studied <i>Clifford Modules</i> by Atiyah, Bott, and Shapiro, and <i>Bott Periodicity and the Index of Elliptic Operators</i> by Atiyah
Fall 2021	Reading course on classical and quantum 2D Yang-Mills theories With UMD Prof. Richard Wentworth Studied parts of <i>The Yang-Mills Equations on Riemann Surfaces</i> by Atiyah and Bott, and Shapiro, and <i>On Quantum Gauge Theories in Two Dimensions</i> by Witten