CURRICULUM VITAE
Philip Milton Engel

PROFESSIONAL PREPARATION

| MIT | Cambridge, MA | Mathematics, Physics | B.S. | 2006-2010 |
| Columbia | New York, NY | Mathematics | Ph.D. | 2010-2015 |

APPOINTMENTS

(1) Postdoctoral Scholar, Harvard University, 2015–2018

(2) Assistant Professor, University of Georgia, 2018–2023

(3) Research Member, MSRI, Fall 2019

(4) Bonn Junior Fellow (W2 Professorship), Hausdorff Institute, 2023–2024

(5) Assistant Professor, University of Illinois, Chicago, 2023–

GRANTS AWARDED

(1) PI for NSF CAREER award DMS-2441240, "CAREER: Hodge theory of Calabi-Yau varieties," **\$415,000**, 2025-

(2) PI for NSF Standard Grant DMS-2401104, "Combinatorics of Complex Curves and Surfaces," **\$67,057**, 2024-2025

(3) PI for NSF Standard Grant DMS-2201221, "Combinatorics of Complex Curves and Surfaces," **\$200,848**, 2022-2024

(4) Co-PI for NSF Collaborative Research Grant: Georgia Algebraic Geometry Symposium DMS-1902154, **\$34,920**, 2018-2021

(5) PI for NSF Postdoctoral Fellowship DMS-1502585, **\$150,000**, 2015-2018

PAPERS

(1) With V. Alexeev, Z. Garza, and L. Schaffler. *Complete moduli of Enriques surfaces in Horikawa's model.* ArXiv: 2312.03638, 2023.

(2) With F. Greer and A. Ward. *Periods of elliptic surfaces with $p_g = q = 1$.* Accepted to **Forum of Math: Sigma**, 2024.

(3) With S. Tayou. *On the non-abelian Hodge locus I.* ArXiv: 2305.00943, 2023.

(4) With P. Smillie. *Exact enumeration of fullerenes.* Accepted to **Duke Math Journal**, 2024.

(5) With F. Greer and S. Tayou. *Mixed mock modularity of special divisors.* ArXiv: 2301.05982, 2023.

(6) With V. Alexeev. *Mirror symmetric compactifications of moduli spaces of K3 surfaces with a nonsymplectic involution.* ArXiv: 2208.10383, 2022.

(7) With R. Krishnamoorthy and D. Litt. *The Manin-Mumford conjecture in genus 2 and rational curves on K3 surfaces.* ArXiv: 2208.08729, 2022.

(8) With V. Alexeev and C. Han. *Compact moduli of K3 surfaces with a nonsymplectic automorphism.* **Transactions of the AMS**, Series B 11, 2024.

(9) With V. Alexeev. *The flex divisor of a K3 surface.* **IMRN**, rnac089, 2022.

(10) With V. Alexeev. *Compact moduli of K3 surfaces.* **Annals of Mathematics**, 198(2): 727-789, 2023.

(11) With V. Alexeev and A. Brunyate. *Compactifications of moduli of elliptic K3 surfaces: stable pair and toroidal.* **Geometry & Topology,** 26: 3525–3588, 2022.

(12) With V. Delecroix, E. Goujard, P. Zograf, A. Zorich. *Contribution of one-cylinder square-tiled surfaces to Masur-Veech volumes.* **Astérisque**, Vol. 415: 223-274, 2020.

(13) With V. Alexeev and A. Thompson. *Stable pair compactification of moduli of K3 surfaces of degree 2.* **Crelle's Journal**, Vol. 799: 1-56, 2023.

(14) *Hurwitz theory of elliptic orbifolds, I.* **Geometry and Topology**, Vol. 25: 229-274, 2021.

(15) *Hurwitz theory of elliptic orbifolds, II.* ArXiv: 1809.07434, 2018.

(16) With P. Smillie. *The number of convex tilings of the sphere by triangles, squares, or hexagons,* **Geometry and Topology**, Vol. 22: 2839-2864, 2018.

(17) With R. Friedman. *Smoothings and rational double point adjacencies for cusp singularities.* **Journal of Differential Geometry**, Vol. 118(1): 23-100, 2021.

(18) *A proof of Looijenga's conjecture via integral-affine geometry,* **Journal of Differential Geometry**, Vol. 109(3): 467-495, 2018.

SERVICE

(1) **Conference & seminar organization**: Organizer of RepTile (representation theory and tilings) conference at UGA (Spring 2019), co-PI and organizer for the NSF-funded Georgia Algebraic Geometry Symposium (2019–present, conference Spring 2023) UGA AG seminar organizer (2018–2023), UIC AG seminar organizer (2024–),

(2) **Outreach to gifted youth:** Guest lecture at the PROMYS program (Summer 2018). Second-year course instructor at PROMYS India program for four weeks, at India Institute of Sciences (IISc) Bangalore (Summer 2023).

(3) **Graduate student development:** Instructor of the UGA VRG (Vertical Research Group) on tilings (Spring 2020) reading seminars with A. Ernst and Z. Garza (2020–2021), development of course on 4-manifolds (Spring 2021). PhD advisor to A. Ernst at UGA (2021–2024). Master's student advisor to J. Galindo and to M. Wen, Bonn (2023–2024). Seminar course on moduli of K3 surfaces, Bonn (Spring 2024) and reading course on moduli of K3 surfaces, UIC (Fall 2024).

(4) **Committees:** UGA search committee, qualifying exam committee (2019–2023), and head appointment committee (2021–2023). Organizer (2015–17) and chair (2017–18) of BHMN (Brandeis-Harvard-MIT-Northeastern) joint colloquium committee, UIC colloquium committee (2024–).

(5) **Refereeing:** Referee for Crelle's Journal, Journal of Differential Geometry, Algebraic & Geometric Topology, Mathematische Zeitschrift, Geometry & Topology, Épijournal de Géométrie Algébrique, Duke Mathematical Journal, Journal de l'École Polytechnique, Memoirs of the EMS, Geometriae Dedicata, Advances in Math, EMS Surveys, Mathematische Nachrichten, etc.

(6) **Outreach via artistic collaboration:** I developed a project with artist Victoria Manganiello, on mathematics and weaving. We created math-inspired weaving art works, funded by NSF grant DMS-2201221 and have shown them at the Greenwich Academy in New York. Funded by the University of Bonn, we created a permanent installation in the mathematics library at the Mathematisches Institut. Photos are available at `https://philip-engel.github.io/weaving_quasicrystals/`.

RECENT TALKS

(1) (upcoming) "Geometric aspects of Hodge theory and related areas", AG Summer Research Institute, CSU, Summer 2025
(2) (upcoming) Bootcamp mentor, AG Summer Research Institute, CSU, Summer 2025
(3) AG MATRIX, Matrix Institute, Fall 2024
(4) AG seminar, NYU, Fall 2024
(5) Colloquium, Boston University, Fall 2024
(6) AG seminar, Northwestern, Fall 2024
(7) AG seminar, UChicago, Fall 2024
(8) "School on Hodge Theory and Shimura Varieties", Essen University, Fall 2024
(9) AIM workshop "Higher-dimensional log Calabi-Yau pairs", Fall 2024
(10) AG seminar, UIC, Fall 2024
(11) AG seminar, University of Sheffield, Summer 2024
(12) AG seminar, University of Cambridge, Summer 2024
(13) AG seminar, University of Bonn, Summer 2024
(14) AG seminar, University of Marburg, Summer 2024
(15) Università degli Studi di Milano, Lecture series on "K3 compactification", Spring 2024
(16) A panorama of moduli spaces, Goethe University, Frankfurt am Main, Spring 2024
(17) Moduli, K-trivial Varieties, and Related Topics, IBS-CCG (Korea), Spring 2024

(18) Lausanne AG seminar, Fall 2023

(19) Hannover AG seminar, Fall 2023

(20) Hausdorff Institute of Math, Bonn, Lecture series on "K3 compactification", Fall 2023

(21) Heidelberg Experimental Geometry Lab, Community Seminar, Summer 2023

(22) Humboldt University, Lecture series on "K3 compactification", Summer 2023

(23) India Institute of Sciences (IISc) G&T seminar, Summer 2023

(24) G&T seminar, Hebrew University, Spring 2023

(25) University of Toronto Colloquium, Spring 2023

(26) UIC Colloquium, Fall 2022

(27) University of Utah AG seminar, Fall 2022

(28) Princeton AG seminar, Fall 2022

(29) Chattanooga AMS "Arithmetic and Geometry of Hyperkahler Varieties", Fall 2022

(30) Harvard dynamics seminar, Fall 2022

(31) "Mirror symmetry for Looijenga interiors," Bogazici University, Summer 2022

(32) "Algebraic Geometry and Singularities," U Washington, Summer 2022

(33) Cornell math colloquium, Spring 2022

(34) University of Kansas math colloquium, Spring 2022

(35) 7th KTGU Mathematics Workshop for Young Researchers, Spring 2022

(36) Copenhagen algebra/topology seminar, Spring 2022

(37) Hausdorff Center of Mathematics, Fall 2021

(38) Stonybrook AG seminar, Fall 2021

(39) Caltech G&T seminar, Fall 2021

(40) Free Mathematics Seminar, Fall 2021

(41) Humboldt AG seminar, Summer 2021

(42) Recent Developments in Hodge Theory, IMSA, Spring 2021

(43) Princeton AG seminar, Spring 2021

(44) Stonybrook AG seminar, Spring 2021

(45) UW Madison AG seminar, Spring 2021

(46) Jussieu AG seminar, Fall 2020

(47) BU Geometry & Physics seminar, Fall 2020

(48) Harvard/MIT AG seminar, Spring 2020

(49) Bonn AG seminar, Spring 2020

(50) MSRI thematic semester on flat surfaces, Fall 2019

(51) Berkeley topology seminar, Fall 2019

(52) University of Oregon AG seminar, Fall 2019

(53) Teichmuller Theory, Hyperbolicity and Dynamics at IMPA, Summer 2019

(54) Casa Matematica Oaxaca, Flat Surfaces and Dynamics on Moduli Space, Summer 2019

(55) Iowa State AG seminar, Spring 2019

(56) Workshop on Modularity in GW Theory, Michigan, Spring 2019

(57) Workshop on Holomorphic Differentials, Stonybrook, Spring 2019

(58) Character Varieties and TQFT, University of Auckland, Fall 2018

(59) University of Toronto Geometry & Topology seminar, Fall 2018

(60) Caltech Geometry & Topology seminar, Fall 2018

(61) University of South Carolina AG seminar, Fall 2018

(62) Flat Surfaces and Algebraic Curves, Oberwolfach, Fall 2018