

KEVIN YEYH
CVRRICVLVM VITÆ

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Marital Status: Single

EDUCATION

- **ETH Zürich (Swiss Federal Institute of Technology in Zürich)** Zürich, Switzerland
Master of Science in Mathematics Sep. 2018 – May 2020 (expected)
- **New York University** New York, NY, U.S.A.
Bachelor of Arts in Mathematics Sep. 2013 – May 2017
- **Columbia University** New York, NY, U.S.A.
Post-Baccalaureate Studies Sep. 2017 – Dec. 2017
- **New York University Courant Institute of Mathematical Sciences** New York, NY, U.S.A.
Graduate Non-Degree Studies Sep. 2017 – Dec. 2017
- **Rutgers University** New Brunswick, NJ, U.S.A.
Non-Degree Studies May. 2017 – Aug. 2017

RESEARCH ACTIVITIES

- **Master Thesis, ETH Zürich** Feb. 2020 - May 2020 (planned)
Advisors: Rahul Pandharipande, Honglu Fan
Title (Tentative): *Hodge-Gromov-Witten Theory of Elliptic Curves*
Recent results by Jérémy Guéré on the deformation invariance to singular varieties of Hodge integrals provided a computation of genus-zero Gromov-Witten invariants for some hypersurfaces in weighted projective spaces which do not satisfy the so-called convexity property. It is a first step towards a mirror symmetry statement for these hypersurfaces. The plan for this thesis is to apply these results and techniques to the case of elliptic curves.
- **Independent Study (Possible Semester Paper), ETH Zürich** Sep. 2019-
Advisors: Rahul Pandharipande, Honglu Fan
Guided independent study as preparation for the Master thesis. Topics include the foundations of moduli of curves, their construction and geometry; virtual fundamental classes; localization and degeneration methods. Focusing on understanding *Gromov-Witten theory*, *Hurwitz theory*, and *completed cycles* by A. Okounkov and P. Pandharipande, *Localization of Virtual Classes* by T. Graber and P. Pandharipande, and *Hodge-Gromov-Witten Theory* by J. Guéré.
- **Semester Paper, ETH Zürich** Jan. 2019 - Sep. 2019
Advisors: Rahul Pandharipande, Longting Wu
Title: *Kontsevich's formula for rational plane curves, Gromov-Witten invariants, and quantum cohomology*
An expository paper introducing moduli problems and moduli spaces, genus-zero moduli spaces of curves and stable maps, and their Delign-Mumford compactifications. A direct combinatorial proof of Kontsevich's recursive formula counting the number of projective rational curves passing through $3d - 1$ points is given. Then genus-zero Gromov-Witten

invariants and quantum cohomology is introduced to give another proof using the associativity of the quantum cup product and its equivalency to the Witten-Dijkgraaf-Verlinde-Verlinde (WDVV) equations.

TALKS

- **Modular Forms Seminar** ETH Zürich
The Classical Theta Function and the Riemann Zeta Function Spring 2019
We motivate the study of the L -series and its analytic continuation associated to a modular form, by studying the classical case of the Jacobi theta function, its associated L -series which is the Riemann zeta function, and proving its analytic continuation to obtain an example of an L -function associated to a modular form. We use techniques from complex analysis and Fourier theory on Schwarz functions.
- **Foundation and Philosophy of Quantum Physics Discussion Group** NYU
What do Tensor Products Mean, Physically? Spring 2017
The tensor product of vector spaces is defined and its universal property is discussed. We then give examples of the use of tensor products in quantum physics, and make attempts at giving them physical and/or philosophical interpretations.

ACADEMIC ACTIVITIES

- **Introduction to Homotopy Theory and Model Category Structure** ETH Zürich
participant (planned) Spring 2020 (planned)
Graduate student seminar on model category structure and derived functors with applications to homotopy limits and colimits.
- **Seminar on Modular Forms** ETH Zürich
participant and speaker Spring 2019
Graduate student seminar introducing modular forms and related topics. Organized and led by Prof. Özlem Imamoglu. Topics include the modular group and fundamental domain, definition and examples of modular forms, the valence formula, θ -function and Riemann ζ -function, Petersson inner product and Poincaré series, Hecke operators and L -functions, Eisenstein series and Jacobi formulas, the class number formula.
- **Étale Cohomology II** University of Zürich
auditor (planned) Spring 2020 (planned)
Continuation of course in étale cohomology, taught by Prof. Joseph Ayoub.
- **Étale Cohomology I** University of Zürich
auditor Fall 2019
Graduate course in étale cohomology, taught by Prof. Joseph Ayoub.
- **Reading Course in Spectral Graph Theory** Courant Institute
organizer Spring 2017
Graduate reading course in spectral graph theory. Reading guided by Prof. Edward Y. Miller. Topics include surveys in basic graph theory, spectral graph theory; Laplacian and eigenvalues of graphs; Ramanujan graphs; Cheeger's Inequality; applications to computer science.

- **Foundation and Philosophy of Quantum Physics Discussion Group** New York University
co-organizer Fall 2016 – Spring 2017
Informal student discussion group on philosophical questions related to quantum physics.
- **Topology and Geometry Discussion Group** Courant Institute
Co-Organizer Spring 2016
Informal student discussion group following Glen E. Bredon’s book *Geometry and Topology*.
Mainly focusing on introductory algebraic topology.
- **Guided Independent Study Group in Topology** Courant Institute
Organizer Fall 2015
Guided and led by Prof. Edward Y. Miller. Discussion-based study group/reading course on point-set topology.
- **Guided Independent Study Group in Differential Geometry** Courant Institute
Organizer Spring 2015
Guided and led by Prof. Edward Y. Miller. Discussion-based study group/reading course on differential geometry, mostly in classical differential geometry in \mathbb{R}^n . Followed the text *Differential Geometry of Curves and Surfaces* by Manfredo Perdigão do Carmo

CONFERENCES ATTENDED

- **Hausdorff School: Perverse Sheaves in Enumerative Geometry** Bonn, Germany
Participant (accepted and registered) Feb. 10-14, 2020
- **Stacks Project Workshop 2020** Ann Arbor, Michigan
Participant (planned) Aug. 3-7, 2020

TEACHING

- **New York University** New York, NY
College Prep Academy Instructor of Mathematics (SAT math and high school math) Jan. – May 2018; July 2019
- **MS8 New York City Public Middle School** Brooklyn, NY
Tutor of Mathematics and Science Sep. 2016 – May 2017

HONORS AND DISTINCTIONS

- **Gopal Varadhan Foundation Scholarship for Mathematics Students** 2015 – 2017
- **NYU College of Arts and Sciences Scholarship** 2015 – 2017
- **NYU Polytechnic Institute Scholarship** 2013 – 2015
- **FIRST Robotics Scholarship** 2013 – 2015

OTHER PROJECTS

- **Rudin Translated (Personal Project)** Ongoing
A “translation” of Walter Rudin’s classic textbook *Principles of Mathematical Sciences* into a more approachable textbook for undergraduates. In collaboration with Nate Stemen. Contents are public and free-for-all at Github repository <https://github.com/natestemen/rudin>

SELECTED COURSEWORK

- **Graduate Level:** Real analysis, functional analysis, linear algebra I-II, probability theory (measure theoretic), abstract algebra, algebraic topology I–II, characteristic classes of vector bundles, commutative algebra, Lie groups, modern algebraic geometry, Riemann surfaces and Hurwitz theory.
Examination planned by end of Fall 2019: Algebraic number theory, O-minimality and Diophantine equations, Differential Geometry I.
Planned in Spring 2020: Symplectic topology, the representation theory of finite symmetric groups, algebraic groups.
- **Undergraduate Level:** Honors analysis I-II, honors algebra I-II, ordinary differential equations, partial differential equations, elementary differential geometry, complex analysis, numerical analysis, combinatorics, dynamical systems, linear optimization, graph theory, general Physics I-III, dynamics.

PROGRAMMING AND SOFTWARE SKILLS

- **Languages:** MATLAB, Python, Java, \LaTeX typesetting
- **Other Software Skills:** Git, Bash/Linux terminals

LANGUAGES

English: native fluency

Mandarin Chinese: native fluency

German: Level A1.2 (Common European Framework)