# Michail Savvas - Curriculum Vitae

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| CONTACT DETAILS | Department of Mathematics<br>14 MacLean Hall (MLH)<br>2 West Washington Street<br>Iowa City, IA 52242-1419 | Telephone: +1 (650) 441-5717<br>E-mail: michail-savvas@uiowa.edu<br>Webpage: michailsavvas.github.io |

RESEARCH
INTERESTS

Enumerative geometry, moduli theory, Donaldson–Thomas theory, derived algebraic & differential geometry, derived categories & stability conditions, logarithmic geometry, artificial intelligence

EMPLOYMENT

**Department of Mathematics, The University of Iowa** — Iowa City, Iowa, U.S.A.
Tenure-track Assistant Professor — 07/2024 - present

**Department of Mathematics, The University of Texas at Austin** — Austin, Texas, U.S.A.
Postdoctoral Instructor — 07/2021 - 06/2024

**Department of Mathematics, University of California, San Diego** — La Jolla, California, U.S.A.
S.E.W. Visiting Assistant Professor — 07/2018 - 06/2021

EDUCATION

**Stanford University** — Stanford, California, U.S.A.
Ph.D. in Mathematics (*GPA 4.0*). Advisor: Jun Li. — 09/2012 - 06/2018
Thesis: Generalized Donaldson–Thomas Invariants via Kirwan Blowups.

**University of Cambridge, Trinity College** — Cambridge, U.K.
- Master of Mathematics ("Cambridge Part III"), *Distinction*. — 10/2011 - 06/2012
  Part III Essay : Cohomology of coherent sheaves on complex
  algebraic varieties and Hodge theory.
- B.A. Honours Mathematics, *First Class Honours* in each year. — 10/2008 - 06/2011

PUBLICATIONS AND
PREPRINTS

*Good Moduli Spaces in Derived Algebraic Geometry* (with E. Ahlqvist, J. Hekking and M. Pernice). *Submitted.* arXiv:2309.16574.

*Cosection Localization for D-Manifolds and $(-2)$-Shifted Symplectic Derived Schemes, Revisited.* **Mathematische Zeitschrift** (to appear). arXiv:2309.03066.

*Stabilizer Reduction for Derived Stacks and Applications to Sheaf-Theoretic Invariants* (with J. Hekking and D. Rydh). *Submitted.* arXiv:2209.15039.

*Virtual Riemann–Roch Theorems for Almost Perfect Obstruction Theories.* **manuscripta mathematica** 173, 463–498 (2024). arXiv:2207.14397.

*The d-critical Structure on the Quot Scheme of Points of a Calabi–Yau 3-fold* (with A. Ricolfi). **Communications in Contemporary Mathematics**, 2023. arXiv:2106.16133.

*Cosection Localization and Vanishing for Virtual Fundamental Classes of D-Manifolds.* **Advances in Mathematics**, Volume 398, 2022, 108232. arXiv:2007.14023.

*Localizing Virtual Structure Sheaves for Almost Perfect Obstruction Theories* (with Y.-H. Kiem). **Forum of Mathematics, Sigma**, Volume 8, 2020, e61. arXiv:2007.06820.

*Intrinsic Stabilizer Reduction and Generalized Donaldson–Thomas Invariants.* **Journal of the Institute of Mathematics of Jussieu**, 22(4), 1987-2025. arXiv:2005.13768.

*K-Theoretic Generalized Donaldson–Thomas Invariants* (with Y.-H. Kiem). **International Mathematics Research Notices (IMRN)**, Volume 2022, Issue 3, February 2022. arXiv:1912.04966.

*Generalized Donaldson–Thomas Invariants via Kirwan Blowups* (with Y.-H. Kiem and J. Li). **Journal of Differential Geometry**, 127 (3) 1149 - 1205, July 2024. arXiv:1712.02544.

*Reduce, Reuse, Recycle: Categories for Compositional Reinforcement Learning* (with G. Bakirtzis, S. Chinchali, U. Topcu and R. Zhao). Proceedings of the **European Conference on Artificial Intelligence (ECAI)**, 2024 (to appear).

*Categorical Semantics of Compositional Reinforcement Learning* (with G. Bakirtzis and U. Topcu).
**Journal of Machine Learning Research** (to appear). `arXiv:2208.13687`.

*Shutout Games on Graphs* (with A. Cioba). **Mathematika**, volume 61 (2015), issue 03, pp. 523-530.
Preprint version available `here`.

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| GRANTS AND SCHOLARSHIPS | **AMS-Simons Travel Grant** | 07/2019 - 08/2023 |
| | **Onassis Foundation Graduate Scholarship** | 09/2016 - 08/2018 |
| | **A.G. Leventis Foundation Scholarship** | 09/2016 - 08/2017 |
| | **Stanford Graduate Fellowship** <br> William R. and Sara Hart Kimball Fellow for three years. | 09/2012 - 08/2017 |
| | **George and Marie Vergottis Bursary** <br> Three year scholarship from the Vergottis Fund of the Cambridge European Trust. | 10/2008 - 06/2011 |
| | **Woods Fund** for summer research, Trinity College, Cambridge. | 2011 |
| | **Heilbronn Prize** for outstanding academic performance, Trinity College, Cambridge. | 2011 |
| | **Senior Scholarship** for outstanding academic performance, Trinity College, Cambridge. | 2010, 2011 |
| | **Junior Scholarship** for outstanding academic performance, Trinity College, Cambridge. | 2009 |
| | **IKY (State Scholarships Foundation, Greece) Scholarships** <br> Scholarships for ranking third in the entrance examinations for the E.C.E. school of N.T.U.A. and ranking first at the end of the first academic year. | 2007, 2008 |
| | **Nikolaos G. Papadimitriou Foundation Scholarship** | 10/2007 - 06/2009 |

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| INVITED RESEARCH VISITS | **KTH Royal Institute of Technology**, Stockholm, Sweden. | 07/2022 |
| | **Seoul National University**, Seoul, South Korea. | 05/2018, 05/2022 |
| | **Institut des Hautes Études Scientifiques (IHÉS)**, Bures-sur-Yvette, France. | 06/2019 - 09/2019 |

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| INVITED TALKS | Geometry & Topology Seminar, University of Iowa. | May 2024 |
| | Algebraic Geometry Seminar, Columbia University. | March 2024 |
| | Algebra & Geometry Day at Thessaloniki, Aristotle University of Thessaloniki. | December 2023 |
| | Algebra Seminar, University of Oregon. | October 2023 |
| | Geometry Seminar, Texas A&M University. | October 2023 |
| | Algebraic Geometry and Number Theory Seminar, Rice University. | September 2023 |
| | Workshop on Moduli Spaces, Virtual Invariants and Shifted Symplectic Structures, Korea Institute for Advanced Study (KIAS). | June 2023 |
| | Algebra Seminar, Michigan State University. | February 2023 |
| | Mathematical Physics Seminar, University of Pennsylvania. | February 2023 |
| | Algebraic Geometry Seminar, University of Michigan. | February 2023 |
| | Department Colloquium, Stony Brook University. | October 2022 |
| | Algebraic Geometry Seminar, Stony Brook University. | October 2022 |
| | Geometry Seminar, University of Texas, Austin. | September 2022 |
| | Algebra, Number Theory and Combinatorics Session, Second Congress of Greek Mathematicians, National Technical University of Athens. | July 2022 |
| | Greek Mathematical Seminar, online. | June 2022 |
| | Algebraic Geometry Seminar, Seoul National University. | May 2022 |
| | Algebraic Geometry Seminar, Stanford University. | April 2022 |
| | Department Colloquium, University of Hawai'i at Mānoa. | March 2022 |
| | Geometry Seminar, Aristotle University of Thessaloniki, Greece. | November 2021 |
| | Algebraic Geometry in String Theory Seminar, Harvard Center of Mathematical Sciences and Applications (CMSA). | November 2021 |
| | Enumerative Geometry Seminar, University of California, San Diego. | October 2021 |
| | Algebraic Geometry Seminar, University of Trieste and SISSA. | May 2021 |
| | Geometry Seminar, University of Texas, Austin. | March 2021 |
| | Spring Eastern Sectional Meeting of the American Mathematical Society. | March 2021 |

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| Algebra Seminar, University of Oregon. | November 2020 |
| Southern California Algebraic Geometry Seminar, University of Southern California. | October 2019 |
| More Algebraic Geometry at Imperial College Seminar, Imperial College London. | June 2019 |
| Algebraic Geometry Seminar, University of California, San Diego. | September 2018 |
| Algebraic Geometry Seminar, Seoul National University. | May 2018 |
| Moduli Spaces and Representation Theory Seminar, Mathematical Sciences Research Institute. | April 2018 |
| Algebraic Geometry Seminar, University of Arizona. | March 2018 |
| Algebraic Geometry Seminar, Columbia University. | February 2018 |
| Shanghai Center for Mathematical Sciences, Fudan University. | August 2017 |

TEACHING, MENTORING AND OUTREACH

### The University of Texas at Austin

**Instructor of Record**

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| M 408K : Differential Calculus. | Fall 2023 |
| M 408C : Differential and Integral Calculus. | Fall 2021 |
| M 328K : Introduction to Number Theory. | Spring 2023 |
| M 365C : Real Analysis I. | Fall 2022 |

**Sunday Morning Math Group (SMMG)**        Fall 2022 - present
Gave an expository talk on the Banach–Tarski Paradox in April 2023.
Volunteering to lead and assist with SMMG outreach activities for students, teachers, and parents.

**Prison Mathematics Project**        08/2022 - present
Volunteering as a "pen-pal" mentor for an incarcerated adult to provide support and guidance for self-education in algebra.

**UT Math Club**        Spring 2023
Gave an expository talk titled "Moduli Spaces in Geometry".

**Mathematicians of Color Alliance of Texas (MoCAT) Pizza Seminar**        Spring 2021
Gave an introductory background talk on Diophantine Equations.

### University of California, San Diego

**Instructor of Record**

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| MATH 10A : Calculus I. | Fall 2018, Fall 2019 |
| MATH 10B : Calculus II. | Winter 2019, Winter 2020, Spring 2021 |
| MATH 18 : Linear Algebra. | Spring 2021 |
| MATH 102 : Applied Linear Algebra. | Spring 2019, Fall 2019 |
| MATH 109 : Mathematical Reasoning. | Winter 2019, Winter 2020, Winter 2021 |

**Research Communications Program Mini-Grant**        11/2019 - 09/2020
Grant for project aiming to develop visual metaphors and host presentations to communicate algebraic geometry at a K-12 school in the San Diego area.

**Research Brief for General Audience**        September 2020
YouTube video, available here, to communicate my research to a wide audience.

**Teaching and Learning Commons Content Training Speaker**        Winter 2020
Presentation on effective learning strategies for mathematics courses for Supplemental Instruction leaders and tutors.

**Association for Women in Mathematics (AWM) Mentor**        Spring 2021
Served as a mentor for a graduate student as part of UCSD's chapter of AWM one-on-one mentoring program for graduate students and postdocs.

### Stanford University

**Instructor of Record**

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|---|---|
| MATH 20 : Calculus. | Fall 2017, Winter 2018 |

**Teaching Assistant (TA)**

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| MATH 63CM : Modern Mathematics: Continuous Methods. | Spring 2017 |
| MATH 53 : Differential Equations with Linear Algebra. | Spring 2016 |
| MATH 53H : Honors Multivariable Mathematics, Ordinary Differential Equations. | Spring 2015 |

MATH 51 : Linear Algebra and Differential Calculus of Several Variables.      Winter 2014

**Course Assistant (CA)**

MATH 215A : Complex Analysis (graduate level).      Fall 2014

MATH 120 : Groups and Rings.      Fall 2013

**Stanford Undergraduate Research Institute in Mathematics (SURIM)**      Summer 2016

Graduate student mentor for 4 Stanford undergraduate students working on group
research project "Toric Varieties and their Geometry".

**Teaching Assistant Mentor**      Spring 2016 & 2017

Provided teaching guidance to 2 Stanford graduate students.

**Stanford Math Directed Reading Program (DRP)**      Spring 2017

Mentored a first-year undergraduate student learning about complex analysis.

PROFESSIONAL SERVICE

Referee reports and quick opinions for: Geometry & Topology, Documenta Mathematica, Selecta Mathematica, International Mathematics Research Notices, Journal of Algebraic Geometry, Journal of Differential Geometry, Advances in Mathematics, Acta Mathematica Sinica, English Series, Bulletin of the London Mathematical Society, Proceedings of the Royal Society A, Forum of Mathematics, Sigma, Moduli.

Reviewer for: Zentralblatt MATH, Mathematical Reviews.

Co-organizer of the Geometry seminar at the University of Texas at Austin during the academic year 2022-2023 and the Algebraic Geometry seminar at the University of California, San Diego during the academic year 2020-2021.

Led one of the Exercise/Q & A sessions for Richard Thomas' minicourse on Vafa-Witten invariants for the 2021 IHÉS Summer School "Enumerative Geometry, Physics and Representation Theory".

AWARDS AND HONORS

**Silver medal** in the International Mathematics Competition (**IMC**)      July 2008
for University students, Blagoevgrad, Bulgaria.

**Bronze medal** in the South Eastern European Mathematical Olympiad      March 2008
for University Students (**SEEMOUS**), Athens, Greece.

**Bronze medal** in the International Mathematical Olympiad (**IMO**), Hanoi, Vietnam.      July 2007

**Bronze medal** in the Balkan Mathematical Olympiad (**BMO**), Rhodes, Greece.      May 2007

**Gold medal** in the Hellenic Mathematical Olympiad (**HMO**), Athens, Greece.      February 2007