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AREAS OF INTEREST

Algebraic Geometry, String Theory, Homological Algebra

POSITIONS HELD

Vilas Associate Research Professor <i>Named professor, University of Wisconsin-Madison, WI</i>	2020-2022
Professor <i>University of Wisconsin-Madison, WI</i>	2012---present
Visiting Invited Professor <i>Max Planck Institute for Mathematics, Bonn, Germany</i>	Fall 2012
Tenured Associate Professor <i>University of Wisconsin-Madison, WI</i>	2008---2012
Tenure Track Assistant Professor <i>University of Wisconsin-Madison, WI</i>	2005---2008
NSF Postdoctoral Fellow/University Lecturer <i>University of Pennsylvania, Philadelphia, PA</i>	2002---2005

EDUCATION

Ph.D. (Mathematics) <i>Cornell University, Ithaca, NY</i> Areas of interest: algebraic geometry, string theory.	May 2000
Master of Science (Computer Science) <i>Cornell University, Ithaca, NY</i> Concentrations: theoretical computer science and cryptography.	May 2000
Bachelor of Science (Mathematics and Computer Science) <i>Hebrew University, Jerusalem, Israel</i> Graduated Summa Cum Laude with a double major in mathematics and computer science.	July 1993

PH. D. THESIS

Derived categories of twisted sheaves on Calabi-Yau manifolds
(Cornell University, 2000)

Thesis advisor: Dr. Mark Gross (currently Professor at Cambridge University, England)

AWARDS	<p>Vilas Associate Research Professorship (\$75,000) <i>Named professorship.</i></p> <p>NSF Research Grant 1811925 (\$250,000) <i>Research grant for travel, visitors, research expenses, and summer salary.</i></p> <p>University of Wisconsin Graduate School Grant (\$23,466) <i>Provides summer salary and graduate student support</i></p> <p>Short term visitor, Institute for Advanced Studies <i>“Homological Mirror Symmetry” special year program.</i></p> <p>Honorary foreign member, Geometry and Physics group <i>GAP group of the Romanian Academy of Sciences</i></p> <p>University of Wisconsin Graduate School Grant (\$17,000) <i>Research grant.</i></p> <p>NSF Research Training Groups Grant 1502553 (\$2,000,000) <i>Algebraic Geometry, Number Theory and Applied Algebra</i> <i>co-PI with Nigel Boston.</i></p> <p>NSF Research Grant 1200721 (\$220,178) <i>Research grant for travel, visitors, research expenses, and summer salary.</i></p> <p>NSA Mathematical Sciences Program <i>Standard Research Grant (awarded, unable to accept due to conflict with NSF).</i></p> <p>NSF Research Training Groups Grant 0838210 (\$1,297,349) <i>Algebraic Geometry and Number Theory at the University of Wisconsin</i> <i>co-PI with Jordan Ellenberg.</i></p> <p>NSF Research Grant 0901224 (\$216,342) <i>Research grant for travel, visitors, research expenses, and summer salary.</i></p> <p>University of Wisconsin Graduate School Grant <i>Research grant (awarded, unable to accept due to conflict with NSF).</i></p> <p>NSF Research Grant 0556042 (\$257,926) <i>Research grant for travel, visitors, research expenses, and summer salary.</i></p> <p>NSF Postdoctoral Research Fellowship 0202567 (\$108,000) <i>Research grant for travel, visitors, research expenses, and summer salary.</i></p> <p>Intel Prize <i>Awarded to outstanding students at the Hebrew University.</i></p> <p>Amirim Fellowship <i>Hebrew University, Jerusalem, Israel</i></p> <p>Silver Medal, International Computer Science Olympiad <i>Part of Romania’s team at the second International Computer Science Olympiad held in Minsk, USSR.</i></p>	<p>2020—2022</p> <p>2018—2022</p> <p>2018</p> <p>Fall 2016</p> <p>Fall 2015—present</p> <p>Summer 2016</p> <p>2015-2020</p> <p>2012—2018</p> <p>2012</p> <p>2011-2014</p> <p>2009-2012</p> <p>2009</p> <p>2006-2009</p> <p>2002-2005</p> <p>Summer 1993</p> <p>1991-1993</p> <p>Spring 1990</p>
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PUBLICATIONS

- 1. Effective algorithms for enumerating ribbon graphs**
to be submitted to SIAGA
- 2. The $g=2$ categorical Gromov-Witten invariants of elliptic curves**
(with Weng-Him Cheung), in preparation
- 3. On the cohomology of the Bridgeland differential**
(with Dima Arinkin), in preparation
- 4. An HKR decomposition for Azumaya orbifolds**
(with Dima Arinkin), in preparation
- 5. Moonshine at Landau-Ginzburg points**
(with Yunfan He and Shengyuan Huang), submitted, (arXiv:2107.12405), 7pp
- 6. The cup product in orbifold Hochschild cohomology**
(with Shengyuan Huang), submitted (arXiv:2101.06276), 33pp
- 7. Categorical enumerative invariants, I: string vertices**
(with Kevin Costello and Junwu Tu), submitted, (arXiv:2009.06673), 35pp
- 8. Categorical enumerative invariants, II: Givental formula**
(with Junwu Tu), submitted, (arXiv:2009.06659), 55pp
- 9. Categorical primitive forms and Gromov-Witten invariants of A_n singularities**
(with Si Li and Junwu Tu), Internat. Math. Res. Notices, rnz315 (2019)
- 10. Computing a categorical Gromov-Witten invariant**
(with Junwu Tu), Compos. Math. 156 (2020), no. 7, 1275-1309
- 11. On intersections of two Grassmannians in \mathbb{P}^9**
(with Lev Borisov and Alex Perry), J. reine angew. Math., doi:10.1515/crelle-2018-0014
- 12. GLSM realizations of maps and intersections of Grassmannians and Pfaffians**
(with Johanna Knapp and Eric Sharpe), J. High Energ. Phys. (2018) 2018: 119
- 13. Formality of derived intersections and the orbifold HKR isomorphism**
(with Dima Arinkin and Márton Hablicsek), J. Algebra (2019), (arXiv:1412.5233), 23pp
- 14. The Hodge theorem as a derived self-intersection**
(with Dima Arinkin and Márton Hablicsek) Algebraic Geometry 4 (2017), 394-423
- 15. On the Lie algebroid of a derived self-intersection**
(with Damien Calaque and Junwu Tu), Adv. in Math. 262 (2014), 751-783
- 16. Curved A-infinity algebras and Landau-Ginzburg models**
(with Junwu Tu), New York J. Math. 19 (2013), 305-342
- 17. PBW for an inclusion of Lie algebras**
(with Damien Calaque and Junwu Tu), J. Algebra 378 (2013), 64-79
- 18. When is the self-intersection of a subvariety a fibration?**
(with Dima Arinkin), Adv. in Math., 231 (2012), no. 2, 815-842
- 19. Non-birational twisted derived equivalences in abelian GLSMs**
(with Jacques Distler, Simeon Hellerman, Tony Pantev and Eric Sharpe) Communications in Mathematical Physics 294 (2010), no. 3, 605-645
- 20. The Mukai pairing, I: a categorical approach**
(with Simon Willerton), New York J. of Math., no. 16 (2010), 61-98

- 21. The Pfaffian-Grassmannian derived equivalence**
(with Lev Borisov), *J. Algebraic Geom.* 18 (2009) 201-222
- 22. Non-birational Calabi-Yau threefolds that are derived equivalent**
Internat. J. Math. 18 (2007), No. 5, 491-504
- 23. Derived categories: a skimming**
Snowbird Lectures in Algebraic Geometry, Contemporary Mathematics no. 388 (2005), 43-75
- 24. The Mukai pairing, II: the Hochschild-Kostant-Rosenberg isomorphism**
Adv. in Math., 194 (2005), no. 1, 34-66
- 25. The Mukai pairing, I: the Hochschild structure**
preprint math.AG/0308079, superseded by paper 12. above
- 26. Algebraic deformations arising from orbifolds with discrete torsion**
(with Anthony Giaquinto, Sarah Witherspoon)
J. Pure Appl. Algebra, **187** (2004), no. 1-3, 51-70
- 27. D-Branes, B-fields, and Ext groups**
(with Sheldon Katz, Eric Sharpe), *Adv. Theor. Math. Phys.*, 7 (2003), no. 3, 381-404
- 28. Fiberwise stable bundles on elliptic fibrations with relative Picard number one**
CR Acad. Sci. Paris Ser. I, 334 (2002), no. 6, 469-472
- 29. Non-fine moduli spaces of sheaves on K3 surfaces**
Internat. Math. Res. Notices 2002 (2002), no. 20, 1027-1056
- 30. Derived categories of twisted sheaves on elliptic threefolds**
J. reine angew. Math. (Crelle's Journal) 544 (2002), 161-179
- 31. Derived categories of twisted sheaves on Calabi-Yau manifolds**
Ph.D. thesis, Cornell University, (2000)

**PUBLICATIONS
COMPLETED BY
PH.D.
STUDENTS
UNDER
SUPERVISION**

- 1. Shengyuan Huang, Functoriality of HKR isomorphisms**, preprint, arXiv:2002.00017
- 2. Nicolas Addington, Spinor sheaves on singular quadrics**, *Proc. Amer. Math. Soc.* 139 (2011), no. 11, 3867–3879
- 3. Nicolas Addington, The Derived Category of the Intersection of Four Quadrics**, preprint arXiv:0904.1764
- 4. Junwu Tu, Matrix factorizations via Koszul duality**, preprint arXiv:1009.4151

**CONFERENCES
ORGANIZED**

- AMS Sectional Meeting on Categorical Enumerative Invariants** September 2019
(with Junwu Tu) *University of Wisconsin-Madison, Madison, WI*
- Categorical Gromov-Witten Invariants** January 2019
(with R. Pandharipande and N. Sheridan) *ETH Zürich, Switzerland*
- Homological Methods in Algebraic Geometry** (with Dima Arinkin) April 2014
University of Wisconsin, Madison
- Mirror Symmetry in the Midwest** (with Yong-Geun Oh) November 2012
University of Wisconsin, Madison
- Midwest Algebraic Geometry Graduate Conference** October 2010
University of Wisconsin, Madison

SELECTED INVITED LECTURES	Categorical Enumerative Invariants (5 lectures) <i>Imperial College, London, UK (online)</i>	September 2020
	Higher structures in geometry and physics <i>Fields Institute, Toronto, Canada</i>	November 2019
	Geometry and algebra of Landau-Ginzburg models <i>Fields Institute, Toronto, Canada</i>	September 2019
	AMS Sectional meeting <i>University of Wisconsin, Madison, WI</i>	September 2019
	Algebraic Geometry seminar <i>University of Edinburgh</i>	July 2019
	Derived categories and geometry in positive characteristic <i>IMPAN, Warsaw, Poland</i>	June 2019
	Ninth congress of Romanian mathematicians <i>Galati, Romania</i>	June 2019
	Derived categories and related topics conference <i>Sun-Yat Sen University, Guangzhou, China</i>	May 2019
	Categorical Gromov-Witten invariants (series of four lectures) <i>ETH, Zürich, Switzerland</i>	January 2019
	AGNES (Algebraic Geometry in the Northeast) <i>University of Massachusetts-Amherst</i>	March 2019
	Algebraic Geometry seminars <i>Stanford University, Virginia Tech University, Cornell University</i>	April-October 2018
	Spring School “Categorical Gromov-Witten invariants” (lead) <i>Castello di Montegufoni, Italy</i>	March 2018
	Algebraic Geometry Seminar <i>RIMS (Research Institute in Mathematical Sciences), Kyoto, Japan</i>	November 2017
	Math-String Seminar <i>IPMU (Institute for the Physics and Mathematics of the Universe), Tokyo, Japan</i>	November 2017
	Algebraic Geometry Seminar <i>Northwestern University, Evanston, IL</i>	November 2017
	AMS Sectional Meeting <i>University at Buffalo, Buffalo, NY</i>	September 2017
Enumerative Geometry, Mirror Symmetry, and Physics <i>University of Illinois at Urbana-Champaign</i>	July 2017	
Symplectic Geometry Seminar <i>Institute for Advanced Studies, Princeton, NJ</i>	April 2017	
Winter school “Higher Categories and TQFT” (primary lecturer) <i>KLAS, South Korea</i>	December 2016	

**INVITED
LECTURES
(CONT'D)**

I-70 Algebraic Geometry Symposium (plenary speaker) <i>University of Missouri, Columbia</i>	November 2016
Workshop on String/M-theory <i>Fields Institute, Toronto, Canada</i>	August 2016
Interacting Algebraic Geometry <i>Institut de Mathématiques de Bourgogne, Dijon, France</i>	July 2016
Factorization Algebras and Functorial Field Theory <i>Mathematisches Forschungsinstitut Oberwolfach, Germany</i>	May 2016
Algebraic Geometry seminar <i>Northeastern University, Boston, MA</i>	November 2015
AMS Sectional Meeting <i>Loyola University, Chicago, IL</i>	October 2015
AMS Summer Institute in Algebraic Geometry <i>University of Utah, Salt Lake City, UT</i>	July 2015
Eighth Congress of Romanian Mathematicians <i>Iasi, Romania</i>	July 2015
GAP XIII, Derived Geometry conference <i>IBS Center for Geometry and Physics, Pohang, Korea</i>	July 2015
Algebraic Geometry seminar <i>Hebrew University, Jerusalem, Israel</i>	June 2015
Spring Eastern regional AMS conference <i>Georgetown University, Washington, DC</i>	March 2015
Mathematics Inspired by String Theory <i>Tsinghua Sanya Mathematical Forum, Sanya, China</i>	December 2014
Higher Structures in Philadelphia conference <i>Temple University, Philadelphia, PA</i>	August 2014
Algebraic Geometry Summer Days <i>Institute of Mathematics of the Romanian Academy, Bucharest, Romania</i>	June 2014
Deformation Theory and Topology seminars <i>University of Pennsylvania and New York University</i>	April 2014
Geometry Seminar <i>University of British Columbia, Vancouver, Canada</i>	March 2014
Algebraic Analysis and Deformation Quantization conference <i>University of Padova, Padova, Italy</i>	February 2014
Higher Categories and Topological Field Theories conference <i>Erwin Schrödinger Institute, Vienna, Austria</i>	June 2013
Moduli Spaces and their Invariants in Mathematical Physics <i>Centre de Recherche Mathématiques, Montréal, Canada</i>	June 2013
Cornell-PSU Symplectic Geometry seminar <i>Penn State University, State College, PA</i>	April 2013

INVITED LECTURES (CONT'D)	Various Geometry Seminars <i>ETH Zurich, EPFL Lausanne, Oxford University, Max Planck Institute Bonn, University of Amsterdam, IMAR Bucharest</i>	Sept-Dec 2012
	Szygies in Algebraic Geometry, with an exploration of a Connection with String Theory <i>Banff International Research Station, Banff, Canada</i>	August 2012
	Spring School on Algebraic Microlocal Analysis <i>Northwestern University, Evanston, IL</i>	May 2012
	Colloquium and Algebra Seminar <i>University of Maryland, College Park, MD</i>	May 2012
	Conference in Honor of Ragnar-Olaf Buchweitz <i>University of Syracuse, Syracuse, NY</i>	April 2012
	Hyperkahler and holomorphic symplectic geometry <i>BIRS, Banff, Canada</i>	March 2012
	Algebraic Geometry Seminar <i>Princeton University, Princeton, NJ</i>	February 2012
	Algebraic Analysis Seminar <i>Université Paris 7, Paris, France</i>	November 2011
	Mirror Symmetry in the Midwest <i>Kansas State University, Manhattan, KS</i>	November 2011
	Colloquium and Algebraic Geometry Seminar <i>University of Utah, Salt Lake City, UT</i>	October 2011
	Seventh International Congress of Romanian Mathematicians <i>Brasov, Romania</i>	August 2011
	The Legacy of Deformation Quantization <i>ETH, Ascona, Switzerland</i>	July 2011
	Loop Algebras, Groups, and Spaces <i>CIRM Luminy, Marseille, France</i>	June 2011
	Colloquium and Algebraic Geometry Seminar <i>University of North Carolina, Chapel Hill, NC</i>	March 2011
	Western Algebraic Geometry Seminar <i>University of Arizona, Tucson, AZ</i>	November 2010
	ETH Zurich Mathematics Colloquium <i>ETH Zurich, Zurich, Switzerland</i>	October 2010
	AMS Sectional Meeting <i>Macalester College, St. Paul, MN</i>	April 2010
Mirror Symmetry and Gromov-Witten Theory <i>NIMS, Seoul National University, Seoul, South Korea</i>	January 2010	
Mirror Symmetry and Gromov-Witten Invariants <i>University of Tokyo, Tokyo, Japan</i>	December 2009	

**GRADUATE AND
POSTDOC
ADVISING**

Graduate Students

Nicolas Addington – Ph.D. received 12/2009, Associate Professor, University of Oregon
Junwu Tu – Ph.D. received 08/2011, Professor, ShanghaiTech University, Shanghai, China
Márton Hablicsek – Ph.D. received 06/2014, tenure-track professor, University of Leyden
Ahmet Kabakulak – Ph.D. received 06/2017, currently at Amazon.com
Shengyuan Huang – Ph.D. received 06/2021, post-doc, University of Birmingham
David Wagner – Ph.D. received 06/2021
Weng-Him Cheung – Ph.D. expected 06/2022
Yunfan He – Ph.D. expected 06/2023

Postdocs Advised and Current Position

Sukhendu Mehrotra (2009-2011), Professor, Chennai Mathematical Institute
Matthew Ballard (2011-2013), Associate Professor, University of South Carolina
Parker Lowrey (UW-Madison, 2013-2014), Senior Data Scientist, Activision
Alexander Pavlov (2016-2018)
Michael Brown (2017-2020), tenure-track Auburn University, Auburn, AL

**TEACHING
EXPERIENCE**

Lead Lecturer: Categorical Gromov-Witten invariants March 2018
Castello di Montegufoni, Italy (organized by the University of Mainz)
Along with Timothy Perutz, presented a five lecture series aimed at post-doctoral fellows and graduate students.

Lecture Series: Gromov-Witten Invariants of A_∞ Categories January 2010
Chinese University of Hong Kong, Hong Kong
Presented a six lecture series aimed at post-doctoral fellows and graduate students.

Instructor June 2009
University of Pennsylvania summer school on Geometry of Quantum Fields And Strings
One of the primary instructors for the summer school, which was aimed at introducing graduate students and post-doctoral fellows to advanced topics in string theory and mirror symmetry

Instructor June 2007
University of Utah summer school on Derived Categories
One of the primary instructors for the summer school, which was aimed at introducing graduate students and post-doctoral fellows to advanced topics in derived categories and physics

Assistant Professor/Associate Professor/Professor 2005-present
University of Wisconsin-Madison
Professor for courses at all levels, from large introductory courses for undergraduate students to advanced graduate courses

SERVICE**Organizer**

Algebraic Geometry Seminar – UW-Madison (2005 – present)

Putnam Club – UW-Madison 2009-2010

NSF Panel member

Evaluating proposals submitted to the NSF Algebra Section – January 2008, January 2009, January 2010, December 2010, February 2014, February 2019; and for Career proposals October 2017.

Referee

Various journals, including *Inventiones Mathematicae*, *Duke Mathematical Journal*, *Advances in Mathematics*, *Communications in Mathematical Physics*

Committee Member (UW-Madison)

Physical sciences divisional committee – 2013-2016, fall 2017

University senator – 2010-2012

Salary committee – 2013, 2014-2017 (chair), 2020-2021 (chair)

Awards committee – 2018-2019 (chair)

Budget committee – 2017-2018

Algebra caucus chair – 2014

Undergraduate program committee – 2005-2008

TA evaluation committee – 2011-2012

Director of computing search committee – 2011

Graduate and undergraduate advisor – 2011-2020

Graduate admissions committee – 2019-present