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AREAS OF INTEREST

Algebraic Geometry, String Theory, Homological Algebra

POSITIONS HELD

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
Visiting Assistant Professor <i>University of Massachusetts, Amherst, MA</i>	2000---2002

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	Short term visitor, Institute for Advanced Studies <i>“Homological Mirror Symmetry” special year program.</i>	Fall 2016
	Honorary foreign member, Geometry and Physics group <i>GAP group of the Romanian Academy of Sciences</i>	Fall 2015—present
	University of Wisconsin Graduate School Grant (\$17,000) <i>Research grant.</i>	Summer 2016
	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>	2015-2020
	NSF Research Grant 1200721 (\$220,178) <i>Research grant for travel, visitors, research expenses, and summer salary.</i>	2012—present
	NSA Mathematical Sciences Program <i>Standard Research Grant (awarded, unable to accept due to conflict with NSF).</i>	2012
	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>	2011-2014
	NSF Research Grant 0901224 (\$216,342) <i>Research grant for travel, visitors, research expenses, and summer salary.</i>	2009-2012
	University of Wisconsin Graduate School Grant <i>Research grant (awarded, unable to accept due to conflict with NSF).</i>	2009
	NSF Research Grant 0556042 (\$257,926) <i>Research grant for travel, visitors, research expenses, and summer salary.</i>	2006-2009
	NSF Postdoctoral Research Fellowship 0202567 (\$108,000) <i>Research grant for travel, visitors, research expenses, and summer salary.</i>	2002-2005
	Intel Prize <i>Awarded to outstanding students at the Hebrew University.</i>	Summer 1993
	Amirim Fellowship <i>Hebrew University, Jerusalem, Israel</i>	1991-1993
	Silver Medal, International Computer Science Olympiad <i>Part of Romania’s team at the second International Computer Science Olympiad held in Minsk, USSR.</i>	Spring 1990

PUBLICATIONS

- 1. On the cohomology of the Bridgeland differential**
(with Dima Arinkin), in preparation
- 2. An HKR decomposition for Azumaya orbifolds,**
(with Dima Arinkin), in preparation
- 3. Higher genus categorical Gromov-Witten invariants**
(with Junwu Tu), submitted, (arXiv:1706.09912), 44pp
- 4. On intersections of two Grassmannians in \mathbf{P}^9**
(with Lev Borisov and Alex Perry), submitted, (arXiv:1707.00534), 28pp
- 5. GLSM realizations of maps and intersections of Grassmannians and Pfaffians**
(with Johanna Knapp and Eric Sharpe), accepted pending revisions, J. High Energy Physics
- 6. Formality of derived intersections and the orbifold HKR isomorphism**
(with Dima Arinkin and Márton Hablicsek), to appear, J. Algebra, (arXiv:1412.5233), 23pp
- 7. The Hodge theorem as a derived self-intersection**
(with Dima Arinkin and Márton Hablicsek)
Algebraic Geometry 4 (2017), 394-423
- 8. On the Lie algebroid of a derived self-intersection**
(with Damien Calaque and Junwu Tu), Adv. in Math. 262 (2014), 751-783
- 9. Curved A-infinity algebras and Landau-Ginzburg models**
(with Junwu Tu), New York J. Math. 19 (2013), 305-342
- 10. PBW for an inclusion of Lie algebras**
(with Damien Calaque and Junwu Tu), J. Algebra 378 (2013), 64-79
- 11. When is the self-intersection of a subvariety a fibration?**
(with Dima Arinkin), Adv. in Math., 231 (2012), no. 2, 815-842
- 12. 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
- 13. The Mukai pairing, I: a categorical approach**
(with Simon Willerton), New York J. of Math., no. 16 (2010), 61-98
- 14. The Pfaffian-Grassmannian derived equivalence**
(with Lev Borisov), J. Algebraic Geom. 18 (2009) 201-222
- 15. Non-birational Calabi-Yau threefolds that are derived equivalent**
Internat. J. Math. 18 (2007), No. 5, 491-504
- 16. Derived categories: a skimming**
Snowbird Lectures in Algebraic Geometry, Contemporary Mathematics no. 388 (2005), 43-75
- 17. The Mukai pairing, II: the Hochschild-Kostant-Rosenberg isomorphism**
Adv. in Math., 194 (2005), no. 1, 34-66
- 18. The Mukai pairing, I: the Hochschild structure**
preprint math.AG/0308079, superseded by paper 12. above
- 19. Algebraic deformations arising from orbifolds with discrete torsion**
(with Anthony Giaquinto, Sarah Witherspoon)
J. Pure Appl. Algebra, **187** (2004), no. 1-3, 51-70

20. D-Branes, B-fields, and Ext groups

(with Sheldon Katz, Eric Sharpe), Adv. Theor. Math. Phys., 7 (2003), no. 3, 381-404

21. Fiberwise stable bundles on elliptic fibrations with relative Picard number one

CR Acad. Sci. Paris Ser. I, 334 (2002), no. 6, 469-472

22. Non-fine moduli spaces of sheaves on K3 surfaces

Internat. Math. Res. Notices 2002 (2002), no. 20, 1027-1056

23. Derived categories of twisted sheaves on elliptic threefolds

J. reine angew. Math. (Crelle's Journal) 544 (2002), 161-179

24. Derived categories of twisted sheaves on Calabi-Yau manifolds

Ph.D. thesis, Cornell University, (2000)

**PUBLICATIONS
COMPLETED BY
PH.D.**

1. Nicolas Addington, Spinor sheaves on singular quadrics, Proc. Amer. Math. Soc. 139 (2011), no. 11, 3867–3879

**STUDENTS
UNDER
SUPERVISION**

2. Nicolas Addington, The Derived Category of the Intersection of Four Quadrics, preprint arXiv:0904.1764

3. Junwu Tu, Matrix factorizations via Koszul duality, preprint arXiv:1009.4151

**CONFERENCES
ORGANIZED**

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**

Spring School “Categorical Gromov-Witten invariants” (lead) March 2018
Castello di Montegufoni, Italy

Algebraic Geometry Seminar November 2017
RIMS (Research Institute in Mathematical Sciences), Kyoto, Japan

Math-String Seminar November 2017
IPMU (Institute for the Physics and Mathematics of the Universe), Tokyo, Japan

Algebraic Geometry Seminar November 2017
Northwestern University, Evanston, IL

AMS Sectional Meeting September 2017
University at Buffalo, Buffalo, NY

Enumerative Geometry, Mirror Symmetry, and Physics July 2017
University of Illinois at Urbana-Champaign

Symplectic Geometry Seminar April 2017
Institute for Advanced Studies, Princeton, NJ

Winter school “Higher Categories and TQFT” (primary lecturer) December 2016
KLAS, South Korea

I-70 Algebraic Geometry Symposium (plenary speaker) November 2016
University of Missouri, Columbia

Workshop on String/M-theory August 2016
Fields Institute, Toronto, Canada

**INVITED
LECTURES
(CONT'D)**

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
Various Geometry Seminars <i>ETH Zurich, EPFL Lausanne, Oxford University, Max Planck Institute Bonn, University of Amsterdam, IMAR Bucharest</i>	Sept-Dec 2012
Syzgies 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
Algebraic Geometry and Lie Theory Seminar <i>University of California, Riverside, CA</i>	November 2009
Oliver Club Lecture (Mathematics Department Colloquium) <i>Cornell University, Ithaca, NY</i>	November 2009
Workshop on Algebraic Geometry and Physics (WAGP) <i>Maresias, Brazil</i>	September 2009

**GRADUATE AND
POSTDOC
ADVISING**

Graduate Students

Nicolas Addington – Ph.D. received 12/2009, tenure-track University of Oregon
Junwu Tu – Ph.D. received 08/2011, tenure-track University of Missouri, Columbia
Márton Hablicsek – Ph.D. received 06/2014, post-doc University of Pennsylvania
Ahmet Kabakulak – Ph.D. received 06/2017, currently at Amazon.com
Shengyuan Huang – Ph.D. expected 06/2020
Weng-Him Cheung – Ph.D. expected 06/2021

Postdocs Advised and Current Position

Sukhendu Mehrotra (2009-2011), tenure-track Pontificia Universidad Catolica de Chile
Matthew Ballard (2011-2013), tenure-track University of South Carolina
Parker Lowrey (UW-Madison, 2013-2014), Senior Data Scientist, Activision
Alexander Pavlov (2016-present)
Michael Brown (2017-present)

**TEACHING
EXPERIENCE**

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

Lead Instructor 2004
Lukecin fall school for advanced graduate students
One of two principal lecturers at the school, presenting six lectures introducing graduate students to current areas of research

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

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)

Budget committee – 2017-present

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-present