

Curriculum Vitæ

Renzo Cavalieri

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Personal Data

Date of Birth: September 24, 1976; Milano, ITALY.

Education

2000-2005 PhD in Mathematics - University of Utah, Salt Lake City, UT.
Dissertation: "A Topological Quantum Field Theory of Intersection Numbers for Moduli Spaces of Admissible Covers."
Advisor: Professor Aaron Bertram.

2000-2002 MA in Mathematics- University of Utah, Salt Lake City, UT.

1995-2000 LAUREA in Mathematics - Universita' degli Studi di Milano, Milano, ITALY.
Dissertation: "Algebraic Curves defined over the Algebraic Closure of the Rational Numbers."
Advisor: Professor Gian Pietro Pirola.

Positions

2013-present Colorado State University - Associate Professor
2008-2013 Colorado State University - Tenure-Track Assistant Professor
2005-2008 University of Michigan - Assistant Professor
2002-2005 University of Utah - Teaching Fellow
2000-2002 University of Utah - Teaching Assistant

Publications: Book

With Eric Miles. Riemann Surfaces and Algebraic Curves: a first course in Hurwitz theory. *LMSST 85. Cambridge University Press* (2016).

Articles

1. with Paul Johnson, Hannah Markwig and Dhruv Ranganathan. Counting curves on Toric Surfaces: Tropical Geometry and the Fock Space.
2. with Vance Blankens. Intersections of ω classes in $\overline{M}_{g,n}$. Preprint: arXiv:1705.10955
3. with Melody Chan, Martin Ulirsch and Jonathan Wise. A moduli stack of tropical curves. Preprint: arXiv:1704.03806

4. with Paul Johnson, Hannah Markwig and Dhruv Ranganathan. A graphical interface for the Gromov-Witten theory of curves. *Proc. Alg. Geom. AMS Program in Salt Lake City*(2016)
5. Hurwitz theory and the double ramification cycle. *Japanese Journal of Mathematics* (2016)
6. with Hannah Markwig and Dhruv Ranganathan. Tropical compactification and the Gromov-Witten theory of \mathbb{P}^1 . *Selecta Math.* (2016)
7. with Andrea Brini. Crepant Resolutions and Open Strings II. Preprint: arXiv:1407.2571.
8. with Simon Hampe, Hannah Markwig and Dhruv Ranganathan. Moduli spaces of rational weighted stable curves and tropical geometry. *Forum Sigma*(2016)
9. with Hannah Markwig and Dhruv Ranganathan. Tropicalizing the Space of Admissible Covers. *Mathsch. Annalen*
10. with Steffen Marcus. A geometric perspective on the piecewise polynomiality of double Hurwitz numbers. *Canad. Math. Bull.* (2014)
11. with Andrea Brini and Dusty Ross. Crepant Resolutions and Open Strings. *Crelle* (2017)
12. with Aaron Bertram and Hannah Markwig. Polynomiality, Wall Crossings and Tropical Geometry of Rational Double Hurwitz Cycles. *J. Combin. Theory Ser. A* 120 (2013), no. 7, 16041631.
13. with Dusty Ross. Open Gromov-Witten Theory and the Crepant Resolution Conjecture. Preprint:arXiv:1102.0717. *Michigan Math. J.* 61 (2012), no. 4, 807837.
14. with Steffen Marcus and Jonathan Wise. Polynomial Families of Tautological Classes on $M_{g,n}^{rt}$. *Journal of Pure and Applied Algebra* 216 (2012) pp. 950-981
15. with Andrea Brini. Open orbifold Gromov-Witten invariants of $[\mathbb{C}^3/\mathbb{Z}_n]$: localization and mirror symmetry. Preprint: arXiv:1007.0934. In press at *Selecta Mathematica*.
16. with Hannah Markwig and Paul Johnson. Wall Crossings for Double Hurwitz Numbers. *Adv. Math.* 228 (2011), no. 4, 18941937.
17. with Hannah Markwig and Paul Johnson. Tropical Hurwitz Numbers. *Journal Algebraic Combinatorics* 2010, Volume 32, Number 2, Pages 241-265
18. with Gueorgui Todorov. An example of crepant resolution conjecture in two steps. Preprint: arXiv:0905.1725. *Comm. Anal. Geom.* 21 (2013), no. 3, 527539.
19. with Stephanie Yang. Tautological Pairings on Moduli Spaces of Curves. *Proc. Amer. Math. Soc.* 139 (2011), 51-62.
20. with Vincent Bouchard. Note on high genus Gromov-Witten Invariants of $[\mathbb{C}^3/\mathbb{Z}_3]$. *Adv. Teor. Math. Phys.*, 13 (2009), no.3., 695-719
21. with Charles Cadman. Gerby Localization, \mathbb{Z}_3 -Hodge Integrals and the GW Theory of $[\mathbb{C}^3/\mathbb{Z}_3]$. Preprint: arXiv: 0705.2158. *American Journal of Mathematics.* 131 (2009), no. 4, 1009–1046.

22. with Aaron Bertram and Gueorgui Todorov. Evaluating tautological classes using only Hurwitz numbers. *Transactions of the American Mathematical Society*. 360 (2008), no. 11, 6103–6111.
23. Generating functions for Hurwitz-Hodge integrals. Preprint: mathAG/0608590, 2006. *Advances in Mathematics* 218 (2008), no. 5, 1419–1429..
24. A TQFT for intersection numbers on moduli spaces of admissible covers. *Algebra and Number Theory Journal*, volume 1, Number 1. Mathematical sciences publishers. 2007.
25. Hodge-type integrals on moduli spaces of admissible covers. *Dave Auckly and Jim Bryan, editors, The interaction of finite type and Gromov-Witten invariants (BIRS 2003)*, volume 8. Geometry and Topology monographs, 2006.
26. with David Ayala. Counting bitangents with stable maps. *Expositiones Mathematicae*, November 2006.
27. with David Hartenstine. Math circles, an outreach program at the University of Utah. *Focus, Newsletter of the MAA*, January 2005.

Grants

- 2016-2019 PI, NSF conference grant DMS-1636713. *WAGS - 3 Year support*
- 2016-2021 PI, Simons Collaboration Grant. *Tautological Intersection on Moduli Spaces* (co-PI's: Casalaina-Martin, Viray)
- 2012-2016 PI, NSF Grant DMS-1159964. *FRG: Gromov-Witten Theory*
- 2011-2014 PI, NSF personal Grant DMS-1101549. *Intersection on Moduli Spaces*
- 2011 PI, Simons Collaboration Grant. *Tautological Intersection on Moduli Spaces*
- 2010-2014 PI, NSF conference grant 0955038. *WAGS - 5 Year support* (co-PI's: Bertram, Casalaina-Martin, Kovacs, Vakil)
- 2009 PI, NSF conference grant 0951907. *WAGS Fall 2009* (co-PI's: Bertram, Casalaina-Martin, Kovacs, Vakil)

Honors and Awards

- 2017 AIM- Square: with Melody Chan, Martin Ulirsch and Jonathan Wise.
- 2015 Oberwolfach - Research in Pairs: with Paul Johnson, Hannah Markwig and Dhruv Ranganathan.
- 2012 Oberwolfach - Research in Pairs: with Aaron Bertram and Hannah Markwig.
- 2011 Graduate Course Best Teacher Award - CSU.
- 2010 Graduate Course Best Teacher Award - CSU.
- 2006 Rackham Fellowship - University of Michigan.
- 2004 Graduate Research Fellowship - University of Utah.
- 2003 Outstanding Graduate Student Award - Department of Mathematics, University of Utah.

1997-2000 INPDAP Scholarship. (Italian Organization of State Employees.)

Research Mentorship

Fall 2016- present **Master adviser:** Adam Afandi.

Fall 2016- present **Master adviser:** Andrew Fry.

Fall 2014- present **Master adviser:** Nand Sharma.

Fall 2014 - present **Master adviser:** Vance Blankers.

Fall 2012 - Spring 2014 **Master adviser:** David Allen.

Fall 2011 - present **PhD adviser:** Douglas Ortego.

Summer 2009 - Spring 2014 **PhD thesis adviser:** Eric Miles.

Summer 2009 - Spring 2013 **PhD thesis adviser:** Dustin Ross.

Winter 2009 - Spring 2011 **PhD thesis co-adviser:** Steffen Marcus (Brown U.).

Committee member Mark Shoemaker (U. of Michigan), Marc Krawitz (PhD, U. of Michigan, 2010) and Eric Schmidt (PhD, CSU), Justin Hughes (PhD, CSU, 2013), Benjamin Cooper (MS, CSU, 2013), Catalina Camacho (CSU).

Undergraduate Research Mentorship

Summer-Fall 2014 **Honors Thesis:** Nate Zbacnik.

Summer 2013 **Honors Thesis:** Justin Wagner.

Summer-Fall 2011 **REU:** David Allen.

Summer 2009 **REU:** Andrew Kiluk.

Summer 2008 **REU:** Andrew Kiluk (with Hannah Markwig).

Summer 2008 **REU:** Alex Larson (with Hannah Markwig).

Summer 2008 **REU:** Brian Mann (with Hannah Markwig).

Summer 2007 **REU:** Pete Troyan.

Organizational Activities

Fall 2016 Organizer (with Jeff Achter et al.) of conference:

Western Algebraic Geometry Symposium.

Colorado State University, Fort Collins.

Fall 2014 Organizer (with Burt Totaro and Noah Giansiracusa) of:

Special Session in Algebraic Geometry.

Regional Meeting of the AMS, San Francisco.

Summer 2014 Organizer (with Dusty Ross et al.) of workshop:

School in Gromov-Witten Theory.

Pingree Park Campus of CSU.

Fall 2011 Organizer (with Jeff Achter et al.) of conference:

Western Algebraic Geometry Symposium.

Colorado State University, Fort Collins.

Summer 2011 Co-organizer (with Yongbin Ruan et al.) of conference:

Recent Developments in Orbifolds.

Chern Institute, Tianjin, China.

Spring 2011 Organizer (with Yano Casalaina-Martin) of FRAGMENT seminar.

Fall 2010 Organizer of FRAGMENT seminar.

Spring 2010 Organizer (with Yano Casalaina-Martin) of FRAGMENT seminar.

Fall 2009 Organizer (with Yano Casalaina-Martin) of FRAGMENT seminar.

Spring 2008 Organizer (with Hannah Markwig) of workshop:
Affine manifolds and Mirror Symmetry.
<http://www.math.lsa.umich.edu/~crenzo/mg/gross.html>

Spring 2008 Organizer (with Aaron Bertram and Jim Bryan):
Recent Progress on the Moduli Space of Curves.
[http://www.birs.ca \(08w5086\)](http://www.birs.ca (08w5086))

Summer 2007 Mini-cycle of 3-lectures at U. of Costa Rica (San Jose').
"Introduction to Moduli Spaces"

Spring 2007 Organizer of workshop:
D- bundles and Integrable Hierarchies.
<http://www.math.lsa.umich.edu/~crenzo/workshop/bn.html>

Spring 2006 Organizer (with Sam Payne) of workshop:
Moduli Space of Curves and Gromov-Witten Theory.
<http://www.math.lsa.umich.edu/conferences/moduli/index.html>

Spring 2006 Organizer of Topics in Algebraic Geometry Seminar.

2001-2003 Organizer of GSAC Colloquium.

Misc. Research Activity

Summer 2017. Master Class, University of Stockholm
 Mini-course: *Classical and Tropical Moduli Spaces*

Summer 2016. Grad Student Summer School, Program in Combinatorial Alg. Geometry, Fields Institute, Toronto
 Mini-course: *Moduli Spaces of Rational Pointed Curves.*

Fall 2014. Modern Trends in Gromov-Witten Theory. Hannover, Germany
 Mini-course: *Hurwitz Theory and the Double Ramification Cycle*

Winter 2014. U. Costa Rica. San Jose'. Costa Rica
 Mini-course: *Intersection Theory on Moduli Spaces or Weighted Stable Curves.*

Summer 2012. U. Costa Rica. San Jose'. Costa Rica
 Mini-course: *Geometry and Combinatorics of Hurwitz Numbers.*

Summer 2012. Beijing International Center for Mathematical Research, Beijing, China.
 Mini-course: *Hurwitz Theory and Orbifold Gromov-Witten Theory.*

Spring 2011 U.Michoacan, Morelia, Mexico.
 Mini-course: *Hurwitz Numbers.*

Spring 2010 U.Utah, Salt Lake City (UT)
 Mini-course: *The Moduli space of Curves*

Spring 2010 IMPA, Rio de Janeiro (Brazil)
 Mini-course: *Hurwitz Theory and Applications*

Spring 2009 Research member in MSRI special program in Algebraic Geometry.

Fall 2008 From Top. Strings to Integrable Hierarchies, SISSA, Trieste (Italy)

Mini-course: *Orbifold Gromov-Witten Theory*

Outreach Activities

Winter 2014 Two Introductory Lectures on Moduli Spaces, Union Matematica de America Latina y el Caribe, Turrialba, Cost Rica.

Spring 2010 Mini-course on the Fundamental Group at Universidad de Costa Rica.

Fall 2009 Speaker at SACNAS annual meeting, Dallas (TX)

Fall 2009 Speaker at Math Day, CSU.

Invited Talks

Spring 2003 Algebraic Geometry Seminar, Universita' degli Studi di Pavia, Pavia, ITALY.

Frobenius Algebras, Topological Quantum Field Theories, Hurwitz Numbers.

A possible approach to Gromov-Witten Theory.

Spring 2005 Algebraic Geometry Seminar, University of Michigan, Ann Arbor, (MI).

Topological Quantum Field Theories, Admissible Covers, and a Deformation of the Class Algebra of the Symmetric group.

Spring 2005 Algebraic Geometry Seminar, Johns Hopkins University, Baltimore, (MD).

Topological Quantum Field Theories, Admissible Covers, and a Deformation of the Class Algebra of the Symmetric group.

Summer 2005 Algebraic Geometry Seminar, Universita' degli Studi di Milano, Milano, ITALY.

Counting Bitangents with Stable Maps.

Summer 2005 Algebraic Geometry Seminar, Universita' degli Studi di Pavia, Pavia, ITALY.

A Topological Quantum Field Theory for Intersection Numbers on Moduli Spaces of Admissible Covers.

Fall 2005 Progress in Algebraic Geometry Motivated by Physics, BIRS, Banff, (AB), Canada.

A Topological Quantum Field Theory for Intersection Numbers on Moduli Spaces of Admissible Covers.

Fall 2005 AMS Special Session on Algebraic Geometry and Physics, University of Oregon, Eugene, (OR).

A Topological Quantum Field Theory for Intersection Numbers on Moduli Spaces of Admissible Covers.

Spring 2006 Algebraic Geometry Seminar, Michigan State University, East Lansing, (MI).

A Topological Quantum Field Theory for Intersection Numbers on Moduli Spaces of Admissible Covers.

Spring 2006 Algebraic Geometry Seminar, Ohio State University, Columbus, (OH).

A Topological Quantum Field Theory for Intersection Numbers on Moduli

Spaces of Admissible Covers.

Spring 2006 Seminar on Moduli Spaces and Representation Theory , Princeton University, Princeton, (NJ).

A Topological Quantum Field Theory for Intersection Numbers on Moduli Spaces of Admissible Covers.

Spring 2006 Algebraic Geometry Seminar, University of Texas, Austin, (TX).

A Topological Quantum Field Theory for Intersection Numbers on Moduli Spaces of Admissible Covers.

Spring 2006 Algebraic Geometry Seminar, University of Utah, Salt Lake City, (UT).

The Crepant Resolution Conjecture: Examples, Computations and Work in Progress.

Spring 2006 Algebraic Geometry Seminar, Northwestern University, Evanston, (IL).

A Topological Quantum Field Theory for Intersection Numbers on Moduli Spaces of Admissible Covers.

Spring 2006 Workshop: New Topological Constructions in String Theory, MSRI, Berkeley, (CA).

*Evaluating $\lambda_g \lambda_{g-1}$ on the Hyperelliptic Locus Knowing only $1/2$.
(and Localization...)*

Fall 2006 Algebraic Geometry Seminar, University of Illinois at Urbana Champaign, (IL).

Evaluating tautological classes using only Hurwitz numbers.

Fall 2006 Algebraic Geometry Seminar, Columbia University, (NY).

Evaluating tautological classes using only Hurwitz numbers.

Spring 2006 Algebraic Geometry Seminar, University of Utah (UT).

$\mathcal{GW}([\mathbb{C}^3/\mathbb{Z}_3])$.

Spring 2007 Geometry Seminar, Northwest University, (IL).

$\mathcal{GW}([\mathbb{C}^3/\mathbb{Z}_3])$.

Spring 2007 Geometry and Rep'n Theory Seminar, UC Berkeley (CA)

$\mathcal{GW}([\mathbb{C}^3/\mathbb{Z}_3])$.

Fall 2007 Algebraic Geometry Seminar, UBC, Vancouver (Canada)

Gerby localization and $\mathcal{GW}([\mathbb{C}^3/\mathbb{Z}_3])$.

Fall 2007 Departmental Seminar, UM Flint (MI)

Counting curves and... $\tan(x/2)$

Spring 2008 Colloquium, U. Colorado, Boulder (CO)

When Moduli spaces play together

Spring 2008 Colloquium, U. Western Ontario, London (ON)

When Moduli spaces play together

Spring 2008 Colloquium, U. Oregon, Eugene (OR)
When Moduli spaces play together

Spring 2008 Colloquium, Colorado State University, Fort Collins (CO)
When Moduli spaces play together

Spring 2008 Topology seminar, CINVESTAV, Mexico City
Moduli Spaces and Hodge Integrals

Fall 2008 Geometry Seminar, UT Austin
Orbifold Gromov-Witten Invariants

Spring 2009 Geometry Seminar, Politecnico Milano, Italy
Tautological Pairings on Moduli Spaces of Curves

Spring 2009 Combinatorics Seminar, SFSU, San Francisco
Wall Crossings for Double Hurwitz Numbers

Spring 2009 MSRI Postdoc Seminar, MSRI
Why should Algebraic Geometers Cut and Paste Graphs

Spring 2009 WAGS, UC Berkeley
Wall Crossings for Double Hurwitz Numbers

Spring 2009 AG Seminar, Cal Tech
Wall Crossings for Double Hurwitz Numbers

Spring 2010 AG Seminar, U. Georgia Athens
Wall Crossings for Double Hurwitz Numbers

Spring 2010 AG Seminar, U. California Davis
Wall Crossings for Double Hurwitz Numbers

Spring 2010 SoCAG, San Diego
Wall Crossings for Double Hurwitz Numbers

Summer 2010 Giornate di Geometria Algebrica, Gargnano, Italy
Orbifold Open GW Invariants

Fall 2010 U. of Connecticut,
Polynomial Families of Tautological Classes

Fall 2010 U. Arizona at Tucson,
Colloquium

Fall 2010 Stony Brooks,
Orbifold Open GW Invariants

Fall 2010 Columbia,
Orbifold Open GW Invariants

Spring 2011 Brown University,
Orbifold Open GW Invariants

Spring 2011 Oberwolfach,
Wall Crossings for Double Hurwitz Numbers

Summer 2011 Conference on GW theory, Grenoble, France,
Orbifold Open GW Invariants

Summer 2011 Orbifold Conference, Tianjin, China,
Orbifold Open GW Invariants

Fall 2011 BIRS workshop, Banff Canada,
Polynomiality phenomena in Hurwitz theory

Fall 2011 AMS special session, Salt Lake City, UT,
Orbifold Open GW Invariants

Spring 2012 Geometry Seminar, Boston University, Boston, MA
Rational Double Hurwitz Cycles.

Fall 2012 Hanover University, Geometry and Physics Colloquium.
Polynomiality in Hurwitz Theory

Fall 2012 Imperial College, London. MAGIC seminar.
The Open CRC in the toric setting

Fall 2012 University of Milan. Algebraic Geometry seminar.
The Open CRC in the toric setting

Spring 2013 PEAK Conference, Riezlern, Austria.
Polynomiality of double Hurwitz Numbers

Spring 2013 The Ohio State University. Algebraic Geometry Seminar.
The Open CRC in the toric setting

Spring 2013 Columbia University. GW theory Seminar.
The Open CRC in the toric setting

Spring 2013 LaCiM, Montreal. Algebraic Combinatorics Seminar.
Polynomiality of double Hurwitz Numbers

Spring 2013 University of Utah. Algebraic Geometry Seminar.
The Open CRC in the toric setting

Fall 2013 BAGS. Algebraic Geometry Seminar.
CRC and Open Strings

Fall 2013 University of Washington. Algebraic Geometry Seminar.
A geometric Perspective on Polynomiality of Double Hurwitz Numbers

Spring 2014. BIRS Workshop on Specialization of Linear Series
A geometric Perspective on Polynomiality of Double Hurwitz Numbers

Spring 2014. Workshop in GW Theory, Simons Center for Geometry and Physics
Orbifold Open GW Invariants

Spring 2014. Algebraic Geometry Seminar, Saarbrucken University
Orbifold Open GW Invariants

Spring 2014. Colloquium, Saarbrucken University
Hurwitz Theory and the Moduli Space of Curves

Spring 2014. Workshop on Mirror Symmetry and Algebraic Geometry, Pavia.
Orbifold Open GW Invariants

Fall 2014. Tropical and Algebraic Geometry Seminar, Yale University.
Orbifold Open GW Invariants

Spring 2015. Algebraic Geometry Seminar, University of Georgia.
Tropicalizing a Hurwitz Theorist

Spring 2015. Algebraic Geometry Seminar, University of Utah.
Tropicalizing a Hurwitz Theorist

- Spring 2015. ANT, University of Colorado.
Tropicalizing a Hurwitz Theorist
- Spring 2015. Algebraic Geometry Seminar, UFF, Niteroi.
Tropicalizing a Hurwitz Theorist
- Summer 2015. Algebraic Geometry Workshop, University of Nairobi, Kenya.
Double Hurwitz numbers and tropical geometry
- Fall 2015. Conference on Algebraic Geometry and Phsyics, Chern Institute, Tianjin.
Open Orbifold GW theory
- Fall 2015. Algebraic Geometry Seminar, Warwick University, UK.
Tropicalizing a Hurwitz Theorist
- Fall 2015. Algebraic Geometry Seminar, KTH, Stockholm, Sweden.
Tropicalizing a Hurwitz Theorist
- Fall 2015. Geometry and Topology Seminar, Imperial College, London, UK.
Crepan transformations and Open Invariants
- Fall 2015. Algebraic Geometry Seminar, Oxford University, UK.
Crepan transformations and Open Invariants
- Fall 2015. Colloquium, University of Liverpool, UK.
Tropicalizing a Hurwitz theorist
- Fall 2015. GLEN conference, University of Manchester, UK.
Tropical geometry, a graphical interface for the GW theory of curves
- Fall 2015. Algebraic Geometry Seminar, University of Edinburgh, UK.
Crepan transformations and Open Invariants
- Fall 2015. Algebraic Geometry Seminar, ETH, Zurich, Switzerland.
Crepan transformations and Open Invariants
- Fall 2015. Tropical Geometry Seminar, Geneva, Switzerland.
Tropical geometry, a graphical interface for the GW theory of curves
- Spring 2016. Colloquium, Montana State University, Bozeman.
Open GW Invariants and the CRC
- Spring 2016. Algebraic Geometry Seminar, Northwestern University, Evanston.
Tropical Enumerative Geometry
- Summer 2016. Global mirror symmetry workshop, Chern Institute, Tianjin, China
GW theory of Hirzebruch surfaces, tropical geometry and the Fock space
- Summer 2016. KIAS, algebraic geometry seminar, Seoul, South Korea.
Open GW Invariants and the CRC
- Summer 2016. SWAG conference, University of Georgia, Athens.
Hyperelliptic curves, Weierstrass points and graph Formulas
- Fall 2016. Algebraic Geometry Seminar, University of Pennsylvania, Philadelphia.
Hyperelliptic curves, Weierstrass points and graph Formulas
- Fall 2016. Colloquium. University of Washington, Seattle.
Loci of decorated hyperelliptic curves at the interface of algebraic geometry and com-

binatorics

Fall 2016. Conference on Moduli Spaces, Program in Combinatorial Algebraic Geometry, Fields Institute, Toronto.

Hyperelliptic curves, Weierstrass points and graph Formulas

Spring 2017. Geometry Seminar, NYU.

Hyperelliptic curves, Weierstrass points and graph Formulas

Spring 2017. Geometry Seminar, San Francisco State University.

Hyperelliptic curves, Weierstrass points and graph Formulas

Summer 2017. Geometry and Topology Conference, Gokova, Turkey

Graph Formulas for Tautological Classes

Teaching

Fall 2000: Math 1210, Calculus I (Teaching Assistant for Professor Hugo Rossi)

Spring 2001: Math 1090, Business Algebra

Fall 2001 - Spring 2003: Organizer of the Mathcircle Program

Original Lectures Written for MC:

Mathematical Induction

Asteroids: what's the shape of your Universe?

Flatland: how fat is your Universe?

Algebra and Number Theory contests and solutions

What is Mathematics all about?

Algebraic Curves and Pascal's Theorem

Fall 2003 Math1220, Calculus II

Spring 2004 Graduate Reading Course

Kontsevich's Formula for Rational Plane Curves.

Fall 2005 Math115, Calculus I

Fall 2006 Math433, Introduction to Differential Geometry.

Winter 2007 Math490, Introduction to Topology.

Fall 2007 Math590, Introduction to Topology.

Fall 2007 Math 731, Topics in Algebraic Geometry. (Intro to Gromov-Witten Theory).

Fall 2008 Math 281, Introduction to Mathematical Thinking.

Fall 2008 Math 472, Introduction to Topology.

Fall 2009 Math 161, Calculus II.

Fall 2009 Math 570, Topology.

Spring 2010 Math 571, Topology.

Fall 2010 Math 472, Introduction to Topology.

Fall 2010 Math 676, Topics in Algebraic Geometry: Moduli Spaces.

Spring 2011 Math 670, Differential Geometry.

Fall 2011 Math 366, Algebra.

Fall 2011 Math 676, Topics in Algebraic Geometry: Orbifolds.

Spring 2012 Math 366, Algebra.

Fall 2012 Math 472, Topology.

Fall 2012 Math 672, Algebraic Geometry.
Spring 2013 Math 673, Algebraic Geometry II.
Fall 2013 Math 366, Algebra.
Fall 2013 Math 474, Differential Geometry.
Spring 2014 Math 469, Linear Algebra.
Spring 2014 Math 476, Undergraduate Topics in Geometry.
Fall 2014 Math 472, Topology.
Fall 2014 Math 672, Toric Geometry.
Spring 2015 Math 673, Toric Geometry II.
Spring 2015 Math 476, Hurwitz Theory.
Spring 2016 Math 469, Linear Algebra.
Fall 2016 Math 676, Moduli Spaces of Rational Pointed Curves.
Spring 2017 Math 366, Algebra.
Spring 2017 Math 469, Linear Algebra.
Fall 2017 Math 369, Linear Algebra.
Fall 2017 Math 619, Complex Variables (Riemann Surfaces).

Service

Refereed articles for *Duke Math. Journal, Geometry and Topology, Advances in Mathematics, American Journal of Mathematics, Bulletin of the CMS, IMRN, Michigan Journal of Mathematics, Proceedings of the AMS, Transactions of the AMS, Journal of Geometry and Physics, Geometriae Dedicata, Selecta Mathematica, Communications in Mathematical Physics, Journal of the European Mathematical Society*.

Peer reviewed grant proposals for NSA, NSF (2012-15), Swiss NSF (2017) .

Served in Hiring committee(2011, 2012, 2014), Executive committee(2012) and Graduate Committee(2013-2017) at CSU.