

# Samuel Grushevsky

## EMPLOYMENT

2014–	Professor	Stony Brook University
2009–2014	Associate Professor	Stony Brook University
2005–2010	Assistant Professor	Princeton University
2002–2005	Instructor	Princeton University

## EDUCATION

2002	Ph.D. in mathematics	Harvard University
	Ph.D. advisor:	Professor Yum-Tong Siu
1998	A.B. in math and physics	Harvard University
1994–1996	undergraduate study	Moscow State University
1993–1996	undergraduate study	Independent U of Moscow
1994	High school diploma	Moscow State 57th school

## RESEARCH INTERESTS

Algebraic and complex geometry, relations with number theory, integrable systems, and mathematical physics. Curves, abelian varieties, and their moduli; Siegel modular forms and superstring scattering amplitudes.

## AWARDS

Bessel Research Award from the Humboldt foundation, 2015  
Simons Fellowship in Mathematics, 2015–2016  
NSF Mathematical Sciences Postdoctoral Research Fellowship, 2002–2006  
Clay Liftoff Fellow in Mathematics, Summer 2002  
NSF Graduate Research Fellowship, 1998–2001

## GRANTS

NSF grants continuously since 2006 (PI on individual Division of Mathematical Sciences grants): DMS-1501265, 2015-2018; DMS-1201369, 2012-2016; DMS-0901086/1053313, 2009-2012; DMS-0555867, 2006-2010.  
Co-PI on NSF conference grants DMS-1651122, DMS-1360586, DMS-1066154: (AGNES conferences, at Stony Brook 04/2017, 04/2014 and 10/2011), DMS-1111152 (Versatility of Integrability conference, at Columbia 05/2011),

## PERSONAL

Birthdate: December 5, 1978  
Birthplace: Moscow, Russia  
Citizenship: USA

## PH.D. STUDENTS

Anant Atyam, Stony Brook Ph.D. 08/14: *Affine stratifications and equivariant vector bundles on the moduli of principally polarized abelian varieties.*

Currently in the industry at JPMorgan, New York.

Chaya Norton, Stony Brook Ph.D. 08/14: *Limits of real-normalized differentials on stable curves,* Currently postdoc at CRM, Montreal.

Xuntao Hu, Ph.D. at Stony Brook expected in 2018, topics on abelian varieties and on Teichmüller dynamics.

Frederik Benirschke, started Ph.D. program in 2015.

## POST-DOC MENTORED

Dmitry Zakharov, 2010–2013: Chow and homology rings of abelian varieties, their moduli, and compactifications, currently tenure-track at Central Michigan University

## PUBLICATIONS

47. (with H. Farkas, R. Salvati Manni) An explicit solution to the weak Schottky problem, preprint arXiv:1710.02938, 22pp.
46. (with I. Krichever, C. Norton) Real-normalized differentials: limits on stable curves, preprint arXiv:1703.07806, 66pp.
45. (with K. Hulek, O. Tommasi; with an appendix by M. Dutour Sikirić) Stable Betti numbers of (partial) toroidal compactifications of the moduli space of abelian varieties, preprint arXiv:1702.06218, 29pp, Proceedings in honor of Nigel Hitchin's 70th birthday, Oxford University Press, to appear.
44. (with M. Bainbridge, D. Chen, Q. Gendron, M. Möller) Strata of  $k$ -differentials, preprint arXiv:1610.09238, 39pp.
43. (with G. Codogni, E. Sernesi) The degree of the Gauss map for theta divisors, *Algebra and Number Theory* **11** (2017), 983–1001.
42. (with E. Clader, F. Janda, D. Zakharov) Powers of the theta divisor and relations in the tautological ring, preprint arXiv:1605.05425, 29pp, *Int. Math. Res. Not.*, to appear.
41. (with M. Bainbridge, D. Chen, Q. Gendron, M. Möller) Compactification of strata of abelian differentials, preprint arXiv:1604.08834, 55pp.
40. (with K. Hulek) The intersection cohomology of the Satake compactification of  $\mathcal{A}_g$  for  $g \leq 4$ , preprint arXiv:1603.02343, 33pp; *Math. Ann.*, to appear.

39. (with S. Casalaina-Martin, K. Hulek, R. Laza) Complete moduli of cubic threefolds and their intermediate Jacobians, preprint arXiv:1510.08891, 48pp.
38. (with M. Möller) Explicit formulas for infinitely many Shimura curves in genus 4, preprint arXiv:1510.05674, 13pp; special issue of Asian J. of Math dedicated to N. Mok, to appear.
37. (with F. Dalla Piazza, A. Fiorentino, S. Perna, R. Salvati Manni) Vector-valued modular forms and the Gauss map, Doc. Math. **22** (2017), 1063–1080.
36. (with S. Casalaina-Martin, K. Hulek, R. Laza; with an appendix by M. Dutour Sikirić) Extending the Prym map to toroidal compactifications of  $\mathcal{A}_g$ , J. Europ. Math. Soc. **19** (2017) 3, 659–723.
35. (with M. Möller) Shimura curves in the locus of genus 3 hyperelliptic curves, Int. Math. Res. Not. **2016** (2016) 6, 1603–1639.
34. (with K. Hulek and O. Tommasi) The stable cohomology of the perfect cone toroidal compactification of the moduli space of abelian varieties, preprint arXiv:1307.4646, 51pp, J. Reine Angew. Math. (Crelle), to appear.
33. (with F. Cléry and G. van der Geer) Siegel modular forms of genus 2 and level 2 (with an appendix by S. Mukai), Internat. J. of Math. **26** (2015) 5, 51 pp.
32. (with R. Salvati Manni) On the Coble quartic, Amer. J. of Math. **137** (2015) 3, 765–790.
31. (with D. Zakharov) *The zero section of the universal semiabelian variety, and the double ramification cycle*, Duke Math. J. **163** (2014) 5, 953–982.
30. (with D. Zakharov) *The double ramification cycle and the theta divisor*, Proc. AMS **142** (2014) 12, 4053–4064.
29. (with K. Hulek) *Geometry of theta divisors — a survey*, A celebration of algebraic geometry, 361-390 (Volume published on the occasion of Joe Harris’ 60th birthday), Clay Math. Proc., 18, Amer. Math. Soc., Providence, RI, 2013.
28. (with G. Farkas, R. Salvati Manni, A. Verra) *Singularities of theta divisors and the geometry of  $\mathcal{A}_5$* , J. Europ. Math. Soc. **16** (2014), 1817–1848.
27. (with R. Salvati Manni) *The Prym map on divisors, and the slope of  $\mathcal{A}_5$  (with an appendix by K. Hulek)*, Int. Math. Res. Not. **2014** (2014) 24, 6645–6660.
26. (with I. Krichever) Real-normalized differentials and the spectral curves of the Calogero-Moser system, in Complex Geometry and Dynamics:

- the Abel symposium 2013, Springer 2015, 123–138.
25. (with I. Krichever) Real-normalized differentials: foliations and deformations, preprint arXiv:1108.4211.
  24. (with K. Hulek) *The class of the locus of intermediate Jacobians of cubic threefolds*, Invent. Math., **190** (2012), 119–168.
  23. (with K. Hulek) *Principally polarized semiabelic varieties of torus rank up to 3, and the Andreotti-Mayer loci*, Pure Appl. Math. Q. (special issue in memory of Eckart Viehweg) **7** (2011), 1309–1360.
  22. (with R. Salvati Manni) *The Scorza correspondence in genus 3*, Manuscripta Math., **141** (2013) 1, 111–124.
  21. *The Schottky problem*, in Current Developments in Algebraic Geometry, MSRI Publications **59**, Cambridge Univ. Press (2012), 129–164.
  20. (with I. Krichever) *The universal Whitham hierarchy and the geometry of the moduli space of pointed Riemann surfaces*, Surv. Differ. Geom. **14** (2010), 111–130.
  19. (with R. Salvati Manni) *The superstring cosmological constant and the Schottky form in genus 5*, Amer. J. Math. **133** (2011) 4, 1007–1027. Erratum **134** (2012) 4, 1139–1142.
  18. (with R. Salvati Manni) *The vanishing of two-point functions for three-loop superstring scattering amplitudes*, Comm. Math. Phys. **294** (2010) 2, 343–352.
  17. (with R. Salvati Manni) *The loci of abelian varieties with points of high multiplicity on the theta divisor*, Geom. Dedicata, **139** (2009) 1, 233–247.
  16. *A special case of the  $\Gamma_{00}$  conjecture*, in Liaison, Schottky Problem and Invariant Theory: Remembering Federico Gaeta. Progr. Math. **280** (2010), 223–234.
  15. *Superstring scattering amplitudes in higher genus*, Comm. Math. Phys. **287** (2009) 2, 749–767.
  14. (with C. Erdenberger and K. Hulek) *Some intersection numbers of divisors on toroidal compactifications of  $\mathcal{A}_g$* , J. of Alg. Geom. **19** (2010), 99–132.
  13. (with I. Krichever) *Integrable discrete Schrödinger equations and a characterization of Prym varieties by a pair of quadrisecants*, Duke Math. J. **152** (2010) 2, 317–371.
  12. (with R. Salvati Manni) *Singularities of the theta divisor at points of order two*, Int. Math. Res. Not. (2007), article ID rnm045, 14pp.
  11. *Geometry of  $\mathcal{A}_g$  and its compactifications*, in Algebraic Geometry: Seattle 2005, Proc. Sympos. Pure Math. **80**, 193–234.
  10. (with R. Salvati Manni) *Jacobians with a vanishing theta-null in genus*

- 4, Israel J. Math. **164** (2008), 303–315.
9. (with D. Lehavi) *Some intersections in the Poincaré bundle, and the universal theta divisor on the moduli space of (semi)abelian varieties*, Int. Math. Res. Not. (2008), article ID rnm129, 19pp.
  8. (with C. Erdenberger and K. Hulek) *Intersection theory of toroidal compactifications of  $\mathcal{A}_4$* , Bull. London Math. Soc. **38** (2006), 396–400.
  7. *Multiplier ideals in algebraic geometry*, in Snowbird lectures in Geometry, Contemp. Math. **388**, AMS 2005, 89–106.
  6. (with R. Salvati Manni) *Theta functions of arbitrary order and their derivatives*, J. Reine Angew. Math. (Crelle), **590** (2006), 31–43.
  5. (with R. Salvati Manni) *Two generalizations of Jacobi’s derivative formula*, Math. Res. Lett. **12** (2005) 6, 921–932.
  4. (with R. Salvati Manni) *Gradients of odd theta functions*, J. Reine Angew. Math. (Crelle) **573** (2004), 43–59.
  3. *Effective algebraic Schottky problem*, math.AG/0403009, 23pp.
  2. *Cubic equations for the hyperelliptic locus*, Asian J. Math. **8** (2004) 1, 161–172 (special issue dedicated to Yum-Tong Siu on his 60th birthday). Erratum **9** (2005) 2, 273.
  1. *An explicit upper bound for Weil-Petersson volumes of the moduli spaces of punctured Riemann surfaces*, Math. Ann. **321** (2001) 1, 1–13.

## TALKS

### Special Schools and Lecture Series:

9. CIMPA-CIMAT-ICTP school on moduli of curves, Guanajuato, Mexico, March 2016;  
5 lectures on birational geometry and topology of the moduli of curves
8. Moduli spaces in algebraic geometry and physics, Hamburg, Germany, August 2013;  
3 lectures on moduli of abelian varieties and string scattering
7. École de géométrie algébrique, Roscoff, France, September 2012;  
4 lectures on moduli of curves for experts in dynamics
6. Géométrie Algébrique en Liberté (GAeL) XX, Grenoble, France, June 2012;  
4 lectures on moduli of curves and abelian varieties
5. Gauge theory and string theory, Cargèse, France, June 2012;  
2 lectures on string scattering amplitude

4. Lectures at Leibniz Universität, Hannover, Germany, January 2010;  
5 lectures on string scattering amplitudes and modular forms
3. Lectures at KIAS, Seoul, South Korea, May 2009;  
8 lectures on abelian varieties and integrable systems
2. School on abelian varieties, Mainz, Germany, April 2008;  
5 lectures on moduli of abelian varieties
1. Conference on algebraic geometry, Zacatecas, Mexico, June 2006;  
3 lectures on theta functions

**Conferences:**

72. American Institute of Mathematics SQuaRE, Sep 2017
71. 14th Weihnachtsworkshop on Geometry and Number Theory, Karlsruhe, Germany, Dec 2016
70. Surface bundles workshop, Oberwolfach, Germany, Dec 2016
69. Complex Geometry Conference, in honor of Ngaiming Mok's 60th birthday, Seoul, South Korea, Oct 2016
68. Cycles on moduli spaces, GIT, and Dynamics, at ICERM, Providence, RI, Aug 2016
67. Integrability, moduli, and dynamics, Institut Mittag-Leffler, Stockholm, Sweden, Jun 2016
66. Modular forms and moduli spaces workshop, Oberwolfach, Germany, Apr 2016
65. Geometry of algebraic varieties, Berlin, Germany, Oct 2015
64. Flat surfaces, CIRM, Luminy, France, Jul 2015
63. Arbeitstagung 2015, Bonn, Germany, Jun 2015
62. Current developments in moduli theory, Boston, MA, Oct 2014
61. Komplexe Analysis workshop, Oberwolfach, Germany, Aug 2014
60. Effective moduli spaces and applications to cryptography, Rennes, France, Jun 2014
59. Flat Surfaces workshop, Oberwolfach, Germany, Mar 2014
58. AGNES, Boston, MA, Oct 2013
57. Cohomology of the moduli space of curves, Zurich, Switzerland, Oct 2013
56. Integrable systems and moduli spaces workshop, Banff, Canada, Aug 2013
55. 10th Abel Symposium: complex geometry, Trondheim, Norway, Jul 2013
54. Complex Geometry Conference, Seoul, South Korea, May 2013
53. Deformation and moduli in complex geometry, Seoul, South Korea, Mar 2013

52. Moduli workshop, Oberwolfach, Germany, Feb 2013
51. Algebraic geometry, modular forms and applications to physics workshop, Edinburgh, Nov 2012
50. Heilbronn Institute lecture, Edinburgh, Nov 2012
49. Texas Geometry and Topology Conference, Houston, Nov 2012
48. Algebraic and complex geometry conference, dedicated to Klaus Hulek's 60th birthday, Hannover, Germany, Sep 2012
47. Komplexe Analysis workshop, Oberwolfach, Germany, Sep 2012
46. Georgia algebraic geometry symposium, in honor of Robert Varley, Athens, GA, May 2012
45. Arithmetic, motives, and moduli spaces, Paris, France, Jan 2012
44. Moduli spaces and modular forms, CIRM, Luminy, France, Oct 2011
43. SIAM conference on applied algebraic geometry, Raleigh, NC, Oct 2011
42. KIAS workshop on periods and moduli, Seoul, South Korea, Sep 2011
41. Park City mathematics institute, Park City, UT, Jul 2011
40. NoGAGS (Northern Germany Algebraic Geometry Seminar), Berlin, Germany, May 2011
39. V Iberoamerican congress on complex geometry, Pucon, Chile, Dec 2010
38. Komplexe Analysis workshop, Oberwolfach, Germany, Aug 2010
37. Geometry and Dynamics of Teichmüller space, Bonn, Germany, Jun 2010
36. Moduli workshop, Oberwolfach, Germany, Jan 2010
35. Moduli, Berlin, Germany, Aug 2009
34. Moduli and Discrete Groups, RIMS, Kyoto, Japan, Jun 2009
33. Classical Algebraic Geometry Today, MSRI, Berkeley, CA, Jan 2009
32. Arithmetic Algebraic Geometry Related to Moduli Spaces, Tokyo, Japan, Jan 2009
31. Komplexe Analysis workshop, Oberwolfach, Germany, Aug 2008
30. Moduli workshop, Symposium on Algebraic Geometry, Warwick, UK, Jul 2008 (two talks)
29. Algebraic Geometry satellite conference of the ECM, Leiden, the Netherlands, Jul 2008
28. Joint International AMS/SBM meeting, Rio de Janeiro, Brazil, Jun 2008
27. Clay workshop on automorphic forms in moduli problems of Schottky and Brill-Noether type, Cambridge, MA, Mar 2008
26. IV Iberoamerican conference on complex geometry, Ouro Preto, Brazil, Aug 2007

25. The geometry of holomorphic and algebraic curves in complex algebraic varieties, Montreal, QC, Apr 2007
24. Curves, abelian varieties and their interactions on the occasion of the 65th birthday of Roy Smith, Athens, GA, Apr 2007
23. Program on moduli spaces, Institut Mittag-Leffler, Djursholm, Sweden, Feb 2007
22. Berkeley-Stanford algebraic geometry colloquium, Stanford, CA, Nov 2006
21. Modular forms, Schiermonnikoog, the Netherlands, Oct 2006
20. Workshop on abelian varieties, Amsterdam, the Netherlands, May 2006 (two talks)
19. Recent developments in higher-dimensional algebraic geometry, Banff, Canada, Apr 2006
18. KIAS workshop on complex geometry, Seoul, South Korea, Sep 2005
17. Modular forms and related moduli spaces, Rome, Italy, Sep 2005
16. AMS summer institute in algebraic geometry, Seattle, WA, Aug 2005
15. University of Michigan/Ohio State University algebraic geometry workshop, Columbus, OH, Apr 2005
14. Birational geometry of moduli spaces (at AIM), Palo Alto, CA, Dec 2004
13. Komplexe Analysis workshop, Oberwolfach, Germany, Aug 2004
12. AMS summer research conference in algebraic geometry, Snowbird, UT, Jul 2004
11. III Iberoamerican congress on geometry, Salamanca, Spain, Jun 2004
10. Recent Developments in Several Complex Variables, CR geometry, and Complex Algebraic Geometry, celebrating Yum-Tong Siu's 60th birthday, Hong Kong, Nov 2003
9. VBAC (Vector bundles on algebraic curves) 2003, Porto, Portugal, Jul 2003
8. Geometry of Moduli Spaces, Lille, France, Jun 2003
7. Perspectives in Classification and Moduli Theory, Cortona, Italy, Oct 2002
6. Komplexe Analysis workshop, Oberwolfach, Germany, Aug 2002
5. ICM 2002 satellite conference on complex analysis, Kyoto, Japan Shanghai, China, Aug 2002 (two talks)
4. Moduli of Curves, Ann Arbor, MI, Mar 2002
3. AMS Eastern sectional meeting, session on abelian varieties, Williamstown, MA, Oct 2001
2. AMS Eastern sectional meeting, special session on enumerative methods in algebraic geometry, Lowell, MA, Mar 2000



1. Workshop on Riemann Surfaces in honor of Hershel Farkas's 60th birthday, Jerusalem, Israel, Jun 1999

**Seminars:** (total: 95)

Algebraic geometry: Bar Ilan, Ben Gurion ( $\times 3$ ), Berkeley, Boston College, Caltech, U of Chicago, U of Illinois at Chicago ( $\times 3$ ), Columbia ( $\times 3$ ), Courant, Duke, Essen, U of Georgia, Göttingen, Leibniz Universität Hannover ( $\times 5$ ), Harvard-MIT ( $\times 4$ ), Humboldt Universität Berlin ( $\times 4$ ), Johns Hopkins ( $\times 2$ ), Köln, Northwestern, Ohio State ( $\times 2$ ), Paris VI (Jussieu), Princeton ( $\times 2$ ), Purdue, Stanford ( $\times 3$ ), Tel Aviv, Yale

Algebra: Copenhagen, IMPA, Roma "La Sapienza" ( $\times 4$ ), UCLA, U of Pennsylvania

Analysis: Michigan State, Princeton

Colloquium: Berlin ( $\times 2$ ), U of Colorado, Hebrew U ( $\times 2$ ), U of Maryland College Park, Rice, Rutgers, Stony Brook ( $\times 2$ )

Dynamics: Institut Henri Poincaré

Geometry: Boston U, Columbia, Essen, Hebrew U, Hong Kong U ( $\times 2$ ), U of Colorado ( $\times 2$ , Fragment), U of Maryland College Park, Osaka, Princeton ( $\times 3$ ), Roma Tre ( $\times 4$ ), Rutgers, Stony Brook ( $\times 3$ ), U of Mass at Amherst (Valley), U of Texas at Austin

Math/physics: CRM Montreal, Stony Brook, U of Pennsylvania

Special series: Hebrew U ( $\times 4$ ), Michigan State

Topology: CUNY, U of Chicago

### INVITED VISITS

Leibniz Universität Hannover, Germany: Jun 2017, Jun 2016, Apr 2016, Sep 2015, Jun 2014, Jan 2010, Aug 2008, Sep 2006, ...

Columbia University, New York, NY: Jan-Mar 2016

Università Roma "La Sapienza", Italy: Dec 2015, Mar 2015, Mar 2014, May 2008, ...

Humboldt Universität Berlin, Germany: Jul 2017, Oct 2015, Jan 2010, Aug 2008

Institute for Advanced Studies, Princeton, NJ: Jan, Feb, and Apr 2015

Université Paris VII professeur invité, France: Jun 2014

Hebrew University, Jerusalem, Israel: May 2010, April 2007

Osaka University, Japan: Jun 2009

MSRI algebraic geometry semester, Berkeley, CA: Jan-Feb 2009

IMPA, Rio de Janeiro, Brazil: Jun 2008

Universität Duisburg-Essen, Germany: Apr 2008

University of Copenhagen, Denmark: Oct 2007

Institut Mittag-Leffler, program on moduli spaces, Stockholm, Sweden: Feb and Jun 2007

### CONFERENCES ORGANIZED

September 2018: co-organizer of Oberwolfach workshop on Flat surfaces and algebraic curves

January 2018: member of the scientific committee for 7th Iberoamerican Congress on Geometry, Valladolid, Spain

April 2017: co-organizer of AGNES (Algebraic Geometry Northeastern Series) conference at Stony Brook

April 2017: co-organizer of the sixth Stony Brook mini-school in geometry: singular metrics and direct images

May 2015: co-organizer of a workshop on supermoduli (of superRiemann surfaces), Simons Center, Stony Brook

April 2015: co-organizer of the fourth Stony Brook mini-school in geometry: birational geometry and derived categories

January 2015: co-organizer of the third Stony Brook mini-school in geometry: invitation to Gromov-Witten theory

July 2014: co-organizer of a graduate workshop on moduli of curves, Simons Center, Stony Brook

April 2014: co-organizer of AGNES (Algebraic Geometry Northeastern Series) conference at Stony Brook

April 2014: co-organizer of the second Stony Brook mini-school in geometry: complex dynamics and algebraic surfaces

December 2013: co-organizer of the first Stony Brook mini-school in geometry: K-stability

March 2013: co-organizer of workshop on deformation and moduli in complex geometry, Seoul, South Korea

October 2011: co-organizer of AGNES (Algebraic Geometry Northeastern Series) conference at Stony Brook

May 2011: co-organizer of “The Versatility of Integrability”, a conference on integrable systems in algebra, geometry, and physics, dedicated to Igor Krichever’s 60th birthday, at Columbia University

### SERVICE

2017–: Stony Brook mathematics associate graduate director

Feb 2016–Jan 2018: American Mathematical Society Eastern section program committee

2016–2017: Stony Brook mathematics department course scheduling director

2016–: Stony Brook mathematics department/Simons Center liaison  
 2009–: member of the standing organizing committee of biannual AGNES (Algebraic Geometry Northeastern Series) workshops  
 2009–: co-organizer of the weekly Stony Brook algebraic geometry (previously algebra, geometry, and physics) seminar  
 2013–2015: member of the Stony Brook math department search committee  
 2013–2014: member of the Stony Brook math department graduate committee  
 2009–2013: co-organizer of Stony Brook mathematics department colloquium  
 2006–2009: Princeton mathematics department undergraduate placement officer  
 2006–2009: co-organizer of Princeton algebraic geometry seminar  
 2005–2008: co-organizer of Princeton mathematics department colloquium  
 Served on numerous Ph.D. defense committees at Stony Brook and Princeton, and also at Columbia, Leibniz Universität Hannover, Humboldt Universität Berlin, and Stony Brook Physics Department.  
 Served on numerous Ph.D. oral exam committees at Stony Brook and Princeton.

## TEACHING

### **Stony Brook University:**

Fall 2017: MAT 319 — Foundation of Analysis: introduction to rigorous analysis with proofs.

Fall 2017: MAT 670 — Topics in Complex Analysis (Teichmüller dynamics): an advanced graduate course, from the definition of the Teichmüller flow to the recent applications of Hodge theory to orbit classification.

Spring 2017: MAT 536 — Complex Analysis I: an introductory graduate course on complex analysis.

Fall 2016: MAT 626 — Topics in Complex analysis (Teichmüller theory): a graduate course, starting from the definition of the Teichmüller space and ending with Mirzakhani’s recursions for Weil-Petersson volumes and intersection numbers on moduli.

Spring 2015: MAT 615 — Topics in Algebraic Geometry (abelian varieties): an advanced graduate course, from the basics of abelian varieties, to the Kodaira dimension of their moduli space.

Fall 2014: MAT 319 — Foundation of Analysis: introduction to rigorous analysis with proofs.

Fall 2014: MAT 590 — Preparation course for the graduate comprehensive examination.

Spring 2014: MAT 614 — Topics in Algebra (introduction to algebraic geometry): an introductory graduate course.

Fall 2013: MAT 536 — Algebra III (commutative algebra): a second-year graduate course on commutative algebra with a view towards algebraic geometry.

Fall 2013: MAT 320 — Introduction to Analysis: advanced introduction to rigorous analysis with proofs.

Spring 2013: MAT 531 — Geometry/Topology II: introductory graduate course on smooth manifolds.

Fall 2012: MAT 626 — Topics in Complex analysis (Teichmüller theory): an advanced graduate course, from the basics of the theory, towards hyperbolic geometry and intersection theory.

Fall 2012: MAT 319 — Foundation of Analysis: introduction to rigorous analysis with proofs.

Spring 2012: MAT 615 — Topics in Algebra (introduction to algebraic geometry): an introductory graduate course for students with some familiarity with complex manifolds or algebraic varieties, covering sheaves and schemes.

Fall 2011: MAT 545 — Complex Geometry: an intermediate graduate course introducing the basic notions and concepts of complex manifolds and Kähler geometry, following the beginning chapters of Griffiths-Harris.

Fall 2011: MAT 260 — Problem solving: a course for undergraduate students interested in sharpening their problem-solving skills in mathematics, quickly going over different mathematical ideas and problems that can be solved using them.

Spring 2011: MAT 615 — Topics in Algebra (multiplier ideal sheaves): an advanced graduate course on the algebraic and analytic construction of multiplier ideal sheaves, proving Nadel vanishing from both viewpoints, and culminating in a proof of invariance of plurigenera for varieties of general type.

Fall 2010: MAT 401 — Undergraduate seminar: a seminar for advanced undergraduate students on representation theory, mostly of finite groups.

Fall 2010: MAT 200 — Logic, Language and Proof: a course introducing rigorous proofs and rigorous mathematical tools, preparing the students for higher-level mathematics courses.

Spring 2010: MAT 615 — Topics in Algebraic Geometry (moduli of curves): an advanced graduate course on the construction of the moduli stack of curves.

Fall 2009: MAT 126 — Calculus (2 sections): second semester calculus, i.e. integration, areas, volumes.

**Princeton University:**

Fall 2008: MAT 553 — Algebraic Geometry: an advanced graduate class on multiplier ideals. Positivity of line bundles; algebraic and analytic definitions and basic properties of multiplier ideals; vanishing theorems; invariance of plurigenera for varieties of general type.

Fall 2007: MAT 104 — Calculus (2 sections): second semester calculus, i.e. limits, series, integration.

Fall 2006: MAT 326 — Algebraic Topology: an advanced course covering differential forms, de Rham homology, Poincaré duality.

Fall 2006: MAT 553 — Algebraic Geometry: an advanced graduate class on the theory of complex abelian varieties, starting from the basic definitions and leading up to the results of Pareschi and Popa on M-regularity.

Spring 2006: MAT 104 — Calculus (2 sections): second semester calculus, i.e. limits, series, integration.

Fall 2005: MAT 516 — Introduction to Algebraic Geometry: an introductory graduate class, covering affine and projective varieties, tangent spaces, divisors, cohomology.

Fall 2005: MAT 314 — Introduction to Real Analysis: an advanced course covering analysis in  $\mathbb{R}^n$ , Lebesgue measure and Lebesgue integral, and Fourier series.

Spring 2005: Junior seminar: a seminar on Riemann surfaces for mathematics juniors, instructing the students on their independent reading projects and presentations on the subject.

Fall 2004: MAT 519 — Teichmüller theory: an advanced graduate class, starting from the basics of Teichmüller theory, and leading up to study of the curvature of the moduli space, Mirzakhani's proof of Witten-Kontsevich formula for intersection numbers on  $\mathcal{M}_g$ , and holography.

Spring 2004: MAT 104 — Calculus (2 sections): second semester calculus, i.e. limits, series, integration.

**Harvard University:**

Fall 2001: Calculus teaching fellow (Math 1b): second semester calculus.

1997-1998: Mathematics Course Assistant: holding problem sessions and grading homework for advanced math classes. Awarded Harvard University Certificate of Distinction in Teaching.

REFEREEING

Acta Mathematica, Acta Mathematica Vietnamica, Advances in Mathematics, Agence National de la Recherche (France), Algebraic Geometry, American Journal of Mathematics, Annales scientifiques de l'École normale

supérieure, Annals of Mathematics, Bulletin of the LMS, Central European Journal of Mathematics, Communications in Algebra and Geometry, Communications in Mathematical Physics, Compositio Mathematica, Contemporary Mathematics, Discrete Mathematics, Documenta Mathematica, Duke Mathematical Journal, Functional Analysis and Applications, Geometriae Dedicata, Houston Journal of Mathematics, Indiana University Mathematics Journal, International Mathematics Research Notices, Inventiones Mathematicae, Israel Journal of Mathematics, Journal of Algebra, Journal of Algebraic Geometry, Journal of the AMS, Journal d'Analyse Mathématique, Journal de Maths pures et appliquées, Journal für die reine und angewandte Mathematik (Crelle), Journal of Geometry and Physics, Journal of the EMS, Journal of Modern Dynamics, Letters in Mathematical Physics, Manuscripta Mathematica, Mathematics Research Letters, Mathematical Reviews, Mathematische Annalen, Mathematische Zeitschrift, Memoirs of the AMS, Michigan Mathematical Journal, National Science Foundation (NSF), National Security Agency (NSA), Netherlands Science Foundation (DTO), Nuclear Physics B, Proceedings of the AMS, Proceedings of the LMS, SIGMA (Symmetry, Integrability and Geometry: Methods and Applications), Simons Foundation, Transactions of the AMS.

Updated: October 2017