

# İZZET COŞKUN

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## CONTACT INFORMATION

Department of Mathematics, Statistics, and Computer Science (M/C 249)  
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## PERSONAL

Born May 24, 1978 in Istanbul, Turkey. Turkish citizen, US permanent resident.

## RESEARCH

I am an algebraic geometer with broad interests, including combinatorics, complex dynamics, several complex variables and number theory. My research focuses on topological and numerical invariants of moduli spaces of curves and surfaces, rationally connected varieties, the cohomology of homogeneous varieties and Gromov-Witten theory.

## EDUCATION

**Harvard University**, Department of Mathematics  
MA 2001, Ph.D. 2004.

**Princeton University**, Department of Mathematics  
A.B. 2000

## APPOINTMENTS

**Associate Professor**, University of Illinois at Chicago  
2010 – present

**Assistant Professor**, University of Illinois at Chicago  
2007 – 2010

**C. L. E. Moore Instructor**, Massachusetts Institute of Technology  
2004 – 2007

**Liftoff Fellow**, Clay Mathematics Institute  
Summer 2004

## PUBLICATIONS

1. I. Coskun, *Degenerations of scrolls and Del Pezzo surfaces and applications to enumerative geometry*. Harvard University Ph.D. Thesis, 2004—under the supervision of Professor Joe Harris.
2. I. Coskun (with C. Cadman, K. Jabbusch, M. Joyce, S. Kovács, M. Lieblich, F. Sato, M. Szczesny, J. Zhang), *A first glimpse at the minimal model program*, Snowbird lectures in algebraic geometry. *Contemp. Math.*, vol 388 (2005) p. 17–42.
3. I. Coskun, *The arithmetic and the geometry of Kobayashi hyperbolicity*, Snowbird lectures in algebraic geometry. *Contemp. Math.*, vol 388 (2005) p. 77–88.
4. I. Coskun, *Degenerations of surface scrolls and the Gromov-Witten invariants of Grassmannians*, *J. Algebraic Geom.* 15 (2006), p. 223–284.
5. I. Coskun, *Enumerative geometry of Del Pezzo surfaces via degenerations*, *Amer. J. Math.*, vol. 128 no. 3 (2006), p. 751–786

6. I. Coskun and J. Starr, *Divisors on the space of maps to Grassmannians*, Int. Math. Res. Not., vol. 2006, Article ID 35273, 25 pages, 2006.
7. I. Coskun, *The Gromov-Witten invariants of jumping curves*, Trans. Amer. Math. Soc., vol. 360 (2008), p. 989–1004.
8. I. Coskun, J. Harris and J. Starr, *The effective cone of the Kontsevich moduli space*, Canad. Math. Bull., vol. 51 no. 4 (2008), p. 519–534
9. I. Coskun, J. Harris and J. Starr, *The ample cone of the Kontsevich moduli space*, Canad. J. Math., vol. 61 no. 1 (2009), p. 109–123.
10. I. Coskun, *A Littlewood-Richardson rule for two-step flag varieties*, Invent. Math., vol. 176 no. 2 (2009), p. 325–395.
11. I. Coskun and R. Vakil, *Geometric positivity and the cohomology of homogeneous spaces and generalized Schubert calculus*, Algebraic Geometry, Proceedings of the Seattle 2005 Conference, vol. 1 (2009), p. 77–124.
12. I. Coskun and J. Starr, *Rational curves on cubic hypersurfaces*, Int. Math. Res. Not., Article RPN102 (2009), 16 pages.
13. D. Chen and I. Coskun, *Stable base locus decompositions for Kontsevich moduli spaces*, Michigan Math. J., vol. 59 no.2 (2010), 435–466.
14. I. Coskun, *The quantum cohomology of flag varieties and the periodicity of the Schubert structure constants*, Math. Ann., vol. 346 no. 2 (2010), 419–447.
15. I. Coskun, *Rigid and non-smoothable Schubert cycles*, J. Differential Geom., **87** no.3 (2011), 493–514.
16. I. Coskun, *Restriction varieties and geometric branching rules*, Adv. Math., **228** no.4 (2011), 2441–2502.
17. D. Chen and I. Coskun, *Towards the Minimal Model Program for the Kontsevich moduli spaces*, (with an appendix with C. Crissman), Amer. J. Math., **133** no.5 (2011), 1389–1419.
18. D. Chen, I. Coskun and S. Nollet, *Hilbert scheme of a pair of codimension two linear subspaces*, Comm. Alg., **39** no.8 (2011), 3021–3043.
19. S. Billey and I. Coskun, *Singularities of generalized Richardson varieties*, to appear in Comm. Alg.
20. R. Abdelkerim and I. Coskun, *Spaces of Schubert varieties contained in hyperplane sections of Grassmannians*, to appear in J. Pure Appl. Algebra.
21. I. Coskun, *Surfaces of low degree containing a canonical curve*, submitted (10 pages).
22. I. Coskun, *Rigidity of Schubert classes in orthogonal Grassmannians*, submitted (26 pages).
23. I. Coskun, *A Littlewood-Richardson rule for partial flag varieties*, submitted (33 pages).
24. I. Coskun, *Intersection theory on moduli spaces*, course notes published on MIT OpenCourseWare (137 pages).
25. D. Arcara, A. Bertram and I. Coskun, *The birational geometry of the Hilbert Scheme of Points and Bridgeland stability conditions*, in preparation.
26. I. Coskun, *Symplectic restriction varieties, geometric branching rules and rigidity in the cohomology of isotropic Grassmannians*, in preparation.
27. I. Coskun, *A Pieri rule for orthogonal flag varieties*, in preparation.
28. I. Coskun, *The geometry of linear spaces on quadrics*, in preparation.
29. I. Coskun, *Birational Geometry of Moduli Spaces*, Lecture notes for Utah VIGRE Summer School (75 pages).

HONORS AND  
AWARDS

- NSF CAREER Grant DMS 0950951535, PI (2010-2015)
- Alfred P. Sloan Foundation Fellowship (2009-2011)
- NSF grant DMS 1045217 (2010-2011), Co-PI, James McKernan, PI
- NSF grant DMS 0737581, PI (2007-2010)
- Kavli Fellow (2010), National Academy of Sciences.
- Jean de Valpin Fellowship, 2004 Harvard University.
- Raphael Salem Fellowship, 2001 Harvard University.
- 2000 Phi Beta Kappa Prize, for highest academic standing in the Class of 2000 at Princeton University.
- 2000 Middleton Miller'29 Prize, for the best senior thesis in mathematics, Princeton University.
- 2000 George B. Covington Prize, highest achievement in the mathematics major, Princeton University.
- 1999 Andrew H. Brown Prize, the highest achieving junior in the Mathematics Department, Princeton University.
- Class of 1939 Princeton Scholar Award, for highest standing at the end of the junior year at Princeton University, shared with Benjamin Sommers.

EDITORIAL

I serve on the editorial board of the Central European Journal of Mathematics.

TEACHING  
EXPERIENCE:

I am a recipient of a Certificate of Distinction in Teaching (Fall 2003) awarded by Harvard's Derek Bok Center. I have taught the following courses and attended the following teacher training programs:

- Math 571, Fall 2010: Topics in Algebraic Geometry, Moduli spaces.
- Math 494, Fall 2010: Undergraduate Algebraic Geometry
- Math 320, Spring 2010: Linear Algebra
- Math 210, Fall 2009: Calculus III
- Math 552, Fall 2008, Fall 2009: Algebraic Geometry
- Math 417, Spring 2008, Fall 2008: Complex Analysis
- Math 330, Fall 2007: Abstract Algebra
- 18.726, Spring 2007: Algebraic Geometry, a course based on Hartshorne at M.I.T.
- 18.727, Fall 2006: Topics in Algebraic Geometry, an advanced graduate class on positivity in algebraic geometry at M.I.T.
- 18.727, Spring 2006: Topics in Algebraic Geometry, an advanced graduate class on intersection theory on moduli spaces at M.I.T.
- 18.100B, Fall 2005: Instructor for Analysis I at M.I.T.
- 18.01, Fall 2005: Calculus recitation instructor for two sections.
- 18.03, Spring 2005: Introduction to ordinary differential equations, recitation instructor for three sections.
- 18.781, Fall 2004: Instructor for introduction to number theory at M.I.T.
- Math 21 b, Fall 2003: Teaching fellow for introductory linear algebra at Harvard University.
- Math 25 a and b, 2002-2003: Teaching fellow for introduction to analysis and linear algebra intended for mathematics majors at Harvard University.
- Math 260 a and b, 2001-2002: The course assistant for a year long graduate class Introduction to Algebraic Geometry.

- Tutorial on Special Functions: Applications to Number Theory and Geometry, Summer 2001. Advanced topics tutorial for sophomores and juniors at Harvard University.
- Math Xb, Spring 2001: Teaching fellow for second semester introductory calculus at Harvard University.
- Tutor of the college in mathematics and physics at Princeton University, 1997-2000.
- M.I.T. teacher training seminar Fall 2004.
- Harvard Derek Bok Teacher Training Program Fall 2000.
- Attended semi-annual Derek Bok Center teaching seminars 2000-2004.

GRADUATE  
STUDENTS:

Richard Abdelkerim (graduated 2011),  
 Cesar Lozano (first year student),  
 Rebecca Lehman (co-advised with Jason Starr, graduated 2007, MIT),  
 Corina Tarnita (Harvard, minor thesis advisor).  
 Main examiner on the qualifying exam committees of Brian Lehmann, Craig Desjardins (MIT, Spring 2007).  
 Examiner on the qualifying exam committee of Fucheng Tan (MIT, Spring 2007).  
 Thesis reader for Ethan Cotterill (Harvard, Spring 2007), Dawei Chen (Harvard, Spring 2008).

UNDERGRADUATE  
STUDENTS:

Conor Jensen, mentor for undergraduate research, Spring 2010 and Fall 2010.  
 Nick Spizzirri, mentor for undergraduate research, Fall 2008.  
 Kai Ho Wong, mentor for summer research, Spring, Summer and Fall 2008.

SERVICE

- Served on the RAP Hiring Committee (2010-2011)
- Co-organizer of Departmental Colloquium (Fall 2009–2011)
- Reviewer for the Sedat Simavi Science Awards (2010)
- Served on the 300 Level Curriculum Committee (2010-2011), the Undergraduate Committee (2008-2009), Graduate Curriculum Committee (2007-2008)
- Chair of the organizing committee for Algebraic Geometry: A Conference in honor of Joe Harris' 60th birthday, August 2011 at Harvard University
- Co-organizer Ohio State-Michigan-UIC Algebraic Geometry Workshop, October 2010
- Co-organizer of Snowbird MRC Conference: Birational Geometry and Moduli Spaces, June 2010
- Served on the Tenure Track Hiring Committee (2009-2010)
- Served on NSF FRG Panel (November 2009)
- Co-organizer of Algebraic Geometry: A conference in honor of Anatoly Libgober's 60th birthday, October 2009 at UIC
- Chair of the organizing committee for the workshop on moduli theory during MSRI 2009 jumbo semester
- Co-organizer of special session in algebraic geometry in the joint AMS/SBM meeting in Rio de Janeiro
- Co-organizer of Algebraic Geometry and Commutative Algebra, in honor of Robin Hartshorne's 70th birthday to take place April 11-13, 2008 at UIC
- Co-organizer of Midwest Number Theory Days March 7-8, 2008 at UIC
- Co-organizer of UIC Algebraic geometry seminar, Fall 2007-present
- Co-organizer of UIC Graduate student algebraic geometry seminar, 2007-2008

- Organizer of The Seminar on MMP, a graduate student seminar on MMP culminating in a Clay workshop, Spring 2007
- Co-organizer of the Harvard-MIT Algebraic Geometry Seminar. Fall 2005-Spring 2007
- Organizer of BAGS, a Boston area graduate student algebraic geometry seminar. Fall 2005-Spring 2007
- Designed web page, with complete course notes, for OpenCourseWare on intersection theory on moduli spaces
- Referee for over twenty articles for journals including Acta Mathematica, Advances in Mathematics, Proceedings of the AMS, Transactions of AMS, IMRN, Experimental Mathematics, Journal of Algebraic Geometry, Michigan Journal of Mathematics, American Journal of Mathematics, Geometry and Topology, Surveys in Differential Geometry, Journal of AMS and Annals of Mathematics.

INVITED LECTURE  
SERIES

1. Utah VIGRE Summer School on Birational Geometry and Moduli Spaces, June 2010, Salt Lake City, Utah (5 lectures)
2. Geometry of Homogeneous Varieties, February 2011, Rio de Janeiro, Brazil (12 hours of lectures)

INVITED TALKS

1. Harvard University, Abelian differentials and dynamics, Dec. 2002
2. M.I.T., Characteristic numbers of surfaces, Feb. 2003
3. Bogazici University, Characteristic numbers of surfaces, Mar. 2003
4. Rice University, Characteristic numbers of scrolls, Sep. 2003
5. Rice University, Characteristic numbers of Del Pezzo surfaces, Sep. 2003
6. University of Michigan, Characteristic numbers of surfaces, Dec. 2003
7. Northwestern University, Characteristic numbers of surfaces, Jan. 2004
8. Brandeis University, Characteristic numbers of surfaces, Feb. 2004
9. Harvard University, The NEF cone of the moduli space of curves and the F-conjecture, May 2004
10. Oberwolfach Mathematics Institute, The geometry of Grassmannians and flag varieties, June 2004
11. Snowbird Conference, The geometry and arithmetic of Kobayashi hyperbolicity, June 2004
12. Rice University, The geometry of Grassmannians and flag varieties, Colloquium, Sep. 2004
13. AMS Special Session on Schubert Calculus, The geometry of Grassmannians and flag varieties, Oct. 2004
14. Brown University, Characteristic numbers of surfaces, Fall 2004
15. Harvard University, The geometry of Grassmannians and flag varieties, Nov. 2004
16. Ohio State University, The geometry of Grassmannians and flag varieties, Nov. 2004
17. Boston University, The geometry of Grassmannians and flag varieties, Nov. 2004
18. Columbia University, Characteristic numbers of surfaces, Jan. 2005
19. Princeton University, The geometry of Grassmannians and flag varieties, Feb. 2005
20. University of Chicago, The geometry of Grassmannians and flag varieties, Feb. 2005
21. Harvard University, Coble sextics and holomorphic actions of lattices on  $\mathbb{P}^1$ , May 2005
22. Stanford University, Counting jumping curves of vector bundles, May 2005
23. Harvard University, The ample and effective cones of Kontsevich moduli spaces, Sep. 2005

24. Johns Hopkins University, The ample and effective cones of Kontsevich moduli spaces, Oct. 2005
25. Banff Research Center, The ample and effective cones of Kontsevich moduli spaces, Oct. 2005
26. Texas A&M University, The ample and effective cones of Kontsevich moduli spaces, Oct. 2005
27. Northeastern University, The geometry of Grassmannians and flag varieties, Nov. 2005
28. University of Michigan-Ohio State University joint workshop, The ample and effective cones of Kontsevich moduli spaces, Dec. 2005
29. TMS/AMS Joint Conference, The ample and effective cones of Kontsevich moduli spaces, Dec. 2005
30. Stanford University, Rational curves on hypersurfaces, Jan. 2006
31. Stanford University, Density of sections for pencils of Calabi-Yau hypersurfaces, Jan. 2006
32. Stanford University, The ample and effective cones of Kontsevich moduli spaces, Jan. 2006
33. UC Berkeley, The ample and effective cones of Kontsevich moduli spaces, Jan. 2006
34. University of Minnesota, The geometry of flag varieties, April 2006
35. University of Illinois at Urbana-Champaign, The ample and effective cones of Kontsevich moduli spaces, May 2006
36. M.I.T., Positivity in the Cohomology of homogeneous varieties, Sep. 2006
37. University of Illinois at Chicago, The ample and effective cones of Kontsevich moduli spaces, Oct. 2006
38. University of Chicago, The ample and effective cones of Kontsevich moduli spaces, Nov. 2006
39. University of Illinois at Chicago, Colloquium, Nov. 2006
40. UMass. Amherst, The geometry of Grassmannians and flag varieties, Dec. 2006
41. University of Illinois at Urbana-Champaign, Colloquium, Dec. 2006
42. Texas AM, Colloquium, Dec. 2006
43. UC Irvine, Colloquium, Jan. 2007
44. University of Pittsburgh, Colloquium, Jan. 2007
45. UC Santa Cruz, Colloquium, Jan. 2007
46. UC Santa Barbara, Colloquium, Jan. 2007
47. The Ohio State University, Colloquium, Jan. 2007
48. Rutgers, Colloquium, Jan. 2007
49. The Georgia Institute of Technology, Colloquium, Jan. 2007
50. Brandeis University, Colloquium, Feb. 2007
51. UC Riverside, Colloquium, Feb. 2007
52. University of Massachusetts Amherst, Colloquium, Feb. 2007
53. SUNY Stony Brook, Colloquium, Feb. 2007
54. Banff International Research Center, Mar. 2007
55. AMS Special Session on Combinatorial Algebraic Geometry, Apr. 2007
56. Western Algebraic Geometry Seminar, Apr. 2007
57. AMS Meeting De Paul University, Fall 2007
58. University of Maryland, Fall 2007
59. Clay Mathematics Institute workshop on rational connectivity, Fall 2007
60. AMS Meeting in NYC, March 2008

61. Princeton University, Algebraic Geometry Seminar, March 2008
62. Bogazici University, Colloquium, May 2008
63. AMS/SBM Joint meeting, Rio de Janeiro, Brazil, Hour lecture, June 2008
64. IMPA, Rio de Janeiro, Brazil, Algebraic Geometry Seminar, June 2008
65. UFMG, Belo Horizonte, Brazil, Colloquium, June 2008
66. Park City, Utah, July 2008
67. UIUC, Algebraic Geometry Seminar, September 2008
68. University of Arizona Tucson, Colloquium, September 2008
69. University of Arizona Tucson, Algebraic Geometry Seminar, September 2008
70. University of Notre Dame, Algebraic Geometry Seminar, October 2008
71. UIC, Number Theory Seminar, October 2008
72. SUNY Stony Brook, Algebraic Geometry Seminar, November 2008
73. MSRI, Emphasis Period Seminar, March 2009
74. MSRI, Combinatorial, Enumerative and Toric Geometry Workshop, March 2009
75. The Show-Me Algebraic Geometry Workshop, St. Louis, MO, May 2009
76. Koc University, Istanbul, Turkey, Mathematics Seminar, May 2009
77. XI. Antalya Algebra Days, Antalya, Turkey, May 2009
78. FRG Conference on Eigenvalue and Saturation Problem for reductive groups, UNC, May 2009
79. FRG Conference on Spaces of curves and their interaction with diophantine problems, Columbia University, June 2009
80. 1st PRIMA Congress, University of New South Wales, Sydney, Australia, July 2009
81. Moduli Konferenz, Humboldt University, Berlin, Germany, August 2009
82. Undergraduate Math Club, UIC, October 2009
83. Colloquium, Bogazici University, Istanbul, Turkey, December 2009
84. Graduate Math Club, Bogazici University, Istanbul, Turkey, December 2009
85. Bilkent-ODTU Algebraic Geometry Seminar, Ankara, Turkey, December 2009
86. Algebraic Geometry Seminar, Bar-Ilan University, Bar-Ilan, Israel, December 2009
87. Algebraic Geometry and Representation Theory Seminar, Ben Gurion University, Beer Sheva, Israel, December 2009
88. Algebraic Geometry Seminar, Ohio State, January 2010
89. Algebraic Geometry Seminar, Stanford University, May 2010
90. Seminar, Yeditepe Universitesi, Istanbul, Turkey, August 2010
91. XXIII National Mathematics Symposium, invited speaker, (2 lectures), Kayseri, Turkey, August 2010.
92. Algebraic Geometry Seminar, SUNY Stony Brook, September 2010
93. Poster presentation, National Academy of Sciences, 22nd Kavli Symposium
94. Algebraic Geometry Seminar, University of Wisconsin Madison, December 2010
95. Algebraic Geometry Seminar, Princeton University, December 2010
96. Algebraic Geometry Seminar, Tulane University, January 2011
97. Special Session in computational algebraic geometry of low dimensional varieties, AMS Joint Meeting, January 2011
98. Special Session in the birational geometry of moduli spaces, AMS Joint Meeting, January 2011

99. UIC Undergraduate Math Club, January 2011
100. Algebraic Geometry Seminar, KIAS, Seoul, Korea, July 2011
101. Workshop on the Birational Geometry of Moduli Spaces, Gyeongju, Korea, July 2011
102. A Celebration of Algebraic Geometry, Harvard University, August 2011
103. University of Houston, Complex Geometry Seminar, September 2011
104. Texas AM, Algebraic Geometry Seminar, September 2011

#### REFERENCES

- Joe Harris, Harvard University (thesis advisor)
- William Fulton, University of Michigan
- Ravi Vakil, Stanford University
- Jason Starr, SUNY Stony Brook
- Brendan Hassett, Rice University
- Lawrence Ein, UIC