

## SEBASTIAN CASALAINA-MARTIN

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**APPOINTMENTS**     **University of Colorado at Boulder**

Assistant Professor, 2008-present.

**Mathematical Sciences Research Institute**

Postdoctoral Fellow, Spring 2009.

**Harvard University**

NSF Postdoctoral Research Fellowship, 2005-2008.

**SUNY Stony Brook**

Simons Instructor, 2004-2007.

**EDUCATION**

**Columbia University**

Ph.D., Mathematics, 2004. Advisor: Robert Friedman.

M.Phil., Mathematics, 2004.

M.A., Mathematics, 2000.

**Brown University**

B.Sc., Mathematics, *Honors*, 1998.

**RESEARCH**

I am an algebraic geometer with a broad range of interests. My research focuses on curves, abelian varieties, cubic threefolds, vector bundles and moduli spaces.

**PUBLICATIONS**

All publications are available online at <http://math.colorado.edu/~sbc21>.

1. S. Casalaina-Martin and J. Kass, *A Riemann singularity theorem for integral curves*, preprint.
2. S. Casalaina-Martin, M. Lahoz and F. Viviani, *Cohomological support loci for Abel-Prym curves*, *Matematiche (Catania)*, Vol. LXIII (2008) -- Fasc. I, pp. 205-222.
3. S. Casalaina-Martin and R. Laza, *The moduli space of cubic threefolds via degenerations of the intermediate Jacobian*, *J. reine angew. Math.* **633** (2009), 29--65.
4. S. Casalaina-Martin and M. Teixidor i Bigas, *Singularities of Brill-Noether loci for vector bundles on curves*, submitted.
5. S. Casalaina-Martin, *Singularities of theta divisors in algebraic*

*geometry*, Curves and abelian varieties, 25--43, Contemp. Math., **465**, Amer. Math. Soc., Providence, RI, 2008

6. S. Casalaina-Martin, T. Gwena, and M. Teixidor i Bigas, *Some examples of vector bundles in the base locus of the generalized theta divisor*, C. R. Math. Acad. Sci. Paris **347** (2009), no. 3-4, 173--176.
7. S. Casalaina-Martin, *Cubic threefolds and abelian varieties of dimension five. II*, Math. Z. **260** (2008), no. 1, 115--125.
8. S. Casalaina-Martin, *Singularities of the Prym theta divisor*, Ann. of Math. **170** (2009), 163--204.
9. S. Casalaina-Martin and R. Friedman, *Cubic threefolds and abelian varieties of dimension five*, J. Algebraic Geom. **14** (2005) 295-326.
10. S. Casalaina-Martin, *Singularities of the Prym theta divisor, with applications to cubic threefolds*, Ph.D. Thesis, Columbia University (2004).

#### AWARDS

- NSF Postdoctoral Research Fellowship, 2005-2008.
- NSF VIGRE, Fellowship, Fall 1999, Spring 2000, Summer 2000.
- Sigma Xi, 1998.
- David Howell Premium for Excellence in Mathematics and Natural Philosophy, 1998 (Brown University Mathematics Award).

#### TEACHING

Teaching is an important and enjoyable part of my academic career.

1. Abstract algebra 1, Fall 2009, University of Colorado. An undergraduate course on Groups, Rings and Fields.
2. Complex analysis, Fall 2008, University of Colorado. An undergraduate course on complex analysis.
3. Introduction to algebraic geometry II: algebraic surfaces, Spring 2008, Harvard. A graduate course focusing on the classification of complex algebraic surfaces.
4. Theory of schemes II, Spring 2008, Harvard. A graduate course focusing on the theory of schemes, sheaves, and sheaf cohomology.
5. PRAGMATIC, Summer 2007, Catania. Teaching assistant for a summer school for graduate students and post-docs on Fourier-Mukai transforms, generic vanishing, and regularity.
6. Curves and abelian varieties, Fall 2006, Harvard. A graduate course on algebraic curves and abelian varieties, focusing on the relation between a curve and its Jacobian.
7. Math 131, Spring 2005, SUNY SB. A first semester course in calculus. Acted also as the coordinator for several sections of the same course.
8. Math 131, Fall 2004, SUNY SB. A first semester course in calculus.
9. Linear Algebra, Summer 2004, Columbia. An undergraduate course in linear algebra.
10. Graduate Commutative Algebra, Fall 2003, Columbia. Teaching assistant for a first year graduate course on commutative algebra

and algebraic geometry.

11. Basic Topology, Fall 2003, Columbia. Teaching assistant for an undergraduate course on point-set topology.
12. VIGRE Undergraduate Summer Research Projects: Discrete Morse Theory, Summer 2003, Columbia. Teaching assistant for a summer project aimed at introducing undergraduate students to an active field of research.
13. Calculus IA, Spring 2003, Columbia. A first semester course in calculus.
14. College Algebra and Analytic Geometry, Fall 2002, Columbia. A one-semester course of pre-calculus.
15. VIGRE Undergraduate Summer Research Projects: Algebraic Coding Theory, Summer 2002. Teaching assistant for a summer project aimed at introducing undergraduate students to an active field of research. See A. Ebin, et. al., *A new construction of maximal curves*, 2002 John H. Barrett Memorial Lectures Conference on Algebraic and Arithmetic Geometry, CONM. 386 (2005) 35-45.
16. College Algebra and Analytic Geometry, Summer 2002, Columbia. A one-semester course of pre-calculus.
17. Basic Mathematics, Spring 2002, Columbia. A course in elementary mathematics as a preparation for pre-calculus.
18. Calculus IIS, *Mathematica* based recitation section, Fall 2001, Columbia. Teaching assistant for a second semester course in Calculus. The sections focused on teaching the students to use the computer program *Mathematica* to solve calculus problems.
19. Calculus I, Summer 2001, Columbia. A first semester course in calculus.
20. Calculus IIS, *Mathematica* based recitation section, Spring 2001, Columbia. Teaching assistant for a second semester course in calculus. See above.
21. Calculus IS, *Mathematica* based recitation section, Fall 2000, Columbia. Teaching assistant for a first semester course in calculus. See above.
22. Training: attended a one-semester course on teaching mathematics, Spring 2000.

#### RESEARCH TALKS

- University of Colorado at Boulder, *Great Plains Operator Theory Special Year One Day Conference*, November 2009.
- University of California at San Diego, *Algebraic Geometry Seminar*, October 2009.
- Columbia University, *Algebraic Geometry Seminar*, September 2009.
- California Polytechnic State University, *Colloquium*, May 2009.
- University of British Columbia, *Algebraic Geometry Seminar*, April 2009.

- University of Utah, *Western Algebraic Geometry Seminar*, November 2008.
- Colorado State University, *Algebra Seminar*, October 2008.
- University of Illinois at Chicago, *Algebraic Geometry Seminar*, October 2008.
- University of North Carolina, Chapel Hill, *Colloquium*, February 2008.
- Texas A&M University, *Colloquium*, February 2008.
- Stanford University, *Algebraic Geometry Seminar*, February 2008.
- University of California, Santa Cruz, *Colloquium*, January 2008.
- University of Colorado, Boulder, *Colloquium*, January 2008.
- Rutgers University, *Colloquium*, January 2008.
- University of Toronto, *Colloquium*, January 2008.
- Harvard University, *Algebraic Geometry Seminar*, December 2007.
- CUNY, Lehman College, *Colloquium*, December 2007.
- University of California, Irvine, *Colloquium*, November 2007.
- University of Georgia, Athens, *Curves, abelian varieties, and their interactions; on the occasion of the 65th birthday of Roy Smith*, April 2007.
- University of Michigan, Ann Arbor, *Algebraic Geometry Seminar*, March 2007.
- Brown University, *Algebraic Geometry Seminar*, March 2007.
- Tufts University, *Seminar on Vector Bundles on Curves*, January 2007, Second lecture.
- Tufts University, *Seminar on Vector Bundles on Curves*, January 2007, First lecture.
- Boston University, *Geometry Seminar*, April 2006.
- University of Chicago, *Algebraic Geometry Seminar*, December 2005.
- Harvard University, *Algebraic Geometry Seminar*, March 2005.
- SUNY Stony Brook, *Algebraic Geometry Seminar*, September 2004, Second lecture.
- SUNY Stony Brook, *Algebraic Geometry Seminar*, September 2004, First lecture.
- Salamanca, Spain, *III Iberoamerican conference on geometry*, June 2004.
- Columbia University, *Algebraic Geometry Seminar*, April 2004.

#### SERVICE

- Co-organizer of the Front Range Algebra, Geometry and Number Theory Seminar, Fall 2009.
- Co-organizer of a working seminar on Stacks and Groupoids, Fall 2009.
- Involved in planning for the Western Algebraic Geometry Symposium (WAGS), Fall 2009.
- Co-organizer of the Harvard-MIT Algebraic geometry seminar, Fall

2007-Spring 2008.

- Co-organizer of the Columbia University Mathematics Department Graduate Colloquium, Fall 2000 & Spring 2001.
- Referee for articles appearing in journals including Comm. Algebra.
- Evaluated NSA grant proposals.
- Thesis defense committee for students at Harvard and Tufts.
- Algebra preliminary exam committee, University of Colorado.

#### REFERENCES

Robert Friedman, `rf@math.columbia.edu`

Joseph Harris, `harris@math.harvard.edu`

Mihnea Popa, `mpopa@math.uic.edu`

Montserrat Teixidor i Bigas,

`montserrat.teixidoribigas@tufts.edu`

Oliver Knill (Teaching), `knill@math.harvard.edu`