

Scott Carnahan

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Education

- **University of California**, Berkeley, CA.
Ph.D. in Mathematics, May 2007.
Advisor: Richard E. Borcherds.
Thesis: *Monstrous Lie algebras and generalized moonshine*.
- **California Institute of Technology**, Pasadena, CA.
B.S. with Honors in Mathematics, June 2001.

Employment

- **Massachusetts Institute of Technology**, Cambridge MA.
C.L.E. Moore Instructor, 2007-present.

Research Interests

- Representation Theory
- Algebraic Geometry
- Number theory

Publications

- **S. Carnahan**, Generalized Moonshine II: Borcherds Products.
<http://arxiv.org/abs/0908.4223>, *Submitted*
- **S. Carnahan**, Generalized Moonshine I: Genus zero functions.
<http://arxiv.org/abs/0812.3440>, *Submitted*
- **S. Carnahan**, L. Childs. Counting Hopf Galois structures on non-abelian Galois field extensions. *J. Algebra* **218** (1999), no. 2, 81–92.

In Preparation:

- **S. Carnahan**, Generalized Moonshine III: Conformal blocks
- **S. Carnahan**, Generalized Moonshine IV: Singular commutative rings

- **S. Carnahan**, Generalized Moonshine V: Comparisons

Awards

- Outstanding Graduate Student Instructor Award. University of California, Berkeley, 2005.
- Scott Johnson Prize (best graduating math major). California Institute of Technology, 2001.
- E.T. Bell Undergraduate Research Prize. California Institute of Technology, 1999.
- Top 25. Putnam Mathematics Competition, 1998.

Selected Talks (full list at <http://math.mit.edu/~carnahan/talks.html>)

- Genus zero functions in generalized moonshine. November 6, 2009, Everytopic seminar, Brandeis University
- Chiral algebras and logarithmic geometry. November 4, 2009, Mathematical physics seminar, Boston University
- Singular commutative rings in a braided category. September 1, 2009, ICMS Workshop on vertex algebras, Lie algebras, and automorphic forms, Edinburgh
- Construction of the exotic 2-compact group $DI(4)$. April 23, 2009, The Thursday Seminar, Harvard University
- Generalized moonshine: an overview. March 11, 2009, Geometry seminar, Boston University
- Genus zero modular functions in generalized moonshine. February 13, 2009, Infinite-dimensional algebra seminar, MIT
- Monstrous moonshine. July 29, 2008, Canada/USA Mathcamp (Portland, OR).
- Construction of the functor $Whit^c \rightarrow FS^c$. April 4, 2008, Workshop on Affine Lie algebras and chiral structures, Talbot 2008 (Plymouth, MA)

Recent conferences attended

- ICMS Workshop in Vertex Algebras, Lie Algebras, and automorphic forms, Edinburgh, September 2009.

- Conference on p -adic geometry and homotopy theory, Loén, Norway, August 2009.
- Talbot workshop on Fukaya categories, Nags Head NC, March 2009.

Teaching Experience

- **Recitation Factotum.** Fall 2009, MIT. Duties include: identifying potential pedagogical problems by watching recitations, monitoring registration and attendance trends, discussing ways to improve teaching technique with instructors and TAs, viewing and commenting on video recordings of first-time TAs.
- **Lecturer, 18.086 (Mathematical Methods for Engineers II).** Spring 2009, MIT. Taught a graduate class on numerical methods for engineers. Topics included PDE initial value problems, Large sparse linear systems, and optimization. Assigned homework and oversaw student projects and presentations.
- **TA, 18.022 (multivariable calculus).** Fall 2007 and Fall 2008, MIT. Taught two semesters, two recitation sections with 22 students each.
- **Course administrator, 18.03 (differential equations).** Spring 2008, MIT. Taught one recitation section, oversaw scheduling and exam logistics for 650 students, helped TAs with problems, wrote solutions for recitation group work, managed course web page.
- **Graduate Student Instructor.** Fall 2002-Spring 2004, University of California, Berkeley. Taught for four semesters, two sections with about 25 students each, in calculus, multivariable calculus, and discrete mathematics.
- **Prelim Workshop instructor.** Summer 2003, University of California, Berkeley. Taught the algebra section of the graduate mathematics preliminary exam workshop. Met with about 10 students for four hours per week to discuss theory and problem solving. Organized lectures and created problem sets for the students.

References

- Richard Borcherds
- Victor Kac
- Pavel Etingof
- Michael Hopkins
- Haynes Miller (teaching)

Contact information available on request.