

## Michael M. Schein

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### Personal

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Born 1982 in Fayetteville, Arkansas; U.S. and Israeli citizen.

### Education

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Ph.D. in Mathematics, Harvard University (2001-2006).

Advisor: Richard Taylor.

B.S. with honors in Mathematics, California Institute of Technology (1997-2001).

### Positions

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Senior Lecturer, Bar-Ilan University. 2013-

Lecturer, Bar-Ilan University. 2008 - 2013.

Golda Meir Postdoctoral Fellow, Hebrew University of Jerusalem. 2006 - 2008.

Professeur invité, Université Paris VI. January-February 2010 (one month).

### Publications

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Weights of Galois representations associated to Hilbert modular forms. *J. Reine Angew. Math.* **622** (2008), 57-94.

Weights in Serre's conjecture for Hilbert modular forms: the ramified case. *Israel J. Math.* **166** (2008), 369-391.

On modular weights of Galois representations. *Math. Research Letters* **15** (2008), 537-542.

Weights in Serre's conjecture for  $GL_n$  via the Bernstein-Gelfand-Gelfand complex. *J. Number Theory* **128** (2008), 2808-2822.

Reduction modulo  $p$  of cuspidal representations and weights in Serre's conjecture. *Bull. London Math. Soc* **41** (2009), 147-154.

Weights in generalizations of Serre's conjecture and the mod  $p$  local Langlands correspondence. *Symmetries in Algebra and Number Theory* (Georg-August-Universitätsverlag, Göttingen, 2009), 115-137.

An irreducibility criterion for supersingular mod  $p$  representations of  $GL_2(F)$ , for  $F$  a totally ramified extension of  $\mathbb{Q}_p$ . *Trans. Amer. Math. Soc* **363** (2011), 6269-6289.

Serre's modularity conjecture. *Travaux Mathématiques* **23** (2013), 139-172. (survey article)

Orbits of a group action as optimal designs. *Mediterr. J. Math* **11** (2014), 89-96.

On the universal supersingular mod  $p$  representations of  $GL_2(F)$ . *J. Number Theory* **141** (2014), 242-277.

Normal zeta functions of the Heisenberg groups over number rings I – the unramified case (with C. Voll). *J. London Math. Soc* **91** (2015), 19-46.

Normal zeta functions of the Heisenberg groups over number rings II – the non-split case (with C. Voll). *Israel J. Math.* **211** (2016), 171-195.

Bolza quaternion order and asymptotics of systoles along congruence subgroups (with K. Katz, M. Katz, and U. Vishne). *Exper. Math.* **25** (2016), 399-415.

### Students Supervised

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Tomer Bauer (M.Sc. in 2013, Ph.D. in progress).

Yotam Hendel (M.Sc. in 2014).

### Postdocs Mentored

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Dr. Mark Berman (January 2012 – January 2013, now tenure-track at Ort Braude).

Dr. Rony Bitan (March – September 2015)

Dr. Shalini Bhattacharya (January 2016 – September 2017, now at MPIM)

### Grants and Honors

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Germany-Israel Foundation grant (joint with C. Voll), 2015-17. (180,000 euros).

Germany-Israel Foundation Young Scientist grant, 2012 (26,000 euros).

Bar-Ilan Rector's Grant, 2010.

Pollack Research Endowment Fund, 2009-12.

Golda Meir Postdoctoral Fellowship, held 2006-08.

National Science Foundation Graduate Research Fellowship. Awarded 2001, held 2004-06.

National Defense Science and Engineering Graduate Fellowship, 2001-04.

Scott Russell Johnson Undergraduate Mathematics Prize, Caltech, 2001. "Awarded to the best graduating mathematics senior."

Herbert J. Ryser Scholarship, Caltech, 2000. Awarded to a junior in pure mathematics.

Caltech Upperclass Merit Scholarship, 1998-99, 1999-2000, and 2000-01.

**Teaching Experience and Publications** 

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(with A. Alvine, T. W. Judson, and T. Yoshida) *What graduate students (and the rest of us) can learn from lesson study*. *College Teaching* **55** (2007), 109-113.

**At Bar-Ilan University:**

Elliptic Curves (88-864): Fall 2017.

Group Theory (88-218): Fall 2017, Fall 2018.

Group Cohomology (88-909): Spring 2016.

Non-Archimedean Functional Analysis (88-818): Fall 2013.

Algebraic Structures for Computer Scientists (89-214): Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016.

Representations of Locally Compact Groups (88-819): Spring 2013.

Number Theory for Computer Scientists (89-256): Spring 2010, Spring 2011, Spring 2012, Spring 2018.

Infinitesimal Calculus II (88-133): Spring 2009, Spring 2010, Spring 2011, Spring 2012, Spring 2013, Spring 2014, Spring 2015, Spring 2016.

Local Fields (88-879): Spring 2011.

Infinitesimal Calculus I (88-132): Fall 2010, Fall 2011, Fall 2015, Fall 2016.

Commutative Algebra (88-813): Fall 2008, Fall 2009, Fall 2011.

Algebraic Number Theory (88-798): Fall 2008, Fall 2012, Spring 2017, Fall 2018.

**At Harvard University:**

Teaching Fellow for Math 21a, Multivariable Calculus. As calculus courses at Harvard are taught entirely in section, I was the students' only instructor. Fall 2005.

Teaching Fellow for Math 251b, Algebraic Number Theory. Conducted recitation sessions and graded homework. Spring 2005.

Math 99r, Additive Number Theory. Designed the curriculum and taught a tutorial for advanced mathematics majors. Fall 2004.

Teaching Fellow for Math 1b, Calculus, Series, and Differential Equations. Lectured three hours per week. Fall 2003.

**At Caltech:**

Teaching Assistant for Math 1abc (freshman calculus). Conducted recitation sessions and graded homework. 2000-01.

**Professional Activities** 

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Vice Chair, BIU Mathematics Department, 2016-

Head of Library Committee, BIU Mathematics Department.

Organizer, Bar-Ilan Algebra Seminar. 2008-10, 2011-14.

Organizer, Amitsur Memorial Symposium, June 2014.

Organizer, Algebra session at the Israel Mathematical Union's annual meeting, 2011.

Organizer, Harvard Trivial Notions Seminar (graduate student seminar). 2002-03.

Referee for *Algebra and Number Theory*, *Annales Scientifiques de l'E.N.S.*,  
*Comm. Math. Helvetici*, *Communications in Algebra*, *Compositio Math.*, *Crelle*,  
*Duke Math. Journal*, *Experimental Mathematics*, *Forum of Math. (Pi and Sigma)*,  
*Glasgow J. Math.*, *Groups Complex. Cryptol.*, *Israel J. Math.*, *Journal of Algebra*,  
*JAMS*, *Journal of Number Theory*, *J. Théorie de Nombres de Bordeaux*,  
*Math. Annalen*, *Math. Zeitschrift*, *Proc. London Math. Soc.*, *Representation Theory*,  
*Trans. Amer. Math. Soc.*. Reviewer for *Math. Reviews*.

External reader for M.Sc. thesis from the Weizmann Institute of Science.

Member of accompanying committee for a Ph.D. thesis, Hebrew University of Jerusalem.

Member of the American Mathematical Society (since 2002) and the Israel Mathematical Union (since 2006).

Languages: fluent English, Hebrew, and Russian; fluent reading in French.