

# Jim L. Brown

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## CURRENT POSITION

**2008-current**                      **Assistant Professor,**  
Clemson University, Clemson, SC.

## PREVIOUS EMPLOYMENT

**2007-2008**                      **Olga Taussky - John Todd Instructor,**  
California Institute of Technology, Pasadena, CA.

**2005-2007**                      **VIGRE Arnold Ross Assistant Professor,**  
The Ohio State University, Columbus, OH.

## EDUCATION

**1999-2005**                      **University of Michigan,** Ann Arbor, Michigan.  
Ph.D. in Mathematics, July 2005.  
Dissertation: *Saito-Kurokawa Lifts, L-Values for  $GL_2$ , and Congruences  
Between Siegel Modular forms.*  
Advisor: Prof. Christopher Skinner

**1995-1999**                      **Michigan State University,** East Lansing, Michigan.  
B.S. with High Honors in Mathematics, December, 1998.

## CITIZENSHIP

United States of America.

## RESEARCH

**Current Interests**                      algebraic number theory, arithmetic geometry, modular forms and applica-  
tions, special values of  $L$ -functions, Galois representations, Iwasawa theory

## HONORS AND AWARDS

**2004-2005**                      **Graduate Student Instructor of the Year**  
University of Michigan, Ann Arbor, Michigan.

**2000-2004**                      **VIGRE Fellowship,** University of Michigan, Ann Arbor, Michigan.

## RESEARCH PAPERS

**in progress with Bernhard Heim**       $L$ -functions on  $GSp(4) \times GL(2)$  and the Bloch-Kato conjecture (part II)

**in preparation**                      On the cuspidality of pullbacks of Siegel Eisenstein series to  $GSp(m) \times$   
 $GSp(n)$

**in preparation**                       $L$ -values for  $GL(2)$  and congruences between Ikeda lifts

**in preparation**                      Saito-Kurokawa lifts of square-free level and non-trivial torsion in Selmer  
groups

**RESEARCH PAPERS (CONTINUED)**

- 2008** The first negative Hecke eigenvalue of genus 2 Siegel cuspforms with level  $N \geq 1$  (preprint, 10 pages)
- 2008**  $L$ -functions on  $\mathrm{GSp}(4) \times \mathrm{GL}(2)$  and the Bloch-Kato conjecture (preprint, 26 pages)
- 2008** On the cuspidality of pullbacks of Siegel Eisenstein series and applications to the Bloch-Kato conjecture (submitted, 37 pages)
- 2007** Residually reducible representations of algebras over local Artinian rings (Proc. AMS. S0002-9939-08-09568-3BRJMX Y, 7 pages)
- 2007** Saito-Kurokawa lifts and applications to arithmetic (Conference Proceedings of the 9th Autumn Workshop on Number Theory, Hakuba, Japan, 1-11.)
- 2007** An inner product relation on Saito-Kurokawa lifts (The Ramanujan Journal, 14 no. 1, 89-105.)
- 2007** Saito-Kurokawa lifts and applications to the Bloch-Kato conjecture (Compositio Mathematica, 143 part 2, 290-322.)
- 2005** Saito-Kurokawa lifts,  $L$ -values for  $\mathrm{GL}_2$ , and congruences between Siegel modular forms, (Ph.D. thesis, University of Michigan, 131 pages)
- 2002** Variation of Hodge Structure (with K. Eistentrager, K. Klosin, J. Pineiro, M. Trifkovic, and O. Watson.)

**EXPOSITORY PAPERS**

- 2008** Local class field theory (97 pages)
- 2007** Alex, I will take congruent numbers for one million dollars please (14 pages, submitted)
- 2007** Congruent numbers and elliptic curves (26 pages)
- 2006** An introduction to Iwasawa theory (102 pages)
- 2005** Abel and the insolvability of the quintic (13 pages)
- 2004** Complex theory of abelian varieties (16 pages)
- 2001** An introduction to algebraic number theory (120 pages)

**UNDERGRADUATE RESEARCH SUPERVISED**

- Summer 2008** Yingkun Li (Caltech '09) will investigate congruences of powers of the partition function and exceptional primes.

<b>INVITED TALKS</b>
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|--------------------------|---|
| <b>March 10, 2008</b>    | <i>Saito-Kurokawa lifts and lower bounds on Selmer groups.</i><br>Number Theory Seminar, UCLA, Los Angeles, CA.   |
| <b>February 21, 2008</b> | <i>Dirichlet's class number formula and generalizations.</i><br>Colloquium, Clemson University, Clemson, SC.  |
| <b>January 18, 2008</b>  | <i>Dirichlet's class number formula and generalizations.</i><br>Colloquium, Florida State University, Tallahassee, FL.  |
| <b>January 17, 2008</b>  | <i>Congruences between automorphic forms and applications to arithmetic.</i><br>Algebra Seminar, Florida State University, Tallahassee, FL.                   |
| <b>November 16, 2007</b> | <i>Dirichlet's class number formula and generalizations.</i><br>Colloquium, Oregon State University, Corvallis, OR.   |
| <b>February 5, 2007</b>  | <i>The congruent number problem and elliptic curves.</i><br>Math Coffees, Davidson College, Davidson, NC.   |
| <b>January 25, 2007</b>  | <i>Automorphy, L-functions, and problems in arithmetic.</i><br>Colloquium, Bucknell University, Lewisburg, PA.  |
| <b>November 6, 2006</b>  | <i>Applications of Saito-Kurokawa lifts to arithmetic.</i><br>9th Autumn Workshop on Number Theory (focusing on $\mathrm{GSp}(4)$ ), Hakuba, Japan.           |
| <b>May 5, 2006</b>       | <i>Mathematics and internet security.</i><br>Mathematics Undergraduate Awards Ceremony, The Ohio State University, Columbus, OH.                              |
| <b>April 5, 2006</b>     | <i>L-functions and arithmetic.</i><br>Colloquium, Arizona State University, Phoenix, AZ.  |
| <b>November 4, 2005</b>  | <i>Saito-Kurokawa lifts and the Bloch-Kato conjecture.</i><br>Midwest Number Theory Day, University of Wisconsin, Madison, WI.                                |
| <b>February 7, 2005</b>  | <i>Saito-Kurokawa lifts, L-values for <math>GL_2</math>, and congruences between Siegel modular forms.</i><br>Algebra Seminar, Boston University, Boston, MA. |
| <b>February 2, 2005</b>  | <i>L-functions and arithmetic.</i><br>Colloquium, Armstrong Atlantic State University, Savannah, GA.  |
| <b>January 26, 2005</b>  | <i>L-functions and arithmetic.</i><br>Colloquium, Stephen F. Austin University, Nacogdoches, TX.  |

<b>TALKS AND PRESENTATIONS</b>	
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|------------------------------|---|
| <b>April 3, 2008</b>         | <i>Saito-Kurokawa lifts and lower bounds on Selmer groups</i> ,<br>Number Theory Seminar, Caltech, Pasadena, CA.  |
| <b>April 25, May 2, 2007</b> | <i>Attaching Galois representations to modular forms</i> ,<br>Graduate student number theory seminar, The Ohio State University,<br>Columbus, OH.   |
| <b>July 12, 2006</b>         | <i>L-functions on <math>GSp(4) \times GL(2)</math> and the Bloch-Kato conjecture</i> ,<br>Canadian Number Theory Association IX Meeting, University of British<br>Columbia, Vancouver, BC, Canada.  |
| <b>March 30, 2006</b>        | <i>L-functions on <math>GSp(4) \times GL(2)</math> and the Bloch-Kato conjecture</i> ,<br>The 20th Annual Workshop on Automorphic Forms and Related Topics,<br>University of Colorado, Boulder, CO.   |
| <b>February 1, 2006</b>      | <i>The congruent number problem and elliptic curves</i> , Radical Pi (undergrad-<br>uate math club) The Ohio State University, Columbus, OH.  |
| <b>January 23,30, 2006</b>   | <i>Number Theory: A couple of "simple" problems</i> . Invitation to Research<br>(Incoming graduate students are exposed to current research areas in various<br>topics.) The Ohio State University, Columbus, OH.   |
| <b>November 1, 2005</b>      | <i>Abel and the insolvability of the quintic</i> .<br>VIGRE Reading Classics Working Group, The Ohio State University,<br>Columbus, OH.   |
| <b>October 3,10, 2005</b>    | <i>Saito-Kurokawa lifts and applications to the Bloch-Kato conjecture</i> .<br>Number Theory Seminar, The Ohio State University, Columbus, OH.  |
| <b>March 20, 2005</b>        | <i>Saito-Kurokawa lifts, L-values for <math>GL_2</math>, and congruences between Siegel<br/>modular forms</i> .<br>The 19th Annual Workshop on Automorphic Forms and Related Topics,<br>University of North Texas, Denton, TX.                              |
| <b>January 06, 2005</b>      | <i>Saito-Kurokawa lifts, L-values for <math>GL_2</math>, and congruences between Siegel<br/>modular forms</i> .<br>AMS-MAA Joint Meeting, Atlanta, GA.  |
| <b>December 18, 2004</b>     | <i>Saito-Kurokawa lifts, L-values for <math>GL_2</math>, and congruences between Siegel<br/>modular forms</i> .<br>West Coast Number Theory Conference, UNLV, Las Vegas, NV.  |
| <b>October 25, 2003</b>      | <i>Saito-Kurokawa Lifts and Congruences Among Siegel Modular Forms</i> .<br>Midwest Number Theory Conference for Graduate Students and Recent<br>PhDs, University of Wisconsin, Madison, WI.  |
| <b>January 15, 2003</b>      | <i>Modular Forms of Half-Integer Weight and the Saito-Kurokawa Lift</i> .<br>Student Number Theory Seminar, University of Michigan, Ann Arbor, MI.  |
| <b>September 18, 2002</b>    | <i>Siegel Modular Forms and a Certain Dirichlet Series</i> .<br>Student Number Theory Seminar, University of Michigan, Ann Arbor, MI.   |
| <b>March 18, 2002</b>        | <i>Variation of Hodge Structures: Some Examples</i> .<br>Arizona Winter School, Southwestern Center for Arithmetic Algebraic Ge-<br>ometry. University of Arizona, Tucson, AZ.<br>This was done as a group projection under the direction of Johan de Jong. |

<b>CONFERENCES AND WORKSHOPS</b>	
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<b>June 28 - July 2, 2008</b>	Modular Forms and Arithmetic, MSRI, Berkeley, CA.
<b>May 21-25, 2008</b>	The Hawaii workshop on the arithmetic of modular forms, U. of Hawaii, Honoulu, HI.
<b>March 24-29, 2008</b>	Selmer Groups, L-functions, and Galois Deformations, Los Angeles, CA.
<b>January 6-8, 2008</b>	Joint Mathematics Meetings, San Diego, CA.
<b>October 27, 2007</b>	Southern California Number Theory Day, UC Irvine, CA.
<b>August 9-13, 2007</b>	Summer School in Iwasawa Theory, McMaster University, Hamilton, ON, Canada.
<b>January 5-8, 2007</b>	Joint Mathematics Meetings, New Orleans, LA.
<b>November 6-10, 2006</b>	9th Autumn Workshop on Number Theory (focusing on $\mathrm{GSp}(4)$ ), Hakuba, Japan.
<b>July 9-14, 2006</b>	The Canadian Number Theory Association IX Meeting, University of British Columbia, Vancouver, BC, Canada.
<b>June 17-22, 2006</b>	Instructional Workshop: Automorphic Galois Representations, L-functions and Arithmetic, Columbia University, New York, New York.
<b>March 29 - April 2, 2006</b>	20th Annual Workshop on Automorphic Forms and Related Topics, University of Colorado, Boulder, CO.
<b>November 4, 2005</b>	Midwest Number Theory Day, University of Wisconsin, Madison, WI.
<b>Fall 2005</b>	VIGRE Reading Classics Group, The Ohio State University, Columbus, OH. The group comprised of undergraduates, graduate students, and faculty focused on reading works of Abel and Galois.
<b>March 17-20, 2005</b>	The 19th Annual Workshop on Automorphic Forms and Related Topics, University of North Texas, Denton, TX.
<b>January 5-8, 2005</b>	Joint Mathematics Meetings, Atlanta, GA.
<b>December 16-20, 2004</b>	West Coast Number Theory Conference, University of Nevada Las Vegas, Las Vegas, NV.
<b>2004-2005</b>	VIGRE Number Theory Working Group Participant, University of Michigan, Ann Arbor, MI. The group worked on understanding aspects of complex multiplication.
<b>Summer 2004</b>	Iwasawa Theory Seminar, University of Michigan, Ann Arbor, MI.
<b>June 20-25, 2004</b>	Canadian Number Theory Association VIII Meeting, Fields Institute, Toronto, ON, Canada.
<b>November 5-8, 2003</b>	AIM Workshop on the Birch-Swinnerton-Dyer Conjecture, Princeton University, Princeton, NJ.

<b>CONFERENCES AND WORKSHOPS (CONTINUED)</b>	
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<b>October 25-26, 2003</b>	Midwest Number Theory Conference for Graduate Students and Recent PhDs, University of Wisconsin, Madison, WI.
<b>2001-2005</b>	Arizona Winter School, Southwestern Center for Arithmetic Algebraic Geometry, University of Arizona, Tucson AZ.
<b>2002-2003</b>	VIGRE Number Theory Working Group Participant, University of Michigan, Ann Arbor, MI. The working group read <i>Travaux de Shimura</i> by Deligne.
<b>2001-2002</b>	VIGRE Number Theory Working Group Participant, University of Michigan, Ann Arbor, MI. The working group read <i>Heegner Points and Derivatives of L-Series</i> by Gross and Zagier.
<b>April 2001</b>	Workshop on Automorphic Forms, Institute for Advanced Study, Princeton, NJ.
<b>2000-2001</b>	VIGRE Number Theory Working Group Participant, University of Michigan, Ann Arbor, MI. The working group read <i>The Beilinson Conjecture for Algebraic Number Fields</i> by Neukirch.

<b>SERVICES</b>
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<b>Spring 2008 - present</b>	<b>Referee</b> , Mathematical Research Letters.
<b>Fall 2007 - present</b>	<b>Reviewer</b> , Mathematical Reviews (2 reviews).
<b>March 8, 2008</b>	<b>Conference co-organizer</b> , Southern California Number Theory Day Caltech, Pasadena, CA.
<b>Summer 2006</b>	<b>Reading Course Instructor</b> Supervised a student in a reading course of algebraic number theory at The Ohio State University.
<b>2006-2007</b>	<b>Seminar Organizer</b> Number Theory Seminar, The Ohio State University, Columbus, OH.
<b>November 5, 2005</b>	<b>Panel Member for "Giving an effective talk."</b> Midwest Number Theory Conference for Graduate Students III.
<b>January 6, 2005</b>	<b>Chair Number Theory Session III</b> AMS-MAA Joint Meetings, Atlanta, GA.
<b>2004-2005</b>	<b>Freshmen/Sophomore Mathematics Program Committee</b> Mathematics Department, University of Michigan, Ann Arbor, MI.
<b>November 13, 2003</b>	<b>King-Chavez-Parks Program Host</b> Gave talk to area high school students entitled "Clocks, Doughnuts, Paper-twisting, and Snowflakes and How They Relate to Modern Mathematics" Office of Academic Multicultural Initiatives, University of Michigan, Ann Arbor, MI.
<b>2000-2001, 2002-2003</b>	<b>Seminar Organizer</b> Student Number Theory Seminar, University of Michigan, Ann Arbor, MI.

## EDUCATION SEMINARS AND WORKSHOPS

<b>January, 2005</b>	MAA Minicourse on Java Applets in Mathematics Participant and MAA Minicourse on Teaching Galois Theory to Undergraduates, AMS-MAA Joint Meetings, Atlanta, GA.
<b>2001-2004</b>	VIGRE Mathematics Education Seminar Participant, University of Michigan, Ann Arbor, MI.
<b>Fall 2003</b>	VIGRE Mathematics Education Seminar Research Assistant, University of Michigan, Ann Arbor, MI. Helped analyze videos of calculus students attempting to explain the concept of a derivative.
<b>Fall 2003</b>	<i>The Engaged Classroom: Getting Students Involved in the Learning Process</i> , Center for Research on Learning and Teaching, University of Michigan, Ann Arbor, MI. Attended seminar.

## TEACHING

<b>Winter-Spring 2008</b>	<b>Primary lecturer for the following courses:</b> Winter 2008 160b Local class field theory Spring 2008 160c Global class field theory California Institute of Technology, Pasadena, CA
<b>Fall 2005-Spring 2007</b>	<b>Primary lecturer for the following courses:</b> Spring 2007 Math 573 Introductory number theory Winter 2007 Math 566 Discrete mathematical structures II Fall 2006 Math 983 Introduction to Iwasawa theory Spring 2006 Math 581 Abstract algebra II Winter 2006 Math 580 Abstract algebra I Fall 2005 Math 153 Calculus III The Ohio State University, Columbus, OH.
<b>Summer 2006, 2007</b>	<b>Seminar Instructor</b> , The Ross Program, A program for gifted middle/high school students to explore basic number theory through exploration. The Ohio State University, Columbus, OH.
<b>Winter 2004, Fall 2004</b>	<b>Assistant Course Coordinator</b> , Math 115 Calculus I, University of Michigan, Ann Arbor, MI. (with Karen Rhea)
<b>Fall 2001, Fall 2003</b>	<b>Assistant Course Coordinator</b> , Math 116 Calculus II, University of Michigan, Ann Arbor, MI. (2001 with Bob Megginson, 2003 with Al Taylor)
<b>Summer 2000, 2001, 2002</b>	<b>Mentor</b> , Michigan Mentorship Program, Ann Arbor, MI. Worked with a gifted high school student teaching him abstract algebra and number theory.
<b>Fall 1999 - Summer 2002</b>	<b>Graduate Student Instructor</b> , University of Michigan, Ann Arbor, MI. Primary lecturer sections of Math 105 Data, Functions and Graphs and Calculus II.
<b>Fall 2000</b>	<b>Graduate Student Supervisor Mathematics Lab</b> , University of Michigan, Ann Arbor, MI.
<b>Spring 1999</b>	<b>Graduate Student Instructor</b> , Michigan State University, East Lansing, MI. Primary lecturer for a section of College Algebra.

<b>TEACHING (CONTINUED)</b>	
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**Summer 1998, 1999**

**Instructor for Internet-based Intermediate Algebra**, Michigan State University, East Lansing, MI.

**1997 - 1998**

**Teaching Assistant**, Michigan State University, East Lansing, MI. Undergraduate teaching assistant for Calculus II, III.