

Thomas Andrew Hulse

CONTACT INFORMATION	Colby College Department of Mathematics and Statistics Mayflower Hill Waterville, ME 04901	<i>Cell Phone:</i> (207) 649-5705 <i>Office Phone:</i> (207)-859-5841 <i>E-mail:</i> tahulse@colby.edu <i>Webpage:</i> www.colby.edu/personal/t/tahulse/
RESEARCH AREAS:	Analytic Number Theory, L-functions, Classical Automorphic Forms, Multiple Dirichlet Series	
EMPLOYMENT	Colby College , Waterville, Maine, USA Visiting Assistant Professor	September 2015 - Present
	Queen's University , Kingston, Ontario Canada Coleman Postdoctoral Fellow Supervisor: M. Ram Murty	August 2013 - August 2015
EDUCATION	Brown University , Providence, Rhode Island USA Sc.M, Mathematics, May 2009 Ph.D, Mathematics, May 2013 Advisor: Jeffrey Hoffstein	September 2007 - May 2013
	Colby College , Waterville, Maine USA B.A., Mathematics and Physics, May 2007	September 2003 - May 2007
PAPERS AND PREPRINTS	Short-Interval Averages of Sums of Fourier Coefficients of Cusp Forms. with Chan Ieong Kuan, David Lowry-Duda, and Alexander Walker. <i>Journal of Number Theory</i> . Volume 173, April 2017, Pages 394-415	April, 2017 (In Press)
	The Second Moment of Sums of Coefficients of Cusp Forms. with Chan Ieong Kuan, David Lowry-Duda, and Alexander Walker. <i>Journal of Number Theory</i> . Volume 173, April 2017, Pages 304-331	April, 2017 (In Press)
	Bertrand's Postulate for Number Fields with M. Ram Murty. <i>Colloquium Mathematicum</i> .	December, 2016 (In Press)
	Sign Changes of Coefficients and Sums of Coefficients of L-Functions with Chan Ieong Kuan, David Lowry-Duda, and Alexander Walker. <i>Journal of Number Theory</i>	April 2016 (Accepted)
	Counting Square Discriminants with E. Mehmet Kiral, Chan Ieong Kuan and Li-Mei Lim. <i>Journal of Number Theory</i> . Volume 162, May 2016, Pages 255-274	May, 2016
	Multiple Dirichlet Series With Shifted Convolutions with Jeffrey Hoffstein. <i>Journal of Number Theory</i> . Volume 161, April 2016, Pages 457-533	April, 2016
	Triple Shifted Sums of Automorphic L-Functions	April, 2013 (Thesis)

The Sign of Fourier Coefficients of Half-Integral Weight Cusp Forms

May, 2012

with E. Mehmet Kiral, Chan Ieong Kuan and Li-Mei Lim

International Journal of Number Theory Vol. 08, No. 03, pp. 749-762

IN PREPERATION AND IN PROGRESS: **The Sign of Fourier Coefficients of Half-Integral Weight Cusp Forms II.**
with Jianing Yang (undergraduate student).

Lattice Points in Spheres.

with Chan Ieong Kuan, David Lowry-Duda, and Alexander Walker.

Effective Sign-Change Intervals for Hilbert Modular Forms.

with Naomi Tanabe.

MATHEMATICS
SERVICE

Journal of Number Theory

Peer Reviewer

SELECTED
RESEARCH
TALKS

Québec-Maine Number Theory Conference, Université Laval, Québec City, Québec, USA

Invited Talk

LATTICE POINTS IN SPHERES

October 2016

Motivated by Gauss's Circle Problem and Dirichlet's Divisor Problem, a talk on the analogous question of finding asymptotics for the partial sums of Fourier coefficients of automorphic forms. More specifically, an introduction to how this problem can be approached via shifted multiple Dirichlet series and our results pursuing this. This is joint work with Chan Ieong Kuan, David Lowry-Duda and Alexander Walker.

Dartmouth College, Hanover, New Hampshire USA

Number Theory Seminar

GENERALIZING SIGN-CHANGE AXIOMATIZATIONS AND AVERAGE ORDERS

January 2016

Here we present new results about the asymptotic behavior of average orders of the Fourier coefficients of holomorphic cusp forms by means of meromorphically continuing Dirichlet Series whose coefficients are squares of these partial sums. We do this by decomposing these Dirichlet series into shifted Multiple Dirichlet Series and taking spectral expansions. More recently, we have begun to generalize this construction to non-cusp forms to investigate the generalization of Gauss's circle problem to higher dimensions. This is joint work with Chan Ieong Kuan, David Lowry-Duda, and Alexander Walker.

Colby College, Waterville, Maine USA

Departmental Colloquium

FINDING IMAGINARY PRIMES

November 2015

An introduction to primality, Bertrand's postulate, the prime number theorem, and how these all can be extended to arbitrary number fields with the Gaussian integers as a concrete example. A new result, stating a generalization of Bertrand's postulate for number fields, is given. Intended for a mixed audience of mainly undergraduates and some faculty. This is joint work with M. Ram Murty.

Maine-Québec Number Theory Conference, University of Maine, Orono, Maine USA

Invited Talk

AVERAGING AVERAGE ORDERS

October 2015

Motivated by Gauss's Circle Problem and Dirichlet's Divisor Problem, a talk on the analogous question of finding asymptotics for the partial sums of Fourier coefficients of automorphic forms. More specifically, an introduction to how this problem can be approached via shifted multiple Dirichlet series and our results pursuing this. This is joint work with Chan Ieong Kuan, David Lowry-Duda and Alexander Walker.

Queen's University, Kingston, Ontario Canada
Departmental Colloquium

COUNTING SQUARE DISCRIMINANTS

October 2014

A presentation of the problem of counting indefinite binary quadratic forms with fixed discriminant given certain restrictions on the coefficients; in particular a novel result when the discriminant is a square. This is joint work with E. Mehmet Kiral, Chan Ieong Kuan and Li-Mei Lim.

Canadian Number Theory Association Conference, Ottawa, Ontario Canada

THE SIGN OF FOURIER COEFFICIENTS OF
MORE GENERAL HALF-INTEGRAL WEIGHT CUSP FORMS

June 2014

Following up on previous joint work with E. Mehmet Kiral, Chan Ieong Kuan and Li-Mei Lim, a presentation of my progress on loosening restrictions on the sign changes of square-free coefficients of half-integral weight holomorphic cusp forms.

Canadian Mathematical Society Winter Meeting, Ottawa, Ontario Canada

Invited Talk, Number Theory Session

SOME RESULTS OF SHIFTED SUMS

December 2013

A talk on some applications of a different sort of truncated Poincaré series in our study of particular shifted sums: non-trivial asymptotics of triple sums of Fourier coefficients of classical holomorphic cusp forms, a Burgess-type bound for twisted automorphic L-functions, and a smoothed count of square discriminants with bounded coefficients. Featured joint work with Jeffrey Hoffstein and joint work with E. Mehmet Kiral, Chan Ieong Kuan and Li-Mei Lim.

Brown University, Providence, Rhode Island USA

Brown Algebra Seminar

A DOUBLE SPECTRAL EXPANSION
OF A TRIPLE SHIFTED DIRICHLET SERIES.

October 2012

An introduction to shifted convolution sums and how knowledge about them can be used to give subconvexity bounds of automorphic L-functions. I discuss my own work, based off of the work of Jeff Hoffstein, which uses shifted convolutions of holomorphic forms with Maass forms to give a continuation of a triple, shifted Dirichlet series.

SELECTED
EXPOSITORY
TALKS

Queen's University, Kingston, Ontario Canada

Number Theory Seminar

A BRIEF INTRODUCTION TO SPECTRAL OBJECTS
AND UNTILING AUTOMORPHIC FORMS.

August 2014

An exploration of the classical real-analytic Eisenstein series, its properties, and how it relates to the spectral decomposition of the space of square-integrable automorphic functions. Also a discussion of the techniques by which the Rankin-Selberg L-function is constructed and how to modify this process with Poincaré series to give spectral expansions of shifted sums.

Brown University, Providence, Rhode Island USA

Graduate Student Seminar

A MODEL FOR REPULSIVE ZEROS.

December 2012

This lecture is an introductory overview of how random matrices are conjecturally used to model the distribution of zeros of L-functions. It also outlines the "excised" model proposed by Dueñez, Huynh, Keating, Miller, and Snaith used to capture the repulsion of low-lying zeros of families of twisted L-functions on elliptic curves.

LINNIK'S NO FINICK.

April 2012

An introduction to the Linnik Problems, how they relate to holomorphic forms and how they can be illuminated by subconvexity estimates.

ADJECTIVE NUMBERS.

March 2011

A lecture about the strangely commonplace number descriptors, and how some of these things are interesting from a number theory perspective.

THE ONLY SELBERG CONJECTURE TOM IS AWARE OF. **September 2009**
An introduction to Selberg's eigenvalue conjecture, and how it corresponds to the generalized Ramanujan conjecture by means of a famous paper by Luo, Rudnick and Sarnak.

APPARENTLY, IT IS HIP TO BE SQUARE. **November 2008**
An introduction to the methods of analytic number theory, specifically outlining the proof of Dirichlet's Theorem for primes in arithmetic progressions and how a non-square integer n is a square modulo a prime p for "half" the primes.

Massachusetts Institute of Technology, Cambridge, Massachusetts USA

STAGE Seminar

SHIFTED SUMS FOR SUBCONVEXITY. **September 2011**
An introduction to the Generalized Lindelöf hypothesis and the convexity bound, by means of the classical Riemann Zeta function as an illustrative example.

TEACHING
EXPERIENCE

Colby College, Waterville, Maine USA

Visiting Assistant Professor

September 2015 - Present

Linear Algebra (MATH 253)

Spring 2017 (expected)

Differential Equations (MATH 311)

Spring 2017 (expected)

Single Variable Calculus (MATH 121 A, D2, and E)

Fall 2016

Multivariable Calculus (MATH 122 B and C)

Spring 2015

Single Variable Calculus (MATH 121 A and F)

Fall 2015

Abstract Algebra (MATH 333)

Fall 2015

Independent Study (MATH 491)

Fall 2015 - Present

Queen's University, Kingston, Ontario Canada

Coleman Postdoctoral Fellow

August 2013 - August 2015

Complex Analysis (MTHE 228)

Spring 2015

Elementary Number Theory (MATH 311)

Fall 2014

Linear Algebra (MATH 111)

Spring 2014

Functions of a Complex Variable (MATH / MTHE 326)

Fall 2013

Brown University, Providence, Rhode Island USA

Brown CE Course Instructor

Introductory Calculus I (Math 0090)

Summer 2013

Teaching Fellow

Introductory Calculus I (Math 0090)

Fall 2012

Analytic Geometry and Calculus I (Math 0050)

Fall 2011

Honors Linear Algebra (Math 0540)

Spring 2010

Introductory Calculus II (Math 0100)

Fall 2009

Teaching Assistant

Intermediate Calculus (Math 0180)

Spring 2009

Introductory Calculus II (Math 0100)

Fall 2008

Tutor **Fall 2007 - Spring 2009**
Worked in the Math Resource Center, a walk-in help session for undergraduates in math.

Harriet W. Sheridan Center for Teaching and Learning

Certificate IV: Teaching Consultant Program

2013

Certificate I: Sheridan Teaching Seminar - Reflective Teaching

2009

DEPARTMENTAL
SERVICE

Colby College, Waterville, Maine, USA

Student Activities Coordinator

Fall 2015 - Present

In charge of a departmental activity each semester. Organized a Board Game Night in the Fall of 2015 and a Math Trivia Night in the Spring of 2016.

Brown University, Providence, Rhode Island USA

Math Resource Center Coordinator

Fall 2009 - Spring 2012

In charge of the Math Resource Center, a walk-in help session for undergraduates in math. Responsible for hiring tutors, composing the schedule, promoting the center, addressing problems and feedback, and implementing new ideas.

HONORS AND
AWARDS

Brown University, Providence, Rhode Island USA

Math Department Teaching Award

May 2013