

Jodin Morey

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Areas of Interest

My interests are in dynamical systems and mathematical physics. Specifically, I conduct research in the full two-body problem (gravitational orbits), and black hole gravity waves. I am seeking a position as a lecturer and researcher. I also have interest in developing specialized mathematics curriculum for undergraduates. In particular, my goal is to use technology to make mathematics easier to learn, and more relevant to the students' lives. See my Teaching Philosophy and Research Statement for more.

Education

- **Ph.D. in Mathematics**, University of Minnesota; Minneapolis MN (Expected) Spring 2022
Dissertation: *Relative Equilibria of Dumbbells Orbiting in a Planar Newtonian Gravitational System*
Advisor: Prof. Richard Moeckel
- **MS in Mathematics**, University of Minnesota; Minneapolis MN Spring 2020
Masters Paper: [Relative Equilibria of Dumbbells Orbiting in a Planar Newtonian Gravitational System](#)
- **Minnesota Teaching License**, Mathematics (grades 5 – 12) June 2015
- **BA in Mathematics Teaching**, Metropolitan State University; St. Paul, MN Spring 2015
Summa Cum Laude. Urban Teaching Program
- **BFA in Music**, University of Minnesota; Morris, MN Spring 1998

Publications

- *High-Overtone Quasinormal Modes for Reissner–Nordström Black Holes* (In Preparation)
(with Green, Daghigh)
- *Relative Equilibria for Orbiting Dumbbells in a Planar System* (Expected) June 2022
University of Minnesota, Dissertation
- *Scalar Perturbations of a Single-Horizon Regular Black Hole* (with Green, Daghigh, Kunstatter) November 2020
Physical Review D 102, 104040 (2020). DOI: [10.1103/PhysRevD.102.104040](https://doi.org/10.1103/PhysRevD.102.104040) (4 citations)
- *Significance of Black Hole Quasinormal Modes: A Closer Look* (with Green, Daghigh) May 2020
Physical Review D 101, 104009 (2020). DOI: [10.1103/physrevd.101.104009](https://doi.org/10.1103/physrevd.101.104009) (8 citations)
- *The Consequence of Using a Quantum Two-State Magnetic Field in a Stern-Gerlach Experiment* August 2016
(with Green, Daghigh, West). Preprint: [arXiv:1608.01638v1](https://arxiv.org/abs/1608.01638v1) [quant-ph] (2 citations)
- Environmental sustainability [Curriculum for College Algebra and Pre-Calculus](#) Summer 2014
Developed through an NSF funded project, *Engaging Mathematics*

Teaching Related Experiences

- Lecturer (Teacher of Record), University of Minnesota; Minneapolis MN Fall 2021
Linear Algebra and Differential Equations, with four sections. Directed two graduate students as TAs
- Mentored an undergraduate as part of a Directed Reading Program Fall 2021
Text: *Analysis I*, by Terence Tao
- TA Instructor, University of Minnesota; Minneapolis MN Fall 2016 – Spring 2021
Calculus I/II, Linear Algebra and Differential Equations
Average student rating over 24 classes: 5.5 out of 6
- Substitute Teacher; Bloomington Public Schools; Bloomington, MN 2015 – 2016
7-12th grade math
- Student Teacher, Kennedy High School; Bloomington, MN January – April, 2015
Algebra 2 and College Algebra
- Developed a *Mathematics Comprehension Strategy Log* to narrow the achievement gap Spring 2014
[Undergraduate Compilation of Mathematics Education Strategies](#)
- Teaching Assistant, Valley View Middle School; Bloomington, MN January – May, 2014
7th grade math
- Volunteer Teaching Assistant, Washburn High School; Minneapolis, MN September 2011 – December 2013
Geometry and Calculus

Teaching Related Experiences (continued)

- Volunteer Tutor, Green Central Middle School; Minneapolis, MN February – May 2013
After School Program (ACES), Mathematics
- Participated in MN chapter of the National Association for Multicultural Education's fall conference, Patrick Henry High School; Minneapolis, MN Fall 2011
- Volunteer Tutor, mathematics for clients with mental illness working toward their GED 2006 – 2014
Treatment Center, Community Options; Fridley, MN

Seminar and Talks

- Brazilian Orbital Dynamics Colloquium, Federal University of Pernambuco; Recife, Brazil December 2021
Talk title: *Relative Equilibria of Dumbbells Orbiting in a Planar Newtonian Gravitational System*
- Minnesota Mathematics of Climate Seminar, University of Minnesota; Minneapolis, MN (Planned) Fall 2021
Talk title: *Stability of Relative Equilibria for Orbiting Dumbbells in a Planar System*
- Masters Oral Exam, University of Minnesota; Minneapolis, MN April 2020
Talk title: [*Relative Equilibria of Dumbbells Orbiting in a Planar Newtonian Gravitational System*](#)
- Dynamical Systems Seminar, University of Minnesota; Minneapolis, MN April 2020
Talk title: [*Relative Equilibria of Dumbbells Orbiting in a Planar Newtonian Gravitational System*](#)
- Joint Mathematics Meetings, Contributed Paper; San Antonio, TX January 2015
Talk title: [*Undergraduate Sustainability Experiences in the Mathematics Classroom*](#)

Grants, Honors, and Awards

- American Mathematical Society travel grant to attend the Joint Mathematics Meetings November 2021
- National Science Foundation summer funding through advisor's research grant 2019 – 2020
- Certification for "Outstanding Teaching and Dedication to Helping Students Learn" 2016 – 2020
Six recognitions from the University of Minnesota, Center for Educational Innovation
Comment from a recent award: "You were an excellent TA before the [pandemic] transition; you were always enthusiastic and willing to help people out. You did wonders when transitioning to online as you quickly switched your office hours to online as well as our discussion sessions."
- Outstanding Student Award, Metropolitan State University, College of Arts and Sciences Spring 2015
Awarded to only one graduating senior
- Granted funding to attend Minnesota Council of Teachers of Mathematics; Duluth, MN May 2015
- Academic Achievement Scholarship, Metropolitan State University; St. Paul, MN May 2013

Other Experiences/Accomplishments

- Mentored several math students with disabilities in use of assistive technology to produce math script 2006-2021
- Participated in GAIN conference "to empower math faculty to support graduate students with respect to issues of discrimination and systemic inequity." Topics included advocacy for *students with disability*. October, 2021
- Invited panelist for Women in Mathematics' "Oral Exam Panel" Fall 2020
- Served as peer mentor for incoming math graduate students, University of Minnesota Fall 2018
- Class project. Developed a mathematical model and ran simulations of electoral ranked-choice voting using Mathematica. Gave presentation of my findings Fall 2013
- Invited to and participated in a Roundtable Discussion with St. Paul Mayor Chris Coleman for the 2013 "State of the City" at Metropolitan State University Spring 2013
- Developed and presented mathematical curriculum to college classrooms 2012 – 2014
(spherical geometry, angle of elevation)
- Built web application "RadioChimp." A service to send audio e-mail messages, podcast radio shows, or embed audio messages into webpages 2008 – 2013
- Built website with MP3 automation for a nonprofit's "Sunday Talks" 2008 – 2012
using Perl, PHP, JavaScript, RSS, HTML
- Built first web-based reservation system in MN for a limousine company (which I founded and co-owned) 1998
- Composer/Musical Director, Danny Boy Productions (television animation) 1995 – 1997