

Charles W. Godfrey

RESEARCH MATHEMATICIAN · DATA SCIENTIST

Seattle, WA USA

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Education

The University of Washington

PHD CANDIDATE IN MATHEMATICS AND ADVANCED DATA SCIENCE

Seattle, WA USA

September 2014-June 2020

- **Thesis:** *Residue triangles and resolutions of pairs*
- **Research area:** algebraic geometry (singularities of the MMP)
- **Advanced data science:** data visualization, machine learning

The University of Wisconsin-Madison

B.S. IN MATH AND PHYSICS (DOUBLE MAJOR)

Madison, WI USA

September 2010-May 2014

Skills

Mathematical Research	Algebraic geometry, moduli spaces, birational geometry, singularities, algebraic vision.
Programming	Macaulay2, SAGE, Matlab/Mathematica, Python (NumPy/SciPy), Git
Data Science	Tableau, D3.js, REST APIs, Pandas, SciKitLearn, PyTorch, Keras, Graph Databases
Markdown and Web Technologies	LaTeX, Markdown, Pandoc, node.js, Vuepress/Gridsome
Languages	English, Spanish, Arabic

Experience

Mathematical Sciences Research Institute

PROGRAM ASSOCIATE

Berkeley, CA USA

March-May 2019

- Attended the *Birational Geometry and Moduli Spaces* program
- Wrote my thesis, began collaborative work
- Served as designated note-taker during *Recent Progress in Moduli* workshop

The University of Washington

PRE-DOCTORAL TEACHING ASSISTANT

Seattle, WA USA

September 2014-June 2020

- **Main instructor:** Introduction to Differential Equations, Algebra with Applications, Introduction to Mathematical Reasoning, Calculus I, Graduate Prelim Exam Summer Boot Camp
- **Teaching assistant:** Pre-Calculus, Calculus I-III, Linear Algebra
- **Grader:** Graduate Algebra

Washington eXperimental Math Laboratory

GRADUATE MENTOR

Seattle, WA USA

January-June 2019

- Mentored a team of undergraduates investigating various forms of quantization in the foundations of quantum mechanics
- **Faculty Mentor:** Dr. Benjamin Feintzeig

Citadel Datathon

CONTESTANT

Seattle, WA USA

October 2019

- Implemented a gradient-descent model attempting to identify high return-on-investment real estate

YMCA Camp Widjiwagan

TRAIL COUNSELOR

Ely, MN USA

May 2011-August 2013

- Guided canoe trips in the Boundary Waters Canoe Area Wilderness Quetico Provincial Park and Crownlands
- Responsibilities included group dynamics, counseling, logistics, navigation, education, cooking, first aid, and everything required for a successful expedition style canoe trip

The University of Minnesota School of Physics and Astronomy

RESEARCH EXPERIENCE FOR UNDERGRADUATES

Minneapolis, MN USA

June-August 2013

- Designed and carried out experiments using the BL21Rosetta2 strain of Escherichia coli in the context of synthetic biology
- Used MATLAB for statistical data analysis, data visualization, and numerical analysis to solve differential equations modelling genetic circuits
- **Principal Investigator:** Dr. Vincent Noireaux

The Badger Herald

EDITORIAL PAGE EDITOR

Madison, WI USA

September 2012-December 2013

- Recruited new writers, worked with writers to create locally relevant content for the Opinion page
- Edited and formatted columns and letters to the editor, sat on the Badger Herald Editorial Board, and wrote regular columns and editorials
- The Badger Herald is the largest independent student newspaper in the nation

Ice Cube Neutrino Observatory

STUDENT RESEARCHER

Madison, WI USA

September 2012-January 2013

- Data analysis, primarily in Python

Wisconsin Union

CASHIER

Madison, WI USA

February 2011-May 2012

- While I don't have statistics to back this up, it's been said that the Stiftskeller serves more beer by volume than any other establishment in the state of Wisconsin, and having worked there I believe it

Talks and Presentations

Graduate Student Seminar

Mathematical Sciences

Research Institute

LOGARITHMIC CHOW-TO-HODGE CYCLE MAPS

April 2019

- Classical Chow-to-Hodge cycle maps and El Zein's construction
- A logarithmic version, following Binda and Saito

1, 2, 3 Seminar

The University of Washington

THE COHOMOLOGY OF A SMOOTH HYPERSURFACE

Fall 2018

- A fun computation, with emphasis on using Hirzebruch-Riemann-Roch to find the rank of the middle cohomology

CSE 546 Final Project Poster Session

The University of Washington

LARGHISSIMO: LONG/SHORT TERM MEMORY NETWORKS FOR MUSIC GENERATION

Fall 2018

- Trained LSTM networks on large volumes of Musical Instrument Digital Interface (MIDI) data

Graduate Student MMP Seminar

The University of Washington

THE CONE OF CURVES

Fall 2017

- Described the cone of curves $NE_1(X)$ on an algebraic variety, with a view towards the Minimal Model Program

1, 2, 3 Seminar

The University of Washington

RATIONAL CURVES ON ALGEBRAIC VARIETIES

Fall 2016

- Discussed conjectures surrounding rationality, unirationality, rational-connectedness, and the bend-and-break proof that Fano varieties are rationally connected

1, 2, 3 Seminar

The University of Washington

THE ALGEBRAIC K-THEORY OF FINITE FIELDS

Spring 2016

- Described Quillen's calculation of $K_*(\mathbb{F}_q)$ via Brauer lifting and fixed points of Adams operations

Awards

2018 **Department of Mathematics Graduate Fellowship**, The University of Washington

Seattle,

Washington

2012 **Honor Society Member**, Phi Beta Kappa

Madison, WI USA

Extracurricular

Electric Bassist

Seattle, WA USA

LOOK AT ME'S, YOUNG CHAYLEE

Spring 2016-Spring 2019

- Electric bass in rock, R&B, neo-soul and singer-songwriter styles, writing bass parts to original songs
- **Venues performed at:** The High Dive, The Sunset Tavern, Conor Byrne Pub, Tim's Tavern, The Columbia City Theater, Barboza, Substation, Chop Suey, The Hotel Cafe (Los Angeles), Bossanova Ballroom (Portland), Timbrrr! Music Festival 2019

International travel

Latin America

November 2009-July 2010

- Studied Spanish in Quetzaltenango, Guatemala
- Volunteered with FOROSIDA (an AIDS NGO) in Tegucigalpa, Honduras
- Travelled widely in Southern Mexico, Costa Rica, Colombia, Peru, Bolivia, Paraguay, and Argentina
- Cultivated an interest in the Pre-Colombian history of the Americas

Outdoors Experience

Alaska, USA

YMCA CAMP WIDJIWAGAN

June-August 2009

- Backpacked through Gates of the Arctic National Park for 6 weeks
- Became proficient in off-trail navigation and snow/ice travel in one of the worlds most remote wilderness areas