

# Charles Godfrey

RESEARCH MATHEMATICIAN · DATA SCIENTIST

Seattle, WA

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## Skills

<b>Mathematical Research</b>	Algebraic geometry (singularities of the MMP/moduli of varieties) derived categories, algebraic vision
<b>Programming</b>	Macaulay2, MATLAB/Mathematica, Python (NumPy/SciPy), Git, shell scripting (Bash), Linux
<b>Data Science</b>	Tableau, D3.js, REST APIs, Pandas, Keras, PyTorch, Excel
<b>Markup &amp; Web Technologies</b>	LaTeX, Markdown, Pandoc, Jekyll
<b>Languages</b>	English (native), Spanish (proficient), Arabic (limited proficiency), French (technical reading)

## Education

### The University of Washington

PHD CANDIDATE IN MATHEMATICS AND ADVANCED DATA SCIENCE

Seattle, WA

September 2014-June 2020

- **Thesis:** *Residue triangles and resolutions of pairs*
- **Research area:** algebraic geometry
- **Advanced data science:** data visualization, machine learning, statistical inference

### The University of Wisconsin-Madison

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

Madison, WI

September 2010-May 2014

## Experience

### The University of Washington

PRE-DOCTORAL TEACHING ASSISTANT

Seattle, WA

September 2014-June 2020

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

### Mathematical Sciences Research Institute

PROGRAM ASSOCIATE

Berkeley, CA

March-May 2019

- Conducted research in the *Birational Geometry and Moduli Spaces* program

### Washington Experimental Math Laboratory (WXML)

GRADUATE MENTOR

Seattle, WA

January-June 2019

- Mentored a team of undergraduates investigating quantization in the foundations of quantum mechanics

### Correlation One

DATATHON/TERMINAL COMPETITOR

Seattle, WA

October 2018/October 2019

- **Datathon:** Implemented a gradient-descent model attempting to identify high return-on-investment real estate
- **Terminal:** Programmed an algorithm to compete in Correlation One's Terminal game (<http://terminal.c1games.com>)

### The University of Minnesota School of Physics and Astronomy

RESEARCH EXPERIENCE FOR UNDERGRADUATES

Minneapolis, MN

June-August 2013

- Designed and carried out experiments using the BL21Rosetta2 strain of *E. 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

## Awards

- 2018 **Department of Mathematics Graduate Fellowship**, The University of Washington
- 2012 **Honor Society Member**, Phi Beta Kappa

Seattle, WA

Madison, WI

## Talks and Presentations

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### Mathematical Sciences Research Institute Graduate Student Seminar

Berkeley, CA

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

- The exciting part: 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

## Extracurricular

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### Electric Bassist

Seattle, WA

LOOK AT ME'S, YOUNG CHHAYLEE

Spring 2016-Fall 2019

- Electric bass in rock, R&B, neo-soul and singer-songwriter styles, writing bass lines to original songs
- **Venues performed at:** Doe Bay Fest 2019, Timbrrrr! Music Festival 2019, The Tractor Tavern, 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)

### International travel

Latin America

VOLUNTEER, STUDENT

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