

# David Ayotte

PhD candidate in Mathematics  
<https://davidayotte.github.io>

## Education

- **Ph.D. in Mathematics** 2019 – Today  
*Concordia University, Montréal*
  - Interests: Computational and arithmetic aspects of Drinfeld modular forms
  - Advisor: Giovanni Rosso
- **M.A. in Mathematics** 2017 – 2019  
*Université Laval, Québec*
  - Interests: Number Theory, Modular forms, Class numbers
  - Advisor: Antonio Lei
- **B.A. in Mathematics with honours** 2014 – 2017  
*Université Laval, Québec*

## Programming and Software skills

- Programming: Python (Pandas, Pytorch, PyPI packaging), Bash,  $\text{\LaTeX}$ , C++
- Software: git, SageMath, PARI/GP, WeBWorK, vscode, GNU/Linux, WSL2

## Experiences

- **Deep Learning Workshop : Applied Computer Vision** October 2022  
*IVADO workshop, Online*
  - Workshop consisting of 4 hours theory and 4 hours tutorial.
  - Learned about common neural network architecture (Multilayer Perceptron and Convolution Neural Network).
  - Use python libraries such as Pandas and Pytorch to implement a rock, paper and scissors game.
- **SageMath Developer** 2021 – Today  
*Google Summer of Code (Summer 2021), Voluntary basis (since Fall 2021)*
  - Selected for the Google Summer of Code 2021 program for the open-source software SageMath (written in Python). I now work on a voluntary basis since then.
  - Contribute to high quality production code for a software with +2k stars on Github and over 800 contributors.
  - Fix bugs, write doctests, refactor legacy code and review merge requests via the collaborative version control server (Sage Trac).
- **Teaching assistant** 2016 – Today  
*Université Laval and Concordia University*
  - Help students solves their exercises. Grade their exams.

- **WeBWorK assistant** 2017 – 2019  
*Université Laval, Québec*
  - WeBWorK is an online homework delivery system allowing questions with randomly generated parameters and automated grading
  - Scripted (WeBWorK language, based on PERL) a number of questions ( $> 100$ ) and assisted the students and the professors in the usage of the platform
- **Sage Days 87 workshop:  $p$ -adics in Sage and the LMFDB** July 2017 (1 week)  
*University of Vermont, Burlington, USA*
  - One-week workshop focused on developing specialized functionalities in the SageMath open source software
  - Learned the basics of the development process of SageMath (Reports, coding, testing and reviewing)
- **Undergraduate summer research projects** Summer 2015, 2016 and 2017  
*Université Laval, Québec*
  - Carried out numerical calculation on different advanced math concepts.
  - Worked in collaboration with another researcher (Prof. Antonio Lei) and graduate students
  - Wrote a paper on the properties of a special class of polynomials (summer 2015)

## Publications

- Ayotte D., *Relations entre le nombre de classes et les formes modulaires*, Master's thesis, 63 pages, 2019
- Ayotte D. and Lei A. and Rondy-Turcotte J.-C., *On the parity of supersingular Weil polynomials*, Archiv der Mathematik, 6 pages, February 2016.

## Scholarships and Awards

- FRQNT Doctoral research scholarship (21 000\$ per year) . . . . . 2020 to 2023
- Concordia School of Graduate Studies top-up funding (10 000\$) . . . . . 2020
- Teaching assistant scholarship of the Mathematics Department at U. Laval . . . . . 2017
- Mention on the roll of honour of the Mathematics Department at U. Laval . . . . . 2016 and 2017
- NSERC undergraduate summer scholarship (5 750\$) . . . . . 2016
- FRQNT supplement to the NSERC undergraduate summer scholarship (1 500\$) . . . . . 2016
- ISM undergraduate summer scholarship (5 000\$) . . . . . 2015

## Other Interests

- **PADI open water diver certified** Fall 2021  
*Montréal, QC, Canada*
- **Completed multiple triathlons (Sprint and Olympic distances)**  
*Province of Quebec*