

# Alex Cowan

## Curriculum Vitae

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### Contact:

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### Personal information:

Born May 10, 1991 in Montréal, Québec  
Canadian citizen - F1 visa OPT STEM extension  
Fluent in English and French

### Education:

2013 - 2019 Columbia University, PhD in Pure Mathematics  
2010 - 2013 McGill University, B.S. honours physics and mathematics with a minor in linguistics.  
2008 - 2010 Marianopolis College, Diplôme d'Études Collégiales (DEC) in pure science.

### Academic Positions:

2019 - Present Harvard University, Research Scientist

### Research Interests:

I am interested in elliptic curves, arithmetic statistics, computational number theory, and analytic number theory.

### Publications:

- Computing newforms using supersingular isogeny graphs.  
[arXiv 2010.10745](https://arxiv.org/abs/2010.10745)
- Conjecture: 100% of elliptic surfaces over  $\mathbb{Q}$  have rank zero.  
Proceedings volume for the Simons Collaboration “Arithmetic Geometry, Number Theory, and Computation”, to appear, [arXiv 2009.08622](https://arxiv.org/abs/2009.08622)
- Non-random behaviour in sums of modular symbols  
International Journal of Number Theory, to appear, [arXiv 1905.10743](https://arxiv.org/abs/1905.10743)
- The distribution of integral multiples of real points on an elliptic curve  
J. Number Theory 211 (2020), [arXiv 1901.10656](https://arxiv.org/abs/1901.10656)
- Constants in Titchmarsh divisor problems for elliptic curves  
with R. Bell, C. Blakestad, A. Cojocaru, N. Jones, V. Matei, G. Smith, and I. Vogt,  
Res. Number Theory 6 (2020), [arXiv 1706.03422](https://arxiv.org/abs/1706.03422)

### Fellowships and Honours

- September 2013 - August 2015: FRQNT B2 (\$40,000)
- September 2013 - August 2014: NSERC PGS M (\$17,200)

- May-September 2012: NSERC Undergraduate Student Research Award (\$6,250): *Mordell-Weil groups over cyclic cubic fields*, supervised by prof. Henri Darmon.
- May-August 2011: NSERC Undergraduate Student Research Award (\$8,000): *Observation with VERITAS*, supervised by prof. David Hanna.
- 2010 1st place, Concours de l'Association Mathématique du Québec.
- 2010 1st in province, Sir Isaac Newton physics competition.

**Teaching experience:**

- Spring 2019, Instructor for Calculus 1 at Columbia University.
- Fall 2015, Instructor for Calculus 1 at Columbia University.
- Fall 2014 - Fall 2018, TA

**Talks:**

- *Non-random behaviour in sums of modular symbols*, March 2020, Harvard University.
- *Non-random behaviour in sums of modular symbols*, January 2020, Joint Mathematics Meetings.
- *Three short stories in arithmetic statistics*, December 2019, Snapshots of math at Harvard.
- *Non-random behaviour in sums of modular symbols*, October 2019, Five College number theory seminar.
- *Non-random behaviour in sums of modular symbols*, September 2019, Johns Hopkins University.
- *Game Theory for Non-Experts*, April 2017, YouTube.
- *Constants in Titchmarsh divisor problems for elliptic curves*, March 2016, University of Arizona.
- *Poker and Game Theory*, November 2015, Undergraduate Math Society, Columbia University.
- *An Introduction to the Theory of Elliptic Curves*, September 2015, Undergraduate Math Society, Columbia University.
- *Arithmetic Statistics of Abelian Varieties*, October 2013, Graduate student seminar, Columbia University.
- *An Introduction to the Theory of Elliptic Curves*, May 2012, Undergraduate Student Symposium, McGill University.
- *An Introduction to Pure Mathematics*, October 2011, Marianopolis College.

**References:**

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 Columbia University  
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Noam Elkies  
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 Harvard University  
 Email: [elkies@math.harvard.edu](mailto:elkies@math.harvard.edu)