

# Raymond Cheng

Columbia University  
Department of Mathematics  
2990 Broadway  
New York, NY 10027

[rcheng@math.columbia.edu](mailto:rcheng@math.columbia.edu)  
<http://math.columbia.edu/~rcheng/>

## Education

PHD Candidate in Mathematics, Columbia University	2016–
B.MATH in Mathematics, University of Waterloo, with Distinction	2016

## Honours and Awards

NSERC Postgraduate Scholarships–Doctoral	2018–2020
Carl B. Boyer Memorial Fellowship, Columbia University	2017–2018
NSERC Canadian Graduate Scholarship–Master's, University of Toronto (Declined)	2016
University of Waterloo Alumni Gold Medal	2016
NSERC Undergraduate Research Award	2016–2014
Mike Vangoch Memorial Award, University of Waterloo	2016
Combinatorics & Optimization Book Prize, University of Waterloo	2016
Stewart and Ann Kelland Award in Pure Mathematic, University of Waterloo	2014
Faculty of Mathematics National Scholarship, University of Waterloo	2012
President's Scholarship of Distinction, University of Waterloo	2012

## Publications and Preprints

<i>Unbounded negativity on rational surfaces in positive characteristic</i> , with Remy van Dobben de Bruyn. Accepted in J. Reine Angew. Math.	2021
<i>Combinatorial iterated integrals and the harmonic volume of graphs</i> , with Eric Katz. Adv. in Appl. Math. 128 (2021), Paper No. 102190, 23 pp.	
<i>Derived categories of quartic double fivefolds</i> , with Huachen Chen, Tony Feng, Alex Perry, and Xiaolei Zhao. Preprint available upon request.	2020
<i>Combinatorial Aspects of the Quantized Universal Enveloping Algebra of <math>\mathfrak{sl}_n</math></i> , with David Jackson and Geoffrey Stanley. Ann. Comb. 22 (2018), no. 4, 681–710.	2018

## Other Writing

*Projectivity of the moduli of curves*, 2021  
with Carl Lian, Yordanka Kovacheva, Monica Marinescu, and Takumi Murayama.  
To appear in *SPEC: Stacks Project Expository Collection*.

*Theorem of the base*  
with Lena Ji, Matt Larson, and Noah Olander.  
To appear in *SPEC: Stacks Project Expository Collection*.

## Invited Talks

Stony Brook University, Algebraic Geometry Seminar 2021 November  
Simon Fraser University, Number Theory and Algebraic Geometry Seminar 2021 October  
Stanford University, Algebraic Geometry Seminar 2021 July  
American Graduate Student Algebraic Geometry Seminar 2020 November  
American Mathematical Society Fall Eastern Sectional Meeting, Special Session on Algebraic Singularities in Arbitrary Characteristic 2020 October  
Ohio State University, Arithmetic Geometry Seminar 2020 March

## Seminars Organized

Columbia University Graduate Algebraic Geometry Learning Seminar, co-organizer:

- Cubic Fourfolds and Rationality 2018 Fall
- Integral  $p$ -adic Hodge Theory 2018 Summer
- Topics in Abelian Varieties 2018 Spring
- Moduli of Sheaves 2017 Fall
- Classic Papers in Algebraic Geometry 2017 Summer

## Service

Co-led a REU Program joint between Columbia University and Paris VII on “Toric varieties”. 2019 Summer

Contributor to the Gerby Project, an open source technical framework for large-scale online mathematical projects, such as the Stacks Project and Kerodon. 2017–2018

Assistant for REU Project at Columbia University on “Curves on surfaces over finite fields”. 2018 Summer

Assistant for REU Project at Columbia University on “Representation theory in graph theory”. 2017 Summer

## Teaching

Columbia University:

- |  |             |
|--|-------------|
| – Undergraduate Seminar on “Entropy and Diversity”.                  | 2021 Fall   |
| – Undergraduate Seminar on “Mathematics of Origami”.                 | 2021 Spring |
| – Undergraduate Seminar on “Indra’s Pearls and Hyperbolic Dynamics”. | 2020 Fall   |
| – Undergraduate Seminar on “The Arithmetic of Elliptic Curves”.      | 2020 Spring |
| – Undergraduate Seminar on “Differential Galois Theory”.             | 2019 Fall   |
| – Calculus II.   | 2019 Spring |
| – Undergraduate Seminar on “Combinatorial Reciprocity Theorems”.     | 2018 Fall   |
| – Teaching Assistant for Algebraic Geometry.                         | 2018 Spring |
| – Teaching Assistant for Honours Mathematics B.                      |             |
| – Undergraduate Seminar on “Hodge Theory in Combinatorics”.          | 2017 Fall   |
| – Teaching Assistant for Commutative Algebra.                        |             |