

Allen Yuan

CONTACT INFORMATION	Address: Department of Mathematics, Columbia University, New York, NY 10027 Email: yuan@math.columbia.edu Webpage: allenyuan.me
RESEARCH	Algebraic topology, higher category theory, and interactions with algebraic K -theory, number theory, and algebraic geometry.
EDUCATION & EMPLOYMENT	<p><i>NSF Postdoctoral Fellow</i> 2020 - Present Columbia University, New York NY</p> <p><i>Visitor</i> 2020 - 2021 Institute for Advanced Study, Princeton, NJ</p> <p><i>Ph.D. Mathematics</i> 2015 - 2020 Massachusetts Institute of Technology, Cambridge, MA Dissertation: <i>The Frobenius in higher algebra</i>, advised by Jacob Lurie.</p> <p><i>A.B. in Mathematics, secondary in Computer Science</i> 2011 - 2015 Harvard University, Cambridge, MA</p>
GRANTS FELLOWSHIPS & AWARDS	<ul style="list-style-type: none">• NSF Mathematical Sciences Postdoctoral Research Fellowship 2020 - 2023• NSF Graduate Research Fellowship 2015 - 2020• Barry M. Goldwater Scholarship 2014 - 2015• William Lowell Putnam Competition, 1st Place Team 2012• International Mathematics Olympiad, Silver Medal 2010• USA Mathematics Olympiad, 1st Place 2010
PAPERS	<ol style="list-style-type: none">13. <i>The Chromatic Nullstellensatz</i> (with R. Burklund and T. Schlank), submitted, 2022.12. <i>Examples of chromatic redshift in algebraic K-theory</i>, submitted, 2021.11. <i>Chromatic convergence for the algebraic K-theory of the sphere spectrum</i> (with A. Blumberg and M. Mandell), submitted, 2021.10. <i>Higher semiadditive Grothendieck-Witt theory and the $K(1)$-local sphere</i> (with S. Carmeli), submitted, 2021.9. <i>A version of Waldhausen's chromatic convergence for TC</i> (with A. Blumberg and M. Mandell), submitted, 2021.8. <i>Wilson Spaces, Snaithe Constructions, and Elliptic Orientations</i> (with H. Chatham and J. Hahn), submitted, 2019.7. <i>Integral Models for Spaces via the Higher Frobenius</i>, J. Amer. Math. Soc. (2022).6. <i>Exotic Multiplications on Periodic Complex Bordism</i> (with J. Hahn). J. Topol. 13 (2020).5. <i>Multiplicative Structure in the Stable Splitting of $\Omega SL_n(\mathbb{C})$</i>, (with J. Hahn), Adv. Math. 348 (2019).

Pre-graduate school:

4. *Irreducible Canonical Representations in Positive Characteristic* (with B. Gunby and A. Smith), Res. Number Theory **1(1)** (2015).
3. *Proof of a Conjecture of Guy on Class Numbers* (with L. Chua, B. Gunby, and S. Park), Int. J. Number Theory, **11(4)** (2015).
2. *Linearly Many Faults in Arrangement Graphs* (with E. Cheng and L. Liptak), Networks, **61(4)** (2013).
1. *Linearly Many Faults in (n, k) -Star Graphs* (with E. Cheng and L. Liptak), Int. J. Found. Comput. S., **22(7)** (2011).

INVITED TALKS

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|-----|---|------------|
| 24. | Generalised Lie algebras in Derived Geometry
Utrecht, Netherlands | TBD |
| 23. | UPenn geometry and topology seminar
<i>The geometric points of a cohomology theory</i> | Apr 2022 |
| 22. | Electronic Computational Homotopy Theory Seminar
<i>The chromatic Nullstellensatz</i> | Apr 2022 |
| 21. | UCSD Topology Seminar
<i>The chromatic Nullstellensatz</i> | Mar 2022 |
| 20. | Chicagoland Topology Seminar
<i>The chromatic Nullstellensatz</i> | Feb 2022 |
| 19. | Utrecht Chromatic Homotopy Theory seminar
<i>Ambidexterity Phenomena at height 1</i> | Jan 2022 |
| 18. | Munster Topology Seminar
<i>Examples of chromatic redshift in algebraic K-theory</i> | Dec 2021 |
| 17. | Jerusalem Topology seminar
<i>Examples of chromatic redshift in algebraic K-theory</i> | May 2021 |
| 16. | Electronic Algebraic K-theory Seminar
<i>Examples of chromatic redshift in algebraic K-theory</i> | April 2021 |
| 15. | Bonn Topology Seminar
<i>Ambidexterity Phenomena at height 1</i> | Dec 2020 |
| 14. | EPFL Topology Seminar
<i>Integral models for spaces via the higher Frobenius</i> | Sep 2020 |
| 13. | Oberseminar: Integral Homotopy Theory (after Allen Yuan)
University of Regensburg
<i>\mathbb{E}_∞-coalgebras and a generalized Segal conjecture</i> | Jul 2020 |
| 12. | CUNY Geometry and Topology Seminar
<i>Integral models for spaces via the higher Frobenius</i> | Jun 2020 |
| 11. | Johns Hopkins Topology Seminar
<i>A generalized Segal Conjecture</i> | Feb 2020 |
| 10. | Copenhagen Topology Seminar
<i>A generalized Segal Conjecture</i> | Dec 2019 |
| 9. | Oberwolfach Seminar: Topological Cyclic Homology and Arithmetic
<i>Integral models for spaces via the higher Frobenius</i> | Oct 2019 |
| 8. | UVA Topology Seminar
<i>Integral models for spaces via the higher Frobenius</i> | Oct 2019 |

7. AMS Sectional Meeting: Homotopy theory and Algebraic K-theory Oct 2019
Binghamton University
Integral models for spaces via the higher Frobenius
6. UCLA Algebraic Topology Seminar Feb 2019
The Frobenius in higher algebra
5. USC Geometry and Topology seminar Feb 2019
The Frobenius in higher algebra
4. UIC Topology Seminar Oct 2018
The Frobenius in higher algebra
3. UChicago Topology Seminar Oct 2018
The Frobenius in higher algebra
2. Northwestern Topology Seminar Oct 2018
The Frobenius in higher algebra
1. BIRS-CMO: ∞ -categories, ∞ -operads, and applications May 2018
Oaxaca, Mexico
The Frobenius for coalgebras

TEACHING

Columbia University

Instructor for Math UN2010: Linear Algebra Spring 2021

Massachusetts Institute of Technology

Teaching Assistant for 18.03: Differential Equations Spring 2018

MIT MathROOTS

Academic mentor Summer 2019

Academic mentor Summer 2018

MIT Directed Reading Program

Mentor for Alexander Clifton and Miguel Young Winter 2015 - 2016

Harvard University

Course Assistant for Math 123: Rings and Fields Spring 2014

IDEA Math

Instructor 2011 - 2013

PROFESSIONAL
ACTIVITIES
& SERVICE

Columbia Algebraic Topology Seminar

Co-organizer 2022 - present

MIT Juvitop

Organizer Fall 2016

MIT Topology seminar

Organizer Spring 2016

Referee for: Adv. Math., Isr. J. Math

Expert opinions for: IMRN, J. Top., Compositio