Eunice Sukarto

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Education

2021- present **Ph.D. Candidate, Mathematics**, *Harvard University*, Advisors: Michael Hopkins and Andrew Senger

2017–2021 **B.A. Mathematics, B.S Electrical Engineering and Computer Science**, *University of California, Berkeley*

Interests Homotopy theory

Projects

2025 **Power operations modulo Lubin-Tate parameters**, *joint with Andrew Senger*, available online

We develop a theory of power operations modulo a sequence of the Lubin-Tate parameters $p, \cdots, u_{i-1}$ for $0 \leq i \leq h$, which act on $\pi_*(-/p, \cdots, u_{i-1})$ of $K(h)$-local $\mathbb{E}_\infty$-algebras over Morava E-theory for height h. We show that the analog of the additive operations is Koszul of length $h-i+1$ i.e. that its Koszul complex has length $h-i+1$.

2025 **Power operations and Tor vanishing**, *joint with Andrew Senger*, available online

We show that there are cofiber sequences relating power operations in Morava E-theory modulo Lubin-Tate parameters $p, \cdots, u_{i-1}$ for various i's and use this to inductively show that certain Tor groups over the algebra of power operations vanish in nonzero degrees. These Tor groups are the linearization of the E_2-page of a bar spectral sequence converging to the graded E-cohomology of configuration spaces on $\mathbb{R}^n$.

2025 **On the rational C_2-homotopy type of $BSU_{\mathbb{R}_m}$**, *arxiv.org/abs/2512.07982*

Motivated by a problem in motivic homotopy theory considered by Asok-Fasel-Hopkins, we give a description of the rational C_2-equivariant homotopy type of the classifying space $BSU_{\mathbb{R}_m}$ in terms of equivariant Eilenberg-Maclane spaces.

2025 **p-typical vs H_∞-orientations**, *joint with Andrew Senger*

Using Ando-Hopkins-Rezk's criterion for E_∞-orientations on K-theories and the p-adic Gamma function, we show that under certain conditions on the logarithm of the formal group law, p-typical orientations are generally not H_∞.

2021 **Understanding the recognition principle for connected n-fold loop spaces**, *supervised by David Nadler*

Expository senior thesis on Peter May's *The Geometry of Iterated Loop Spaces*.

2020 **Counting k-Naples parking functions through permutations and the k-Naples area statistic**, *with L. Colmenarejo, P.E. Harris, Z. Jones, C. Keller, A. Ramos Rodríguez, and A.R. Vindas-Meléndez*, Enumerative Combinatorics and Applications, 1:2 (2021) Article S2R11

2019 **Ranks and Singularities of Cubic Surfaces**, *with Anna Seigal*, Le Matematiche vol. 75 no. 2 (2020), 575-594

Talks

2025 *Power operations modulo Lubin-Tate parameters* (Zygotop seminar, Harvard)

2025 *Power operations modulo Lubin-Tate parameters* (NEAT MAPS New England Algebraic Topology and Mathematical Physics Seminar, Boston University)

2023 *HH, THH, etc.* (Zygotop seminar, Harvard)

2023 *Chromatic crash course* (Babytop seminar, MIT)

2022 *Power operations and Rezk's $\mathbb{T}$-algebras* (Juvitop seminar, MIT)

2022 *On the K-theory of Pullbacks* (Land-Tamme) (poster in YTM Young Topologists Meeting, Copenhagen)

2022 *SW (Subtractive Waldhausen)-categories* (Campbell) (MIT Talbot workshop)

2022 *Math H104: Introduction to real analysis* (Trivial Notions seminar, Harvard)

2022 *Power operations on spectral Lie algebras* (Juvitop seminar, MIT)

2021 *Nilpotence and stable homotopy theory II* (Hopkins-Smith) (Kan seminar, MIT)

2021 *K-theory* (Atiyah) (Kan seminar, MIT)

Conferences & Workshops Attended

2025 Isaac Newton Institute: Beyond the telescope conjecture (Cambridge, UK)

2025 Talbot Workshop: Homological stability (Cassopolis, MI)

2024 MIT Talbot Workshop: Topological Cyclic Homology of Ring Spectra (Nacogdoches, TX)

2024 Masterclass: Continuous K-theory, dualizable and rigid categories (Copenhagen)

2023 MIT Talbot Workshop: Computations in stable motivic homotopy theory (McGrath, MN)

2023 Homotopy theory in honor of Paul Goerss (Northwestern)

2022 Young Topologists Meeting (Copenhagen)

2022 Homotopical Methods in Fixed Point Theory (CU Boulder)

2022 MIT Talbot Workshop: Scissors Congruence and Algebraic K-theory (New Lebanon, NY)

Work Experience

2022-present **Teaching Assistant**, Harvard University
Math 22a Linear Algebra (Fall 2022 & 2024), Math 25b Real Analysis (Spring 2024), and Math 231br Algebraic Topology (Spring 2023).

2019-2021 **Grader**, UC Berkeley
Math 104 Real Analysis, Math 105 Second Course in Analysis, and Math 185 Complex Analysis in various semesters.

Summer 2019 **Auto-Grid Systems Inc.**, *Software engineering intern*, Redwood City, CA
Improved user experience by improving the whole scheduling flow, including adding sort and filter capabilities to the flow via Ajax requests. Improved stability of platform by fixing bugs, used byebug to efficiently debug in Ruby on Rails, MySQL, and CoffeeScript.

Summer 2018 **Taralite (acquired by OVO)**, *Software engineering intern*, Jakarta, Indonesia
Wrote NodeJS scripts to query databases and Google Cloud Functions to automate generation of monthly loan reports. Updated sections of the main source code to reflect changes and looked for fraud patterns based on borrowers' data.

Spring 2018 **CS 61A Structure and Interpretation of Computer Programs**, *Lab assistant*, UC Berkeley EECS

Activities & Awards

2022-24 Raphael and Daniel Salem Fellowship (Harvard)

2022 Certificate of Student Recognition of Teaching (Harvard)

2021 Dorothea Klumpke Roberts Prize (UC Berkeley Mathematics department)

2021 AWM 2021 Schafer Prize Runner-Up

2018 Edward Frank Kraft Award for Fall 2017, UC Berkeley

2016–2017, 2015–2016 Top 20 in IMO (International Mathematical Olympiad) Selection Camps for the Indonesian IMO team

2015, 2016 Bronze and silver medals in the 2015 and 2016 Indonesian National Math Olympiads respectively

Volunteer

Fall 2022-Summer 2025 Talbot workshop: co-organizer

Fall 2021 Math Includes (Harvard): mentored a group of five undergraduates to create a friendlier environment in the math department.