

# Yao-Rui Yeo

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## CONTACT INFORMATION

New York University  
180 Madison Ave, 17th Floor  
New York, NY 10016

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## EDUCATION

**Ph.D. in Mathematics**, University of Pennsylvania 2016 Aug – 2021 May  
*Thesis advisor: Ching-Li Chai*  
*Thesis title: Mixed Carlitz motives and colored multizeta values in characteristic  $p$*   
**B.A. in Mathematics**, University of Minnesota 2013 Aug – 2016 May  
*Honor: Summa cum laude*

## EMPLOYMENT

**Research Scientist**, New York University 2023 Feb – Present  
**Senior Systems Analyst**, New York University 2021 Aug – 2023 Feb

## RESEARCH INTERESTS

**Health and Disease Modeling**  
*Health and welfare economics; Cost-effectiveness analysis; Decision analytic modeling*  
**Algebraic Number Theory and Combinatorics**  
*Arithmetic and geometry of zeta functions; Special functions, graphs, and their applications*

## PAPERS (\* = 1ST/CO-1ST)

1. Cebisile Ngcamphalala, **Yao-Rui Yeo**, Jasmine Su, Mellesia Jeetoo, Dyanna Charles, Zwakele Tfwala, Nokuthula Mahlalela, Lenhle Dube, Ruben Sahabo, Tengetile Dlamini, Harriet Nuwagaba-Biribonwoha, Scott Braithwaite, *Determining minimum resources required by Eswatini to meet its Ending the HIV Epidemic 2030 goal*, JAIDS, to appear.
2. Tsitsi Apollo, **Yao-Rui Yeo**, Owen Mugurungi, Ngwarai Sithole, Isaac Taramusi, Emmanuel Tachiwenyika, Emily Gwavava, Wanzirai Majoni, Anesu Chimwaza, Kudawashe Takarinda, Getrude Ncube, Mellesia Jeetoo, Dyanna Charles, Scott Braithwaite. *Case study of PEPFAR funding cuts on HIV infections and deaths: Reversing hard-won gains*, AIDS **39** (2025), Issue 14, 2143–2146.
3. Jasmine Su, **Yao-Rui Yeo**, Mellesia Jeetoo, Neo Morojele, Joel Francis, Sheela Shenoi, Scott Braithwaite, *Cost-effectiveness of screening and treating alcohol use and depression among people living with HIV in Zimbabwe: a mathematical modelling study*. BMC Med. **22** (2024), No. 481.
4. **Yao-Rui Yeo\***, *Algebraic independence results for colored multizeta values in characteristic  $p$* , Int. J. Number Theory **19** (2023), No. 3, 677–708.
5. Logan Crew\*, Alexander Kirillov\*, **Yao-Rui Yeo\***, *Branching rules for splint root systems*, Algebr. Representat. Theory **25** (2022), 963–981.
6. Wan-Jin Yeo\*, **Yao-Rui Yeo\***, Samu Taulu, *Towards analytical calculation of the magnetic flux measured by magnetometers*, Phys. Lett. A **411** (2021), 127545.
7. Yao-Yu Yeo\*, **Yao-Rui Yeo\***, Wan-Jin Yeo\*, *A computational model for estimating the progression of coronavirus cases in the US West and East Coasts*, Exp. Results **1** (2020), e41.
8. Wan-Jin Yeo\*, **Yao-Rui Yeo\***, *Enumerating  $(k, l)$ -critical and supercritical permutations*, Math. Medley **41** (2015), No. 1.

## PREPRINTS

1. **Yao-Rui Yeo\***, *Regular intersection graphs of line segments*.
2. **Yao-Rui Yeo\***, *Equally-distributed-equivalent income from a number-theoretic viewpoint*.
3. **Yao-Rui Yeo\***, *A functional analysis approach to analyzing inequality aversion in health*.
4. **Yao-Rui Yeo\***, Mellesia Jeetoo, Dyanna Charles, Cebisile Ngcamphalala, Sheela Shenoi, Scott Braithwaite, *Could using WALYs rather than QALYs influence inferences from allocative efficiency results? A case study of HIV-related interventions in Southern Africa*.
5. **Yao-Rui Yeo\***, Mellesia Jeetoo, Dyanna Charles, Scott Braithwaite, *Cost-effectiveness of implementing long acting antiretroviral therapy in Zimbabwe: A modeling study*.

## INVITED PRESENTATIONS

1. Conference on Retroviruses and Opportunistic Infections, *Modeled comparison of well-being and quality-adjusted-life-years as HIV outcomes in Southern Africa*, Poster Presentation, 2026 Feb 24.

	<ol style="list-style-type: none"> <li>2. Joint Mathematics Meetings, <i>Regular intersection graphs of line segments</i>, Oral presentation, 2026 Jan 07.</li> <li>3. Society for Medical Decision Making 47th Annual Meeting, <i>How much do allocative efficiency analyses change by using well-being-adjusted life-years rather than quality-adjusted life-years?</i>, Oral Presentation, 2025 June 16.</li> <li>4. Conference on Retroviruses and Opportunistic Infections, <i>Cost-effectiveness of alternative targeting strategies for 3 types of PrEP in Zimbabwe</i>, Poster Presentation, 2025 Mar 11.</li> <li>5. University of Pennsylvania, Algebra Seminar, <i>Colored multizeta values in characteristic <math>p</math></i>, Oral Presentation, 2021 Mar 19.</li> <li>6. Temple University, Fifth Annual Graduate Student Conference, <i>Branching rules for splint root systems</i>, Oral Presentation, 2019 June 01.</li> <li>7. University of Minnesota, Undergraduate Honors Seminar, <i>Dessins d'enfants and superpotentials</i>, Oral Presentation, 2016 May 03.</li> <li>8. University of Illinois at Chicago, Undergraduate Mathematics Symposium, <i>The Hurwitz existence problem</i>, Oral Presentation, 2015 Oct 24.</li> </ol>
STAKEHOLDER PRESENTATIONS	<ol style="list-style-type: none"> <li>1. Shelby County Health Department, <i>Allocative efficiency modeling in Memphis, 3rd workshop</i>, Onsite Presentation, 2025 Nov 13.</li> <li>2. Shelby County Health Department, <i>Allocative Efficiency Modeling in Memphis, 2nd workshop</i>, Onsite presentation, 2025 May 22.</li> <li>3. Shelby County Health Department, <i>Introduction to HIV intervention prioritization in Memphis</i>, Onsite Presentation, 2025 Feb 13.</li> <li>4. Eswatini Ministry of Health, <i>Allocative efficiency modeling for Eswatini to meet EHE 2030 goals</i>, Online Presentation, 2023 May 10.</li> <li>5. Zimbabwe Ministry of Health and Child Care, <i>Allocative efficiency modeling for Zimbabwe to meet EHE 2030 goals</i>, Online Presentation, 2023 Mar 29.</li> <li>6. KwaZulu-Natal Department of Health, <i>Allocative efficiency modeling for Kwazuku-Natal to meet EHE 2030 goals</i>, Online Presentation, 2023 Mar 21.</li> <li>7. New York City Department of Health and Mental Hygiene, <i>Rapid COVID-19 modeling on Delta and Omicron variants</i>, Bi-weekly Online Presentations, 2021 Aug – 2022 Dec.</li> </ol>
INVITED LECTURES	<ol style="list-style-type: none"> <li>1. University of Washington, Institute for Learning and Brain Sciences, <i>Analytical and numerical methods for special differential equations</i>, 5-Hour Lecture, 2019 Dec – 2020 Jan.</li> </ol>
OTHER INVITES	<ol style="list-style-type: none"> <li>1. New York University, <i>Poster Judge</i>, Trainee Research Day, 2025 Apr 22.</li> <li>2. University of Pennsylvania, <i>Booth Designer</i>, Math Fest, 2018 – 2020.</li> </ol>
AWARDS	<b>Distinguished Service Award</b> , New York City Department of Health 2021
TEACHING	<p><b>Tutoring Service of New York</b> 2021 – 2025  <i>Subjects: Mathematics, Statistics, Physics.</i></p> <p><b>Directed Reading Program, University of Pennsylvania</b> 2020 – 2021  <i>Alex Kalbach, Spring 2021. Topic: The Fifteen Theorem.</i>  <i>Mihal Zelenin, Fall 2020. Topic: Traffic Flow Modeling and Car Accident Risk.</i>  <i>Esther Guan, Spring 2020. Topic: Cryptosystems.</i></p> <p><b>Graduate Student Instructor, University of Pennsylvania</b> 2019  <i>MATH 240 (Calculus III), Summer 2019.</i></p> <p><b>Teaching Assistant, University of Pennsylvania</b> 2017 – 2021  <i>MATH 603 (Algebra), Spring 2021.</i>  <i>AMCS 602 (Applied Algebra), Fall 2020.</i>  <i>MATH 241 (Calculus IV), Spring 2019.</i>  <i>MATH 420 (Ordinary Differential Equations), Fall 2018.</i>  <i>MATH 240 (Calculus III), Spring 2018.</i>  <i>MATH 371 (Algebra), Fall 2017.</i>  <i>MATH 110 (Calculus for Wharton Students), Fall 2017.</i>  <i>High School Summer Mathematics Academy, Summer 2017.</i></p>

OTHERS

**Citizenship:** Taiwan

**Permanent Residence:** USA

**Music:** Fellow of Trinity College London in Piano Performance