

KARMEN TRACY YU, PHD

Department of Mathematics
Montclair State University
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EDUCATION

Montclair State University, Montclair, NJ

May 2024 Ph.D. Mathematics Education

Dissertation: *The Nature of Undergraduate Calculus I Students' Participation in the Parallel Spaces of Coursework and Peer-Led, Cooperative, Inquiry-Oriented Complementary Instruction*

Supervisor: Steven Greenstein, Ph.D.

New York City College of Technology, CUNY, Brooklyn

January 2013 B.S. Applied Mathematics (Cum Laude)

New York City College of Technology, CUNY, Brooklyn

June 2013 A.S. Computer Science (Graduated: Honors)

WORK EXPERIENCE

Montclair State University, Department of Mathematics

August 2024 – Current *Assistant Teaching Professor*

Teach undergraduate mathematics and mathematics education courses.

Monitor students' learning progress. Provide office hours to assist students outside of class.

August 2020 – June 2024 *Adjunct Instructor*

Teach Pre-Calculus and Calculus I courses. Monitor students' learning progress. Provide office hours to assist students outside of class. Taught classes for a Math in Elementary Schools II methods course as a substitute instructor. Collaborate on designing the Transition to College Mathematics course. Provide assistance to new Pre-Calculus faculty members to familiarize with the course curriculum, structure, and norms.

Mathnasium, NY

June 2020 – August 2022 *Mathematics Tutor*

Tutored K-12 students on various math concepts.

Huntington Learning Center, NY

July 2020 – June 2022 *Tutor*

Trained SAT math tutors and tutored K-8 students in English and Math, subject tutor for various mathematics classes and high school students in SAT Math. Awarded Teacher of the Month twice for demonstrating outstanding teaching and student engagement.

BASIS Independent Manhattan, NY

June 2019 – July 2020 *Kindergarten Teaching Fellow*

Monitored, assisted, and taught civics to kindergarten students.

July 2018 – June 2019 *PreK Teaching Fellow*
 Monitored, assisted, and taught mathematics, literacy, and civics to PreK 4 students. Taught as the head teacher for 5 months.

July 2017 – June 2018 *Teaching Fellow*
 Taught and supported second grade as a Learning Expert Teacher, fifth grade as a Mathematics Teacher, and Kindergarten as a Teaching Fellow. Assisted front office administration duties.

Montclair State University, Department of Mathematical Sciences
 August 2013 – June 2017 *Doctoral Research Assistant*
 Assisted and collaborated with faculty members on various research projects.

Bridging the Gap Program, New York City College of Technology
 July 2016 – July 2018 *Summer Program Instructor*
 Taught Algebra, Algebra I, and Geometry to middle and high school student.

CUNY Service Corps, New York City College of Technology, Brooklyn
 Spring 2014 & 2015 *Application Reviewer*
 Reviewed student internship applications

May 2013 – July 2013 *Recruitment Specialist*
 Recruited students and reviewed internship applications

New York City College of Technology, CUNY, Brooklyn
 January 2010 – May 2013 *Peer Leader*
 Facilitated Peer-Led Team Learning (PLTL) workshops in mathematics

Bridge to College Mathematics Preparatory Program, Brooklyn, NY
 2010 – 2014 *Instructor*
 Taught nine-hour prep courses in Precalculus (MAT 1375), Calculus I (MAT 1475), and Fundamentals of Mathematics (MAT 1175)

Gifted Math and Reading Learning Center, Brooklyn, NY
 August 2010 – July 2013 *Tutor*
 Tutored children in mathematics and reading

Kumon Math and Reading Learning Center, Brooklyn, NY
 January 2007 – July 2010 *Tutor*
 Tutored children in mathematics and reading

TEACHING EXPERIENCES

Montclair State University

- MATH 111: Applied Precalculus
- MATH 108: Transition to College Mathematics
- MATH 104: Fractals and Infinity
- MATH 122: Calculus I
- MTHM 201: Math in Elementary Schools I

SERVING THE PROFESSIONAL AND COMMUNITY

Fall 2025 – Current	Math 108 Transition to College Mathematics New Instructor Mentor
June 2024 – Current	Board Member, Workbook Committee Member, Research Committee Member, <i>Peer-Led Team Learning International Society (PLTLIS)</i>
Fall 2024 – Current	Math 111 Precalculus New Instructor Mentor
Spring 2025 – Current	Splatoon Club Campus Advisor
December 2023 – Current	Manuscript Reviewer, <i>Digital Experiences in Mathematics Education</i>
Fall 2024	Math 108 Curriculum & Course Design
October 2024	Panelist, <i>STEM Like a Girl NJ Workshop</i>

PUBLICATIONS

- Yu, K.** (Accepted) A complementary instructional approach for Calculus I: Illustrative cases of students' agentic participation in the parallel spaces of conventional coursework and a workshop model of inquiry-oriented, groupworthy problem solving. In V. Martinez-Luaces (Editor), *New Trends in Teaching and Learning of Calculus*. Springer.
- Gastón, J.L., Saladini, F.G., & **Yu, K.T.** (Editors) (2025). *Calculus I: Resources For Peer-Led Team Learning Workshop*. Peer-Led Team Learning International Society (PLTLIS).
- Yu, K.** (2024). Undergraduate students' participation in Calculus I coursework and peer-led, complementary instruction workshop: Case of Neil. *Proceedings of the 2024 North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*.
- Greenstein, S., Looney, B., Kerr, I., **Yu, K.**, Olson, E., Pomponio, E. (2024). Teaching for deep creativity through qualitative geometry: The case of Opal, age 5. *Proceedings of the 2024 North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*.
- Yu, K.T.**, Greenstein, S. (2024). Novel representations of the experiences of Calculus I students' participation in the parallel spaces of coursework and complementary instruction. *Journal of Research in Science, Mathematics and Technology Education*, 7(SI), 177-195.
- Yu, K.**, Greenstein, S. (2024). Case studies of undergraduate students' agentic participation in the parallel spaces of Calculus I coursework and peer-led, inquiry-oriented, complementary instruction. *Proceedings of the 2024 Research in Undergraduate Mathematics Education (RUME)*.
- Krupa, E.E., Munakata, M., **Yu, K.** (2019). Mathematics field day: Content-embedded play activities. *Teaching Mathematics in the Middle School*, 24(5), 296-299.
- Han, S., Liou-Mark, J., **Yu, K.T.**, Zeng, S. (2015). Self-efficacy and attitudes towards mathematics of undergraduates: A U.S. and Taiwan comparison. *Journal of Mathematics Education*, 8(1), 1-15.

Liou-Mark, J., Dreyfuss, A.E., Han, S., Yuen-Lau, L., Yu, K. (2015). Aim for success: Peer-led team learning supports first-year transition to college-level mathematics. *Journal of Learning Development in Higher Education, (Special Edition: Peer Assisted Learning)*, 1-24.

Liou-Mark, J., Dreyfuss, A.E., Blake, R.A., Lansiquot, R.D., Yu, K. (2013). Navigation by mentoring and leadership: Sustaining women majoring in mathematics. *Mathematics and Computer Education*, 47(2), 134-142.

RESEARCH EXPERIENCE

The Stretchy Minds Research Project Summer 2023 – Summer 2024
Member of a research team developing new theories and approaches to teaching children deep creativity for radical change. Lead recruitment, collaborate on data collection and analysis, and assist with grant writing.
Research Advisor: Dr. Steven Greenstein

Noyce @ Montclair: Inquiry-Based Instructional Support (IBIS) Spring 2014 – Spring 2017
Design, coordinate, and pilot the IBIS workshop model for Calculus I and II as part of the NSF Noyce @ Montclair Scholarship Program. Conduct focus group interview with pilot cohort. Analyze pilot study data and present findings in conferences.
Research Advisor: Dr. Steven Greenstein

CUSP: Creative University-School Partnership in Mathematics August 2013 – Spring 2017
Funded by the NJ Department of Education to provide PD to elementary mathematics teachers. Member of professional development research team, assist with data collection, conduct and analyze semi-structured interviews with teacher participants.
Research Advisors: Drs. Mika Munakata and Erin Krupa

NYPD Subway-Surface Air Flow Exchange (S-SAFE) Project Summer 2013
Member of research team working with the Brookhaven National Laboratory and the New York Police Department to collect and analyze air samples in New York City.

Emerging Scholars Program Spring 2012 – Fall 2012
Conducted Research: *Self-Efficacy and Attitudes towards Mathematics of Undergraduates in a Technical College: A United States and Taiwan Comparison* to analyze survey data to determine the difference in students' self-efficacy and attitudes towards Mathematics.
Research Advisors: Professors Janet Liou-Mark and Sandie Han

Honors Scholars Program Fall 2011
Honors Credit for Research: *Monte Carlo Simulations on the Wave Nature of Light: Recreating the Interference Pattern Produced by Photons in Young's Double-Slit Experiment*, to recreate the interference pattern with Monte Carlo Simulations using MATLAB.
Research Advisors: Professor Boyan Kostadinov

Research Experiences for Undergraduates (REU) Summer 2011
Conducted research: *Proof a Maximal Antichain is a Quantum* try to determine a general class of covers to be a quantum cover at Rutgers, the State University of New Jersey
Research Advisor: Katy Craig

Bio-Math Mapping Water Quality Analysis Research Summer 2010
Member of research team investigating water quality for the Hudson River and the Gowanus Canal at New York City College of Technology

Research Advisors: Professors Urmi Ghosh-Dastidar and Liana Tsenova

INVITED TALK

Spring 2024 Case Studies of Calculus I Students' Agentive Participation in the Parallel Spaces of Coursework and Peer-Led, Inquiry-Oriented, Complementary Instruction Workshop. *The Mathematics Department Seminar, Montclair State University, Montclair, NJ.*

PRESENTATIONS

- Huang, S. & Yu, K. (2025) Working Group: Peer-Led Cooperative Models for Student Support in Higher Education: Sharing Lessons, Building Knowledge. *Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*, State College, PA
- Davidson, J., Yu, K., & Leszczynski, E. (2025). Making Precalculus Meaningful: Facilitating Worthwhile Learning Experiences Through Problem Solving. *National Council of Teachers of Mathematics (NCTM)*, Atlanta, GA.
- Yu, K., Greenstein, S. (2025). How Is It That Four Heads are Better Than One?: An Exploratory Analysis of the Emergent Path of Small-Group Problem Solving. *Research in Undergraduate Mathematics Education (RUME)*, Alexandria, VA.
- Yu, K. (2024). Students' Agentive Participation in the Parallel Spaces of Calculus I Coursework and Peer-Led, Complementary Instruction: The Case of Boris. *Annual Student Research Symposium*, Montclair State University, NJ.
- Greenstein, S., Yu, K., Olson, E. (2024). DIY Math Manipulatives for Agentive Teaching and Playful Learning. *eduFab's Annual Fab Educators Summit*. Virtual meeting.
- Yu, K. (2023). Characterizing Calculus I Students' Participation in the Parallel Spaces of Coursework and Inquiry-Oriented Complementary Instruction. *Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*, Reno, Nevada.
- Yu, K. (2023). Characterizing Calculus I Students' Participation in the Parallel Spaces of Coursework and Inquiry-Oriented Supplemental Instruction. *Annual Student Research Symposium*, Montclair State University, NJ.
- Greenstein, S., Krupa, E., Yu, K., Seventko, J. (2017). Peer-led, Inquiry-Based, Group-Oriented Instructional Support for Calculus. *STEM C² Research Summit*, Paramus, NJ.
- Rahman, Z.G., Basu, D., Yu, K. (2016). Exploring Connections Between Teachers' Mathematical Content Knowledge and Its Relevance to Teaching K-12 Mathematics. *Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*, Tucson, AZ.
- Seventko, J., Yu, K. (2016). *An Inquiry-Based Instructional Support (IBIS) Workshop Model for Calculus*. *National Council of Teachers of Mathematics (NCTM) Regional Conference and Exposition*, Philadelphia, PA.
- Rahman, Z., Basu, D., Yu, K. (2016). Using the Chain Rule to Develop Secondary School Teachers' Mathematical Knowledge for Teaching, Focused on the Rate of Change: Secondary Mathematics

- Teachers' Knowledge of the Chain Rule and Its' Impact on Their Teaching of the Rate of Change. *Annual Student Research Symposium*, Montclair State University, NJ.
- Yu, K.** (2016). Students' Experiences and Perceptions of an Inquiry-Based Model of Supplemental Instruction for Calculus. *Research in Undergraduate Mathematics Education (RUME)*, Pittsburgh, PA.
- Rahman, Z., Basu, D., **Yu, K.** (2016). Using the Chain Rule to Develop Secondary School Teachers' Mathematical Knowledge for Teaching, Focused on the Rate of Change. *Research in Undergraduate Mathematics Education (RUME)*, Pittsburgh, PA.
- Yu, K.**, Seventko, J. (2015). Inquiry Based Instructional Supplement (IBIS) for the Calculus Sequence. *Mathematical Association of America (MAA) MathFest*, Washington, DC.
- Yu, K.**, Wooten, T. (2015). Piloting a Model of Inquiry-Oriented Supplemental Instruction for Calculus I. *Annual Student Research Symposium*, Montclair State University, NJ.
- Yu, K.T.** (2014). PLTL + CL \rightarrow IBIS: Merging Peer-Led Team Learning and Complex Instruction to Build an Inquiry-Based Instructional Supplement. *Annual Student Research Symposium*, Montclair State University, NJ.
- Dreyfuss, A.E., Liou-Mark, J., Young, J.A., **Yu, K.T.** (2013). Summer Bridge Programs: Preparing Minority STEM Students for the First Year of College. *Mathematical Association of America (MAA) Metro New York Section*, Farmingdale State College, NY.
- Blake, R., Dreyfuss, A.E., Han, S., Lansiquot, R., Liou-Mark, J., Santos, D., **Yu K.T.**, Zeng, S. (2013). The Navigation by Mentoring and Leadership Project: Empowering Women through Peer-Led Workshops. *Mathematical Association of America (MAA) Metro New York Section*, Farmingdale State College, NY.
- Liou-Mark, J., Dreyfuss, A.E., Bonhomme A., Jevtic, M., Santos, D., **Yu, K.T.**, Zeng, S. (2012). The "Treats" of Being Involved in a Mentoring and Leadership Program for Undergraduate Women. *New York State Mathematics in Two-Year Colleges (NYSMATYC) Region IV Conference*, Westchester Community College, NY.
- Liou-Mark, J., Dreyfuss, A.E., **Yu, K.T.**, Jevtic, M., Zeng, S. Blake, R., Lansiquot, R.D. (2012). Supporting the Community of Women in STEM Through the Navigation by Mentoring and Peer Leadership Program. *Peer-Led Team Learning International Society (PLTLIS) Conference*, New York City College of Technology.
- Yu, K.T.**, Zeng, S., Han, S., Liou-Mark, J. (2012). Self-Efficacy and Attitudes Towards Mathematics of Undergraduates in a Technical College: A United States and Taiwan Comparison. *Honors and Emerging Scholars Poster Presentation*, New York City College of Technology.
- Blake, R., Dreyfuss, A.E., Lansiquot, R., Liou-Mark, J., **Yu, K.T.**, Zeng, S. (2012). Expanding the Community of Women in STEM through the Navigation by Mentoring and Leadership Project. *Mathematical Association of America (MAA) Metro New York Section*, Borough of Manhattan Community College, NY.
- Yu, K.T.** (2012). Is a Maximal Antichain a Quantum Cover?. *Mathematical Association of America (MAA) Metro New York Section*, Borough of Manhattan Community College, NY.

- Lansiquot, R., Liou-Mark, J., Bonhomme, A., Brooks, T., Joseph, T., Malik, F., Mitchell, S., Okoro, J., **Yu, K.T.** (2012). Creating Case Studies in Mathematics: An Internship Experience. *Mathematical Association of America (MAA) Metro New York Section*, Borough of Manhattan Community College, NY.
- Liou-Mark, J., Hendricks, T., Zeng, S., **Yu, K.T.**, Clark, R. (2012). Retaining Women Undergraduates in Mathematics through the Navigation by Mentoring and Leadership Program. *New York State Mathematics in Two-Year Colleges (NYSMATYC)*, Ellenville, NY.
- Yu, K.T.** (2012). Proof a Maximal Antichain is a Quantum Cover. *Emerging Researchers National (ERN) Conference in STEM*, Atlanta, GA.
- Yu, K.T.**, Kostadinov, B. (2011). Monte Carlo Simulations on the Wave Nature of Light: Recreating the Interference Pattern Produced by Photons in Young's Double-Slit Experiment. *Honors and Emerging Scholars Poster Presentation*, New York City College of Technology.
- Blake, R., Dreyfuss, A.E., Jevtic, M., Lasiquot, R., Liou-Mark, J., **Yu, K.T.**, Zeng, S. (2011). The Navigation by Mentoring and Leadership Project: Supporting Women Undergraduates in STEM. *Annual Poster Session of Faculty and Student Research and Faculty Publications Exhibit*, New York City College of Technology.
- Liou-Mark, J., Dreyfuss, A.E., Yuen-Lau, L., Bonhomme, A., Meija, J., Wang, B., **Yu, K.T.**, Yu, Y.M. (2011). The Peer-Led Team Learning Model: Engaging Students in Mathematics and Science. *Mind to Mind, Hand to Hand: CUNY SI Mini-Conference*, Lehman College, CUNY, Bronx, NY.
- Liou-Mark, J., Dreyfuss, A.E., Yuen-Lau, L., **Yu, K.T.** (2011). Peer-Led Team Learning Workshops: A Model for Enhancing the Learning of Mathematics. *Annual CUNY General Education Conference at York College*, York College, CUNY, Jamaica, NY.
- Liou-Mark, J., Dreyfuss, A.E., Bonhomme, A., Tan, S.M., Aline, F., Yu, Y., Meija, J., **Yu, K.T.** (2011). Peer-Assisted Learning Workshops: A Program to Improve Persistence and Retention. *Mathematical Association of America (MAA) Metro New York Section*, Stony Brook University, SUNY, NY.
- Dreyfuss, A.E., Liou-Mark, J., Aline, F., Lora, S., **Yu, K.T.** (2010). Engaging Activities for Peer-Led Sessions: A Workshop on How to Create Modules. *New York State Mathematics in Two-Year Colleges (NYSMATYC)*, Nassau Community College, NY.
- Young, J.A., **Yu, K.T.** (2010). Bio-Math Mapping and Water Quality Analysis of Hudson River. *Mathematical Association of America (MAA) MathFest*, Pittsburgh, PA.
- Yu, K.T.** (2010). How Can the Peer Leader Encourage Students to be Prepared for Calculus II Workshop? *Emerging Scholar Poster Presentation*, New York City College of Technology.
- Dreyfuss, A.E., Liou-Mark, J., **Yu, K.T.**, Yu, Y.M. (2010). Learning to Teach Mathematics and Science Through Peer Leading. *New York State Mathematics in Two-Year Colleges (NYSMATYC)*, Ithaca, NY.

HONORS AND AWARDS

- National Society of Collegiate Scholars Spring 2010 – Spring 2013

- Honor Scholars Program
New York City College of Technology, CUNY, Brooklyn
Honors and Emerging Scholars Project
Self-Efficacy and Attitudes towards Mathematics of Undergraduates in a Technical College: A United States and Taiwan Comparison Fall 2010 – Spring 2013
- Dean's List Spring 2010, Fall 2011

OTHER ACTIVITIES

- New York City College of Technology
- President, City Tech Women in STEM Club Fall 2011 – Spring 2012
 - Vice President of Planning to Achieve Collegiate Excellence (PACE),
National Society of Collegiate Scholars (NSCS) Fall 2011 – Spring 2012

OTHER SKILLS

- Institutional Review Board (IRB) Certified,
Montclair State University Fall 2013
- Institutional Review Board (IRB) Certified, CUNY Spring 2011
- Fluent in Mandarin and Cantonese