

Christopher R. H. Hanusa

Department of Mathematics
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RESEARCH INTERESTS

Enumerative combinatorics, involving questions in polytopes, matrix theory, and graph theory.
Algebraic combinatorics, with applications to Coxeter groups, number theory, and representation theory.
Mathematical and generative art, including theory, creative coding, sculpture, and 3D modeling.

TEACHING INTERESTS

Particular courses of interest: Mathematical Computing, Mathematical Art, Combinatorics, Creative Coding, Discrete Mathematics, Graph Theory, Mathematical Modeling.

EMPLOYMENT

Professor, QUEENS COLLEGE, CUNY, Flushing, NY, 2020 – present.
Associate Professor, QUEENS COLLEGE, CUNY, Flushing, NY, 2015 – 2020.
Assistant Professor, QUEENS COLLEGE, CUNY, Flushing, NY, 2008 – 2015.
Robert Riley Assistant Professor, BINGHAMTON UNIVERSITY, SUNY, Binghamton, NY, 2005 – 2008.

EDUCATION

UNIVERSITY OF WASHINGTON, Seattle, WA, 2003 – 2005.
Ph.D. in Mathematics, June 2005 *Advisor:* Henry Cohn
Dissertation: A Gessel-Viennot-Type Method for Cycle Systems and Applications to Aztec Pillows
UNIVERSITY OF WASHINGTON, Seattle, WA, 2001 – 2003.
M.S. in Mathematics, June 2003
HARVEY MUDD COLLEGE, Claremont, CA, 1997 – 2001.
B.S. in Mathematics, May 2001 *Advisor:* Francis Su
Thesis: A Generalized Binet's Formula for k th Order Linear Recurrences: A Markov Chain Approach

HONORS AND AWARDS

- 2019 2019 Wolfram Innovator Award. (Award for individuals who have made significant contributions in their fields through the innovative use of Wolfram technologies.)
- 2018–2019 Queens College Faculty Fellow, professional development program run by the QC Provost. (One of only two college-wide positions in the second year of its existence.)
- 2017 Inducted as an Ultimaker Pioneer for bringing digital fabrication to the classroom
- 2013 First Place Poster Presenter, ICERM Workshop on Whittaker functions, Schubert calculus, and crystals. Providence, RI.
- 2012 Sole recipient of the 2012 Distinguished Teaching Award by the Metropolitan New York Section of the Mathematical Association of America.
- 2005 VIGRE Fellowship, UW Department of Mathematics.
- 2004 Research Assistantship, UW Department of Mathematics.
- 2003–2004 Excellence in Teaching Award, UW Department of Mathematics.
- 2001 NSF Fellowship Honorable Mention.
- 1998 Freshman Mathematics Award, Harvey Mudd College.

GRANTS RECEIVED

- 2018–2022 AIM SQuaRE Workshop Grant *Computing volumes and lattice points of flow polytopes*
Travel, food, and lodging funds for three years of small-group research workshops at the American Institute of Mathematics in San Jose, CA. (~\$5500)
- 2020–2022 PSC-CUNY Research Award TRADA-51-145.
Flow Polytopes and Mathematical Sculpture.
- 2018–2019 CUNY Academy Stefan Bernard Baumrin Associate Professor travel grant (\$500)
- 2018–2019 PSC-CUNY Research Award TRADA-49-67.
Flow Polytopes and Mathematical Visualization.
- 2016–2017 Shapeways EDU Research Grant.
(First of its kind, for innovation in 3D printing.)
- 2016–2017 PSC-CUNY Research Award TRADA-47-191.
Rational Catalan combinatorics and their visualizations.
- 2014–2015 PSC-CUNY Research Award TRADA-45-60.
Statistics on simultaneous core partitions.
- 2012–2014 CUNY Graduate Center GRTI-16 (Graduate Research Technology Incentive).
Received and administered grant for the Queens College Mathematics Department (~\$50,000).
Sought and received matching funds (~\$200,000) from the Queens College Technology Fee to renovate Kiely Hall Room 258 into a state-of-the-art mathematics lecture hall.
- 2013–2014 PSC-CUNY Research Award TRADA-44-168.
Applications of core partitions.
- 2012–2013 PSC-CUNY Research Award TRADA-43-127.
Research in core partitions.
- 2011–2012 QC Undergraduate Research and Mentoring Education.
Higher-Order Functional Recurrences.
- 2011–2012 PSC-CUNY Research Award TRADA-42-115.
Combinatorial interpretations in affine Coxeter groups.
- 2010–2011 PSC-CUNY Research Award PSCREG-41-303.
Fully commutative elements in affine Coxeter groups.
- 2009–2010 PSC-CUNY Research Award PSCOOC-40-124.
Sequences, Matrices, and Graph Theory.

PUBLICATIONS

(* denotes student researcher)

- Christopher R. H. Hanusa and Emily Garfield. Datamining imaginary maps. In preparation, 2022.
- Christopher R. H. Hanusa. Teaching mathematical techniques of 3D design. In preparation, 2022.
- Christopher R. H. Hanusa. Turning mathematics into jewelry. To appear, Math Horizons, 2022.
- Rafael González D'Leon, Christopher R. H. Hanusa, Alejandro Morales and Martha Yip. Column convex matrices, G -cyclic orders, and flow polytopes. Submitted, 2021.
- Christopher R. H. Hanusa. Humanity and practicality during the emergency conversion to online learning. Journal of Mathematics Education at Teachers College. Volume 12(1), p. 51. (2021)
- Christopher R. H. Hanusa and Arvind V. Mahankali*. A billiards-like dynamical system for attacking chess pieces. European Journal of Combinatorics. Volume 95, pp. 103341. (2021) arXiv:1901.01917
- Carolina Benedetti, Christopher R. H. Hanusa, Pamela Harris, Alejandro Morales, and Anthony Simpson. Kostant's partition function and magic multiplex juggling sequences. Annals of Combinatorics. Volume 24, pp. 439–473. (2020) arXiv:2001.03219
- Seth Chaiken, Christopher R. H. Hanusa, and Thomas Zaslavsky. A q -queens Problem. V. Some of our favorite pieces: queens, bishops, rooks, and nightriders. Journal of the Korean Mathematical Society. Volume 57 (6), pp. 1407–1433. (2020) arXiv:1609.00853. arXiv:1609.00853
- Christopher R. H. Hanusa and Thomas Zaslavsky. A q -queens Problem. VII. Combinatorial types of non-attacking chess riders. Australasian Journal of Combinatorics. Volume 77(3), pp. 326–335. (2020) arXiv:1906.08981

- Seth Chaiken, Christopher R. H. Hanusa, and Thomas Zaslavsky. A q -queens Problem. IV. Attacking configurations and their denominators. *Discrete Mathematics*. Volume 343(2), pp. 111649. (2020) arXiv:1807.04741
- Carolina Benedetti, Rafael González D'Leon, Christopher R. H. Hanusa, Pamela Harris, Apoorva Khare, Alejandro Morales and Martha Yip. A combinatorial model for computing volumes of flow polytopes. *Transactions of the AMS*, Volume 372, pp. 3369–3404, 2019. arXiv:1801.07684
- Seth Chaiken, Christopher R. H. Hanusa, and Thomas Zaslavsky. A q -queens problem. III. Nonattacking partial queens. *Australasian Journal of Combinatorics*, Volume 74(2), pp. 305–331, 2019. arXiv:1402.4886
- Seth Chaiken, Christopher R. H. Hanusa, and Thomas Zaslavsky. A q -queens problem. VI. The bishops' period. *Ars Mathematica Contemporanea*. Volume 16(2), pp 549–561. (2019) arXiv:1405.3001
- Christopher R. H. Hanusa and Carla Savage. Lecture hall partitions and the affine hyperoctahedral group. *Electronic Journal of Combinatorics*. Volume 25(1) (2018) Research Paper 32 (19 pp.)
- Cesar Caballos, Tom Denton, and Christopher R. H. Hanusa. Combinatorics of the zeta map on rational Dyck paths. *Journal of Combinatorial Theory, Series A*. Volume 141, pp 33–77. (2016) arXiv:1504.06383
- Seth Chaiken, Christopher R. H. Hanusa, and Thomas Zaslavsky. A q -queens problem. II. The square board. *Journal of Algebraic Combinatorics*. (2014) arXiv:1402.4880
- Seth Chaiken, Christopher R. H. Hanusa, and Thomas Zaslavsky. A q -queens problem. I. General theory. *Electronic Journal of Combinatorics*. Volume 21(3), Research Paper 33, 28 pp. (2014)
- Drew Armstrong, Christopher R. H. Hanusa, and Brant C. Jones. Results and conjectures on simultaneous core partitions. *European Journal of Combinatorics*. Volume 41, pp 205–220. (2014) arXiv:1308.0572
- Michael Chon*, Christopher R. H. Hanusa, and Amy Lee*. Solving multivariate functional equations. *Discrete Mathematics*. Volume 319, pp 40–46. (2014) arXiv: 1206.6750
- Mark D. Baker, A. David Baker, Christopher R. H. Hanusa, Karen Paltoo, Elisha Danzig, and Jane Belanger. Bonding in Sodium Chloride nanotubes: A new analysis via Madelung constants and cohesive energies. *The Journal of Physical Chemistry C*. Volume 117, pp 25742–25747. (2013)
- Christopher R. H. Hanusa and Rishi Nath. The number of self-conjugate core partitions. *Journal of Number Theory*. Volume 133(2), pp 751–768. (2013) arXiv:1201.6629
- Mark D. Baker, A. David Baker, Jane Belanger, Christopher R. H. Hanusa, and Alana Michaels. Linear relationship between weighted-average Madelung constants and density functional theory energies for MgO nanotubes. *Journal of Physical Chemistry C*. Volume 116(48), pp 25588–25593. (2012)
- Christopher R. H. Hanusa and Brant C. Jones. Abacus models for parabolic quotients of affine Weyl groups. *Journal of Algebra*, Volume 361, pp 134–162. (2012) arXiv:1105.5333
- Baker, A. David, Mark D. Baker, and Christopher R. H. Hanusa. Corner ion, edge-center ion, and face-center ion Madelung expressions for Sodium Chloride. *Journal of Mathematical Chemistry*. Vol 49, pp. 1192–1198. (2011)
- Hanusa, Christopher R. H. On successive sampling and fixed inclusion probabilities. Preprint, 2010.
- Hanusa, Christopher R. H. and Thomas Zaslavsky. Determinants in the Kronecker product of matrices: The incidence matrix of a complete graph. *Linear and Multilinear Algebra*. Vol 59, pp. 399–411. (2010)
- Chaiken, Seth, Christopher R. H. Hanusa, and Thomas Zaslavsky. Nonattacking queens in a rectangular strip. *Annals of Combinatorics*. Vol 14, pp. 419–441. (2010)
- Hanusa, Christopher R. H. and Brant C. Jones. The enumeration of fully-commutative affine permutations. *European Journal of Combinatorics*. Vol 31, pp. 1342–1359. (2010)
- Hanusa, Christopher R. H. Ensuring every candidate wins under positional voting. *Social Choice and Welfare*. Vol 33, pp. 311–333. (2009)
- Hanusa, Christopher R. H. Applying a combinatorial determinant to count weighted cycle systems in a directed graph. *Discrete Mathematics*. Vol 309, pp. 1746–1748. (2009)
- Hanusa, Christopher R. H. Pseudo-centrosymmetric matrices, with applications to counting perfect matchings. *Linear Algebra and its Applications*, Vol 427 (2-3), pp. 206–217. (2007)
- Hanusa, Christopher R. H. A Gessel–Viennot-type method for cycle systems in a directed graph. *Electronic Journal of Combinatorics*, 13 (2006), Research Paper 37, 28 pp. (electronic).
- Benjamin, A. T., Christopher R. H. Hanusa, and Francis E. Su. Linear recurrences through tilings and

- Markov chains. *Utilitas Mathematica*, Vol 64, pp. 3–17. (2003)
- Hanusa, Christopher R. H., Ari Nieh, and Matthew Schnaider. Jammin' with Floyd: A traffic flow analysis of South Carolina hurricane evacuation. *UMAP Journal* Vol 22 (3), pp 301–310. (2001)

EXHIBITIONS

- 2022 Solo exhibition, *Existence and Uniqueness*, Gallery 1064, Seattle, WA.
<https://gallery1064.com/collections/christopher-hanusa-solo-show>
- 2022 Group exhibition, *Joint Math Meetings Art Exhibition*, Virtual Meeting due to covid.
<http://gallery.bridgesmathart.org/exhibitions/2022-joint-mathematics-meetings>
- 2021 Group exhibition, *Bridges Conference Art Exhibition*, Virtual Meeting due to covid.
<http://gallery.bridgesmathart.org/exhibitions/2021-Bridges-Conference>
- 2021 Group exhibition, *Joint Math Meetings Art Exhibition*, Virtual Meeting due to covid.
<http://gallery.bridgesmathart.org/exhibitions/2021-joint-mathematics-meetings>
- 2020 Group exhibition, *Bridges Conference Art Exhibition*, Virtual Meeting due to covid.
<http://gallery.bridgesmathart.org/exhibitions/2020-Bridges-Conference>
- 2020 Group exhibition, *Mathapalooza!*, Atlanta Science Festival, Atlanta, GA. (Cancelled due to covid.)
<https://atlantasciencefestival.org/events-2020/111-mathapalooza/>
- 2019 Group exhibition, *Math and Art*, West Windsor Arts Council, Princeton Junction, NJ
<https://westwindsorarts.org/exhibition/steam-series-math-and-art/>
- 2019 Consignment artist, Gallery North, East Setauket, NY.
- 2019 Group exhibition, *Weather the Weather*, a SciArt Initiative exhibition at the New York Hall of Science (New York City). (Sept. 2019–Jan. 2020)
<http://www.sciartinitiative.org/weather-the-weather.html>
- 2019 Group exhibition, *Networked*, a SciArt Initiative exhibition at the Nook Gallery, Inglewood, CA
<http://www.sciartinitiative.org/networked.html>
- 2019 Group exhibition, *Bridges Fashion Show*, Linz, Austria.
<http://gallery.bridgesmathart.org/exhibitions/2019-bridges-conference-fashion-show>
- 2019 Group exhibition, *Mathapalooza!*, Atlanta Science Festival, Atlanta, GA.
<https://atlantasciencefestival.org/events-2019/mathapalooza/>
- 2019 Group exhibition, *Mathematical Art: Made in Mathematica*, Queens College Library, Flushing, NY.
- 2018 Site-specific installation, *Tree-light Holder*, Construct 3D conference, Atlanta, GA
- 2018 Group exhibition, *Infinite Potentials*, SciArt Center exhibition at New York Hall of Science (New York City), in collaboration with the Cambridge Stem Cell Institute.
<http://www.sciartinitiative.org/infinite-potentials.html>
- 2018 Group exhibition, *Bridges Conference Art Exhibition*, Stockholm, Sweden
<http://gallery.bridgesmathart.org/exhibitions/2018-Bridges-Conference>
- 2017 Group exhibition, *Discrete Math Day at Queens College Art Display*, Flushing, NY
- 2017 Group exhibition, *The Void and the Cloud*, SciArt Center at UES Gallery, New York, NY
<http://www.sciartinitiative.org/the-void-and-the-cloud.html>
- 2017 Group exhibition, *Bridges Conference Art Exhibition*, Waterloo, ON
<http://gallery.bridgesmathart.org/exhibitions/2017-Bridges-Conference>
- 2017 Group exhibition, Queens College Mathematics Department Display, Flushing, NY
- 2017 Site-specific installation, *Holey Cylinder Tealight Holder*, Construct3D Conference, Durham, NC

MEDIA AND IMPACT

- Featured in *The QView #123*, Han Solo: Professor Christopher Hanusa Displays Mathematical Art in One-Man Show, March 2022.
- Interview with Gallery 1064: <https://gallery1064.com/blogs/news/in-between-randomness-and-deliberation-art-and-math-a-look-at-christopher-hanusas-art>, March 2, 2022
- Development and launch of artvote.net, an online generative art rating platform with students, 2021
- Post on 3D-Printed Jewelry Made with the Wolfram Language Showcases the Beauty of Mathematics, February 15, 2021. <https://blog.wolfram.com/2021/02/15/3d-printed-jewelry-made-with->

the-wolfram-language-showcases-the-beauty-of-mathematics/
 Featured in *The QView #65*, Math and 3D Printing Figure in Professor's Artful Designs, Dec. 2019
 Post on Costa Rica Keychains featured as a Staff Pick on the Wolfram Community, November 2018.
<https://community.wolfram.com/groups/-/m/t/1549848>
 SciArt Center Instagram Takeover, week of June 17, 2018.
 Featured in *Intersecting Perspectives 2018*, Digital art gallery and artist showcase.
<http://www.sciartinitiative.org/intersecting-perspectives---3.html>
 Academic writing on 3D Printing on the Ultimaker blog:
 Integrating 3D printing and The Goblet Project. June 18, 2018
<https://ultimaker.com/en/blog/52514-integrating-3d-printing-and-the-goblet-project>
 3D Design in Mathematica: Tealight Holders. November 12, 2018
<https://ultimaker.com/en/blog/52745-3d-design-in-mathematica-tea-light-holders>
 MathRazzle, the math education blog of Christopher R. H. Hanusa. mathrazzle.blogspot.com
 The Mathematical Zorro, the math research blog of Christopher R. H. Hanusa. blog.mathzorro.com
 Post on Generative Jewelry featured as a Staff Pick on the Wolfram Community, February 2018.
<http://community.wolfram.com/groups/-/m/t/1270499>
 Featured on the Wolfram Blog, January 2018.
<http://blog.wolfram.com/2018/01/26/the-wolfram-language-bridges-mathematics-and-the-arts/>
 Member of the Month, SciArt Center, December 2017
<http://www.sciartinitiative.org/christopher-hanusa.html>
 Blog series on 3D Design in Mathematica, blog.mathzorro.com
 3D Design in Mathematica: Generative Jewelry. July 1, 2017
 3D Design in Mathematica: Custom Dice. June 1, 2017
 3D Design in Mathematica: Costa Rica Keychain. May 1, 2017.
 3D Design in Mathematica: Polyhedral Terrarium. April 3, 2017.
 3D Design in Mathematica: Creating a Name Ring. March 1, 2017
 Guest blogger for the Queens College Teaching Circle. teachingcircle.qwriting.qc.cuny.edu
 Announcing the Circular Teaching Squad. February 24, 2016.
 Student Forays into Pencil Puzzles. February 23, 2016.
 Puzzles! February 22, 2016.
 Creative Writing is Experiential Learning! November 2, 2015.
 Experiential Learning Lunch on 21 Oct 2015. October 26, 2015.
 The Experiential Learning Group at Queens College. October 21, 2015.
 Announcing The MathZorro Podcast. July 16, 2015.
 Teaching students Mathematica. April 2, 2015.
 Christopher R. H. Hanusa. A brief introduction to reflection groups. Online video clip. YouTube.
 August 4, 2014. https://www.youtube.com/watch?v=qeI710SR1_s.
An engaging video directed and starring Hanusa, produced with Joseph Cohen (QC Sociology) and his students.
 Christopher R. H. Hanusa. Posters You Can Count On. Online video clip. YouTube.
 June 17, 2014. <https://www.youtube.com/watch?v=i01mu1TKtyQ>.
 Christopher R. H. Hanusa. Experimental Mathematics at Queens College. Online video clip. YouTube.
 February 18, 2014. <https://www.youtube.com/watch?v=5sszakemGMo>.
 Christopher R. H. Hanusa. Animations of symmetries of Platonic solids. Fall 2013. (over 30,000 views)
<https://plus.google.com/photos/+ChristopherHanusa/albums/5947067145336244401>
 Christopher R. H. Hanusa. *The combinatorics of the affine symmetric group \tilde{A}_n* , Version 2.1. Sept. 2013.
<http://people.qc.cuny.edu/faculty/christopher.hanusa/research/animations/Pages/abacusA.aspx>
 Christopher R. H. Hanusa. Additional interactive *Mathematica* worksheets, various dates, 2011–2013.
<http://people.qc.cuny.edu/faculty/christopher.hanusa/research/animations/>

BOOK REVIEWS

Christopher R. H. Hanusa. Review of the book *Analytic Combinatorics* by P. Flajolet and R. Sedgewick.
 MAA Reviews, July 4, 2009. Available at

<http://www.maa.org/publications/maa-reviews/analytic-combinatorics>.

Christopher R. H. Hanusa. Review of the book *A Walk Through Combinatorics* by M. Bona.

MAA Reviews, January 29, 2009. Available at <http://www.maa.org/publications/maa-reviews/a-walk-through-combinatorics-an-introduction-to-enumeration-and-graph-theory>.

PRESENTATIONS

Gallery 1064 Artist Talk: Existence and Uniqueness

Streamed worldwide March 11, 2022; Available at <https://www.youtube.com/watch?v=wVbgF7fwGOE>.

3D Design in the Wolfram Ecosystem

Construct3D Summer Symposium 2021, June 17, 2021.

A q-Queens Problem

Ohio State University, Columbus, OH. October 12, 2020.

University of Kentucky, Lexington, KY. April 14, 2017.

North Carolina State University, Raleigh, NC. October 3, 2016.

Arizona State University, Tempe, AZ. April 28, 2016.

Northern Arizona University, Flagstaff, AZ. April 26, 2016.

MOVES Conference 2019, National Museum of Mathematics, New York, NY. August 2–4, 2015.

Slipcasting and 3D Printing

Construct3D 2020, Rice University, Houston, TX. February 2020.

Datamining Imaginary Maps

Wolfram Technology Conference, Champaign, IL. October 29, 2019.

MOVES Conference 2019, New York, NY. August 5, 2019.

Standards-Based Grading in Math and Beyond

Queens College Center for Teaching and Learning Faculty Seminar Series, October 2019.

Mathematical Art

Queens College Mathematics Competition, May 31, 2019.

Guiding and Grading Mathematical Art

Construct3D 2018, Georgia Institute of Technology, Atlanta, GA. October 6, 2018.

The Making Of Mathematical Art

Hofstra University Math Seminar, Hempstead, NY. October 19, 2018.

3D Printed Mathematical Art

Presentation to HS of American Studies students at Queens College, Flushing, NY. October 25, 2018.

Experimenting with Standards-Based Grading

Queens College Teaching & Learning Showcase, Flushing, NY. November 2, 2018.

Using Random Numbers to Create Art

Maggie L. Walker Governor's School, Richmond, VA. February 12, 2018.

The Process of Mathematical Art

Maggie L. Walker Governor's School, Richmond, VA. February 12, 2018.

An Ultimaker Evening with Mathematica and 3D Printing

NYU ITP, New York, NY. October 10, 2017.

3D Printed Mathematical Art

Queens College Math Club, Flushing, NY. May 15, 2017.

The power and pitfalls of Mathematica for 3D design

Construct3D, Duke University, Durham, NC. May 6, 2017.

Mathematical Art

Queens College Teaching and Learning Showcase. May 1, 2015.

Teaching Mathematical Art: Coordinating design and 3D printing

MAA MathFest, Washington, DC. August 5–8, 2015.

Combinatorics of Core Partitions

Combinatorics Class Research Presentation, Queens College. November 25, 2014.

Posters You Can Count On

Teaching Innovation Carnivale, Queens College. May 9, 2014.

Applications of abacus diagrams

York University Applied Algebra Seminar, Toronto, ON, November 2013.

Combinatorial and Additive Number Theory 2013, CUNY Grad Center, NYC, May, 2013.

Self-conjugate core partitions: It's storytime!

Combinatorial and Additive Number Theory 2012, CUNY Grad Center, NYC, May, 2012.

A combinatorial introduction to reflection groups

Queensborough Community College Mathematics Colloquium, September 2012.

Queens College Mathematics Colloquium, April 2012.

University of Washington Combinatorics Pre-Seminar, April 2012.

Combinatorial interpretations in affine Coxeter groups

University of Washington Combinatorics Seminar, April 2012.

Binghamton University Combinatorics Seminar, Binghamton, NY, May 2011.

A quasi-polynomial q -Queens result and related Kronecker products of matrices

New York Combinatorics Seminar, February 2012.

University of California, Davis, May 2009.

Queens College, May 2009.

Combinatorial interpretations in affine Coxeter groups of type B , C , and D

NY Workshop on the Symmetric Group, CUNY Graduate Center, September 9, 2011. (Invited)

Let's Count: Domino Tilings

Manhattan College IIME and TΣK induction, April 14, 2011. (Invited)

The enumeration of fully-commutative affine permutations

2011 Spring Eastern Sectional Meeting of the AMS, Worcester, MA, April 9, 2011. (Invited)

An introduction to \LaTeX for students

Queens College, February 2011.

Where Mathematica betters my instruction

CUNY's "Technology in Mathematics Instruction Conference 2010", June 8, 2010. (Invited)

Let's Count: Enumeration through matrix methods

Queens College, February 2008.

Temple University Colloquium, March 2006.

Voting Methods and Colluding Voters

Gettysburg College, January 2008.

Binghamton University, December 2007.

Five days of five speakers in (roughly) fifty minutes

Binghamton University, March 2007.

A Gessel-Viennot-Type Method for Cycle Systems

Gettysburg College, January 2008.

Laboratoire Bordelais de Recherche en Informatique (given in French), June 2006.

Cornell University, November 2005.

Binghamton University, September 2005.

Carnegie Mellon University, March 2005.

University of Washington, February 2005.

University of California, Berkeley, February 2005.

Matrix Types and Operations Arising in Matching Theory

Binghamton University, September 2005.

University of Washington, April 2005.

POSTERS PRESENTED

ICERM Workshop on Whittaker functions, Schubert calculus, and crystals, March 2013.

Abacus models for affine Weyl groups. [Joint with Brant C. Jones.] (Won First Place Poster Presenter.)

Formal Power Series and Algebraic Combinatorics, June 2011.

The enumeration of fully-commutative affine permutations [Joint with Brant C. Jones.]

Formal Power Series and Algebraic Combinatorics, June 2005.

A Gessel–Viennot-Type Method for Cycle Systems.

International Biometric Society - ENAR, Pittsburgh, PA, March 2004.

Sample Size Determination in Studies Where Health State Utility Assessments Are Compared Across Groups and Time. [Joint with Barbara H. Hanusa.]

CONFERENCES

AIM SQuaRE: Computing volumes and lattice points of flow polytopes. San Jose, CA. 3/28–4/1 2022.

CANADAM 2021. Virtual. May 25–28, 2021.

CUNY Faculty Diversity and Inclusion Conference. April 15–16, 2021.

AIM SQuaRE: Computing volumes and lattice points of flow polytopes. Virtual. December 14–18, 2020.

Construct3D 2020. Houston, TX. February 13–16, 2020.

Wolfram Technology Conference 2019. Champaign, IL. October 28–31, 2019.

AIM SQuaRE: Computing volumes and lattice points of flow polytopes. San Jose, CA. 9/30–10/4 2019.

MOVES 2019, New York, NY. August 4–6, 2019.

Lilly Conference on Evidence-Based Teaching and Learning. Austin, TX, January 10–12, 2019.

AIM SQuaRE: Computing volumes and lattice points of flow polytopes. San Jose, CA. Nov. 12–16, 2018.

Construct3D 2018. Atlanta, GA. October 5–8, 2018.

Bridges 2018. Stockholm, Sweden. July 25–29, 2018.

2018 Creative Tech Week Conference. Manhattan, NY. May 11, 2018.

Discrete Math Day at Queens College. Flushing, NY. October 21, 2017.

Bridges 2017. Waterloo, ON, Canada. July 27–30, 2017.

Formal Power Series and Algebraic Combinatorics. London, England. July 9–13, 2017.

Construct3D Conference, Duke University, Durham, NC. May 5–7, 2017.

AIM Workshop on Polyhedral geometry and Partition Theory. San Jose, CA. November 7–11, 2016.

Illustrating Mathematics, an ICERM Topical Workshop. Providence, RI. June 27–July 1, 2016.

MAA MathFest, Washington, DC. August 5–8, 2015.

MOVES Conference, National Museum of Mathematics, NYC, NY. August 2–4, 2015.

Stanley @ 70. Cambridge, MA. June 23–27, 2014.

Discrete Math Day at Wesleyan College. Middletown, CT. October 5, 2013.

Formal Power Series and Algebraic Combinatorics. Paris, France. June 24–28, 2013.

Combinatorial and Additive Number Theory 2013. CUNY Grad Center, NYC. May 21–24, 2013.

ICERM Workshop on Whittaker functions, Schubert calculus, and crystals. Providence, RI. Mar. 4–8, 2013.

Combinatorial and Additive Number Theory 2012. CUNY Graduate Center. May 22–25, 2012.

Hudson River Undergraduate Mathematics Conference. Springfield, MA. April 21, 2012. (faculty advisor)

NY Workshop on the Symmetric Group. CUNY Graduate Center. September 8–9, 2011.

Formal Power Series and Algebraic Combinatorics. Reykjavik, Iceland. June 13–17, 2011.

AMS Spring Eastern Sectional Meeting. Worcester, MA. April 9–10, 2011.

Ninth Northeast Probability Seminar. CUNY Graduate Center. November 19, 2010.

MAA MathFest 2010. Pittsburgh, PA. August 5–7, 2010.

Technology in Mathematics Instruction Conference 2010. CUNY Graduate Center. June 8, 2010.

Discrete Math Day at Misericordia College. Dallas, PA. September 26, 2009.

Eighth Northeast Probability Seminar. Columbia University, NYC. November 20, 2009.

Formal Power Series and Algebraic Combinatorics. Hagensberg, Austria. July 20–24, 2009.

Graph Theory Day Fifty-Seven. Garden City, NY. May 16, 2009.

Joint Mathematics Meetings. San Diego, CA. January 6–9, 2008.

Discrete Mathematics Day at Middlebury College. Middlebury, VT. September 15, 2007.

Statistical Mechanics and Combinatorics School. Val-Morin, Québec. February 12–16, 2007.

Discrete Mathematics Day at Binghamton University. Binghamton, NY. May 6, 2006.

Formal Power Series and Algebraic Combinatorics. Taormina, Italy. June 20–25, 2005.

MSRI workshop on Markov Chains in Algorithms and Statistical Physics. Berkeley, CA.

January 31–February 4, 2005.

Joint Mathematics Meetings. Atlanta, GA. January 5–8, 2005.

Formal Power Series and Algebraic Combinatorics. Vancouver, BC, Canada. June 28–July 2, 2004.
Mt. Baldy Mathematics Conference. Claremont, CA. October 28, 2000.

MATHEMATICAL ACTIVITIES

Reviewer for FPSAC Proposals 2022.

Co-organizer and Host of the Minisymposium on Flow Polytopes at CANADAM, 2021.

Reviewer of PSC-CUNY Grant Proposals, 2022, 2021, 2019, 2017.

Organizer of the Discrete Math Day at Queens College, October 21, 2017.

Secured funding, room, parking, chose and invited speakers, managed website, publicity, attendees

Co-organizer of the New York Combinatorics Seminar, CUNY Graduate Center. 2011–2016.

Organizer of the Queens College Mathematics Colloquium, 2009–2012.

Co-organizer of the NY Workshop on the Symmetric Group. September 8–9, 2011.

Organized speaker schedule, maintained workshop website, provided technical assistance.

Co-organizer of the Binghamton University combinatorics seminar, 2005–2008.

Co-organizer of Discrete Mathematics Day at Binghamton University, May 6, 2006.

Co-organizer of the University of Washington combinatorics and geometry seminar, 2004–2005.

Referee for American Mathematical Monthly, Annals of Combinatorics, Ars Combinatoria, Canadian Applied Mathematics Quarterly, Discrete Mathematics, Discrete Applied Mathematics, Electronic Journal of Combinatorics, European Journal of Combinatorics, Involve, Journal of Algebraic Combinatorics, Journal of Combinatorial Theory Series A, Journal of Combinatorics, Journal of Mathematics and the Arts, Linear Algebra and its Applications, SIAM Journal on Discrete Mathematics.

Referee for Yau High School Mathematics program (Beijing).

Reviewer for the 14th International Fibonacci Conference.

Book Reviewer for MAA Reviews.

Member of the National Association of Mathematicians, 2020–present.

Member of the Mathematical Association of America. 2010–2013

CURRICULAR ACTIVITIES

Redesign and implementation of MATH 120: Discrete Mathematics for Computer Science, 2021–2022.

Coordinated with the computer science department to determine course content and ensure agreement on final product. Created and led curriculum development committee, overseeing development of learning objectives, choice of book, common curriculum, exam structure. Coordinated course implementation of course in Fall 2022.

Development and implementation of Mathematical Design class, Fall 2020 and Fall 2021.

New interdisciplinary class using mathematical concepts and design thinking to design art. Student work created in coordination with the QC Makerspace. Created exhibits in the library to display final student projects. Course developed as part of the Quid Pro NSF Grant.

Created OER videos for classes during Fall 2020 and Spring 2021 semesters.

Standards-Based Grading in Combinatorics, Fall 2018.

Developed holistic standards, created assessments and reassessments to measure student mastery.

Curation of Art Exhibit *Mathematical Art: Made in Mathematica*, Fall 2018.

Worked with QC library to install an art exhibit to showcase the work of Math with Mathematica students. On display from December 2018 through April 2019.

Standards-Based Grading in Calculus II, Fall 2017.

Developed holistic standards, created assessments and reassessments to measure student mastery.

The Goblet Project: 3D Printing in Calculus II, Fall 2017.

Adapted, incorporated into Math 142 the design and 3D printing of goblets. Students gained hands-on experience with solids of revolution, group work, Mathematica, 3D printing.

Project-centered redesign of MATH 245: Mathematical Models, Spring 2018.

Redesigned course to have active-learning and computer-programming components. Students use Python to simulate real-world scenarios, work in groups, and present their findings to the class.

Development of Games and Puzzles Class, Spring 2016.

Student-driven content. Students designed pencil puzzles, and created an Escape The Room puzzle.

Redesign of Math with Mathematica Class, Spring 2015, 2016.

Purely project-based class including mathematical art. Designed interactive tutorials for students, coordinated with L. Slowik at Shapeways to receive \$750 in funds for 3D printing.

Recorded research podcasts with students in Combinatorics class, Dec. 2014, 2015, 2018.

Binghamton University learning community faculty contact, Binghamton, NY. Fall 2006, Fall 2007.

A supported-learning group for incoming freshman. Discussions on teaching, learning, and mentoring, holding office hours in the dorm, organizing workshops on succeeding in math classes.

Organizer of the combinatorics pre-seminar for undergraduates, 2005.

Introduction to ideas presented in the combinatorics seminar for research-motivated undergraduates.

TEACHING AND LEARNING ACTIVITIES

Presenter, Queens College Teaching & Learning Showcase. November 2, 2018.

Organized and Moderated 5 meetings of the Circular Teaching Squad, Queens College, 2015–2016.

Topics: Recent innovative teaching practices use of technology in the classroom, giving up control in the classroom, teaching students how to learn, interdepartmental teaching collaboration.

Consultant for Quantitative Reasoning workshop, Oct. 9, 2015.

Faculty participant in Queens College Undergraduate Research Opportunities Day, Oct. 7, 2015.

Presenter, Queens College Teaching and Learning Showcase. May 1, 2015.

Presenter, Teaching Innovation Carnivale, Center for Teaching and Learning. May 9, 2014

Organized and Moderated Experiential Learning Lunch, Queens College, April 29, March 5, 2014

Topics: Reflections on Spring 2014 teaching, Innovation in Education at Queens College.

Syllabus Bootcamp, Center for Teaching and Learning, Queens College. January 6–10, 2014

Coordinating Experiential Learning mailing list, 2013–2016.

Founding member of the Queens College Experiential Learning Group, 2012–2016

Participated in Experiential Learning Workshops, Oct., Dec. 2012, May, Nov. 2013.

Presented teaching techniques, set group goals in Initial Experiential Learning workshop, June 2012.

Teaching Innovation Lunch. Queens College. December 10, 2013

Institute for Student-Centered Learning Conference, Binghamton University. May 21–22, 2007

STUDENT-FOCUSED ACTIVITIES

Coordinated the visit of P. Winterbotham (Wolfram), April 2018.

Coordinated with math club and QC Development Office to bring alumni to campus. 2014–2015.

Wrote solicitation for speakers, fielded responses from 15 alumni, coordinated visits to campus.

G. Xenakis (Mercer Consulting), R. Frank (QC '68) J. Toomey '87 (CEO, National Consumer Panel),

L. Michalopoulou '93 (FullBeauty.com), L. Shao (NS/LIJ)

Department liaison to the Math Club, 2014–2015, 2017–2018

Provided support to start club, coordinated funds for pizza, wrote a letter of support for funding.

Faculty advisor for the Mathematical Contest in Modeling Competition at QC. 2011–2014.

Initiated competition at Queens College, sponsored two three-student teams in 2011, 2012.

In 2011, one team was designated Meritorious (Top 15% of around 3000 teams).

In 2014, one team was designated Honorable Mention (Top 40% of around 6800 teams).

Faculty co-advisor for the William Lowell Putnam Competition at Queens College. 2011–2016.

Designed and ran a course on Putnam Preparation. Fall 2011.

Responsible for Putnam Exam participation of eight students, the most in one sitting since 1991.

Organized math student participation in QC 75th Anniversary Poster Session, October 2013.

Organized math student participation in Sigma Xi Poster Session, April 2013.

Organizer of Queens College Post-bac Mathematics Education information session. November, 2012.

Organizer of Math for America information session. September, 2012.

Organizer of “Quantitative Careers” session in QC Careers in Science Seminar Series. April 30, 2012.

Invited and managed speakers: Ryan Haskett (Hutchin Hill Capital), Gregory Rae (former Google

employee and current Broadway producer). Served as the discussion moderator.
Organizer of Town Hall meeting on “What can you do with a Math Major?”. March, 2012.
Invited and managed speakers: Tina Chang (Novo Nordisk), Benjamin Baumer (NY Mets), and Matthew Fried (hedge fund creator). Served as the discussion moderator.
Faculty co-sponsor of the Binghamton University undergraduate math club, 2005–2008.
Faculty contact for Graduate TA Orientation, Binghamton University, August 21, 2007.

SERVICE TO THE DEPARTMENT

Member of the Personnel and Budget Committee, 2020–present
Discussion of personnel issues, including tenure and promotion portfolios, non-compliance by colleagues. Development of hiring documents, encouraging discussion in department. Lobbying for increase in departmental DEI initiatives.

Chair of the joint MATH–SEEK Lecturer Search, 2022.

Leader of undergraduate and graduate course cross-listing policy discussion. 2021–2022.
Held meetings, gained consensus on cross-listing policy, developed curricular proposals, shepherded policies and proposals through department and college curriculum committees.

Leader of the Department of Mathematics Curriculum Reform Initiative, 2018–2019.
Initiative to reform the pure and applied mathematics majors and curriculum for the first time in 50 years. Conducted survey of department, organized full-day discussions, collected feedback from other departments. Together we defined the goals of the pure and applied mathematics majors; updated the required courses for the pure and applied mathematics majors; created a Foundations of Mathematics class; rearranged course material to enable a one-semester course in Multivariable Calculus; standardized the topics to be covered in Linear Algebra, Abstract Algebra, and Real Analysis.

WebWork Administrator, 2018–present.
Received funding under the CUNY Open Access Grant, ensured participant payment, helped implement WebWork server, create automatic scripts to create and populate courses. Promoted department use, Troubleshooted, completed admin tasks. Assignments for Math 115, 120, 122, 131, 142, 152, 201.

Created and curated 3D Printed art display in Department Office, 2017–present.

Designed Mathematical Images for display in the hallway outside the department office, 2017.

Mathematics Department Curriculum Committee. Chair, 2017–present.
Addressed 20 curriculum proposals in first year. Shepherded through the data science major option. Developed language for accelerated MA program. Organized and ran meetings effectively. Submitted proposals to QC UCC, GCC. Introduced Slack.

Mathematics Department Hiring Committee, 2017–2018.

Committee for HSI-STEM grant implementation, 2017–2018.
Hiring and supervision of two assistants to gather and compile curricular information, 2017. Contributed suggestions for Math 115, 122 study design and curriculum reform, 2018.

Head of Math Department 3D printing lab, 2016–present.
Coordinated with M. Greco (QC Art) for loan of their 3D printers. Set up 3D printing lab in KY061A / KY507. Created props for Math 142 & 201. Submitted Tech Fee request.

Department coordinator for Math/English group learning space in KY061, 2016–present.
Represented department in room usage allocation and discussion. Coordination of class scheduling.

Set up Shapeways Online Web Shop for QC student Artwork to benefit department, Jan–Mar 2017.

Committee to determine the curriculum for incoming NAVITAS Students, headed by Dean W. McClure in cooperation with Provost E. Hendrey, May–June 2016.

Video and Photo shoot with W. Wong in coordination with Alumni Affairs (Y. Anteri), Mar. 2016.

Department Self Study Curriculum comm. chair and Faculty Development comm. member. 2015–2016.
Arranging meetings and setting agenda, collecting syllabus information from department colleagues.

Co-chair of department teas, November 2015–May 2016
Initiation of department tea idea, coordination with K. Klosin.

Providing content (writeup and pictures) for department newsletter. November 2015.

Chair of the department committee for repopulating Kiely Hall, Dec. 2014–Sept. 2015.

Queried colleagues, allocated offices, corresponded with administration, delegated responsibilities, oversaw movers, guided furniture positioning, addressed colleague concerns.

Organization of student photo shoot with A. Hassan (QC Photo Services), Oct. 27, 2014.

Preparation of mathematical posters with Reprographics and Creative Services, Sept.-Oct. 2014.

Department representative to the Queens College Undergraduate Research Council. 2011–2014.

Helped promote and organize the Queens College Undergraduate Research Conference, each fall.

Chair of department committee to repopulate Kiely Hall, 2014–2015

Administration of GRTI-16 funding for the Queens College Mathematics Department (\$50,000 grant)

Queried colleagues, wrote proposal, modified proposal, ordered and received materials, including computers and accessories, software, chalkboards, Zometools. Organized and oversaw renovation of Kiely 258 and 242, involving protracted set of email exchanges and meetings with key players.

Sought and received matching funds for renovation for a total project scope of \$200,000.

Math department advocate for renovation of the technology suite in Kiely 226.

Initiating, overseeing installation of WeBWorK, an open source homework management software. 2013

Discussed payment, service level agreement, class list generation, oversaw transition to B. Koroveshi

Co-webmaster for the Queens College Mathematics Department, 2009–present.

Design and maintenance of department internet and intranet sites, including department photos and directory, final exam repository, news and events section, creation of content for faculty and students.

Designed and implemented an exit survey for graduating math majors. May 2012.

Faculty contact for Queens College Mathematics Computer Laboratory, 2009–present.

Liaison from the Department of Mathematics to the Office of Converging Technology. 2013–2018.

Aided colleagues with Smart Classroom, L^AT_EX, and *Mathematica* questions

Peer Observations: Ernest Porchetta, Josh Good, Zhani Joanidhi, Michael Joseph, Hye Ok Lee.

SERVICE TO THE CAMPUS

Queens College Curriculum Council Member, 2021–2022.

Queens College Strategic Planning Curriculum Group Member, 2020–2021.

Quid Pro group first cohort.

Faculty Fellow through the QC Provost Office, 2018–2019.

One-on-one meetings with Provost Hendrey; participated in meetings with Academic Affairs and the Academic Deans; contributed to the 2019 Strategic Planning Retreat; networked and brainstormed with professionals on and off campus for campus improvement. Crafted the following individual initiative.

Architect of Faculty Excellence in Teaching Initiative, 2018–2019.

Initiative to incorporate more emphasis on faculty excellence in teaching and learning in the campus community and during the tenure and promotion processes. Plan developed and revised in collaboration with decision makers with goal of incremental structural changes. Key ideas: A focus on teaching reflection in the annual evaluation process; Increasing the visibility of teaching in tenure and promotion; Encouraging professional development in teaching; Valuing the scholarship of teaching and learning; Circulating guidelines and prompts developed by the Provost's office

Contributed to the new HSI QUID Proposal to introduce making into the QC curriculum, 2019.

Participated in meetings with Navitas advance planning committee about math curriculum, April 2019.

Member of the Open Educational Resources Group, 2017–present.

Participated in multiple meetings about Queens College Data School with W. McClure, 2018.

Coordinated campus visits by students from the H.S. of Amer. Studies at Lehman College, 2017, 2018.

Presentation about 3D Printing at Queens College to Japanese Visitors, June 13, 2017.

Profiled on the webpage of the Queens College Office of Undergraduate Research in coordination with J. Dennehy and T. Brown, 2016–17.

Facilitated the visit of Mathematician Arthur Benjamin, March 1, 2013.

Suggested his visit, coordinated his travel to campus, and gave introduction at his presentation.

Web developer for the Queens College Division of Mathematics and Natural Sciences, Summer 2011.

Redesigned the division website under consultation with Dean Liebovitch.

Technology director for the Queens College DMNS Faculty Achievement In Research Day, April 8, 2011.

Improving Mathematics Grant Design Assistance Workshop, CUNY, Sept. 11, 2009.
Volunteer for The Summit residence hall move-in, August 26, 2009.
Faculty Marshal at Queens College Commencement. May 2012, 2013, 2014, 2018, 2019.
Faculty Marshal at Queens College Baccalaureate Ceremony. May 2016.

ADVISING

Research students supervised in the Experimental Mathematics Laboratory

F20–S22 Christopher Soto, Peter Antonaros

– Creation of artvote.net

S19 Yanxi Piao ('19), Jeremy Quail ('20)

F18 Christopher Soto

S16–S18 Arvind Mahankali (HS, CMU)

– Co-authored article “Trajectories and Partial Nightriders”, April–June 2018.

F17–S18 Juhyun (Eunice) So (QC, Macauley 2018). Served as thesis advisor.

F. 2015 Tamar Ehrenreich ('16), Davida Popik (Grad '16)

S. 2015 Miriam Striks ('15), Aleksandr Yaroslavskiy (Grad '15), Roman Bohdanowycz (Grad '16)

2013 Kirsten Berger (Grad), Matthew DeAndrade ('13),

F11–S12 Amy Lee ('12) and Michael Chon ('12)

– Supervised poster presentation at Sigma Xi event, March 2012.

– Supervised oral presentation at Hudson River Undergraduate Mathematics Conference, April 2012.

– Co-authored article “Solving multivariate functional equations”, April–June 2012.

S. 2010 Michael Pandazis ('11)

Mentor for Mellon Mays Undergraduate Fellowship: 2015–2016: Nikkia Hanson

Advised undergraduate Bryan Nevarez '13 in poster preparation for conference attendance, served as informal mentor. Bryan is attending the prestigious Applied Mathematics program at the University of Michigan starting Fall 2013.

Masters exams supervised:

2019 Daniel Haslbauer

2016 Roman Bohdanowycz

2015 Michael Duffy, Daniel Summers, Aleksandr Yaroslavskiy

2014 Kirsten Berger, Rajat Agarwal

2013 Carrie Ambrosio

2012 Bibi Mohammed, Saida Boudlal, Tom Meigel, Itchelle Whyte, HERN Pierre, Elisabeth Tulley, Katherine Tulley, Nigel Sookram, Mark Carman

2011 Jean Oriental, Robert Goffner, Eric Corsini, Angela Upton, Lance Lohman, Joseph Lipani

2010 Matthew Fried, Tak Hui, Ana Mojacco, Leanne Schultz, Danielle Borroni

2009 Fernando Torres

2008 Qi Zhuang

SERVICE TO THE COMMUNITY

Participation in Career Day at New York City Public School 209 Clearview Gardens. February 8, 2019.

Career Day at New York City Intermediate School 25 Adrian Block. April 26, 2018.

Participation in Career Day at New York City Public School 209 Clearview Gardens. February 9, 2018.

Participation in Career Day at New York City Public School 209 Clearview Gardens. February 10, 2017.

Participation in Career Day at New York City Public School 209 Clearview Gardens. February 26, 2016.

Presentation to Holy Cross Coding Club, Flushing NY. January 6, 2016.

Participation in Career Day at New York City Public School 209 Clearview Gardens. May 1, 2015.

Participation in Career Day at New York City Public School 209 Clearview Gardens. February 12, 2014.

Participation in Career Day at New York City Public School 209 Clearview Gardens. May 10, 2013.

Math Olympiad Program Co-Leader, TOPS at Seward Public School, Seattle. Nov. 2003–May 2004.

After-school program for fourth and fifth graders. Preparing questions, administering the Olympiad, preparing directed homework questions.

LANGUAGES _____

Fluent in English and French. Basic skills in Dutch.