THOMAS C. HULL

Mathematics Department
Franklin & Marshall College

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Education

University of Rhode Island

- Ph.D. Mathematics (1997)
  advisor: Nancy Eaton, dissertation: *Some Problems in List Coloring Bipartite Graphs*
- M.S. Mathematics (1993)

Hampshire College

- B.A. (1991) Mathematics and Philosophy

Research Interests

The modeling of folding processes (origami), combinatorics, graph theory, and discrete geometry.

Positions Held and Teaching Experience

Associate Professor of Applied Mathematics, Franklin & Marshall College (Aug 2023-present)

Courses taught:

Calculus I, II (Active Calculus text; used gateway exams, regular in-class group work, group homework)

Linear Algebra and Differential Equations (Andrilli & Hecker text and Blanchard, Devaney, and Hall text; with Mathematica labs)

Linear Algebra with Modern Applications (Andrilli & Hecker text, Mathematica Labs, for data science majors)

Introduction to Higher Mathematics (belcastro text on discrete math, active learning)

Origami Math (math modeling class, discovery-based format, final projects-papers and presentations)

Nonlinear Dynamics (Strogatz text, Mathematica labs, major group project)

Galois Theory (directed reading course, Stewart text, assigned reading and student lectures every class)

Independent Studies (at least one per year, topics: Gaussian curvature and origami; Buckyballs and geodesic spheres)

Independent Student Research (advised 16 undergraduate students in original research projects, 2023–present, supported by NSF grants)

Associate Professor, Western New England University, Dept. of Mathematics (Sept 2008–May 2023)

Undergraduate courses taught:

Calculus I, II, III (Hughes-Hallett, Briggs et al. text and *Active Calculus* text; derivative and integration gateway exams; group homework; *Mathematica* labs, MyMathLab assignments)

Linear Algebra (Andrilli & Hecker text; taught in computer classroom in discovery-based manner with emphasis on learning proof-writing; take-home exams; *Mathematica* used extensively)

Modern Aspects of Geometry (Stillwell text; Euclidean, spherical, hyperbolic, and projective geometries; GeoGebra, Spherical Easel used; final project paper and presentation)

Creative Problem Solving (Zeitz text; focus on different tactics and tools for problem-solving and for communicating solutions; regular in-class presentations; final project paper and presentation)

Graph Theory (Chartrand & Zhang and Trudeau texts; inquiry-based with assigned proof presentations)

Combinatorics (Mazur text problem presentations by students at the start of every class)

Real Analysis (Schumacher text and Marsden-Hoffman text; inquiry-based with required readings and assigned proof presentations; take-home exams)

Real Analysis II (Marsden-Hoffman and Wilcox-Myers texts; inquiry-based with required readings and assigned problem presentations; topics included Lesbegue measure and integration)

Complex Analysis (Marsden text; inquiry-based with required reading assignments)

Topology (Morris open textbook; seminar-style class)

Special Topics: Origami: Math in Creasing (Hull textbook; inquiry-based, conjecture-building, final projects)

Senior Research Projects (advised 18 year-long projects 2009–present; major paper drafting, HRUMC presentations; 14 projects were expository, 4 projects were original research)

Independent Student Research (advised 17 undergraduate students in original research projects 2013–present, with 4 published papers (Farnham & Rumbolt, Ginepro x2, Urbanski) and more in development)

Master of Arts for Mathematics Teachers (MAMT) in-person 2009-2020, online 2020-present; courses taught:

All courses emphasized proof-writing with in-class group work and regular presentation of solutions.

Discrete Mathematics (Ensley & Crawley and belcastro texts; inquiry-based learning class; readings and presentations required)

Creative Problem Solving (Polya and Zeitz texts; daily problem activities to emphasize problem-solving strategies and communication of solutions; final project paper and presentation)

Calculus Revisited (Marsden & Tromba text; extensive group projects on textbooks from the calculus reform movement)

Geometry Revisited (Stillwell and Sibley text; GeoGebra, Spherical Easel, and other software used extensively)

Analysis (Schumacher text with supplements on Lebesgue integral; student presentation intensive)

Algebraic Structures (Judson text; covered groups, rings, fields, and some Galois Theory; weekly assigned problem presentations)

Fractals and Topology (Barnsley's *Superfractals* text; taught in computer classroom with extensive use of *Mathematica*)

Origami in Mathematics and Education (Hull text; activity-driven class with emphasis on conjecture and proof-building; final project paper and presentation)

Director, MathILy-EST REU, Bryn Mawr College (summers, 2019, 2024)
Supervised 6–10 undergraduates in combinatorial geometry research in this NSF-funded REU.

Project Associate Professor, University of Tokyo, Graduate School of Arts and Sciences (Nov.–Dec. 2015)
Taught intensive, 3-day graduate class: Mathematical Methods in Origami

Assistant & Associate Professor, Merrimack College, Dept. of Mathematics (Sept. 1997–May 2008)
Courses taught: Discrete Mathematics, Calculus for Business, Precalculus, Calculus I, II, III, Topics in Geometry, Combinatorics, Abstract Algebra, Introduction to Real Analysis, Combinatorial Geometry

Visiting Assistant Professor, University of Cincinnati, Dept. of Mathematical Sciences (2002–03)
Courses taught: Honors Calculus I, II, and III, Calculus III *Mathematica* Lab, Finite Mathematics.

Summer Teaching Experience

Lead Instructor, MathILy, Bryn Mawr College (summers 2013–18, 20-23, 25-26)
MathILy (which stands for serious Mathematics Infused with Levity) is a 5-week summer enrichment program for talented high-school students. Taught intensive courses on linear algebra, proof techniques, generating functions, projective geometry, finite difference calculus, complex analysis, dynamical systems, computational geometry, Lesbegue integration, and origami mathematics.

Staff, Hampshire College Summer Studies in Mathematics (Junior Staff 1991–1994, Senior Staff 1998–2009)
HCSSiM is a 6-week enrichment program for talented high-school students. Taught many subjects, including proof techniques, graph theory, group theory, generating functions, fractal geometry, projective geometry, discrete dynamical systems, set theory, automata theory, Markov chains, and origami mathematics.

Research Publications (Math) (* indicates undergraduate student coauthors)

- Flat origami is Turing complete, with I. Zakharevich, submitted.
- On random locally flat-foldable origami, with M. Michelen and C. Yap, submitted.
- The origami flip graph of the 2 x n Miura-ori, with L. Christensen*, E. O'Neil*, V. Pappano*, Natalya Ter-Saakov, and K. Yang*, *Journal of Graph Algorithms and Applications*, Vol. 30, No. 1 (2026), 419–442.
- Nonlinear Kinematics of Recursive Origami Inspired by the Spidron, with R. Imada, J. Ku, and T. Tachi, in Lu, G., You, Z., Assis, M. (eds), *Origami8, Volume I. OSME 2024. Lecture Notes in Mechanical Engineering*, Springer, Singapore (2026). 63–78. https://doi.org/10.1007/978-981-96-8664-3_5
- The stamp folding problem from a mountain-valley perspective, with A. Ibrahim*, J. Paltrowitz*, N. Ter-Saakov, and G. Wang*, *Discrete Mathematics and Theoretical Computer Science*, Vol. 27, No. 3 (2025), 15 pages.
- A rigid origami elliptic-hyperbolic vertex duality, *Results in Mathematics*, Vol. 80, Issue 5 (2025), Article 138, 13 pages.
- Explicit kinematic equations for degree-4 rigid origami vertices, Euclidean and non-Euclidean, with R. Foschi and J. Ku, *Physical Review E*, Vol. 106, No. 5 (2022), 055001–055011.
- Maximal origami flip graphs of flat-foldable vertices: properties and algorithms, with M. Morales*, S. Nash*, and N. Ter-Saakov*, *Journal of Graph Algorithms and Applications*, Vol. 26, No. 4 (2022), 503–517.
- Rigid folding equations of degree-6 origami vertices, with J. Farnham* and A. Rumbolt*, *Proc. of the Royal Society A*, Vol. 478, No. 2260 (2022), 20220051 (19 pages).
- Counting locally flat-foldable origami configurations via 3-coloring graphs, with A. Chiu*, W. Hoganson*, and S. Wu*, *Graphs and Combinatorics*, Vol. 37, No. 1 (2021), 241–261.
- Face flips in origami tessellations, with H. Akitaya, V. Dujmović, D. Eppstein, K. Jain, and A. Lubiw, *Journal of Computational Geometry*, Vol. 11, No. 1 (2020), 397–417.
- Rigid foldability is NP-hard, with H. Akitaya, E. Demaine, T. Horiyama, J. Ku, and T. Tachi, *Journal of Computational Geometry*, Vol. 11, No. 1 (2020), 93–124.
- Self-foldability of rigid origami, with T. Tachi, *ASME Journal of Mechanisms & Robotics*, Vol. 9, No. 2 (2017), 021008-021017.
- Box Pleating is Hard, with H. Akitaya, K. Cheung, E. Demaine, T. Horiyama, J. Ku, T. Tachi, R. Uehara, in Akiyama et al. (eds) *Discrete and Computational Geometry and Graphs. JCDCGG 2015. Lecture Notes in Computer Science*, Vol. 9943, Springer (2016), 167-179.
- Rigid origami vertices: conditions and forcing sets, with Z. Abel, J. Cantarella, E. Demaine, D. Eppstein, J. Ku, R. Lang, and T. Tachi, *Journal of Computational Geometry*, Vol. 7, No. 1 (2016), 171–184.
- Counting Miura-ori foldings, with J. Ginepro*, *Journal of Integer Sequences*, Vol. 17 (2014), Article 14.10.8.
- Solving cubics with creases: the work of Beloch and Lill, *American Mathematical Monthly*, Vol. 118, No. 4 (2011), 307–315.
- Counting mountain-valley assignments for flat folds, *Ars Combinatorica*, Vol. 67 (2003), 175–188.
- Modelling the folding of paper into three dimensions using affine transformations, with s-m. belcastro, *Linear Algebra and its Applications*, Vol. 348 (2002), 273–282.
- Classifying frieze patterns without using groups, with s-m. belcastro, *The College Mathematics Journal*, Vol. 33, No. 2 (2002), 93–98.
- Defective list colorings of planar graphs, with N. Eaton, *Bulletin of the Institute of Combinatorics and its Applications*, Vol. 25 (1997), 79–87.
- A note on "impossible" paperfolding, *American Mathematical Monthly*, Vol. 103, No. 3 (1996), 242–243.

- On the mathematics of flat origamis, *Congressus Numerantium*, Vol. 100 (1994), 215–224.

Research Publications (Science)

- Topological kinematics of origami metamaterials, B. Liu, J. Silverberg, A. Evans, C. Santangelo, R. Lang, T. Hull, and I. Cohen, *Nature Physics*, Vol. 14, 2018, 811–815.
- Origami structures with a critical transition to bistability arising from hidden degrees of freedom, J. Silverberg, J. Na, A. Evans, T. Hull, C. Santangelo, R. Lang, R. Hayward, and I. Cohen, *Nature Materials*, Vol. 14, (2015), 389–393.
- Programming reversibly self-folding origami with micro-patterned photo-crosslinkable polymer trilayers, J. Na, A. Evans, J. Bae, M. Chiappelli, C. Santangelo, R. Lang, T. Hull, and R. Hayward, *Advanced Materials*, Vol. 27, No. 1 (2015), 79–85.
- Using origami design principles to fold reprogrammable mechanical metamaterials, J. Silverberg, A. Evans, L. McLeod, R. Hayward, T. Hull, C. Santangelo, and I. Cohen, *Science*, Vol. 345, No. 6197 (2014), 647–650.

Math Papers in Computer Science Conference Proceedings

- Quasigeodesics on the cube, with H. Akitaya, E. Demaine, A. Hesterberg, A. Lubiw, J. Lynch, K. Mundilova, C. Nara, J. O'Rourke, F. Stock, J. Tkadlec, R. Uehara, *Proceedings of the 37th Canadian Conference on Computational Geometry* (2025), 78–84.
- Quasi-twisting convex polyhedra, with J. O'Rourke, A. Lubiw, R. Uehara, C. Nara, K. Mundilova, and J. Tkadlec in Bahoo, Georgiou eds., *Proc. of the 34rd Canadian Conference on Computational Geometry (CCCG 2022)*, 270–276.
- Folding points to a point and lines to a line, with H. Akitaya, B. Ballinger, E. Demaine, and C. Schmidt, in He, Sheehy eds., *Proc. of the 33rd Canadian Conference on Computational Geometry (CCCG 2021)*, 271–278.
- Minimum forcing sets for Miura folding patterns, with B. Ballinger, M. Damian, D. Eppstein, R. Flatland, and J. Ginepro*, *ACM-SIAM Symposium on Discrete Algorithms (SODA15)*, (2015), 136–147.

Other Conference Proceedings Papers

- Self-foldability of monohedral quadrilateral origami tessellations, with T. Tachi, in Bolitho et al. (eds.), *Origami^7: Proc. of the 7th International Meeting on Origami Science, Mathematics, and Education*, Tarquin (2018), 521–532.
- Rigid foldability of the augmented square twist, with M. Urbanski*, in Bolitho et al. (eds.), *Origami^7: Proc. of the 7th International Meeting on Origami Science, Mathematics, and Education*, Tarquin (2018), 533–543.
- Double-line rigid origami, with T. Tachi, in *Proc. of the 11th Asian Forum on Graphic Science*, August 6–10 (2017), Tokyo, Japan, H. Suzuki (ed.)
- Zero-area reciprocal diagram of origami, with E. Demaine, M. Demaine, D. Huffman, D. Koschitz, T. Tachi, *Proc. of the IASS Annual Symposium 2016 "Spatial Structures in the 21st Century,"* September 26–30 (2016), Tokyo, Japan, K. Kawaguchi, M. Ohsaki, T. Takeuchi (eds.)
- Locked rigid origami with multiple degrees of freedom, with Z. Abel and T. Tachi, in Miura et al. (eds.), *Origami^6: Proc. of the 6th International Meeting on Origami Science, Mathematics, and Education*, AMS (2015), 131–138.
- Rigid flattening of polyhedra with slits, with Z. Abel, R. Connelly, E. D. Demaine, M. L. Demaine, A. Lubiw, and T. Tachi, in Miura et al. (eds.), *Origami^6: Proc. 6th Int. Meeting on Origami Science, Mathematics, and Education*, AMS (2015), 109–117.
- Symmetric colorings of polypolyhedra, with sarah-marie belcastro, in Miura et al. (eds.), *Origami^6: Proc. 6th Int. Meeting on Origami Science, Mathematics, and Education*, AMS (2015), 21–31.
- Coloring connections with counting mountain-valley assignments, in Miura et al. (eds.), *Origami^6: Proc. 6th Int. Meeting on Origami Science, Mathematics, and Education*, AMS (2015), 3–10.
- The flat vertex fold sequences, with E. Chang*, in Wang-Iverson et al. (eds.), *Origami^5: Fifth International Meeting of Origami in Science, Mathematics, and Education*, A K Peters (2011), 599–607.

- Configuration spaces for flat vertex folds, in Lang (ed.), *Origami^4: Fourth International Meeting of Origami Science, Mathematics, and Education*, AK Peters, (2009), 361–370.
- The combinatorics of flat folds: a survey, in Hull (ed.), *Origami^3: Third International Meeting of Origami Science, Mathematics, and Education*, A K Peters (2002), 29–38.

Publications in Progress

- Pruning branches from rigid origami configuration spaces, with T. Tachi, in preparation.
- Coloring duality for polypolyhedra, with s-m. belcastro, in preparation.

Books

- *Origametry: Mathematical Methods in Paper Folding* (research monograph), Cambridge University Press, UK, (2020).
- *Project Origami: activities for exploring mathematics* 2nd edition, CRC Press/AK Peters, Wellesley, MA (2012).
  Translated into Japanese under the title ドクター・ハルの折り紙数学教室 by Nippon Hyoronsha, Tokyo (2015) and in Chinese under 數學摺紙計畫 by Shimao Publishing, New Taipei City, Taiwan (2018).
- Editor, *Origami^3: Proceedings of the Third International Meeting of Origami Science, Mathematics, and Education*, AK Peters, Natick, MA (2002).
  Selections translated into Japanese under the title 折り紙の数理と科学 (*Mathematics and Science of Origami*), T. Kawasaki ed., Morikita Publishing Co., Tokyo (2005).

Other Publications

- Origami Quiz, *The Mathematical Intelligencer*, Vol. 26, No. 4 (Fall 2004), 38–39, 61–63.
- Final Exam, *Math Horizons*, November (2003), inside back cover.
- In search of a practical map fold, *Math Horizons*, February (2002), 22–24.
- Interviewing for a job in academia, with M. Jones and D. Thomas, *Notices of the AMS*, Vol. 45, No. 10 (1998), 1353–1357.

Selected Recent Presentations

- "Origami Mechanics are Sugoi (凄い)!" Uniori-Kiriori 2026 Research Conference, Shonan, Japan (keynote speaker, Aug. 16, 2026)
- "Math Advances in Origami Mechanics" as part of the Structural Origami Gathering Public Lecture, EPFL, Lausanne, Switzerland (invited speaker, Feb. 3, 2026)
- "Elliptic-hyperbolic Rigid Origami Vertex Duality," Geometry of Materials Workshop, ICERM, Brown University (April 8, 2025)
- "Flexible 3D structures arising from a non-Euclidean rigid origami vertex duality", engineering-physics seminar, University of Pennsylvania, (invited speaker, March 12, 2024)
- "Origami Logic", Harvard-MIT Mathematics Tournament, keynote speaker, MIT, (keynote speaker, Feb. 16-18, 2024)
- "Flat origami is Turing complete", AMS Special Session on Serious Recreational Mathematics, at the Joint Mathematics Meetings, San Francisco, CA, (invited speaker, Jan. 6-9, 2024)
- "Flat origami is Turing Complete", F&M-Millersville Joint Math Colloquium, Franklin & Marshall College, Lancaster, PA (Nov. 30, 2023)
- "Origami: Art, Geometry, and Robots," for the National Night of the Classical High School, Italy (invited speaker, over Zoom, May 5, 2023)

- "Origami: Where Art, Math, and Science Meet," Deerfield Gallery Art Association Fiddleheads Gallery, Northfield, MA (invited speaker, April 21, 2023)
- "Origami: Doing Math and Science without Scissors or Glue" and "Rigid Origami and No-hands Folding," Pi Mu Epsilon Conference, University of Saint Benedict and Saint John's College, Collegeville, MN (keynote speaker, April 14-15, 2023)
- "Flexible 3D structures arising from a non-Euclidean rigid origami vertex duality," AMS Special Session on Mathematics and Art, Joint Mathematics Meetings, Boston, MA, (invited speaker, Jan. 4-7, 2023)
- "Rigid origami applications in engineering: configuration spaces and self-folding," AMS Special Section on Real World Applications of Mathematics, Joint Mathematics Meetings, (invited speaker, virtual, April 6-9, 2022)
- "Mathematical Origami and its Myriad Applications," Spring 2022 Section Meeting of the Eastern Pennsylvania-Deleware MAA Section (invited speaker, given via Zoom, April 2, 2022)
- "Face Flips in Flat Origami and the Origami Flip Graph," Art, mathematics and engineering based on the science of origami symposium, Advanced Mathematical Science Institute, Meiji University, Tokyo, Japan (keynote speaker, given via Zoom, Dec. 2, 2021) https://www.youtube.com/watch?v=ad9-IRXC93A
- "Folding Points to a Point and Lines to a Line," 33rd Canadian Conference on Computational Geometry, CCCG (online conference, August 12, 2021)
- "Origami and Math: Paper, Polymers, and Robots" for STEM World: Free Virtual STEM Convention, hosted by STEMEY (invited speaker, given via Zoom, August 15, 2020)
- "Origami-Mathematics: How to fold paper, polymers, and robots," Pi Mu Epsilon Student Mathematics Conference, Moravian College, PA (keynote address, February 22, 2020)
- "The Persistent Usefulness of Origami Mathematics in Engineering : Some New Results to Consider," The Third International Workshop on Origami Engineering (IWOE 2020), Melbourne, Australia (invited lecture given remotely, via Zoom, January 21, 2020)
- "Origami math and its in-creasing applications," Fitchburg State University Pi Mu Epsilon Induction Ceremony, Fitchburg, MA (invited speaker, April 4, 2019)
- "Higher dimensional flat origami and non-crossing conditions.," Joint Meetings of the AMS/MAA, Baltimore, MD (Jan. 2019)
- "Folding Compact Manifolds and Modern Origami," Mathematics Colloquium, University of Essex, Colchester, UK (invited speaker, Sept. 3, 2018)
- "Rigid Foldability of the Augmented Square Twist," 7th International Meeting of Origami Science, Mathematics, and Education, Oxford University, Oxford, UK (Sept., 2018)
- "Self-foldability of Monohedral Quadrilateral Origami Tessellations," 7th International Meeting of Origami Science, Mathematics, and Education, Oxford University, Oxford, UK (Sept., 2018)
- "Folding Paper, Polymers, and Robots: Origami & Math," Common Hour Talk, Franklin & Marshall College, Lancaster, PA (invited speaker, Feb. 15, 2018) https://tinyurl.com/yad652vo
- "Combinatorial Geometry in Origami: the Kawasaki-Maekawa Connection," Joint Meetings of the AMS/MAA, San Diego, CA (Jan., 2018)
- "The Central Role of Combinatorics in Origami," Origami-based Geometric Modeling and Analysis Symposium, Meiji University, Tokyo, Japan, (keynote speaker, Aug. 2017)
- "Double-Line Rigid Origami," 11th Asian Forum on Graphic Science, The University of Tokyo, Komaba Campus, Japan (Aug. 2017)
- "Self-foldability and Rigid Origami," MEAM Seminar, University of Pennsylvania (invited speaker, June 2017)
- "Origami: How to Do Math and Science Without Scissors or Glue," National Academy of Sciences Distinctive Voices Lecture Series, Irving, CA (Dec. 2016) http://www.nasonline.org/programs/distinctive-voices/

- "Origami-Mathematics and Applications"
  Yokohama National University, Yokohama, Japan (invited speaker, Nov. 2015)
  International Christian University, Mitaka, Japan (invited speaker, Dec. 2015)
- "Folding a New Tomorrow: Origami Meets Math and Science," Distinguished Lecture Series, MAA Carriage House, Washington D.C. (invited speaker, Nov. 2015) https://www.youtube.com/watch?v=c3SJ7W6OWfM
- "Folding Compact Manifolds Without Boundary: An Origami Perspective," Mathematics Colloquium, Worcester Polytechnic University, Worcester, MA (invited speaker, Sept. 2015)
- "Modern Origami Theory," 14th Japanese-American Frontiers of Science (JAFoS) Symposium, National Academy of Sciences/Japan Society for the Promotion of Science, Tokyo, Japan (invited speaker, Dec. 2014)
- "Mathematical Methods in Origami, Self-Folding, and Meta-Materials," ASME Conference on Smart Materials, Adaptive Structures, and Intelligent Systems, Newport, RI (invited speaker, Sept. 2014)
- "Counting Miura-ori Phantom Folds," 6th International Meeting of Origami Science, Mathematics, and Education, University of Tokyo, Tokyo, Japan (August, 2014)
- "Forcing Sets in Self-folding Origami," SIAM Conference on Discrete Mathematics, Minn., MN (June 2014)

(and an additional 30 talks given before 2014)

Grants

- PI, NSF standard research grant: "RUI: Configuration Spaces of Flexible Polyhedral Surfaces" (DMS-2347000), awarded Sept. 2023. $225,000, 3-year grant to study the folding angle relationships (configuration spaces) of flexible polyhedral vertices and their connections to the kinematics of flat origami vertices.
- PI, NSF standard research grant: "RUI: Configuration Spaces of Rigid Origami" (DMS-1906202), awarded July 2019. $220,000, 4-year grant to study configuration spaces of rigidly-foldable origami mechanisms.
- Japan Society for the Promotion of Science (JSPS) Grant
  Funded 2-week research visit at the Univ. of Tokyo, Japan to work with Dr. Tomohiro Tachi, Aug. 6–19, 2017.
- Co-PI, NSF Emerging Frontiers in Research and Innovation ODISSEI grant: "Meta-Materials from Self-Folding Polymer Sheets" (EFRI-1240441), PI: Christian Santangelo (UMass), Co-PIs: Itai Cohen (Cornell), Ryan Hayward (UMass), Thomas Hull, awarded August 2012.
  $2 million, 5-year grant to develop theory and mechanics of a self-folding polymer technology. Supported undergraduate research and outreach through the MAMT program at Western New England University.
- PI, Regional Undergraduate Mathematics Conference (RUMC) grant, MAA/NSF, awarded June 2011
  $5000 grant to help host the Hudson River Undergraduate Mathematics Conference at WNE in April 2012.

Awards

- Florence Temko Innovation Award, OrigamiUSA, July 2024
- Western New England University's 2018 Arts and Sciences Faculty Research Award, May 2018
- A. T. Yang Memorial Award in Theoretical Kinematics, with T. Tachi for our paper "Self-foldability of rigid origami" presented at the American Society of Mechanical Engineers' 40th Mechanisms and Robotics Conference, Charlotte, NC, August 23, 2016
- Kavli Fellow of the National Academy of Sciences, 2014
  Invited by the NAS to speak and participate at interdisciplinary symposia emphasizing communication of a wide range of contemporary science topics across the traditional disciplines.
- Murray Fellowship Award, Merrimack College, 2004–2005
  $10,000 grant to pursue research work and book-writing projects in origami-mathematics.
- Yoshino Award, Japanese Origami Academic Society, 2004
  Funded invitation to the 2004 convention of the Japanese Origami Academic Society, where I gave a presentation at Toyo University on the uses of paper folding in education.

- Project NExT Fellow, 1998–1999 (silver dot)
  Competitive MAA Fellowship for new Ph.D.s. Helped organize panel discussions for Project NExT fellows at the 1999 AMS/MAA Joint Meetings.

Committees and Service

Department

- Committees:
  Colloquium Committee (F&M, 2024-2025), MAMT Committee (WNE, 2012–2023, chair), Web Page Committee (WNE, 2012–2023, chair), Technology Committee (WNE, 2012–2023), Job Search Committee (WNE, 2010, 2011, 2014, 2016), HRUMC Committee (WNE, 2010–2012, PI on grant), MAA Conference Committee (WNE, 2009), Search Committee (Merrimack, 1997–2002, chair 1998)
- Math Club advisor (F&M, 2023–present; WNE, 2008–2023; Merrimack, 2000–2008)

College/University

- Committees:
  F&M: Committee on the Faculty Handbook (2024–2027, chair 26-27)
  WNE: JEDI Initiative Committee (2022–2023), Graduate Programs Committee (2021-2023), A&S Curriculum Committee (2016–2018), A&S Peer Review Committee (2019–2023), Faculty Senate Personnel Committee (2013–2015), Faculty Senate Sub-Committee on the Undergraduate Curriculum (2010–2012, co-chair), Salary Equity Committee (2009–2010). Merrimack: Curriculum and Educational Policy Committee (1999–2002, chair 2000–2002), Academic Strategic Planning Committee (1998–2002).
- Ping-Pong Club advisor (F&M, 2025–present)
- Elected offices: Faculty Senate (WNE, 2010–2012), Faculty Senate Executive Committee (Merrimack, 2007–2008)
- Berkshire Hall Learning Interest Community invited faculty guest speaker (WNE, 2018)
- Weekly radio show for WNEK, the WNE student-run radio station. (WNE, 2009–2013, 2016–2017)
- Co-director of the Interdisciplinary Studies Group (Merrimack, 2003–2004)
- Gay-Straight Alliance faculty advisor (Merrimack, 1999–2002)

Profession

- AMS-Simons Research Enhancement Grants for PUI Faculty Committee (2026–2029)
- Steering Committee, Origami Science, Math, and Education (OSME) Meetings (2017–present)
- Masters defense committee member for Elizabeth Hankins thesis "Origami with Infinite Folds," Bryn Mawr College (Spring, 2022)
- NSF Panel reviewer (Fall, 2019)
- Program Committee member for 7OSME (the 7th International Meeting of Origami in Science, Mathematics, and Education), Oxford University (Sept. 5–7, 2018)
- External Examiner for a math Ph.D. defense on origami mathematics, University of Essex, UK, (Sept 4, 2018)
- Kavli Japanese-American Frontiers of Science, Program Group Member (2014–2016, co-chair 2016)
- Organized AMS Special Session on Origami Methods and Applications with E. Demaine and R. Lang, Joint Mathematics Meetings (Seattle 2016)
- Hudson River Undergraduate Mathematics Conference, Steering Committee Chair (2012)
  Managed planning and local organization of the 2012 HRUMC, held at Western New England University
- Arnold Ross Lecture Committee, AMS (2008–2011, chair 2010–2011)
- Organized MAA Invited Paper Session on The Mathematics of Origami with T. Veenstra
  Joint Mathematics Meetings (San Francisco 2010)
- Project NExT Consultant (2009–2010, 2016–2017)
- Board of Directors: Origami USA (a national non-profit cultural and educational arts organization) (1995–2008)
- MAA minicourse "Using Origami in Undergraduate Mathematics Classes"
  Joint Mathematics Meetings (New Orleans 2007, Atlanta 2005, Phoenix 2004)
- Panel Discussion: Getting your first book published, Joint Mathematics Meetings (Jan. 2007)
- 3rd International Meeting of Origami Science, Math, and Education, Program Chair, Asilomar Conference Center, Monterey, CA (March 2001)
- Organized AMS Special Session on Mathematical Methods in Paper Folding with R. Lang, Joint Mathematics Meetings, Baltimore, MD (Jan. 1998)

- Referee for The American Mathematical Monthly (2007–2021), Mathematics Magazine (2002–2020), The College Mathematics Journal (2004–2021), SoCG (2008–2010), MathSciNet (2009, 2022), Science (2015), Nature (2015-2021), ASME (2012–2021), and other journals

Selected Media Mentions

- "How to Build an Origami Computer" by Jordana Cepelewicz, Quanta Magazine, Jan. 30, 2024.
- "The Future is Folded" by Maya Wei-Haas, National Geographic Magazine, February 2023, pp. 34–55.
- "The Atomic Theory of Origami", *Quanta Magazine*, October 31, 2017.
- "How Ancient Origami Techniques Could Help Engineers Fold in 3-D", *Forbes Online*, July 30, 2015.
- "Geometric Origami" TV interview, *Connecting Point* on WGBY (public television, Springfield, MA), May 2012.
- Featured in the documentary *Between the Folds* (2009, Green Fuse Films, distributed by Independent Lens).

Other

- Origami model *Five Intersecting Tetrahedra* was recognized by the British Origami Society in 2000 in their list of "Top 10 Origami Models of All Time."
- Member: AMS, AWM, MAA, AAUP