

Susan Goldstine

Professor of Mathematics
Department of Mathematics and Computer Science
St. Mary's College of Maryland
47645 College Drive
St. Mary's City, MD 20686-3001
✉ sgoldstine@smcm.edu
🌐 <http://faculty.smcm.edu/sgoldstine>



Education

- Harvard University **Ph.D. in Mathematics**, November 1998.
Dissertation title: *Spin Representations and Lattices*.
- A. M. in Mathematics**, June 1996.
- Amherst College **A. B. in Mathematics and French** (*summa cum laude*), June 1993.

Academic Appointments

- St. Mary's College of Maryland **Steven Muller Distinguished Professorship in the Sciences**, August 2019 – May 2022.
- Professorship**, August 2015 – present.
- Associate Professorship**, August 2008 – July 2015.
- Assistant Professorship**, August 2004 – July 2018.
- Amherst College **Visiting Assistant Professorship**, July 2003 – June 2004.
- The Ohio State University **Ross Assistant Professorship**, September 2000 – June 2003.
- McMaster University **Britton Postdoctoral Fellowship**, September 1998 – June 2000.

Post-Tenure Publications

Peer-Reviewed Proceedings Papers and Journal Articles

- *A Mathematical Analysis of Mosaic Knitting: Constraints, Combinatorics, and Color-Swapping Symmetries*, Journal of Mathematics and the Arts, DOI: 10.1080/17513472.2022.2058819 (with Carolyn Yackel).
- *Eight Heptagons: The Double Torus Revisited*, Bridges 2020: Mathematics, Art, Music, Architecture, Education, Culture: Conference Proceedings, Tessellations Publishing, July 2020, pp. 413–416.
- *Self-Diagramming Lace*, Bridges Stockholm: Mathematics, Art, Music, Architecture, Education, Culture: 2018 Conference Proceedings, Tessellations Publishing, July 2018, pp. 519–522.
- *A Survey of Symmetry Samplers*, Bridges Waterloo: Mathematics, Art, Music, Architecture, Education, Culture: Conference Proceedings, Tessellations Publishing, July 2017, pp. 103–110.
- *A Recursion in Knitting*, Bridges Finland: Mathematics, Music, Art, Architecture, Culture: Conference Proceedings, Tessellations Publishing, July 2016, pp. 395–398.
- *Capturing Eight-Color Double-Torus Maps*, Bridges Seoul: Mathematics, Music, Art, Architecture, Culture: Conference Proceedings, Tessellations Publishing, July 2014, pp. 377–380.
- *Bead Crochet Bracelets: What Would Escher Do?*, Bridges Towson: Mathematics, Music, Art, Architecture, Culture: Conference Proceedings, Tessellations Publishing, July 2012, pp. 567–572 (with Ellie Baker).
- *Building a better bracelet: Wallpaper patterns in bead crochet*, Journal of Mathematics and the Arts 6 (2012), no. 1, pp. 5–17 (with Ellie Baker).

Post-Tenure Publications (continued)

Other Journal Articles

- *Ars Mathematica*: *From Math to Art and Back Again*, Notices of the American Mathematical Society, **69** (2022), no. 7, pp. 1220–1229 (with Liz Paley and Henry Segerman).
- *Report: The 2014 Joint Mathematics Meetings Exhibition of Mathematical Art*, Journal of Mathematics and the Arts, **9** (2015), no. 1–2, pp. 54–61.
- *Review: Beyond Rubik's Cube Exhibit*, The College Mathematics Journal, **45** (September 2014), no. 4, pp. 254–256 (with Calvin Armstrong).
- *Beading the Seven Color Map Theorem*, Math Horizons, September 2013, pp. 22–24 (with Ellie Baker and Sophie Sommer).
- *Fibonacci Mobiles*, Math Horizons, November 2008, pp. 24–25 (with Alison Frane).

Books and Chapters

- *Crafting Conundrums: Puzzles and Patterns for the Bead Crochet Artist*, A.K. Peters/CRC Press, December 2014 (with Ellie Baker).
- *Perfectly Simple: Squaring the Rectangle*, Chapter 7 of *Crafting by Concepts*, editors sarah-marie belcastro and Carolyn Yackel, A.K. Peters, April 2011, pp. 141–148

Post-Tenure Mathematical Artworks

Solo and Recurring Exhibitions

- *Fundamental Regions: The Math/Art of Susan Goldstine*, Boyden Gallery, St. Mary's College of Maryland, January–March 2022 (**FBMA 2022**)
- *Joint Mathematics Meetings Exhibition of Mathematical Art*, January, years and locations as noted (**JMM**)
- *Bridges Conference Art Exhibition*, July/August, years and locations as noted (**Bridges**)

Award-Winning Works

- *Map Coloring Jewelry Set*, Bead crochet and bead woven necklace, bracelet, and earrings, 2014.
 - FRMA 2022; Bridges Baltimore 2015
 - **Best Textile, Sculpture, or Other Medium**, JMM San Antonio 2015.
- *Tessellation Evolution*, Bead crochet necklace with parquet deformation, 2012.
 - **Honorable Mention**, JMM San Diego 2013.

Juried and Invited Exhibition Works

- *Seed Values II*, Digital print showing photos of a daisy seed head overlaid with color-coded seed-growth numbers, 2021.
 - Bridges Aalto, Finland 2022; FRMA 2022.
- *Seed Values I*, Digital print showing photos of a daisy seed head overlaid with color-coded seed-growth numbers, 2021.
 - FRMA 2022.
- *A Tree for Virahanka*, Two-color brioche knitting with recursive branching on copper wire, 2021.
 - FRMA 2022.
- *Virahanka's Thoughts Overflow*, Negatively-curved two-color brioche knitting with recursive branching on copper wire, 2021.
 - FRMA 2022.

Post-Tenure Mathematical Artworks (continued)

- *Symmetry Flow*, Wire-and-paper mobile flowchart of wallpaper symmetries, 2020.
 - FRMA 2022; JMM Virtual 2021; Bridges Virtual 2021.
- *Makeri Mosaic*, Mosaic knitting with frieze designs, 2019.
 - FRMA 2022; JMM Denver 2020.
- *Float Free, Bumblebee*, Mosaic knitting with two-color frieze designs, 2019.
 - FRMA 2022; Bridges Linz, Austria 2019; *Mathematical Beauty*, AAAS Gallery, Washington D.C., March–June 2019.
- *Fundamental Frieze Scroll II*, Knitted-lace ornamented Truchet tiles forming all possible frieze symmetries, marked by colored beads, 2018.
 - FRMA 2022; Bridges Linz, Austria 2019; *Mathematical Beauty*, AAAS Gallery, Washington D.C., March–June 2019; JMM Baltimore 2019.
- *Fundamental Frieze Scroll I*, Knitted-lace Truchet tiles forming all possible frieze symmetries, marked by colored beads, 2018.
 - FRMA 2022; JMM Baltimore 2019.
- *The Symmetries Diagram Themselves*, Lace knitting with frieze symmetries marked by colored beads, 2018.
 - FRMA 2022; Bridges Stockholm, Sweden 2018.
- *Coded Symmetries*, Lace knitting with frieze symmetries marked by colored beads, 2018.
 - FRMA 2022; *Scientific Methods (Art + Science)*, Blue Spiral 1 Gallery, Asheville, May–June 2018.
- *Serpentine Symmetries*, Bead crochet and bead woven necklace, bracelet, and earrings with wallpaper symmetries, 2017.
 - FRMA 2022; *Bisect*, Frances Sewell Plunkett Gallery, Macon, March 2019; Bridges Stockholm, Sweden 2018; JMM San Diego 2018.
- *Linear Lace in Burgundy*, Knitted lace with all possible frieze symmetries, 2017.
 - FRMA 2022; JMM San Diego 2018.
- *Linear Lace Pendant*, Knitted lace with all possible frieze symmetries, 2017.
 - Bridges Waterloo, Ontario 2017.
- *The Double Knitting Groups*, Double-knit wall hanging with wallpaper group designs, 2016.
 - FRMA 2022; Bridges Waterloo, Ontario 2017; *Adjacent*, Frances Sewell Plunkett Gallery, Macon, February–March 2017;
 - JMM Atlanta 2017.
- *Fibonacci Downpour*, Negatively curved lace knitting with recursive branching, 2015.
 - FRMA 2022; *Mathematical Beauty*, AAAS Gallery, Washington D.C., March–June 2019; Bridges Jyväskylä, Finland 2016; JMM Seattle 2016.
- *Knit Bifurcation*, Lace knitting with branched doubling, 2015.
 - FRMA 2022; *Mathematical Beauty*, AAAS Gallery, Washington D.C., March–June 2019; *Scientific Methods (Art + Science)*, Blue Spiral 1 Gallery, Asheville, May–June 2018; JMM Seattle 2016.
- *Frieze Frame*, Framed bead crochet disk with frieze designs, 2015.
 - FRMA 2022; *Mathematical Beauty*, AAAS Gallery, Washington D.C., March–June 2019; Bridges Baltimore 2015.
- *Hyperbolic Constellation*, Bead crochet surface of constant negative curvature, 2014.
 - FRMA 2022; *Bisect*, Frances Sewell Plunkett Gallery, Macon, March 2019; JMM San Antonio 2015.

Post-Tenure Mathematical Artworks (continued)

- *Eight-Color 8*, Bead crochet double-torus pendant with map coloring, 2014.
 - FRMA 2022; *Bisect*, Frances Sewell Plunkett Gallery, Macon, March 2019; Bridges Seoul, South Korea 2014.
- *Toroidal Tessellations*, Bead crochet bracelets with regular tessellations, 2012 (with Ellie Baker).
 - Bridges Towson 2012.
- *Crystallographic Bracelet Series*, Bead crochet bracelets with wallpaper group designs, 2011 (with Ellie Baker).
 - JMM Boston 2012.
- *Tea for Eight*, Ceramic tea set with map coloring, 2010.
 - FRMA 2022; JMM New Orleans, 2011.
- *Seven-Color Torus Series in Bead Crochet*, Bead crochet bracelets with map colorings, 2009 (with Ellie Baker and Sophie Sommer).
 - JMM San Francisco 2010

Juried Fashion Show Pieces

- *Fourteen Ciphers*, Mosaic-knitted shawl with all two-color frieze types compatible with mosaic knitting, 2019.
 - FRMA 2022; Bridges Math + Fashion Show, Linz, Austria, July 2019.
- *Seven Peaks*, Mosaic-knitted cardigan with designs for all the frieze symmetry types, 2019.
 - Bridges Math + Fashion Show, Linz, Austria, July 2019.
- *Crystalline*, Double-knitted scarf with designs for all nine wallpaper groups compatible with double knitting, 2016.
 - FRMA 2022; Bridges Math + Fashion Show, Linz, Austria, July 2019.

Collaborative Installation

- *Mathemalchemy*, Large-scale multimedia collaborative mathematical art installation, 2021 (with Ingrid Daubechies, Dominique Ehrmann, and 21 others).
 - National Academy of the Sciences Gallery, Washington DC, January–June 2022; Juniata College, Pennsylvania, June–November 2022; 808 Gallery, Boston University, January–March 2023; Beaty Biodiversity Museum, University of British Columbia, April–October 2023.

Post-Tenure Presentations

Plenary Addresses

- “Maps of Strange Worlds: Adventures in Topological Art,” Martin Gardner Address, MathFest, Tampa, August 2023.
- “When Mathematics Says No: The Aesthetics of Impossibility,” Invited Address, Regional Undergraduate Mathematics Research Conference, Towson University, April 2023.
- “When Mathematics Says No: The Aesthetics of Impossibility,” Invited Address, Rose-Hulman Undergraduate Mathematics Conference, Terre Haute, April 2019.
- “A Survey of Symmetry Samplers,” Plenary Lecture, Bridges 2017, Waterloo, Ontario, July 2017.
- “Fortunatus’s Purse: a many-colored story,” Keynote Address, Michigan REU Conference, Central Michigan University, June 2009.

Post-Tenure Presentations (continued)

Invited and Conference Talks

- “Number Sequences in Knitting and Crochet,” Fundapromat (Panamanian Foundation for the Promotion of Mathematics) Webinar, July 2023.
- “Confessions of a Number Addict,” AMS Special Session on the Mathematics and the Arts, Joint Mathematics Meetings, Boston, January 2023.
- “If You Give a Mouse Some Symmetries,” AMS Special Session on the Math and Art of Mathematics, Joint Mathematics Meetings, Boston, January 2023.
- “Branch and Twist: Mathematics in Two-Color Brioche Knitting,” AMS Special Session on Mathematics and Fiber Arts, Joint Mathematics Meetings, Boston, January 2023.
- “Slip, Branch, Twist: Adventures in Mathematics and Two-Color Knitting,” InfoMaCS Division Colloquium, Juniata College, October 2022.
- “Adventures in Brioche Knitting,” Bay Area Art and Math!, Zoom Conference, August 2022.
- “Mosaic Knitting Friezes: seventeen symmetries, minus three,” Gathering for Gardner 14, Atlanta, April 2022.
- “Seed Values: Confessions of a Number Addict,” Bay Area Art and Math!, Zoom Conference, June 2021.
- “When Mathematics Says No: The Aesthetics of Impossibility,” Albion College Mathematics and Computer Science Colloquium, March 2021.
- “Maps of Strange Worlds: Beyond the Four-Color Theorem,” Gathering for Gardner Celebration of Mind, Zoom, January 2021.
- “Eight Heptagons: The Double Torus Revisited,” Bay Area Art and Math!, Zoom Conference, July 2020.
- “Symmetry Flow: The Perils of Staring at Flowcharts,” Bay Area Art and Math!, Zoom Conference, June 2020.
- “Color Swaps in Mosaic Knitting,” MAA Session on Mathematics and the Arts, Joint Mathematics Meetings, Denver, January 2020.
- “Yarn, Stitch, Fabric: Searching for a Theory of Knitted Lace Symmetry,” Computational Textiles Workshop, ICERM, Providence, September 2019.
- “Color Swaps in Mosaic Knitting,” MOVES Conference, Museum of Mathematics, New York, August 2019.
- “Color Swaps in Mosaic Knitting,” MAA MD-DC-VA Section Meeting, Frederick County Community College, April 2019.
- “Bichromatic Symmetries in Mosaic Knitting,” Mathematics Colloquium, American University, Washington, D.C., February 2019.
- “Self-Diagramming Lace: Minimalist Edition”, MAA Session on Mathematics and the Arts, Joint Mathematics Meetings, Baltimore, January 2019.
- “Symmetry Samplers,” Gathering for Gardner 13, Atlanta, March 2018.
- “The Fabric of Symmetry: Connecting Mathematics and Fiber Arts,” Math Encounters, National Museum of Mathematics, New York, February 2018.
- “Knitting Symmetries: Yarn, Stitch, and Fabric”, MAA Session on Arts and Mathematics: The Interface, Joint Mathematics Meetings, San Diego, January 2018.
- “Knitting Symmetries: Preliminary Needling,” MAA MD-DC-VA Section Meeting, Christopher Newport University, November 2017.
- “Symmetric Threads: Classifying Symmetries in the Fiber Arts,” Graduate-Student AMS Chapter Lecture, Rutgers University, November 2017.

Post-Tenure Presentations (continued)

- “Symmetric Threads: Classifying Symmetries in the Fiber Arts,” Symmetry Festival, Vienna, July 2016.
- “Thinking Outside the Torus: Geometric explorations in bead crochet,” MAA Session on Mathematics and the Arts, Joint Mathematics Meetings, Seattle, January 2016.
- “You can never have too many bracelets: Adventures in mathematical beading,” Undergraduate Lecture, American University, Washington, D.C., October 2015.
- “You can never have too many bracelets: Adventures in mathematical beading,” Undergraduate Lecture, McDaniel College, Westminster, MD, September 2015.
- “Maps of Strange Worlds: Beyond the Four-Color Theorem,” MathFest, Washington DC, August 2015.
- “Thinking Outside the Torus: New directions in bead crochet,” AMS-EMS-SPM Meeting, Porto, Portugal, June 2015.
- “You can never have too many bracelets: Adventures in mathematical beading,” Longwood University Undergraduate Colloquium, November 2014.
- “Building a Better Bracelet: Wallpaper Patterns in Bead Crochet,” Bridges Conference, Seoul, August 2014.
- “Beading the Seven-Color Torus,” Gathering for Gardner XI, Atlanta, March 2014.
- “Tessellations on Bead Crochet Bracelets,” MAA MD-DC-VA Section, Longwood University, November 2013.
- “Tessellations on Bead Crochet Bracelets,” MOVES Conference, Museum of Mathematics, New York, August 2013.
- “Fortunatus’s Purse and the wealth of the world,” PME Induction Ceremony, Randolph-Macon College, April 2012.
- “Fortunatus’s Purse: a many-colored story,” Gathering for Gardner X, Atlanta, March 2012.
- “Building a Better Beaded Bracelet: Transformations, Tesselations and Tori,” MAA Session on Mathematics and the Arts, Together Again, Joint Mathematics Meetings, Boston, January 2012.
- “Building a better bracelet: Wallpaper patterns in bead crochet,” MathFest (National MAA Meeting), Lexington, KY, August 2011.
- “Fortunatus’s Purse and the wealth of the world,” Mathematics Colloquium, Montgomery College, Germantown, November 2010.
- “The Discovery of Non-Euclidean Geometry,” Mathematics Colloquium, Virginia Commonwealth University, April 2009.

Conference Workshops

- “Teaching Mathematics with Bead Crochet,” MAA minicourse on the mathematics of bead crochet lead with Ellie Baker, MathFest, Washington DC, August 2015.
- “Bead Crochet Bracelets: What Would Escher Do,” Bead crochet workshop lead with Ellie Baker, Bridges Conference, Towson University, July 2012.

Campus and Community Talks

- “Math + Art + Zoom = Mathemalchemy,” Natural Sciences and Mathematics Colloquium, March 2022.
- Steven Muller Lecture/Artist’s Talk for the exhibit “Fundamental Regions: The Math/Art of Susan Goldstine,” Boyden Gallery, February 2022.
- “Symmetric Threads: the language of symmetry in the fiber arts,” Natural Sciences and Mathematics Colloquium, February 2020.

Post-Tenure Presentations (continued)

- “Too many bracelets: Further adventures in mathematical beading,” Natural Sciences and Mathematics Colloquium, February 2015.
- “Serial Geometries,” (workshop lead together with Fred Scharmen), Big Table Connections, Baltimore Museum of Art, August 2014.
- “You can never have too many bracelets: Adventures in mathematical beading,” Southern Maryland Sticks and Stitches, Lexington Park, August 2012.
- “You can never have too many bracelets: Adventures in mathematical beading,” Natural Sciences and Mathematics Colloquium, April 2012.
- “The Geometries of Escher,” Natural Sciences and Mathematics Colloquium, February 2010.

Post-Tenure Teaching and Mentoring

Teaching Award

- John Smith Teaching Award, MD-DC-VA Section of the Mathematical Association of America, 2020.

Four-Credit Courses (2008 – 2022)

- Core Seminars ■ Core 101 (History of Scientific Thought), 2 sections.
- 100-level ■ Math 151 (Calculus I), 25 sections; Math 152 (Calculus II), 5 sections, Math 131 (Survey of Mathematics: Mathematics and the Arts), 1 section.
- 200-level ■ Math 281 (Foundations of Mathematics), 14 sections; Math 200 (Discrete Mathematics), 1 section; Math 256 (Linear Algebra), 1 section.
- 300-level ■ Math 321 (Abstract Algebra I), 9 sections; Math 322 (Abstract Algebra II), 5 sections.
- 400-level ■ Math 421 (Combinatorics), 1 section; Math 422 (Abstract Algebra II), 4 sections; Math 485 (Topics in Mathematics: Galois Theory), 1 section; Math 485 (Topics in Mathematics: On Beyond Euclid), 1 section; Math 495 (Senior Topics Seminar: The Number Theory of Sophie Germain), 1 section

Recent Student Research

- Summer 2019 ■ Mentor for Kyler Crank’s St. Mary’s Undergraduate Research Fellowship project, “Developing Analogous Models of the $3x+1$ Conjecture.”
- Summer 2013 ■ Advisor for Demara Austin, Randalle Engstrom-Nadeau, Aye Mi San, and Mario Sanchez’s NSF Research Experience for Undergraduates project, “Small Universe, Infinite Possibilities: Restricting Conway’s Game of Life to a Finite Universe.”
- Summer 2012 ■ Instructor for Intro to Research Seminar, NSF Research Experience for Undergraduates.
- Summer 2011 ■ Instructor for Intro to Research Seminar, NSF Research Experience for Undergraduates.
- Summer 2009 ■ Instructor for Intro to Research Seminar, MAA National Research Experience for Undergraduates.
- 2008 – 2022 ■ Advisor for 8 St. Mary’s Projects and 7 Senior Projects.

Post-Tenure Professional Service

Department Service

- 2022 – 2023 📌 Mathematics Search Committee.
- 📌 Co-organizer for Math 12/ldots3 talk series.
- 2018 – 2024 📌 Mathematics TA Coordinator.
- 📌 WeBWorK Administrator.
- 2018 – 2019 📌 Organizer for 246 Math Lounge talk series.
- 2015 – 2017 📌 Math Club Advisor.
- 📌 WeBWorK Administrator.
- Spring 2014 📌 Computer Science Search Committee Chair.
- 2013 – 2017 📌 Math TA Coordinator,
- Summer 2013 📌 Mathematics Search Committee Chair.
- 2012 – 2015 📌 Department Chair.
- 2012 – 2013 📌 Mathematics Search Committee Chair.
- 2011 – 2013 📌 Math Club Advisor.
- 2009 – 2010 📌 Mathematics Search Committee.
- 2008 – 2009 📌 Mathematics Search Committee.

College Service

- Spring 2022 📌 Physics Visiting Search Committee.
- 2021 – 2024 📌 Faculty Senate.
- January 2021 📌 Faculty Council.
- 2019 – 2023 📌 Faculty Lecture Committee.
- 2015 – 2017 📌 Curriculum Committee.
- Summer 2015 📌 Faculty Co-leader, Greece Summer Study Tour.
- 2013 – 2016 📌 Natural Sciences and Mathematics Colloquium Committee.
- 2011 – 2012 📌 College Evaluation Committee.
- Fall 2009 📌 Physics Department Evaluation Committee.
- 2008 – 2010 📌 Faculty Senate.
- 📌 Faculty Issues Committee.
- 📌 Faculty Seminar Committee (Chair 2009 – 2010).
- 2008 – 2009 📌 Nitze Scholars Program Committee
- 📌 Natural Sciences and Mathematics Colloquium Committee

Mathematical Community Service

- January 2023 📌 Hexaflexagon Table, AMS/PME Undergraduate Student Reception, Joint Math Meetings, Boston.
- 2020 – 📌 Co-chair of the Bridges Fashion Show Committee.
- 2019 – 📌 Member of the Bridges Organization Board of Directors.
- 2018 – 2019 📌 Bridges 2019 Program Chair.
- 2018 – 2020 📌 Chair and Founder of the Bridges Fashion Show Committee.
- 2016 – 2024 📌 Associate Editor, *Journal of Mathematics and the Arts*.

Post-Tenure Professional Service (continued)

- August 2015 **■** Hexaflexagon Table, Mathematical Carnival at the MAA Centennial, MathFest, Washington DC.
- 2014 – 2023 **■** Member of Bridges Conference Proceedings Program Committee.
- November 2013 **■** Member of Section NExT Panel on tenure and promotion, MAA MD-DC-VA Section Meeting, Longwood University.
- January 2012 **■** Member of Project NExT Panel “Building a Tenure Portfolio,” Joint Mathematics Meetings, Boston.
- 2008 – 2017 **■** Member of the Editorial Board, *College Mathematics Journal*.