Ryan Shifler, Ph.D.

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Education and Training

2025 — **Emerging Leader Program, Leadership Maryland.** Competitively selected from public, private, government, education, and nonprofit sectors in the State of Maryland.

2013 – 2017 — **Ph.D., Virginia Tech** in Mathematics.

2011 – 2013 — **M.S., Virginia Tech** in Mathematics.

2009 – 2011 — **B.S., Salisbury University** in Mathematics.

2007 – 2009 — **A.A. & A.S., Hagerstown Community College** in Mathematics and Arts and Sciences.

Academic Administrative Experience

Associate Dean of the Richard A. Henson School of Science and Technology, Salisbury University

2022 – · · ·

- Director of the Integrated Science Program.

I work with students and faculty to help students meet their goals to graduate with a Bachelor's of Science. I facilitate the necessary administrative components for a program study, including the Academic Program Review. I propose curriculum changes as appropriate to align the program to student educational and career goals.

- Co-Coordinator of the Forensic Science Concentration within the Integrated Science Program.

I facilitate the concentration in partnership with a faculty member with content expertise. This work includes maintaining a close working relationship with Wor-Wic Community College (WWCC) to execute a Memorandum of Understanding that allows Salisbury University students to take courses at WWCC with key financial and logistical components specified.

- Oversee the Urban and Regional Planning Program.

I support key personnel in the administration of the program. This includes recommending program updates based on changing university policy, supporting proposed changes through the curriculum process, and communicating key administrative information to the Program Director.

- Data analytics for informed decision making.

I Informed decisions by utilizing data analytics. This includes a study on DFW rates, degree completion rates, program selection and changes, summer and winter sessions, and other key data points over six years for first-time students. In addition, I did a study of math and chemistry placement exams. Changes were implemented in both cases as a result of the study. In particular, placement into Calculus I is now determined by high school transcripts.

- Articulation agreements for student recruitment.

I led an effort to build partnerships with community colleges to create articulation agreements to better ensure a smooth transfer for STEM students. This is includes bringing faculty together to discuss curricular matters as a means to reduce administrative challenges in the transfer space. At least nine agreements with five community colleges are receiving final review.

- Outreach initiatives.

I assembled a team of faculty to write NSF grant proposals to support the educational mission of the university to provide resources to students. I serve as an ex officio member of the STEM Outreach Committee to advocate for appropriate resources to support faculty efforts. Additional outreach efforts include facilitating Henson Newsletters and Henson Seminars.

Mathematics and Computer Science Tutor Coordinator, Salisbury University

Fall 2021 – Spring 2022 for the Department of Mathematical Sciences and the Department of Computer Science.

Academic Administrative Experience (continued)

Spring 2018 – Spring 2019 for the Department of Mathematics and Computer Science.

I facilitated the application and hiring processes with Department Chairs. I worked with student contracts, met deadlines for Human Resources, and was cognizant of administrative factors. I broadened student recruitment to all science programs and an effort was made to recruit students from diverse backgrounds. I introduced electronic sign-in system to track student attendance.

Calculus Readiness Director, Salisbury University

Spring 2018 – Spring 2019

This is a program that implemented a co-requisite and just-in-time learning program to support students in Calculus I. Calculus Readiness came about as my colleagues in the department noticed a significant decline in student's mastery of prerequisite material necessary to succeed in Calculus I. The main idea was to offer students the opportunity to learn the prerequisite material in tandem with the material in calculus. The students would attend a Calculus Readiness Session in the Math Emporium to learn about the prerequisite material right before that material was covered in Calculus I. Developing the program required me to lead three other colleagues in the development of the Calculus Readiness Session materials. The material needed to follow in logical order along with being introduced at the appropriate time to coincide with the Calculus I course. Finding a balance between these two goals took careful consideration. I organized Calculus Readiness Leaders to run the Calculus Readiness Sessions and created infrastructure to organize students across six sections of Calculus I (about 150 students) into Calculus Readiness Sessions.

External Leadership Experience

Maryland State Department of Education (MSDE)

Fall 2024 – · · · › Co-Chair, Launch Years Task Force.

The Launch Years Task Force is assigned to inform policy changes in secondary education mathematics. As an invited Co-Chair I serve in this role to provide insights into higher education in terms of curriculum alignment. In particular, I act as a conduit between post secondary institutions and MSDE to communicate proposed changes and associated challenges to help ensure alignment in mathematics between high schools and colleges.

University System of Maryland (USM)

Fall 2023 – · · · › Member, USM High School Math Course Evaluation Group.

USM admission standards require four years of high school mathematics. Since high school curriculum in Maryland is locally controlled the work requires a team of math faculty across USM institutions to review courses for each county and Baltimore City to determine whether or not USM math admissions requirements are met. The team of faculty review course syllabi, exams, and other assessments to ensure the inclusion of appropriate mathematical content.

Fall 2022 – · · · › Co-Chair, USM-Maryland Association of Community Colleges Math Affinity Group.

The group recommends and considers policy questions regarding admissions standards, the transfer with success act, the blueprint legislation, etc. Part of the work is having faculty across the State of Maryland agree on student learning outcomes for mathematics courses to improve the experience for students transferring from a community college to a four-year institutions of higher education. In particular, I chaired a subcommittee on creating student learning outcomes for differential equations across the statement of Maryland.

MD-DC-VA Section of the Mathematical Association of America (MAA)

Fall 2020 – Fall 2022 › Program Chair.

External Leadership Experience (continued)

The main tasks of the Program Chair, an elected position, include finding 2-3 invited speakers, finding a workshop leader, and creating the schedule for the contributed talks at the Section Meetings. Section Meetings are held twice per year with one in the Fall and the other in the Spring. The impact of COVID pushed the Fall 2020 Section Meeting online and I was a key player in making sure the meeting was a success. There was no precedence for how to hold a virtual Section Meeting and along with the Section Chair devised a plan that worked well and the attendees were able to enjoy the Section Meeting. The Spring 2021 Section Meeting also moved online and we kept the same plan as Fall 2020 and we were able to have an enjoyable Section Meeting.

Spring 2020 and Fall 2021 › Salisbury University Representative/Site Coordinator for the MD-DC-VA Section Meeting.

Salisbury University had planned to host the Spring 2020 Section Meeting and I was the Site Coordinator. We anticipated about 120 attendees. We had worked to make sure an appropriate number of hotel rooms were booked, classrooms were reserved, we had signage made, we had catering planned, and the the section Webmaster had the appropriate information to post on the website as mathematicians planned their trip to Salisbury University. Then COVID hit and the section meeting was canceled. Salisbury University later hosted the Fall 2021 Section Meeting in-person and I was the Program Chair and the Site Coordinator. 72 people registered for the meeting. The COVID protocols were fluid and any one of the plans could change at anytime. There are usually a few dozen in person MAA events and in 2021 there were two or three with Salisbury University being one of them.

Academic and Teaching Appointments

2023 – · · · › **Associate Professor,** Department of Mathematical Sciences, Salisbury University.

2017 – 2023 › **Assistant Professor,** Department of Mathematical Sciences, Salisbury University.

2011 – 2017 › **Graduate Teaching Assistant,** Department of Mathematics, Virginia Tech.

2011 & 2014 › **Adjunct Faculty,** Developmental Mathematics, Hagerstown Community College.

Publications

Research

In pure mathematics, authors are listed in alphabetical order. It is generally accepted that each author contributed equally to the work.

Bold font indicates undergraduate coauthors.

- *On the quantum parameter in the quantum cohomology of a family of odd symplectic partial flag varieties*, Journal of Algebra and Its Applications, to appear. (with **C. Bean** and **C. Shank**.)
- *Minimum quantum degrees with Maya diagrams*, Annals of Combinatorics 29 (2), 395-413, 2025.
- *Curve neighborhoods and combinatorial property $\mathcal{O}$ for a family of odd symplectic partial flag manifolds*, Rocky Mountain Journal of Mathematics, to appear. (with **C. Bean** and **B. Cruikshank**.)
- *Positivity determines the quantum cohomology of the odd symplectic Grassmannian of lines*, Communications in Algebra 52 (11), 4955-4960, 2024.
- *Curve neighborhoods of Schubert varieties in the odd symplectic Grassmannian*, Transformation Groups 29 (1), 361-408, 2024. (with C. Pech.)
- *On the spectral properties of the quantum cohomology of the odd quadrics*, Involve, a Journal of Mathematics 16 (1), 27-34, 2023. (with **S. Warman**.)
- *Minimum quantum degrees for isotropic Grassmannians of types B and C*, Annals of Combinatorics 26 (2), 453-480, 2022. (with C. Withrow.)
- *On Frobenius-Perron dimension*, Proceedings of the American Mathematical Society 150 (12), 5035-5045, 2022. (with C. Li, M. Yang, and **C. Zhang**.)

Publications (continued)

- *Galkin's lower bound conjecture holds for the Grassmannian*, Communications in Algebra 48 (2), 857-865, 2020. (with **L. Evans**, L. Schneider, **L. Short**, and **S. Warman**.)
- *Conjecture $\mathcal{O}$ holds for some horospherical varieties of Picard rank 1*, Involve, a Journal of Mathematics 13 (4), 551-558, 2020. (with **L. Bones**, **G. Fowler**, and L. Schneider.)
- *Conjecture $\mathcal{O}$ holds for the odd symplectic Grassmannian*, Bulletin of the London Mathematical Society 51 (4), 705-714, 2019. (with C. Li, and L. Mihalcea.)
- *Equivariant quantum cohomology of the odd symplectic Grassmannian*, Mathematische Zeitschrift 291 (3-4), 1569-1603, 2019. (with L. Mihalcea.)
- *Equivariant quantum cohomology of the odd symplectic Grassmannian*, Ph.D. Dissertation, Virginia Polytechnic Institute and State University Library, 2017.
- *Universal Groebner bases of circulant polynomial systems*, Proceedings of The National Conference On Undergraduate Research (NCUR), 2011.

Expository

- *Faculty writing groups for mathematicians*, MAA Focus (October/November 2018). (with J. Anderson, J. Austin, Y. Jing, L. Schneider, and S. Wesolowski.)

Journal Refereeing

- Journal of Algebraic Combinatorics.
- Communications in Algebra.

Student Mentee Awards and Recognition

Departmental Honors	**Garrett Fowler** (2019), **Stephanie Warman** (2021), **Laurie Short** (2021), and **Caleb Shank** (2025).
University Honors	**Stephanie Warman** (2021) and **Connor Bean** (2024).
MAA Sectional Paper Award	**Garrett Fowler** presented *Conjecture $\mathcal{O}$ holds for some horospherical varieties of Picard rank 1* at the contributed paper session of the Spring 2019 MD-DC-VA Sectional Meeting of the MAA. **He won the second place award for Best Paper**.
JMM Poster Award	**Lela Bones** and **Garrett Fowler** presented *Conjecture $\mathcal{O}$ holds for some horospherical varieties of Picard rank 1* at the undergraduate poster session of the 2019 Joint Mathematics Meetings. **They received the Outstanding Poster Award**.

Funding and Grants Administration

$368	Received the Henson Travel Award to attend the Spring Meeting of the MD-DC-VA section of the MAA held at George Mason University held on April 11-12, 2025.
$3,300	Received through the Henson Summer Research Program at Salisbury University for Summer 2025 to work with student **Stephen Barr**.
$1,000	Received the Henson Travel Award to attend The Joint Mathematics Meeting held in San Francisco, CA held on January 3-6, 2024.
$12,000	Received, with Josh Sokoloski, Susanne Daly, and Giulia Franchi, through the Faculty Research Enhancement Grants Program at Salisbury University in a collaborative project across departments to support transfer students in the school of science for 2024.

Funding and Grants Administration (continued)

$4,000	Received through the Henson Summer Research Program at Salisbury University for Summer 2023 to work with students **Connor Bean** and **Caleb Shank**.
$4,000	Received through the Henson Summer Research Program at Salisbury University for Summer 2022 to work with students **Connor Bean** and **Bradley Cruikshank**.
$10,645	Received through the Faculty Research Enhancement Grants Program at Salisbury University for 2020.
$1,000	Received the Henson Travel Award to attend The Joint Mathematics Meeting held in Denver, CO held on January 15-18, 2020.
$1,000	Received the Henson Travel Award to attend The Joint Mathematics Meeting held in Baltimore, MD held on January 16-19, 2019.
$1,000	Received the Henson Travel Award to attend The Joint Mathematics Meeting held in San Diego, CA held on January 10-13, 2018.
$1,000	Awarded grant (Declined) from the SU foundation to attend Math Fest in Denver, CO held in 2018.
$450	Awarded to attend The Ohio State Workshop on Schubert Calculus held on May 9-12, 2018.
$39,763	**Total amount awarded.**

Presentations

Invited Talks

- *Curve neighborhoods of Schubert Varieties of the odd symplectic Grassmannian*, Eastern Fall Sectional Meeting of the American Mathematical Society, UMass Amherst, October 1-2, 2022.
- *Curve neighborhoods of Schubert Varieties of the odd symplectic Grassmannian*, Virginia Tech, Algebra Seminar, January 28, 2022.
- *Curve neighborhoods of Schubert Varieties of the odd symplectic Grassmannian*, University of Poitiers, Groups, Algebra, and Geometry Seminar, November 18, 2021.
- *Minimum quantum degrees for isotropic Grassmannians of types B and C*, (Cancelled) Virginia Tech, Algebra Seminar, April 3, 2020.
- *Equivariant quantum cohomology of the odd symplectic Grassmannian*, Rutgers University, Algebra Seminar, February 22, 2017.

Invited Talks at Salisbury University

- *An introduction to (quantum) Schubert calculus*, Salisbury University Math and Computer Science Club Meeting, October 20, 2020.
- *An invitation to algebraic geometry*, Salisbury University Math and Computer Science Department Colloquium, September 26, 2019.

Contributed Presentations

- *Quantum cohomology determined with negative structure constants present* at The Joint Mathematics Meetings. San Francisco, CA January 3-6, 2024.
- *A proposed generalization of a full rim hook removal on partitions* at The Mathematical Association of America Maryland-District of Columbia-Virginia Section Meeting. Montgomery College; Germantown, MD. April 22-23, 2022.
- *Calculus readiness* at The Mathematical Association of America Maryland-District of Columbia-Virginia Section Meeting. Hood College and Frederick Community College; Frederick, MD, April 12-13, 2019.
- *Calculus readiness* at the Joint Mathematics Meetings. Baltimore, MD January 16-19, 2019.

Presentations (continued)

- *Calculus readiness* at The Mathematical Association of America Maryland-District of Columbia-Virginia Section Meeting. Mary Washington University; Fredericksburg, VA. November 2-3, 2018.
- *Universal Groebner bases of circulant polynomial systems* at The Joint Mathematics Meetings. San Diego, CA January 10-13, 2018.
- *Curve neighborhoods of the odd symplectic Grassmannian* at The Mathematical Association of America Maryland-District of Columbia-Virginia Section Meeting. Christopher Newport University; Newport News, VA. November 17-18, 2017.
- *Schubert calculus* at The Mathematical Association of America Maryland-District of Columbia-Virginia Section Meeting. Johns Hopkins University; Baltimore, Maryland. November 5, 2016.
- Seminar talk of *Quantum cohomology of the odd symplectic Grassmannian* at the Algebra Seminar. Virginia Tech; Blacksburg, Virginia. April 29, 2016.
- Show and tell presentation of *Quantum cohomology of the odd symplectic Grassmannian* at the Algebra Seminar. Virginia Tech; Blacksburg, Virginia. April 17, 2015.
- Master thesis defense of *Computation algebraic geometry applied to invariant theory*. Virginia Tech; Blacksburg, Virginia. April 30, 2013.
- *Universal Groebner bases of circulant polynomial systems* at The Salisbury University Student Research Conference. Salisbury University; Salisbury, Maryland. April 29, 2011.
- *Universal Groebner bases of circulant polynomial systems* at The Mathematical Association of America Maryland-District of Columbia-Virginia Section Undergraduate Research Conference. Received second place for the student paper awards. Randolph-Macon College; Ashland, Virginia. April 15-16, 2011.
- Poster presentation *Universal Groebner bases of circulant polynomial systems* at the National Conference of Undergraduate Research (NCUR). Ithaca College; Ithaca, New York. March 31-April 2, 2011.

Conference and Workshop Attendance

- Attended and accompanied student **Caleb Shank** to the Spring Meeting of the MD-DC-VA section of the MAA, George Mason University, April 11-12, 2025.
- Launch Years Initiative: 2025 Conference, University of Texas at Austin, February 27-28, 2025.
- Council of Colleges of Arts and Sciences (CCAS) Annual Meeting, Austin, TX, November 6-9, 2024.
- Joint Mathematics Meetings, San Francisco, CA, January 3-6, 2024.
- Council of Colleges of Arts and Sciences (CCAS) Annual Meeting, San Diego, CA, November 1-4, 2023.
- Fall Meeting of the MD-DC-VA section of the MAA, Stevenson University, October 13-14, 2023.
- Council of Colleges of Arts and Sciences (CCAS) Annual Meeting, Washington, DC, November 2-5, 2022.
- Eastern Fall Sectional Meeting of the American Mathematical Society, UMass Amherst, October 1-2, 2022.
- Spring Meeting of the MD-DC-VA section of the MAA, Montgomery College, April 22-23, 2022.
- Fall Meeting of the MD-DC-VA section of the MAA, Salisbury University, November 5-6, 2021.
- Spring Meeting of the MD-DC-VA section of the MAA, virtual, April 23-24, 2021.
- Introductory workshop: Combinatorial Algebraic Geometry, ICERM, February 1-5, 2021. Served as a recitation leader.
- The conference Quantum Groups and Cohomology Theory of Quiver and Flag Varieties, virtual through Centre International De Rencontres Mathematiques Scientific Events, December 14-18, 2020. My collaborator, Clelia Pech, presented our joint work in an invited talk titled Curve Neighbourhoods of the odd symplectic Grassmannian.

Conference and Workshop Attendance (continued)

- Fall Meeting of the MD-DC-VA section of the MAA, virtual, November 7, 2020.
- Fall Meeting of the MD-DC-VA section of the MAA, Norfolk State University, November 8-9, 2019.
- Attended and accompanied student **Garrett Fowler** to the Spring Meeting of the MD-DC-VA section of the MAA meeting, Hood College and Frederick Community College, Frederick, MD, April 12-13, 2019.
- Attended and accompanied students **Lela Bones** and **Garrett Fowler** to the JMM held in Baltimore, MD, January 16-19, 2019.
- Fall Meeting of the MD-DC-VA section of the MAA, Mary Washington University, November 2-3, 2018.
- The Ohio State Workshop on Schubert Calculus held on May 9-12, 2018.
- Spring Meeting of the MD-DC-VA section of the MAA, VMI/Washington and Lee, April 13-14, 2018.
- Joint Mathematics Meetings, San Diego, CA, January 10-13, 2018.
- Fall Meeting of the MD-DC-VA section of the MAA, Christopher Newport University, November 17-18, 2017.
- Joint Mathematics Meetings, Atlanta, GA, January 4-7, 2017.
- Fall Meeting of the MD-DC-VA section of the MAA, Johns Hopkins University, November 4-5, 2016.
- Workshop on Symplectic Varieties and Geometric Representation Theory, UNC, October 29-30, 2016.
- Algebraic Groups, Quantum Groups and Geometry, University of Virginia. May 24-27, 2016.
- Fall Eastern Sectional Meeting, Rutgers University, New Brunswick, NJ. November 14-15, 2015.
- Positivity in Combinatorial Algebraic Geometry at the University of Oregon, Eugene, OR. August 10-14, 2015.
- Graduate Student Combinatorics Conference at the University of Kentucky, Lexington, KY. March 27-29, 2015.
- Triangle Lectures in Combinatorics at North Carolina State University, Raleigh, NC. February 21, 2015.
- Fall Southeastern Sectional Meeting, University of North Carolina at Greensboro, Greensboro, NC. November 8-9, 2014.
- Spring Meeting of the MD-DC-VA section of the MAA, Salisbury University, April 12-13, 2013.
- Fall Meeting of the MD-DC-VA section of the MAA, Virginia Military Institute, October 26-27, 2012.
- Spring Meeting of the MD-DC-VA section of the MAA, Randolph-Macon College, April 15-16, 2011.

Faculty Service

Fall 2023 – · · ·	Member (of two committees), Tenure and Promotion Committees.
Fall 2022 – · · ·	Faculty Advisor, Club Cross Country and Track and Field Team.
Fall 2019 – Spring 2027	Member (4 terms), Athletics Committee.
Fall 2024 – Spring 2026	Member, Government Relations Committee.
Fall 2024 – Spring 2025	Chair, Long Range Academic Planning Committee.
Fall 2021 – Spring 2024	Member, Faculty Development Committee.
Fall 2022 – Spring 2023	Member, Faculty Search Committee for Statistics.
Spring 2021 – Spring 2022	Organizer, Department Colloquium.

Courses Taught

Salisbury University

- MATH 105 Liberal Arts Mathematics: Moneymatics, where Money and Mathematics Meet.
- MATH 140 Algebra and Trigonometry.
- MATH 201 Differential Calculus.
- MATH 202 Integral Calculus with Sequences and Series.
- MATH 210 Discrete Mathematics.
- MATH 306 Linear Algebra.
- MATH 310 Multivariable Calculus.
- MATH 385 (Independent Study) Topology.
- MATH 385 (Independent Study) Sports Analytics.
- MATH 390 (Undergraduate Research) Taught numerous times on varying topics in Schubert Calculus.
- MATH 406 Geometric Structures.
- MATH 441 Abstract Algebra 1.
- MATH 442 Abstract Algebra 2.
- MATH 451 Analysis 1.
- MATH 452 Analysis 2.
- MATH 471 Numerical Methods (with Python).
- MATH 490 (Topics Course) Undergraduate Algebraic Geometry.
- MATH 490 (Topics Course) Combinatorics.
- HONR 495 Honors Thesis.
- COSC 390 (Undergraduate Research) Project on programming in Schubert Calculus.

Virginia Tech

- MATH 2015 Differential Calculus for Biological Sciences.
- MATH 2016 Integral/Multivariable Calculus for Biological Sciences.
- MATH 1225 Engineering Differential Calculus.
- MATH 1226 Engineering Integral Calculus with Sequences and Series.
- MATH 2204 Engineering Multivariable Calculus.

Hagerstown Community College

- MATH 099 Developmental College Algebra.
- MATH 100 Developmental College Algebra.

Professional Memberships

- Member, Mathematical Association of America.
- Member, American Mathematical Society.
- Member, Council of Colleges of Arts and Sciences.

Academic and Professional Honors

- Nominated for the University System of Maryland Board of Regents' Faculty Award for Mentoring in 2023.
- Nominated for SUSRC's Outstanding Research Mentor Award in 2018 and 2019.

Academic and Professional Honors (continued)

- Section NExT Fellow for the MD-DC-VA Section of the MAA in 2017.

References

Available on Request.