Ellen E. Eischen

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Organization of this CV

§1 Professional profile; §2 Research; §3 Teaching; §4 Service; §5 Outreach.

More detailed CV available upon request.

1. PROFESSIONAL PROFILE

• Professional foci and objectives

Contribute to research developments in number theory and beyond; expand participation in mathematics; and communicate with broader communities.

• Primary employment

- University of Oregon, Professor (previous: Associate and Assistant Professor), 2015-
- The University of North Carolina at Chapel Hill, Assistant Professor, 2012–2015
- Northwestern University, Ralph Boas Assistant Professor, 2009–2012
- Visits
 - Institute for Advanced Study in Princeton, von Neumann Fellow, 2024–2025
 - SLMath/MSRI, Research Professor (spring) and Member (fall), 2022–2023
 - ICERM, Research Fellow, fall 2019
 - Caltech, Invited Guest, November–December 2018
 - EPFL in Switzerland, Invited Academic Guest, August and December 2017
 - Columbia University, Visiting Scholar, spring 2014

• Education

- University of Michigan, Ann Arbor, PhD in Mathematics, 2009
- Princeton University, A.B. summa cum laude in Mathematics, 2003

• Honors and Grants

- von Neumann Fellowship, Institute for Advanced Study in Princeton, 2024–2025
- Fellow of the AMS (2025) and Fellow of the AWM (2024)
- NSF CAREER Grant, 2018–2024
- Continuous NSF research grant support as sole PI: DMS-2302011 ('23-'26), DMS-1751281 ('18-'24), DMS-1559609 ('15-'19), DMS-1249384 ('12-'15). Also collaborative research grant DMS-1557642 ('15-'17) and conference grant DMS-1601959 ('16).
- Other external funding includes NSA MSP conference grant '21-'23, AIM SQuaRE '18, BIRS FRG '14, US Junior Oberwolfach Fellow '14.
- Robert Calderbank and Ingrid Daubechies Scholar, Duke University, 2023–2025
- Teaching awards: Excellence in Remote Teaching (Oregon '20), Williams Fund for Undergraduate Education (Oregon '20), Excellence in Teaching (Northwestern '11)

2. Research

• Primary research focus

Number theory, especially algebraic and p-adic aspects of L-functions and automorphic forms, analytic functions that encode data arising in number theory and beyond. Connections with other areas.

• Research papers

- Algebraicity of Spin L-functions for GSp₆. E. Eischen, G. Rosso, and S. Shah. 60 pages. August 2024 preprint. https://arxiv.org/pdf/2408.03442.
- Constructing vector-valued automorphic forms on unitary groups. T. L. Browning,
 P. Čoupek, E. Eischen, C. Frechette, S. Hong, S.-Y. Lee, and D. Marcil. 32 pages.
 Submitted in September 2024. https://arxiv.org/abs/2408.05198
- Archimedean zeta integrals for unitary groups. E. Eischen and Z. Liu. Journal für die reine und angewandte Mathematik (Crelles Journal) 2024 (2024), No. 813, 103–132. http://dx.doi.org/10.1515/crelle-2024-0035
- Automorphic forms on unitary groups. E. Eischen. In Automorphic Forms Beyond GL₂: Lectures from the 2022 Arizona Winter School. Mathematical Surveys and Monographs 279, American Mathematical Society (2024), 1–58. https://doi.org/10.1090/surv/279
- Entire theta operators at unramified primes. E. Eischen and E. Mantovan. International Mathematics Research Notices (2022), No. 21, 16405–16463. https://doi.org/10.1093/imrn/rnab190
- p-adic families of automorphic forms in the μ-ordinary setting. E. Eischen and E. Mantovan. American Journal of Mathematics. Vol. 143 (2021), No. 1, 1–52. https://doi.org/10.1353/ajm.2021.0006
- An Introduction to Eisenstein Measures. E. Eischen. Journal de Théorie des Nombres de Bordeaux. Vol. 33 (2021), No. 3.1, 779–808. http://doi.org/10.5802/jtnb.1178
- Differential operators mod p: analytic continuation and consequences. E. Eischen, M. Flander, A. Ghitza, E. Mantovan, and A. McAndrew. Algebra & Number Theory. Vol. 15 (2021), No. 6, 1469–1504. http://doi.org/10.2140/ant.2021.15.1469
- p-adic L-functions for unitary groups. E. Eischen, M. Harris, J.-S. Li, and C. Skinner.
 Forum of Mathematics, Pi. Vol. 8 (2020), E9, 160 pages.
 http://doi.org/10.1017/fmp.2020.4
- Applications of nonarchimedean developments to archimedean nonvanishing results for twisted L-functions. E. Eischen. Math. Res. Lett. 27 (2020), no. 4, 973–1002. https://dx.doi.org/10.4310/MRL.2020.v27.n4.a2
- A gallery of Gaussian periods. E. Eischen and S. Garcia. Proceedings of Bridges 2020: Mathematics, Art, Music, Architecture, Education, Culture. Carolyn Yackel, Robert Bosch, Eve Torrence, and Kristóf Fenyvesi, eds., Tessellations Publishing (2020), 243– 248. http://archive.bridgesmathart.org/2020/bridges2020-243.html Associated app: https://apps.apple.com/us/app/gaussianperiods/id1622050577

Research papers, continued

- Bootstrapping estimates of stability for clusters, observations, and model selection.
 H. Yu, B. Chapman, A. Di Florio, E. Eischen, D. Gotz, M. Jacob, and R. Hageman Blair. Computational Statistics. Vol. 34 (2019), Issue 1, 349-372.
 http://doi.org/10.1007/s00180-018-0830-y
 Associated R package: https://cran.r-project.org/web/packages/bootcluster/ bootcluster.pdf
- Differential operators and families of automorphic forms on unitary groups of arbitrary signature. E. Eischen, J. Fintzen, E. Mantovan, and I. Varma. Doc. Math. 23 (2018), 445-495. http://doi.org/10.25537/dm.2018v23.445-495
- p-adic Eisenstein series and L-functions of certain cusp forms on definite unitary groups. E. Eischen and X. Wan. J. Inst. Math. Jussieu. 15 (2016), no. 3, 471–510. http://dx.doi.org/10.1017/S1474748014000395
- Differential operators, pullbacks, and families of automorphic forms. E. Eischen. Ann. Math. Qué. 40 (2016), no. 1, 55-82. http://dx.doi.org/10.1007/s40316-015-0049-z
- p-adic q-expansion principles on unitary Shimura varieties. A. Caraiani, E. Eischen, J. Fintzen, E. Mantovan, and I. Varma. Directions in Number Theory: Proceedings of the 2014 WIN3 Workshop. Springer International Publishing (2016), 197–243. http://dx.doi.org/10.1007/978-3-319-30976-7_7
- A p-adic Eisenstein measure for unitary groups. E. Eischen. J. Reine Angew. Math. 699 (2015), 111-142. http://dx.doi.org/10.1515/crelle-2013-0008
- A p-adic Eisenstein measure for vector-weight automorphic forms. E. Eischen. Algebra Number Theory. 8 (2014), No. 10, 2433-2469. http://dx.doi.org/10.2140/ant.2014.8.2433
- p-adic differential operators on automorphic forms for unitary groups. E. Eischen. Ann. Inst. Fourier (Grenoble). 62, No. 1 (2012), 177-243. http://dx.doi.org/10.5802/aif.2704
- Decomposition of almost complete tripartite graphs into two isomorphic factors of fixed diameter. E. Eischen. Discrete Math. 306 (2006), 745-761. http://dx.doi.org/10.1016/j.disc.2006.02.009
- Patterns, linesums, and symmetry. E. Eischen, C. Johnson, K. Lange, and D. Stanford. Linear Algebra Appl. 357 (2002), 273-289. http://dx.doi.org/10.1016/S0024-3795(02)00417-2

• Computer app to help visualize number theoretic data

The Gaussian Periods computer app is available on the Mac App Store. https://apps.apple.com/us/app/gaussianperiods/id1622050577

• Invited lecture series

- Arizona Winter School, March 2022 (4 lectures on automorphic forms beyond GL_2)
- Iwasawa 2019, Bordeaux, France, June 2019 (4 lectures on p-adic L-functions)
- Introductory Workshop on Euler Systems and Special Values of L-functions, EPFL, Switzerland, August 2017 (3 lectures on p-adic L-functions)

• Invited research talks during past 10 years

- Workshop on *p*-adic families of automorphic forms: theories and applications, International Centre for Mathematical Sciences, Edinburgh, Scotland, July 2024
- Workshop on *Recent Progress on Hilbert's 12th Problem*, International Centre for Mathematical Sciences, Edinburgh, Scotland, June 2024
- Number Theory Seminar, UCSD, May 2024
- Colloquium, University of Arizona, March 2024
- Number Theory Seminar, University of Arizona, March 2024
- Colloquium, Caltech, February 2024
- Number Theory Seminar, UCSB, December 2023
- Plenary Lecture, TORA, Oklahoma, October 2023
- Karcher Colloquium, University of Oklahoma, October 2023
- ORCID Colloquium, Duke University, September 2023
- Number Theory Seminar, Duke University, September 2023
- "Number Theory and Combinatorics in Duluth" conference in honor of Joe Gallian's 80th birthday, Duluth, MN, August 2023
- Colloquium, University of Utah, April 2023
- Number Theory Seminar, University of Utah, April 2023
- Shimura Varieties and L-functions workshop, MSRI/SLMath, March 2023
- Number Theory Seminar, Caltech, February 2023
- Colloquium, University of California, Berkeley, November 2022
- Colloquium, Temple University, September 2022
- Philadelphia Area Number Theory Seminar, September 2022
- "Community-building in the Langlands program" research conference, University of Bonn, Germany, August 2022
- Algebra and Number Theory Seminar, Yale University, May 2022
- Algebra and Number Theory Seminar, University College Dublin, Ireland, April 2022
- Number Theory Seminar, University of British Columbia, December 2021
- Algebra and Number Theory seminar, Penn State, April 2021
- Algebra & Discrete Mathematics seminar, University of California, Davis, April 2021
- Colloquium, Penn State, February 2021
- Conference on automorphic forms, automorphic representations, Galois representations, and related topics, RIMS, Kyoto, Japan, January 2021
- Colloquium, University of Arizona, October 2020
- Conference on Serre Weights Conjectures and Geometry of Shimura Varieties, Centre de Recherches Mathématiques, Montréal, Canada, September 2020
- Pacific Rim Conference in Mathematics, UC Berkeley, August 2020

Invited research talks during past 10 years, continued

- Colloquium, Rice University, February 2020
- Joint Colloquium, Harvard University, November 2019
- Algebra and Number Theory Seminar, Brown University, November 2019
- Automorphic $p\mbox{-adic}\ L\mbox{-functions}$ and Regulators conference, Lille, France, October 2019
- Heilbronn Number Theory Seminar, University of Bristol, England, October 2019
- AMS special session on Recent Developments in Automorphic Forms (45-min talk), Central and Western Joint Sectional Meeting, University of Hawaii, March 2019
- AMS special session on Advances in Iwasawa Theory, Central and Western Joint Sectional Meeting, University of Hawaii, March 2019
- Number Theory Seminar, Caltech, November 2018
- Workshop on Special Values of Automorphic *L*-functions and Associated *p*-adic *L*-functions, BIRS-CMO, Oaxaca, Mexico, October 2018
- Number Theory Seminar, Stanford University, May 2018
- BC-MIT Number Theory Seminar, MIT, May 2018
- Bellairs workshop on Unitary Shimura Varieties & Modular Forms, Barbados, May2018
- Number Theory Seminar, University of Chicago, March 2018
- Paul J. Sally Midwest Representation Theory Conference in honor of Freydoon Shahidi's 70th birthday, Purdue University, October 2017
- Colloquium, University of Southern California, September 2017
- Special Cycles on Shimura Varieties and Iwasawa Theory conference, EPFL, Switzerland, August 2017
- Mathematical Congress of the Americas, special session on Galois Representations and Automorphic Forms, Montreal, Canada, July 2017
- The Quebec-Vermont Number Theory Seminar, McGill University, May 2017
- Special session on Automorphic Forms and Arithmetic, AMS sectional meeting, New York, NY, May 2017
- Number Theory Seminar, Caltech, March 2017
- Number Theory Seminar, Oregon State University, October 2016
- Clay Mathematics Institute workshop on Recent Developments on Elliptic Curves, Mathematical Institute of the University of Oxford, England, September 2016
- Plenary speaker, Galois Representations and Automorphic Forms Conference, Bedlewo, Poland, August 2016
- Topic contributed paper session on The NSF/NIH/SAMSI Workshop on Interdisciplinary Approaches to Biomedical Data Science Challenges, JSM, Chicago, August 2016
- Invited lecture, Canadian Number Theory Association Conference (CNTA XIV), University of Calgary, Canada, June 2016
- Number Theory Seminar, University of Chicago, May 2016

Invited research talks during past 10 years, continued

- Number Theory Seminar, Northwestern University, May 2016
- Plenary lecture, Alberta Number Theory Days, Banff International Research Station, Canada, April 2016
- Southern California Number Theory Day, UCSD, February 2016
- Number Theory Seminar, UCLA, February 2016
- Special session on Number Theory and Cryptography, JMM, Seattle, January 2016
- AMS special session on The Langlands Program and Related Topics, Central Fall Sectional Meeting, Loyola University, Chicago, October 2015
- Pacific Northwest Number Theory Conference, Eugene, Oregon, May 2015
- Philadelphia Area Number Theory Seminar, Bryn Mawr College, April 2015
- Colloquium, University of Washington, January 2015
- Special session on Recent Developments in Algebraic Number Theory, JMM, San Antonio, TX, January 2015
- Colloquium, University of Oregon, January 2015
- Special session on Automorphic Forms and Related Topics, AMS Sectional Meeting, The University of North Carolina, Greensboro, November 2014

• Public Lecture

- Creativity Counts: Math+Art, Jordan Schnitzer Museum of Art, May 2021

• Invited expository talks (for students, etc) during past 10 years

- AWM Colloquium, UCSD, May 2024
- Plenary Lecture, Berkeley RTG Undergraduate Conference, UC Berkeley, April 2023
- AWM-RTG Lecture Series, University of Utah, April 2023
- Colloquium, Swarthmore College, October 2022
- TATERS seminar, Boise State University, April 2022
- Maseeh Colloquium, Portland State University, May 2021
- Open Neighborhood Seminar, Harvard University, November 2019
- Applied Science Program, The Pennington School, NJ, September 2019
- REU, Oregon State University, July 2019
- Faculty Perspectives, IntroDUCKtion, U. Oregon, June 2018 and July 2019
- The North Star Lectures, University of Oregon, May 2019
- Undergraduate Math Club, Occidental College, Los Angeles, November 2018
- Colloquium, Reed College, October 2018
- Distinguished Lecture for Students, MAA Southeastern Section Meeting, March 2015

3. Teaching

• Mentorship and supervision

- PhD supervisor to Cathy Hsu '18 (current position: tenure-track assistant professor, Swarthmore College), Jonathan Aycock '22 (current position: Stefan E. Warschawski Visiting Assistant Professor, UCSD), Samantha Platt '24 (current position: assistant professor, Augsburg University), Sean Haight '24 (current position: adjunct, Seattle University), Francis Dunn (PhD expected '25), Sidney Washburn (PhD expected '28)
- NSF postdoctoral mentor to Maria Fox (current position: tenure-track assistant professor, Oklahoma State University) and postdoctoral mentor to Vivek Pal
- Research supervisor to undergraduates Abby Lewis, Nat Milnes, Robert Macy, Max Dickinson, and Heidi van Batenburg-Stafford

• Undergraduate course development

- Developed new course, Math and the Creative Process: A Participatory Exploration of Number Theory, to introduce undergraduates early in their education to skills for exploring and communicating about math.

https://pages.uoregon.edu/eeischen/CreativityCounts/course/

 Designed elaborate cryptography scavenger hunt for students in Mathematical Methods of Cryptography.

http://www.elleneischen.com/cryptography-scavenger-hunt.html

• Courses taught

Range from beginning undergrad to advanced graduate. Courses taught at U. Oregon: Abstract Algebra (Math 44x/54x), Algebraic Number Theory (Math 607), Math and the Creative Process: A Participatory Exploration of Number Theory (Math 199), Modular Forms (Math 684), Linear Algebra (Math 441/451), Mathematical Cryptography (Math 458), Statistics (Math 461/561), and Multivariable Calculus (Math 281/282).

• Reading courses

Nearly every term, including 7-person reading courses in Winter '22 and '24.

4. Selected service

• Editorial boards

- Member of Editorial Board for the journal Essential Number Theory, 2021-present
- Member of Editorial Board for the journal Research in Number Theory, 2020–present
- Co-editor of Directions in Number Theory: Proceedings of the 2014 WIN3 Workshop. Springer International Publishing (2016).

• Conference, workshop, and program organization

- Coorganized semester-long research program at SLMath/MSRI in spring 2023
- Coorganized 13 conferences/workshops/special sessions since 2016:
 - * Co-organizing (with F. Andreatta, E. Hellmann, M. Kakde) Algebraische Zahlentheorie, Oberwolfach Research Institute, Germany, June 2026
 - * Co-organizing (with K. Stange) Advancing Algebra and Number Theory Research through Illustration, Institut Henri Poincaré, France, March 2026
 - * Co-organized (with H. Darmon, B. Howard, E. Mantovan) Introductory Workshop on Euler Systems and Special Values of *L*-functions, MSRI, January 2023
 - * Co-organized (with H. Darmon, B. Howard, E. Mantovan) Connections Workshop on Euler Systems and Special Values of *L*-functions, MSRI, January 2023
 - * Co-organized (with S.W. Shin, L. Xiao) Number Theory and Arithmetic Geometry session, Pacific Rim Mathematical Association Congress, Vancouver, Canada, December 2022
 - * Organized 2 weeklong workshops: collaborative research workshop to promote diverse collaborations and instructional workshop on recent developments, U. Oregon, July and August 2022 https://sites.google.com/view/automorphic2021
 - $\ast\,$ Co-organized (with M. Dimitrov, A. Jorza) 5-day instructional workshop and 5-day conference on $p\text{-adic}\,L\text{-functions}$ and eigenvarieties, Notre Dame, July 2022
 - * Co-organized (with D. Barrera Salazar, L. Alberto Lomelí, A Pacetti, C. Sorensen) session on Galois representations and automorphic forms, Mathematical Congress of the Americas, Buenos Aires, Argentina, July 2021
 - * Co-organized (with J. Kamnitzer, A. Kontorovich, K. Stange) Illustrating Algebra and Number Theory workshop, week-long workshop as part of the semesterlong ICERM program Illustrating Mathematics, Brown University, Providence, RI, October 2019
 - * Co-organized (with Y. Liu, L. Xiao, W. Zhang) AMS Special Session on Special Values of *L*-functions and Arithmetic Invariants in Families, Spring Eastern Sectional Meeting, University of Connecticut, Hartford, CT, April 2019
 - * Co-organized (with A. Bucur) the AMS/MAA Joint Mathematics Meetings AWM Workshop (special session on number theory), Atlanta, GA, January 2017
 - * Co-organized (with J. Rouse, K. Thompson) the 30th Automorphic Forms Workshop, Wake Forest University, Winston-Salem, NC, March 2016

• Service to professional organizations

- Scientific Review Panel, Pacific Institute for the Mathematical Sciences, 2023–2026
- AMS Committee on the Profession, 2020–2023
 -Subcommittee to analyze the report from Committee on Professional Ethics (COPE)
 -Subcommittee to organize panel on COVID and the Profession for JMM 2022
 -Subcommittee to organize panel on Careers Outside Academia for JMM 2023
 -Subcommittee on mitigating the effects of COVID-19
- AMS Liaison Committee with the AAAS, 2020–2022
- MAA Committee on the Earle Raymond Hedrick Lectures, 2022–2025
- AWM Joint Mathematics Meetings committee, 2016

• Selected university and departmental service

- Post-Tenure Review Committee (elected 3-person committee), '23-'24
- College of Arts and Sciences Women in Science Mentoring Group, '23-'24
- At-Large Graduate Affairs Committee, UO Math Department, '18-'19, '21-'22, '23-'24
- Teaching Effectiveness Committee, UO Math Department, '21-'22
- Undergrad Research Opportunity Program Faculty Advisory Committee, UO, '21-'22
- Faculty supervisor, Oregon Undergraduate Mathematics Club, '18-'22
- Organizer of Number Theory Seminar, most years 2010–present
- Graduate Advising Committee, UO Math Department, '19–'21
- PhD Committee, UO Math Department, '19–'20
- Open Tenure-Track Search Committee, UO Math Department, '18–'19
- Executive Committee, UO Math Department, '18-'19
- Search committee for UO Director of McNair Scholars Program, '18
- Committee chair, Niven and Moursund Distinguished Lectures, U. Oregon, '17-'18

• Selected projects to promote broader participation

- Created research workshop to facilitate new, diverse research collaborations.
 https://sites.google.com/view/automorphic2021/collaborative-research-workshop
- Spearheaded the creation of the AWM Reading Room at the University of Oregon. Featuring resources to help women and other members of underrepresented groups thrive at UO and beyond. https://pages.uoregon.edu/uoawm/library.html
- Led a research project at Women in Numbers 3 (co-leader: A. Caraiani)

5. Selected outreach

• Museums

- Serve on the Advisory Board and the Exhibits Committee for the newly forming Seattle Universal Math Museum, 2021–2024
- Organized *Creativity Counts* exhibit, on display for 3 months at the Jordan Schnitzer Museum of Art in 2021.

https://jsma.uoregon.edu/art/exhibition/creativity-counts

*Accompanying virtual exhibit quickly became JSMA's most-visited virtual exhibit and was extended to run for over three years, during which it has been viewed from 63 countries and 474 cities. https://mpembed.com/show/?m=FGvT8EzPQpy&mpu=885

• Improv

Develop and lead workshops for faculty and graduate students that integrate principles of improvisational theater for engagement in the classroom and beyond, 2018-present http://www.elleneischen.com/improv-1.html

• Lectures for broader audiences

Developed and chaired Oregon's *Distinguished Lectures for Students*, 2015–2024 http://blogs.uoregon.edu/mathisawesome/

• Nontechnical writing

- *Time for Math.* E. Eischen. Notices of the American Mathematical Society. Accepted for publication in the December 2024 issue.
- Planting Seeds for Community. E. Eischen and C. Hsu. Notices of the American Mathematical Society. Vol. 69 (2022), no. 10, 775-777.
 https://www.ams.org/journals/notices/202210/rnoti-p1738.pdf?adat=November% 202022&trk=2563&cat=career&galt=career.
- The Seattle Universal Math Museum: Transforming Perceptions of Math. E. Eischen. MAA FOCUS. Oct/Nov 2022. Vol. 42, No. 5, 6-7. https://digitaleditions.walsworth.com/publication/?i=762972&article_id= 4354785&view=articleBrowser
- Illustrating Mathematics. E. Eischen. Review of Illustrating Mathematics, by D. Davis. Math Horizons. Vol. 29 (2022), no.1, 29–29. http://doi.org/10.1080/10724117.2021.1940509
- Creativity Counts. E. Eischen. Math Buffet column in the Girls' Angle Bulletin. Vol. 15 (2021), no. 1, 12-16 and cover image.
 http://www.girlsangle.org/page/bulletin-archive/GABv15n01E.pdf
- Moving Ahead in Your Research. E. Eischen. Notices of the American Mathematical Society. Vol. 66 (2019), no. 2, 194–195. http://dx.doi.org/10.1090/noti1791
- Improv-ing a Mathematician's Professional Skills. E. Eischen. MAA FOCUS. Dec 2016/Jan 2017. Vol. 36, No. 6, 22-24. http://bit.ly/2ikwVg9
- 5 Key Takeaways from the Innovations Lab. E. Eischen. August 2015. Report on the first NIH/NSF Innovations Lab. http://bit.ly/2igAjwK
- Selected interviews
 - The Secret Math Journal with Ellen Eischen, Numberphile Podcast, hosted by Brady Haran. July 30, 2024. https://www.numberphile.com/videos/ellen-eischen-podcast
 - QED: a conversation about math and math education. Hosted by Ingrid Daubechies Featuring Ellen Eischen, National Museum of Math (virtual program), November 16, 2023. https://momath.org/civicrm/?page=CiviCRM&q=civicrm%2Fevent%2Finfo& reset=1&id=9656
 - Oregon professors focus on equity, accessibility in STEM, KGW (NBC affiliate), hosted by Brittany Falkers, February 11, 2022. https://www.kgw.com/article/features/oregon-professors-focus-equity-accessibility-in-stem/ 283-a5adab25-d9f6-47bd-a906-24e68dd6ccb1
 - Creativity Counts: An exhibit inspired by mathematical processes, Ester Barkai, Eugene Weekly, June 24, 2021. https://eugeneweekly.com/2021/06/24/creativity-counts/
 - Mathematicians Find Long-Sought Building Blocks for Special Polynomials, Kelsey Houston-Edwards, Quanta Magazine, May 25, 2021.

https://www.quantamagazine.org/mathematicians-find-polynomial-building-blocks-hilbert-sought-20210525/

 Stepping Outside the Mold to Improv-e Mathematics. Winning submission to the AWM/Math for America high school essay contest, 2021
 https://awm-math.org/awards/student-essay-contest/2021-student-essay-contest-results/ 2021-student-essay-contest-high-school-winner/