CURRICULUM VITAE

AGNÈS BEAUDRY

Contact Information

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Educational Background

June, 2013	Northwestern University, PhD in Mathematics, Advisor: Professor Paul Goerss
November, 2008	McGill University, BA, Honours in Mathematics, Minor in Philosophy

Academic Employment History

2022-present	Associate Professor, Department of Mathematics, University of Colorado Boulder
2016-2022	Assistant Professor, Department of Mathematics, University of Colorado Boulder
2013-2016	L. E. Dickson Instructor, Department of Mathematics, University of Chicago

Research expertise

- Stable, chromatic and equivariant homotopy theory
- Homotopy theory in relation to condensed matter physics

Honors, Awards and Grants

Honors.

Fellow of the American Mathematical Society, class of 2024

Research Grants.

(1) National Science Foundation. DMS: CAREER: From Equivariant Chromatic Homotopy Theory to Phases of Matter: Voyage to the Edge. A. Beaudry (PI). August 1, 2022 to July 31, 2027 (est.)
(2) National Science Foundation. DMS: Topological and C^*-Algebraic Quantum Matter. M. Pflaum (PI), A. Beaudry (co-PI), M. Hermele (co-PI). July 1, 2021 to June 30, 2024 (est.)
(3) National Science Foundation. Chromatic Phenomena with an Equivariant Perspective. A. Beaudry (PI). August 15, 2019 to July 31, 2023 (est.)
(4) University of Colorado Boulder Research & Innovation Office Seed Grant. Mathematical Physics of Quantum Matter. M. Hermele (PI), A. Beaudry (co-PI), M. Pflaum (co-PI). 07/2020-12/2021.
(5) National Science Foundation. Computational Chromatic Homotopy Theory. A. Beaudry (PI). June 1, 2016 to January 31, 2020.
(6) Natural Sciences and Engineering Research Council of Canada, Postgraduate Scholarship. September, 2008 to June, 2010.

Conference Grants.

(7) National Science Foundation. DMS Conference: C*-Algebraic Quantum Mechanics and Topological Phases of Matter. M. Pflaum (PI), A. Beaudry (co-PI), M. Hermele (co-PI), D. Spiegel (co-PI). June 1, 2024 to May 30, 2025 (est.)
(8) National Science Foundation. DMS: Conference on Chromatic Homotopy Theory and Related Areas. I. Bobkova (PI). A. Beaudry (co-PI). V. Stojanoska (co-PI). June 23 2022 to June 30, 2024 (est.).
(9) National Science Foundation. Homotopical Methods in Fixed Point Theory. A. Beaudry (PI). K. Ponto (co-PI). D. Wilson (co-PI). May 15, 2022 to April 30, 2023.
(10) Foundation Nagoya Mathematical Journal Award. For the summer school *Homotopical Methods in Fixed Point Theory* (University of Colorado Boulder, July 11-15, 2022). Awarded to the organizing committee (A. Beaudry, P. G. Goerss, K. Ponto, D. Wilson).
(11) National Science Foundation. DMS: Chromatic Homotopy Theory: Journey to the Frontier. A. Beaudry (PI), M. Hill (co-PI), M. Pflaum (co-PI), D. Wilson (co-PI). March 1, 2018 to May 31, 2020.
(12) Faculty Conference Award. Research & Innovation Office. Chromatic Homotopy Theory: Journey to the Frontier. January 11, 2018 to July 19, 2018.
(13) National Science Foundation. DMS: Homotopy Theory in the Ecliptic: Chromatic, Equivariant, and Motivic Mathematics. A. Osorno (PI), J. Lind (co-PI), A. Beaudry (co-PI), K. Ormsby (co-PI), M. Hill (co-PI). June 1, 2017 to May 31, 2018.

RTG Subaward.

(14) Sub-award with National Science Foundation. RTG: eCHT: electronic Computational Homotopy Theory Research Community. D. Isaksen (Pass-Through Entity PI) A. Beaudry (Sub-award PI). August 15, 2022 to July 31, 2025 (est.).

Other.

(1) Simons Visiting Professor, Mathematisches Forschungsinstitut Oberwolfach and University of Strasbourg. June 18 to July 22, 2016.
(2) Natural Sciences and Engineering Research Council of Canada, Postgraduate Scholarship. September, 2008 to June, 2010.
(3) Institut des Sciences Mathématiques Summer Research Award. 2008.
(4) NSERC Undergraduate Student Research Award. 2007.
(5) NSERC Undergraduate Student Research Award to attend Math in Moscow. 2007.
(6) Mary Coppin Scholarship for Academic Distinction, McGill University. 2007.
(7) McGill Alumnae Georgina Hunter Scholarship for Academic Distinction, (declined). 2007.
(8) Institut des Sciences Mathématiques Summer Research Award. 2006.
(9) TD Canada Trust Community Leadership Scholarship. 2004-2008.

Publications

Publications in Mathematics Journals.

(1) Beaudry, Agnès; Hermele, Michael; Moreno, Juan; Pflaum; Markus J.; Qi. Marvin; Spiegel, Daniel D. Homotopical foundations of parametrized quantum spin systems. *Rev. Math. Phys.*, 36(9):Paper No. 2460003, 87, 2024.
(2) Beaudry, Agnès; Bobkova, Irina; Goerss, Paul G.; Henn, Hans-Werner; Pham, Viet-Cuong; Stojanoska, Vesna. Cohomology of the Morava stabilizer group through the duality resolution at $n = p = 2$. *Trans. Amer. Math. Soc.*, 377(3):1761–1805, 2024.
(3) Beaudry, Agnès; Hill, Michael A.; Shi, XiaoLin Danny; Zeng, Mingcong. Transchromatic extensions in motivic bordism. *Proc. Amer. Math. Soc.* Ser. B 10 (2023), 76–90.
(4) Beaudry, Agnès; Bobkova, Irina; Pham, Viet-Cuong; Xu, Zhouli. The topological modular forms of $\mathbb{R}P^2$ and $\mathbb{R}P^2 \wedge \mathbb{C}P^2$. *J. Topol.* 15 (2022), no. 4, 1864–1926.
(5) Spiegel, Daniel; Moreno, Juan; Qi, Marvin; Hermele, Michael; Beaudry, Agnès; Pflaum, Markus J.. Continuous dependence on the initial data in the Kadison transitivity theorem and GNS construction. *Rev. Math. Phys.* 34 (2022), no. 9, Paper No. 2250031, 84 pp.

(6) Beaudry, Agnès; Goerss, Paul G.; Hopkins, Michael J.; Stojanoska, Vesna. Dualizing spheres for compact p-adic analytic groups and duality in chromatic homotopy. *Invent. Math.* 229 (2022), no. 3, 1301–1434.
(7) Barthel, Tobias; Beaudry, Agnès; Goerss, Paul G.; Stojanoska, Vesna. Constructing the determinant sphere using a Tate twist. *Math. Z.* 301 (2022), no. 1, 255–274.
(8) Beaudry, Agnès; Goerss, Paul G.; Henn, Hans-Werner. Chromatic splitting for the $K(2)$-local sphere at $p = 2$. *Geom. Topol.* 26 (2022), no. 1, 377–476.
(9) Beaudry, Agnès; Hill, Michael A.; Lawson, Tyler; Shi, XiaoLin Danny; Zeng, Mingcong. Quotient rings of $H\mathbb{F}_2 \wedge H\mathbb{F}_2$. *Trans. Amer. Math. Soc.* 374 (2021), no. 12, 8949–8988.
(10) Beaudry, Agnès; Behrens, Mark; Bhattacharya, Prasit; Culver, Dominic; Xu, Zhouli. The telescope conjecture at height 2 and the tmf resolution. *J. Topol.* 14 (2021), no. 4, 1243–1320.
(11) Beaudry, Agnès; Hill, Michael A.; Shi, XiaoLin Danny; Zeng, Mingcong. Models of Lubin-Tate spectra via real bordism theory. *Adv. Math.* 392 (2021), Paper No. 108020, 58 pp.
(12) Barthel, Tobias; Beaudry, Agnès. Chromatic structures in stable homotopy theory. *Handbook of homotopy theory*, 163–220, CRC Press/Chapman Hall Handb. Math. Ser., CRC Press, Boca Raton, FL, [2020], ®2020.
(13) Beaudry, Agnès; Bobkova, Irina; Hill, Michael; Stojanoska, Vesna. Invertible $K(2)$-local E_2-modules in C_4-spectra. *Algebr. Geom. Topol.* 20 (2020), no. 7, 3423–3503.
(14) Beaudry, Agnès.; Behrens, Mark; Bhattacharya, Prasit; Culver, Dominic; Xu, Zhouli. On the E_2-term of the bo-Adams spectral sequence. *J. Topol.* 13 (2020), no. 1, 356–415.
(15) Barthel, Tobias; Beaudry, Agnès; Stojanoska, Vesna. Gross-Hopkins duals of higher real K-theory spectra. *Trans. Amer. Math.* Soc. 372 (2019), no. 5, 3347–3368.
(16) Beaudry, Agnès; Downey, Naiche; McCranie, Connor; Meszar, Luke; Riddle, Andy; Rock, Peter. Computations of orbits for the Lubin-Tate ring. *J. Homotopy Relat. Struct.* 14 (2019), no. 3, 691–718.
(17) Beaudry, Agnès. The α-family in the $K(2)$-local sphere at the prime 2. Homotopy theory: tools and applications, 1–19, *Contemp. Math.*, 729, Amer. Math. Soc., Providence, RI, 2019
(18) Beaudry, Agnès; Campbell, Jonathan A.. A guide for computing stable homotopy groups. Topology and quantum theory in interaction, 89–136, *Contemp. Math.*, 718, Amer. Math. Soc., Providence, RI, 2018
(19) Beaudry, Agnès; Hess, Kathryn; Kędziorek, Magdalena; Merling, Mona; Stojanoska, Vesna. Motivic homotopical Galois extensions. *Topology Appl.* 235 (2018), 290–338.
(20) Beaudry, Agnès. The chromatic splitting conjecture at $n = p = 2$. *Geom. Topol.* 21 (2017), no. 6, 3213–3230.
(21) Beaudry, Agnès. Towards the homotopy of the $K(2)$-local Moore spectrum at $p = 2$. *Adv. Math.* 306 (2017), 722–788.
(22) Beaudry, Agnès. The algebraic duality resolution at $p = 2$. Algebr. *Geom. Topol.* 15 (2015), no. 6, 3653–3705.
(23) Basterra, Maria; Bauer, Kristine; Beaudry, Agnès; Eldred, Rosona; Johnson, Brenda; Merling, Mona; Yeakel, Sarah. Unbased calculus for functors to chain complexes. Women in topology: collaborations in homotopy theory, 29–48, *Contemp. Math.*, 641, Amer. Math. Soc., Providence, RI, 2015.
(24) Beaudry, Agnès. The Duality Resolution Spectral Sequence for the Moore Spectrum at the Prime 2. Thesis (Ph.D.)–Northwestern University. 2013.

Publications in Physics Journals.

(25) Salvatore D. Pace, Chenchang Zhu, Agnès Beaudry, and Xiao-Gang Wen. Generalized symmetries in singularity-free nonlinear σ-models and their disordered phases. *Phys. Rev. B*, 110:195149, Nov 2024.
(26) Wen, Xueda; Qi, Marvin; Beaudry, Agnès; Moreno, Juan; Pflaum, Markus J., Spiegel, Daniel; Vishwanath, Ashvin; Hermele, Michael. Flow of higher berry curvature and bulk-boundary correspondence in parametrized quantum systems. *Phys. Rev. B*, 108:125147, Sep 2023.

Preprints.

(27) Beaudry, Agnès; Hermele, Michael; Pflaum, Markus J.; Qi, Marvin; Spiegel, Daniel D.; Stephen, David T.. A Classifying Space for Phases of Matrix Product States. arXiv:2501.14241. 2025.
(28) Beaudry, Agnès; Lewis, Chloe; May, Clover; Pauli, Sabrina; Tatum, Elizabeth. A Guide to Equivariant Parametrized Cohomology. arXiv:2410.13971. 2024. (Accepted in *Topology and its Applications*).
(29) Qi, Marvin; Stephen, David T.; Wen, Xueda; Spiegel, Daniel; Pflaum, Markus J.; Beaudry, Agnès; Hermele, Michael. Charting the space of ground states with tensor networks. arXiv:2305.07700. 2023. (Submitted)
(30) Beaudry, Agnès; Hill, Michael A.; Lawson, Tyler; Shi, XiaoLin Danny; Zeng, Mingcong. On the slice spectral sequence for quotients of norms of Real bordism. arXiv:2204.04366. 2022. (Accepted in the *Journal of Topology*).
(31) Beaudry, Agnès; Bobkova, Irina; Goerss, Paul G.; Henn, Hans-Werner; Pham, Viet-Cuong; Stojanoska, Vesna. The Exotic $K(2)$-Local Picard Group at the Prime 2. arXiv:2212.07858. 2022. (Submitted)

Talks

International conferences and events (invited speaker).

(1) "A Classifying Space for Injective Matrix Product States", A Panorama of Homotopy Theory — A Conference in Honour of Mike Hopkins. Oxford University. Oxford, UK. June 2023.
(2) "Quotients of Real bordism and $H\mathbb{F}_2 \wedge H\mathbb{F}_2$". Conference Chromatic Homotopy, K-Theory and Functors, Centre International de Rencontres Mathématiques (CIRM), Marseille, France. January 27, 2023.
(3) "Duality and invertibility in chromatic homotopy theory 1& 2". Summer School: Spectral methods in algebra, geometry, and topology, Hausdorff Research Institute for Mathematics, Bonn, Germany. September 20 & 22, 2022.
(4) "Equivariant Morava K-Theories?", Workshop on Equivariant Stable Homotopy Theory and p-adic Hodge Theory, Banff International Research Station, Banff, Alberta. March 5, 2020.
(5) "The Equivariant Dual of Morava E-Theory", Descent and Chromatic Homotopy Theory, University of Strasbourg, Strasbourg, France. September 3, 2019.
(6) "Duality and invertibility using finite resolutions", Derived algebraic geometry and chromatic homotopy theory, Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom. September 25, 2018
(7) "$K(n)$-local homotopy from a Galois theory perspective", Derived algebraic geometry and chromatic homotopy theory, Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom. September 24, 2018
(8) "Pic(E-$\mathbb{Z}/4$) and Tools to Compute It" Equivariant and Motivic Homotopy, Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom. August 13, 2018.
(9) "Dispersion and Reassembly in the Homotopy Groups of Spheres", AMS-CMS Special Session on Algebraic and Geometric Topology, Fudan University, Shanghai, China. June 12, 2018.
(10) "The Linearization Conjecture", 1st Canadian Geometry and Topology Seminar, Toronto, Canada. March 16, 2018
(11) "Perspectives on the chromatic splitting conjecture", The Transatlantic Transchromatic Homotopy Theory Conference, University of Regensburg, Regensburg, Germany. June 6, 2017.
(12) "Gross-Hopkins duals of higher real K-theory spectra", Invertibility and Duality in Derived Algebraic Geometry and Homotopy Theory, University of Regensburg, Regensburg, Germany. April 6, 2017.
(13) "The $K(2)$-local Picard group at $p = 2$", Alpine conference on algebraic and applied topology, Saas-Almagell, Switzerland. August 18, 2016.
(14) "A preliminary report on the $K(2)$-local Picard group at $p = 2$", Group Actions - Classical and Derived, Fields Institute, Toronto, Canada. June 14, 2016.
(15) "A preliminary report on the $K(2)$-local Picard group at $p = 2$", 56th Cascade Topology Seminar, Banff International Research Station, Banff, Canada. May 1, 2016.

(16) "The Chromatic Splitting Conjecture at $p = n = 2$", Workshop on homotopy theory, Mathematisches Forschungsinstitut Oberwolfach, Germany. March 10, 2015.

Conferences and events within the US (invited speaker).

(17) "On chromatic vanishing in characteristic p". Fall Midwest Topology Seminar. University of Chicago. Chicago. November 2024.
(18) "Parametrized cohomology of the classifying space for C_2-line bundles". Algebraic Structures in Topology. San Juan, Puerto Rico. June 2024.
(19) "Homotopical framework for parametrized quantum spin systems". Mid-Atlantic Topology Conference, University of Pennsylvania, Philadelphia, PA. April 2023.
(20) "The Big Computation", Homotopy theory in honor of Paul Goerss, Northwestern University. Evanston, Illinois. March, 2023.
(21) "Equivariant Tools in Chromatic Homotopy Theory". Equivariant techniques in stable homotopy theory. American Institute for Mathematics Workshop. San Jose, CA. May, 2021.
(22) "Homotopy Theory and Phases of Matter", Cornell Topology Festival, Cornell University, Ithaca, NY. May 2021.
(23) "Homotopical Methods in Phases of Matter", AMS Joint Mathematics Meetings, Denver, CO. January 18, 2020.
(24) "Invertibility, $K(n)$-Locally", MayDay Conference (Fall 2019 Midwest Topology Seminar), University of Chicago, Chicago, IL. October 5, 2019.
(25) "Picard Groups and Orientability", AWM Research Symposium, Rice University, Houston, Texas. April 6, 2019.
(26) "Invertible $K(2)$-Local E-Modules in C_4-Spectra", AMS Special Session on Homotopy Theory, University of Hawaii at Manoa, Honolulu, Hawaii. March 24, 2019.
(27) "The Linearization Conjecture", AMS Special Session on Algebraic Topology, Portland, Oregon. April 14, 2018.
(28) "$K(n)$-local Picard Groups and Gross-Hopkins Duality", Homotopy Theory: Tools and Applications, University of Illinois at Urbana-Champaign, Urbana, Illinois. July 17, 2017.
(29) "Gross-Hopkins duals of higher real K-theory spectra", Spring 2017 Midwest Topology Seminar, University of Chicago, Chicago, Illinois. May 14, 2017.
(30) "The Chromatic Splitting Conjecture at $p = n = 2$", Conference in Geometry and Topology, Princeton University, Princeton, New Jersey. March 19, 2015.
(31) "The Chromatic Splitting Conjecture at $n = p = 2$", Third Midwest Women in Mathematics Symposium, Dominican University, Chicago, Illinois. March 7, 2015.
(32) "The Chromatic Splitting Conjecture at $p = n = 2$", AMS Joint Mathematics Meetings, San Antonio, Texas. January 13, 2015.
(33) "An Algebraic Finite Resolution for $K(2)$-Local Computations at the Prime 2", Midwest Topology Seminar, Wayne State University, East Lansing, Michigan. October 5, 2013.

International seminar and colloquia (invited speaker).

(34) "Homotopy Theory of Parametrized Quantum Systems". (Online Talk). TQFT Club seminar. University of Lisbon. June 2024.
(35) "Dualizing spheres for compact p-adic analytic groups and duality in chromatic homotopy". Max Planck Topology Seminar. June 14, 2021.
(36) "Homotopy Theory and Phases of Matter". University of Jerusalem Topology Seminar. June 7, 2021.
(37) "The Picard group of higher real K-theories from an equivariant perspective". University of Haifa Topology and Geometry Seminar. March 21, 2021.
(38) "The Chromatic Splitting Conjecture", Ruhr-Universität Bochum Topology Seminar, December 10, 2020.
(39) "Determining the Determinant Sphere", Gong Show, Harnessing Higher Structures, Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom. October 11, 2018.
(40) "Linearize this!", Gong Show, Harnessing Higher Structures, Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom. August 9, 2018.

(41) "bo and tmf-resolutions", University of Copenhagen Algebra/Topology Seminar, Copenhagen, Denmark. May 29, 2017.
(42) "The Chromatic Splitting Conjecture", Séminaire de Topologie, Université Paris 13, Paris, France. July 4, 2016.
(43) "The tmf-resolution and its relationship to the Telescope Conjecture", Séminaire Algèbre et Topologie, Université de Strasbourg, Strasbourg, France. June 28, 2016.
(44) "Chromatic splitting: the way things work at $p = 2$", Chromatic homotopy theory seminar, Max Planck Institute, Bonn, Germany. August 12, 2015.
(45) "Finite Resolutions and $K(2)$-Local Computations", Seminaire Algèbre et Topologie, Université de Strasbourg, Strasbourg, France. June 24, 2014.

Seminar and colloquia within the US (invited speaker).

(46) "Homotopical Framework for Quantum Spin Systems", Mathematics Seminars, Montana State University, Bozeman, September 2024.
(47) "Homotopy Theory of Parametrized Quantum Systems", Topology Seminar, Northwestern University, Evanston, May 2024.
(48) "Homotopy Theory of Parametrized Quantum Systems", Topology Seminar, Northeastern University, Boston, April 2024.
(49) "It's The Great Grading, Edgar Brown", New Mexico State University Special Colloquia. (Satellite talk to The South Central Topology Conference III), Las Cruces, New Mexico. October 2023.
(50) "Quotients rings $H\mathbb{F}_2 \wedge H\mathbb{F}_2$". Princeton Topology Seminar. October 28, 2021.
(51) "Homotopy Theory and Phases of Matter". Rocky Mountain Mathematical Physics and Topology Seminar. CU Boulder, May 28, 2021.
(52) "Equivariant quotients and localizations of norms of $BP_{\mathbb{R}}$". UIUC Topology Seminar, April 17, 2021.
(53) "Equivariant Morava K-Theories?". University of Michigan Algebraic Topology Seminar. March 29, 2021.
(54) "Equivariant Morava K-Theories?" . UChicago/Northwestern Topology seminar. February 2021.
(55) "Equivariant Morava K-Theories?", Massachusetts Institute of Technology, Cambridge, MA. November 16, 2020.
(56) "Equivariant Morava E and K-Theories", UCLA Topology Seminar, University of California Los Angeles, Los Angeles. April 24, 2020.
(57) "Models of Lubin-Tate spectra via Real bordism theory", Topology Seminar, Massachusetts Institute of Technology, Cambridge, MA. February 10, 2020.
(58) "Models of Lubin-Tate spectra via Real bordism theory", Topology Seminar, University of Rochester, Rochester, NY. February 4, 2020.
(59) "Invertibility in Chromatic Homotopy Theory", Topology seminar, University of Utah, Salt Lake City, UT. November 1, 2019.
(60) "Higher K-Theory and their Adams Operations", Mathematics colloquium, University of Utah, Salt Lake City, UT. October 31, 2019.
(61) "The Linearization Conjecture", Hopkins Topology Seminar, Johns Hopkins University, Baltimore, MD. December 3, 2018.
(62) "The Linearization Conjecture", Colorado State University Topology Seminar, Fort Collins, CO. October 23, 2018.
(63) "The Equivariant Dual of Morava E-Theory", University of Chicago Topology Seminar, University of Chicago, Chicago, Illinois. January 9, 2018.
(64) "The Equivariant Dual of Morava E-Theory", Northwestern University Topology Seminar, Northwestern University, Evanston, Illinois. January 8, 2018.
(65) "Duality and $K(n)$-local Picard groups", Electronic Computational Homotopy Theory Seminar, hosted by Wayne State University. December 8, 2016.
(66) "The $K(2)$-local Picard group at $p = 2$", University of Minnesota Topology Seminar, Minneapolis, Minnesota. November 14, 2016.
(67) "Dispersion and reassembly in the homotopy groups of spheres", colloquium, University of Notre Dame, Notre Dame, Indiana. February 1, 2016.

(68) "Dispersion and reassembly in the homotopy groups of spheres", colloquium, University of Minnesota, Minneapolis, Minnesota. January 19, 2016.
(69) "Dispersion and reassembly in the homotopy groups of spheres", colloquium, University of Oregon, Eugene, Oregon. January 15, 2016.
(70) "Dispersion and reassembly in the homotopy groups of spheres", colloquium, University of Colorado Boulder, Boulder, Colorado. January 13, 2016.
(71) "Assembling the chromatic homotopy theory", colloquium, Cornell University, Ithaca, New York. November 23, 2015.
(72) "Gluing data in chromatic homotopy theory", Topology seminar, University of Oregon, Eugene, Oregon. November 6, 2015.
(73) "Gluing data in chromatic homotopy theory", Geometry and topology seminar, Georgia Tech, Atlanta, Georgia. September 14, 2015.
(74) "Gluing data in chromatic homotopy theory", Topology seminar, Indiana University Bloomington, Bloomington, Indiana. September 2, 2015.
(75) "Chromatic splitting: the way things work at p=2", UIUC Topology Seminar, University of Illinois at Urbana-Champaign, Urbana, Illinois. September 1, 2015.
(76) "The Chromatic Splitting Conjecture at $p = n = 2$", Topology seminar, Massachusetts Institute of Technology, Cambridge, Massachusetts. May 4, 2015.
(77) "The Chromatic Splitting Conjecture at $p = n = 2$", Topology seminar, Northwestern University, Evanston, Illinois. April 30, 2015.
(78) "The Chromatic Splitting Conjecture at $p = n = 2$", Topology seminar, The University of Notre Dame, Notre Dame, Indiana. April 20, 2015.
(79) "The Chromatic Splitting Conjecture at $p = n = 2$", Topology seminar, The University of Rochester, Rochester, New York. January 30, 2015.
(80) "A Preliminary Report on the Chromatic Splitting Conjecture at $p = n = 2$", Purdue University, West Lafayette, Indiana. November 19, 2014.
(81) "Cohomology : A Mirror of Homotopy", Topology Seminar, University of Louisiana at Lafayette, Lafayette, Louisiana. September 19, 2014.
(82) "Chromatic Levels in the Homotopy Groups of Spheres", Colloquium, University of Louisiana at Lafayette, Lafayette, Louisiana. September 18, 2014.
(83) "Chromatic Levels in the Homotopy Groups of Spheres", Topology Seminar, University of Kentucky, Lexington, Kentucky. September 11, 2014.
(84) "Chromatic homotopy theory", FRAGMENT Seminar, University of Colorado at Boulder, Boulder, Colorado. August 16, 2014.
(85) "Finite Resolutions and $K(2)$-Local Computations", Geometry & Topology Seminar, University of Western Ontario, London, Ontario. March 17, 2014.
(86) "Formal Group Laws, Elliptic Curves and Modular Forms in Stable Homotopy Theory", FRAGMENT Seminar, Colorado State University, Fort Collins, Colorado. September 19, 2013.
(87) "The $K(2)$-Local Moore Spectrum at $p = 2$", University of Chicago Topology Seminar, University of Chicago, Chicago, Illinois. January 29, 2013.
(88) "The $K(2)$-Local Moore Spectrum at $p = 2$", UIUC Topology Seminar, University of Illinois at Urbana-Champaign, Urbana, Illinois. October 23, 2012.

Other research talks.

(89) "Cohomology: A Mirror of Homotopy", Young Topologists Meeting, Copenhagen, Denmark. July 1, 2014.

Visits to institutes as invited scholar

(1) Spectral Methods in Algebra, Geometry, and Topology, Hausdorff Institute Trimester Program, Bonn, Germany. September 12 - November 4, 2022
(2) Max Planck Institute for Mathematics. Bonn, Germany. June 1-30, 2021.
(3) Homotopy Harnessing Higher Structures, Isaac Newton Institute for Mathematical Sciences, Cambridge, England. July 10 - August 17, 2018 and Sept 18 - October 19, 2018.

(4) Homotopy theory, manifolds, and field theories, Hausdorff Institute Trimester Program, Bonn, Germany. July 23-August 18, 2015.

Teaching Accomplishments

Courses Taught at CU Boulder.

(1) MATH 4140/5140 (001) Abstract Algebra 2, Spring 2025.
(2) MATH 6210 (001) Topology 1, Fall 2024.
(3) MATH 2135 (002) Linear Algebra for Math Mjrs, Fall 2024.
(4) MATH 2135 (002) Linear Algebra for Math Mjrs, Spring 2024.
(5) MATH 6220 Topology 2, Spring 2024.
(6) MATH-8900-900 Independent Study on Vector bundles, topological K-theory, characteristic classes, Fall 2023. Enrollment: 7.
(7) MATH 4200/5200 Topology, Fall 2023.
(8) MATH 3001(002) Analysis 1, Spring 2023.
(9) MATH 6220 Topology 2, Spring 2023.
(10) MATH 6220 Topology 2, Spring 2022.
(11) MATH 4200/5200 Topology, Fall 2021.
(12) MATH 2135 (001) Linear Algebra for Math Mjrs, Fall 2021.
(13) MATH 6900-900 Independent Study on Stable Homotopy Theory, Spring 2021. Enrollment: 3
(14) MATH 2135 (001) Linear Algebra for Math Mjrs, Spring 2021.
(15) MATH 3001(001) Analysis 1, Fall 2020.
(16) MATH 6280 Advanced Algebraic Topology, Fall 2020.
(17) MATH 6900-900 Independent Study on Characteristic Classes, Fall 2019. Enrollment: 6
(18) MATH 4200/5200 Topology, Fall 2019.
(19) MATH 2002 Number Systems, Fall 2019.
(20) MATH 3001(003) Analysis 1, Spring 2019.
(21) MATH 6220 Topology 2, Spring 2019.
(22) MATH 2001(003) Discrete Mathematics, Spring 2018.
(23) MATH 6220 Topology 2, Spring 2018
(24) MATH 4200/5200 Topology, Fall 2017.
(25) MATH 3001(003) Analysis 1, Spring 2018
(26) MATH 3001(002) Analysis 1, Spring 2018
(27) MATH 6280 Advanced Algebraic Topology, Fall 2016.

Course Creation at CU Boulder.

(1) MATH 8210 - Topics in Topology, created with Professors Casalaina-Martin, Deeley, Pflaum and Wise.
(2) MATH 2002 - Number Systems, created with Professors Czubak, Pflaum and Walter.

Students.

PhD Students.

(1) Katharine Adamyk. PhD Spring 2020.
(2) Cherry Ng. PhD Spring 2022.
(3) André Davis. PhD Spring 2022.
(4) Erik Knutsen. PhD Spring 2024.
(5) Juan Moreno (advanced to candidacy, PhD expected 2025)
(6) Courtney Hauf (advanced to candidacy)
(7) Alexander Lajeunesse (advanced to candidacy)
(8) Stephanie Oh
(9) Taylor Rogers

Concurrent Master Students.

(1) (Mathematics co-advisor) Brandon Breedon. MA Spring 2020.

Educational talks, mini-courses and colloquia.

(1) Math Honor Society Guest Speaker, Fairview High School, May 1, 2024.
(2) "Ants on Pants, or an Introduction to Manifolds and Cobordism", Program for in Mathematics for Young Scientists, Boston University, July 16, 2020. (Online)
(3) "Ants on Pants, or an Introduction to Manifolds and Cobordism", UChigao REU, June 23, 2020 and July 23, 2020. (Online)
(4) "An Introduction to Chromatic Homotopy Theory". Online mini-course in the electronic Computational Homotopy Theory Seminar hosted by Wayne State University. May 2019.
(5) "Higher Real K-Theories", Graduate Student Topology and Geometry Conference, University of Illinois at Urbana-Champaign, Urbana, Illinois. March 30, 2019.
(6) "Ants on Pants, or an Introduction to Manifolds and Cobordism", Illinois Geometry Lab (Undergraduate Colloquium), University of Illinois at Urbana-Champaign, Urbana, Illinois. March 29, 2019.
(7) Some $K(1)$-local computations, Chromatic Homotopy Theory: Journey to the Frontier (Graduate workshop), University of Colorado Boulder, Boulder, Colorado. May 16, 2018.
(8) "Transforming Shapes Into Algebra", CU Math Club, University of Colorado Boulder, Boulder, Colorado. Featuring Nikki Sanderson (CU Boulder). April 4, 2018.
(9) "Transforming shapes into algebra", Colorado Academy Math Club, Denver, Colorado. February 8, 2018.
(10) "Computations in Homotopy Theory", Topological and Geometric Methods in QFT, Montana State University, Bozeman, Montana. August 3, 2017.
(11) "Vector fields and topology", CU Math Club, University of Colorado Boulder, Boulder, Colorado. September 21, 2016.
(12) "Find Stability: Suspend a Sphere", Kalamazoo College Colloquium, Kalamazoo College, Kalamazoo, Michigan. November 7, 2012.

Teaching Experience before CU.

(1) Instructor, the University of Chicago Mathematics REU, University of Chicago. Summer 2015.
(2) Instructor, Algebra 1, The Algebra Initiative, Seminars for Endorsement of Science and Mathematics Educators, University of Chicago. Winter 2015.
(3) Instructor, Honors Calculus Inquiry Based Learning, Math 161-163, University of Chicago. Fall 2014, Winter 2015, Spring 2015, Fall 2015, Winter 2016, Spring 2016
(4) Instructor, Honors Calculus 1, Math 161, University of Chicago. Fall 2014.
(5) Instructor, Introduction to Analysis and Linear Algebra, Math 199, University of Chicago. Fall 2013, Winter 2014 and Spring 2014.
(6) Mentor, Directed reading program, University of Chicago. Spring 2014.
(7) Instructor, Math 224: Integral Calculus of One Variable Functions, School of Continuing Studies, Northwestern University. Winter 2013.
(8) Instructor, Math 211: A Short Course in Calculus, School of Continuing Studies, Northwestern University. Fall 2012.
(9) Teaching Assistant, Bridge Program, Northwestern University. Summer 2012.
(10) Teaching Assistant, Math 285 Accelerated Mathematics for MMSS: First Year, Department of Mathematics, Northwestern University. Spring 2012.
(11) Teaching Assistant, Math 290-1: MENU Linear Algebra and Multivariable Calculus, Department of Mathematics, Northwestern University. Fall 2011.
(12) Teaching Assistant, Math 340-0: Geometry, Northwestern University. Spring 2011.
(13) Teaching Assistant, Math 321-1: Real Analysis and Math 321-1: MENU Real Analysis, Department of Mathematics, Northwestern University. Fall 2010.
(14) Counsellor, Program in Mathematics for Young Scientists, Boston University, Boston, Massachusetts. Summers 2006, 2007.

Service Activities

Departmental and university service.

Departmental Committees.

(1) Member of the Executive Committee, Department of Mathematics, CU Boulder. July 2023-Present
(2) Chair of the Diversity Committee, Department of Mathematics, CU Boulder, September 2019-July 2022 & January 2023-July 2023
(3) Member of the Graduate Committee, Department of Mathematics, CU Boulder. August 2018-May 2021.
(4) Member of the Diversity Committee, Department of Mathematics, CU Boulder. October 2018-August 2019.
(5) Faculty mentor for the CU Math Club. August 2016-May 2018.

Divisional Committees.

(1) Member of the Natural Sciences Council, CU Boulder. AY 2024/2025

Service to the profession.

Conferences and workshop organization.

(1) Co-Organizer for conference *Hot Topics: Life after the Telescope Conjecture*, Simons Laufer Mathematical Sciences Institute, December 9-23, 2024.
(2) Co-Organizer for conference *C^*-Algebraic Quantum Mechanics and Topological Phases of Matter*, University of Colorado Boulder, July 29-August 2, 2024.
(3) Co-Organizer for *AMS Special Session on Homotopy Theory*, Creighton University, Omaha, NE October 7-8, 2023.
(4) Co-Organizer of AMS Special Session *Higher Topological and Algebraic K-Theories*, Salt Lake City, Utah. October 22-23, 2022.
(5) Co-Organizer for a Summer School on Homotopical Methods in Fixed Point Theory, University of Colorado Boulder, Boulder, Colorado. (July 11-15, 2022)
(6) Co-Organizer for *Homotopy Theory with Applications to Arithmetic and Geometry*, hosted jointly with the Max Plank Institute (Bonn) and Fields Institute (Toronto). June 27-30, 2022.
(7) Co-Organizer for a Chromatic Homotopy Theory and Friends, Institut Mittag-Leffler, Djursholm, Sweden. (June 7-10, 2022)
(8) Co-Organizer for AMS Special Session *Effective DEI Efforts in Math Departments*, Virtual AMS Joint Mathematics Meetings. April, 2022.
(9) Co-Organizer of Canadian Mathematical Society Meeting Session *Homotopy Theory*. December 4-6, 2020. Online event.
(10) Co-Organizer for AMS Special Session on *Categorical and Computational Methods in Homotopy Theory*, AMS Joint Mathematics Meetings, Denver, CO. January 16, 2020.
(11) Co-Organizer for "International Workshop on Algebraic Topology", Fudan University, Shanghai, China. August 19-21, 2019.
(12) Co-Organizer for the 2019 Summer School in Equivariant Homotopy Theory, Fudan University, Shanghai, China. August 13-17, 2019
(13) Co-Organizer for "International Workshop on Algebraic Topology" (satellite conference to the AMS Joint International Meeting), South University of Science and Technology of China, Shenzhen, China. June 7-9, 2018.
(14) Co-Organizer for Chromatic Homotopy Theory: Journey to the Frontier – Conference, University of Colorado at Boulder, Boulder, Colorado. This event was filmed. Videos of the talks are available on the conference website. May 18-20, 2018
(15) Co-Organizer for Homotopy Theory in the Ecliptic: Chromatic, Equivariant, and Motivic Mathematics, Reed College, Portland, Oregon. Videos of the talks are available online. August 18-21, 2017.
(16) Supplementary expert for NSF-CBMS conference Topological and Geometric Methods in Quantum Field Theory, Montana State University, Bozeman, Montana. July 31-August 4, 2017.
(17) Scientific Co-Organizer for the West Coast Algebraic Topology Summer School, University of Oregon, Eugene, Oregon. August 8-13, 2016.

(18) Co-Organizer for the Second Chicago Summer School in Geometry and Topology, University of Chicago, Chicago, Illinois. This event was filmed to create an online minicourse. July 25-29, 2016.
(19) Co-Organizer for the Spring Midwest Topology Seminar, University of Chicago, Chicago, Illinois. May 9-10, 2015.

Other service activities.

(1) BIRS Scientific and Equity, Diversity and Inclusion advisory boards (BIRS SAB and EDIAB) for the period 2024-2026
(2) AMS Invited Address Committee for National Meetings. Appointment effective February 2024 (work began November 2023) through June 2027.
(3) Referee for peer-reviewed journals and grants
(4) Recommendation and promotion letters
(5) Guest Reviewer for zbMath. November 2019-January 2020
(6) Reviewer for MathSciNet. February 2017-January 2021.
(7) Co-Organizer for the University of Chicago Topology Seminar. September 2013-June 2016.
(8) Editor and Founding Member, The Delta-Epsilon-McGill's undergraduate Mathematics Magazine, McGill University, Montréal, Québec, Canada. 2005-2008.