David J. Hunter

Education

Ph.D., Mathematics, University of Virginia, May 1997.
   Dissertation: "Stable Homotopy Groups of Spheres and Brown-Gitler Spectra"
   Thesis Advisor: Nicholas J. Kuhn

M.S., Mathematics, University of Virginia, May 1994.

B.S. *magna cum laude*, Mathematics, University of Illinois, May 1990.

Teaching Experience

Professor of Mathematics, Westmont College, August 2008–present.

Associate Professor of Mathematics, Westmont College, August 2002–August 2008.

Assistant Professor of Mathematics, Westmont College, August 2000–August 2002.

Assistant Professor of Mathematics, North Central College, September 1997–June 2000.

Graduate Instructor, University of Virginia, August 1992–August 1997.

Teacher, Oak Park and River Forest High School, August 1990–July 1992.

Publications

Essentials of Discrete Mathematics, 4th Edition, Jones and Bartlett, 2022.

Segregation Surfaces, (with Chisondi Warioba). Mathematics Magazine 94:3, June 2021.

New metrics for evaluating home plate umpire consistency and accuracy. Journal of Quantitative Analysis in Sports 14(4), December 2018, pp. 159–172.

Better Estimates from Binned Income Data: Interpolated CDFs and Mean-Matching, (with P. T. von Hippel and McKalie Drown). Sociological Science 2017:4, pp. 641–655.

Inquiry Problems for Essentials of Discrete Mathematics, Jones and Bartlett, 2017.

Essentials of Discrete Mathematics, 3rd Edition, Jones and Bartlett, 2017.

Contributing author for *The New Mathways Project, Reasoning with Functions II,* Charles A. Dana Center, University of Texas at Austin, 2016.

Contributing author for *The New Mathways Project, Reasoning with Functions I,* Charles A. Dana Center, University of Texas at Austin, 2015.

Essentials of Discrete Mathematics, 2nd Edition, Jones and Bartlett, 2012.

The Two Color Theorem. Resources for Teaching Discrete Mathematics, Mathematical Association of America, 2009.

Essentials of Discrete Mathematics, Jones and Bartlett, 2008.

Regular correspondent for *Media Highlights,* College Mathematics Journal, 2001–2006.

How rare is symmetry in 12-tone musical rows? (with P. T. von Hippel). American Mathematical Monthly, (110), February 2003, pp. 124–132.

Characterizations of spectra with $\mathcal{U}$-injective cohomology which satisfy the Brown-Gitler property, (with N. Kuhn). Transactions of the American Mathematical Society, (352), March 2000, pp. 1171–1190.

Mahowaldean families of elements in stable homotopy groups revisited, (with N. Kuhn). Mathematical Proceedings of the Cambridge Philosophical Society, (127), 1999, pp. 237–251.

Selected Presentations

Binsmoothing and the Joys and Perils of CRAN, Santa Barbara R Users Group, August, 2020.

New Metrics for Evaluating Home Plate Umpire Consistency and Accuracy, Joint Statistical Meetings, August 2020.

Measuring Umpire Consistency, AMS/MAA National Meeting, San Diego, CA, January 2018.

Presentations and Portfolios in Introductory Statistics, Legacy of R. L. Moore Conference, Austin, TX, June 2013.

The Topology of the Three-Sphere
Santa Barbara High School Mathematics Honor Society, December, 2012.

RSA Cryptography: Applications After Aesthetics
Santa Barbara High School Mathematics Honor Society, October, 2010.

Matemáticas para el siglo XXI: Una propuesta discreta
Universidad Autonoma de Querétaro, Mexico, November 2009.

Una programa de estudios esencial para las matemáticas discretas
Universidad Politécnica de Querétaro, Mexico, October 2009.

Major League Baseball Meets Facebook: Modeling Trades Using Social Network Theory
AMS/MAA National Meeting, Washington D.C., January 2009.

Teaching Induction Using Fractals
AMS/MAA National Meeting, San Diego, CA, January 2008.

Why Biology Majors Should take Discrete Mathematics
Session on Biomathematics in the First Two Years, MAA National Meeting, San Jose, CA, August 2007.

Exercises in Reconstructing Evolutionary Trees
Session on Nifty Examples in Discrete Mathematics, MAA National Meeting, Albuquerque, NM, August 2005.

Widening the Audience for Discrete Mathematics
MAA National Meeting, Albuquerque, NM, August 2005.

The Perfect Shuffle: Mathematical Apologetics
Session on Applications of Mathematics in Computer Science, MAA National Meeting, Phoenix, AZ, January 2004.

Phylogenetic Distance and Coxeter Groups
SCNSMAA Meeting, Pomona, CA, October 2003.

How rare is symmetry in 12-tone musical rows?
Mathematics Colloquium, University of Redlands, Redlands, CA, February, 2002.

Group exercises for abstract algebra
Session on Learning to Prove in Cooperative Learning and Technology Supported Environments, MAA National Meeting, San Diego, CA, January 2002.

Symmetry in 12-tone musical rows
SCSMAA Meeting, Los Angeles, CA, October 2001.

Group exercises for abstract algebra
Panelist for discussion on modern pedagogy in upper division courses, ISMAA Meeting, Naperville, IL, March 2000.

RSA cryptography: An application of "theoretical" mathematics
Mu Alpha Theta induction ceremony, Joliet Catholic Academy, November 1999.

Duals of summands of $B\mathbf{Z}/p$
Topology Session, AMS National Meeting, San Antonio, TX, January 1999.

Characterizing spectra with $\mathcal{U}$-injective cohomology which satisfy the Brown-Gitler property
    Topology Seminar, Northwestern University, Evanston IL, April 1998.

Characterizing spectra with $\mathcal{U}$-injective cohomology which satisfy the Brown-Gitler property
    Topology Seminar, University of Chicago, Chicago IL, March 1998.

Some new infinite families in $_p\pi_*^S$
    Fields Institute Conference on Unstable Homotopy Theory, Toronto, Ontario, June 1996.

Brown-Gitler spectra, $\Omega^2 S^3$, and π_*^S
    Regional Meeting of the American Mathematical Society: Special Session on Homotopy Theory, Lawrenceville, New Jersey, October 1996.

Student Research Projects

Segregation Measurement and Visualization using Kernel Density Estimate Contours, Chisondi Warioba, Spring 2019.

Smoothing Binned Data by Recursive Subdivision: Estimating Income Inequality, McKalie Drown, Summer 2016. Presented at the Southern California Nevada Section MAA Meeting, April 2017.

Using Quaternions to Improve Statistical Analysis in $SO(3)$: A New Two-Sample Hypothesis Test for Orientation Data., Emma Donelson and Bethany Le, Summer 2016. Presented at the Southern California Nevada Section MAA Meeting, April 2017.

Visualization and Analysis of Orientation Data: Statistical Methods on $SO(3)$ Data Represented as Quaternions, Abigail DeYoung, Summer 2016. Presented at Fall Undergraduate Research Symposium, Westmont College, 2016.

Investigation of Phylogenetic Tree Reconstruction, Chase Clanton, Summer, 2005. Presented at the 2005 Westmont College Celebration of Undergraduate Research.

Hybridization of Euclidean 2-space and the Poincaré Disk Model for Planar Geometry, Gib Gerard, Manuel Reyes and Kevin Kishiyama. Presented at the March 2004 SCNSMAA meeting in San Diego, CA, and at the 2004 Westmont College Undergraduate Research Symposium.

Transforming Origami Into Knots, Chase Clanton, Justin Marks, and Michael Strongman. Presented at the March 2004 SCNSMAA meeting in San Diego, CA, and at the 2004 Westmont College Undergraduate Research Symposium.

Is National Sovereignty Possible? A Geometric Look at International Agreements, Kristin Bailey. Presented at the 2004 Westmont College Undergraduate Research Symposium.

Applications of Group Theory to Rubik-Type Puzzles, Kerin Heck and Jody Radowicz. Presented at the March 2000 ISMAA meeting and at the May 2000 Rall Symposium for Undergraduate Research, North Central College.

Knots and DNA Gel Electrophoresis, Tammy Pudzimis, Haven Johnson, Anna Tollberg. Presented at the Rall Symposium for Undergraduate Research, North Central College, May 2000.

A Family of Torus Knots, Lisa Platkus, Evie Rote, Jenni Underhill. Presented at the Rall Symposium for Undergraduate Research, North Central College, May 2000.

Knots and their Effects on Manifolds, Sarah Schmidt, Jackie Regan, Carrie Schramm. Presented at the Rall Symposium for Undergraduate Research, North Central College, May 2000.

Traffic Flow on Chicago Avenue: A Dynamical Systems Approach, Norman Johnson, David Kang, Lisa Lim. Presented at the Rall Symposium for Undergraduate Research, North Central College, May 1999.

Differential Equation Models for Computer Virus Propagation, Anusha Gururajan, Tim Johnson, Rachel O'Toole. Presented at the Rall Symposium for Undergraduate Research, North Central College, May 1999.

Selected Public Software Repositories

Binsmooth: An R package for smoothing binned data, available on CRAN.
https://github.com/djhunter/binsmooth

RWorkshop: Slides and other materials for training faculty to use R in their teaching and research.
https://github.com/djhunter/Rworkshop

Cryptography: Slides, assignments, and resources for my Cryptography and Coding Theory class.
https://github.com/djhunter/cryptography

Inconsistency: Ideas for measuring inconsistency in data.
https://github.com/djhunter/inconsistency

Segregation: Research on general forms of segregation: racial, economic, etc.
https://github.com/djhunter/segregation

Service to Mathematical Community

Referee for *Journal of Quantitative Analysis in Sports,* 2019.

Referee for *Journal of Integer Sequences,* 2012.

Referee for *College Mathematics Journal,* 2001–present.

Referee for *Journal of Online Mathematics and its Applications,* 2001–2004.

Board Member, Southern California Section of the Mathematical Association of America (Web Page Editor), October 2001–July 2008.

Grants Received

Implementing algebraic structures in C++
Summer Development Grant, Westmont College, 2001.

Computer Visualizations of Higher Dimensional Topological Phenomena
Summer Faculty Development Research Grant, North Central College, 1999.

Stable Decomposition of Classifying Spaces and Spanier-Whitehead Duality
Summer Faculty Development Research Grant, North Central College, 1998.

Selected Conferences and Workshops

Joint Statistical Meetings, August 2020.

National Meeting of the AMS/MAA, San Diego, CA, January 2018.

Southern California-Nevada Section of the Mathematical Association of America Spring Meeting, Los Angeles, CA, April 2017.

New Mathways Author Team Meeting, Charles A. Dana Center, Austin TX, October 2014.

Legacy of R. L. Moore Conference, Austin, TX, June 2013.

NSF PREP Workshop on Inquiry-Based Learning, Santa Barbara, CA, June 2012.

National Meeting of the AMS/MAA, Washington, D.C., January 2009.

National Meeting of the AMS/MAA, San Diego, CA, January 2008.

MATHFEST, San Jose, CA, August 2007.

MATHFEST, Albuquerque, NM, August 2005.

Southern California-Nevada Section of the Mathematical Association of America Spring Meeting, Los Angeles, CA, March 2005.

NSF PREP Workshop on Nifty Applications in Discrete Mathematics, Valporaiso University, Valporaiso, IN, June 2004. Invited Participant.

Southern California-Nevada Section of the Mathematical Association of America Spring Meeting, San Diego, CA, March 2004.

National Meeting of the American Mathematical Society and Mathematical Association of America, Phoenix, AZ, January 2004.

Southern California-Nevada Section of the Mathematical Association of America Fall Meeting, Pomona, CA, October 2003.

NSF PREP Workshop on Knot Theory, Wake Forest University, Winston-Salem NC, June 2002. Invited Participant.

National Meeting of the American Mathematical Society and Mathematical Association of America, San Diego, CA, January 2002.

Southern California Section of the Mathematical Association of America Fall Meeting, Los Angeles, CA, October 2001.

Illinois Section of the Mathematical Association of America Annual Meeting, Augustana College, Rock Island, IL, March 2000. Regional Project NExT program.

MATHFEST, Providence, RI, July 1999. Project NExT Fellowship program. Included a short course on undergraduate research. Invited Participant.

Illinois Section of the Mathematical Association of America Annual Meeting, Augustana College, Rock Island, IL, April 1999. Regional Project NExT program.

National Meeting of the American Mathematical Society, San Antonio, TX, January 1999. Project NExT Fellowship program. Invited Participant.

MATHFEST, Toronto, Ontario, July 1998. Project NExT Fellowship program. Included a short course on active learning techniques.

Awards and Honors

Project NExT Fellow, 1998–1999.

Society of Actuaries Exams 100 and 110 (60 credits)

Graduate Research Fellowship (competitive), University of Virginia, 1995–1996.

Graduate Assistantship, University of Virginia, 1992–1995, 1996–1997.

Department of Education Teacher Trainee Program, University of Virginia, 1992–1996

Bronze Tablet, University of Illinois, 1990.

Phi Beta Kappa, University of Illinois, 1990.

Professional Memberships

American Statistical Association

Mathematical Association of America

National Council of Teachers of Mathematics, 1990–1992

Illinois Council of Teachers of Mathematics, 1990–1992

Metropolitan Mathematics Club of Chicago, 1990–1992