

CURRICULUM VITAE OF TOM CUCHTA

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EDUCATION

Missouri University of Science and Technology

Rolla, MO

🎓 Ph.D. Mathematics

(2011 Fall–2015 Fall)

- Advisor: Dr. Martin Bohner
- Thesis: Discrete analogues of some classical special functions
- Award: Chancellor’s Fellowship

Marshall University

Huntington, WV

🎓 M.A. Mathematics

(2009 Fall–2011 Spring)

🎓 B.S. Mathematics, 🎓 B.S. Applied Mathematics

(2006 Fall–2009 Spring)

- Advisor: Dr. Bonita Lawrence
- Thesis: Infinitesimal Time Scale Calculus

POSITIONS

Fairmont State University

Fairmont, WV

(2016 Fall–present) Assistant Professor of Mathematics

Missouri University of Science and Technology

Rolla, MO

(2016 Spring) Instructor

(2011 Fall–2015 Fall) Graduate Teaching Assistant

Marshall University

Huntington, WV

(2011 Summer) Instructor

(2009 Fall–2011 Spring) Graduate Teaching Assistant

GRANTS

- (2022–2025) **Principal Investigator:** NSF Research Experience for Undergraduates grant (\$323,352) “*Discrete and Continuous Analysis in Appalachia*”
- (2022–2028) **Senior Personnel:** NSF S-STEM Track 1 Institutional Capacity Building grant (\$749,693) “*Bridging the STEM Gap in Appalachia: Engaging with students to iteratively improve faculty practices in support of student success*”
- (2019 Apr) Fairmont State University Foundation Grant Award
- (2018 Nov–2019 May) **Principal Investigator:** NASA Software Assurance Research Program grant “*Human Hazards in Cybersecurity*”
- (2017 Nov) Grant from NVIDIA Corporation for a Titan XP graphics processing unit
- (2017 Aug–2018 Jul) TMC² Technologies Undergraduate machine learning training grant

WV NASA Space Grant Consortium Awards

- (2022 Nov–2023 Jul) “*Matrix dynamic Gompertz equations*”
- (2021 Nov–2022 Jul) “*Periodic carrying capacity in Gompertz dynamic equations*”
- (2021 Mar–2021 Jul) “*Multi-valued matrix logarithm and matrix inverse trigonometric functions on time scales*”
- (2020 Nov–2021 Jul) “*Discrete Meijer G*”

Undergraduate WV NASA Space Grant Consortium Awards Mentored

- (2022 Nov–2023 Jul) Richard Williams “*Linear quadratic pursuit-evasion games on time scales*”
- (2021 Nov–2022 Jul) Jacob Branch “*Monodiffic extensions of discrete special functions*”
- (2020 Nov–2021 Jul) Rebecca Luketic “*Discrete Legendre polynomials*”
- (2020 Nov–2021 Jul) Dallas Freeman “*Discrete polylogarithm functions*”
- (2019 Nov–2020 Jul) Brooke Fincham “*Discrete fractional population models*”

PEER-REVIEWED PUBLICATIONS

- [1] Tom Cuchta and Robert J. Niichel. Memoryless properties on time scales. *Math. Slovaca*, 2022. In press.
- [2] Samer Assaf and Tom Cuchta. The rational sequence topology is partially metrizable. *Top. Proc.*, 2022. In press.
- [3] Ümit Aksoy, Tom Cuchta, Svetlin Georgiev, and Yeliz Yolcu Okur. A normal distribution on time scales with application. *Filomat*, 2022. In press.
- [4] Tom Cuchta and Dallas Freeman. Discrete polylogarithm functions. *Tatra Mt. Math. Publ.*, 2022. In press.
- [5] Tom Cuchta, David Grow, and Nick Wintz. Discrete matrix hypergeometric functions. *J. Math. Anal. Appl.*, 518(2):126716, 2023.
- [6] Samer Assaf and Tom Cuchta. The half disc topology is partially metrizable. *Top. Proc.*, 61:139–144, 2023.
- [7] Alexander Lyapun and Tom Cuchta. Sections of a generating series of a solution to a difference equation in a simplicial cone. *Bull. Irkutsk State Univ. Ser. Math.*, 42:75–89, 2022.
- [8] Tom Cuchta, David Grow, and Nick Wintz. Divergence criteria for matrix generalized hypergeometric series. *Proc. Am. Math. Soc.*, 150(3):1235–1240, 2022.
- [9] Tom Cuchta and Nick Wintz. Periodic functions related to the Gompertz difference equation. *Math. Biosci. Eng.*, 19(9):8774–8785, 2022.
- [10] Martin Bohner, Tom Cuchta, and Sabrina Streipert. Delay dynamic equations on isolated time scales and the relevance of one-periodic coefficients. *Math. Meth. Appl. Sci.*, 45(10):5821–5838, 2022.
- [11] Tom Cuchta and Rebecca Luketic. Discrete Hypergeometric Legendre Polynomials. *Mathematics*, 9(20):2546, 2021.
- [12] Tom Cuchta and Sabrina Streipert. A discrete SIS model of fractional order. *Int. J. Dyn. Syst. Differ. Equ.*, 11(3/4):275, 2021.
- [13] Tom Cuchta and Svetlin Georgiev. Analysis of the bilateral Laplace transform on time scales with applications. *Int. J. Dyn. Syst. Differ. Equ.*, 11(3/4):255, 2021.
- [14] Tom Cuchta, Robert Jon Niichel, and Sabrina Streipert. A Gompertz distribution for time scales. *Turk. J. Math.*, 45(1):185–200, 2021.
- [15] Tom Cuchta and Brooke Fincham. Some new Gompertz fractional difference equations. *Involve*, 13(4):705–719, 2020.
- [16] F. Ayça Çetinkaya and Tom Cuchta. Sturm-Liouville and Riccati conformable dynamic equations. *Adv. Dyn. Syst. Appl.*, 15(1):1–13, 2020.
- [17] Samer Assaf, Tom Cuchta, and Matt Insall. Binary metrics. *Topol. Appl.*, 274:107116, 2020.
- [18] Tom Cuchta, Michael Pavelites, and Randi Tinney. The Chebyshev Difference Equation. *Mathematics*, 8(1), 2020.
- [19] Tom Cuchta and Sabrina Streipert. Dynamic Gompertz model. *Appl. Math. Info. Sci.*, 14(1):1–9, 2020.
- [20] Tom Cuchta, David Grow, and Nick Wintz. A dynamic matrix exponential via a matrix cylinder transformation. *J. Math. Anal. Appl.*, 479(1):733–751, 2019.
- [21] Tom Cuchta et al. Human risk factors in cybersecurity. In *Proceedings of the 20th Annual SIG Conference on Information Technology Education*, SIGITE '19, pages 87–92, New York, NY, USA, 2019. ACM.
- [22] Martin Bohner and Tom Cuchta. The generalized hypergeometric difference equation. *Demonstr. Math.*, 51:62–75, 2018.
- [23] Martin Bohner and Tom Cuchta. The Bessel difference equation. *Proc. Am. Math. Soc.*, 145(4):1567–1580, 2017.
- [24] Abigail Bishop, Tom Cuchta, Kathryn Lokken, and Oliver Pechenik. The nilradical and non-nilradical graphs of commutative rings. *Int. J. Algebra*, 2(17-20):981–994, 2008.
- [25] Tom Cuchta, Kathryn Lokken, and William Young. Zero-divisor graphs of localizations and modular rings. *Rose-Hulman Undergraduate Math Journal*, 9(2), 2008.

SUBMITTED MANUSCRIPTS

- Tom Cuchta, Rui Ferreria. The heat equation on time scales.
- Tom Cuchta, Dylan Poulsen, and Nick Wintz. Linear quadratic tracking with continuous conformable derivatives.
- Tom Cuchta, et al. Human Risk Factors in Cybersecurity: Experimental Assessment of an Academic Human Attack Surface.

TEACHING EXPERIENCE & PROFESSIONAL DEVELOPMENT

Fairmont State University		(2016 Fall–2022 Fall)	
Course	# sections	Course	# sections
Undergraduate Research	6	Real Analysis	3
Complex Variables	1	Differential Equations	2
Linear Algebra	2	Calculus 3	4
Calculus 2	6	Mathematical Logic	5
Calculus 1	3	Applied Calculus 2	1
Intro to Programming	2	Trigonometry	9
Applied Statistics	3	College Algebra	2
College Algebra with Support	1	Applied Tech Math I	1
Pre-College Algebra	1		

Missouri S&T (2011 Fall–2016 Summer)	
Course	# sections
Linear Algebra	4
Differential Equations	1
Calculus 3	8
Calculus 1	2
“Problem Solving Workshop”	2
“Hit the Ground Running”	3

Marshall University (2009 Fall–2011 Summer)	
Course	# sections
Trigonometry	3
College Algebra	2
Finite Math	1
Basic Skills in Mathematics II	1

Section NExT teaching workshops attended

- (2021 Sep) sustainability quantitative literacy course & teaching lower-level courses Triadelphia, WV (virtual)
- (2020 Sep) resampling in basic stats & activity-based learning online Slippy Rock, PA
- (2019 Sep) mastery based grading California, PA
- (2018 Sep) student issues and concerns & using the instructional practices guide Grove City, PA
- (2017 Sep) engagement and grading Pittsburgh, PA
- (2017 Apr) expository writing Wooster, OH
- (2016 Oct) teaching statistics Indiana, PA
- (2016 Sep) teaching math to liberal arts majors

SERVICE

To profession

Peer Review

- (2022) 20 papers
- (2021) 13 papers
- (2020) 30 papers
- (2019) 15 papers
- (2018) 3 papers
- (2017) 4 papers
- (2016) 2 papers

Writer for *Mathematical Reviews*



- (2022) 5 reviews
- (2021) 6 reviews
- (2020) 6 reviews
- (2019) 6 reviews

Reviewer for







- Advances in Continuous and Discrete Models: Theory and Applications
- Advances in Difference Equations

- Advances in the Theory of Nonlinear Analysis and its Application
- AIMS Mathematics
- Analysis: International Mathematical Journal of Analysis and its Applications
- Applied Mathematics in Science and Engineering
- Axioms
- Computational and Applied Mathematics
- Differential Equations and Dynamical Systems
- Dynamics of Continuous, Discrete and Impulsive Systems Series A: Mathematical Analysis
- Filomat
- Fundamental Journal of Mathematics and Applications
- International Journal of Dynamical Systems and Differential Equations
- Journal of Classical Analysis
- Journal of Difference Equations and Applications
- Journal of Fixed Point Theory and Applications
- Journal of Inequalities and Special Functions
- Journal of Mathematics and Computer Science
- Journal of Mathematics and Statistics
- Journal of Nonlinear Sciences and Applications
- Journal of the Egyptian Mathematical Society
- Malaysian Journal of Mathematical Sciences
- Mathematical Biosciences and Engineering
- Mathematical Population Studies
- Mathematics
- Nonlinear Dynamics and Systems Theory
- Nonlinearity
- Numerical Methods for Partial Differential Equations
- Real Analysis Exchange
- Rocky Mountain Journal of Mathematics
- Symmetry
- Turkish Journal of Mathematics
- TWMS Journal of Applied and Engineering Mathematics

To Mathematical Association of America

- (2022 Apr) Host organizer of Spring 2022 Allegheny Mountain Section conference (moved virtual)
- (2022 Spring) Nominating Committee (chair)
- (2021–present) Allegheny Mountain Colloquium (founder and chair)
 <https://www.alleghenymtn.maa.org/colloquium>
- (2021, 2020 Springs) Nominating Committee
- (2018 Apr–present) Allegheny Mountain Section Director of E-Communications
 Webmaster <https://www.alleghenymtn.maa.org/>
- (2018 Spring) Allegheny Mountain Section 2018 Teaching Award Committee

Other Service to profession

- (2022 Nov) Review Panel for NSF Division of Mathematical Sciences
- (2022 Feb–present) Communications Editor for *Applied Mathematics in Science and Engineering*
 <https://twitter.com/AppMathSciEng>
- (2016–present) Maintainer of an open source Python project on GitHub for time scale calculus
 <https://github.com/tomcuchta/timescalecalculus>
- (2012–present) Maintainer of a solutions manual to Rainville's *Special Functions*
 <https://github.com/tomcuchta/rainvillesfsolutions>
- **Owner and operator of...**
 - Time Scale Wiki  <http://timescalewiki.org>
 - Special Functions Wiki  <http://specialfunctionswiki.org>
 - Hyperspace Wiki  <http://hyperspacewiki.org>

To Fairmont State University

Undergraduate researchers mentored

- Summer 2022 cohort of *Discrete and Continuous Analysis in Appalachia*
- (2022) Richard Williams (discrete fractional calculus of variations)
- (2021–2022) Jacob Branch (monodiffic functions)
WV NASA Space Grant “*Monodiffic extensions of discrete special functions*”
- (2020–2021) Rebecca Luketic (discrete Legendre polynomials)
WV NASA Space Grant “*Discrete Legendre polynomials*”
- (2020–2021) Dallas Freeman (discrete polylogarithms)
WV NASA Space Grant: “*Discrete polylogarithm functions*”
- (2019–2020) Brooke Fincham (discrete fractional Gompertz models)
WV NASA Space Grant “*Discrete fractional population models*”
- (2019) Michael Pavelites (discrete Chebyshev polynomials)
- (2019) Kristina Daniels, Caleb Lutjens, Sydney Maibach, Ryan Stephenson (NASA IV&V SARP grant)
- (2018–2019) Matthias Baur (timescalecalculus package)
- (2018) Randi Tinney (discrete Chebyshev polynomials)
- (2017–2018) Mattison Johnson, Dawn Sargent, Carl Wahler, Anna Westfall (TMC² Technologies grant)
- (2017–2018) Zack Linger (zeta functions on time scales)
- (2017) Treston Brown (discrete special functions)
- (2016) Antonietta Bonanno (educational methods in geometry; masters student from U. Calabria, Italy)


Wrote reference letters for . . .

- (2022) 5 individuals
- (2021) 7 individuals
- (2020) 6 individuals
- (2019) 9 individuals
- (2018) 3 individuals
- (2017) 1 individual


Organized student trips

- | | |
|---|---------------------|
| – (2020) Pi Mu Epsilon conference | Youngstown, OH |
| – (2019) Marshall University differential analyzer | Huntington, WV |
| – (2019) Pi Mu Epsilon conference | Youngstown, OH |
| – (2019) Miami University of Ohio Annual Conference | Oxford, OH |
| – (2018) Allegheny Mountain MAA conference | Erie, PA |
| – (2018) Pi Mu Epsilon conference | Youngstown, OH |
| – (2017) Ohio MAA conference | St. Clairsville, OH |
| – (2017) Marshall University differential analyzer | Huntington, WV |
| – (2017) Pi Mu Epsilon conference | Youngstown, OH |

Faculty Senate

- (2022 Fall, 2019 Fall–2021 Spring) Faculty Senate Executive Committee (Webmaster)
 <https://www.fairmontstate.edu/facstaffresources/fsusenate>
- (2022 Spring) Faculty Senate Committee on Committees (ex-officio, past chair)
- (2021, 2020 Springs) Faculty Senate Committee on Committees (chair)
- (2021 Spring) Executive Committee Provost Interviews and Faculty Forums
- (Fall 2020–present) Faculty Senate Bylaws Committee
- (2019, 2018 Springs) Faculty Senate Committee on Committees (member)
- (2018 Fall–2019 Spring) Faculty Senate Executive Committee (at large member)
- (2017 Spring–present) Senator for Department of Computer Science and Mathematics

Other Service to Fairmont State

- (2021 Dec–2022 Sep) Host of Visiting Fulbright Scholar Alexander Lyapin (Siberian Federal University)
- (2022 Fall, 2017 Spring) Mathematics program advisory board committee
- (2021 Nov, 2019 Oct) Judge at Fairmont State honors quiz bowl
- (2021 Fall–present) Honors Council
- (2021 Spring) University website vendor procurement committee
- (2020 Fall–present) Operator of the  csmath.fairmontstate.edu server (not public-facing) providing WebWork and RStudio for math classes
- (2018 Fall–present) Coordinator of calculus assessment
- (2018 Fall–present) Technology Committee
- (2017 Fall–present) Student Publications Board
- (2018 Fall–2020 Spring) Institutional Review Board
- (2016–present) Social media for mathematics program

- **Organized visiting lecturers for department seminars (2016–2019)**
 - (2019 Nov) Dr. Stephen Deterding, West Liberty University (West Liberty, WV)
 - (2018 Nov) Drs. Darrah, Sealy, Diamond, Milans; West Virginia University (Morgantown, WV)
 - (2017 Nov) Dr. Matt Insall, Missouri University of Science & Technology (Rolla, MO)
 - (2017 Nov) Mark Suder, NASA IV&V (Fairmont, WV)
 - (2017 Mar) Dr. Bonita Lawrence, Marshall University (Huntington, WV)
 - (2016 Nov) Dr. Annarosa Serpe, University of Calabria (Arcavacata, Italy)
 - (2016 Nov) Dr. Patrick Juola, Duquesne University (Pittsburgh, PA)

Other service

- (2021 Jul) Volunteer judge at WVU Undergraduate Culminating Symposium
- (2019 Apr) Exam writer and grader for West Virginia Math Field Day
- (2018 Apr) Volunteer scorer at West Virginia Math Field Day

CONFERENCE TALKS

Research Conferences

- (2023 Jan) Special Session on Ecological and Evolutionary Dynamics in Life and Social Sciences (**invited**)
Joint Mathematics Meetings Boston, MA
- (2023 Jan) Special Session on Advances in qualitative theory and applications to life sciences of differential, difference, and dynamic equations (**invited**)
Joint Mathematics Meetings Boston, MA
- (2023 Jan) Special Session on Discrete and Hybrid Dynamical Systems: Time Scales and Fractional Approaches (**invited**)
Joint Mathematics Meetings Boston, MA
- (2022 Sep) Session: Hybrid phenomena in systems and control (**invited**)
IFAC Symposium on System Structure and Control Montréal, QC
- (2022 May) Dynamic equations on time scales workshop (**invited**)
Mathematical conference centre Będlewo, Poland
- (2022 Apr) Special Session on Analysis of and Recent Advances in Difference, Differential and Dynamic Equations with Applications (**invited**)
Joint Mathematics Meetings (virtual)
- (2021 Aug) Dynamic equations on time scales workshop (**invited**)
Mathematical conference centre Będlewo, Poland
- (2021 Jul) International Conference on Difference Equations and Applications
University of Sarajevo (virtual)
- (2020 Aug) Dynamic equations on time scales workshop (**invited**)
Mathematical conference centre Będlewo, Poland
- (2020 May) 95th Annual WV Academy of Sciences Meeting (**invited plenary speaker, cancelled**)
Fairmont State University Fairmont, WV
- (2019 Sep) 47th Annual Math Conference: Differential Equations and Dynamical Systems and their Applications
Miami University Oxford, OH
- (2019 Jul) International Conference on Differential & Difference Equations and Applications
VIP Zuriq Hotel Lisbon, Portugal
- (2019 Jun) Dynamic equations on time scales workshop (**invited plenary speaker**)
Mathematical conference centre Będlewo, Poland
- (2019 Jan) MAA Contributed Paper Session on Mathematical Experiences and Projects in Business, Industry, and Government
Joint Mathematics Meetings Baltimore, MD
- (2018 Aug) International Workshop on Nonlinear Dynamical Systems and Functional Analysis
University of Brasília Brasília, Brazil.
- (2017 Jul) International Conference on Difference Equations and Applications
West University of Timișoara Timișoara, Romania
- (2014 May) Conference on Partial Differential Equations

Abbazia di Novacella

Neustift, Italy

Mathematical Association of America Conferences

- (2022 Apr) Allegheny Mountain MAA Meeting (virtual)
- (2021 Apr) Allegheny Mountain MAA Meeting (virtual)
- (2019 Apr) Allegheny Mountain MAA Meeting
Shepherd University Shepherdstown, WV
- (2018 Apr) Allegheny Mountain MAA Meeting
Penn State Erie Erie, PA
- (2017 Oct) Ohio MAA Meeting
Ohio University Eastern St. Clairsville, OH
- (2017 Apr) Allegheny Mountain MAA Spring Meeting
Duquense University Pittsburgh, PA
- (2016 Oct) Ohio MAA Fall Meeting
College of Wooster Wooster, OH
- (2015 Mar) Missouri MAA Spring Meeting
Missouri University of Science & Technology Rolla, MO

Seminar and Colloquium Talks

- (2022 Jul) First2 Immersion Program
Fairmont State University Fairmont, WV
- (2019–2021) WVU Math Colloquium (3 talks)
West Virginia University Morgantown, WV
- (2011–2016) Time Scales Seminar (17 talks)
Missouri University of Science & Technology Rolla, MO
- (2011–2016) Analysis Seminar (7 talks)
Missouri University of Science & Technology Rolla, MO
- (2011–2016) Topology and Hyperspaces Seminar (10 talks)
Missouri University of Science & Technology Rolla, MO