













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)
– Advisor: Dr. Bonita Lawrence
– Thesis: Infinitesimal Time Scale Calculus
-  B.S. Mathematics,  B.S. Applied Mathematics (2006 Fall–2009 Spring)

POSITIONS

-  **Marshall University** *Department of Mathematics and Physics* Huntington, WV
(2023 Fall–present) Assistant Professor of Mathematics
-  **Fairmont State University** *Department of Computer Science and Mathematics* Fairmont, WV
(2016 Fall–2023 Sum) Assistant Professor of Mathematics
-  **Missouri University of Science and Technology** *Department of Mathematics and Statistics* Rolla, MO
(2016 Spr) Instructor
(2011 Fall–2015 Fall) Graduate Teaching Assistant
-  **Marshall University** *Department of Mathematics* Huntington, WV
(2011 Summer) Instructor
(2009 Fall–2011 Spr) Graduate Teaching Assistant

GRANTS

- (*pending*) **Principal Investigator:** NSF Research Experience for Undergraduates grant (\$371,668)
“*Appalachian Mathematics and Physics Site*”
- (2022 Spr–2023 Sum) **Principal Investigator:** NSF Research Experience for Undergraduates grant (\$323,352)
“*Discrete and Continuous Analysis in Appalachia*”
- (2022 Spr–2023 Spr) **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 (\$1,000)
- (2018 Nov–2019 May) **Principal Investigator:** NASA Software Assurance Research Program grant (\$26,300)
“*Human Hazards in Cybersecurity*”
- (2017 Aug–2018 Jul) TMC² Technologies Undergraduate machine learning training grant (\$23,750)

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 trig functions on time scales*”
- (2020 Nov–2021 Jul) “*Discrete Meijer G*”

Undergraduate WV NASA Space Grant Consortium Awards Mentored

- (2023 Fal–2024 Spr) Richard Williams “*A contour integral approach to solving generalized heat equations on time scales*”
- (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] Svetlana S. Akhtamova, Tom Cuchta, and Alexander P. Lyapin. An approach to multidimensional discrete generating series. *Mathematics*, 12(1):143, 2024.
- [2] Tom Cuchta, David Grow, and Nick Wintz. Discrete matrix hypergeometric functions. *J. Math. Anal. Appl.*, 518(2):126716, 2023.
- [3] Tom Cuchta, Dylan Poulsen, and Nick Wintz. Linear quadratic tracking with continuous conformable derivatives. *Eur. J. Control*, 72:100808, 2023.
- [4] Tom Cuchta and Rui AC Ferreira. The heat equation on time scales. *Opuscula Mathematica*, 43(4):475–491, 2023.
- [5] Tom Cuchta and Robert J. Niichel. Memoryless properties on time scales. *Math. Slovaca*, 73(4):911–920, 2023.
- [6] Samer Assaf and Tom Cuchta. Discrete analogues of complementary exponential and sine integral functions. *Demonstr. Math.*, 56(1):20230119, 2023.
- [7] Samer Assaf and Tom Cuchta. The rational sequence topology is partially metrizable. *Top. Proc.*, 62:65–72, 2023.
- [8] Samer Assaf and Tom Cuchta. The half disc topology is partially metrizable. *Top. Proc.*, 61:139–144, 2023.
- [9] Tom Cuchta and Dallas Freeman. Discrete polylogarithm functions. *Tatra Mt. Math. Publ.*, 84:1–6, 2023.
- [10] Tom Cuchta, Brian Blackwood, Thomas R. Devine, and Robert J. Niichel. Human risk factors in cybersecurity: Experimental assessment of an academic human attack surface. *Interaction Studies*, 24(3):437–463, 2023.
- [11] Tom Cuchta, David Grow, and Nick Wintz. Divergence criteria for matrix generalized hypergeometric series. *Proc. Am. Math. Soc.*, 150(3):1235–1240, 2022.
- [12] 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.
- [13] Alexander Lyapin 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.
- [14] Tom Cuchta and Nick Wintz. Periodic functions related to the Gompertz difference equation. *Math. Biosci. Eng.*, 19(9):8774–8785, 2022.
- [15] Ümit Aksoy, Tom Cuchta, Svetlin Georgiev, and Yeliz Yolcu Okur. A normal distribution on time scales with application. *Filomat*, 36(16):5391–5404, 2022.
- [16] Tom Cuchta and Rebecca Luketic. Discrete Hypergeometric Legendre Polynomials. *Mathematics*, 9(20):2546, 2021.
- [17] Tom Cuchta and Sabrina Streipert. A discrete SIS model of fractional order. *Int. J. Dyn. Syst. Differ. Equ.*, 11(3/4):275, 2021.
- [18] 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.
- [19] Tom Cuchta, Robert Jon Niichel, and Sabrina Streipert. A Gompertz distribution for time scales. *Turk. J. Math.*, 45(1):185–200, 2021.
- [20] Tom Cuchta and Brooke Fincham. Some new Gompertz fractional difference equations. *Involve*, 13(4):705–719, 2020.
- [21] F. Ayça Çetinkaya and Tom Cuchta. Sturm-Liouville and Riccati conformable dynamic equations. *Adv. Dyn. Syst. Appl.*, 15(1):1–13, 2020.
- [22] Samer Assaf, Tom Cuchta, and Matt Insall. Binary metrics. *Topol. Appl.*, 274:107116, 2020.
- [23] Tom Cuchta, Michael Pavelites, and Randi Tinney. The Chebyshev Difference Equation. *Mathematics*, 8(1), 2020.
- [24] Tom Cuchta and Sabrina Streipert. Dynamic Gompertz model. *Appl. Math. Info. Sci.*, 14(1):1–9, 2020.
- [25] 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.
- [26] 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.
- [27] Martin Bohner and Tom Cuchta. The generalized hypergeometric difference equation. *Demonstr. Math.*, 51:62–75, 2018.
- [28] Martin Bohner and Tom Cuchta. The Bessel difference equation. *Proc. Am. Math. Soc.*, 145(4):1567–1580, 2017.

- [29] 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.
- [30] Tom Cuchta, Kathryn Lokken, and William Young. Zero-divisor graphs of localizations and modular rings. *Rose-Hulman Undergraduate Math Journal*, 9(2), 2008.

BOOK CHAPTERS

- Tom Cuchta and Nick Wintz. ‘Foundations of Linear Control Theory on Time Scales’. In Ravi P. Agarwal et. al. *Dynamic Equations on Time Scales and Applications*, CRC Press, Taylor & Francis Group. In press.

SUBMITTED MANUSCRIPTS

- F. Ayça Çetinkaya, Tom Cuchta, Nick Wintz. Solutions of dynamic Sturm–Liouville conformable initial and boundary value problems.

TEACHING EXPERIENCE

Marshall University		(2023 Fall–2024 Spring)	
Course	# sections	Course	# sections
Modern Algebra I	1	Modern Algebra II	1
Elementary Linear Algebra	1	Calculus I (honors)	1
Applied Calculus	1	Independent Study (lin. alg.)	1

Fairmont State University		(2016 Fall–2023 Spring)	
Course	# sections	Course	# sections
Undergraduate Research	6	Real Analysis	3
Topology	1	Complex Variables	1
Differential Equations	2	Linear Algebra	2
Calculus 3	4	Calculus 2	6
Mathematical Logic	6	Calculus 1	3
Applied Calculus 2	1	Intro to Programming	2
Trigonometry	10	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

SERVICE

To profession

Peer Review


- (2024) 6 papers
- (2023) 16 papers
- (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* Writer for *Zentralblatt Reviews*

- (2023) 1 review
- (2022) 5 reviews
- (2021) 6 reviews
- (2020) 6 reviews
- (2019) 6 reviews
- (2023) 2 reviews
- (2022) 1 review

Editing for ...

- Editorial Board member of *Fundamental Journal of Mathematics and Applications*

 <https://dergipark.org.tr/en/pub/fujma>

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
- Boundary Value Problems
- Bulletin of Irkutsk State University, Series Mathematics
- 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
- Fractal and Fractional
- 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 Mathematical Analysis and Applications
- 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
- Proceedings of the West Virginia Academy of Sciences
- 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

- (2023 Fall–present) **Webmaster**, Ohio Section
🌐 <https://www.ohio.maa.org/>
- (2018 Apr–2023 Spr) **Director of E-Communications**, Allegheny Mountain Section
🌐 <https://www.alleghenymtn.maa.org/>
- (2021–2023 Spr) **Founder and Chair**, Allegheny Mountain Colloquium
🌐 <https://www.alleghenymtn.maa.org/colloquium>
- (2022 Apr) Host organizer of Spring 2022 Allegheny Mountain Section conference (moved virtual)
🌐 <https://www.alleghenymtn.maa.org/2022springconference>
- (2022 Spr) Nominating Committee (chair)
- (2021, 2020 Springs) Nominating Committee
- (2018 Spring) Allegheny Mountain Section 2018 Teaching Award Committee

Other Service to profession

- (2022 Feb–present) Communications Editor for *Applied Mathematics in Science and Engineering*
🐦 <https://twitter.com/AppMathSciEng>
- (2022) Review Panel for NSF Division of Mathematical Sciences
- (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>
- **Creator and host of...**
 - Time Scale Wiki 🌐 <http://timescalewiki.org>
 - Special Functions Wiki 🌐 <http://specialfunctionswiki.org>

To Marshall University

Graduate researchers mentored

- (2024 Spr–present) Rebecca Oduro (fractional models on time scales)

Undergraduate researchers mentored

- (2023 Fall–present) Richard Williams (heat equation on time scales)
- (2023 Fall) Andrew Scheneberg (capstone: Lean theorem prover)

Wrote reference letters for...

- (2024) 4 individuals
- (2023) 7 individuals

Organized student trips

- (2024) University of Dayton Undergraduate Conference Dayton, OH

College of Science

- (2023 Fall–present) College of Science Research & Scholarships Committee (elected)

Department of Mathematics and Physics

- (2023 Fall–2024 Spr) Thesis committee of Evan Abshire
- (2023 Nov) Judge for senior capstone course poster session
- (2023 Sum–present) System administrator of department WeBWork server

Thundering Herd Amateur Radio Club

- (2024 Feb) Campus radio operation day
- (2023 Nov) Parks on the Air club trip to Wayne National Forest
- (2023 Oct) Cabell County, WV community disaster exercise
- (2023 Sep–present) Club trustee
- (2023 Sep) Club issued callsign W8HRD
- (2023 Sep) Campus radio operation day
- (2023 Fall–present) Faculty advisor of the club; meetings every two weeks of the semester

To Fairmont State University

Undergraduate researchers mentored

- (Sum 2023) (DCAA) Drew Barnes, Raina Burton, Vincent Ng
- (Sum 2022) (DCAA) Megan Benkendorf, Tim Lund, Guaravpreet Singh
- (2022–2023) Richard Williams (discrete fractional calc. of variations, pursuit-evasion games on time scales)

- (2021–2022) Jacob Branch (discrete complex analysis)
- (2020–2021) Rebecca Luketic (discrete Legendre polynomials)
- (2020–2021) Dallas Freeman (discrete polylogarithms)
- (2019–2020) Brooke Fincham (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) 7 individuals
- (2021) 7 individuals
- (2020) 6 individuals
- (2019) 9 individuals
- (2018) 3 individuals
- (2017) 1 individual


Organized student trips

- | | |
|---|---------------------|
| – (2023) Allegheny Mountain MAA conference | Edinboro, PA |
| – (2023) JMM with 2022 REU students | Boston, MA |
| – (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 |

Fairmont State University Faculty Senate

- (2022 Fall–2023 Spr, 2019 Fall–2021 Spr) Faculty Senate Executive Committee (Webmaster)
 <https://www.fairmontstate.edu/facstaffresources/fsusenate>
- (2022 Spr) Faculty Senate Committee on Committees (Past Chair; ex-officio)
- (2021, 2020 Springs) Faculty Senate Committee on Committees (Chair)
- (2021 Spr) Executive Committee Provost Interviews and Faculty Forums
- (2020 Fall–2023 Spr) Faculty Senate Bylaws Committee
- (2019, 2018 Springs) Faculty Senate Committee on Committees (member)
- (2018 Fall–2019 Spr) Faculty Senate Executive Committee (at large member)
- (2017 Spr–2023 Spr) Senator for Department of Computer Science and Mathematics

Other Service at Fairmont State University

- (2023 Spr) Computer Science hiring committee
- (2021 Dec–2022 Sep) Host of Visiting Fulbright Scholar Alexander Lyapin (Siberian Federal University)
- (2022 Fall, 2017 Spr) Mathematics program advisory board committee
- (2021 Nov, 2019 Oct) Judge at Fairmont State honors quiz bowl
- (2021 Fall–2023 Spr) Honors Council
- (2021 Jul) Volunteer judge at WVU Undergraduate Culminating Symposium
- (2021 Spr) University website vendor procurement committee
- (2020 Fall–2023 Spr) Operator of the  csmath.fairmontstate.edu server (not public-facing) providing WeBWork and RStudio for math classes
- (2018 Fall–2023 Spr) Coordinator of calculus assessment
- (2018 Fall–2023 Spr) Technology Committee
- (2017 Fall–2023 Spr) Student Publications Board
- (2018 Fall–2020 Spr) Institutional Review Board
- (2016–2023 Spr) Social media for mathematics program
- (2016–2019) Organized visiting lecturers for department seminars

CONFERENCE TALKS

Research Conferences

- (2023 Oct) TYAN-Humboldt Workshop in Mathematics (**invited**)

- University of Brasília Brasília, Brazil
- (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) 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

- (2023 Apr) Allegheny Mountain Section Conference Edinboro, PA
- (2022 Apr) Allegheny Mountain Section Conference (virtual)
- (2021 Apr) Allegheny Mountain Section Conference (virtual)
- (2019 Apr) Allegheny Mountain Section Conference Shepherdstown, WV
- (2018 Apr) Allegheny Mountain Section Conference Erie, PA
- (2017 Oct) Ohio Section Fall Conference St. Clairsville, OH
- (2017 Apr) Allegheny Mountain Section Conference Pittsburgh, PA
- (2016 Oct) Ohio Section Fall Conference Wooster, OH
- (2015 Mar) Missouri Section Spring Conference Rolla, MO

Seminar and Colloquium Talks

- (2023 Apr) University of Tulsa Amateur Radio Club
University of Tulsa (virtual)
- (2022 Jul) First2 Immersion Program
Fairmont State University Fairmont, WV
- (2019–2021) WVU Math Colloquium (3 talks)

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|---|----------------|
| 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 |