

Alexander Wiedemann

Curriculum Vitae

November 19, 2020

Contact Information	Department of Mathematics and Computer Science Davidson College, Box 7129 Davidson, NC 28035-7129 USA	alwiedemann@davidson.edu www.alexwiedemann.online 704-894-2343
Research Interests	Spectral graph theory, operator theory, mathematical physics (esp. quantum dynamics), ranking in social networks (esp. dark net markets)	
Education	University of South Carolina , Columbia, South Carolina USA Ph.D., Mathematics, Advisor George Androulakis Dissertation Title: <i>On The Generators of Quantum Dynamical Semigroups</i>	May 2019
	Tusculum University , Greeneville, Tennessee USA B.A., Mathematics, Minor in Biology, Minor in Chemistry, Rank 2/237	Spring 2013
Academic Employment	Davidson College , Davidson, North Carolina USA <i>Visiting Assistant Professor of Mathematics and Computer Science</i> Multivariable Calculus and Modeling Calculus I and Modeling Complex Analysis Linear Algebra	Fall 2019 - present Fall 2020, Spring 2020 2x Fall 2020, Fall 2019 Spring 2020 2x Fall 2019
	University of South Carolina , Columbia, South Carolina USA <i>Instructor of Record, Graduate Level</i> Algebraic Structures I Analysis I	Fall 2013 - Spring 2019 Summer 2018 Summer 2016
	<i>Instructor of Record, Undergraduate Level</i> Vector Calculus Basic College Mathematics Calculus for Business Administration and Social Sciences Elementary Differential Equations Basic Concepts of Elementary Mathematics I Precalculus Mathematics Finite Mathematics Calculus II Intensive Basic College Mathematics	Spring 2019 Fall 2018, Fall 2017 Spring 2018, Spring 2015 Summer 2017, Summer 2014 Spring 2017 Fall 2016 Spring 2016, Fall 2015 Summer 2015 Fall 2014
	<i>Teaching Assistant, Undergraduate Level</i> Calculus I (Recitation and Computer Lab) Calculus II (Recitation and Computer Lab)	2x Fall 2015, 2x Fall 2013 2x Spring 2014
	Tusculum University , Greeneville, Tennessee USA <i>Teaching Assistant, Undergraduate Level</i> General Physics II (Recitation and Lab) General Physics I (Recitation and Lab)	Fall 2011 - Spring 2012 Spring 2012 Fall 2011

Research Publications (undergraduates marked *)	T. R. Cameron, A. Wiedemann <i>On Digraphs with Polygonal Restricted Numerical Range</i>	In Preparation
	G. Wang*, A. Wiedemann, M. Zhao* <i>Detecting Shadow Players in Complex Networks</i>	In Preparation
	G. J. Clark, F. Thomaz, A. Wiedemann <i>Designed to Go Dark: An Examination of Incentives for Digital Black Markets to Self-Terminate</i>	In Preparation
	T. R. Cameron, M. D. Robertson*, A. Wiedemann <i>On the restricted numerical range of the Laplacian matrix for digraphs</i> Linear and Multilinear Algebra	Spring 2020
	G. Androulakis, A. Wiedemann, M. Ziemke <i>The Induced Semigroup of Schwarz Maps to the Space of Hilbert-Schmidt Operators</i> Mathematical Physics, Analysis and Geometry 23.1	Spring 2020
	G. Androulakis, A. Wiedemann <i>GKSL Generators and Digraphs: Computing Invariant States</i> J. Phys. A: Math. Theor. 52.30	Summer 2019
	A. Wiedemann <i>On The Generators of Quantum Dynamical Semigroups</i> (Dissertation) UofSC Scholar Commons 5231	Spring 2019
Other Publications	A. Hoover, A. Wiedemann <i>A Word from...</i> Notices of the AMS, June/July 2020	Summer 2020
Undergraduate Research Advisement	Geoffrey Wang* and Max Zhao, Research Project Advisor <i>Detecting Shadow Players in Complex Networks</i> Davidson College, Davidson, North Carolina *Wang was supported as a Davidson Research Initiative Fellow for Summer 2020	Summer 2020 - present
	Michael Robertson, Honors Thesis Advisor (with Dr. Thomas Cameron) <i>On the Numerical Range, Algebraic Connectivity, and Characterization of Digraphs</i> , High Honors Davidson College, Davidson, North Carolina USA	Fall 2019 - Spring 2020
	Alexander Kirby, Research Project Advisor <i>Stability of Pair Block Diagonal GKSL Generators under Perturbation</i> University of South Carolina, Columbia, South Carolina	Summer 2018 - Fall 2018

Invited Research Presentations	Discrete Seminar <i>The Restricted Numerical Range of the Digraph Laplacian</i> University of South Carolina, Columbia, South Carolina	Fall 2020
	40th Int'l Conference on Quantum Probability and Infinite Dimensional Analysis <i>Open Quantum Random Walks: Transitions Between Superposition States</i> Ohio State University, Columbus, Ohio	Fall 2019
	BIRS-CMO Workshop on Quantum Transport Equations and Applications <i>Quantum Dynamical Semigroup Generator Induced Digraphs</i> Casa Matemàtica Oaxaca, Oaxaca, Mexico	Fall 2018
	2018 Annual Reputation Symposium <i>A Hypergraph Model for Dark Net Markets</i> Oxford University, Oxford, United Kingdom	Fall 2018
	The Community of Practice for Coordinators of Large Undergraduate Courses <i>A Mentorship Model for Graduate Student Instructors in Large Undergraduate Courses</i> University of South Carolina Center for Teaching Excellence, Columbia, South Carolina	Fall 2017
	Carolina Math Seminar <i>Graph Theoretical Conditions for Equilibrium in Quantum Mechanical Systems</i> Benedict College, Columbia, South Carolina	Fall 2017
	Conference on Research in Undergraduate Mathematics Education XXI <i>Mentor Professional Development for Mathematics Graduate Student Instructors</i> Kona Kai, San Diego, California	Spring 2017
	2017 Joint Mathematics Meeting AMS Special Session on Teaching Assistant Development Programs <i>Graduate Student Instructor Mentorship Model: A professional development that trains experienced graduate students to pedagogically mentor novice mathematics graduate student instructors</i> Hyatt Regency Atlanta and Marriott Atlanta Marquis, Atlanta, Georgia	Spring 2017
Other Invited Presentations	Cresswind Speakers Series <i>Quantum Computing 101: What is it, and why should we care?</i> Cresswind Charlotte, Charlotte, North Carolina	Fall 2020
	Pi Mu Epsilon Induction Ceremony <i>Understanding the Spread of COVID-19</i> University of South Carolina, Columbia, South Carolina	Fall 2020
	Honors Convocation Keynote Address <i>Building a World Full of Cathedrals</i> Tusculum University, Greeneville, Tennessee	Spring 2017
	Math and Science Lecture Series <i>Why Mathematics? Goats, Unneeded Surgeries, and the Fallibility of Intuition</i> Tusculum University, Greeneville, Tennessee	Fall 2015

Contributed Presentations	2021 American Marketing Association Winter Academic Conference Special Session on Marketing Vice: Influences and Impacts of Vice Platforms, Products, and Services <i>Designed to Go Dark: An Examination of Incentives for Digital Black Markets to Self-Terminate</i> Virtual conference sponsored by the AMA	Upcoming, Spring 2021
	Math & CS Coffee <i>Community-Centered Redistricting: A Discussion on Fairness and Social Choice</i> Davidson College, Davidson, North Carolina	Fall 2020
	Analysis Seminar <i>Open Quantum Random Walks: Transitions Between Superposition States</i> University of South Carolina, Columbia, South Carolina	Spring 2019
	2019 Joint Mathematics Meeting AMS Special Session on Advances in Quantum Walks, Quantum Simulations, and Related Theory <i>GKSL Generators and Digraphs: Computing Invariant States</i> Baltimore Convention Center, Baltimore, Maryland	Spring 2019
	Analysis Seminar <i>Generalizing Digraph Induced GKSL Generators: The Generic Case</i> University of South Carolina, Columbia, South Carolina	Fall 2018
	Analysis Seminar <i>Graph Theoretical Conditions for Unique Relaxation of Open Quantum Systems</i> University of South Carolina, Columbia, South Carolina	Fall 2017
	Analysis Seminar <i>Approach to Equilibrium for Completely Positive Quantum Dynamical Semigroups of N-level systems</i> University of South Carolina, Columbia, South Carolina	Fall 2016
Further Conferences, Workshops Attended	Mastery Grading Conference Virtual conference sponsored by College Bridge	Summer 2020
	NSF-CBMS Workshop of Additive Combinatorics from a Geometric Perspective University of South Carolina, Columbia, South Carolina	Summer 2018
	Virginia Operator Theory and Complex Analysis Meeting University of Virginia, Charlottesville, Virginia	Fall 2017
	QMath13: Mathematical Results in Quantum Physics Georgia Institute of Technology, Atlanta, Georgia	Fall 2016
	Virginia Operator Theory and Complex Analysis Meeting Washington & Lee University, Lexington, Virginia	Fall 2015
	BIRS-CMO Workshop on Quantum Markov Semigroups in Analysis, Physics, and Probability (15w5086) Casa Matemática Oaxaca, Oaxaca, Mexico	Fall 2015
	Virginia Operator Theory and Complex Analysis Meeting Washington & Lee University, Lexington, Virginia	Fall 2014

Travel Awards	40th Int'l Conference on Quantum Probability and Infinite Dimensional Analysis Conference resources (inclusive lodging, travel)	Fall 2019
	2018 Annual Reputation Symposium Oxford University Centre for Corporate Reputation (inclusive meals, lodging, \$1200 travel)	Fall 2018
	BIRS-CMO Workshop on Quantum Transport Equations and Applications University of South Carolina Graduate School Travel Grant (\$800 travel) Conference resources (inclusive meals, lodging)	Fall 2018
	Virginia Operator Theory and Complex Analysis Meeting Conference resources (inclusive meals, lodging, travel)	Fall 2017
	Conference on Research in Undergraduate Mathematics Education XXI NSF EAGER Grant for Innovative Research, award ID 1725295. (travel, lodging) Conference resources (inclusive meals)	Spring 2017
	2017 Joint Mathematics Meeting NSF EAGER Grant for Innovative Research, award ID 1725295. (travel, lodging)	Spring 2017
	QMath13: Mathematical Results in Quantum Physics Conference resources (inclusive meals, lodging, travel)	Fall 2016
	BIRS-CMO Workshop on Quantum Markov Semigroups in Analysis, Physics, and Probability (15w5086) University of South Carolina Department of Mathematics Travel Fund (\$800 travel) Conference resources (inclusive meals, lodging)	Fall 2015
	Virginia Operator Theory and Complex Analysis Meeting Conference resources (inclusive meals, lodging, travel)	Fall 2015
	Virginia Operator Theory and Complex Analysis Meeting Conference resources (inclusive meals, lodging, travel)	Fall 2014

Professional Service	Board Member of Spectra, The Association for LGBT Mathematicians	Spring 2020 - present
	Davidson College Math & CS Social Justice Speaker Series Organizer	Fall 2020 - present
	Davidson College Math & CS Coffee Series Organizer	Fall 2019 - present
	Reviewing Committee for the Out to Innovate Scholarships from NOGLSTP, the National Organization of Gay and Lesbian Scientists and Technical Professionals	Summer 2020
	Davidson College Math Jeopardy Organizer and Host	Spring 2020
	UofSC Analysis Seminar Organizer	Fall 2018, Spring 2017
	UofSC Center for Teaching Excellence Symposium Moderator	Fall 2018
	UofSC SIAM Student Chapter Vice-President	Elected '15/'16, '16/'17
	UofSC Graduate Advisory Council Representative The Graduate Advisory Council advises on running all aspects of the graduate program. The student representative is elected to discuss vote on issues concerning academic regulations and to address any student questions and concerns on topics related to the graduate program.	Elected '13/'14, '14/'15, '15/'16, '16/'17
	High School Mathematics Competition Proctor	Fall 2017, Fall 2013
	Math PenPal Program Matched students in two 3rd grade classes from BC Grammar School with my Basic Concepts of Elementary Mathematics I students at UofSC to exchange math penpal letters for a semester. The letters were fun and contained math questions which aligned with the Common Core standards. This program was part of a larger department coordinated math PenPal Program, which was included with UofSC's submission for the national Honor Roll for Community Service.	Spring 2017
	NSF Graduate Student Mentorship Program, Former Mentor Mentors for this program change yearly. Former mentors assist in training new mentors and periodically meet with current graduate student mentors to provide advice and support.	Summer 2017 - Spring 2019
	NSF Graduate Student Mentorship Program, Mentor Conducted periodic classroom observations and post-observation discussions with five novice graduate student instructors over the semester. Facilitated biweekly meetings with novice graduate instructors to discuss teaching practices and habits and their impact on student outcomes. This work was supported by NSF EAGER Grant for Innovative Research, award ID 1725295.	Spring 2017
	Joint Mathematics Meeting Table for new graduate students	Spring 2017
NSF Graduate Student Mentorship Program, Research Assistant Participated in semester-long mentorship training which focused on pedagogical discourse. Reviewed over twenty hours of video data from fifteen novice instructors and wrote detailed notes on their teaching styles and procedures. Converted observations into numerical values for analysis of trends in teaching style before and after mentorship. This work was supported by NSF EAGER Grant for Innovative Research, award ID 1725295.	Fall 2016	

Professional Development	<p>Fostering Inclusivity and Respect in Science Together (FIRST) Fall 2019 - present FIRST is a HHMI-funded inclusive excellence project that emphasizes faculty development to enhance inclusivity in STEM at Davidson. I have attended 10+ FIRST presentations and workshops on topics such as countering stereotype threat and understanding implicit bias in course design.</p> <p>Anti-Racism I Fall 2020 A 3-week course offered by the University of Colorado Boulder through Coursea which focused on defining and identifying anti-racism and developing specific actions that each of us can do to be anti-racist allies and educators.</p> <p>Digital Learning Institute Summer 2020 A week-long workshop for Davidson faculty which focused on creating inclusive, equitable, and student-focused course material for a remote setting.</p> <p>MAA Project NExT Workshop Summer 2020 With MathFest 2020 canceled, this week-long workshop on early career development was held online. Topics included grant writing, jump-starting scholarship, inquiry based learning, accessibility, project design, and diversity in STEM.</p> <p>Preparing Future Faculty with Distinction in Teaching (PFF Plus) Spring 2019 Successful PFF candidates have completed activities designed to prepare participants in the critical areas of faculty competence: teaching, research and service. This accomplishment is an indicator of the participant's initiative and a measure of experience toward becoming future faculty. PFF Plus is designed to further illustrate a distinction in teaching.</p>												
Honors and Awards	<p>MAA Project NExT Fellow Brown '20 Cohort</p> <p>Featured in Tusculum University Magazine Summer 2015</p> <p>Notable awards earned while at Tusculum University:</p> <table border="0" style="width: 100%;"> <tr> <td>Senior Honor Key Award for Mathematics</td> <td style="text-align: right;">Spring 2013</td> </tr> <tr> <td>Barnett, Conley, and Davis Award in Natural Sciences and Mathematics</td> <td style="text-align: right;">Spring 2013</td> </tr> <tr> <td>Featured in Tusculum University Magazine as Student of the Block</td> <td style="text-align: right;">Spring 2013</td> </tr> </table>	Senior Honor Key Award for Mathematics	Spring 2013	Barnett, Conley, and Davis Award in Natural Sciences and Mathematics	Spring 2013	Featured in Tusculum University Magazine as Student of the Block	Spring 2013						
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