

Per Sebastian Skardal

Associate Professor
Department of Mathematics
Trinity College

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Trinity College
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Education

University of Colorado at Boulder , Department of Applied Mathematics <i>Ph.D. Applied Mathematics</i>	Boulder, CO May 2013
<i>M.S. Applied Mathematics</i>	May 2010
Boston College , Department of Mathematics, Department of Computer Science <i>B.A. Mathematics with Honors, Computer Science Minor</i>	Chestnut Hill, MA May 2008

Academic Positions

Trinity College <i>Associate Professor of Mathematics</i>	Hartford, CT 2020 – present
<i>Assistant Professor of Mathematics</i>	2015 – 2020
Universitat Rovira i Virgili <i>Postdoctoral Research Fellow with Professor Alex Arenas</i> This position was funded by the James F. McDonnell Foundation.	Tarragona, Spain 2013 – 2015
University of Colorado at Boulder <i>Research Assistant with Professor Juan G. Restrepo</i> This position was funded by NSF Grant No. DMS-0908221.	Boulder, CO 2009 – 2013
<i>Instructor of Record</i>	2010 – 2013
<i>Teaching Assistant</i>	2008 – 2011
Boston College <i>Research Assistant with Professors Stella X. Yu and David Martin</i>	Chestnut Hill, MA 2006 – 2007

Publications

Book Chapters

1. Per Sebastian Skardal and Alex Arenas, Explosive synchronization and multistability in large systems of Kuramoto oscillators with higher-order interactions, in Federico Battiston and Giovanni Petri (Editors), *Higher-Order Systems*, 217–232 (Springer, 2022).

Peer-Reviewed Journal Articles

2. Sabina Adhikari, Juan G. Restrepo, and Per Sebastian Skardal, Synchronization of phase oscillators on complex hypergraphs, Submitted, arXiv:2208.00909.
3. Per Sebastian Skardal, Sabina Adhikari, and Juan G. Restrepo, Multistability in coupled oscillator systems with higher-order interactions and community structure, Submitted, arXiv:2207.00070.
4. Lluís Arola-Fernández, Sergio Faci-Lázaro, Per Sebastian Skardal, Emmanuel Boghiu, Jesús Gómez-Gardeñes, and Alex Arenas, Self-organized explosive synchronization in complex networks: Emergence of synchronization bombs, Submitted, arXiv:2203.03728.

5. Pranick R. Chamlagai, Dane Taylor, and Per Sebastian Skardal, Grass-roots optimization of coupled oscillator networks, *Physical Review E* **106**, 034202 (2022).
6. Can Xu, Xuan Wang, and Per Sebastian Skardal, Generic criterion for explosive synchronization in heterogeneous phase oscillator populations, *Physical Review Research* **4**, L032033 (2022).
7. Per Sebastian Skardal and Can Xu, Tiered synchronization in coupled oscillator populations with interaction delays and higher-order interactions, *Chaos* **32**, 053120 (2022).
8. Cameron Ziegler, Per Sebastian Skardal, Haimonti Dutta, and Dane Taylor, Balanced Hodge Laplacians optimize consensus dynamics over simplicial complexes, *Chaos* **32**, 023128 (2022).
9. Per Sebastian Skardal, Lluís Arola-Fernández, Dane Taylor, and Alex Arenas, Higher-order interactions improve optimal collective dynamics of networks, *Physical Review Research* **3**, 043193 (2021).
10. Digesh Chitrakar and Per Sebastian Skardal, Chaos in nonlinear random walks with non-monotonic transition probabilities, *Physical Review Research* **3**, 043189 (2021).
11. John P. Georges, Kirsti Kuenzel, David W. Mauro, and Per Sebastian Skardal, On a distance-constrained graph labeling to model cooperation, *Discrete Applied Mathematics* **306**, 12-31 (2021).
12. Lluís Arola-Fernández, Per Sebastian Skardal, and Alex Arenas, Geometric unfolding of synchronization dynamics on networks, *Chaos* **31**, 061105 (2021).
13. Can Xu and Per Sebastian Skardal, Spectrum of extensive multiclusts in the Kuramoto model with higher-order interactions, *Physical Review Research* **3**, 013013 (2021).
14. Per Sebastian Skardal and Alex Arenas, Higher-order interactions in complex networks of phase oscillators promote abrupt synchronization switching, *Communications Physics* **3**, 218 (2020).
15. Per Sebastian Skardal and Alex Arenas, Memory selection and information switching in oscillator networks with higher-order interactions, *Journal of Physics: Complexity* **2**, 015003 (2020).
16. Can Xu, Xuebin Wang, and Per Sebastian Skardal, Universal scaling and phase transitions of coupled phase oscillator populations, *Physical Review E* **102**, 042310 (2020).
17. Can Xu, Xuebin Wang, and Per Sebastian Skardal, Bifurcation analysis and structural stability of simplicial oscillator populations, *Physical Review Research* **2**, 023281 (2020).
18. Per Sebastian Skardal, Quasi-periodic dynamics and a Neimark-Sacker bifurcation in nonlinear random walks on complex networks, *Physical Review E* **101**, 012307 (2020).
19. Per Sebastian Skardal, Dane Taylor, and Jie Sun, Synchronization of network-coupled oscillators with uncertain dynamics, *SIAM Journal on Applied Mathematics* **79**, 2409-2433 (2019).
20. Juan G. Restrepo and Per Sebastian Skardal, Competitive suppression of synchronization and non-monotonic transitions in oscillator communities with distributed time delay, *Physical Review Research* **1**, 033042 (2019).
21. Per Sebastian Skardal and Alex Arenas, Abrupt desynchronization and extensive multistability in globally coupled oscillator simplexes, *Physical Review Letters* **122**, 248301 (2019).
22. Per Sebastian Skardal, Symmetry and symmetry breaking in coupled oscillator communities, *European Physical Journal B* **92**, 46 (2019).
23. Per Sebastian Skardal and Sabina Adhikari, Dynamics of nonlinear random walks on complex networks, *Journal of Nonlinear Science* **29**, 1419-1444 (2018).
24. Per Sebastian Skardal, Low dimensional dynamics of the Kuramoto model with rational frequency distributions, *Physical Review E* **98**, 022207 (2018).
25. Per Sebastian Skardal, Stability diagram, hysteresis, and critical time delay and frequency for the Kuramoto model with heterogeneous interaction delays, *International Journal of Bifurcation and Chaos* **28**, 1830014 (2018).
26. Per Sebastian Skardal, Diffusion Dynamics and synchronizability of hierarchical products of networks, *Physical Review E* **96**, 042302 (2017).
27. Per Sebastian Skardal, Juan G. Restrepo, and Edward Ott, Uncovering low dimensional macroscopic chaotic dynamics of large finite size complex systems, *Chaos* **27**, 083121 (2017).

28. Vincenzo Nicosia, Per Sebastian Skardal, Alex Arenas, and Vito Latora, Collective phenomena emerging from the interactions between dynamical processes in multiplex networks, *Physical Review Letters* **118**, 138302 (2017).
29. Shufan Wang, Mariam Avagyan, and Per Sebastian Skardal, Evolving network structure of academic institutions, *Applied Network Science* **2**, 1 (2017).
30. Per Sebastian Skardal, Ricardo Sevilla-Escoboza, Victor Vera-Ávila, and Javier Martín Buldú, Optimal phase synchronization in networks of phase-coherent chaotic oscillators, *Chaos* **27**, 013111 (2017).
31. Per Sebastian Skardal and Kirsti Wash, Spectral properties of the hierarchical product of graphs, *Physical Review E* **94**, 052311 (2016).
32. Dane Taylor, Per Sebastian Skardal, and Jie Sun, Synchronization of heterogeneous oscillators under network modifications: Perturbation and optimization of the Synchrony Alignment Function, *SIAM Journal on Applied Mathematics* **76**, 1984 (2016).
33. Per Sebastian Skardal and Alex Arenas, On controlling networks of limit-cycle oscillators, *Chaos* **26**, 094812 (2016).
34. Per Sebastian Skardal, Dane Taylor, and Jie Sun, Optimal synchronization of directed complex networks, *Chaos* **26**, 094807 (2016).
35. Per Sebastian Skardal, Dane Taylor, Jie Sun, and Alex Arenas, Collective frequency variation in network synchronization and reverse PageRank, *Physical Review E* **93**, 042314 (2016).
36. Per Sebastian Skardal, Dane Taylor, Jie Sun, and Alex Arenas, Erosion of synchronization: Coupling heterogeneity and network structure, *Physica D* **323-324**, 40 (2016).
37. Per Sebastian Skardal and Alex Arenas, Control of coupled oscillator networks with application to microgrid technologies, *Science Advances*, **1**, e1500339 (2015).
38. Per Sebastian Skardal, Juan G. Restrepo, and Edward Ott, Frequency assortativity can induce chaos in oscillator networks, *Physical Review E: Rapid Communications* **91**, 060902(R) (2015).
39. Per Sebastian Skardal, Dane Taylor, Jie Sun, and Alex Arenas, Erosion of synchronization in networks of coupled oscillators, *Physical Review E: Rapid Communications* **91**, 010802(R) (2015).
40. Per Sebastian Skardal and Juan G. Restrepo, Coexisting chaotic and multi-periodic dynamics in a model of cardiac alternans, *Chaos* **24**, 043126 (2014).
41. Per Sebastian Skardal, Dane Taylor, and Jie Sun, Optimal synchronization of complex networks, *Physical Review Letters* **113**, 144101 (2014).
42. Per Sebastian Skardal and Alex Arenas, Disorder induces explosive synchronization, *Physical Review E* **89**, 062811 (2014).
43. Per Sebastian Skardal, Alain Karma, and Juan G. Restrepo, Spatiotemporal dynamics of calcium-driven cardiac alternans, *Physical Review E* **89**, 052707 (2014).
44. Per Sebastian Skardal, Dane Taylor, and Juan G. Restrepo, Complex macroscopic behavior in systems of phase oscillators with adaptive coupling, *Physica D* **267**, 27 (2014).
45. Per Sebastian Skardal, Jie Sun, Dane Taylor, and Juan G. Restrepo, Effect of degree-frequency correlations on network synchronization: Universality and full phase-locking, *Europhysics Letters* **101**, 20001 (2013).
46. Per Sebastian Skardal, Alain Karma, and Juan G. Restrepo, Unidirectional pinning and hysteresis of spatially discordant alternans in cardiac tissue, *Physical Review Letters* **108**, 108103 (2012).
47. Per Sebastian Skardal and Juan G. Restrepo, Hierarchical synchrony of phase oscillators in modular networks, *Physical Review E* **85**, 016208 (2012).
48. Per Sebastian Skardal, Edward Ott, and Juan G. Restrepo, Cluster synchrony in systems of coupled phase oscillators with higher-order coupling, *Physical Review E* **84**, 036208 (2011).

Conference Proceedings and Technical Reports

49. Erkin Verbeek, Per Sebastian Skardal, and Lin Cheng, A preliminary study on the VANET topology characteristics from propagation-aware traffic flows extracted from measured data, Submitted to Proceedings of the 2020 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting (Montreal, July 2020).

50. Prawesh Dahal, Mariam Avagyan, Per Sebastian Skardal, Harry J. Blaise, and Taikang Ning, Characterizing chaotic behavior of REM sleep EEG using Lyapunov exponent, in Proceedings of the 10th International Congress on Image and Signal Processing, Biomedical Engineering and Informatics (Shanghai, October 2017).
51. Per Sebastian Skardal and Juan G. Restrepo, Synchronization of Kuramoto oscillators in networks of networks, in Proceedings of the 2012 International Symposium on Nonlinear Theory and its Applications (Palma, October 2012).
52. Per Sebastian Skardal, Spatiotemporal chaos: Effect of spatial smoothing on bifurcations in a discrete-time chaotic map, Technical Report CU-CS 1066-10 (University of Colorado, 2010).

Other Expository Writing

53. Per Sebastian Skardal, An overview of complex systems, *Physics Today* **74**, 51 (2021).
54. Dane Taylor, Per Sebastian Skardal, and Jie Sun, Introduction to focus issue: Symmetry and optimization in the synchronization and collective behavior of complex systems, *Chaos* **30**, 060401 (2020).

Doctoral Dissertation

55. Per Sebastian Skardal, Periodic behavior in cardiac tissue: Dynamics of spatially discordant calcium alternans, PhD Dissertation, University of Colorado Boulder, AAT 3562052 (2013).

Talks and Presentations

Invited Talks

Dynamics Days 2022, <i>Virtual</i> TBD	January 2022
Networks 2021: TopoNets 2021, <i>Virtual</i> “Improved synchronization and forced diffusion in networks with higher-order interactions”	June 2021
SIAM Conference on Applications of Dynamical Systems 2021, <i>Virtual</i> “Abrupt Synchronization Transitions and Memory in Higher-Order Interaction Networks”	May 2021
AIMS Conference on Dynamical Systems and Differential Equations, <i>Atlanta, GA</i> “Complex Macroscopic Dynamics in Oscillator Networks with Higher-Order Interactions”	June 2020
Faculty Research Committee Lecture, <i>Trinity College</i> “Fireflies, Power Grids, and Parkinson's Disease: What Mathematical Modeling and Coupled Oscillators Tell Us About the Science of Synchronization”	February 2020
MRSEC Seminar, <i>Brandeis University</i> “Practical Questions in Network Synchronization: Control and Optimization”	September 2019
REU Mathematics Colloquium, <i>University of Connecticut</i> “Nonlinear Dynamics, Complex Networks, and Random Walks”	July 2019
SIAM Conference on Applications of Dynamical Systems 2019, <i>Snowbird</i> “Synchronization, Information, and Memory in Simplex Networks: Dynamics of Coupled Oscillators with Higher-Order Interactions”	May 2019
Applied Mathematics Colloquium, <i>University of Colorado at Boulder</i> “Practical and Theoretical Questions in Network Synchronization: Optimization and Control”	February 2019
Applied Mathematics Dynamics Seminar, <i>University of Colorado at Boulder</i> “Dynamics of Nonlinear Random Walks on Complex Networks”	February 2019
MathFest 2018, Denver “Patterns of Collective Oscillations: Effects of Modularity and Time-Delay”	August 2018
Network Frontier Workshop, <i>Northwestern University</i> “Why Directness Improves Synchronization”	December 2017
Canadian Society of Applied and Industrial Mathematics, Halifax	July 2017

“Optimal Synchronization in Complex Oscillator Networks”	
SIAM Conference on the Life Sciences, <i>Boston, MA</i>	July 2016
“Spatiotemporal Dynamics of Calcium-Driven Alternans: Hysteresis, Multi-Periodicity, and Chaos”	
Summer Research Program, <i>Trinity College</i>	June 2016
“Dynamics and Networks”	
Mathematics Research Seminar, <i>Trinity College</i>	September 2015
“Networks and Dynamical Systems: Union and Intersection”	
Mathematics Colloquium, <i>Western New England University</i>	February 2015
“Synchronization Processes and Self Organization in Networks of Coupled Oscillators”	
Mathematics Colloquium, <i>Trinity College</i>	January 2015
“Synchronization Processes and Self Organization in Networks of Coupled Oscillators”	
Applied Mathematics and Statistics Seminar, <i>Johns Hopkins University</i>	December 2014
“Synchronization Processes and Self Organization of Coupled Oscillators”	
Mathematics and Computer Science Colloquium, <i>Clark University</i>	December 2014
“Synchronization of Coupled Oscillators: Emergence of Collective Behavior and Optimal Networks”	
Mathematics and Computer Science Colloquium, <i>Beloit College</i>	November 2014
“Synchronization of Coupled Oscillators: Fireflies, Wobbly Bridges, and Optimal Networks”	
NetSci 2014 Satellite Symposium: ISODS, <i>Berkeley, CA</i>	June 2014
“Optimal Synchronization of Complex Networks”	
Applied Dynamics Lab Seminar, <i>Colorado State University</i>	April 2013
“Synchronization in Complex Networks: Effects of Hierarchical and Community Structure”	
Physics Colloquium, <i>University of Barcelona</i>	October 2012
“Synchronization in Complex Networks: Effect of Hierarchical and Community Structure”	
Mathematics Colloquium, <i>Clarkson University</i>	August 2012
“Periodic Behavior in Heart Tissue: Mathematics of Cardiac Arrhythmias”	
Arts and Sciences Seminar, <i>Clarkson University</i>	August 2012
“Synchronization Phenomena in Science and Nature”	

Contributed and Other Talks

NetSci 2019, <i>Burlington, VT</i>	May 2019
CompleNet 2019, <i>Tarragona, Spain</i>	March 2019
SIAM Annual Meeting 2018, <i>Portland OR</i>	July 2018
SIAM Workshop on Network Science (Ignite), <i>Boston</i>	July 2016
Dynamics Days Poster, <i>Duke University</i>	January 2016
40 Year of Kuramoto, <i>Max Planck Institute</i>	July 2015
NetSci, <i>Zaragoza</i>	June 2015
Joint Mathematics Meeting, <i>San Antonio</i>	January 2015
ECCS (I), <i>Lucca, Italy</i>	September 2014
ECCS (II), <i>Lucca, Italy</i>	September 2014
Jornada Complexitat, <i>Universitat Politècnica de Catalunya</i>	June 2014
NetSci, <i>Berkeley</i>	June 2014
SIAM Conference on Applications of Dynamical Systems, <i>Snowbird</i>	May 2013
Dynamics Days, <i>University of Colorado Boulder</i>	January 2013
Dynamics and Complex Systems Seminar, <i>University of Colorado Boulder</i>	November 2012
NOLTA 2012, <i>Palma de Mallorca</i>	October 2012
SIAM CU Student Chapter, <i>University of Colorado Boulder</i>	October 2012
Dynamics and Complex Systems Seminar, <i>University of Colorado Boulder</i>	March 2012

SIAM FRAMSC, <i>University of Colorado Denver</i>	March 2012
Dynamics Days Poster, <i>University of Maryland</i>	January 2012
Network Frontiers Workshop, <i>Northwestern University</i>	December 2011
Dynamics and Complex Systems Seminar, <i>University of Colorado Boulder</i>	September 2011
SIAM Conference on Applications of Dynamical Systems, <i>Snowbird</i>	May 2011
Dynamics Days Poster, <i>University of North Carolina</i>	January 2011
Dynamics and Complex Systems Seminar, <i>University of Colorado Boulder</i>	September 2010
SIAM FRAMSC, <i>University of Colorado Denver</i>	March 2010
Dynamics Days Poster, <i>Northwestern University</i>	January 2010

Event Organization

Organizing Committee Chair

Dynamics Days 2020, <i>Hartford, CT</i>	January 2020
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Organizing/Program Committee Member

Complex Networks 2022, <i>Palermo, Italy</i>	November 2022
Complex Data Blocks 2022, <i>Palma de Mallorca, Spain</i>	October 2022
NetSci 2022, <i>Shanghai, China</i>	July 2022
NERCCS 2022, <i>Buffalo, NY</i>	March 2022
Complex Networks 2021, <i>Madrid, Spain</i>	December 2021
CompleNet 2021, <i>Virtual</i>	May 2021
NERCCS 2021, <i>Binghamton, NY</i>	April 2021
SIAM Conference on Applications of Dynamical Systems, <i>Portland, OR</i>	May 2021
Complex Networks 2020, <i>Madrid, Spain</i>	December 2020
NetSci 2020, <i>Rome, Italy</i>	July 2020
SIAM Workshop on Network Science 2020, <i>Toronto, Canada</i>	July 2020
NERCCS 2020, <i>Buffalo, NY</i>	April 2020
CompleNet 2020, <i>Exeter, UK</i>	March 2020
NetSciX 2020, <i>Tokyo, Japan</i>	January 2020
Dynamics Days 2020, <i>Hartford, CT</i>	January 2020
Complex Networks 2019, <i>Lisbon, Portugal</i>	December 2019
NetSci 2019, <i>Burlington, VT</i>	May 2019
Complex Networks 2018, <i>Cambridge, UK</i>	December 2018
Complex Networks 2017, <i>Lyon, France</i>	December 2017
Complex Networks 2016, <i>Milan, Italy</i>	December 2016

Satellite/Minisymposium Organizer

SIAM Conference on Applications of Dynamical Systems, <i>Portland, OR</i> “Network Dynamics and Higher-Order Interactions”	May 2021
NetSci 2019, <i>Burlington, VT</i> “Information, Self-Organizing Dynamics, and Synchronization on Complex Networks IV”	May 2019
SIAM Annual Meeting 2018, <i>Portland, OR</i> “Network Dynamics”	July 2018
NetSci 2017, <i>Indianapolis, IN</i>	June 2017

“Information, Self-Organizing Dynamics, and Synchronization on Complex Networks III”	
SIAM Applications of Dynamical Systems 2017, <i>Snowbird</i>	May 2017
“Advances in Network Synchronization”	
NetSci 2015, <i>Zaragoza, Spain</i>	June 2015
“Information, Self-Organizing Dynamics, and Synchronization on Complex Networks II”	
NetSci 2014, <i>Berkeley, CA</i>	June 2014
“Information, Self-Organizing Dynamics, and Synchronization on Complex Networks”	

Grants

ONR: “Conference: Dynamics Days 2020” — \$15,000.00, funded	March 2020
NSF: “Conference: Dynamics Days 2020” — \$25,000.00, funded	December 2019
Simons Foundation: “Collaboration Grant” — \$35,000.00, not funded	January 2017
NSF: \$228,231.00, not funded (ratings: very good, good, and fair)	November 2016
“Collaborative Research: Optimal Synchronization of Power Grid Network Dynamics — Structural Reconfiguration, Adaptive Demand and Supply, and Multi-scale Synchronization”	
Simons Foundation: “Collaboration Grant” — \$35,000.00, not funded	January 2016

Software

Synched for Mac OSX

Synched is a software tool created for simulating and visualizing synchronization phenomena of large complex systems in real-time. It is designed for use by both students and experts and is copyrighted under a Creative Commons license. It is free for download and non-commercial use. Download and more information available at:

<https://sites.google.com/site/persebastianskardal/software/synched>

CardioVis for Mac OSX

CardioVis is a software tool created for simulating and visualizing the spatiotemporal dynamics of cardiac alternans in real-time. It is designed for use by both students and experts and is copyrighted under a Creative Commons license. It is free for download and non-commercial use. Download and more information available at:

<https://sites.google.com/site/persebastianskardal/software/cardiovis>

Editorial Work

Academic Editor for *PLOS One (Public Library of Science)*

Guest Editor for *Chaos: An Interdisciplinary Journal of Nonlinear Science (American Institute of Physics)*
Focus Issue: “Symmetry and optimization in the synchronization and collective behavior of complex systems”

Referee Work

Journals Refereed:

Science Advances – *American Association for the Advancement of Science*
 Nature Communications – *Nature Publishing Group*
 Communications Physics – *Nature Publishing Group*
 Scientific Reports – *Nature Publishing Group*
 Physical Review Letters – *American Physical Society*
 Physical Review X – *American Physical Society*
 Physical Review Research – *American Physical Society*
 Physical Review E – *American Physical Society*

Chaos: An Interdisciplinary Journal of Nonlinear Science – *American Institute of Physics*
 SIAM Journal on Applied Dynamical Systems – *SIAM*
 SIAM Journal on Control and Optimization – *SIAM*
 Journal of the Royal Society Interface – *The Royal Society*
 Philosophical Transactions of the Royal Society A (Math, Physics, and Engineering) – *The Royal Society*
 Journal of Physics: Complexity – *Institute of Physics*
 Journal of Physics A: Mathematical and Theoretical – *Institute of Physics*
 Nonlinearity – *Institute of Physics*
 Europhysics Letters – *Institute of Physics*
 Journal of Statistical Mechanics: Theory and Experiment – *Institute of Physics*
 Physica Scripta – *Institute of Physics*
 European Physical Journal B – *Springer*
 Nonlinear Dynamics – *Springer*
 Journal of Mathematical Neuroscience – *Springer*
 Applied Network Science – *Springer*
 Journal of Analysis – *Springer*
 Computational Social Networks – *Springer*
 Physica D – *Elsevier*
 Chaos, Solitons, and Fractals – *Elsevier*
 Applied Mathematics and Computation – *Elsevier*
 Physics Letter A – *Elsevier*
 Theoretical Computer Science – *Elsevier*
 Journal of Complex Networks – *Oxford*
 Discrete and Continuous Dynamical Systems – *American Institute of Mathematical Sciences*
 Frontiers in Computational Neuroscience – *Frontiers*
 PLOS One – *Public Library of Science*
 PLOS Computational Biology – *Public Library of Science*
 IEEE Transactions on Network Science and Engineering – *IEEE*
 IEEE Transactions on Circuits and Systems I: Regular Papers – *IEEE*
 The Computer Journal – *Oxford University Press*
 Entropy – *MDPI*
 International Journal of Environmental Research and Public Health – *MDPI*
 Geoscience – *MDPI*

Teaching Experience

Trinity College

Hartford, CT, USA

Courses taught:

Statistical Data Analysis	January 2021
Fractal Geometry	Fall 2020
Analysis	Fall 2020
Analysis	Spring 2020
Applied Linear Algebra	Fall 2019
Statistical Data Analysis	Fall 2019
Calculus I	Fall 2019
Dynamical Systems	Fall 2018
Applied Linear Algebra	Fall 2018
Scientific Method in Society	Fall 2018
Differential Equations	Spring 2018
Statistical Data Analysis	Spring 2018
Applied Linear Algebra	Fall 2017
Calculus II	Fall 2017
Independent Study (Dynamical Systems)	Fall 2017
Senior Exercise (Fractals)	Spring 2017

Statistical Data Analysis	Spring 2017
Dynamical Systems	Fall 2016
Calculus II	Fall 2016
Differential Equations	Spring 2016
Statistical Data Analysis	Spring 2016
Independent Study (Network Structures)	Spring 2016
Calculus III	Fall 2015
Statistical Data Analysis	Fall 2015
Independent Study (Fractals)	Fall 2015

Theses Advised:

Erkin Verbeek “Modeling and Mitigating Contagions on Networks”	AY 2019/20
Sabina Adhikari “Random Walks in Complex Networks”	AY 2018/19
Maria Warns “Multi-scale Modeling of Epidemics in Interconnected Urban Environments”	AY 2018/19
Shufan Wang “A Survey On Using Variational Inference for Community Detection”	AY 2017/18
Lauren Konopka “On Symmetries of Generalized Mandelbrot Sets”	AY 2015/16
Rachel Lee (Second Reader) “Modeling Long Bone Growth After a Fracture Using the Turing Model”	AY 2015/16

Mediterranean School of Complex Networks

Senior Lecturer

Salina, Sicily, Italy
June 2014

University of Colorado at Boulder

Courses taught:

Calculus III (Instructor)	Spring 2013
Calculus III (Instructor)	Fall 2012
Calculus III (Instructor)	Summer 2012
Differential Equations and Linear Algebra (Instructor)	Summer 2011
Differential Equations and Linear Algebra (Teaching Assistant)	Spring 2011
Calculus II (Teaching Assistant)	Fall 2010
Differential Equations and Linear Algebra (Instructor)	Summer 2010
Differential Equations and Linear Algebra (Teaching Assistant)	Spring 2010
Calculus III (Teaching Assistant)	Fall 2009
Calculus II (Teaching Assistant)	Spring 2009
Differential Equations and Linear Algebra (Teaching Assistant)	Fall 2008

Miscellaneous

Honors, Awards, and Affiliations

Outstanding Referee: <i>Chaos: An Interdisciplinary Journal of Nonlinear Science</i>	2014
Complex Systems Society (CSS) – Member	September 2014 – Present
University of Colorado Graduate School Travel Grant	January 2012
Society for Industrial and Applied Mathematics (SIAM) – Member	September 2008 – Present
Pi Mu Epsilon National Mathematics Honor Society – Member	May 2007 – Present

Press

For Evolving Network Structure of Academic Institutions. *Applied Network Science* **2**, 1 (2017):
Summer Research Students and Assistant Professor of Mathematics Co-Author Paper, *Trinity News*,
 Annelise Gilbert (2017).

For Control of Coupled Oscillator Networks with Application to Microgrid Technologies. *Science Advances*, **1**, e1500339 (2015).

Skardal Research Published, *Trinity Reporter* (2016).

Trinity Math Professor Publishes Paper; Findings Could Impact Grid Technology, *West Hartford News* (2015).

Math Professor Publishes in Science Advances, *Trinity News*, Andrew Concatelli (2015).

Synchronization Controls Could Help Smooth Microgrids, *IEEE Spectrum*, Katherine Tweed (2015).

Programming Languages

C, C++, MATLAB, Java, FORTRAN, LATEX, HTML, and some use of Unix shell scripts

Spoken Languages

English, Norwegian, Spanish