

Dan A. Mazilu

Washington and Lee University ♦ Department of Physics and Engineering ♦ Lexington, VA 24450

(540) 458-8172 ♦ mazilud@wlu.edu

EDUCATION

Doctor of Philosophy, Physics, December 2002

Virginia Polytechnic Institute and State University, Blacksburg, VA

Master of Science, Physics, December 1998

Virginia Polytechnic Institute and State University, Blacksburg, VA

Master of Science, Physics, June 1996

Alexandru Ioan Cuza University, Iasi, Romania

Bachelor of Science, Engineering Physics, June 1995

Alexandru Ioan Cuza University, Iasi, Romania

ACADEMIC APPOINTMENTS

Associate Professor, Department of Physics and Engineering, Washington and Lee University, Lexington, VA, 2014 – present

Assistant Professor, Department of Physics and Engineering, Washington and Lee University, Lexington, VA, July 2008 – 2014

Instructor, Department of Physics, Virginia Tech, Blacksburg, VA, January 2005 – May 2008

Visiting Assistant Professor, Department of Physics and Physical Oceanography, Memorial University of Newfoundland, St. John's, Canada, January 2003 – May 2003

COURSES TAUGHT AT W&L

- PHYS 111/112 – General Physics I & II
- PHYS 113/114 – General Physics Laboratory I & II
- PHYS 125 – Particle Physics at CERN
- PHYS 120 – Dreams of a Final Theory: The Quest for Unification in Physics
- PHYS 202 – Relativity
- PHYS 210 – Modern Physics
- PHYS 230 – Newtonian Mechanics
- PHYS 275 – Electricity and Magnetism
- PHYS 295A – Special Topics in Modern and Contemporary Physics
- PHYS 401 – Directed Individual Study
- PHYS 421/422/423 – Directed Individual Research
- PHYS 493 – Honors Thesis

SERVICE

- Society of Physics Students Faculty Advisor (2019-)
- Faculty Executive Committee (2018-2020)
- Public Functions Committee (2018-2023)
- Graduate Fellowships Committee (2017-2021)
- Faculty Executive Committee (2015-2016)
- STEM Pedagogy Working Group (2015-2016)
- University Library Committee (2012-2015)
- Historic Preservation and Archaeological Conservation Advisory Board (2012-2014)
- Science, Society and the Arts Committee (2010)
- Johnson Scholarship Competition (2009, 2011-2014, 2016)

BOOK

D. A. Mazilu, I. Mazilu, H. T. Williams, "From Complex to Simple: Interdisciplinary Stochastic Models", IOP Science, Morgan & Claypool Publishers (2018), online ISBN 978-1-64327-120-0, print ISBN 978-1-64327-117-0



PEER-REVIEWED PUBLICATIONS

*Undergraduate students

Y. R. Chang, S. Taylor, S. Duncan, D. A. Mazilu, A. L. Ritter, W. A. Ducker, "Fabrication of stabilized colloidal crystal monolayers", *Colloids and Surfaces A: Physicochemical and Engineering Aspects* 514 (2017) 185–191

I. Mazilu, D. A. Mazilu, R. E. Melkerson*, E. Hall-Mejia*, G. J. Beck*, S. Nshimyumukiza*, C. M. da Fonseca, "Class of cooperative stochastic models: exact and approximate solutions, simulations, and experiments using ionic self-assembly of nanoparticles", *Physical Review E* 93, 032803 (2016)

C. M. da Fonseca, S. Kouachi, D. A. Mazilu, I. Mazilu, "A multi-temperature kinetic Ising model and the eigenvalues of some perturbed Jacobi matrices", *Applied Mathematics and Computation* 259 (2015) 205-211

E. M. Schwen*, I. Mazilu, D. A. Mazilu, "A two-state stochastic model for nanoparticle self-assembly: theory, computer simulations and applications", *European Journal of Physics* 36 (2015) 025003

L. J. Cook, D. A. Mazilu, I. Mazilu, B. M. Simpson*, E. M. Schwen*, V. O. Kim*, A. M. Seredinski*, "Cooperative sequential-adsorption model in two dimensions with experimental applications for ionic self-assembly of nanoparticles", *Physical Review E* 89, 062411 (2014)

C. M. da Fonseca, D. Mazilu, I. Mazilu, H.T. Williams, "The eigenpairs of a Sylvester-Kac type matrix associated with a simple model for one-dimensional deposition and evaporation", *Applied Mathematics Letters* 26 (2013) 1206-1211

D. A. Mazilu, I. Mazilu, A. M. Seredinski*, V. O. Kim*, B. M. Simpson*, W. E. Banks*, "Cooperative sequential adsorption models on a Cayley tree: analytical results and applications", *Journal of Statistical Mechanics: Theory and Experiment*, 1742-5468, P09002 (2012)

D. A. Mazilu, G. Zamora*, I. Mazilu, "From complex to simple: interdisciplinary stochastic models", *European Journal of Physics* 33, pp. 793-803 (2012)

I. Mazilu, D. A. Mazilu, H. T. Williams, "Applications of tridiagonal matrices in non-equilibrium statistical physics", *Electronic Journal of Linear Algebra*, Volume 24, pp. 7-17 (2012)

H. T. Williams, I. Mazilu, D. A. Mazilu, "Stochastic epidemic-type model with enhanced connectivity: exact solution", *Journal of Statistical Mechanics: Theory and Experiment*, 1742-5468, P01017, (2012)

D. A. Mazilu, A. L. Ritter, "The abrasive wear of alumina: Correlation with electron triboemission", *Wear* 258, 1384-1403, (2005)

D. A. Mazilu, A. L. Ritter, "Exploratory study of alumina-on-alumina sliding contact in the presence of the chemical vapor aluminum tri-sec-butoxide", *Tribology Letters* Vol. 9, No. 3-4, (2000)

P. Wagner, D. Mazilu, L. Trappeniers, V. V. Moshchalkov, Y. Bruynseraede, "Anomalous Hall effect in thin films of $\text{Pr}_{0.5}\text{Sr}_{0.5}\text{MnO}_3$ ", *Physical Review B-Condensed Matter* 55, 14721-14724 (1997)

SELECTED PEER-REVIEWED CONFERENCE PROCEEDINGS

*Undergraduate students

D. A. Mazilu, M. O. Withers*, W. Hanstedt*, S. Gibbs*, A. P. Lorson*, I. Mazilu, "A Monte Carlo study of a cooperative three-state model with adsorption and evaporation and its applications", accepted for publication in the *Journal of Physics: Conference Series* (2019)

E. Baker*, M. O. Withers*, E. Aldrich*, I. Shaffrey*, J. Pusztay*, D. A. Mazilu, I. Mazilu, "Computational model for the ionic self-assembly of nanoparticles under the influence of external electric fields", accepted for publication in the *Journal of Physics: Conference Series* (2019)

M. O. Withers*, E. Baker*, D. A. Mazilu, I. Mazilu, "Modeling directed self-assembly of nanoparticles under parallel electric fields", accepted for publication in the *Journal of Physics: Conference Series* (2019)

I. Mazilu, A. P. Lorson*, S. Gibbs*, W. Hanstedt*, D. A. Mazilu, "A multi-temperature kinetic Ising model and its applications to partisanship dynamics in the US Senate", accepted for publication in the *Journal of Physics: Conference Series* (2019)

I. Mazilu, E. M. Schwen*, W. E. Banks*, B. K. Pope*, D. A. Mazilu, “A stochastic model of nanoparticle self-assembly on Cayley trees”, Journal of Physics: Conference Series 574 (2015) 012086

E. M. Schwen*, I. Mazilu, D. A. Mazilu, “A stochastic model of particle deposition and evaporation for ionic self-assembly of thin films”, Journal of Physics: Conference Series 574 (2015) 012043

D. A. Mazilu, E. M. Schwen*, I. Mazilu, “An analytical and computational study of a stochastic adsorption model with variable attachment and detachment rates”, Journal of Physics: Conference Series 574 (2015) 012087

D. A. Mazilu, I. Mazilu, H. T. Williams, “Exact analytical solutions of charged monomer and dimer deposition models in one and two dimensions”, Journal of Physics: Conference Series 417 (2013) 012070

SELECTED CONFERENCE PRESENTATIONS

*Undergraduate students

†Presenter

D. A. Mazilu†, M. O. Withers*, W. Hanstedt*, S. Gibbs*, A. P. Lorson*, I. Mazilu, “A Monte Carlo study of a cooperative three-state model with adsorption and evaporation and its applications”, poster presentation at the 8th International Conference on Mathematical Modeling in Physical Sciences, Bratislava, Slovakia, August 2019

E. Baker†*, M. O. Withers*, E. Aldrich*, I. Shaffrey*, J. Puszta*, D. A. Mazilu, I. Mazilu, “Computational model for the ionic self-assembly of nanoparticles under the influence of external electric fields”, poster presentation at the 8th International Conference on Mathematical Modeling in Physical Sciences, Bratislava, Slovakia, August 2019

M. O. Withers†*, E. Baker*, D. A. Mazilu, I. Mazilu, “Modeling directed self-assembly of nanoparticles under parallel electric fields”, poster presentation at the 8th International Conference on Mathematical Modeling in Physical Sciences, Bratislava, Slovakia, August 2019

I. Mazilu†, A. P. Lorson*, S. Gibbs*, W. Hanstedt*, D. A. Mazilu, “A multi-temperature kinetic Ising model and its applications to partisanship dynamics in the US Senate”, poster presentation at the 8th International Conference on Mathematical Modeling in Physical Sciences, Bratislava, Slovakia, August 2019

M. O. Withers†*, M. Roberts, D. A. Mazilu, I. Mazilu, “Directed Self-Assembly of Nanoparticles under Electric Fields”, poster presentation at the American Physical Society Meeting, Boston, MA, March 2019

D. A. Mazilu†, I. Mazilu, G. J. Beck*, M. Abudayyeh*, R. E. Melkerson*, “Time Dependence of Ionic Nanoparticle Self-Assembly: An Experimental and Theoretical Study”, poster presentation at the

5th International Conference on Mathematical Modeling in Physical Sciences, Athens, Greece, May 2016

I. Mazilu[†], D. A. Mazilu, R. E. Melkerson*, G. J. Beck*, C. M. da Fonseca, “Analysis of Two-State Systems using Matrix Theory”, poster presentation at the 5th International Conference on Mathematical Modeling in Physical Sciences, Athens, Greece, May 2016

G. J. Beck^{†,*}, S. Nshimyumukiza*, M. Abudayyeh*, R. E. Melkerson*, E. Hall-Mejia*, I. Mazilu, D. A. Mazilu, “Experimental Investigations of Ionic Self-Assembly of Silica Nanoparticles”, oral presentation at the American Physical Society Meeting, Baltimore, MD, March 2016

R. E. Melkerson^{†,*}, G. J. Beck*, E. Hall-Mejia*, S. Nshimyumukiza*, C. M. da Fonseca, D. A. Mazilu, I. Mazilu, “Exact and Approximate Solutions for a Class of Cooperative Stochastic Models”, poster presentation at the American Physical Society Meeting, Baltimore, MD, March 2016

C. M. da Fonseca[†], S. Kouachi, D. A. Mazilu, I. Mazilu, “A Kinetic Ising Model and the Spectra of Some Jacobi Matrices” oral presentation at the SIAM Conference on Applied Linear Algebra, Atlanta, GA, October 2015

I. Mazilu[†], D. A. Mazilu, G. J. Beck*, E. Hall-Mejia*, R. E. Melkerson*, S. Nshimyumukiza*, “Ionic Self-Assembly of Nanoparticles: Theory, Simulations, and Experiments”, oral presentation at TUI-3 at KITP, Santa Barbara, CA, July 2015

D. A. Mazilu[†], E. M. Schwen*, I. Mazilu, W. E. Banks*, “An Analytical and Computational Study of a Stochastic Adsorption Model with Variable Attachment and Detachment Rates”, poster presentation at the 3rd International Conference on Mathematical Modeling in Physical Sciences, Madrid, Spain, August 2014

I. Mazilu[†], W. E. Banks*, E. M. Schwen*, B. Pope*, D. A. Mazilu, “A Stochastic Model of Nanoparticle Self-Assembly on Cayley Trees”, poster presentation at the 3rd International Conference on Mathematical Modeling in Physical Sciences, Madrid, Spain, August 2014

E. M. Schwen^{†,*}, I. Mazilu, D. A. Mazilu, “A Stochastic Model of Particle Deposition and Evaporation for Ionic Self-Assembly of Thin Films”, poster presentation at the 3rd International Conference on Mathematical Modeling in Physical Sciences, Madrid, Spain, August 2014

E. M. Schwen^{†,*}, I. Mazilu, D. A. Mazilu, “Experimental Analysis and Stochastic Modeling of Particle Deposition and Evaporation for Ionic Self-Assembly of Thin Films”, poster presentation at CMD 25–JMC 14: Condensed Matter in Paris, France, August 2014

W. E. Banks^{†,*}, E. M. Schwen*, A. M. Seredinski*, B. M. Simpson*, V. O. Kim*, Conan Zhao*, I. Mazilu, D. A. Mazilu, “Cooperative Sequential Adsorption Model with Evaporation on Cayley Trees”, poster presentation at the American Physical Society Meeting, Denver, CO, March 2014

V. O. Kim†*, B. M. Simpson*, A. M. Seredinski*, E. M. Schwen*, D. A. Mazilu, I. Mazilu, “Concentration Dependence of Nanoparticle Surface Coverage for Ionic Self-Assembled Monolayers”, poster presentation at the American Physical Society Meeting, Denver, CO, March 2014

A. M. Seredinski†*, E. M. Schwen*, B. M. Simpson*, V. O. Kim*, C. M. da Fonseca, H. T. Williams, I. Mazilu, D. A. Mazilu, “Random Sequential Adsorption of Monomers with Evaporation: Exact Results and Application to Ionic Self-Assembly”, poster presentation at the American Physical Society Meeting, Denver, CO, March 2014

E. M. Schwen†*, V. O. Kim*, B. M. Simpson*, L. J. Cook, I. Mazilu, D. A. Mazilu, “Two-Dimensional Cooperative Sequential Adsorption with Evaporation for Ionic Self-Assembly of Nanoparticles”, poster presentation at the American Physical Society Meeting, Denver, CO, March 2014

B. M. Simpson†*, M. Abudayyeh*, A. Ali*, A. Hamrick*, D. A. Mazilu, I. Mazilu, “Experimental Study of the Temperature Dependence of Substrate Coverage in Ionic Self-Assembled Monolayers”, poster presentation at the American Physical Society Meeting, Denver, CO, March 2014

C. Zhao†*, E. M. Schwen*, A. M. Seredinski*, V. O. Kim*, B. M. Simpson*, W. E. Banks*, L. J. Cook, D. A. Mazilu, I. Mazilu, “Monte Carlo Simulation Study of Self-Assembly of Nanoparticles on Cayley Trees”, poster presentation at the American Physical Society Meeting, Denver, CO, March 2014

I. Mazilu†, D. A. Mazilu, A. M. Seredinski*, W. E. Banks*, B. M. Simpson*, V. O. Kim*, “Cooperative Sequential Adsorption and Evaporation Models on a Bethe Lattice: Analytical Results and Applications to Nanoparticle Self-Assembly”, poster presentation at STATPHYS 25, Seoul, South Korea, July 2013

V. O. Kim†*, B. M. Simpson*, A. M. Seredinski*, W. E. Banks*, D. A. Mazilu, I. Mazilu, “Ionic Self-Assembly of Thin Films: Analytical and Experimental Results”, poster presentation at STATPHYS 25, Seoul, South Korea, July 2013

A. M. Seredinski†*, W. E. Banks*, B. M. Simpson*, V. O. Kim*, D. A. Mazilu, I. Mazilu, “Analytical Study of Cooperative Sequential Adsorption Models on Cayley Trees and their Applications to Drug Encapsulation of Nanoparticles”, poster presentation at the American Physical Society Meeting, Baltimore, MD, March 2013

B. M. Simpson†*, W. E. Banks*, V. O. Kim*, A. M. Seredinski*, K. Wilson*, I. Mazilu, D. A. Mazilu, “Experimental and Analytical Study of Ionic Self-Assembly of Silica and Titania Nanoparticles”, oral presentation at the American Physical Society Meeting, Baltimore, MD, March 2013

W. E. Banks†*, A. M. Seredinski*, B. M. Simpson*, V. O. Kim*, I. Mazilu, D. A. Mazilu, “Computational Study of a Class of Cooperative Sequential Adsorption Models on Cayley Trees

and Two-Dimensional Lattices”, oral presentation at the American Physical Society Meeting, Baltimore, MD, March 2013

V. O. Kim†*, W. E. Banks*, A. M. Seredinski*, B. M. Simpson*, D. A. Mazilu, I. Mazilu, “Ionic Self-Assembly of Thin Films: Analytical and Experimental Results”, poster presentation at the American Physical Society Meeting, Baltimore, MD, March 2013

D. A. Mazilu†, A. Lal*, R. V. Castedo*, “Self-Assembled Antireflective Coatings Using Silica and Titania Nanoparticles”, poster presentation at the 15th International Conference on Thin Films in Kyoto, Japan, November 2011

D. A. Mazilu†, H. T. Williams, I. Mazilu, “Exact Analytical Solutions and Computational Study of Charged Monomer and Dimer Deposition Models in One and Two Dimensions”, oral presentation at the 15th International Conference on Thin Films in Kyoto, Japan, November 2011

I. Mazilu†, D. A. Mazilu, “Applications of tridiagonal matrices in non-equilibrium statistical physics”, oral presentation at Directions in Matrix Theory, Coimbra, Portugal, July 2011

R. V. Castedo†*, A. Lal*, D. A. Mazilu, “Antireflective Coatings using Layer by Layer Self Assembly of Silica and Titania Nanoparticles”, oral presentation at the American Physical Society Meeting, Dallas, TX, March 2011

A. Lal†*, R. V. Castedo*, D. A. Mazilu, “Self-Assembled Double-Quarter Antireflective Coatings using Silica and Titania Nanoparticles”, poster presentation at the American Physical Society Meeting, Dallas, TX, March 2011

D. A. Mazilu†, R. V. Castedo*, A. Lal*, “Self-Assembled Double-Quarter Antireflective Coatings using Silica Nanoparticles”, poster presentation at the Gordon Conference on Nanostructure Fabrication, Tilton, NH, July 2010