

SORIN MITRAN

CURRICULUM VITAE

Education

Politehnica University Bucharest, Dr.Eng., Fluid Mechanics. June 1995
Advisor: Corneliu Berbente
Politehnica University Bucharest, Eng., Aerospace Engineering. June 1985

Professional Experience

Professor, Department of Mathematics, 2013-present
University of North Carolina, Chapel Hill
Associate Professor, Department of Mathematics, 2008-2013
University of North Carolina, Chapel Hill
Assistant Professor, Department of Mathematics, 2002-2008
University of North Carolina, Chapel Hill
Research Associate, Department of Applied Mathematics, 1999-2002
University of Washington, Seattle
Guest Scientist, Institut für Reaktor Sicherheit, 1998-1999
Forschungszentrum Karlsruhe
Lecturer, Department of Aerospace Engineering, 1995-1998
Politehnica University Bucharest

Honors and Awards

Senior Faculty Competitive Research and Scholarly Leave 2010

Bibliography 2013-2018

15. Nault, I, Mitran, S, “Modeling high strain-impacts using Eulerian hyper-elastoplasticity with Johnson-Cook Constitutive law”, Intl. J. Plasticity (submitted, 2018, 46p)
14. Malahe, M, Mitran, S, “Hybrid Krylov-Random Walk Algorithms for Solving Discretized Elliptic Partial Differential Equations on CPU-GPU architectures”, SIAM J. Sci. Comp., (submitted, 2017, 15p).
13. Fovargue, D, Mitran, S, Sankin, G, Zhang, Y, Zhong, P, “An experimentally-calibrated damage mechanics model for stone fracture in shock wave lithotripsy”, Int. J. Fracture, (accepted, Feb, 2018), 33p.
12. Feng, Y, Mitran, S, “Data - driven reduced - order model of microtubule mechanics”, Cytoskeleton, Nov. 30, 2017, 16p., DOI: 10.1002/cm.21419

11. Zhang, Y, Nault, I, Mitran, S, Iversen ES, Zhong, P, “Effects of stone size on the comminution process and efficiency in shock wave lithotripsy”, *Ultrasound in Med. & Bio.*, 42(11):2662-2675, 2016.
10. Zdanski, C, Davis, S, Hong, Y, Miao, D, Quammen, C, Mitran, S, Niethammer, M, Kimbell J, Pitkin, E, Fine, J, Fordham, L, Vaughn, B, Superfine, R, “Quantitative Assessment of the Upper Airway in Infants and Children with Subglottic Stenosis”, *Laryngoscope* 126(5):1225-1231, 2016
9. Moot, T, Palin, C, Mitran, S, Cahoon, JF, Lopez, R, “Designing plasmon-enhanced thermochromic films using a vanadium dioxide nanoparticle elastomeric composite”, *Adv. Opt. Materials*, 4(4):578-583, 2016.
8. Quammen C, Taylor, RM, Krajcevski, P, Mitran, S, Enquobahrie, A, Superfine, R, Davis, B, Davis, S, Zdanski, C, “The virtual pediatric airways workbench”, *Medicine Meets Virtual Reality* 220:295-300, 2016, DOI: 10.3233/978-1-61499-625-5-295.
7. Bu, R., Price, H., Mitran, S., Zdanski, C, Oldenburg, AL, “Swept-source anatomic coherence elastography of porcine trachea”, *Photonic Therapeutics and Diagnostics XII* (16p), DOI:10.1117/12.2213186
6. Herschlag, G., Mitran, S, Lin, G, “ A consistent hierarchy of generalized kinetic equation approximations to the master equation applied to surface catalysis”, *J. Chem. Phys.* 142(23):A234703 (14p), 2015
5. A. Neisius, N.B. Smith, G. Sankin, N.J. Kuntz, J.F. Madden, D.E. Fovargue, S. Mitran, M.E. Lipkin, W.N. Simmons, G.M. Preminger, P. Zhong, “Improving the lens design and performance of a contemporary electromagnetic shock wave lithotripter”, *Proc. Natl. Acad. Sci.* 111:E1167-E1175, 2014.
4. Liu, YC, Tippets, CA, Kirsch, C, Mitran, S, Samulski, ET, Lopez, R, “Balance between light trapping and charge carrier collection: Electro-photonic optimization of organic photovoltaics with ridge-patterned back electrodes”, *J. Appl. Phys.* 113(24):244503, 2013.
3. Y. Liu, C. Kirsch, A. Gadisa, M. Aryal, S. Mitran, E.T. Samulski, R. Lopez, “Effects of nano-patterned versus simple flat active layers in upright organic photovoltaic devices”, *J. Phys. D.* 46(2):024008, 2013.
2. D.E. Fovargue, S. Mitran, N.B. Smith, G.N. Sankin, W.N. Simmons, P. Zhong, “Experimentally validated multiphysics computational model of focusing and shock wave formation in an electromagnetic lithotripter”, *J. Ac. Soc. Am.*, 134(2):1598-1609, 2013.
1. S. Mitran, “Continuum-kinetic-microscopic model of lung core-annular fluid clearance”, *J. Comp. Phys.*, 244:193-211, 2013.

Participation in national and international societies and meetings since 2013

Member: Society for Industrial and Applied Mathematics, American Association for the Advancement of Science, American Institute of Aeronautics and Astronautics

SELECTED TALKS

Computational Mathematics Seminar, Lausanne, Switzerland	June, 2015
Frontiers in Computational Physics, Zurich, Switzerland	June, 2015
Duke High Dimensional Data Meeting	Mar. 2015
International Society for Theurapeutic Ultrasound	Nov. 2014
Acoustical Society of America Fall Meeting	Oct. 2014
Triangle Cytoskeleton Meeting, Durham, NC	Sep. 2014
SIAM Annual Meeting, Chicago, IL	Jun. 2014
14 th International Symposium on Therapeutic Ultrasound, Las Vegas, NV	Apr. 2014
SIAM Conference on Computational Science and Engineering, Boston, MA	Feb. 2013

Editorial responsibilities since 2013

Associate Editor for: *Advances in Water Resources*, *Communication in Applied Mathematics and Computational Science*

University, regional, national and/or international committees since 2013

University of North Carolina Faculty Council	2013-15
University of North Carolina Appointment, Promotion, and Tenure Committee	2018
Department of Mathematics Graduate Committee	2013-17
NSF Grant Proposal Review Service (5 times)	2013-17
Reviewer for national science foundations of: Romania, Israel, Netherlands, Japan	

Mentoring activities since 2013

Doctoral dissertation advising with graduation dates and first positions:

- D. Fovargue, 2013, Postdoc, Rensselaer Polytechnic Institute
- G. Herschlag 2013, Postdoc, Duke University
- M. Malahe 2016, Postdoc, Capetown University
- Y. Feng 2017, Research scientist, Taiwan Semiconductor Manufacturing Company
- I. Nault 2017, Staff Scientist, Army Research Laboratories

Current PhD advisees:

- B. Adam (2020)
- J. Pearson (2020)
- W. Bridgman (2020)

Current Master advisees:

- C. Sadek

Post-doctoral scholar advising with time period and first position:

- C. Kirsch (2009-2011), Staff scientist, Zurich University of Applied Sciences
- P. Vasquez (2010), Postdoc, UNC

Research grant awards since 2013

NIH (R21, K001837-00-S01), SBIR: An interactive, patient-specific virtual surgical planning system for upperairway obstruction treatments, J. Kimbell, S. Mitran, \$49,963, 2018.

DOD, Engineered Materials and Materials Design of Engineered Materials (EMMDEM), 2016, \$100,000, S. Mitran

NIH (R01-HL123557) 2016-18, Anatomic optical coherence tomography for quantitative bronchoscopy, \$662,948, A. Oldenburg, J. Kimbell, S. Mitran, S. Randell, C. Zdanski.

NSF-NIH (DMS-1361375) 2014-2018, *Computational cell motility model educed from single-cell and high-throughput phenotype analysis*, \$514,046 (2014-2016), R. Superfine, M. Falvo, S. Mitran

NIH (1-R56-HL123557-01) 2014-2018, *Anatomic Optical Coherence Tomography for Quantitative Bronchoscopy*, \$555,943, A. Oldenburg, C. Zdanski, S. Mitran, J. Kimbell

NIH (R01-HL105241-01-41) 2010-2015, *Predictive modeling for treatment of upper airway obstruction in young children*, \$3,514,574, S. Davis (PI), R. Superfine (PI), C. Zdanski (PI), J. Fine, L. Fordham, J. Kimbell, S. Mitran, M. Muhlebach, A. Oldenburg, G. Retsch-Bogart, R. Taylor.

NIH (11-NIH-1002) - Duke Medical Center, 2009-2017, *Innovations in Shock Wave Lithotripsy technology*, \$394,036, S. Mitran.

NSF (CMMI-1068918), 2011-2014, *Ciliary Mechanics*, R. Superfine (PI), M. Falvo (coPI), S. Mitran (coPI), \$465,851, 08/11-08/14.

27 Research grant applications submitted 2013-18, of which 14 were funded.

Research grant awards has allowed full support of Mathematics graduate students for 28 semesters, 15 summer months