

University of Michigan, Electrical Engineering and Computer Science Dept., 1301 Beal Ave, Ann Arbor, MI 48109-2122, USA
Phone: +1 (734) 647 - 4840, Homepage: <http://www.markosyanaram.com>, E-Mail: armarkos@umich.edu

Academic Experience

University of Michigan, USA

2014-present Research Fellow, Department of Electrical Engineering and Computer Science
Centrum Wiskunde & Informatica, Netherlands

2010-2014 PhD candidate and researcher, Multiscale Dynamics (MD) group
Affiliate: Eindhoven University of Technology, Department of Applied Physics
Centrum Wiskunde & Informatica, MD

Education

2010-2014 PhD degree, Eindhoven University of Technology
Doctor at TU/e, Department of Applied Physics.

Thesis title: Modeling multiple time scales in streamer discharges.

Thesis Advisors: prof.dr. U.M. Ebert and dr. S. Dujko

2008-2009 Master 2, University Pierre and Marie Curie, Paris 6
Master of Sciences and Technologies, Mathematics and Applications, Numerical Analysis and Partial Differential Equations.

Thesis title: SVI implied variance parameterization.

Thesis Advisors: Dr. C. Martini (Zeliade Systems), Prof. O. Pironneau (Paris 6), Prof. H. Berestycki (Paris 6)

2006-2008 Master degree, Yerevan State University, Armenia
Faculty of Mathematics.

Thesis title: Existence of the Minimal Element of the Class of Supersolutions in the One - Phase Parabolic Free Boundary Problem in Convex Domain.

Thesis Advisors: Assoc. Prof. Michael Poghosyan

2002-2006 Bachelor degree, Yerevan State University, Armenia
Faculty of Mathematics. Diploma earned with excellence.

Industrial Experience

2009-2009 Intern, Zeliade Systems

Fellowships, Grants, and Awards

1. Short visit grant from European Science Foundation (ESF) No. 5297 (13-20.01.2013) within the activity entitled 'Thunderstorm effects on the atmosphere-ionosphere system'. Collaborating Research with F. J. Gordillo-Vázquez and A. Luque.

2. Short visit grant from European Science Foundation (ESF) No. 5697 (23-29.06.2013) within the activity entitled 'Thunderstorm effects on the atmosphere-ionosphere system'. Collaborating Research with F. J. Gordillo-Vázquez and A. Luque.

3. Short visit grant from European Science Foundation (ESF) No. 5698 (01-08.06.2013) within the activity entitled 'Thunderstorm effects on the atmosphere-ionosphere system'. Collaborating Research with F. J. Gordillo-Vázquez and A. Luque.

Referee/Reviewer

Computer Physics Communications
Plasma Science and Technology

Professional Society Memberships

American Physical Society (member)
American Mathematical Society (member)
Werkgemeenschap Scientific Computing (member)

Areas of Professional Interest

Low Temperature Plasmas, Plasma Chemistry, Laser Physics, Pulsed Power Plasmas, High Performance Computing, Numerical Methods and Scientific Computing, Adaptive Mesh Refinement, Hyperbolic Problems with Source Terms, Free Boundary Problems.

Technical Skills

C/C++(STL, QT, BOOST), Python, Fortran, MPI, OpenMP, Matlab, Mathematica, Tex.

Spoken Languages

Armenian, Russian, English, French

Activities and Hobbies

Music, modern art, philosophy, psychoanalysis, literature, digital photography.

Publications and Talks

Papers in international journals

1. S. Dujko, A.H. Markosyan, R.D. White, U. Ebert, High order fluid model for streamer discharges: I. Derivation of model and transport data, *J. Phys. D: Appl. Phys.* **46** 475202 (2013)
2. A.H. Markosyan, S. Dujko, U. Ebert, High order fluid model for streamer discharges: II. Numerical solution and investigation of planar fronts, *J. Phys. D: Appl. Phys.* **46** 475203 (2013)
3. S. Nijdam, E. Takahashi, A.H. Markosyan and U. Ebert, Investigation of positive streamers by double pulse experiments, effects of repetition rate and gas mixture, *Plasma Sources Sci. Technol.* **23** 025008 (2014)
4. A.H. Markosyan, A. Luque, F. J. Gordillo-Vázquez, U. Ebert, PumpKin: A tool to find principal pathways in plasma chemical models, *Computer Physics Communications* **185**, pp. 2697-2702, (2014)
5. J. Zhang, A.H. Markosyan, M. Seeger, E.M. van Veldhuizen, E.J.M. van Heesch and U. Ebert, Numerical and experimental investigation of recovery in super-critical N₂, submitted to *Plasma Sources Sci. Technol.*
6. S. Dujko, A.H. Markosyan and U. Ebert, Streamers in rare gases, to be submitted to *J. Phys. D.*
7. A.H. Markosyan, J. Teunissen, S. Dujko and U. Ebert, Comparing fluid models for streamer discharges, to be submitted to *Plasma Sources Sci. Technol.*

Contributed papers and abstracts at international conferences

Full refereed proceedings:

1. S. Dujko, A.H. Markosyan, U. Ebert, Propagation of negative planar streamer fronts in noble gases; proceedings of the 27th Summer School and Int. Symposium on the Physics of Ionized Gases, SPIG 2014, August 26 - 29, 2014, Belgrade, Serbia [4 pages]
2. E.J.M. van Heesch, Jin Zhang, A.H. Markosyan, Takao Namihira, F.J.C.M. Beckers, T. Huiskamp, W.F.L.M. Hoebe, A.J.M. Pemen, U. Ebert, Supercritical Fluids for High-power Switching; proceedings of IEEE International Power Modulator and High Voltage Conference, IPMHVC 2014, June 1 - 5, 2014, Santa Fe, NM, USA [4 pages]
3. S. Dujko, A. Markosyan, U. Ebert, High order fluid model for negative planar streamer fronts in rare gases, Proceedings of the 9th EU-Japan Joint Symposium on Plasma Processing, JSPP2014, January 19-23, 2014, Bohinjska Bistrica, Slovenia [4 pages]
4. S. Dujko, D. Bošnjaković, J. Mirić, I. Simonović, Z.M. Raspopović, R.D. White, A.H. Markosyan, U. Ebert, Z.Lj. Petrović, Recent results from studies of non-equilibrium electron transport in modeling of low-temperature plasmas and particle detectors, Proceedings of the 9th EU-Japan Joint Symposium on Plasma Processing, JSPP2014, January 19-23, 2014, Bohinjska Bistrica, Slovenia [4 pages]
5. A.H. Markosyan, A. Luque, F. J. Gordillo-Vázquez, U. Ebert, Analyzing atmospheric kinetic

- pathways using PumpKin, Proceedings of the European Planetary Science Congress 2013, EPSC2013, September 08-13, 2013, London, United Kingdom; Vol. 8, EPSC2013-655 [2 pages]
6. A.H. Markosyan, J. Zhang, B. van Heesch, U. Ebert, Streamer to spark transition in supercritical N₂, Proceedings of the XXth Symposium on Physics of Switching Arc, FSO 2013, September 2-6, 2013, Nove Mesto na Morave, Czech Republic [4 pages]
 7. A.H. Markosyan, A. Luque, F. J. Gordillo-Vázquez, U. Ebert, PumpKin: A tool to find principal pathways in plasma chemical models, Proceedings of the XXXI International Conference on Phenomena in Ionized Gases, ICPIG 2013, July 14-19, 2013, Granada, Spain [2 pages]
 8. A. Markosyan, S. Dujko, U. Ebert, Derivation and test of high order fluid model for streamer discharges, Proceedings of the Scientific Computing in Electrical Engineering, SCEE2012, September 11-14, 2012, ETH Zurich, Switzerland; pp. 107-108 [2 pages]
 9. S. Dujko, A. Markosyan, R.D. White, U. Ebert, High order fluid model for streamer discharges, Proceedings of the 26th Summer School and International Symposium on the Physics of Ionized Gases, SPIG 2012, August 27-31, 2012, Zrenjanin, Serbia; ISBN: 978-86-7031-244-9, pp. 345-348 [4 pages]
 10. A. Markosyan, S. Dujko, U. Ebert, High order fluid model for ionization fronts in streamer discharges, Proceedings of the XXI Europhysics Conference on Atomic and Molecular Physics of Ionized Gases, XXith ESCAMPIG, July 10-14, 2012, Viana do Castelo, Portugal [2 pages]

Talks:

1. A.H. Markosyan, J. Teunissen, S. Dujko, U. Ebert, Comparison of various fluid models for streamer discharge; proceedings of the Plasma Processing Science Gordon Research Seminar, [GRS 2014](#), July 26 - 27, 2014, Bryant University, Smithfield, RI, USA
2. *Comparison of various fluid models for streamer discharge*, A.H. Markosyan, J. Teunissen, S. Dujko, U. Ebert; proceedings of the Plasma Processing Science Gordon Research Seminar, [GRS 2014](#), July 26 - 27, 2014, Bryant University, Smithfield, RI, USA
3. A.H. Markosyan, A. Luque, F. J. Gordillo-Vázquez, U. Ebert, PumpKin: A tool to find principal pathways in plasma chemical models, Proceedings of the Physics@FOM, January 21 - 22, 2014, Veldhoven, Netherlands
4. A.H. Markosyan, A. Luque, F. J. Gordillo-Vázquez, U. Ebert, PumpKin: A tool to find principal pathways in plasma chemical models, Bulletin of the American Physical Society, 66th Annual Gaseous Electronics Conference, GEC 2013, September 30 - October 4, 2013, Princeton, New Jersey, USA; vol. 58, No. 8, p. 72
5. A.H. Markosyan, J. Zhang, B. van Heesch, U. Ebert, Numerical investigation of voltage recovery after breakdown supercritical nitrogen, Proceedings of the XXth Symposium on Physics of Switching Arc, FSO 2013, September 2-6, 2013, Nove Mesto na Morave, Czech Republic
6. *[invited talk]* A.H. Markosyan, S. Dujko, U. Ebert, Challenges in fluid modeling of streamer discharges, Proceedings of the Werkgemeenschap Scientific Computing spring meeting 2013, WSC Spring Meeting 2013, May 17, 2013, Amsterdam, Netherlands

7. A. Markosyan, S. Dujko, U. Ebert, Numerical study of high order fluid model for streamer discharges, Proceedings of the 25th Symposium Plasma Physics & Radiation Technology, March 5 - 6, 2013, Lunteren, Netherlands
8. A. Markosyan, S. Dujko, R. White, J. Teunissen, U. Ebert, High order fluid model for streamer discharges, Bulletin of the American Physical Society, 65th Annual Gaseous Electronics Conference, GEC 2012, October 22-26, 2012, Austin, Texas, USA; vol. 57, No. 8, p. 53

Posters

1. A.H. Markosyan, A. Luque, F. J. Gordillo-Vázquez, U. Ebert, PumpKin: A tool to find principal pathways in plasma chemical models, roceedings of the 5th Annual MIPSE Graduate Student Symposium, October 8, 2014, Ann Arbor, USA; p15
2. A.H. Markosyan, J. Teunissen, S. Dujko, U. Ebert, Comparison of various fluid models for streamer discharge; proceedings of the Plasma Processing Science Gordon Research Conference, [GRC 2014](#), July 27 - August 1, 2014, Bryant University, Smithfield, RI, USA
3. A.H. Markosyan, J. Teunissen, S. Dujko, U. Ebert, Comparison of various fluid models for streamer discharge, Proceedings of the Plasma Processing Science Gordon Research Conference (GRC 2014), July 27 - August 1, 2014, Bryant University, Smithfield, RI, USA
4. A.H. Markosyan, J. Teunissen, S. Dujko, U. Ebert, Comparison of various fluid models for streamer discharge, Proceedings of the Plasma Processing Science Gordon Research Seminar (GRS 2014), July 26-27, 2014, Bryant University, Smithfield, RI, USA
5. A.H. Markosyan, J. Teunissen, S. Dujko, U. Ebert, Fluid models and the reality, Proceedings of the 26th Symposium Plasma Physics & Radiation Technology, March 11 - 12, 2014, Lunteren, Netherlands; A19
6. A.H. Markosyan, J. Teunissen, S. Dujko, U. Ebert, Comparing fluid model for streamer discharges, Bulletin of the American Physical Society, 66th Annual Gaseous Electronics Conference, GEC 2013, September 30 - October 4, 2013, Princeton, New Jersey, USA; vol. 58, No. 8, p. 20
7. A.H. Markosyan, J. Zhang, B. van Heesch, U. Ebert, Investigating streamer to spark transition in supercritical N₂, Bulletin of the American Physical Society, 66th Annual Gaseous Electronics Conference, GEC 2013, September 30 - October 4, 2013, Princeton, New Jersey, USA; vol. 58, No. 8, p. 25
8. S. Dujko, Z.Lj. Petrović, R.D. White, D. Bošnjaković, J. Mirić, A.H. Markosyan, U. Ebert, Non-conservative electron transport in gases and its application in modelling of non-equilibrium plasmas and particle detectors, Proceedings of the XVII International Workshop on Low-Energy Positron and Positronium Physics and the XVIII International Symposium on Electron-Molecule Collisions and Swarms, [POSMOL 2013](#), July 19-21, 2013, Kanazawa, Japan
9. A.H. Markosyan, S. Dujko, R. U. Ebert, High order fluid model for streamer discharges in rare gases, Proceedings of the XVII International Workshop on Low-Energy Positron and Positronium Physics and the XVIII International Symposium on Electron-Molecule Collisions and Swarms, POSMOL 2013, July 19-21, 2013, Kanazawa, Japan

10. A. Markosyan, J. Zhang, B. van Heesch, U. Ebert, Investigating heating dynamics in sparks, Proceedings of the European Geoscience Union General Assembly 2013, EGU2013, April 07-12, 2013, Vienna, Austria
11. A. Markosyan, J. Zhang, B. van Heesch, U. Ebert, On the heating dynamics in sparks, Proceedings of the Physics@FOM, January 22 - 23, 2013, Veldhoven, Netherlands; p.41
12. A. Markosyan, J. Zhang, B. van Heesch, U. Ebert, Investigating voltage recovery after breakdown supercritical nitrogen, Bulletin of the American Physical Society, 65th Annual Gaseous Electronics Conference, GEC 2012, October 22-26, 2012, Austin, Texas, USA; vol. 57, No. 8, p. 84
13. A. Markosyan, S. Dujko, R. White, J. Teunissen, U. Ebert, High order fluid model for streamer discharges, Bulletin of the American Physical Society, 65th Annual Gaseous Electronics Conference, GEC 2012, October 22-26, 2012, Austin, Texas, USA; vol. 57, No. 8, p. 53
14. [award for poster] A. Markosyan, S. Dujko, U. Ebert, Why do we need high order fluid model for streamer discharges? Proceedings of the 37th Woudschoten conference, WSC Conference 2012, October 3-5, 2012, Zeist, Netherlands
15. A. Markosyan, S. Dujko, U. Ebert, High order fluid model for simulations of streamer and sprites, Proceedings of the 1st Thunderstorm Effects on the Atmosphere-Ionosphere System Summer School, TEA-IS, June 17-22, 2012, Los Alamos, Torremolinos (Malaga), Spain.
16. S. Dujko, A. Markosyan, R.D. White, Z.Lj. Petrovic, U. Ebert, High-order fluid model of streamer discharges in molecular nitrogen, Bulletin of the American Physical Society, 43rd Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, DAMOP 2012, June 4-8, 2012, Anaheim, California; vol. 57, No. 5, p. 118
17. A. Markosyan, S. Dujko, U. Ebert, High order fluid model for ionization fronts in streamer discharges, Proceedings of the 24th Symposium Plasma Physics & Radiation Technology, March 6 - 7, 2012, Lunteren, Netherlands; p. B7
18. A. Markosyan, S. Dujko, W. Hundsdorfer, U. Ebert, A high order density model for streamer discharges, Proceedings of the Physics@FOM, January 17 - 18 2012, Veldhoven, Netherlands; p. 250
19. A. Markosyan, S. Dujko, W. Hundsdorfer, U. Ebert, A high order density model for streamer discharges, Proceedings of the 14th Euregional WELTPP Workshop on the Exploration of Low Temperature Plasma Physics, December 1 - 2, 2011, "Rolduc" Kerkrade, Netherlands; P42