Aram H. Markosyan

Contact Information

Scalable Modeling and Analysis Systems
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Research Interests

My research interests lie at the confluence of applied mathematics, high performance computing and computer science. In particular, I am interested in runtime systems for HPC, numerical methods for high performance computing (HPC), conservation laws, computational fluid dynamics, computational plasma physics, reacting multiphase flow, chemical kinetics, code verification and validation, object-oriented design in scientific computing, data science, uncertainty quantification.

Employment

2016 - Present, Postdoctoral Appointee, Sandia National Laboratories, Livermore, CA
2016 - Present, Visiting Scholar, EECS, Computational Plasma Science and Engineering Group of Prof. Mark J. Kushner, University of Michigan, USA
2014 - 2016, Postdoctoral Research Fellow, EECS, Computational Plasma Science and Engineering Group of Prof. Mark J. Kushner, University of Michigan, USA
2010 - 2014, PhD Candidate and Researcher, CWI (National Research Institute for Mathematics and Computer Science), Amsterdam, The Netherlands
2009 (9 months), Intern, Zeliade Systems, Paris, France

Education

2010 - 2014, PhD, Applied Physics, Eindhoven University of Technology, The Netherlands
PhD thesis title: *Modeling of multiple time scales in streamer discharges*
Supervised by Prof. Ute Ebert and Prof. Saša Dujko
2008 - 2009, MSci, Mathematics and Applications, Numerical Analysis and Partial Differential Equations, University Pierre and Marie Curie (Paris 6), France
2002 - 2008, MSci, Mathematics (Honors), Yerevan State University, Armenia

Research Grants

2013, European Science Foundation (ESF): No. 5697 (€3000), No. 5698 (€3000), No. 5297 (€3000) within the activity entitled "Thunderstorm effects on the atmosphere-ionosphere system". Collaborating research with F. J. Gordillo-Vázquez and A. Luque

Publication Overview

- Author or co-author of 13 published, refereed journal articles. 4 in preparation
- 1 book
- 1 technical report
- 13 full refereed proceedings at international conferences
- 40 conference presentations (2 invited oral, 13 contributed oral, 25 posters)

Professional Activities

- Session Chair, "Medical and Biological Applications", 43^{rd} IEEE International Conference on Plasma Science, IEEE ICOPS 2016, Banff, Canada (2016)
- International Organizing Committee, EMN Plasma Science and Technology Meeting 2016, Melbourne, Australia (2016)
- Elected Vice-Chair, IEEE Southeastern Michigan Section, Chapter 15: Nuclear Plasma Sciences Society (2015)
- Judge, Michigan Institute for Plasma Science and Engineering Annual Graduate Student Symposium (2015)
- Journal referee (Computer Physics Communications, Plasma Science and Technology, IEEE Transactions on Plasma Science, Plasma Sources Science and Technology, New Journal of Physics, Applied Mathematical Modelling, Laser Physics(IOP), Optics Express)

Professional Associations

- Society for Industrial and Applied Mathematics (SIAM), Member (2015 - present)
- Association for Computing Machinery (ACM), Member (2016 - present)
- American Mathematical Society (AMS), Member (2014 - present)
- American Physical Society (APS), Member (2014 - present)
- American Vacuum Society (AVS), Member (2017 - present)
- IEEE Nuclear and Plasma Sciences Society, Member (2015 - present)
- Werkgemeenschap Scientific Computing (WSC), Member (2010 - present)
- Armenian Mathematical Union (AMU), Member (2015 - present)

Technical Skills

Languages: C/C++ (STL, Boost), Fortran, Python (numpy, scipy, matplotlib), CUDA, MPI, OpenMP, QT, MATLAB, Mathematica, LaTeX
Platforms: Linux (Arch, OpenSuse, Fedora, Ubuntu), Mac OSX, MS Windows

Current Collaborators

Mark J. Kushner (University of Michigan, USA), Steven L. Girshick (University of Minnesota, USA), Yogesh B. Gianchandani (University of Michigan, USA), E.J.M. van Heesch (Eindhoven University of Technology, The Netherlands), Ute Ebert (CWI, The Netherlands), Saša Dujko (University of Belgrade, Serbia), Ronald D. White (James Cook University, Australia)

Spoken Languages

Armenian (native), English, Russian, French

Citizenship

Citizen of the Republic of Armenia

References

Prof. Mark J. Kushner
Director of Department of Energy Plasma Science Center, University of Michigan
George I. Haddad Professor of Engineering EECS, University of Michigan
University of Michigan, EECS,
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Prof. Ronald D. White
Node Director and Chief Investigator in the ARC Centre of Excellence for Antimatter-Matter Studies, Australia
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Townsville, Australia, QLD 4811
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Prof. Hae June Lee
Electrical Engineering and Computer Science Department, Pusan National University
Visiting Prof. University of Michigan
University of Michigan, EECS,
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Dr. Francisco J. Gordillo Vázquez
Tenured Scientist at Solar System Department
Instituto de Astrofísica de Andalucía-CSIC
Glorieta de la Astronomia, Spain
IAA-CSIC, P.O. Box 3004,
Granada, Spain, 18080
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Books

- **A.H. Markosyan**, *Modeling multiple time scales in streamer discharges*, Eindhoven: Eindhoven University of Technology (171 p.), (2014), ISBN 978-94-6259-167-7, doi: 10.6100/IR774469

Refereed Journal Articles

[13] **Aram H. Markosyan**, *Comparing laser induced plasmas formed in diode and excimer pumped alkali lasers*, *Opt. Express* **26**(1), 488-495 (2018)

[12] **Aram H. Markosyan**, *On the importance of electron impact processes in excimer pumped alkali laser induced plasmas*, *Opt. Lett.* **42**(21), 4295-4298 (2017)

[11] **Aram H. Markosyan**, Scott R. Green, Shiyang Deng, Yogesh B. Gianchandani and Mark J. Kushner, *Miniaturized Magnet-less RF Electron Trap: I. Modeling and Analysis*, J. Vac. Sci. Technol. B **35** 042001 (2017)

[10] Shiyang Deng, Scott R. Green, **Aram H. Markosyan**, Mark J. Kushner and Yogesh B. Gianchandani, *Miniaturized Magnet-less RF Electron Trap: II. Experimental Verification*, J. Vac. Sci. Technol. B **35** 042002 (2017)

[9] **A.H. Markosyan** and M.J. Kushner, *Plasma formation in diode pumped alkali lasers sustained in Cs*, Journal of Applied Physics Vol. **120** 193105 (2016)

[8] R. Le Picard, **A.H. Markosyan**, D.H. Porter, M.J. Kushner and S.L. Girshick, *Capacitively Coupled RF Plasmas for the Synthesis of Silicon Nanocrystals: Scaling and Mechanisms*, Plasma Chemistry and Plasma Processing Vol. **36**, Issue 4, pp. 941-972 (2016)

[7] **Aram H. Markosyan**, Jannis Teunissen, Sasha Dujko and Ute Ebert, *Comparing fluid models for streamer discharges*, Plasma Sources Sci. Technol. **24** 065002 (2015)

[6] J. Zhang, E.J.M. van Heesch, F.J.C.M. Beckers, A.J.M. Pemen, R.P.P. Smeets, T. Namihira and **A.H. Markosyan**, *Breakdown Streangth and Dielectric Recovery in a High Pressure Supercritical Nitrogen Switch*, IEEE Trans. Diel. and El. Insul. Vol. **22**, Issue 4, pp. 1823-1832 (2015)

[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* N_2, Plasma Sources Sci. Technol. **24** 025008 (2015)

[4] **A.H. Markosyan**, A. Luque, F. J. Gordillo-Vázquez and U. Ebert, PumpKin: *A tool to find principal pathways in plasma chemical models*, Computer Physics Communications **185**, pp. 2697- 2702 (2014)

[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)

[2] S. Dujko, **A.H. Markosyan**, R.D. White and U. Ebert, *High order fluid model for streamer discharges: I. Derivation of model and transport data*, J. Phys. D: Appl. Phys. **46** 475202 (2013)

[1] **A.H. Markosyan**, S. Dujko and 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)

Technical Reports

[1] Janine C. Bennett, Matthew T. Bettencourt, Robert L. Clay, Harold C. Edwards, Micheal W. Glass, David S. Hollman, Hemanth Kolla, Jonathan J. Lifflander, David J. Littlewood, **Aram H. Markosyan**, Stan G. Moore, Stephen L. Olivier, J. Antonio Perez, Eric T. Phipps, Francesco Rizzi, Nicole L. Slattengren, Daniel Sunderland, Jeremiah J. Wilke, *ASC ATDM Level 2 Milestone #6015: Asynchronous Many-Task Software Stack Demonstration*, Technical Report **SAND2017-9980**, Sandia National Laboratories, Albuquerque, NM, September 2017, [168 page]

Conference Contributions

Full Refereed Proceedings

[13] E.J.M van Heesch, J. Zhang, U. Ebert, **A.H. Markosyan**, W.F.L.M. Hoeben, F.J.C.M. Beckers, T. Huiskamp and A.J.M. Pemen, *Proposing Supercritical Fluides as a Replacement for* SF_6 *in High-Voltage Circuit Breakers*, proceedings of the IEEE International Power Modulator and High Voltage Conference, IPMHVC 2016, July 5 - 9, 2016, San Francisco, CA, USA [3 pages]

[12] **A.H. Markosyan** and M.J. Kushner, *Plasma formation during operation of a diode pumped alkali laser*, proceedings of the 22^{nd} International Symposium on Plasma Chemistry, ISPC22, July 5 - 10, 2015, Antwerp, Belgium [3 pages]

[11] R. Le Picard, **A.H. Markosyan**, D.H. Porter, M.J. Kushner and S.L. Girshick, *Numerical simulation of capacitively-coupled RF plasma flowing through a tube for the synthesis of silicon nanocrystals*, proceedings of the 22^{nd} International Symposium on Plasma Chemistry, ISPC22, July 5 - 10, 2015, Antwerp, Belgium [3 pages]

[10] S. Dujko, **A.H. Markosyan** and U. Ebert, *Propagation of negative planar streamer fronts in noble gases*, proceedings of the 27^{th} Summer School and Int. Symposium on the Physics of Ionized Gases, SPIG 2014, August 26 - 29, 2014, Belgrade, Serbia [4 pages]

[9] E.J.M. van Heesch, J. Zhang, **A.H. Markosyan**, Takao Namihira, F.J.C.M. Beckers, T. Huiskamp, W.F.L.M. Hoeben, A.J.M. Pemen and 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]

[8] S. Dujko, **A. Markosyan** and U. Ebert, *High order fluid model for negative planar streamer fronts in rare gases*, Proceedings of the 9^{th} EU-Japan Joint Symposium on Plasma Processing, JSPP2014, January 19-23, 2014, Bohinjska Bistrica, Slovenia [4 pages]

[7] S. Dujko, D. Bošnjaković, J. Mirić, I. Simonović, Z.M. Raspopović, R.D. White, **A.H. Markos yan**, U. Ebert and Z.Lj. Petrović, *Recent results from studies of non-equilibrium electron transport in modeling of low-temperature plasmas and particle detectors*, Proceedings of the 9^{th} EU-Japan Joint Symposium on Plasma Processing, JSPP2014, January 19-23, 2014, Bohinjska Bistrica, Slovenia [4 pages]

[6] **A.H. Markosyan**, A. Luque and 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]

[5] **A.H. Markosyan**, J. Zhang, B. van Heesch and U. Ebert, *Streamer to spark transition in supercritical N_2*, Proceedings of the XX^{th} Symposium on Physics of Switching Arc, FSO 2013, September 2-6, 2013, Nove Mesto na Morave, Czech Republic [4 pages]

[4] **A.H. Markosyan**, A. Luque, F. J. Gordillo-Vázquez and 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]

[3] **A. Markosyan**, S. Dujko and 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]

[2] S. Dujko, **A. Markosyan**, R.D. White and U. Ebert, *High order fluid model for streamer discharges*, Proceedings of the 26^{th} 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]

[1] **A. Markosyan**, S. Dujko and 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, XXI ESCAMPIG, July 10-14, 2012, Viana do Castelo, Portugal [2 pages]

Invited Talks

[2] **A.H. Markosyan**, R. Le Picard, D.H. Porter, M.J. Kushner and S.L. Girshick, *Numerical Studies of Synthesis of Silicon Nanoparticles in Capacitively-Coupled Radiofrequency Plasmas*,

proceedings of the 43^{rd} IEEE International Conference on Plasma Science, IEEE ICOPS 2016, June 19-23, 2016, Banff, Alberta, Canada

[1] **A.H. Markosyan**, S. Dujko and 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

Regular Talks

[13] **Aram H. Markosyan**, Chris Moore, Matthew Bettencourt, Janine C. Bennett, Jonathan Lifflander, David S. Hollman, Jeremiah Wilke, Hemanth Kolla, *Particle in Cell Algorithms and Codes Towards the Next Generation Architectures*, proceedings of the 70^{th} Annual Gaseous Electronics Conference, GEC 2017, November 6-10, 2017, Pittsburgh, PA, USA

[12] **Aram H. Markosyan**, Matthew Bettencourt, Janine C. Bennett, Jonathan Lifflander, David S. Hollman, Jeremiah Wilke, Hemanth Kolla and Chris Moore, *Exploring DARMA abstraction layer for PIC and DSMC kernels on next generation platforms*, proceedings of the DSMC 2017 Conference, DSMC 2017, August 27-30, 2017, Santa Fe, NM, USA

[11] **A.H. Markosyan** and M.J. Kushner, *Plasma Formation During Operation of Diode (DPAL) and Excimer (XPAL) Pumped Alkali Lasers*, proceedings of the 43^{rd} IEEE International Conference on Plasma Science, IEEE ICOPS 2016, June 19-23, 2016, Banff, Alberta, Canada

[10] **A.H. Markosyan**, R. Le Picard, D.H. Porter, M.J. Kushner and S.L. Girshick, *Capacitively Coupled RF Plasmas for the Synthethesis of Silicon Nanocrystals: Scaling and Mechanisms*, proceedings of the 68^{th} Annual Gaseous Electronics Conference and 9^{th} International Conference on Reactive Plasmas, GEC68/ICRP9, October 12 - 16, 2015, Honolulu, HI, USA

[9] **A.H. Markosyan** and M.J. Kushner, *Effects of Plasma Formation on Cesium Diode (DPAL) and Excimer (XPAL) Pumped Alkali Lasers*, proceedings of the 68^{th} Annual Gaseous Electronics Conference and 9^{th} International Conference on Reactive Plasmas, GEC68/ICRP9, October 12 - 16, 2015, Honolulu, HI, USA

[8] N.Y. Babaeva, **A.H. Markosyan**, O. Zatsarinny, K. Bartschat and M.J. Kushner, *Plasma formation during operation of adiode pumped alkali laser*, proceedings of the 67^{th} Annual Gaseous Electronics Conference, GEC 2014, November 3 - 7, 2014, Raleigh, North Carolina, USA

[7] **A.H. Markosyan**, J. Teunissen, S. Dujko and U. Ebert, *Testing fluid models of different order on streamer discharges*, proceedings of the 67^{th} Annual Gaseous Electronics Conference, GEC 2014, November 3 - 7, 2014, Raleigh, North Carolina, USA

[6] **A.H. Markosyan**, J. Teunissen, S. Dujko and 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**, A. Luque, F. J. Gordillo-Vázquez and 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 and U. Ebert, *PumpKin: A tool to find principal pathways in plasma chemical models*, Bulletin of the American Physical Society, 66^{th} Annual Gaseous Electronics Conference, GEC 2013, September 30 - October 4, 2013, Princeton, New Jersey, USA; vol. 58, No. 8, p. 72

[3] **A.H. Markosyan**, J. Zhang, B. van Heesch and U. Ebert, *Numerical investigation of voltage recovery after breakdown supercritical nitrogen*, Proceedings of the XX^{th} Symposium on Physics of Switching Arc, FSO 2013, September 2-6, 2013, Nove Mesto na Morave, Czech Republic

[2] **A. Markosyan**, S. Dujko and U. Ebert, *Numerical study of high order fluid model for streamer discharges*, Proceedings of the 25^{th} Symposium Plasma Physics and Radiation Technology, March 5 - 6, 2013, Lunteren, Netherlands

[1] **A. Markosyan**, S. Dujko, R. White, J. Teunissen and U. Ebert, *High order fluid model for streamer discharges*, Bulletin of the American Physical Society, 65^{th} Annual Gaseous Electronics Conference, GEC 2012, October 22-26, 2012, Austin, Texas, USA; vol.57, No.8, p.53

Posters

[25] Matthew Bettencourt, Janine C. Bennett, Eric C. Cyr, Richard Kramer, **Aram H. Markosyan**, Chris Moore, Roger Pawlowski, Edward Phillips, Allen Robinson and John Shadid, *Performance portabile multi-species plasma code*, proceedings of the IEEE 44th International Conference on Plasma Science, IEEE ICOPS 2017, May 21-25, 2017, Atlantic City, NJ, USA

[24] E.J.M. van Heesch, J. Zhang, U. Ebert, **A.H. Markosyan**, W.F.L.M. Hoeben, F.J.C.M. Beckers, T. Huiskamp and A.J.M. Pemen, *Proposing Supercritical Fluides as a Replacement for SF_6 in High-Voltage Circuit Breakers*, proceedings of the IEEE International Power Modulator and High Voltage Conference, IPMHVC 2016, July 5 - 9, 2016, San Francisco, CA, USA

[23] S. Dujko, Z.Lj. Petrović, R.D. White, G. Boyle, A. Banković, I. Simonović, D. Bošnjaković, J. Mirić, **A.H. Markosyan** and S. Marjanović, *Transport processes for electrons and positrons in gases and soft-condensed matter: Basic phenomenology and applications*, proceedings of the 29^{th} International Conference on Photonic, Electronic and Atomic Collisions, ICPEAC 2015, July 22 - 28, 2015, Toledo, Spain

[22] E.J.M. van Heesch, J. Zhang, F.J.C.M. Beckers, T. Huiskamp, W.F.L.M. Hoeben, E.M. van Veldhuizen, A.J.M. Pemen, **A.H. Markosyan** and U. Ebert, *Super-critical and high-pressure media for high-repetition rate plasma switch*, proceedings of the 20^{th} IEEE Pulsed Power Conference (PPC) and the 26th IEEE Symposium on Fusion Engineering (SOFE), PPC 2015 SOFE, May 31 - June 4, 2015, Austin, Texas, USA

[21] **A.H. Markosyan**, S. Dujko and U. Ebert, *2D streamer simulations using the high order fluid model*, proceedings of the 67^{th} Annual Gaseous Electronics Conference, GEC 2014, November 3 - 7, 2014, Raleigh, North Carolina, USA

[20] R. Le Picard, **A.H. Markosyan**, D. Porter, M.J. Kushner and S.L. Girshick, *Numerical simulation of 2D capacitively-coupled RF plasma for the synthesis of silicon nanocrystals*, proceedings of the 67^{th} Annual Gaseous Electronics Conference, GEC 2014, November 3 - 7, 2014, Raleigh, North Carolina, USA

[19] **A.H. Markosyan**, A. Luque, F. J. Gordillo-Vázquez and U. Ebert, *PumpKin: A tool to find principal pathways in plasma chemical models*, proceedings of the 5^{th} Annual MIPSE Graduate Student Symposium, October 8, 2014, Ann Arbor, USA; p15

[18] **A.H. Markosyan**, J. Teunissen, S. Dujko and 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

[17] **A.H. Markosyan**, J. Teunissen, S. Dujko and 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

[16] **A.H. Markosyan**, J. Teunissen, S. Dujko and 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

[15] **A.H. Markosyan**, J. Teunissen, S. Dujko and U. Ebert, *Fluid models and the reality*, Proceedings of the 26^{th} Symposium Plasma Physics and Radiation Technology, March 11 - 12, 2014, Lunteren, Netherlands; A19

[14] **A.H. Markosyan**, J. Teunissen, S. Dujko and U. Ebert, *Comparing fluid model for streamer discharges*, Bulletin of the American Physical Society, 66^{th} Annual Gaseous Electronics Conference, GEC 2013, September 30 - October 4, 2013, Princeton, New Jersey, USA; vol. 58, No. 8, p. 20

[13] **A.H. Markosyan**, J. Zhang, B. van Heesch and U. Ebert, *Investigating streamer to spark transition in supercritical N_2*, Bulletin of the American Physical Society, 66^{th} Annual Gaseous Electronics Conference, GEC 2013, September 30 - October 4, 2013, Princeton, New Jersey, USA; vol. 58, No. 8, p. 25

[12] S. Dujko, Z.Lj. Petrović, R.D. White, D. Bošnjaković and 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

[11] **A.H. Markosyan**, S. Dujko and 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 and U. Ebert, *Investigating heating dynamics in sparks*, Proceedings of the European Geoscience Union General Assembly 2013, EGU2013, April 07-12, 2013, Vienna, Austria

[9] **A. Markosyan**, J. Zhang, B. van Heesch and U. Ebert, *On the heating dynamics in sparks*, Proceedings of the Physics@FOM, January 22 - 23, 2013, Veldhoven, Netherlands; p.41

[8] **A. Markosyan**, J. Zhang, B. van Heesch and U. Ebert, *Investigating voltage recovery after breakdown supercritical nitrogen*, Bulletin of the American Physical Society, 65^{th} Annual Gaseous Electronics Conference, GEC 2012, October 22-26, 2012, Austin, Texas, USA; vol.57, No.8, p.84

[7] **A. Markosyan**, S. Dujko, R. White, J. Teunissen and U. Ebert, *High order fluid model for streamer discharges*, Bulletin of the American Physical Society, 65^{th} Annual Gaseous Electronics Conference, GEC 2012, October 22-26, 2012, Austin, Texas, USA; vol.57, No.8, p.53

[6] *poster award* **A. Markosyan**, S. Dujko and U. Ebert, *Why do we need high order fluid model for streamer discharges?* Proceedings of the 37^{th} Woudschoten conference, WSC Conference 2012, October 3-5, 2012, Zeist, Netherlands

[5] **A. Markosyan**, S. Dujko and U. Ebert, *High order fluid model for simulations of streamer and sprites*, Proceedings of the 1^{st} Thunderstorm Effects on the Atmosphere-Ionosphere System Summer School, TEA-IS, June 17-22, 2012, Los Alamos, Torremolinos (Malaga), Spain

[4] S. Dujko, **A. Markosyan**, R.D. White, Z.Lj. Petrović and U. Ebert, *High-order fluid model of streamer discharges in molecular nitrogen*, Bulletin of the American Physical Society, 43^{rd} 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

[3] **A. Markosyan**, S. Dujko and U. Ebert, *High order fluid model for ionization fronts in streamer discharges*, Proceedings of the 24^{th} Symposium Plasma Physics & Radiation Technology, March 6 - 7, 2012, Lunteren, Netherlands; p. B7

[2] **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

[1] **A. Markosyan**, S. Dujko, W. Hundsdorfer and U. Ebert, *A high order density model for streamer discharges*, Proceedings of the 14^{th} Euregional WELTPP Workshop on the Exploration of Low Temperature Plasma Physics, December 1 - 2, 2011, "Rolduc" Kerkrade, Netherlands; P42

THESES

- **A.H. Markosyan**, *Modeling multiple time scales in streamer discharges.* Advised by Prof. Ute Ebert and Prof. Saša Dujko. Eindhoven University of Technology, The Netherlands. May 2014.

- **A.H. Markosyan**, *SVI implied variance parameterization.* Advised by Dr. Claude Martini and Prof. Olivier Pironneau. University Pierre and Marie Curie (Paris 6), France. December 2009.

- **A.H. Markosyan**, *Existence of the minimal element of the class of super-solutions in the one-phase parabolic free boundary problem in convex domain.* Advised by Prof. Michael Poghosyan. Yerevan State University, Armenia. May 2008.