John P. Verboncoeur
Michigan State University, East Lansing MI

Education

University of Florida	Engineering Science	B.S. 1986
University of California - Berkeley	Nuclear Engineering	M.S. 1987
University of California - Berkeley	Nuclear Engineering	Ph.D. 1992

Academic Appointments:

2018-	Associate Dean for Research and Graduate Studies, College of Engineering, Michigan State University
2014-	Associate Dean for Research, College of Engineering, Michigan State University (Acting 2014-2015)
2011-	Professor, Dept. Electrical and Computer Engineering, Michigan State University
2001-2010	Chairperson, Computational Engineering Science Program, University of California at Berkeley
2001-2010	Professor in Residence, Dept. Nuclear Engineering, University of California-Berkeley (Assoc. 2001-2007), Chair Computational Engineering Science Program
1996-2001	Research Scientist, Dept. Electrical Engineering and Computer Science, UC-Berkeley
1992-1995	Postdoctoral Researcher, Lawrence Livermore National Laboratory and UC-Berkeley EECS (joint)

Leadership Experience

2020	Acting VP, IEEE Publications Services and Products Board. Led the $270M business unit with 135 paid employees and over 1,000 volunteer editors, with oversight of strategy, operations, and policy for over 220 archival journals and publications from over 2000 conferences.
2019-	Member of the IEEE TAB-PSPB Products and Services Committee charged with managing the portfolio of products for the $500M products and services portfolio, as well as innovating for new revenue sources. Recent products include IEEE DataPort, IEEE Technology Roadmaps, IEEE DesignPoint: Communications (first in a series across technology areas), revenue-generating third-party products to make the IEEE e-marketplace comprehensive in the field, and data analytics to personalize and make the browsing and buying experience more relevant to individuals.
2019-2020	IEEE Board of Directors. Fiduciary and strategic leadership for $500M non-profit company with a presence in over 160 countries. Largest scientific professional society in the world, with 420,000 members, 220 publications, over 2,000 conferences per year.
2019	Chaired IEEE-wide committee to improve shared governance policy and process, including document transparency and election system reforms to ensure equity and inclusion.
2019	Chaired Powered by IEEE entrepreneurship packaged product delivering publications and other IEEE products and services to startup companies at a steeply discounted rate, along with a third-party marketplace for startup-focused products and services such as bookkeeping, business planning, legal, HR, and graphics arts.
2018-	American Center for Mobility Board of Directors. Fiduciary and strategic oversight of the premier national proving grounds for connected and autonomous vehicles and smart infrastructure.
2018-	Associate Dean for Graduate Studies. Oversee the funding resources, curriculum, and policy for nearly 1,000 graduate students. Implemented accountability on work location and pay sources, expanded travel support and dissertation completion programs. Expanded

annual graduate student symposium, incorporating industry judges, awards, and financial support.

2015-2016 Led the global opposition to an attempt to change the IEEE Constitution which employed methods not permitted in the governing documents, prevailing at the ballot box despite threats of censor and expulsion, ultimately preserving egalitarian democratic ideals. Subsequently often serve the diplomatic role of bridging potentially acrimonious differences in major governance matters.

2015-2016 President IEEE Nuclear and Plasma Sciences Society. Executive position overseeing $5M annual portfolio of conferences, publications, and 3,000 members. NPSS has the highest per-capita reserves of any IEEE Society or Council.

2014-2015 Co-founded pioneering Department of Computational Mathematics, Science, and Engineering (CMSE), building consensus among colleges and the administration for resources. Within five years, CMSE has more than 30 faculty split between data science and high-performance computing and applications.

2014- Associate Dean for Research: Lead the research strategy, operations, and compliance for the college of Engineering at MSU. Designed a hiring strategy around emerging research areas resulting in a 40% increase in the number of tenure system faculty, 7.5% average annual growth of the research portfolio. Government affairs and corporate engagement resulted in strong partnership with both stakeholders, and an increase in industry sponsored research from 14% to nearly 20% of the total. Designed new accounting and management processes for fee-for-service and gifts, resulting in improved compliance and elimination of nearly $100,000 in annual over-expenditures. High efficiency customer-service oriented research operations are now top in the university, with highest productivity and retention achieved by adoption of cutting-edge tools, processes, and training, fueled by diversity, resulting in staff contributions to process improvement.

1997 Co-founded the pioneering multidisciplinary undergraduate program, Computational Engineering Science (CES) at UC-Berkeley. The program encompasses Engineering, Applied Mathematics, and the Natural Sciences.

1991-1992 Chief Technology Officer, The University Research Network: led a startup team designing a cutting edge digital medical management system.

1991-1992 Chief Technology Officer, Wellness Institute Network (WIN): led startup developing physical therapy quality computerized fitness and rehabilitation equipment.

Academic Administration, Committees and Chairmanship

2020- Chair, Engineering Research and Instructional Lab reopening and COVID safety committee

2020- Strategic Planning Committee

2018- Associate Dean of Graduate Studies, College of Engineering

2015-2017 Advisory Committee, Computational Mathematics, Science, and Engineering Dept.

2014- Associate Dean of Research, College of Engineering

2014- Council of Research Deans

2011-2014 Graduate Admissions, Recruitment, and Financial Aid Committee, ECE (Chair 2012-2014)

2011-2013 Advisory Committee, Electrical and Computer Engineering

2001-2010 Computational Engineering Science Program Chair, UC-Berkeley

Research Interests

Computational plasma physics, numerical methods, boundary conditions, chemistry and collisional effects, with applications including microwave beam devices, high pressure discharges, cathode physics, magnetic and inertial fusion, conventional and wakefield accelerators, low temperature plasmas for mate-

rials processing, lighting, combustion, and ion thrusters. Pioneered bounded plasmas with self-consistent external circuits, object-oriented plasma modeling, accurate boundary conditions and collision models for particle codes, as well as novel kinetic global models for non-equilibrium plasma chemistry.

Research Highlights

Prof. Verboncoeur has 30 years experience developing and applying kinetic particle simulation tools. Prof. Verboncoeur has over 100 journal publications in computational plasmas and applications, in addition to over 300 conference publications, and 5 book chapters, with over 4100 citations. He has pioneered several key technologies in the area, including the first self-consistent model for plasmas bounded by electrodes connected to real driving circuits [A.2], the first interactive graphical user interface, and the first object-oriented plasma model [A.3-A.4]. His group also developed the first time-dependent explanation of the transition of multipactor breakdown to gaseous discharge [A.44], as well as a novel kinetic global model [A.58,A.60,A.61,A.63]. Several of these key journal articles have well over 100 citations each, indicating a high impact on the research community. Prof. Verboncoeur has also been involved in many other advances in plasma simulation, as summarized in a recent review article [A.34], which was recently noted as one of the top 10 cited articles in the journal.

The Plasma Theory and Simulation Group (PTSG) at MSU (formerly UCB) has been a leader in developing and distributing plasma modeling tools for over two decades. The PTSG code suite, comprising one and two dimensional codes, has over 1000 users in academia, industry, and government labs, with over 450 publications in the last decade. The flagship code in the PTSG suite, OOPIC, has two commercial versions in addition to the freely distributed version, with advanced graphical user interfaces and professional support. Prof. Verboncoeur teaches an average of more than one mini-course per year on plasma simulation at conferences, government and industrial laboratories, and academic institutions internationally.

Research Supervision:

Past Students

- Keith Cartwright, MS 1995, PhD 1999
- Peter Mardahl, MS 1995, PhD 2001
- Weigang Qiu, PhD 2004
- Hang Ping Chen, MS 2004
- Jeff Hammel, MS 2004
- Yang Feng, PhD 2007
- Chul Hyun Lim, MS 2004, PhD 2007
- Christine Nguyen, MS 2007
- Alan Wu, MS-NE 2005, MS-EECS 2007, PhD 2007
- Sven Chilton, MS 2008, PhD 2014
- Jonathan Noland, PhD 2011
- Ying Wang, PhD 2012
- Benjamin Ragan-Kelley, MS 2009, PhD 2013
- Manuel Aldan, MS 2009, PhD 2015
- Mayur Jain, MS 2015
- Rahnuma Chowdhury, MS 2016
- Guy Parsey, PhD 2017
- Scott Rice, PhD 2017

Current Students:

- Janez Krek, PhD expected 2021
- Asif Iqbal, PhD expected in 2021 (co-advisor)

Significant role in thesis research:

- David Cooperberg, PhD 1996
- Peggy Christiansen, PhD 1996
- Trudy VanDerStratten, PhD 1998
- Kevin Bowers PhD 2001
- Emi Kawamura, PhD 2003
- Lana Garmire, PhD 2008
- Jung Yel Lee, PhD 2013
- David Liaw, PhD 2014
- Mohammad Ali Asgarian, PhD 2014
- Naiguang Lei, PhD 2014
- Janez Krek, MS 2015
- Hyo Won Bae, PhD 2015
- Gautham Dharuman, PhD 2018
- Scott O'Connor, PhD expected 2021

Postdoctoral Researchers:

- Venkatesh Gopinath 1995-1997
- Peggy Christiansen 1996-1998
- Helen Smith 1998-1999
- Hae June Lee 2000-2001
- Hyun Chul Kim 2005-2007
- Sang Ki Nam 2008-2009
- Yaman Guclu 2011-2014
- Yangyang Fu 2016-2020
- Deqi Wen 2018-
- Patrick Wong (co-advised) 2018-

Hosted over 25 visiting scholars.

Current/Recent Research Funding (MSU, excluding UCB funding, individual credit in parens)

- UW Consortium (AFOSR Prime): Basic Studies of Distributed Discharge Limiters for Counter-HPM 2011-2013 $387,696 (100%)
- AFOSR-BRI: Novel tools for the modeling and simulation of ultra cold plasmas 2012-2017 $1,142,135 (33%)
- MSU Foundation SPG: Plasma Assisted Combustion 2011-2014 $400,000 (50%)
- AFOSR: Advanced Modeling of Electro-Energetic Devices 2011-2012 $139,416 (100%)
- NSF: Conference Travel Grant 2012 $8,000 (100%)
- ONR: PPPS 2013 Grant $12,000 (100%)
- NSF: Conference Travel Grant 2013-2014 $10,000 (100%)
- MSU Foundation SPG: Accelerator Technology Modeling Center 2014-2018 $400,000 (34%)
- New Mexico Consortium: Modeling Quantum Effects 2014-2016 $160,318 (50%)
- DOE: Center for Predictive Control of Plasma Kinetics: Multi-phase and Bounded Systems 2015-2019 $370,900 (100%).
- Boise State University (AFOSR prime): AFOSR in 2030 Research Directions ($34k) (100%).

- AFOSR: Multipactor and breakdown susceptibility and mitigation in space-based RF systems, 2017-2022 ($7.6M) (MSU portion $1.8M) (50%).
- DOE Accelerator Science and Engineering Traineeship, 2018-2022 ($1,490,000) (25%)
- American Center for Mobility: Preparing the Workforce for Automation in the Mobility Space 2017-18 ($169,220.52)(25%)
- NSF-IRES Track 1: Algorithms and Software for SUpercomputers and emerging aRchitEctures (AS-SURe) 2019-2021 ($197,575)(33%)
- Sandia National Laboratories: ElectroMagnetic Plasma In Radiation Environments (EMPIRE) 2018-2019 ($141k)(33%).
- NSF: Preparing the Future Workforce for the Era of Automated Vehicles (WEAVE) 2019-2023 ($2,499,999)(1%)
- AFOSR: Exploration of Fundamental Limits to High Power Electromagnetic Amplification, 2020-2025 ($7.5M, MSU portion $1,250,000)(50%)
- NSF-DOE Partnership: Studies of key mechanisms and control strategies for plasmas in micro/sub-micro scales, 2021-2024 ($462,000)(50%)
- AFOSR: Multipactor and breakdown susceptibility and mitigation in space-based RF systems, 2021-2023 ($3,230,842)(50%)

Teaching and Curriculum Development

MSU courses taught:

- ECE 802-602 Plasma Simulation (developed new course)
- ECE 850 Fundamentals of Plasma Physics
- ECE 305 Electromagnetics I

UC-Berkeley courses taught:

- CES 39B Introduction to Computational Engineering Science (developed new course)
- CES 170A,B Introduction to Modeling and Simulation I and II (developed new course)
- CES 180A,B Computational Engineering Science Modeling and Simulation I and II (developed new course)
- E 92 Perspectives in Engineering
- E 117 Methods of Engineering Analysis
- NE 155 Introduction to Numerical Simulation in Radiation Transport
- EECS 298-9 Plasma Simulation
- NE 290F Particle Simulation of Plasmas (developed new course)

Professional Societies, Awards, and Service

- Fellow, Institute of Electrical and Electronic Engineers (IEEE), 2013: *For contributions to computational plasma physics and plasma device applications*
- Member American Physical Society (APS)
- 2019 IEEE Plasma Science Applications Committee Award
- 2018 IEEE NPSS Richard F. Shea Distinguished Member Award
- DOE Incite Leadership Computing Review Panel for Accelerator/High Energy Physics 2014
- DOE Incite Leadership Computing Review Panel for Plasma Physics 2012-2013, Chair 2015
- DOE Fusion Energy Sciences Advisory Committee 2015-
- DOE Sandia National Laboratories Grand Challenge LDRD External Advisory Board 2018-2020
- Administrative Committee, IEEE Nuclear and Plasma Sciences Society 2010-2013
- Vice President/President Elect IEEE Nuclear and Plasma Sciences Society 2013-2014
- President IEEE Nuclear and Plasma Sciences Society 2015-2016

- IEEE Technical Activities Board Management Committee 2017-2019
- Acting Vice President, IEEE Publications, Services, and Products Board ($270M rev, 135 paid employees, 1000+ volunteer editors) 2020
- IEEE Division IV Director 2019-2020
- Chair, IEEE SmartAg Executive Committee and AdHoc 2017-
- Chair, Powered by IEEE initiative for startup companies, 2019
- Chair, IEEE Transparency in Meeting, Documents, and Elections Ad Hoc Committee 2019-
- Member, IEEE PSPB/TAB Products and Services Committee 2019-
- Vice Chair, IEEE Publication Services and Products Board 2020
- Acting VP, IEEE Publication Services and Products Board 2020
- Board Coordinator, IEEE Public Visibility Committee 2019-2020
- Associate Editor, Physics of Plasmas 2012-
- Guest Editor, IEEE Trans. Plasma Sci. Special Issue for Plenary and Invited Papers of the PPPS2013
- Guest Editor, IEEE Trans. Plasma Sci. Special Issue on High Power Microwaves (2008)
- Senior Guest Editor, IEEE Trans. Plasma Sci. Special Issue on Chinese National Conference on Plasma Science (2017-18)
- Technical Program Co-Chair, 2013 IEEE Pulsed Power and Plasma Sciences Conference (PPPS)
- Technical Area Coordinator – Basic Plasmas, 2012 IEEE ICOPS
- Session Organizer – Computational Plasmas, Basic Plasmas, Microwave Sources, Microwave-Plasma Interactions, IEEE ICOPS 1998-2011.
- Session Organizer, Computational Plasmas, APS Division of Plasma Physics 2008-2009
- Expert witness in a number of legal suits including with Fortune 500 companies, prevailing in each
- Over 15 International Workshops and Short Courses on Plasma Simulation taught
- Led the co-founding of the Asia-Pacific Conference on Plasma and Terahertz Science (inaugural meeting 2018).

Publications

A. Journals

122. S. O'Connor, Z.D. Crawford, J.P. Verboncoeur, J. Luginsland, B. Shanker, "A Set of Benchmark Tests for Validation of 3-D Particle-in-Cell Methods," *IEEE Trans. Plasma Sci.* **49**, 1724 (2021).
121. Y. Fu, B. Zheng, P. Zhang, Q.H. Fan, J.P. Verboncoeur, "Transition characteristics and electron kinetics in microhollow cathode discharges," *J. Appl. Phys.* **129**, 023302 (2021)
120. J. Krek, Y. Fu, G.M. Parsey, J.P. Verboncoeur, "Benchmark of the KGMf with a coupled Boltzmann equation solver," *Comput. Phys. Comm.* **260**, 107748 (2021).
119. Y. Fu, B. Zheng, D.-Q. Wen, P. Zheng, Q.H. Fan, J.P. Verboncoeur, "Similarity law and frequency scaling in low pressure capacitive radio frequency plasmas," *Appl. Phys. Lett.***117**, 204101 (2020).
118. Y. Fu, B. Zheng, P. Zhang, Q.H. Fan, J.P. Verboncoeur, and X. Wang, "Similarity of capacitive radio-frequency discharges in nonlocal regimes," *Phys. Plasmas* **27**, 113501 (2020).
117. A. Iqbal, P.Y. Wong, D.-Q. Wen, S. Lin, J. Verboncoeur, and P. Zhang, "Time-dependent physics of single-surface multipactor discharge with two carrier frequencies," *Phys. Rev. E* **102**, 043201 (2020).
116. Y. Fu, B. Zheng, D. Wen, P. Zhang, Q. H. Fan, and J. P. Verboncoeur, "High-Energy Ballistic Electrons in Low-Pressure Radio-Frequency Plasmas", *Plasma Sources Sci. Technol*. **29**, 09LT01 (2020).
115. Y. Fu, P. Zhang, X. Wang, and J.P. Verboncoeur, "Electrical breakdown from macro to micro/nano scales: A tutorial and a review of the state of the art", *Plasma Research Express* **2** (2020). [Invited Review]

114. A. Iqbal, P.Y. Wong, J.P. Verboncoeur, and P. Zhang, "Frequency-Domain Analysis of Single-Surface Multipactor Discharge With Single- and Dual-Tone RF Electric Fields," IEEE Trans. Plasma Sci. 48, 1950 (2020).
113. P.Y. Wong, P. Zhang, and J.P. Verboncoeur, "Harmonic Generation in Multipactor Discharges," IEEE Trans. Plasma Sci. **48**, 1959 (2020).
112. M. Y. Hur, J. S. Kim, I. C. Song, J. V. Verboncoeur, and H. J. Lee, "Model description of a two-dimensional electrostatic particle-in-cell simulation parallelized with a graphics processing unit for plasma discharges," *Plasma Res. Express* **1**, 015016 (2019).
111. D.-Q. Wen, P. Zhang, Y. Fu, J. Krek, J.P. Verboncoeur, "Temporal single-surface multipactor dynamics under obliquely incident linearly polarized electric field," *Phys. Plasmas* **26**, 123509 (2019).
110. P. Wong, Y.Y. Lau, P. Zhang, N. Jordan, R. Gilgenbach, and J. Verboncoeur, "The Effects of Multipactor on the Quality of a Complex Signal Propagating in a Transmission Line," *Phys. Plasmas* (2019)
109. Y. Fu, J. Krek, D. Wen, P. Zhang, and J.P. Verboncoeur, "Transition of low-temperature plasma similarity laws from low to high ionization degree regimes," *Plasma Sources Sci. Technol.* **28**, 095012 (2019).
108. D.-Q. Wen, A. Iqbal, P. Zhang, and J.P. Verboncoeur, "Suppression of single-surface multipactor discharges due to non-sinusoidal tangential electric field," *Phys. Plasmas* **26**, 093503 (2019).
107. Y. Fu, P. Zhang, J. Krek, and J.P. Verboncoeur, "Gas breakdown and its scaling law in microgaps with multiple concentric cathode protrusions," *Appl. Phys. Lett.* **114**, 014102 (2019).
106. A. Iqbal, J. Verboncoeur, and P. Zhang, "Temporal Multiparticle Monte Carlo Simulation of Dual Frequency Single Surface Multipactor," *Phys. Plasmas* **26**, 024503 (2019).
105. Y. Fu, J.P. Verboncoeur, "On the Similarities of Low-Temperature Discharge Plasmas," *IEEE Trans. Plasma Sci.* **47**, 1994 (2019). [invited]
104. Y. Fu, J. Krek, P. Zhang, and J.P. Verboncoeur, "Gas Breakdown in Microgaps with a Surface Protrusion on the Electrode," *IEEE Trans. Plasma Sci.*, **47**, 2011 (2019) [invited].
103. Y. Fu, J. Krek, P. Zhang, and J.P. Verboncoeur, "Evaluating microgap breakdown mode transition with electric field non-uniformity," *Plasma Sources Sci. Technol*. **27**, 095014 (2018).
102. Y. Fu, P. Zhang, and J.P. Verboncoeur, "Paschen's curve in microgaps with an electrode surface protrusion," *Appl. Phys. Lett.* **113**, 054102 (2018).
101. A. Iqbal, J. Verboncoeur, and P. Zhang, "Multipactor susceptibility on a dielectric with two carrier frequencies," *Phys. Plasmas* **25**, 043501 (2018).
100. Y. Fu, P. Zhang, J. P. Verboncoeur, "Gas breakdown in atmospheric pressure microgaps with a surface protrusion on the cathode", *Appl. Phys. Lett.*, **112**, 254102 (2018). Featured.
99. J. Y. Lee, J. P. Verboncoeur, and H. J. Lee, "Analysis of energy relaxation kinetics for control of the electron energy distributions in capacitively coupled RF discharges," *Plasma Sources Sci. Technol.* **27**, 04LT01 (2018).
98. Y. Fu, J. Krek, G.M. Parsey, and John P. Verboncoeur, "Characterizing the dominant ions in low-temperature argon plasmas in the range of 1-800 Torr," *Phys. Plasmas* **25**, 033505 (2018).
97. Y. Fu, P. Zhang, J. P. Verboncoeur, A. J. Christlieb, and X. Wang, "Effect of surface protrusion on plasma sheath properties in atmospheric microdischarges", *Phys. Plasmas*, **25**, 013530 (2018).
96. Y. Fu, G.M. Parsey, J.P. Verboncoeur, and A. Christlieb, "Investigation on the effect of nonlinear processes on similarity law in high-pressure argon discharges," *Phys. Plasmas* **24**, 113518 (2017).
95. Y. Fu, J.P. Verboncoeur, and A. J. Christlieb, "Pressure effect on a tandem hollow cathode discharge in argon," *Phys. Plasmas* **24**, 103514 (2017).
94. Y. Fu, X. Wang, X. Zou, S. Yang, J.P. Verboncoeur and A.J. Christlieb. "Investigation on the similarity law of low pressure glow discharges based on the light intensity distributions in geometrically similar gaps," *Phys. Plasmas* **24**, 083510 (2017).
93. Y. Fu, J.P. Verboncoeur, A.J. Christlieb, and X. Wang, "Transition characteristics of low-pressure discharges in a hollow cathode," *Phys. Plasmas* **24**, 083516 (2017).

92. S.A. Rice and J.P. Verboncoeur, "Migration of Multipactor Trajectories via Higher-Order Mode Perturbation," *IEEE Trans. Plasma Sci.* **45**, 1739 (2017).
91. C. Chang, C. Wu, Y.K. Pu, M. Zhu, X. Zhang, J. Verboncoeur, "Diagnostic of ultrafast temporal plasma evolution in high-power microwave discharge," *J. Appl. Phys.* **121**, 213301 (2017).
90. C. Chang, Y. D. Li, J. Verboncoeur, Y. S. Liu, and C. L. Liu, "Suppressing double-metal-surface resonant multipactor by three dimensional wavy surface," Phys. Plasmas 24, 040702 (2017).
89. C. Chang, J. Verboncoeur; F. Wei, J. Xie, J. Sun, C. Liu, C. Wu, and Y. Liu, "Nanosecond discharge at the interfaces of flat and periodic ripple surfaces of dielectric window with air at varied pressure", IEEE Trans. Diel. Elec. Insul. **24**, 375-381 (2017)
88. G. Dharuman, J. Verboncoeur, A. Christlieb, M. S. Murillo, "Atomic bound state and scattering properties of effective momentum-dependent potentials," Phys. Rev. E 94, 043205 (2016).
87. C.S. Meierbachtol, A.D. Greenwood, J.P. Verboncoeur, and B. Shanker, "Conformal Electromagnetic Particle in Cell: A Review", *IEEE Trans. Plasma Sci.* **43**, 3778-3793 (2015).
86. C. Chang, Y.S. Liu, J. Verboncoeur, C.H. Chen, L.T. Guo, S. Li, and X.L. Wu, "The effect of periodic wavy profile on suppressing window multipactor under arbitrary electromagnetic mode," *Appl. Phys. Lett.* **106**, 014102 (2015).
85. C. Chang, J. Verboncoeur, M. N. Guo, M. Zhu, W. Song, S. Li, C. H. Chen, X. C. Bai, and J. L. Xie, "Ultrafast high-power microwave window breakdown: Nonlinear and postpulse effects" *Phys. Rev. E* **90**, 063107 (2014).
84. J. P. Verboncoeur, "Guest Editorial: Special Issue on Plenary and Invited Papers from PPPS 2013" *IEEE Trans. Plasma. Sci.* **42**, 1086-7 (2014).
83. M. Ali Asgarian, A. Parvazian, M. Abbasi, and J. P. Verboncoeur, "Direct X-B mode conversion for high-β national spherical torus experiment in nonlinear regime", *Phys. Plasmas* **21**, 092516 (2014).
82. S. A. Rice and J. P. Verboncoeur, "A Comparison of Multipactor Predictions Using Two Popular Secondary Electron Models", *IEEE Trans. Plasma. Sci.* **42**, 1484-7 (2014).
81. B. Ragan-Kelley, J.P. Verboncoeur and M.C. Lin, "Optimizing physical parameters in 1-D particle-in-cell simulations with Python", Comp/ Physics Comm. (2014).
80. J.Y. Lee, H.W. Bae, H.J. Lee, and J. P. Verboncoeur, "The effect of power balance on the heating mode transition in micro-dielectric barrier helium glow discharges", *Plasma Sources Sci. Tech.* **23**, 035017 (2014).
79. C. Chang, M. Zhu, J. Verboncoeur, S. Li, J. L. Xie, K. Yan, D. T. Luo, X. X. Zhu, "Enhanced window breakdown dynamics in a nanosecond microwave tail pulse", *Appl. Phys. Lett.* **104**, 063107 (2014).
78. M. C. Lin, P. S. Lu, P. C. Chang, B. Ragan-Kelley, and J. P. Verboncoeur, "A relativistic self-consistent model for studying enhancement of space charge limited field emission due to counter-streaming ions", *Phys. Plasmas* **21**, 023118-6 (2014).
77. F. S. Lo, P. S. Lu, B. Ragan-Kelley, A. Minnich, T. H. Lee, M. C. Lin, and J. P. Verboncoeur, "Modeling a thermionic energy converter using finite-difference time-domain particle-in-cell simulations", *Phys. Plasmas* **21** 023510-6 (2014).
76. J. Noland, J. Y. Benitez, D. Leitner, C. Lyneis, J. Verboncoeur, "Measurement of radial and axial high energy x-ray spectra in electron cyclotron resonance ion source plasmas", *Rev. Sci. Instr.* **81** (2013).
75. M. Ali Asgarian, J. P. Verboncoeur, A. Parvazian, and R. Trines, "Kinetic simulation of the O-X conversion process in dense magnetized plasmas", Phys. Plasmas 20, 102516-11 (2013).
74 M. T. P. Aldan and J. P. Verboncoeur, "Simulations of multipactor breakdown in low-pressure background gas for angled dielectrics in DC", IEEE Trans. Diel. Elec. Insul. 20, 1209-1217 (2013).
73 R. H. Jackson, A. C. F. Wu, and J. P. Verboncoeur, "Numerical solution of the cylindrical Poisson equation using the Local Taylor Polynomial technique", J. Comput. Phys. 231, 5421-5442 (2012).
72 J. Noland, O. Tarvainen, J. Benitez, D. Leitner, C. Lyneis and J. Verboncoeur, "Studies of electron heating on a 6.4 GHz ECR ion source through measurement of diamagnetic current and plasma bremsstrahlung ", Plasma Sources Sci. Tech. 20, 035022 (2011)

71 C. Chang, J. Verboncoeur, S. Tantawi, and C. Jing, “The effects of magnetic field on single-surface resonant multipactor ”, J. Applied Phys. 110, 063304 (2011).
70 Ying Wang, Michael A. Lieberman, Alan C. F. Wu and J. P. Verboncoeur, “Verification of collisionless sheath model of capacitive rf discharges by particle-in-cell simulations”, J. Appl. Phys. 110 033307 (2011).
69 J.-M. Jeong, J.-H. Kim, H. Hwang, D.-J. Jin, J.-H Koo, E.-H. Choi, J. P. Verboncoeur, H. S. Uhm, and G. Cho, “Propagation of a Light-Emitting Wave-Front in a Fine Tube Positive Column Discharge”, Japan. J. Appl. Phys. 49, 026001 (2010).
68 J. Noland, J. Y. Benitez, D. Leitner, C. Lyneis, and J. P. Verboncoeur, “Measurement of radial and axial high energy x-ray spectra in electron cyclotron resonance ion source plasmas”, Rev. Sci. Instr. 81, 02A308 (2010).
67 E. Kawamura, A. J. Lichtenberg, M. A. Lieberman, and J. P. Verboncoeur, “Double layer formation in a two-region electronegative plasma ”, Phys. Plasmas 16, 122114 (2009)
66 B. Ragan-Kelley, J. Verboncoeur, and Y. Feng, “Two-dimensional axisymmetric Child--Langmuir scaling law”, Phys. Plasmas 16, 103102 (2009).
65 S. K. Nam and J. P. Verboncoeur, “Theory of Filamentary Plasma Array Formation in Microwave Breakdown at Near-Atmospheric Pressure”, Phys. Rev. Lett. 103, 055004 (2009).
64 D. Erzen, J. P. Verboncoeur, J. Duhovnik, and N. Jelic, “Simulations of single charged particle motion in external magnetic and electric fields” Euro. Physics J. D54 409-415 (2009).
63 S. K. Nam, C.-H. Lim, and J. P. Verboncoeur, “Dielectric window breakdown in oxygen gas: global model and particle-in-cell approach”, Phys. Plasmas 16, 023501 (2009).
62 G. S. Cho, J.-H. Kim, J.-M. Jeong, H. Hwang, D.-J. Jin, J.-H. Koo, E.-H. Choi, J. P. Verboncoeur, and H. S. Uhm, “Plasma Diffusion along a Fine Tube Positive Column”, IEEE Trans. Plasma Sci. 37, 438-443 (2009).
61 S. K. Nam and J. P. Verboncoeur, “Global model for high power microwave breakdown at high pressure in air”, Comp. Phys. Comm. 180, 628-635 (2009).
60 S. K. Nam and J. P. Verboncoeur, “Effect of Microwave Frequency on Breakdown and Electron Energy Distribution Function using a Global Model”, Appl. Phys. Lett. 93, 151504-6 (2008).
59 A. Minnich and J. P. Verboncoeur, “A model of a thermionic energy converter”, Phys. Bimonthly 30, 406 (2008).
58 S. K. Nam and J. P. Verboncoeur, “Effect of Electron Energy Distribution Function on the Global Model for High Power Microwave Breakdown at High Pressures”, Appl. Phys. Lett. 92, 231502:1-3 (2008).
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E. Patents

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