

## Curriculum vitae of Massimo V. Fischetti

Place of birth: Catania, Italy  
 Date of Birth: February 13, 1952  
 Citizenship: Italian, Permanent US Resident since 1987  
 Department of Material Science and Engineering  
 RL 3.108  
 800 West Campbell Road  
 Richardson, Texas 75080  
 Ph: (972) 883-5724  
 FAX: (972) 883-5725  
 e-mail: max.fischetti@utdallas.edu

### Education

- **Ph. D. in Physics** at the University of California at Santa Barbara, California, August 1978.  
Thesis title: "Effective Action and Particle Production in Cosmology", Prof. James B. Hartle advisor.
- **Laurea** degree in Physics at the Università degli Studi di Milano, Italy, October 1974, with 110/110 and *Magna cum Laude*.  
Thesis title: "Stochastic Methods in Constructive Quantum Field Theory", Prof. Vittorio Berzi advisor.

### Positions held

- **September 2010-present:** Texas Instruments Distinguished Professor of Nanoelectronics, Erik Jonsson School of Engineering and Computer Science at the University of Texas at Dallas, Department of Materials Science and Engineering.
- **January 2005-September 2010:** Full Professor at the University of Massachusetts, Amherst, Department of Electrical and Computer Engineering.
- **September 1991 - January 2005:** Research Staff Member at the IBM Research Division, Thomas J. Watson Research Center, Yorktown Heights, New York.
- **June 1990 - September 1991:** Member of the Technical Staff of the Director of Research, IBM Research Division, Thomas J. Watson Research Center, Yorktown Heights, New York.
- **September 1986 - June 1990:** Research Staff Member at the IBM Research Division, Thomas J. Watson Research Center, Yorktown Heights, New York.
- **September 1984 - September 1986:** Adjunct Staff Member at the IBM Research Division, Thomas J. Watson Research Center, Yorktown Heights, New York.
- **January 1983 - September 1984:** Visiting Scientist at the IBM Research Division, Thomas J. Watson Research Center, Yorktown Heights, New York.
- **September 1981 - December 1982:** Research Staff Member at the Physics Group of 3M-Italia Ricerche S.p.A., Ferrania (Savona), Italy.
- **September 1979 - August 1981:** Research Staff Member at the Physics Group of SGS-Ates (now ST-Micro), Milan, Italy.
- **January 1976 - June 1976, September 1976 - June 1977, and January 1978 - June 1978:** Teaching Assistant at the Physics Department of the University of California at Santa Barbara.
- **November 1974 - July 1975:** Teaching Assistant at the Physics Department of the Università degli Studi di Milano, Italy.

## Scientific Activities

- **Quantum Field Theory and General Relativity.** Thesis work at the University of California, Santa Barbara (1975-1978). Study of Quantum Field Theory in curved spacetimes, particle production in the early universe, renormalization of the quantum fields.
- **Experimental Activities on Silicon Dioxide.** Work performed both at SGS-Ates - now ST-Micro - (1979-1981) and at the IBM Thomas J. Watson Research center (1983-1986). Experimental investigation of the degradation processes (generation of interface traps, positive charge, bulk electron trapping) of silicon dioxide during electron injection at high electric fields.
- **Theory of high-field electron transport in Silicon Dioxide.** Work performed at the IBM Thomas J. Watson Research Center (1984-1987). Theoretical study and numerical simulation (with Monte Carlo techniques) of electron transport in silicon dioxide (see below).
- **Physics of electronic transport in semiconductors and Simulation of small semiconductor devices.** Work performed at the IBM Thomas J. Watson Research Center (1983-2005), UMass (2005-2010), and UT-Dallas (2010-present). Major accomplishments include:
  - Theory of high-field degradation of insulators in MOS systems (papers 10 and 12 in the list of publications below), highlighting the role of surface-plasmon mediated hole injection from the anode as a mechanism contributing to SiO<sub>2</sub> degradation at high field and voltages.
  - Theory of high-field electron transport in SiO<sub>2</sub> (journal publications 7 and 13, among others), showing how LO-phonon runaway is prevented by strong *Umklapp* scattering with acoustic and zone-edge phonons at high (>2 eV) energy.
  - Development of the first full-band self-consistent Monte Carlo device simulator "DAMOCLES" (see mainly paper 28 among many), including the determination of electron-phonon and impact-ionization scattering rate for high-energy electrons in Si (book chapter 7, journal paper 44, and conference proceeding 26) – rates which have become the standard in the literature –, the viability (or lack thereof) of III-V compound semiconductors in the sub-100 nm VLSI technology (conference proceeding 5, journal publications 36 and 37) in light of the '*density-of-states bottleneck*' (journal publication 37) and '*source starvation*' (conference proceeding 44), and the role of short-range Coulomb interactions in limiting the performance of devices of the sub-50 nm VLSI technology (journal papers 58-60), predictions which have been confirmed experimentally a few years later.
  - Development of a Master-equation approach to deal with quantum electronic transport in small semiconductor structures (journal papers 54 and 56, and ongoing, see conference proceedings 35 and 47).
  - From a pure technological perspective, work on electron and hole transport in strained Si, Ge, and III-V compound semiconductors (journal publications 51, 66, 70, 95, and conference proceeding 48), identifying the most promising semiconductor, surface, strain and channel orientation.
  - Theory of the mobility degradation in high- $\kappa$  MOSFETs (journal paper 64 and conference proceeding 34) identifying scattering with interfacial optical insulator phonons as an intrinsic unavoidable process.
  - Use of empirical pseudopotentials to calculate the electronic excitation spectrum of nanometer-scale structures (such as thin layers, heterochannels, nanowires, graphene, graphene nanoribbons, see journal papers 103, 104, 108-110, 114, 116, 118, and 119, conference proceedings 57-60, 64, and 65), and employ this band structure to study numerically semiclassical low- and high-field electronic transport, and also open boundary-conditions quantum transport, developing the methods to deal both with open boundary conditions and collision processes within the pseudopotential framework (ongoing, book chapter 14).
  - Use of Density Functional Theory (DFT) and empirical pseudopotentials to study the atomic and electronic properties, electron-phonon interactions, electron transport, and device applications of two-dimensional topological-insulators (Sn, Bi, and Sb monolayers) (ongoing, see journal papers 123-126, conference proceedings 70, 71).

## Professional Activities and Honors

- Recipient of two IBM Technical Innovation Awards (1987 and 1989) and of one IBM Research Division Award (1993).
- Fellow of the American Physical Society (since 1997).
- Member of the Editorial Board of the *Journal of Applied Physics* and *Applied Physics Letters* (2005-2007).
- Member of the Advisory Committee of the "International Workshop for Computational Electronics" (1993-present).
- Member of the Editorial Board and Associate Editor of the *Journal of Computational Electronics* (2007-present).
- Chair of the "International Workshop for Computational Electronics" (IWCE-12) held at UMass-Amherst, October 8-10, 2007.
- Member of the Technical Program Committee of the "Semiconductor Interface Specialists Conference" (SISC), 2007-2009.
- Member of the Technical Program Committee of the "IEEE-NANO" 2009-2014 Conference.

- Member of the subcommittee “Modeling and Simulation”, International Electron Device Meeting (IEDM), 2008-2009.
- Member of the Technical Program Committee of the “International Conference on the Simulation of Semiconductor Processes and Devices” (SISPAD 2010-2012).
- Member of the Technical Program Committee of the “European Solid-State Device Research Conference” (ESSDERC 2010-2013).
- Recipient of the 2011 IEEE Cleo Brunetti Award, shared with David J. Frank and Steven E. Laux “for contributions to the fundamental understanding of the physics, design and scaling of nanosized electronic devices”.
- Member of the Technical Program Committee of “International Workshop for Computational Electronics” (IWCE-16), held in Osaka, Japan, June 2013.
- Member of the Technical Program Committee of the “International Workshop for Computational Electronics” (IWCE-17), held in Paris, France, June 2014.
- Member of the Technical Program Committee of the International Conference on Superlattices, Nanostructures and Nanodevices, 2014.
- Member of the Technical Program Committee of the “Semiconductor Interface Specialists Conference” (SISC), 2015, 2016.
- Member of the IEEE Cleo Brunetti Award Committee, 2011-2013, Chair 2014-2015, Ex-Officio Chair 2016.
- Member of the Advisory Board of the 15th IEEE International Conference on Nanotechnology, 2015.
- Senior Editor (November 2015-December 2016) and Senior Editor Emeritus (December 2016-present) of IEEE Transaction on Nanotechnology (IEEE TNano).
- Co-Editor-in-Chief (with Professor Stephen M. Goodnick) of the Journal of Computational Electronics (January 2016-present).
- Member of the European Academy of Sciences (since July 2016).

### Grants and Contracts

1. (*Completed*) PI: Sigfrid Yngvesson, Co-PI: **Massimo V. Fischetti**  
 “NER: Ultrafast Terahertz Hot Electron Bolometer Heterodyne Detectors Based on Single Wall Carbon Nanotubes”  
 NSF ECS-Nanoscale Exploratory Research  
 June 1, 2005-May 31, 2006  
 Funded amount \$160,000, 0% shared
2. (*Completed*) PI: Ting-wei Tang, Co-PI: **Massimo V. Fischetti**  
 “Simulation of Multi-Bridge-Channel MOSFETs”  
 Samsung Electronics Co., Ltd.  
 July 1 2005-June 30, 2008  
 Funded amount: \$630,000, 50% shared
3. (*Completed*) PI: **Massimo V. Fischetti**  
 “Simulation of Electronic Transport in unconventional MOSFETs”  
 Semiconductor Research Corporation (SRC)  
 January 1, 2006-December 31, 2008  
 Funded amount: \$368,380
4. (*Completed*) PI: **Massimo V. Fischetti**  
 “III-V and Ge MOSFETs for sub-22nm Scaling: Devices, Dielectrics and Integration”  
 Semiconductor Research Corporation (SRC)  
 July 1, 2006-June 30, 2009  
 Funded amount: \$237,735
5. (*Completed*) PI: **Massimo V. Fischetti**  
 “Simulation of Electronic Transport in CMOS extensions: Si-Ge and III-V channels and non-bulk structures”  
 MARCO Focus Center for Materials, Structures, and Devices  
 September 1, 2006-August 31, 2009  
 Funded amount: \$301,781
6. (*Completed*) PI: **Massimo V. Fischetti**, Co-PI: Ting-wei Tang  
 “Theory and Simulation of Electron Transport in Small Structures: Band-structure and Quantum Effects”  
 Samsung Electronics Co., Ltd.  
 May 1, 2009-April 30, 2011  
 Funded amount: \$252,145, 50% shared
7. (*Completed*) PI: **Massimo V. Fischetti**, Co-PI: Eric Polizzi  
 “Simulation of Electronic Transport in Unconventional FETs: From Semiclassical to Quantum Models”  
 Semiconductor Research Corporation (SRC)  
 January 1, 2009-December 31, 2011  
 Funded amount: \$316,151, 50% shared

8. *(Completed)* PI: **Massimo V. Fischetti**  
 “Semiclassical Simulation of Advanced Transistors”  
 MARCO Focus Center for Materials, Structures, and Devices  
 November 1, 2009-October 31, 2011  
 Funded amount: \$232,313
9. *(Completed)* PI: **Massimo V. Fischetti**  
 “Semiclassical Simulation of Advanced Transistors”  
 MARCO Focus Center for Materials, Structures, and Devices  
 November 1, 2011-January 31, 2013  
 Funded amount: \$75,860
10. *(Completed)* PI: **Massimo V. Fischetti**  
 “Theory and Simulation of Electron Transport in Small Structures: Band-structure and Quantum Effects”  
 Samsung Electronics Co., Ltd.  
 Nov 1, 2011-October 30, 2013  
 Funded amount: \$272,340
11. *(Completed)* PI: **Massimo V. Fischetti**  
 “Issues on III-V FETs”  
 Semiconductor Research Corporation (SRC)  
 April 1, 2012-March 31 30, 2013  
 Funded amount: \$75,000
12. *(Completed)* PI: Julia W. P. Hsu, co-PI: **Massimo V. Fischetti**  
 “Impact of interfacial contact layers on photon-to-electron conversion loss in organic solar cells”  
 National Science Foundation  
 September 1, 2013-August 31, 2016  
 Funded amount: \$474,093, 30% shared
13. *(Active)* PI: S. Banerjee (UT-Austin); co-PIs: L. Register, A. MacDonald, E. Tutuc, D. Akinwande, R. Ruoff (UT-Austin), R. Wallace, J. Kim, M. Kim, C. Hinkle, **M. V. Fischetti** (UTD), S. Aboud (Stanford), J. Sinova (Texas A&M), P. Ajayan (Rice), S. Das Sarma (Maryland), E. Vogel (GaTech), K. W. Kim (NCSU), A. Kummel (UCSD), A. Yacoby (Harvard)  
 “South-West Academy of Nanoelectronics (SWAN) 2.0”  
 April 1, 2013-March 31, 2018  
 Funded amount: \$2.8M, Fischetti’s share ~\$100,000/year; additional ‘gift’ of \$75,000 (Jan-Dec 2016, Fischetti’s share \$20,000)
14. *(Active)* PI: Mark Lee, co-PI: **Massimo V. Fischetti**  
 “Approach to Room Temperature Integrated Quantum Devices in Silicon CMOS”  
 NSF GOALI and ECCS  
 October 1, 2014-September 30, 2017  
 Requested amount: \$416,584, Fischetti’s share 50%
15. *(Active)* PI: **Massimo V. Fischetti**, co-PI: William G. Vandenberghe  
 “Electronic properties and transport of low-dimensionality materials for future transistor applications”  
 TSMC Joint Development Program (JDP)  
 September 15, 2015-August 31, 2017  
 Requested amount: \$218,878, Fischetti’s share 90%

### Teaching experience

- Courses taught

1. “Electromagnetism and Waves”, Physics undergraduate (Spring 2015, 2016).
2. “Semiconductor Devices and Materials”, EE undergraduate (Fall 2005, 2009).
3. “Optoelectronics”, EE undergraduate (Fall 2006, 2007, 2008).
4. “Microelectronics Fabrication”, EE undergraduate (Spring 2009).
5. “Physics of Semiconductor Devices”, EE graduate (Spring 2005, 2008, 2010).
6. “Fundamental Solid-State Electronics II”, EE graduate (Spring 2006, 2007, 2009, 2010, 2011)
7. “Modern Physics II”, physics undergraduate (Fall 2011)
8. “Quantum Mechanics for Material Scientists”, MSE graduate (Spring 2012, 2013, 2014)
9. “Computational Physics for Material Scientists”, MSE graduate (Fall 2012, 2014)
10. “Advanced Physics of Semiconductors: Electronic Properties and Transport”, MSE Graduate (Spring 2011, Fall 2013, 2015)

- Graduate Students Advised

- 2 M.S. students graduated in January 2008 (who went on to complete their Ph.D. program)
- 1 M.S. student graduated in June 2009 (who went on to complete his Ph.D. program)

- 7 Ph.D. students graduated:
  1. Terrance P. O’Regan, graduate April 2008, now at the Naval Research Laboratory (NRL), Arlington, MD.
  2. Yan Zhang, graduated September 2010, now at the MACOM/IBM, Burlington, VT.
  3. Jiseok Kim, graduated December 2010, now at GlobalFoundries, Albany, NY.
  4. Alexander Kirk, graduated May 2012, post doctoral fellow, EE Department, Arizona State University, Tempe, AZ (August 2012-July 2015).
  5. Sudarshan Narayanan, graduated December 2012, now at GlobalFoundries, Malta, NY.
  6. Bo Fu, graduated May 2013, now at the Samsung Microelectronics Lab, San Jose, CA.
  7. Gautam Hemani, graduated August 2013, now at Applied Materials, Boise, ID.
  8. Jingtian Fang, graduated May 2016, now post doctoral fellow, EE/Physics Department, Vanderbilt University, Nashville, TN.
- Currently advising 3 Ph.D. students: Gautam Geddamani, Pratik Vyas (EE), and Shanmeng Chen.

- Post-doctoral fellows mentored

- Seonghoon Jin, UMass, 2006-2009, now at the Samsung Microelectronics Lab, San Jose, CA;
- Jiseok Kim, UT-Dallas, 2010-2013, now at GlobalFoundries, Albany, NY.
- Zhun-Yong Ong, UT-Dallas, 2011-2013, now at the Singapore Supercomputing Institute
- William Vandenberghe, UT-Dallas, 2012-2015
- Ana Suarez Negreira, UT-Dallas, 2013

- Summer Schools

- “Modeling of Micro and Nano-Electronics” (MoMiNE 2008), 5 90-minute graduate lectures on Advanced Semiconductor Physics and Electronic Transport, organized by the Department of Mathematics, University of Catania, Baia Samuele, Sicily, June 2008.
- “Summer Lecture in 2012 for Nanotechnology and Nanoscience”, 10 75-minute graduate lectures on Advanced Semiconductor Physics and Electronic Transport, organized by the Department of Applied Physics, University of Tsukuba, Tsukuba, Japan, July 11-25, 2012.

**Publications. h-index: 45 (ISI Web of Science); 52 (Googlescholar)**

- Journal Publications

1. **M. V. Fischetti**, J. B. Hartle, and B. L. Hu, *Quantum effects in the early universe. I. Influence of trace anomalies on homogeneous, isotropic, classical geometries*, Phys. Rev. D **20**, 1757-1771 (1979). [**221 citations from ISI Web of Science**] (**283 citation from GoogleScholar**) as of 1/8/2016.
2. M. Conti, **M. V. Fischetti**, and R. Gastaldi, *Physical Characterization of deep Bulk Levels by the MOS Conductance Technique*, Solid State Electron. **25**, 5 (1982). [**2**](**5**)
3. **M. V. Fischetti**, R. Gastaldi, F. Maggioni, and A. Modelli, *Positive charge effects on the flatband voltage shift during avalanche injection on Al-SiO<sub>2</sub>-Si capacitors*, J. Appl. Phys. **53**, 3129-3135 (1982). [**43**](**42**)
4. **M. V. Fischetti**, R. Gastaldi, F. Maggioni, and A. Modelli, *Slow and fast states induced by hot electrons at Si-SiO<sub>2</sub> interfaces*, J. Appl. Phys. **53**, 3136-3144 (1982). [**69**](**66**)
5. B. Ricco. and **M. V. Fischetti**, *Temperature dependence of the current in SiO<sub>2</sub> in the high field tunneling regime*, J. Appl. Phys. **55**, 4322-4329 (1984). [**14**](**19**)
6. **Massimo V. Fischetti**, *The importance of the anode field in controlling the generation rate of the donor states at the Si-SiO<sub>2</sub> interface*, J. Appl. Phys. **56**, 575-577 (1984). [**45**](**45**)
7. **Massimo V. Fischetti**, *Monte Carlo solution to the problem of high-field electron heating in SiO<sub>2</sub>*, Phys. Rev. Lett., **53**, 1755 -1758 (1984). [**84**](**108**)
8. **M. V. Fischetti**, Z. A. Weinberg, and J. A. Calise, *The effect of gate metal and SiO<sub>2</sub> thickness on the generation of donor states at the Si-SiO<sub>2</sub> interface*, J. Appl. Phys. **57**, 418-425 (1985). [**103**](**113**)
9. Z. A. Weinberg and **M. V. Fischetti**, *Investigation of the SiO<sub>2</sub>-induced substrate current in silicon field-effect-transistors*, J. Appl. Phys. **57**, 443-452 (1985). [**50**](**56**)
10. **Massimo V. Fischetti**, *Model for the generation of positive charge at the Si-SiO<sub>2</sub> interface based on hole injection from the anode*, Phys. Rev. B **31**, 2099-2113 (1985). [**95**](**119**)
11. **M. V. Fischetti** and B. Ricco, *Hot electron induced defects at the Si-SiO<sub>2</sub> interface at high fields at 295 K and 77 K*, J. Appl. Phys. **57**, 2854-2859 (1985). [**41**](**55**)
12. **Massimo V. Fischetti**, *Generation of positive charge in silicon dioxide during avalanche and tunnel electron injection*, J. Appl. Phys. **57**, 2860-2879 (1985). [**130**](**166**)
13. **M. V. Fischetti**, D. J. DiMaria, S. D. Brorson, T. N. Theis, and J. R. Kirtley, *Theory of high-field electron transport in silicon dioxide*, Phys. Rev. B **32**, 8124-8142 (1985). [**223**](**258**)

14. S. D. Brorson, D. J. DiMaria, **M. V. Fischetti**, F. L. Pesavento, P. M. Solomon, and D. W. Dong, *Direct measurements of the energy distribution of hot electrons in SiO<sub>2</sub>*, J. Appl. Phys. **58**, 1302-1313 (1985). [**93**](**106**)
15. **Massimo V. Fischetti** and D. J. DiMaria, *Quantum Monte Carlo simulation of high-field electron transport: An application to silicon dioxide*, Phys. Rev. Lett. **55**, 2475-2478 (1985). [**34**](**46**)
16. Z. A. Weinberg, **M. V. Fischetti**, and Y. Nissan-Cohen, *SiO<sub>2</sub>-induced substrate current and its relation to positive charge in field-effect transistors*, J. Appl. Phys. **59**, 824-832 (1986). [**56**](**72**)
17. D. J. DiMaria, **M. V. Fischetti**, E. Tierney, and S. D. Brorson, *Direct observation of the threshold for electron heating in silicon dioxide*, Phys. Rev. Lett. **56**, 1284-1286 (1986). [**44**](**38**)
18. D. J. DiMaria, **M. V. Fischetti**, M. Arienzo, and E. Tierney, *Electron heating studies in Silicon Dioxide: Low Fields and Thick Films*, J. Appl. Phys. **60**, 1719-1726 (1986). [**39**](**45**)
19. D. J. DiMaria, **M. V. Fischetti**, J. Batey, L. Dori, E. Tierney, and J. Stasiak, *Direct observation of ballistic electron in SiO<sub>2</sub>*, Phys. Rev. Lett. **57**, 3213-3216 (1986). [**29**](**39**)
20. L. Dori, M. Arienzo, T. Nguyen, **M. V. Fischetti**, and K. Stein, *Electron Avalanche injection on 10 nm dielectric films*, J. Appl. Phys. **61**, 1910-1915 (1987). [**8**](**8**)
21. **M. V. Fischetti** and D. J. DiMaria, *Electronic Conduction in Silicon Dioxide*, Physics Today, S54-55, January 1987.
22. **M. V. Fischetti**, D. J. DiMaria, L. Dori, J. Batey, E. Tierney, and J. Stasiak, *Ballistic Electron Transport in Thin Silicon Dioxide Films*, Phys. Rev. B **35**, 4404-4415 (1987). [**76**](**92**)
23. M. Heiblum, **M. V. Fischetti**, W. P. Dumke, D. J. Frank, I. M. Anderson, C. M. Knoedler, and L. Osterling, *Electron Interference Effects in Quantum Wells: Observation of "bound" and "unbound resonant" states*, Phys. Rev. Lett. **58**, 816-819 (1987). [**77**](**87**)
24. D. J. DiMaria and **M. V. Fischetti**, *Hot Electron Transport in SiO<sub>2</sub>: Ballistic to Steady-State Transport*, Appl. Surf. Sci. **30**, 278 (1987). [**21**](**23**)
25. **M. V. Fischetti** and D. J. DiMaria, *Hot Electrons in SiO<sub>2</sub>: Ballistic to Steady-State Transport*, Solid State Electron. **31**, 629 (1988). [**18**](**20**)
26. D. J. DiMaria, **M. V. Fischetti**, L. Dori, and J. Stasiak, *Vacuum Emission of Hot Electrons from Silicon Dioxide at Low Temperatures*, J. Appl. Phys., **64**, 4683-4691 (1988). [**36**](**42**)
27. S. E. Laux and **M. V. Fischetti**, *Monte Carlo Simulation of Submicron Si n-MOSFETs at 77 and 300 K*, IEEE Electron Device Lett. **ED-L9**, 467-469 (1988). [**92**](**112**)
28. **M. V. Fischetti** and S. E. Laux, *Monte Carlo Analysis of Electron Transport in Small Semiconductor Devices Including Band-Structure and Space-Charge Effects*, Phys. Rev. B **38**, 9721-9745 (1988). [**623**](**883**)
29. S. E. Laux, **M. V. Fischetti**, and D. J. Frank, *Monte Carlo Analysis of Semiconductor Devices: The DAMOCLES program*, IBM Journal of Research and Development, **34**, 466-494 (1990). [**91**](**139**)
30. M. Heiblum and **M. V. Fischetti**, *Ballistic Hot Electron Transistors*, IBM Journal of Research and Development, **34**, 530-549 (1990). [**43**](**53**)
31. D. A. Buchanan, **M. V. Fischetti**, and D. J. DiMaria, *Coulombic and Neutral Electron Trapping Centers in SiO<sub>2</sub>*, Appl. Surf. Science **39**, 420 (1989). [**8**](**8**)
32. **M. V. Fischetti**, S. E. Laux, and D. J. DiMaria, *The Physics of Hot-Carrier Degradation of Si-MOSFETs: Can we understand it?*, Appl. Surf. Science **39**, 578 (1989). [**28**](**37**)
33. **M. V. Fischetti**, S. E. Laux, and W. Lee, *Monte Carlo simulation of hot carrier transport in real semiconductor devices*, Solid State Electron. **32**, 1723 (1989). [**10**](**17**)
34. D. C. Cole, E. M. Buturla, S. S. Furkay, K. Varahramyan, J. A. Mandelman, D. P. Foty, O. Bula, A. W. Strong, J. W. Park, T. D. Linton, Jr., J. B. Johnson, **M. V. Fischetti**, S. E. Laux, P. E. Cotrell, H. G. Lusitg, F. Pileggi, D. Katcoff, *The Use of Simulation in Semiconductor Technology Development*, Solid State Electron. **33**, 591 (1990). [**21**](**36**)
35. E. Cartier, D. Arnold, D. J. DiMaria, **M. V. Fischetti**, P. Braunlich, S. C. Jones, X. A. Shen, R. T. Casper, and P. Kelly, *Dielectric Breakdown in Wide-Band-Gap Insulators at DC and Optical Frequencies*, Reviews of Solid State Science, **5**, 531-550 (1991). (**11**)
36. **Massimo V. Fischetti**, *Monte Carlo Simulation of Electron Transport in Technologically Significant Semiconductors of the Diamond and Zinc-blende Structures. Part I: Homogeneous Transport*, IEEE Trans. Electron Devices, **ED-38**, 634-649 (1991). [**348**](**417**)
37. **Massimo V. Fischetti** and Steven E. Laux, *Monte Carlo Simulation of Electron Transport in Technologically Significant Semiconductors of the Diamond and Zinc-blende Structures. Part II: Submicron MOSFETs*, IEEE Trans. Electron Devices, **ED-38**, 650-660 (1991). [**126**](**146**)
38. **Massimo V. Fischetti** and Steven E. Laux, *Reply to "Comments on Monte Carlo Simulation of Electron Transport in Technologically Significant Semiconductors of the Diamond and Zinc-blende Structures. Part II: Submicron MOSFETs"*, IEEE Trans. Electron Devices, **ED-39**, 749-750 (1992).

39. F. R. McFeely, E. Cartier, L. J. Terminello, A. Santoni, and **M. V. Fischetti**, *Soft X-Ray Induced Core Level Photoemission As a Probe of Hot Electron Dynamics in SiO<sub>2</sub>*, Phys. Rev. Lett. **65**, 1937-1940 (1990). [**21**](**28**)
40. D. A. Buchanan, **M. V. Fischetti** and D. J. DiMaria, *Coulombic and Neutral Trapping Centers in Silicon Dioxide.*, Phys. Rev. B **43**, 1471-1486 (1991). [**61**](**73**)
41. **M. V. Fischetti**, *Effect of the electron-plasmon interaction on the electron mobility in Silicon*, Phys. Rev. B **44**, 5527-5534 (1991). [**68**](**100**)
42. Wai Lee, S. E. Laux, **M. V. Fischetti**, G. Baccarani, A. Gnudi, J. A. Mandelman, J. Stork, E. Crabbé, F. Odeh, and M. R. Wordeman, *Numerical Modeling of Advanced Semiconductor Devices*, IBM Journal of Research and Development **36**, 208-232 (1992). [**15**](**19**)
43. **M. V. Fischetti** and S. E. Laux, *Monte Carlo study of electron transport in Si inversion layers*, Phys. Rev. B **48**, 2244-2274 (1993). [**362**](**482**)
44. E. Cartier, **M. V. Fischetti**, E. A. Eklund, and F. R. McFeely, *Impact ionization in Si*, Appl. Phys. Lett. **62**, 3339-3341 (1993). [**111**](**144**)
45. L. Carbone, R. Brunetti, C. Jacoboni, A. Lacaita, and **M. V. Fischetti**, *Polarization analysis of hot-carrier light emission in silicon*, Semicond. Sci. Technol. **9**, 674-676 (1994). (**44**)
46. D. J. Frank, S. E. Laux, and **M. V. Fischetti**, *Monte Carlo Simulations of p- and n-Channel Dual-Gate MOSFETs at the Limits of Scaling*, IEEE Trans. Electron Devices **40**, 2103 (1993). [**19**](**28**)
47. Antonio Abramo, L. Baudry, Rossella Brunetti, René Castagné, M. Charef, F. Dessenne, Philippe Dollfus, Robert Dutton, W. L. Engl, R. Fauquembergue, Claudio Fiegna, **Massimo V. Fischetti**, Sylvie Galdin, Neil Goldsman, Michael Hackel, Chihiro Hamaguchi, Karl Hess, Ken Hennacy, Patrice Hesto, J. M. Higman, Takahiro Iizuka, C. Jungemann, Y. Kamamura, Hans Kosina, T. Kunikiyo, Steven E. Laux, Hongchin Lin, Christine Maziar, Hiroyuko Mizuno, H. J. Peifer, Sridhar Ramaswamy, Nobuyuki Sano, Paul G. Scrobahaci, Siegfried Selberherr, M. Takenaka, Ting-Wei Tang, Kenji Taniguchi, J. L. Thobel, R. Thoma, Kazukata Tomizawa, Masaaki Tomizawa, Thomas Vogelsang, Shihuh-Luen Wang, Xiaolin Wang, Chiang-Sheng Yao, P. D. Yoder, and Akira Yoshii, *A Comparison of Numerical Solutions of the Boltzmann Transport Equation for High-Energy Electron Transport in Silicon*, IEEE Trans. Electron Devices **41**, 1646-1654 (1994). [**47**](**72**)
48. **Massimo V. Fischetti**, *Comments on "Oxide-Field Dependence of Electron Injection from Silicon into Silicon Dioxide"*, IEEE Trans. Electron Devices **41**, 1680-1681 (1994). [**2**](**2**)
49. **M. V. Fischetti**, S. E. Laux, and E. Crabbé, *Understanding hot-electron transport in silicon devices: Is there a short-cut?*, J. Appl. Phys. **78**, 1058-1087 (1995). [**165**](**220**)
50. O. Muscato, **M. V. Fischetti**, and R. M. Pizatella, *Monte Carlo and Hydrodynamic Simulation of a One-Dimensional n<sup>+</sup>nm<sup>+</sup> Silicon Diode*, VLSI Design, **6**, 247 (1998). [**13**](**19**)
51. **M. V. Fischetti** and S. E. Laux, *Band structure, deformation potentials, and carrier mobility in strained Si, Ge, and SiGe alloys*, J. Appl. Phys. **80**, 2234-2252 (1996). [**838**](**1169**)
52. **M. V. Fischetti**, N. Sano, S. E. Laux, and K. Natori, *Full-band-structure theory of high-field transport of electrons and holes in Ge, Si, and GaAs*, Journal of Technology Computer Aided Design, **10**, 1-50 (1996), DOI: 10.1109/TCAD.1996.6449160, <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6449160> [**2**](**28**)
53. E. Cartier, J. Tsang, **M. V. Fischetti**, and D. A. Buchanan, *Light emission during direct and Fowler-Nordheim tunneling in ultra thin MOS tunnel junctions*, J. Microelectron. Eng. **36**, 103 (1997). [**32**](**40**)
54. **M. V. Fischetti**, *Theory of electron transport in small semiconductor devices using the Pauli master equation*, J. Appl. Phys. **83**, 270-291 (1998). [**81**](**115**)
55. **M. V. Fischetti**, *Theory of electron transport in small semiconductor devices using the Pauli master equation*, VLSI Design **8** 173, (1998). [**1**]
56. **M. V. Fischetti**, *A master equation approach to the study of electronic transport in small semiconductor devices*, VLSI Design **9** 80, (1998).
57. N. Sano, **M. V. Fischetti**, and S. E. Laux, *Hole-Initiated Impact Ionization and Split-Off Band in Ge, Si, GaAs, and InGaAs*, VLSI Design **9**, 198-201 (1998).
58. **M. V. Fischetti**, *Master equation approach to the study of electronic transport in small semiconductor devices*, Phys. Rev. B **59**, 4901-4917 (1999). [**78**](**114**)
59. **M. V. Fischetti** and S. E. Laux, *Comment on "Influence of the doping element on the electron mobility in n-type silicon" [J. Appl. Phys. 83, 3096 (1998)]*, J. Appl. Phys. **85**, 7984-7985 (1999). [**5**](**6**)
60. **M. V. Fischetti** and S. E. Laux, *Performance degradation of small silicon devices caused by long-range Coulomb interactions*, Appl. Phys. Lett. **76**, 2277-2279 (2000). [**28**](**46**)
61. **M. V. Fischetti** and S. E. Laux, *Long-range Coulomb interactions in small silicon devices. Part I: Performance and reliability*, J. Appl. Phys. **89**, 1205-1231 (2001). [**105**](**129**)
62. **M. V. Fischetti**, *Long-range Coulomb interactions in small silicon devices. Part II: Effective electron mobility in thin-oxide structures*, J. Appl. Phys. **89**, 1232-1250 (2001). [**100**](**130**)

63. Cristian Rivas, Roger Lake, Gerhard Klimeck, William R. Frensley, **Massimo V. Fischetti**, Phillip E. Thompson, Sean L. Rommel, and Paul R. Berger, *Full band simulation of indirect phonon assisted tunneling in a silicon tunnel diode with delta-doped contacts*, Appl. Phys. Lett. **78**, 814-816 (2001). [46](49)
64. F. Gámiz and **M. V. Fischetti**, *Monte Carlo simulation of double gate silicon in insulator inversion layers: The role of volume inversion*, J. Appl. Phys. **89**, 5478-5487 (2001). [116](148)
65. L. A. Ragnarsson, S. Guha, N. A. Bojarczuk, E. Cartier, **M. V. Fischetti**, K. Rim, and J. Karasinski, *Electrical characterization of Al<sub>2</sub>O<sub>3</sub> n-channel Metal-Oxide-Semiconductor Field-Effect Transistors with aluminum gates*, IEEE Electron Device Lett. **22**, 490-492 (2001). [22](27)
66. **Massimo V. Fischetti**, Deborah A. Neumayer, and Eduard A. Cartier, *Effective electron mobility in Si inversion layers in MOS systems with a high- $\kappa$  insulator: The role of remote phonon scattering*, J. Appl. Phys. **90**, 4587-4608 (2001). [478](670)
67. J. C. Tsang and **M. V. Fischetti**, *Why Hot Carrier Emission Based Timing Probes Will Work for 50 nm 1V CMOS Technologies*, Microelectronic Reliability **41**, 1465-1470 (2001). [7](14)
68. **M. V. Fischetti**, F. Gámiz, and W. Hänsch, *On the enhanced electron mobility in strained-Si inversion layers*, J. Appl. Phys. **92**, 7320-7324 (2002). [174](221)
69. Steven E. Laux, Arvind Kumar, and **Massimo V. Fischetti**, *Ballistic FET Modeling using QDAME: Quantum Device Analysis via Modal Evaluation*, IEEE Trans. Nanotechnology **1**, 255-259 (2002). [48](52)
70. **M. V. Fischetti**, *Comment on "Unified compact theory of tunneling gate current in metal-oxide-semiconductor structures: Quantum and image force barrier lowering" [J. Appl. Phys. 92, 3724 (2002)]* J. Appl. Phys. **93**, 3123-3124 (2003).
71. Sufi Zafar, Alessandro Callegari, Evgeni Gusev, and **Massimo V. Fischetti**, *Charge trapping related threshold voltage instabilities in high permittivity gate dielectric stacks*, J. Appl. Phys. **93**, 9298-9303 (2003). [194](278)
72. **M. V. Fischetti**, Z. Ren, P. M. Solomon, M. Yang, and K. Rim, *Six-band  $\mathbf{k} \cdot \mathbf{p}$  calculation of the hole mobility in silicon inversion layers: Dependence on surface-orientation, strain, and silicon-thickness*, J. Appl. Phys. **94**, 1079-1095, (2003). [343](442)
73. A. Kumar, **M. V. Fischetti**, T. H. Ning, and E. Gusev, *Hot-Carrier Trap Generation in HfO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> Field-Effect Transistors*, J. Appl. Phys. **94**, 1728-1737, (2003). [48](52)
74. S. E. Laux, A. Kumar, and **M. V. Fischetti**, *Analysis of Quantum Ballistic Electron Transport in Ultra-Small Semiconductor Devices Including Space-Charge and Geometric Effects*, J. Appl. Phys. **95** 5545-5582 (2004). [76](114)
75. S. E. Laux, A. Kumar, and **M. V. Fischetti**, *Does Circulation in Individual States Survive in the Total Current Density?*, J. Comp. Electron. **2**, 105-108 (2003). [2](2)
76. **M. V. Fischetti**, *Scaling MOSFETs to the Limit: A Physicist's Perspective*, J. Comp. Electron. **2**, 73-79 (2003). [16](30)
77. F. Gámiz and **M. V. Fischetti**, *Remote Coulomb scattering in Metal-Oxide-Semiconductor transistors: Screening by electrons in the gate*, Appl. Phys. Lett. **83**, 4848-4850 (2003). [30](41)
78. **Massimo V. Fischetti**, Steven E. Laux, Paul M. Solomon, and Arvind Kumar, *Thirty years of Monte Carlo simulations of electronic transport in semiconductors: Their relevance to science and to mainstream VLSI technology*, J. Comp. Electron. **3**, 287-293 (2004). [10](18)
79. Santhosh Krishnan, Dragica Vasileska, and **Massimo V. Fischetti**, *Band-structure and Quantum Effects on Hole Transport in p-MOSFETs*, J. Comp. Electron. **4**, 27-30 (2005). [3](6)
80. Santhosh Krishnan, Dragica Vasileska, and **Massimo V. Fischetti**, *Modeling p-channel SiGe MOSFETs by taking into account band-structure and size quantization effects self-consistently*, J. Comp. Electron. **5**, 435-438 (2006). [2](6)
81. M. Yang, V. Chan, K. K. Chan, L. Shi, D. Fried, J. H. Stathis, A. Chou, E. Gusev, J. Ott, L. Burns, M. Fischetti, and M. Jeong, *Hybrid Orientation Technology (HOT): Opportunities and Challenges*, IEEE Trans. Electron Devices **53**, 965-978 (2006). [126](164)
82. W. Hänsch, E. Nowak, R. Dennard, P. Solomon, A. Bryant, O. Dokumaci, A. Kumar, X. Wang, J. Johnson, and M. Fischetti, *Silicon CMOS Devices Beyond Scaling*, IBM Journal of Research and Development, **50**, 339-361 (2006). [155](292)
83. F. Rodriguez-Morales, R. Zannoni, J. Nicholson, **M. V. Fischetti**, K. S. Yngvesson, and J. Appenzeller, *Direct and Heterodyne Detection of Microwaves in a Metallic Single-Wall Carbon Nanotube*, Appl. Phys. Lett. **89**, 083502-083505 (2006). [11](28)
84. S. Krishnan, **M. V. Fischetti**, and D. Vasileska, *Self-consistent full band two-dimensional Monte Carlo two-dimensional Poisson device solver for modeling SiGe p-channel devices*, J. Vac. Sci. Technol. B **24**, 1997-2003 (2006). (4)
85. T. O'Regan and **M. V. Fischetti**, *Electron Mobility in Silicon and Germanium Inversion Layers: The Role of Remote Phonon Scattering*, J. Comp. Electron. **6**, 81-84 (2007). [6](9)



86. T. O'Regan and **M. V. Fischetti**, *Remote Phonon Scattering in Si and Ge with SiO<sub>2</sub> and HfO<sub>2</sub> Insulators: Does the Electron Mobility Determine Short Channel Performance?*, Jap. J. Appl. Phys. **46**, 3265-3272 (2007). [**3**](**6**)
87. S. Jin, **M. V. Fischetti**, and T. Tang, *Modeling of Surface Roughness Scattering in Ultrathin-body SOI MOSFETs*, IEEE Trans. Electron Devices **54**, 2191-2203 (2007). [**77**](**98**)
88. **M. V. Fischetti**, T. O'Regan, S. Narayanan, C. Sachs, S. Jin, J. Kim, and Y. Zhang, *Theoretical Study of Some Physical Aspects of Electronic Transport in nMOSFETs at the 10 nm Gate-Length*, IEEE Trans. Electron Devices **54**, 2116-2136 (2007). [**72**](**90**)
89. S. Jin, T. Tang, and **M. V. Fischetti**, *Simulation of Silicon Nanowire Transistors Using the Boltzmann Transport Equation under the Relaxation-Time Approximation*, IEEE Trans. Electron Devices, **55**, 727-736 (2008). [**38**](**55**)
90. S. Jin, **M. V. Fischetti**, and T. Tang, *Modeling of electron mobility in gated silicon nanowires at room temperature: Surface roughness scattering, dielectric screening, and band nonparabolicity*, J. Appl. Phys. **102**, 083715 1-14, (2007). [**137**](**225**)
91. Y. Zhang, J. Kim, and **M. V. Fischetti**, *Self-Consistent Calculation of the Subband Structure and Hole Mobility in p-channel inversion layers*, J. Comp. Electron. **7**, 176-180 (2008). [**11**](**10**)
92. S. Narayanan, C. Sachs, and **M. V. Fischetti**, *Study of performance and leakage currents in nanometer-scale bulk, SOI and double-gate MOSFETs*, J. Comp. Electron. **7**, 24-27 (2008). [**4**](**4**)
93. S. Jin, **M. V. Fischetti**, and Ting-wei Tang, *Differential conductance fluctuations in silicon nanowire transistors caused by quasi-ballistic transport and scattering-induced intersubband transitions*, Appl. Phys. Lett. **92**, 082103 1-3 (2008). [**8**](**15**)
94. S. Jin, **M. V. Fischetti**, and Ting-wei Tang, *Theoretical Study of Carrier Transport in Silicon Nanowire Transistors Based on the Multisubband Boltzmann Transport Equation*, IEEE Trans. Electron Devices **55**, 2886-2897 (2008). [**19**](**28**)
95. Y. Zhang, **M. V. Fischetti**, B. Sorée, W. Magnus, M. Heyns, and M. Meuris, *Physical Modeling of Strain-dependent Hole Mobility in Ge p-Channel Inversion Layers*, J. Appl. Phys. **106**, 083704 -19 (2009). [**22**](**33**)
96. **M. V. Fischetti**, S. Jin, T.-w. Tang, P. Asbeck, Y. Taur, S. Laux, M. Rodwell, and N. Sano, *Scaling to 10 nm: Coulomb Effects, Source Starvation, and Virtual Source Model*, Journal of Computational Electronics **8**, 60-77 (2009). [**32**](**57**)
97. T. O'Regan, P. K. Hurley, B. Sorée, and **M. V. Fischetti**, *Modeling the capacitance-voltage response of In<sub>0.53</sub>Ga<sub>0.47</sub>As MOS structures: charge quantization and nonparabolic corrections*, Appl. Phys. Lett. **96**, 213514, 1-3 (2010). [**19**](**27**)
98. J. Kim and **M. V. Fischetti**, *Electronic band structure calculations for biaxially strained Si, Ge and III-V semiconductors*, J. Appl. Phys. **108**, 013710, 1-15 (2010). [**42**](**59**)
99. T. P. O'Regan, **M. V. Fischetti**, B. Sorée, S. Jin, W. Magnus, and M. Meuris, *Calculations of the electron mobility in III-V inversion layers with high- $\kappa$  dielectrics*, J. Appl. Phys. **108**, 103705, 1-11 (2010). [**4**](**16**)
100. Y. Zhang, **M. V. Fischetti**, B. Sorée, and T. P. O'Regan, *Theory of hole mobility in strained Ge and III-V p-channel inversion layers with high- $\kappa$  insulators*, J. Appl. Phys. **108**, 123713, 1-9 (2010). [**12**](**14**)
101. W. Vandenberghe, B. Sorée, W. Magnus, G. Groeseneken, and **M. V. Fischetti**, *Impact of field-induced quantum confinement in tunneling field-effect devices*, Appl. Phys. Lett. **98**, 143503 (2011). [**21**](**39**)
102. W. Vandenberghe, B. Sorée, **M. V. Fischetti**, W. Magnus, and G. Groeseneken, *Generalized phonon-assisted Zener tunneling in indirect semiconductors with non-uniform electric fields: A rigorous approach*, J. Appl. Phys. **109**, 124503 (2011). [**13**](**22**)
103. J. Kim and **M. V. Fischetti**, *Empirical Pseudopotential Calculation of the Band Structure and Ballistic Conductance of Strained [001], [110], and [111] Si Nanowires*, J. Appl. Phys. **110**, 033716 (2011). [**8**](**8**)
104. **M. V. Fischetti** and S. Narayanan, *An empirical pseudopotential approach to surface and line-edge roughness scattering in nanostructures: Application to Si thin films and nanowires and to graphene nanoribbons*, J. Appl. Phys. **110**, 083713 (2011). [**12**](**17**)
105. J. Kim, S. A. Krishnan, S. Narayanan, M. P. Chudzik, and **M. V. Fischetti**, *Thickness and temperature dependence of the leakage current in hafnium-based Si SOI MOSFETs*, Microelectronics Reliability **52**, 2907 (2012). [**4**](**4**)
106. T.-w. Tang, **M. V. Fischetti**, S. Jin, and N. Sano, *One-Flux Theory of Saturated Drain Current in Nanoscale Transistors*, Solid State Electron. **78**, 115 (2012). [**1**](**1**)
107. A. P. Kirk and **M. V. Fischetti**, *Fundamental limitations of hot carrier solar cells*, Phys. Rev. B **86**, 165302 (2012). [**9**](**11**)
108. Zhun-Yong Ong and **M. V. Fischetti**, *Charged impurity scattering in top-gated graphene nanostructures*, Phys. Rev. B **86**, 121409 (2012). [**13**](**15**)
109. Zhun-Yong Ong and **M. V. Fischetti**, *Theory of interfacial plasmon-phonon scattering in supported graphene*, Phys. Rev. B **86**, 165422 (2012); Erratum: Phys. Rev. B **86**, 199904(E) (2012). [**30**](**33**)

110. J. Kim, **M. V. Fischetti**, and S. Aboud, *Structural, electronic, and transport properties of silicane nanoribbons*, Phys. Rev. B **86**, 205323 (2012). [**12**](**13**)
111. William G. Vandenberghe, Anne S. Verhulst, Bart Sorée, Wim Magnus, Guido Groeseneken, Quentin Smets, Marc Heyns, and **Massimo V. Fischetti**, *Figure of merit for and identification of sub-60 mV/decade devices*, Appl. Phys. Lett. **102**, 013510 (2013). [**12**](**22**)
112. Zhun-Yong Ong, **Massimo V. Fischetti**, Andrei Serov, and Eric Pop, *Signature of dynamic screening in interfacial thermal transport of graphene*, Phys. Rev. B **87**, 195404 (2013). [**4**](**6**)
113. Zhun-Yong Ong and **Massimo V. Fischetti**, *Top Oxide Thickness Dependence of Remote Phonon and Charged Impurity Scattering in Top-Gated Graphene*, Appl. Phys. Lett. **102**, 183506 (2013). [**5**](**10**)
114. G. K. Hemani, W. G. Vandenberghe, B. Brennan, Y.J. Chabal, A. V. Walker, R. M. Wallace, M. Quevedo-Lopez, and **M. V. Fischetti**, *Interfacial graphene growth in the Ni/SiO<sub>2</sub> system using Pulsed Laser Deposition*, Appl. Phys. Lett. **103**, 134102 (2013). [**2**](**2**)
115. Zhun-Yong Ong and **Massimo V. Fischetti**, *Theory of remote phonon scattering in top-gated single layer graphene*, Phys. Rev. B, **88**, 045405 (2013). [**8**](**13**)
116. **Massimo V. Fischetti**, Bo Fu, and William G. Vandenberghe, *Theoretical Study of the Gate Leakage Current in sub-10 nm Field-Effect Transistors*, IEEE Trans. Electron Devices **60**, 3862 (2013). [**3**](**8**)
117. **Massimo V. Fischetti**, Jiseok Kim, Sudarshan Narayanan, Zhun-Yong Ong, Catherine Sachs, David K. Ferry, and Shela J. Aboud, *Pseudopotential-based studies of electron transport in graphene and graphene nanoribbons*, J. Phys.: Cond. Matter **25**, 473202 (2013). [**10**](**19**)
118. Zhun-Yong Ong and **Massimo V. Fischetti**, *Mobility enhancement and temperature dependence in top-gated single-layer MoS<sub>2</sub>*, Phys. Rev. B **88**, 165316 (2013). [**26**](**34**)
119. Andrey Y. Serov, Zhun-Yong Ong, **Massimo V. Fischetti**, and Eric Pop, *Theoretical analysis of high-field transport in graphene on a substrate*, J. Appl. Phys. **116**, 034507 (2014). [**6**](**8**)
120. William G. Vandenberghe, **Massimo V. Fischetti**, Roel Van Beeumen, Karl Meerbergen, Wim Michiels, and Cedric Effenberger, *Determining bound states in a semiconductor device with contacts using a non-linear eigenvalue solver*, J. Comp. Electron. **13**, 753 (2014). [**1**](**1**)
121. **Massimo V. Fischetti**, *Depression of the normal-superfluid transition temperature in gated bilayer graphene*, J. Appl. Phys. **115**, 163711 (2014). [**2**](**3**)
122. G. Jolley, G. Umana-Membreno, N. D. Akhavan, J. Antoszewski, L. Faraone, and **M. V. Fischetti**, *Intrinsic broadening of the mobility spectrum in bulk GaAs*, New J. Phys. **16**, 113033 (2014). [**1**](**2**)
123. William G. Vandenberghe and **Massimo V. Fischetti**, *Calculation of Room Temperature Conductivity and Mobility in Tin-Based Topological Insulator Nanoribbons*, J. Appl. Phys. **116**, 173707 (2014). [**1**](**5**)
124. Andrey Y. Serov, Zhun-Yong Ong, **Massimo V. Fischetti**, and Eric Pop, *Response to “Comment on ‘Theoretical analysis of high-field transport in graphene on a substrate’”* [*J. Appl. Phys.* **116**, 236101 (2014)], J. Appl. Phys. **116**, 236102 (2014).
125. William G. Vandenberghe and **Massimo V. Fischetti**, *Deformation potentials for band-to-band tunneling in silicon and germanium from first principles*, Appl. Phys. Lett. **106**, 013505 (2015).
126. Ana Suarez Negreira, William G. Vandenberghe, and **Massimo V. Fischetti**, *Ab initio study of the electronic properties and thermodynamic stability of supported and functionalized two-dimensional Sn films*, Phys. Rev. B **91**, 245103 (2015). [**1**](**1**)
127. Gabriel Greene-Diniz, **M. V. Fischetti**, and J. C. Greer, *Energies of the X and L valleys in In<sub>0.53</sub>Ga<sub>0.47</sub>As from electronic structure calculations*, J. Appl. Phys. **119**, 055707 (2016).
128. Jingtian Fang, William G. Vandenberghe, Bo Fu, and **Massimo V. Fischetti**, *Pseudopotential-based electron quantum transport: Theoretical formulation and application to nanometer-scale silicon nanowire transistors*, J. Appl. Phys. **119**, 035701 (2016).
129. **Massimo V. Fischetti** and William G. Vandenberghe, *The Mermin-Wagner theorem, flexural modes, and degraded carrier mobility in 2D crystals with broken horizontal mirror ( $\sigma_h$ ) symmetry*, Phys. Rev. B **93**, 155413 (2016).
130. M. Van de Put, W. Magnus, B. Sorée, William G. Vandenberghe, and **Massimo V. Fischetti**, *Inter-ribbon tunneling in graphene: An atomistic Bardeen approach*, J. Appl. Phys. **119**, 214306 (2016).
131. Jingtian Fang, William G. Vandenberghe, and **Massimo V. Fischetti**, *Microscopic dielectric permittivities of graphene nanoribbons and graphene*, Phys. Rev. B **94**, 045318 (2016).
132. William G. Vandenberghe and **Massimo V. Fischetti**, *Imperfect Two-dimensional Topological Insulator Field-effect Transistors*, Nature Comm. **8**, 14184 (2017).
133. P. B. Vyas, C. Naquin, H. Edwards, M. Lee, W. G. Vandenberghe, and **M. V. Fischetti**, *Theoretical simulation of negative differential transconductance in lateral quantum well nMOS devices*, J. Appl. Phys. **121**, 044501 (2017).
134. Shanmeng Chen, Jingtian Fang, William G. Vandenberghe, and **Massimo V. Fischetti**, *Theoretical Study of Ballistic Transport in Silicon Nanowire and Graphene Nanoribbon Field-Effect Transistors Using Empirical Pseudopotentials*, IEEE Trans. Electron Devices **67**, 2758 (2017).

• Publications in Conference Proceedings

1. **Massimo V. Fischetti**, *Modelling of flatband voltage shift during avalanche injection on MOS capacitors*, in “*Insulating Films on Semiconductors*”, M. Shultz and G. Pensl Eds., (Springer-Verlag, Berlin, 1981), p.126-129.
2. **Massimo V. Fischetti**, *High-Field Electron Transport in SiO<sub>2</sub> and Generation of Positive Charge at the Si-SiO<sub>2</sub> Interface*, in “*Insulating Films on Semiconductors*”, J.J. Simonne and J. Buxo Eds., (Elsevier North-Holland, Amsterdam, 1986), p. 181-189. **(9)**
3. **M. V. Fischetti** and D.J. DiMaria, *Hot Electrons in SiO<sub>2</sub>: Ballistic and Steady State Transport*, in *Proceedings of the International Conference on “The Physics and Technology of Amorphous SiO<sub>2</sub>”*, J. Arndt, R. Devine, and A. Revesz Eds., (Plenum, New York, 1988), p.275.
4. **M. V. Fischetti** and S.E. Laux, *Monte Carlo Simulation of Submicron Si MOSFETs*, in “*Simulation of Semiconductor Devices and Processes*”, Vol. 3, G. Bacarani and M. Rudan Eds., (Tecnoprint, Bologna, 1988), p. 349-368. **(14)**
5. **Massimo V. Fischetti** and Steven E. Laux, *Are GaAs MOSFETs worth building? A model-based comparison of Si and GaAs n-MOSFETs*, IEDM Tech. Dig., 481-484 (1989). **(10)**
6. Wai Lee, Steven E. Laux, **Massimo V. Fischetti**, and Denny D. Tang, *Monte Carlo simulation of non-equilibrium transport in ultra-thin base Si bipolar transistors*, IEDM Tech. Dig., 473-476 (1989). **(9)**
7. P. Braunlich, S. C. Jones, X. A. Shen, R. T. Casper, E. Cartier, D. J. DiMaria, **M. V. Fischetti**, and P. Kelly, *Non-Avalanche Dielectric Breakdown in Wide-Band-Gap Insulators at DC and Optical Frequencies*, in “*Proceedings of the 22<sup>nd</sup> Annual Symposium on Optical Materials for High Power Lasers*” (Natl. Inst. Stand. Technol., Boulder, Colorado, 1990).
8. Sandip Tiwari, **Massimo V. Fischetti**, and Steven E. Laux, *Overshoot in transient and steady-state in GaAs, InP, Ga<sub>0.47</sub>In<sub>0.53</sub>As and InAs bipolar transistors*, IEDM Tech. Dig., 463-466 (1990). **(3)**
9. E. F. Crabbé, J. M. C. Stork, G. Bacarani, **M. V. Fischetti**, and S. E. Laux, *The impact of non-equilibrium transport on breakdown and transit time in bipolar transistors*, IEDM Tech. Dig., 435-438 (1990) **(52)**.
10. D. Arnold, E. Cartier, and **M. V. Fischetti**, *Monte Carlo calculations of laser-induced free electron heating in SiO<sub>2</sub>*, in *Proceeding of XXII Symposium on Optical Materials for High Power Lasers, 1990; SPIE Proceedings*, vol. 1441, pp. 478-487 (1991). **(3)**
11. D. Arnold, E. Cartier, and **M. V. Fischetti**, *Monte Carlo calculations of laser-induced free electron heating in SiO<sub>2</sub>*, in “*Proceeding of the NASECODE VII*”, J. J. H. Miller Ed., (1990).
12. Steven E. Laux and **Massimo V. Fischetti**, *Simulation of Small Semiconductor Devices using a Coupled Monte Carlo-Poisson Approach*, in “*Proceedings of the Thirteenth Biennial IEEE/Cornell University Conference on Advanced Concepts in High Speed Semiconductor Devices and Circuits*”, R. J. Trew Ed., (IEEE, New York, 1991), p. 338.
13. **M. V. Fischetti** and S. E. Laux, *Monte Carlo study of electron transport in Si inversion layers*, IEDM Tech. Dig., 721-724 (1992).
14. D. J. Frank, S. E. Laux, and **M. V. Fischetti**, *Monte Carlo simulation of a 30 nm dual-gate MOSFET: How short can Si go?*, IEDM Tech. Dig., 553-556 (1992). **(315)**
15. **M. V. Fischetti**, S. E. Laux, and D. J. Frank, *Monte Carlo Simulation of Small Silicon Field-Effect Transistors*, Extended Abstract of the 1993 International Conference on Solid State Devices and Materials, SSDM93, 255-257 (1993).
16. S. E. Laux and **M. V. Fischetti**, *mcplotgl: Graphics for the DAMOCLES program*, IEDM Tech. Dig., 217-220 (1994).
17. **M. V. Fischetti**, S. E. Laux, and E. Crabbé, *Monte Carlo simulation of high-energy electron transport in silicon devices: Is there a short-cut to happiness?*, in “*Proceeding of the Fourth Seminar on Simulation of Devices and Technologies - ISSDT95*”, M. du Plessis Ed. (Pretoria, South Africa, 1995), p. 42. **[1]**
18. S. E. Laux and **M. V. Fischetti**, *Transport models for advanced device simulation: Truth or Consequences?*, in “*Proceedings of the 1995 Bipolar/BiCMOS Circuits and Technology Meeting*” (IEEE, New York, 1995), pp. 27-34. **[8](12)**
19. **M. V. Fischetti** and S. E. Laux, *Monte Carlo study of sub-bandgap impact ionization in silicon field-effect transistors*, IEDM Tech. Dig., 305-308 (1995). **[52](72)**
20. **M. V. Fischetti** and S. E. Laux, *Monte Carlo simulation of electron transport in Si: The first 20 years*, in “*Proceedings of the European Solid State Device Research Conference (ESSDERC’96)*”, G. Bacarani and M. Rudan Eds. (Éditions Frontières, 1996), p. 813. **(42)**
21. E. Migliore, P. Chavarkar, J. Yen, U. K. Mishra, **M. V. Fischetti**, and S. E. Laux, *Drain engineering in AlInAs/GaInAs HEMTs for high  $f_T$  and  $f_{max}$* , Proceedings of the 1997 International Conference on “Indium Phosphide and Related Materials”, (IEEE, New York, 1997), pp. 400-403.
22. P. Chavarkar, E. Migliore, J. Yen, **M. V. Fischetti** and S. E. Laux, *Reduction of short-channel effects in self-aligned AlInAs/GaInAs HEMTs by lateral band-gap engineering for high  $f_{max}$* , Proc. IEEE/Cornell Conference on Advanced Concepts in High-Speed Semiconductor Devices and Circuits, (IEEE, New York, 1997), p. 379-382.

23. S. E. Laux and **M. V. Fischetti**, *Monte Carlo study of velocity overshoot in a 0.1 $\mu$ m CMOS switching inverter*, IEDM Tech. Dig., 877-880 (1997). [6](10)
24. S. Tiwari, **M. V. Fischetti**, P. M. Mooney, and J. J. Welser, *Hole mobility improvement in silicon-on-insulator and bulk silicon transistors using local strain*, IEDM Tech. Dig., 939-942 (1997). [28](54)
25. **M. V. Fischetti** and S. E. Laux, *Coulomb interactions and hot-electron effects in sub-0.1 $\mu$ m Si MOS-FETs*, Proc. Symp. Silicon Nanoelectronics Workshop (IEEE Press, Kyoto, 1999), pp.78-81.
26. S. E. Laux and M. V. Fischetti, *Full Band Monte Carlo simulation of small MOSFETs*, Proc. SSDM, Tokyo, 1999, pp. 112-113.
27. S. E. Laux and **M. V. Fischetti**, *Issues in Modeling Small Devices*, IEDM Tech. Dig., 523 (1999). [2](8)
28. **M. V. Fischetti** and S. E. Laux, *Long-range Coulomb Interactions in Small Silicon Devices: Transconductance and Mobility Degradation*, Proc. Int. Conf. Modeling and Simulation of Microsystems (MSM2000), (Computational Publications, Boston, 2000), p. 461. [1](1)
29. Arvind Kumar, Tak H. Ning, Massimo V. Fischetti, and Evgeni Gousev, *Hot-Carrier Charge Trapping and Reliability in high-K Dielectrics*, 2002 Symposium on VLSI Technology Technical Dig., 152 (IEEE, 2002). [7](10)
30. Sufi Zafar, Alessandro Callegari, Evgeni Gousev, **Massimo V. Fischetti**, *Charge Trapping in High K Gate Dielectric Stacks*, IEDM Tech. Dig., 517-520 (2002). [64](95)
31. S. E. Laux, A. Kumar, and **M. V. Fischetti**, *QDAME Simulation of 7.5 nm Double-Gate nFETs with Different Access Geometries*, IEDM Tech. Dig., 715-718 (2002). [26](18)
32. Z. Ren, **M. V. Fischetti**, E. P. Gusev, E. A. Cartier, and M. Chudzik, *Inversion channel mobility in high- $\kappa$  high performance MOSFETs*, IEDM Tech. Dig., 793-796 (2003). (61)
33. **M. V. Fischetti**, S. E. Laux, and A. Kumar, *Simulation of quantum electronic transport in small devices: A Master equation approach*, IEDM Tech. Dig., 467-470 (2003). [2](9)
34. Qiqing (Christine) Ouyang, Meikei Ieong, **Massimo Fischetti**, Siddhartha Panda, Diane Boyd, Ken Rim, and John A. Ott, *Investigation of CMOS Devices with Embedded SiGe Source/Drain on Hybrid Orientation Substrates*, 2005 Symposium on VLSI Technology, Digest of Technical Papers, pp. 28-29 (IEEE, 2005). [8](23)
35. Qiqing (Christine) Ouyang, Meikei Ieong, **Massimo Fischetti**, Siddhartha Panda, Diane Boyd, Ken Rim, and John A. Ott, *Characteristics of High-Performance pFETs with Embedded SiGe Source/Drain and  $j100^\circ$  Channels on 45-degree Rotated Wafers*, 2005 Symposium VLSI-TSA, Digest of Technical Papers, pp. 27-28 (IEEE, 2005). [3](7)
36. C. D. Sheraw, M. Yang, D. M. Fried, G. Costrini, T. Kanarsky, W.-H. Lee, V. Chan, **M. V. Fischetti**, J. Holt, L. Black, GM. Naeem, S. Panda, L. Economikos, J. Groschopf, A. Kapur, Y. Li, R. T. Mo, A. Bonnoit, D. Degraw, S. Luning, D. Chimbarrao, X. Wang, A. Bryant, D. Brown, C.-Y. Sung, P. Agnello, M. Ieong, S.-F. Huang, X. Chen, and L. Khare, *Dual Stress Liner Enhancement in Hybrid Orientation Technology*, 2005 Symposium on VLSI Technology, Digest of Technical Papers, pp. 12-13 (IEEE, 2005). [1](33)
37. **M. V. Fischetti**, S. E. Laux, and A. Kumar, *Simulation of Quantum Transport in Small Semiconductor Devices*, Proc. 2005 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2005), pp. 19-22 (IEEE, 2005).
38. Arvind Kumar, **Massimo V. Fischetti**, and Steven E. Laux, *Monte Carlo Simulation of Performance Scaling in Strained-Si nMOSFETs*, Proc. 2005 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2005), pp. 299-302 (IEEE, 2005). (1)
39. K. S. Yngvesson, F. Rodriguez-Morales, R. Zannoni, J. Nicholson, **M. V. Fischetti**, and J. Appenzeller, *Microwave Detection and Mixing in Metallic Single-Wall Carbon Nanotubes and Potential for a New TeraHertz Detector*, Proc. 17-th Inter. Symp. on Space TeraHertz Technology (May 2006).
40. **M. V. Fischetti**, S. Narayanan, T. O'Regan, and C. Sachs, *Electron Transport in Engineered Substrates: Strain, Orientation, and Substrate/Insulator Material Effects*, ECS Transactions **3**, 33-44 (2006). [3](3)
41. Seonghoon Jin, **Massimo V. Fischetti**, and Ting-wei Tang, *Surface Roughness Scattering in Ultrathin-Body SOI MOSFETs*, Proc. 2007 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2007), T. Grassler and S. Selbeherr Eds. (Springer, Wien, 2007), pp. 61-64. (3)
42. **M. V. Fischetti**, L. Wang, B. Yu, C. Sachs, P. M. Asbeck, Y. Taur, and M. Rodwell, *Simulation of Electron Transport in High-Mobility MOSFETs: Density of States Bottleneck and 'Source Starvation'*, IEDM Tech. Dig., 109-112 (2007). [49](57)
43. Y. Zhang, **M. V. Fischetti**, B. Soree, W. Magnus, and M. Heyns, *An Improved Self-consistent Method and Hole Mobility in Ge and GaAs Bulk pMOSFETs*, in Proc. European Solid State Device Research Conference (ESSDERC), Fringe Poster Session, 2008.
44. **M. V. Fischetti**, S. Jin, T.-w. Tang, P. Asbeck, Y. Taur, S. Laux, and N. Sano, *Scaling to 10 nm: Coulomb Effects, Source Starvation, and the Virtual Source*, in Proc. International Workshop on Computational Electronics (2009), <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5091145&isnumber=5091070>.

45. Bo Fu and **M. V. Fischetti**, *Dissipative Quantum Transport Using the Pauli Master Equation*, in Proc. International Workshop on Computational Electronics (2009), <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5091106&isnumber=5091070>. [1](2)
46. Y. Zhang and **M. V. Fischetti**, *Calculation of the Hole Mobility in Relaxed and Strained Ge and III-V  $p$ -Channels*, in Proc. International Workshop on Computational Electronics (2009), <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5091089&isnumber=5091070>. (3)
47. Jiseok Kim and **M. V. Fischetti**, *Empirical Pseudopotential Calculation of Band Structure and Deformation Potentials of Biaxially Strained Semiconductors*, in Proc. International Workshop on Computational Electronics (2009), <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5091113&isnumber=5091070>.
48. S. Jin, T.-w. Tang, and **M. V. Fischetti**, *Anatomy of Carrier Backscattering in Silicon Nanowire Transistors*, in Proc. International Workshop on Computational Electronics (2009), <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5091085&isnumber=5091070>. (5)
49. M. J. W. Rodwell, M. Wistey, U. Singiseti, G. Burek, A. Gossard, S. Stemmer, R. Engel-Herbert, Y. Hwang, Y. Zheng, C. van de Walle, C. Palmstroem, E. Arkun, P. Simmonds, P. Asbeck, Y. Taur, A. Kummel, B. Yu, D. Wang, Y. Yuan, P. McIntyre, J. Harris, **M. V. Fischetti**, and C. Sachs, *Technology Development and Design for 22 nm InGaAs/InP-channel MOSFET*, in Proc. 20<sup>th</sup> International Conference on Indium Phosphide and Related Materials (2008), <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=4703065&isnumber=4702892>. (7)
50. Jiseok Kim, Siddarth A. Krishnan, Sudarshan Narayanan, Michael P. Chudzik, James H. Stathis and **Massimo V. Fischetti**, *Thickness and temperature dependence of leakage current density in Hafnium-based Si SOI MOSFETs*, Proc. TechCon 2009, available online for SRC/GRC members only at: [http://fcrcp.src.org/\\_shared/displaypdf.asp?filename=/member/engine/pub/pubdir/52/p\\_P052470.pdf&title=Thickness%20and%20Temperature%20Dependence%20of%20Leakage%20Current%20Density%20in%20Hafnium-Based%20Si%20SOI%20MOSFET](http://fcrcp.src.org/_shared/displaypdf.asp?filename=/member/engine/pub/pubdir/52/p_P052470.pdf&title=Thickness%20and%20Temperature%20Dependence%20of%20Leakage%20Current%20Density%20in%20Hafnium-Based%20Si%20SOI%20MOSFET).
51. **M. V. Fischetti**, S. Jin, T.-w. Tang, P. Asbeck, Y. Taur, S. Laux, M. Rodwell, and N. Sano, *Scaling to 10 nm: Coulomb Effects, Source Starvation, and Virtual Source Model*, Electrochemical Society Transactions, **28**, 15-26 (2010).
52. J. Kim and **M. V. Fischetti**, *Band Structure and Ballistic Conductance of Strained Si Nanowires*, in Proc. International Workshop on Computational Electronics (2010), <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5677926>.
53. T.-w. Tang, Il-o Yoon, N. Sano, S. Jin, **M. V. Fischetti**, and Y. J. Park, *Model-Comparison Study of Quasi-Ballistic Electron Transport in Nanoscale Semiconductor Devices*, in Proc. International Workshop on Computational Electronics (2010), <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5677940>.
54. T. O'Regan, P. Hurley, and **M. V. Fischetti**, *Delta-Doped HfO<sub>2</sub>/In<sub>0.53</sub>Ga<sub>0.47</sub>As Inversion Layers: Density-of-States Bottleneck and Electron Mobility*, in Proc. International Workshop on Computational Electronics (2010), <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5677977>. (1)
55. A. S. Verhulst, W. G. Vandenberghe, D. Leonelli, R. Rooyackers, A. Vandooren, J. Zhuge, K.-H. Kao, B. Sorée, W. Magnus, **M. V. Fischetti**, G. Pourtois, C. Huyghebaert, K. De Meyer, W. Dehaene, M. M. Heyns, and G. Groeseneken, *Si-Based Tunnel Field-Effect Transistor for Low-Power Nano-Electronics*, Proc. Device Research Conference (2011).
56. W. Vandenberghe, B. Sorée, W. Magnus, G. Groeseneken, and **M. V. Fischetti**, *Field-induced quantum confinement in indirect semiconductors: Quantum mechanical and modified semiclassical model*, Proc. SISPAD (IEEE, Curran Associates Inc., Red Hook, New York, 2011), pp. 1-4, 10.1109/SISPAD.2011.6035077. (5)
57. William G. Vandenberghe, Bart Sorée, Wim Magnus, **Massimo V. Fischetti**, Anne S. Verhulst, and Guido Groeseneken, *Two Dimensional Quantum Mechanical Modeling of Band-to-Band Tunneling in Indirect Gap Semiconductors*, IEDM Tech. Dig. (2011). (15)
58. Jiseok Kim, S. J. Aboud and **M. V. Fischetti**, *Electronic properties of armchair and zigzag  $sp^3$ -hybridized silicane nanoribbons*, in Proc. International Workshop on Computational Electronics, pp. 107-108 (2012).
59. S. J. Aboud, M. Saraniti, S. M. Goodnick and **M. V. Fischetti**, *Electron-phonon interaction in graphene and nanoribbons from density-functional theory*, in Proc. International Workshop on Computational Electronics, pp. 93-94 (2012).
60. S. Narayanan and **M. V. Fischetti**, *Full-band Monte Carlo simulation of electron transport in thin Si and graphene*, in Proc. International Workshop on Computational Electronics, pp. 281-282 (2012).
61. **M. V. Fischetti**, *Pseudopotential-based calculation of electronic structure and transport in nanostructures*, in Proc. International Workshop on Computational Electronics, pp. 18-19 (2013).
62. Bo Fu and **M. V. Fischetti**, *Open-Boundary-Condition Ballistic Quantum Transport using Empirical Pseudopotentials*, in Proc. International Workshop on Computational Electronics, pp. 28-29 (2013).
63. W. G. Vandenberghe and **M. V. Fischetti**, *Determination of Bound States in a Device with Transmitting Boundary Conditions*, in Proc. International Workshop on Computational Electronics, pp. 44-45 (2013).

64. S. Ravandi, Bo Fu, W. G. Vandenberghe, S. Aboud, and **M. V. Fischetti**, *Pseudopotential-Based Study of Gate Leakage and Contact Resistance beyond the 10 nm Node*, in Proc. International Workshop on Computational Electronics, pp. 48-49 (2013).
65. S. Aboud, J. Kim, and **M. V. Fischetti**, *DFT Study of Electronic Transport Properties in Supported Armchair Graphene Nanoribbons*, in Proc. International Workshop on Computational Electronics, pp. 106-107 (2013).
66. **M. V. Fischetti**, S. J. Aboud, Z.-Y. Ong, J. Kim, S. Narayanan, and C. Sachs, *Pseudopotential-Based Study of Electron Transport in Low-Dimensionality Nanostructures*, ECS Trans. **58**(7), 229-234 (2013).
67. **Massimo V. Fischetti** and Shela Aboud, *Reduction of the Normal-Superfluid Transition Temperature in Gated Bilayer Graphene*, in Proc. International Workshop on Computational Electronics, pp. 1-4 (2014); DOI: 10.1109/IWCE.2014.6865817.
68. William G. Vandenberghe and **Massimo V. Fischetti**, *Calculation of the Electron-Phonon Interaction Strength from First Principles in Graphene and Silicon*, in Proc. International Workshop on Computational Electronics, (2014), pp. 1-2, DOI: 10.1109/IWCE.2014.6865830. (1)
69. Jingtian Fang, William G. Vandenberghe, and **Massimo V. Fischetti**, *Full-Band Ballistic Quantum Transport in Nanostructures using Empirical Pseudopotentials*, in Proc. International Workshop on Computational Electronics, (2014).
70. Jingtian Fang, **Massimo V. Fischetti**, William G. Vandenberghe, and Bo Fu, *Full-band Quantum Transport in Nanotransistors using Empirical Pseudopotentials*, Proc. TechCon 2014, available online for SRC/GRC members only at: [http://fcfp.src.org/\\_shared/displaypdf.asp?filename=/member/engine/pub/pubdir/52/p\\_P?????.pdf&title=Full-band%20and%20Quantum%20Transport%20in%20Nanotransistors%20Using%20Empirical%20Pseudopotential](http://fcfp.src.org/_shared/displaypdf.asp?filename=/member/engine/pub/pubdir/52/p_P?????.pdf&title=Full-band%20and%20Quantum%20Transport%20in%20Nanotransistors%20Using%20Empirical%20Pseudopotential). (1)
71. William G. Vandenberghe and **Massimo V. Fischetti**, *Realizing a Topological Insulator Field-Effect Transistor using Iodostannane*, IEDM Tech. Dig., pp. 804-807 (33.4.1-33.4.4) (2014); DOI: 10.1109/IEDM.2014.7047162. (1)
72. **M. V. Fischetti**, W. G. Vandenberghe, Bo Fu, S. Narayanan, J. Kim, Z.-Y. Ong, A. Suarez-Negreira, C. Sachs, and S. J. Aboud, *Physics of electronic transport in low-dimensionality materials for future FETs*, Proc. SISPAD (IEEE, Curran Associates Inc., Red Hook, New York, 2014), pp. 1-4, DOI: 10.1109/SISPAD.2014.6931548.
73. **M. V. Fischetti**, William G. Vandenberghe, Jingtian Fang, Ana Suarez Negreira, Zhun Yong Ong, and Bo Fu, *Physics of electronic transport in low-dimensionality materials for future FETs*, in Proc. 2015 IEEE Nano Conference, pp. 759-761 (IEEE, Piscataway, New Jersey, 2015); DOI: 10.1109/NANO.2015.7388720.
74. Jingtian Fang, William G. Vandenberghe, and **M. V. Fischetti**, *Progress on quantum transport simulation using empirical pseudopotentials*, in Proc. International Workshop on Computational Electronics, pp. 1-3 (2015); DOI: 10.1109/IWCE.2015.7301957.
75. M. Van de Put, W. G. Vandenberghe, W. Magnus, B. Sorée, and **M. V. Fischetti**, *Modeling inter-ribbon tunneling in graphene*, in Proc. International Workshop on Computational Electronics, p. 1-4; DOI: 10.1109/IWCE.2015.7301987 (2015).
76. Jingtian Fang, William G. Vandenberghe, and **M. V. Fischetti**, *Transistor Performance in the Sub-1 nm Technology Node based on One-Dimensional Materials*, in Proc. SISPAD (IEEE, Curran Associates Inc., Red Hook, New York, 2015), pp. 84-87, DOI: 10.1109/SISPAD.2015.7292264.
77. William G. Vandenberghe and **M. V. Fischetti**, *Modeling Topological-Insulator Field-Effect Transistors using the Boltzmann Equation*, in Proc. 2016 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2016), pp. 73-76 (IEEE, 2016); DOI: 10.1109/SISPAD.2016.7605151.
78. Gautam Gaddemane, William G. Vandenberghe, and **M. V. Fischetti**, *Theoretical study of electron transport in silicene and germanene using full-band Monte Carlo simulations*, in Proc. 2016 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2016), pp. 353-356 (IEEE, 2016); DOI: 10.1109/SISPAD.2016.7605219.
79. **Massimo V. Fischetti** and William G. Vandenberghe, *Physics of electronic transport in two-dimensional materials for future FETs*, IEDM Tech. Dig., pp. 356-359 (14.2.1-14.2.4) (2016).
80. Shanmeng Chen, Jingtian Fang, William G. Vandenberghe, and **Massimo V. Fischetti**, *Study of Ballistic Transport in Phosphorene-Nanoribbon-FETs using Empirical Pseudopotentials*, in Proc. International Workshop on Computational Nanotechnology (to appear, 2017).
81. Gautam Gaddemane, William G. Vandenberghe, and **Massimo V. Fischetti**, *Theoretical study of charge transport in mono- and bi-layer phosphorene using full-band Monte Carlo simulations*, in Proc. International Workshop on Computational Nanotechnology (to appear, 2017).
82. P. B. Vyas, C. Naquin, M. Lee, W. G. Vandenberghe, and **M. V. Fischetti**, *Simulation Of Negative Differential Conductance From Devices Fabricated Using Conventional CMOS Technology*, in Proc. International Workshop on Computational Nanotechnology (to appear, 2017).

- Books

1. **Massimo V. Fischetti** and William G. Vandenberghe, “*Advanced Physics of Semiconductors. Electronic Properties and Transport*”, series of ‘Graduate Texts in Physics’ (Springer, New York, 2016), ISBN 978-3-319-01101-1.

#### • Book chapters

1. J.R. Kirtley, T.N. Theis, D.J. DiMaria, J.C. Tsang, **M. V. Fischetti**, and S.D. Brorson, *Surface Plasmon emission as a probe for hot electron dynamics*, in “*Dynamical Phenomena at Surfaces, Interfaces, and Superlattices*”, F. Nizzoli, K.-H. Rieder, and R. F. Willis Eds., (Springer-Verlag, Berlin, 1985), p. 276.
2. M. Heiblum and **M. V. Fischetti**, *Ballistic Electron Transport in Hot Electron Transistors*, in “*Physics of Quantum Electron Devices*”, F. Capasso Ed., (Springer-Verlag, Heidelberg, 1990), pp. 271-320. **(15)**
3. D.J. DiMaria and **M. V. Fischetti**, *Hot electron transport in Silicon Dioxide*, in “*The Physics and Chemistry of SiO<sub>2</sub> and the Si-SiO<sub>2</sub> Interface*”, C. Robert Helms and Bruce E. Deal Eds., (Plenum, New York, 1988), pp. 509-518. **(30)**
4. D.J. DiMaria and **M. V. Fischetti**, *Hot Electron Transport and Trapping in Silicon Dioxide*, in “*Excess Electrons in Dielectric Media*”, C. Ferradini and J.-P. Jay-Gerin Eds., (CRC Press, Boca Raton, 1991) pp. 315-378. **(1)**
5. Steven E. Laux and **Massimo V. Fischetti**, *The DAMOCLES Monte Carlo Device Simulation Program*, in “*Computational Electronics. Semiconductor Transport and Device Simulation*”, K. Hess, J.P. Leburton, and U. Ravaioli Eds., Kluwer Academic (Norwell, Ma. 1990), pp. 87-92. **[5]**
6. **M. V. Fischetti** and J. M. Higman, *Theory and Calculation of the Deformation Potential Electron-Phonon Scattering Rates in Semiconductors*, in *Monte Carlo Device Simulation: Full Band and Beyond*, K. Hess ed., Kluwer Academic (Norwell, MA, 1991), pp. 123-160. **(25)**
7. S. E. Laux and **M. V. Fischetti**, *Numerical aspects and implementation of the DAMOCLES Monte Carlo device simulation program*, in *Monte Carlo Device Simulation: Full Band and Beyond*, K. Hess ed., Kluwer Academic (Norwell, MA, 1991), pp. 1-26. **(21)**
8. **M. V. Fischetti**, S. E. Laux, and E. Crabbé, *Monte Carlo simulation of high-energy electron transport in silicon devices: Is there a short-cut to happiness?*, in “*Hot Carriers in Semiconductors*”, K. Hess, J.-P. Leburton, and U. Ravaioli Eds. (Plenum, New York, 1995), p. 475. **[1](2)**
9. S. E. Laux and **M. V. Fischetti**, *Semiconductor Device Physics and Modeling of Small Semiconductor Devices*, in “*Some New Directions in Science on Computers*”, Gyan Bhanot, Shiyi Chen, and Phil Seiden Eds., (World Scientific, Singapore, 1997), pp. 114-144.
10. **M. V. Fischetti**, E. A. Cartier, and D. A. Neumayer, *Reduction of the electron mobility in high- $\kappa$  MOS systems caused by remote scattering with soft interfacial optical phonons*, in “*Fundamental and Technological Aspects of High- $\kappa$  Dielectrics*”, Michel Houssa Ed. (Institute of Physics Publishing, UK, 2003), pp. 397-430.
11. D. Vasileska, S. Krishnan, and **M. Fischetti**, *Examining Performance Enhancement of p-Channel Strained-SiGe MOSFET Devices*, in “*Lecture Notes in Computer Science, Numerical Methods and Applications*”, T. Boyanov *et al.* Eds. (Springer-Verlag Berlin-Heidelberg, 2007), pp. 189-196.
12. **M. V. Fischetti** and S. Jin, *The effect of defects on electron transport in nanometer-scale electronic devices: Impurities and Interface Roughness*, in “*Defects in Microelectronic Materials and Devices*”, Sokrates Pantelides, Dan Fleetwood, and Ron Schrimpf Eds. (CRC Press, 2008), pp. 71-118.
13. **M. V. Fischetti**, Bo Fu, S. Narayanan, and J. Kim, *Semiclassical and Quantum Electronic Transport in Nanometer-Scale Structures: Band Structure, Monte Carlo Simulations and Pauli Master Equation*, in “*Nano-Electronic Devices: Semiclassical and Quantum Transport Modeling*”, D. Vasileska and Stephen M. Goodnick Eds. (Springer, New York, 2011), pp. 183-247.
14. William G. Vandenberghe, Ana Suarez Negreira, and **Massimo V. Fischetti**, *Stannene: A likely 2D topological insulator*, in “*2D Materials for Nanoelectronics*”, M. Houssa Ed. (CRC Press, Taylor & Francis, 2016), pp. 379-408.

#### • Other scholarly publications

1. **M. V. Fischetti** and M. Rudan, *Hydrodynamic and Monte Carlo simulation of an  $n^+ - n - n^+$  submicron device*, IBM Research Report RC 13010 7/31/87.
2. **Massimo V. Fischetti** and Doyeol Ahn, *Band-Structure Effects on Quantized Energy Levels in Quantum Wells and Inversion Layers*, IBM Research Report RC 14801 7/25/89.
3. J. P. Krusius and **M. V. Fischetti**, *Band Structure Effects on Electron Transport in Strained Layer  $Si_{1-x}Ge_x$  Thin Films*, IBM Research Report RC 15089 10/27/89.

## Patents

1. **Massimo V. Fischetti** and Qiqing C. Ouyang, *Higher performance CMOS on (110) wafers*, US Patent 7,968,946 B2, June 28, 2011.
2. Victor Chan, **Massimo V. Fischetti**, John M. Hergenrother, Meikei Jeong, Rajesh Rengarajan, Alexander Reznicek, Paul M. Solomon, Chun-yung Sung, and Min Yang, *Enhancement of electron and hole mobilities in Si under biaxial compressive strain*, US Patent Application 2008/0044987, Filed February 21, 2008.
3. **Massimo V. Fischetti**, Steven E. Laux, Paul M. Solomon, and Hon-Sum Philip Wong, *Germanium field effect transistor and method of fabricating the same*, US Patent 6,864,520 B2, March 8, 2005.
4. William G. Vandenberghe, Christopher L. Hinkle, and **Massimo V. Fischetti** *Memory Device Based on Gate Controlled Ferromagnetism and Spin-Polarized Current Injection*, The University of Texas at Dallas, Invention Disclosure, November 17, 2015.

## Invited Presentations at International Conferences

1. *Generation of slow and fast states at the Si-SiO<sub>2</sub> interface during avalanche injection in MOS capacitors*, Gordon Conference on MIS systems, Tilton, New Hampshire, July 1982.
2. *High-field electron transport in SiO<sub>2</sub> and generation of positive charge at the Si-SiO<sub>2</sub> interface*, Gordon Conference on MIS systems, Tilton, New Hampshire, July 1984.
3. *Monte Carlo simulation of Electron Transport at High Fields in SiO<sub>2</sub>*, 1985 March Meeting of the American Physical Society, Baltimore, Maryland, March 1985.
4. *High-field electron transport in SiO<sub>2</sub> and generation of positive charge at the Si-SiO<sub>2</sub> interface*, international conference on Insulating Films on Semiconductors (INFOS85), Toulouse, France, April 1985.
5. *Hot electron transport in SiO<sub>2</sub>: ballistic to steady-state regimes*, with D. J. DiMaria, international conference on Insulating Films on Semiconductors (INFOS87), Leuven, Belgium, April 1987 (presented by D.J. DiMaria).
6. *High-Field Electron Transport in SiO<sub>2</sub>: Transition from the Ballistic to the Steady State Regime*, with D. J. DiMaria, international conference on The Physics and Technology of Amorphous SiO<sub>2</sub>, Les Arcs, France, June-July 1987 (presented by D.J. DiMaria).
7. *Ballistic Electron Transport in SiO<sub>2</sub>*, with D. J. DiMaria, 5<sup>th</sup> international conference on Hot Carriers in Semiconductors (HCIS), Boston, Massachusetts, July 1987.
8. *Ballistic Electron Transport in SiO<sub>2</sub>*, with D. J. DiMaria, international conference on Superlattices and Heterostructures, Chicago, Illinois, August 1987.
9. *Ballistic Electron Transport in SiO<sub>2</sub>*, with D. J. DiMaria, 1988 March Meeting of the American Physical Society, New Orleans, Louisiana, March 1988 (presented by D.J. DiMaria).
10. *Hot electron transport in SiO<sub>2</sub>*, with D. J. DiMaria, 1988 ECS Conference, Atlanta, Georgia, April 1988 (presented by D.J. DiMaria).
11. *Monte Carlo simulation of Electron Transport in Submicron Silicon MOSFETs*, with S. E. Laux, Third International Conference on Supercomputing, Boston, Massachusetts, May 1988.
12. *Electron Transport Through Silicon Dioxide Films in Vacuum*, with D. J. DiMaria, First International Vacuum Microelectronics Conference, Williamsburg, Virginia, June 1988 (presented by D.J. DiMaria).
13. *Silicon MOSFETs at the 0.1 $\mu$ m Gate-Length-Level: Experiments and Modeling*, with G. Sai-Halasz and S.E. Laux, First International Vacuum Microelectronics Conference, Williamsburg, Virginia, June 1988.
14. *Monte Carlo simulation of Electron Transport in Submicron Silicon MOSFETs*, with S. E. Laux, VLSI Process/Device Modeling Workshop (VPAD), Tokyo, Japan, August 1988.
15. *Monte Carlo simulation of Electron Transport in Submicron Silicon MOSFETs*, with S. E. Laux, Third International Conference on Simulation of Semiconductor Devices and Processes (SISDEP III), Bologna, Italy, September 1988.
16. *The Physics of Hot-Carrier Degradation of Si-MOSFETs: Can we understand it?*, with S. E. Laux and D.J. DiMaria, Workshop on Hot-Electron Degradation of Si-MOSFETs, Siemens Laboratory, Munich, West Germany, April 1989.
17. *Monte Carlo simulation of Hot-Carrier Transport in Real Semiconductor Devices*, with S. E. Laux and W. Lee, 6<sup>th</sup> international conference on Hot Carriers in Semiconductors (HCIS), Scottsdale, Arizona, July 1989.
18. *Semiconductor Device Simulation using an Advanced Monte Carlo Transport Model*, with S. E. Laux, Advanced Summer Institute in Supercomputing, Cornell University, Ithaca, New York, July-August 1989.
19. *Electronic Transport in Small Semiconductor Devices*, 1990 March Meeting of the American Physical Society, Anaheim, California, March 12-16 1990.
20. *Monte Carlo methods in device modeling*, 10<sup>th</sup> General Conference of the Condensed Matter Division, European Physical Society, Lisbon, Portugal, April 9-12 1990.
21. *The DAMOCLES Monte Carlo device simulation program*, with S. E. Laux, First International Workshop on Computational Electronics (IWCE), University of Illinois, Urbana, May 21-22 1990.



22. *Monte Carlo studies of hot carrier transport*, International Conference on the Physics of Semiconductors (ICPS), Thessaloniki, Greece, August 6-10 1990.
23. *Monte Carlo simulation of Small Semiconductor Devices*, Workshop on Monte Carlo Methods on High-Performance Computers, IBM Europe Summer Institute, Oberlech, Austria, August 13-17, 1990.
24. *Monte Carlo simulation of Small Semiconductor Devices*, with S. E. Laux, Symposium on Supercomputer modeling of Semiconductor Devices, Minneapolis, Minnesota, November 19-20 1990 (presented by S. E. Laux).
25. *Simulation of Small Semiconductor Devices using a Coupled Monte Carlo-Poisson Approach*, with S. E. Laux, Thirteenth Biennial IEEE/Cornell University Conference on "Advanced Concepts in High Speed Semiconductor Devices and Circuits", Ithaca, New York, August 5-7, 1991, (presented by S. E. Laux).
26. *Monte Carlo Simulation of Semiconductor Devices*, with S. E. Laux, SPIE Conference, Somerset, New Jersey, March 23-27, 1992.
27. *Studies of Hot Electron Transport in Semiconductors Using Soft X-Ray Photoemission*, with E. Cartier, E. Eklund, F. R. McFeely, International Workshop on Computational Electronics, Beckman Institute, University of Illinois at Urbana-Champaign, Illinois, May 28-29, 1992.
28. *Monte Carlo Simulation of Electron Transport in Solids*, International School of Physics, St. Petersburg, Commonwealth of Independent States (former USSR), August 23-September 3, 1992.
29. *Monte Carlo Study of Electron Transport in Silicon Inversion Layers*, 1993 March meeting of the American Physical Society, Seattle, Washington, March 21-24, 1993.
30. *Monte Carlo Simulation of Small Silicon Field-Effect Transistors*, 1993 International Conference on Solid State Devices and Materials, SSDM93, Tokyo-Chiba, Japan, August 29- September 1, 1993.
31. *Simulation of Small Semiconductor Devices*, 1993 American Institute of Physics Corporate Associates Meeting, Buffalo, New York, October 24-26, 1993.
32. *Monte Carlo Simulation of Small Semiconductor Devices*, invited lectures at the University of Catania, Italy, November 1993.
33. *Monte Carlo Simulation of Small Semiconductor Devices*, Conference on Computational Science on Materials and Transport, Nancy, France, April 12-14, 1994.
34. *Monte Carlo Simulation of Small Semiconductor Devices*, 3rd International Seminar on Simulation of Devices and Technologies, Obninsk, Russia, July 5-8, 1994.
35. *Monte Carlo Simulation of High-Energy Electron Transport in Silicon: Is There a Short-Cut to Happiness?*, 9th International Conference on Hot-Carriers in Semiconductors, HCIS IX, Chicago, Illinois, July 31-August 4, 1995.
36. *Transport Models for Advanced Device Simulation: Truth or Consequences?*, with S. E. Laux, BCTM95, Minneapolis, MN, October 1995, (presented by S. E. Laux).
37. *Monte Carlo Simulation of High-Energy Electron Transport in Silicon: Is There a Short-Cut to Happiness?*, 4th International Seminar on Simulation of Devices and Technologies, ISSDT '95, Kruger National Park, South Africa, November 14-17, 1995.
38. *DAMOCLES: Monte Carlo simulation of small semiconductor devices*, Workshop held at the University of Catania, Italy, March 1996.
39. *Monte Carlo simulation of semiconductor devices*, 6th Conference on Computational Research on Materials, Morgantown, West Virginia, May 8-10, 1996.
40. *Monte Carlo simulation of electron transport in Si: The first 20 years*, 26th European Solid State Device Research Conference - ESSDERC'96, Bologna, Italy, September 9-11, 1996.
41. *Monte Carlo simulation of MOS devices*, 27th IEEE Semiconductor Interface Specialists Conference - SISC96, San Diego, California, December 5-7, 1996.
42. *Simulation of electron transport in small semiconductor devices using the Pauli Master equation: How big is an electron?*, First European Symposium on Applied Kinetic Theory, Toulouse, France, May 4-7, 1998.
43. *A master equation approach to the study of electron transport in small semiconductor devices*, 6th International Workshop on Computational Electronics, Osaka, Japan, October 19-22, 1998.
44. *On the simulation of sub-100 nm devices*, workshop on "Nanotransistors: Technology, Physics, and Simulation", Gaithersburg, Maryland, February 1999.
45. *Theory of Electron Transport in Small Semiconductor Devices Using the Pauli Master Equation*, International Conference on Modeling and Simulation of Microsystems, MSM99, San Juan, Puerto Rico, April 19-22, 1999.
46. *Theory of Electron Transport in Small Semiconductor Devices Using the Pauli Master Equation*, European Material Research Society Spring Meeting, Strasbourg, France, June 1-4, 1999.
47. *Coulomb interactions and hot-electron effects in sub-0.1 $\mu$ m Si MOSFETs*, with S. E. Laux and D. J. DiMaria, 1999 Silicon Nanoelectronics Workshop, Kyoto, Japan, June 12-13, 1999.
48. *Full Band Monte Carlo simulation of small MOSETs*, with S. E. Laux, International Conference on Solid State Devices and Materials (SSDM), Tokyo, Japan, August 1999.

49. *Long-range Coulomb effects in small Si MOSFETs: Are smaller devices getting slower?*, with S. E. Laux, International Conference on Modeling and Simulation of Microsystems (MSM2000), San Diego, March 25-27, 2000.
50. *Long-range Coulomb effects in small Si MOSFETs: Are smaller devices getting slower?*, with S. E. Laux, Institute for Mathematics Application (IMA), Workshop 8: *Simulation of Transport in Transition Regimes*, Minneapolis, Minnesota, May 22-26, 2000.
51. *Long-range Coulomb effects in small Si MOSFETs: Are smaller devices getting slower?*, with S. E. Laux, 234<sup>th</sup> WE-Heraeus-Stiftung Seminar on *High Field and Quantum Transport in Semiconductors*, Rostock, Germany, May 28-June 1, 2000.
52. *Long-range Coulomb effects in small Si MOSFETs: Are smaller devices getting slower?*, with S. E. Laux, International Conference of the Society for Industrial and Applied Mathematics (SIAM 2000), San Juan, Puerto Rico, July 10-14, 2000.
53. *Monte Carlo simulation of long-range Coulomb interactions: Performance degradation in small Si MOSFETs* with S. E. Laux, International Workshop on "Numerical Methods for Hyperbolic and Kinetic Equations", University of Catania, Italy, February 8-10, 2001.
54. *Effective electron mobility in Si inversion layers in MOS systems with a high- $\kappa$  insulator: The role of remote phonon scattering*, with D. A. Neumayer and E. A. Cartier, Advanced Research Workshop on Quantum Transport, Maratea, Italy, June 17-22, 2001.
55. *Ballistic FET Modeling using QDAME: Quantum Device Analysis by Modal Evaluation*, with Steven E. Laux and Arvind Kumar, Silicon Nanoelectronics Workshop, Honolulu, HI, June 2002 (presented by A. Kumar).
56. *Effective electron mobility in Si inversion layers in MOS systems with a high- $\kappa$  insulator: The role of remote phonon scattering*, with Deborah A. Neumayer and Eduard A. Cartier, Fourth International Symposium on Control of Semiconductor Interface, Karuizawa, Japan, October 2002.
57. *Electron Mobility in Si inversion layers in MOS systems with a high- $\kappa$  insulator: The role of remote-phonon scattering*, with Deborah A. Neumayer and Eduard A. Cartier, Material Research Society Fall Meeting, Boston, Ma., December 2002.
58. *Performance degradation of small Si MOSFETs caused by long-range Coulomb interactions and insulator optical phonons*, with S. E. Laux, E. A. Cartier, and D. A. Neumayer, 2003 March Meeting of the American Physical Society, Austin, Texas, March 2003.
59. *Scaling MOSFETs to the limit: A physicist's perspective*, with E. A. Cartier, F. Gámiz, W. Hänsch, S. E. Laux, D. A. Neumayer, Z. Ren, K. Rim, P. M. Solomon, and M. Yang, Ninth International Workshop on Computational Electronics (IWCE-9), Frascati, Italy, May 25-28, 2003.
60. *Theoretical study of the electron mobility and on-current in strained Si MOSFETs*, with F. Gámiz and W. Hänsch, Workshop on "Modeling and Simulation Issues in Strained Si MOSFETs", MIT Campus, Cambridge, MA, September 6, 2003.
61. *Two-dimensional simulation of quantum electronic transport in small devices: A Master equation approach*, with S. E. Laux and A. Kumar, workshop on "Quantum and Many-Body Effects in Nanoscale Devices", Arizona State University, Tempe, AZ, October 25,26, 2003.
62. *Reduced electron mobility in high- $\kappa$  MOSFETs due to insulator optical phonons: Density, temperature, and material dependence*, with Z. Ren, E. Gusev, E. A. Cartier, and A. C. Callegari, International Workshop on Gate Insulators, Tokyo, Japan, November 6-8, 2003.
63. *Simulation of quantum electronic transport in small devices: A Master equation approach*, with S. E. Laux and A. Kumar, International Electron Device Meeting (IEDM03), Washington, D.C., December 8-10, 2003.
64. *Thirty years of Monte Carlo simulations of electronic transport in semiconductors: Their relevance to science and to mainstream VLSI technology*, with Steven E. Laux, Paul M. Solomon, and Arvind Kumar, Tenth International Workshop on Computational Electronics (IWCE-10), Purdue University, West Lafayette, Indiana, October 24-27 2004.
65. *Scaling MOSFETs to the limit: A physicist's perspective*, Distinguished Speakers Lectures Series, University of Padua, March 17, 2005.
66. *Electron Mobility in high- $\kappa$  MOSFETs: Remote Phonon Scattering and its Temperature and Material Dependence*, Material Research Society Spring Meeting, San Francisco, California, March 28-April 1, 2005.
67. *Simulation of Quantum Transport in Small Semiconductor Devices*, with S. E. Laux and A. Kumar, Proc. 2005 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2005), Tokyo, Japan, September 1-3, 2005.
68. *Electron Mobility in Engineered Substrates: Strain, Orientation, and Channel/Insulator Material Effects*, with S. Narayanan, C. Sachs, and T. O'Regan, European Material Research Society Meeting, Nice, France, May 29-June 2, 2006.
69. *Electron Mobility in Engineered Substrates: Strain, Orientation, and Channel/Insulator Material Effects*, with S. Narayanan, T. O'Regan, and C. Sachs, Electrochemical Society International Conference on: SiGe: Materials, Processing, and Devices, Cancun, Mexico, October 29-November 3, 2006.
70. *Electronic transport in "unconventional" SOI MOS systems: Thin-body and high- $\kappa$  effects in Si, Ge, and III-V layers*, with S. Jin, S. Narayanan, and T. O'Regan, Electrochemical Society International Conference on: SOI Device Technology, Chicago, Illinois, May 6-11, 2007.

71. *Theory and Simulation of Electronic Transport in Unconventional MOSFETs at the 20 nm Length Scale*, Plenary Lecture, First Global COE Symposium “Electronic Device Innovation” (EDIS 2008), Osaka, Japan, January 20-21, 2008.
72. *Monte Carlo Simulation of carrier transport in III-V MOSFETs with high- $\kappa$  gate materials*, with L. Wang, B. Yu, T. O’Regan, C. Sachs, S. Narayanan, P. M. Asbeck, Y. Taur, and M. Rodwell, 2008 March Meeting of the American Physical Society, New Orleans, March 10-14, 2008.
73. *Semiclassical and Quantum Electronic Transport in Semiconductors and Nanoscale Semiconductor Devices*, Plenary Lecture, COMSON International Summer School on Modeling and Optimization in Micro- and Nano-Electronics (MOMiNE’08), Baia Samule, Ragusa (Italy), June 14-28, 2008.
74. *Scaling FETs to 10 nm: Coulomb Effects, Source Starvation, and the Virtual Source*, **M. V. Fischetti**, 2009 Connecticut Symposium on Microelectronics and Optoelectronics (CMOC), Yale University, New Haven, Connecticut, March 11, 2009.
75. *Quantum Transport and the Pauli Master Equation*, **M. V. Fischetti**, International Workshop on Quantum Systems and Semiconductor Devices: Analysis, Simulations, and Applications, Peking University, Beijing, China, April 20-24, 2009.
76. *Scaling to 10 nm: Coulomb Effects, Source Starvation, and the Virtual Source*, **M. V. Fischetti**, S. Jin, T.-w. Tang, P. Asbeck, Y. Taur, S. E. Laux, and N. Sano, Thirteenth International Workshop on Computational Electronics (IWCE-13), Tsinghua University, Beijing, China, May 27-29, 2009.
77. *Electron Transport in Nanoscale Semiconductor Devices using the Pauli Master Equation*, **M. V. Fischetti**, IEEE-NANO, Genoa, Italy, July 26-30, 2009.
78. *Ultimate Transport Mechanisms in III-V Semiconductors for Low-Power CMOS Applications*, **M. V. Fischetti**, “First Workshop on Advances in Future Integrated Intelligent Nanosystems. Selected topics in Technology and Architecture”, Grenoble, France, June 4, 2009 (presented via telephone).
79. *Scaling to 10 nm: Coulomb Effects, Source Starvation, and Virtual Source Model*, **M. V. Fischetti**, S. Jin, T.-w. Tang, P. Asbeck, Y. Taur, S. Laux, M. Rodwell, and N. Sano, Material Research Society Spring Meeting, San Francisco, April 5-9, 2010.
80. *Scaling to 10 nm: Coulomb Effects, Source Starvation, and Virtual Source Model*, **M. V. Fischetti**, S. Jin, T.-w. Tang, P. Asbeck, Y. Taur, S. Laux, M. Rodwell, and N. Sano, Electrochemical Society Meeting, Vancouver, Canada, April 25-30, 2010.
81. *Scaling to 10 nm: Coulomb Effects, Source Starvation, and Virtual Source Model*, **M. V. Fischetti**, S. Jin, T.-w. Tang, P. Asbeck, Y. Taur, S. Laux, M. Rodwell, and N. Sano, SEMATECH 7th International Symposium on Advanced Gate Stack Technology, Troy, New York, September 29-October 1, 2010.
82. *Issues on Electronic Transport at the 10 nm Scale: How Far Can We Go?*, **M. V. Fischetti**, EUROSOCI 2011, Granada, Spain, January 17-20, 2011.
83. *Empirical Pseudopotential Approach to Semiclassical and Quantum Electronic Transport in Nanostructures*, **M. V. Fischetti**, 2011 March Meeting of the American Physical Society, Dallas, Texas, March 21-25, 2011.
84. *Si-based Tunnel Field-Effect Transistors for Low-Power Nano-Electronics*, A. S. Verhulst, W. G. Vandenberghe, D. Leonelli, R. Rooyackers, A. Vendooren, J. Zhuge, K.-H. Kao, B. Sorée, W. Magnus, **M. V. Fischetti**, G. Pourtois, C. Huyghebaert, R. Huang, Y. Wang, K. De Meyer, W. Dehaene, M. M. Heyns, and G. Groeseneken, Device Research Conference, Santa Barbara, California, June 20-22, 2011 (presented by A. S. Verhulst).
85. *Pseudopotential study of electronic structure and transport in armchair-edge graphene nanoribbons*, **M. V. Fischetti**, S. Aboud, J. Kim, S. Narayanan, and C. Sachs, Third International Symposium on Advanced Nanodevices and Nanotechnology (ISANN), Kaanapali, Maui, Hawaii, Dec. 4-9, 2011.
86. *Electronic transport in high-mobility channels: A good idea?*, **Massimo V. Fischetti**, 2012 International SiGe Technology and Device Meeting (ISTDM), University of California, Berkley, California, June 4-6, 2012.
87. *Post Si-CMOS Devices*, **Massimo V. Fischetti**, 2012 CMOS Emerging Technology Meeting, Vancouver, BC, Canada, July 18-20, 2012.
88. *Scaling FETs to 5 nm(?): From Semiclassical to Quantum Models*, **Massimo V. Fischetti**, 2012 Tsukuba Nanotechnology Symposium (TNS’ 12), Tsukuba, Japan, July 26-27, 2012.
89. *Theory of Electron Transport in Graphene*, **Massimo V. Fischetti**, 2012 IEEE Nanomaterials and Devices Conference, Waikiki Beach, Hawaii, October 16-19, 2012.
90. *Device scaling at 10 nm and beyond: Are high channel-mobility FETs the solution?*, **Massimo V. Fischetti**, 2012 Samsung Future Technology Forum, Seoul, Korea, November 8, 2012.
91. *Scaling FETs to (beyond?) 10 nm: From Semiclassical to Quantum Models*, **Massimo V. Fischetti**, 2012 Conference on Optoelectronics and Microelectronics Materials and Devices (COMMAD 2012), Melbourne, Australia, December 12-14, 2012.
92. *Pseudopotential-based study of electron transport in low-dimensionality nanostructures*, **Massimo V. Fischetti**, 2013 March Meeting of the American Physical Society, Baltimore, Maryland, March 18-22, 2013.
93. *Pseudopotential-based study of electronic structure and transport in nanostructures*, **tutorial, Massimo V. Fischetti**, 2013 International Workshop on Computational Electronics (IWCE), Nara, Japan, June 4-7, 2013.

94. *Electronic structure and transport in low-dimensionality nanostructures*, **tutorial, Massimo V. Fischetti**, 2013 International Conference of Insulating Films on Semiconductors (INFOS), Cracow, Poland, June 25, 2013.
95. *Electronic structure and transport in low-dimensionality nanostructures*, **Massimo V. Fischetti**, 2013 Electrochemical Society Fall Meeting, San Francisco, California, October 27-November 1, 2013.
96. *Electronic structure and transport in low-dimensionality nanostructures*, **Massimo V. Fischetti**, 2014 Materials Research Society Spring Meeting, San Francisco, California, April 21-24, 2014.
97. *Electronic structure and transport in low-dimensionality nanostructures*, **Massimo V. Fischetti**, 18th European Conference on Mathematics for Industry, Taormina, Italy, June 9-13, 2014.
98. *Physics of electronic transport in low-dimensionality materials for future FETs*, **Massimo V. Fischetti**, plenary invited presentation at the 2014 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD2014), Yokohama, Japan, September 9-11, 2014.
99. *Phonons, Scattering, and Semiclassical Transport Studies in 2D Materials and Devices*, **Massimo V. Fischetti**, American Vacuum Society (AVS) 61st International Symposium & Exhibition, Baltimore, Maryland, November 9-14, 2014.
100. *Topological-insulator based field-effect transistor*, William G. Vandenberghe and **Massimo V. Fischetti**, American Physical Society March Meeting, San Antonio, TX, March 2-6, 2015 (given by William G. Vandenberghe).
101. *Numerical Study of Electronic Transport in Low-Dimensionality Materials for Future FETs*, William G. Vandenberghe and **Massimo V. Fischetti**, Workshop on Applied Mathematics and Simulation for Semiconductors (AMaSiS), WIAS, Berlin, Germany, March 11-13, 2015 (given by William G. Vandenberghe).
102. *Physics of electronic transport in low-dimensionality materials for future FETs*, **Massimo V. Fischetti**, IEEE-NANO, Rome, Italy, July 27-30, 2015.
103. *Physics of electronic transport in low-dimensionality materials for future FETs*, **M. V. Fischetti**, William G. Vandenberghe, Jingtian Fang, Ana Suarez Negreira, Zhun Yong Ong-and Bo Fu, Semiconductor Interface Specialist Conference (SISC) 2015, Arlington, Virginia, December 2-5, 2015.
104. *Physics of electronic transport in low-dimensionality materials for future FETs*, **M. V. Fischetti** and William G. Vandenberghe, 2016 Electrochemical Society Meeting, San Diego, California, May 28-June 2, 2016.
105. *Physics of electronic transport in low-dimensionality materials for future FETs*, **M. V. Fischetti** and William G. Vandenberghe, 2016 International Electron Devices Meeting (IEDM), San Francisco, California, December 3-7, 2016.
106. *Electron transport in nanostructures: Physical models and numerical methods*, **Massimo V. Fischetti**, William G. Vandenberghe, Maarten Van de Put, Jingtian Fang, and Shanmeng Chen, 2017 SIAM Conference on Computational Science and Engineering, Atlanta, Georgia, February 27-March 3, 2017.
107. *Ab initio study of carrier transport in low-dimensionality materials*, **M. V. Fischetti**, W. G. Vandenberghe, G. Gaddemane, S. Chen, J. Fang, E. Chen, Z.-Y. Ong, A. Suarez Negreira, S. Narayanan, and S. Aboud, 2017 Electrochemical Society Meeting, National Harbor, Maryland, October 1-6, 2017.

### Contributed Presentations at International Conferences

1. *Physical characterization of bulk states by the MOS conductance technique*, with M. Conti and R. Gastaldi, European Solid State Device Research Conference (ESSDERC80), York, England, September 1980.
2. *Modelling of flat-band voltage shift during avalanche injection in MOS capacitors*, international conference on Insulating Films on Semiconductors (INFOS81), Erlangen, West Germany, April 1981.
3. *Hot electron induced defects at the Si-SiO<sub>2</sub> interface*, with R. Gastaldi, F. Maggioni, and A. Modelli, European Solid State Device Research Conference (ESSDERC81), Toulouse, France, September 1981 (presented by A. Modelli).
4. *The importance of the anode field in controlling the generation of donor states at the Si-SiO<sub>2</sub> interface*, Semiconductor Interface Specialist Conference (SISC), Fort Lauderdale, Florida, December 1983.
5. *Direct measurement of the energy distribution of hot electrons in SiO<sub>2</sub>*, with S.D. Brorson, D.J. DiMaria, P.M. Solomon, and D.W. Dong, Semiconductor Interface Specialist Conference (SISC), San Diego, California, December 1984 (presented by D.J. DiMaria).
6. *Hot electrons in SiO<sub>2</sub>: onset of heating and high-energy tails*, with D.J. DiMaria and E. Tierney, Semiconductor Interface Specialist Conference (SISC), Ft. Lauderdale, Florida, December 1985 (presented by D.J. DiMaria).
7. *SiO<sub>2</sub>-induced substrate current and its relation to positive charge in field-effect-transistor*, with Z. A. Weinberg, Semiconductor Interface Specialist Conference (SISC), Ft. Lauderdale, Florida, December 1985 (presented by Z. A. Weinberg).
8. *Quantum Monte Carlo simulation of electron transport: An application to SiO<sub>2</sub>*, Workshop on Ultrasmall and Quantum-Structured Devices, Arizona State University, Tempe, Arizona, December 1985.
9. *Direct observation of Ballistic Electrons In Silicon Dioxide*, with D. J. DiMaria, J. Batey, E. Tierney, J. Stasiak, and L. Dori, Semiconductor Interface Specialist Conference (SISC), San Diego, California, December 1986 (presented by D.J. DiMaria).

10. *Quantum Interference Effects of Ballistic Electrons: Observation of Bound and Virtual States in Quantum Wells*, with M. Heiblum, 1987 March Meeting of the American Physical Society, New York, New York, March 1987.
11. *Ballistic Electron Transport in Thin SiO<sub>2</sub> Films*, with D.J. DiMaria, First Workshop on Ballistic Transport in Solids, Santa Barbara, California, March 1987 (presented by D.J. DiMaria).
12. *Monte Carlo simulation of Electron Transport in Submicron Silicon MOSFETs*, with S. E. Laux, Workshop on Numerical Modeling of Process and Devices for Integrated Circuits (NUPAD II), San Diego, California, May 1988 (presented by S. E. Laux).
13. *Coulombic and Neutral Trapping Centers in SiO<sub>2</sub>*, with D.A. Buchanan and D.J. DiMaria, international conference on Insulating Films on Semiconductors (INFOS89), Munich, West Germany, March-April 1989 (presented by D.J. DiMaria).
14. *Are GaAs MOSFETs worth building? A model-based comparison of Si and GaAs n-MOSFETs*, with S. E. Laux, International Electron Device Meeting (IEDM89), Washington, DC, December 6-9 1989 (presented by S. E. Laux).
15. *Monte Carlo simulation of non-equilibrium transport in ultra-thin base Si bipolar transistors*, with W. Lee, S. E. Laux, and D. Tang, International Electron Device Meeting (IEDM89), Washington, DC, December 6-9, 1989 (presented by W. Lee).
16. *Monte Carlo calculations of laser-induced free electron heating in SiO<sub>2</sub>*, with D. Arnold and E. Cartier, XXII Symposium on Optical Materials for High Power Lasers, Boulder Colorado, October 24-26, 1990 (presented by D. Arnold).
17. *Transient and steady-state overshoot in GaAs, InP, In<sub>0.53</sub>Ga<sub>0.47</sub>As and InAs bipolar transistors*, with S. Tiwari and S. E. Laux, International Electron Device Meeting (90), San Francisco, California, December 6-9, 1990 (presented by S. Tiwari).
18. *The impact of non-equilibrium transport on breakdown and transit time in bipolar transistors*, with J. M. C. Stork, E. F. Crabbé., G. Baccarani, and S. E. Laux, International Electron Device Meeting (IEDM90), San Francisco, California, December 6-9, 1990 (presented by J. M. C. Stork).
19. *Monte Carlo calculations of laser-induced free electron heating in SiO<sub>2</sub>*, with D. Arnold and E. Cartier, NASEC-ODE VII, Copper Mountain, Colorado, April 8-12, 1991, (presented by D. Arnold).
20. *Impact Ionization in Silicon*, with E. Cartier, F. R. McFeely, and E. Eklund, Semiconductor Interface Specialist Conference, San Diego, California, December 1992, (presented by E. Cartier).
21. *Monte Carlo study of electron transport in silicon inversion layers*, with S. E. Laux, International Electron Device Meeting, San Francisco, California, December 1992, (presented by S. E. Laux).
22. *Monte Carlo Simulations of p- and n-Channel Dual-Gate MOSFETs at the Limits of Scaling*, with D.J. Frank and S.E. Laux, 51st Annual Device Research Conference, Santa Barbara, California, June 21, 1993, (presented by D.J. Frank).
23. *Polarization Analysis of Hot-Carrier Light Emission in Silicon*, with L. Carbone, R. Brunetti, C. Jacoboni, and A. Lacaita, Eighth International Conference on Hot Carriers in Semiconductors', Oxford, UK, Aug. 16-20 1993, (presented by R. Brunetti).
24. *Monte Carlo and hydrodynamic simulation of a one-dimensional n<sup>+</sup> - n - n<sup>+</sup> silicon diode*, with O. Muscato and R. M. Pidotella, Fourth International Workshop on Computational Electronics (IWCE-4), Tempe, Arizona, October 30-November 2, 1995, (presented by O. Muscato).
25. *Monte Carlo Study of Sub-Bandgap Impact Ionization in Silicon Field-Effect Transistors*, with S. E. Laux, International Electron Device Meeting, Washington, D.C., December 1995.
26. *Full-Band Monte Carlo Simulation of High-Energy Transport and Impact Ionization of Electrons and Holes in Si, Ge, and GaAs*, with N. Sano, S. E. Laux, and K. Natori, 1996 International Conference on Simulation of Semiconductor Processes and Devices - SISPAD'96, Tokyo, Japan, September 2-4, 1996, (presented by N. Sano). [1](10)
27. *Light emission during direct and Fowler-Nordheim tunneling in ultra-thin MOS tunnel junctions*, with E. Cartier, J. C. Tsang, and D. A. Buchanan, 27th IEEE Semiconductor Interface Specialists Conference - SISC96, San Diego, California, December 5-7, 1996, (presented by E. Cartier).
28. *Drain engineering in AlInAs/GaInAs HEMTs for high  $f_T$  and  $f_{max}$* , with E. Migliore, P. Chavarkar, J. Yen, U. K. Mishra, and S. E. Laux, 1997 International Conference on "Indium Phosphide and Related Materials", Hyannis, Massachusetts, May 11-15, 1997, (presented by U. K. Mishra).
29. *Reduction of short-channel effects in self-aligned AlInAs/GaInAs HEMTs by lateral band-gap engineering for high  $f_{max}$* , with P. Chavarkar, E. Migliore, J. Yen, and S. E. Laux, IEEE/Cornell Conference on Advanced Concepts in High-Speed Semiconductor Devices and Circuits, Ithaca, New York, Aug. 4-6, 1997 (presented by E. Migliore).
30. *Theory of electron transport in small semiconductor devices using the Pauli master equation*, Fifth International Workshop on Computational Electronics (IWCE-5), University of Notre Dame, Indiana, May 28-30, 1997.
31. *Light emission during direct and Fowler-Nordheim tunneling in ultra thin MOS tunnel junctions*, with E. Cartier, J. C. Tsang, and D. A. Buchanan, international conference on Insulating Films on Semiconductors (INFOS97), Göteborg, Sweden, June 1997, (presented by E. Cartier).

32. *Monte Carlo study of velocity overshoot in a 0.1 $\mu$ m CMOS switching inverter*, with S. E. Laux, International Electron Device Meeting, Washington D.C., December 1997, (presented by S. E. Laux).
33. *Hole mobility improvement in silicon-on-insulator and bulk silicon transistors using local strain*, with S. Tiwari, P. M. Mooney, and J. J. Welser, International Electron Device Meeting, Washington D.C., December 1997, (presented by S. Tiwari).
34. *Hole-initiated impact ionization and split-off band in Ge, Si, GaAs, and InGaAs*, with N. Sano and S. E. Laux, 6th International Workshop on Computational Electronics, Osaka, Japan, October 19-22, 1998 (presented by N. Sano).
35. *Issues in modeling small devices*, with S. E. Laux, **INVITED**, International Electron-Device Meeting, San Francisco, December 1999 (presented by S. E. Laux).
36. *Why Hot Carrier Emission Based Timing Probes Will Work for 50 nm 1V CMOS Technologies*, with James C. Tsang, 12th European Symposium Reliability of Electron Devices Failure Physics Analysis, Bordeaux, France, October 2002.
37. *Using the Quantum Transmitting Boundary Method to Derive the Density-of-States for Self-Consistent Poisson-Schrödinger Ballistic Device Simulation*, with S. E. Laux and A. Kumar, Eighth International Workshop on Computational Electronics (IWCE-8), University of Illinois, Urbana-Champaign, Urbana-Champaign, Illinois, October 14-16, 2001 (presented by S. E. Laux).
38. *Tunneling studies of high dielectric constant thin films deposited on Si*, with Robert Laibowitz, Evgeny Gousev, Roger Koch, Harald Okorn-Schmidt, James H. Stathis, and John R. Kirtley, 2002 March Meeting, American Physical Society, Indianapolis, In, March 21, 2002 (presented by R. Laibowitz).
39. *Hot-Carrier Charge Trapping and Reliability in high-K Dielectrics*, with Arvind Kumar, Tak H. Ning, and Evgeny Gousev, 2002 Symposium on VLSI Technology, Honolulu, Hi, June 2002 (presented by A. Kumar).
40. *QDAME Simulation of 7.5 nm Double-Gate Si nFET with Different Access Geometries*, with Steven E. Laux and Arvind Kumar, International Electron Device Meeting (IEDM02), San Francisco, Ca., December 6-9, 2002 (presented by S. E. Laux).
41. *Charge Trapping Related Reliability in High-K Gate Dielectric Films*, with Sufi Zafar, Alessandro Callegari, and Evgeny Gousev, International Electron Device Meeting (IEDM02), San Francisco, Ca., December 6-9, 2002 (presented by S. Zafar).
42. *Does Circulation in Individual States Survive in the Total Current Density?*, with S. E. Laux and A. Kumar, Ninth International Workshop on Computational Electronics (IWCE-9), Frascati, Italy, May 25-28, 2003 (presented by S. E. Laux).
43. *Inversion channel mobility in high- $\kappa$  high performance MOSFETs*, with Z. Ren, E. P. Gusev, E. A. Cartier, and M. Chudzik, International Electron Device Meeting (IEDM03), Washington, D.C., December 8-10, 2003 (presented by Z. Ren).
44. *Band-structure and Quantum Effects on Hole Transport in p-MOSFETs*, with Santhosh Krishnan and Dragica Vasileska, Tenth International Workshop on Computational Electronics (IWCE-10), Purdue University, West Lafayette, Indiana, October 24-27, 2004, (presented by Santhosh Krishnan).
45. *Investigation of CMOS Devices with Embedded SiGe Source/Drain on Hybrid Orientation Substrates*, with Qiqing (Christine) Ouyang, Meikei Jeong, Siddhartha Panda, Diane Boyd, Ken Rim, and John A. Ott, VLSI International Symposium on Technology, Systems, and Application, Hsinchu, Taiwan ROC, April 25-29, 2005, (presented by Qiqing Ouyang).
46. *Characteristics of High-Performance pFETs with Embedded SiGe Source/Drain and  $j100\%$  Channels on 45-degrees Rotated Wafers*, with Qiqing (Christine) Ouyang, Meikei Jeong, Siddhartha Panda, Diane Boyd, Ken Rim, and John A. Ott, VLSI International Symposium on Technology, Systems, and Application, Hsinchu, Taiwan ROC, April 25-29, 2005, (presented by Qiqing Ouyang).
47. *Dual Stress Liner Enhancement in Hybrid Orientation Technology*, with C. D. Sharaw, M. Yang, D. M. Fried, G. Costrini, T. Kanarsky, W.-H. Lee, V. Chan, J. Holt, L. Black, GM. Naeem, S. Panda, L. Economikos, J. Groschopf, A. Kapur, Y. Li, R. T. Mo, A. Bonnoit, D. Degraw, S. Luning, D. Chimbarrao, X. Wang, A. Bryant, D. Brown, C.-Y. Sung, P. Agnello, M. Jeong, S.-F. Huang, X. Chen, and L. Khare, VLSI International Symposium on Technology, Systems, and Application, Hsinchu, Taiwan ROC, April 25-29, 2005, (presented by Qiqing Ouyang).
48. *Simulation of Hole Transport in p-Channel Si MOSFETs*, with S. Krishnan and D. Vasileska, Device Research Conference, Santa Barbara, June 20-22, 2005 (presented by D. Vasileska).
49. *Monte Carlo Simulation of Performance Scaling in Strained-Si nMOSFETs*, with S. E. Laux and A. Kumar, Proc. 2005 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2005), Tokyo, Japan, September 1-3, 2005.
50. *Microwave Detection and Mixing in Metallic Single-Wall Carbon Nanotubes and Potential for a New TeraHertz Detector*, with K. S. Yngvesson, F. Rodriguez-Morales, R. Zannoni, J. Nicholson, and J. Appenzeller, 17-th International Symposium on Space TeraHertz Technology, Paris, France, May 2006 (presented by K. S. Yngvesson).
51. *Electron Mobility in Si and Ge Inversion Layers: The Role of Remote Phonon Scattering*, with T. O'Regan, International Workshop of Computational Electronics, Vienna, Austria, May 24-26, 2006.

52. *First Self-Consistent Full-Band Monte Carlo 2D-Poisson Solver for Modeling SiGe Heterostructure p-Channel Devices*, with S. Krishnan and D. Vasileska, International Workshop of Computational Electronics, Vienna, Austria, May 24-26, 2006.
53. *Remote Phonon Scattering in Si and Ge with SiO<sub>2</sub> and HfO<sub>2</sub> Insulators: Does the Electron Mobility Determine Short Channel Performance?*, with T. O'Regan, "2006 International Workshop on Dielectric Thin Films for Future ULSI Devices" (IWDTF2006), Tokyo, Japan, November 8-10, 2006 (presented by T. O'Regan).
54. *Remote Phonon Scattering in Si and Ge with SiO<sub>2</sub> and HfO<sub>2</sub> Insulators: Does the Electron Mobility Determine Short Channel Performance?*, with T. O'Regan, "Semiconductor Interface Specialists Conference 2006" (SISC 2006), San Diego, California, December 7-9, 2006 (presented by T. O'Regan).
55. *Surface Roughness Scattering in Ultrathin-Body SOI MOSFETs*, with Seonghoon Jin and Ting-wei Tang, 2007 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2007), Vienna, September 25-27, 2007 (presented by S. Jin).
56. *Electron Mobility Calculations for Si, Ge and III-V Inversion Layers with HfO<sub>2</sub>*, with T. O'Regan, Twelveth International Workshop on Computational Electronics (IWCE-12), University of Massachusetts, Amherst, October 8-10, 2007 (presented by T. O'Regan).
57. *Self-Consistent Calculation of the Subband Structure and Hole Mobility in Ge, InGaAs, GaSb, and InSb p-channels*, with Y. Zhang and J. Kim, Twelveth International Workshop on Computational Electronics (IWCE-12), University of Massachusetts, Amherst, October 8-10, 2007 (presented by Y. Zhang).
58. *Study of performance and leakage currents in nanometer-scale bulk, SOI and double-gate MOSFETs*, with S. Narayanan and C. Sachs, Twelveth International Workshop on Computational Electronics (IWCE-12), University of Massachusetts, Amherst, October 8-10, 2007 (presented by S. Narayanan).
59. *Surface roughness scattering in gates silicon nanowires*, with S. Jin and Ting-wei Tang, Twelveth International Workshop on Computational Electronics (IWCE-12), University of Massachusetts, Amherst, October 8-10, 2007 (presented by S. Jin).
60. *Simulation of Electron Transport in High-Mobility MOSFETs: Density of States Bottleneck and 'Source Starvation'*, with L. Wang, B. Yu, C. Sachs, P. M. Asbeck, Y. Taur, and M. Rodwell, International Electron Device Meeting (IEDM07), Washington, DC, December 10-12, 2007.
61. *An Improved Self-consistent Method and Hole Mobility in Ge and GaAs Bulk pMOSFETs*, with Y. Zhang, B. Soreé, and W. Magnus, European Physical Society Meeting, Condensed Matter Division, Rome, Italy, August 25-29, 2008 (presented by Y. Zhang).
62. *An Improved Self-consistent Method and Hole Mobility in Ge and GaAs Bulk pMOSFETs*, with Y. Zhang, B. Soreé, and W. Magnus, European Solid State Device Research Conference (ESSDERC), Edinburgh, Scotland, September 15-19, 2008 (presented by B. Soree'e).
63. *Device architecture and processing for III-V MOS technology*, with M. Rodwell, M. Wistey, U. Singiseti, G. Burek, A. Gossard, S. Stemmer, R. Engel-Herbert, Y. Hwang, Y. Zheng, C. van de Walle, Y. Yuan, C. Palmstroem, E. Arkun, P. Simmonds, P. McIntyre, J. Harris, C. Sachs, P. M. Asbeck, and Y. Taur, Workshop on Germanium and III-V MOS technology, Edinburgh, Scotland, September 19, 2008 (presented by M. Rodwell).
64. *Dissipative Quantum Transport Using the Pauli Master Equation*, Bo Fu and **M. V. Fischetti**, Thirteenth International Workshop on Computational Electronics (IWCE-13), Tsinghua University, Beijing, China, May 27-29, 2009 (presented by Bo Fu).
65. *Calculation of the Hole Mobility in Relaxed and Strained Ge and III-V p-Channels*, Yan Zhang and **M. V. Fischetti**, Thirteenth International Workshop on Computational Electronics (IWCE-13), Tsinghua University, Beijing, China, May 27-29, 2009 (presented by Yan Zhang).
66. *Anatomy of Carrier Backscattering in Silicon Nanowire Transistors*, Seonghoon Jin, Ting-wei Tang, and **M. V. Fischetti**, Thirteenth International Workshop on Computational Electronics (IWCE-13), Tsinghua University, Beijing, China, May 27-29, 2009 (presented by Ting-wei Tang).
67. *Band Structure and Ballistic Conductance of Strained Si Nanowires*, J. Kim and **M. V. Fischetti**, Fourteenth<sup>th</sup> International Workshop of Computational Electronics (IWCE-14), Pisa, Italy, October 27-29, 2010 (presented by J. Kim).
68. *Model-Comparison Study of Quasi-Ballistic Electron Transport in Nanoscale Semiconductor Devices*, T.-w. Tang, Il-o Yoon, **M. V. Fischetti**, N. Sano, S. Jin, and Y. J. Park, Fourteenth<sup>th</sup> International Workshop of Computational Electronics (IWCE-14), Pisa, Italy, October 27-29, 2010 (presented by T.-w. Tang).
69. *Delta-Doped HfO<sub>2</sub>/In<sub>0.53</sub>Ga<sub>0.47</sub>As Inversion Layers: Density-of-States Bottleneck and Electron Mobility*, T. O'Regan, P. Hurley, and **M. V. Fischetti**, Fourteenth<sup>th</sup> International Workshop of Computational Electronics (IWCE-14), Pisa, Italy, October 27-29, 2010 (presented by T. O'Regan).
70. *Calculation of electron and hole mobility in inversion layers of MOS systems with III-V channels and high- $\kappa$  insulators*, **M. V. Fischetti**, T. O'Regan and Y. Zhang, Semiconductor Interface Specialists Conference (SISC), San Diego, California, December 2-4, 2010.
71. *Open boundary-conditions using empirical pseudopotentials in quantum transport*, Bo Fu and **M. V. Fischetti**, 2011 March Meeting of the American Physical Society, Dallas, Texas, March 21-25, 2011 (presented by Bo Fu).
72. *Modeling of Phonon-assisted Zener tunneling in indirect Semiconductors*, W. Vandenberghe, B. Soreé, W. Magnus, G. Groeseneken, and **M. V. Fischetti**, 2011 March Meeting of the American Physical Society, Dallas, Texas, March 21-25, 2011 (presented by W. Vandenberghe).

73. *An empirical pseudopotential approach to surface and line-edge roughness scattering in nanostructures: Application to Si thin films and nanowires and to graphene nanoribbons*, **M. V. Fischetti** and S. Narayanan, 17<sup>th</sup> International Conference of Electron Dynamics in Semiconductors, Optoelectronics and Nanostructures (EDISON 17), Santa Barbara, California, August 8-12, 2011.
74. *Phonon modes and electron transport in graphene nanoribbons*, S. Aboud, S. M. Goonick, M. Saraniti, and **M. V. Fischetti**, 17<sup>th</sup> International Conference of Electron Dynamics in Semiconductors, Optoelectronics and Nanostructures (EDISON 17), Santa Barbara, California, August 8-12, 2011.
75. *Electron-Phonon Coupling Variability in Armchair Graphene Nanoribbons*, Shela Aboud, **Massimo V. Fischetti**, Stephen Goodnick, and Marco Saraniti, Third International Symposium on Advanced Nanodevices and Nanotechnology (ISANN), Kaanapali, Maui, Hawaii, Dec. 4-9, 2011.
76. *Two-Dimensional Quantum Mechanical Modeling of Band-to-Band Tunneling in Indirect Semiconductors*, William G. Vandenberghe, Bart Sorée, Wim Magnus, **Massimo V. Fischetti**, Anne S. Verhurlst, and Guido Groeseneken, International Electron Device Meeting (IEDM11), Washington, DC, December 5-7, 2011 (presented by W. Vandenberghe).
77. *One-Flux Theory of Saturated Drain Current in Nanoscale MOSFETs*, Ting-wei Tang, **Massimo V. Fischetti**, Seonghoon Jin, and Nobuyuki Sano, International Semiconductor Device Research Symposium (ISDRS 2011), College Park, Maryland, Dec. 7-9, 2011, (presented by T.-w. Tang).
78. *Remote Phonon Scattering in Graphene*, Zhun-Yong Ong and **M. V. Fischetti**, Fifteen<sup>th</sup> International Workshop of Computational Electronics (IWCE-15), Madison, Wisconsin, May 22-25, 2012 (presented by Z.-Y. Ong).
79. *Electronic properties of armchair and zigzag  $sp^3$ -hybridized silicene nanoribbons*, Jiseok Kim, Shela J. Aboud, and **M. V. Fischetti**, Fifteen<sup>th</sup> International Workshop of Computational Electronics (IWCE-15), Madison, Wisconsin, May 22-25, 2012 (presented by J. Kim).
80. *Semiclassical electron transport in thin silicon inversion layers and graphene using the Monte Carlo method*, Sudarshan Narayanan and **Massimo V. Fischetti**, Fifteen<sup>th</sup> International Workshop of Computational Electronics (IWCE-15), Madison, Wisconsin, May 22-25, 2012 (poster presented by S. Narayanan).
81. *Theory of Remote Phonon and Charged Impurity Scattering in Supported Graphene*, Zhun-Yong Ong and **M. V. Fischetti**, Semiconductor Interface Specialists Conference (SISC 2012), San Diego, California, December 6-8, 2012 (presented by Z.-Y. Ong).
82. *Determination of bound states in a device with transmitting boundary conditions*, William G. Vandenberghe and **Massimo V. Fischetti**, 2013 International Workshop on Computational Electronics (IWCE), Nara, Japan, June 4-7, 2013 (presented by W. G. Vandenberghe).
83. *Open boundary conditions ballistic quantum transport using empirical pseudopotentials*, Bo Fu and **Massimo V. Fischetti**, 2013 International Workshop on Computational Electronics (IWCE), Nara, Japan, June 4-7, 2013.
84. *DFT study of electronic transport properties in supported armchair graphene nanoribbons*, Shela J. Aboud, Jiseok Kim, and **Massimo V. Fischetti**, 2013 International Workshop on Computational Electronics (IWCE), Nara, Japan, June 4-7, 2013 (presented by S. Aboud).
85. *Pseudopotential-based study of gate leakage and contact resistance beyond the 10 nm node*, Saeedeh Ravandi, Bo Fu, William G. Vandenberghe, Shela J. Aboud, and **Massimo V. Fischetti**, 2013 International Workshop on Computational Electronics (IWCE), Nara, Japan, June 4-7, 2013.
86. *Reduction of the Normal-Superfluid Transition Temperature in Gated Bilayer Graphene*, **Massimo V. Fischetti** and Shela Aboud, 2014 International Workshop on Computational Electronics (IWCE), Paris, France, June 5-8, 2014.
87. *Calculation of the Electron-Phonon Interaction Strength from First Principles in Graphene and Silicon*, William G. Vandenberghe, and **Massimo V. Fischetti**, 2014 International Workshop on Computational Electronics (IWCE), Paris, France, June 5-8, 2014.
88. *Full-Band Ballistic Quantum Transport in Nanostructures using Empirical Pseudopotentials*, Jingtian Fang, William G. Vandenberghe, and **Massimo V. Fischetti**, 2014 International Workshop on Computational Electronics (IWCE), Paris, France, June 5-8, 2014.
89. *Three-dimensional plane-wave full-band quantum transport using empirical pseudopotentials*, Jingtian Fang, William G. Vandenberghe, and **Massimo V. Fischetti**, 2015 March Meeting of the American Physical Society, San Antonio, Texas, March 2-6, 2015.
90. *Jingtian Fang, William G. Vandenberghe, and M. V. Fischetti, Progress on quantum transport simulation using empirical pseudopotentials*, Jingtian Fang, William G. Vandenberghe, and **M. V. Fischetti**, International Workshop on Computational Electronics, Purdue University, West Lafayette, Indiana (September 2-5, 2015).
91. *Overlaps in Stacked Graphene Flakes using Empirical Pseudopotentials*, M. L. Van de Put, W. G. Vandenberghe, and **M. V. Fischetti**, International Workshop on Computational Electronics, Purdue University, West Lafayette, Indiana (September 2-5, 2015).
92. *Transistor Performance in the Sub-1 nm Technology Node based on One-Dimensional Materials*, Jingtian Fang, William G. Vandenberghe, and **M. V. Fischetti**, 2015 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD2015), Washington, D.C. September 9-11, 2015.



93. *Modeling Topological-Insulator Field-Effect Transistors using the Boltzmann equation*, William G. Vandenberghe and **M. V. Fischetti**, 2016 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD2016), Nuremberg, Germany, September 6-8, 2016.
94. *Theoretical study of electron transport in silicene using full-band Monte Carlo simulations*, Gautam Gaddemane, William G. Vandenberghe, and **M. V. Fischetti**, 2016 International Conference on Simulation of Semiconductor Processes and Devices (SISPAD2016), Nuremberg, Germany, September 6-8, 2016.
95. *Making High-performance Low-power Transistors out of Imperfect Materials using Two-dimensional Topological Insulators*, William G. Vandenberghe and **M. V. Fischetti**, Semiconductor Interface Specialist Conference (SISC) 2016, San Diego, California, December 7-10, 2016.
96. *Study of Ballistic Transport in Phosphorene-Nanoribbon-FETs using Empirical Pseudopotentials*, Shanmeng Chen, Jingtian Fang, William G. Vandenberghe, and **Massimo V. Fischetti**, International Workshop on Computational Nanotechnology, Windermere, UK, June 5-9, 2017.
97. *Theoretical study of charge transport in mono- and bi-layer phosphorene using full-band Monte Carlo simulations*, Gautam Gaddemane, William G. Vandenberghe, and **Massimo V. Fischetti**, International Workshop on Computational Nanotechnology, Windermere, UK, June 5-9, 2017.
98. *Simulation Of Negative Differential Transconductance From Devices Fabricated Using Conventional CMOS Technology*, P. B. Vyas, C. Naquin, M. Lee, W. G. Vandenberghe, and **M. V. Fischetti**, International Workshop on Computational Nanotechnology, Windermere, UK, June 5-9, 2017.