

CURRICULUM VITAE

FORMATO EUROPEO/EUROPEAN FORMAT

INFORMAZIONI PERSONALI/ PERSONAL INFORMATION

Nome, Cognome/Name, Surname	Jonathan E Spanier
Indirizzo/Address	43 Llanberris Road, Bala Cynwyd PA 19004 USA
Via, numero civico, c.a.p., città, nazione/ House number, street name, postcode, city, country	
Telefono/Telephone	+1.610.747.0439 (home), +1.215.895.2301 (office)
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E-mail	spanier@drexel.edu
Sito web/Website	meso.materials.drexel.edu/mml
Nazionalità/Nationality	US
Luogo e data di nascita/ Place and Date of birth	Atlantic City, NJ 22 FEBURARY 1969

ESPERIENZA PROFESSIONALE/ WORK EXPERIENCE

Se dipendente CNR indicare:

**N. MATRICOLA
QUALIFICA
LIVELLO**

In ordine di data /Dates (from – to)

[Iniziare con le più recenti ed
elencare separatamente ciascun
incarico ricoperto/ Add separate
entries for each relevant post
occupied, starting with the most
recent]

Associate Dean, 2011-present, College of Engineering, Drexel University, Philadelphia PA
Associate Professor, 2007-present, Dept of Materials Science & Engineering, Drexel University,
Philadelphia PA
University Provost Fellow, 2009
Assistant Professor, 2003-2007, (same)
Affiliated faculty, Department of Electrical and Computer Engineering (2005-)
Affiliated faculty, Dept of Mechanical Engineering and Mechanics (2004-)

Visiting lecturer at the Technion, the Israel Institute of Technology, in 2001

Nome e indirizzo del datore di lavoro
/ Name and address of employer

Drexel University, 3141 Chestnut Street, Philadelphia PA 19104 USA

Tipo o settore di attività / Type of
business or sector

academe

Funzione o posto occupato /
Occupation or position held

Associate Professor

Principali mansioni e responsabilità /

research, teaching, supervision of postdoctoral researchers and graduate students,

Main activities and responsibilities In ordine di data /Dates (from – to) [Add separate entries for each relevant post occupied, starting with the most recent]	administration, recruiting, other duties as assigned 1994-2001
Nome e indirizzo del datore di lavoro / Name and address of employer	Kulite Semiconductor Products
Tipo o settore di attività / Type of business or sector	Semiconductors
Funzione o posto occupato / Occupation or position held	Research Staff
Principali mansioni e responsabilità / Main activities and responsibilities	Research Staff on Semiconductors
In ordine di data /Dates (from – to) [Add separate entries for each relevant post occupied, starting with the most recent]	1990-94
Nome e indirizzo del datore di lavoro / Name and address of employer	US Naval Research Laboratory
Tipo o settore di attività / Type of business or sector	
Funzione o posto occupato / Occupation or position held	Research Engineer
Principali mansioni e responsabilità / Main activities and responsibilities	Research Engineer in the field of condensed matter

**ISTRUZIONE E FORMAZIONE /
EDUCATION AND TRAINING**

In ordine di data /Dates (from – to) [Add separate entries for each relevant course you have completed, starting with the most recent]	2001-2003
Nome e tipo d'istituto di istruzione o formazione / Name and type of organisation providing education and training	Harvard University, Dept of Chemistry
Principali materie e competenze professionali apprese / Principal subjects occupational skills covered	physical chemistry
Certificato o diploma ottenuto /Title of qualification awarded	Postdoctoral Research Fellowship
Livello nella classificazione nazionale o internazionale / Level in National classification	N/A
In ordine di data /Dates (from – to) [Add separate entries for each relevant course you have completed, starting with the most recent.]	1994-2001
Nome e tipo d'istituto di istruzione o formazione / Name and type of organisation providing education and training	Columbia University in the City of New York
Principali materie e competenze professionali apprese / Principal	applied physics (condensed matter), with Distinction

subjects occupational skills covered
Certificato o diploma ottenuto /Title of
qualification awarded
Livello nella classificazione nazionale
o internazionale / Level in National
classification
Certificato o diploma ottenuto /Title of
qualification awarded

PhD

N/A

BA degree in Physics from Drew University in Madison, NJ

ATTIVITA' DI RICERCA / RESEARCH ACTIVITIES

Attuali campi di ricerca / Research
sectors

Nanoscience & nanotechnology, electronic and photonic materials, oxides and functional materials

Professor Spanier applies a variety of experimental methods, including variable-temperature and multi-channel scanning proximal probes, Raman scattering spectroscopy, and high-resolution electron and ion-beam microscopy and nano-fabrication.

Current research interests include the synthesis of, and collective electronic, optical and functional properties in individual single- and multi-component inorganic nanostructures, and in thin-film materials and devices.

Recenti attività scientifiche/ Recent
Scientific Activities.

Electronic transport, laser spectroscopy, device fabrication, characterization, nanomaterials and thin-film growth.

Investigation of the electronic and optoelectronic properties of nanostructured and ultra thin film semiconductor materials, particularly core-shell III-V nanowires, multifunctional materials and complex oxide thin films. Materials and ecologically-friendly process design, growth and structural and property characterization of chalcogenide nanowires, oxide perovskite and complex oxide perovskite thin films, particularly for solar energy conversion. Professor Spanier uses expertise in variable-temperature transport and nanodevice fabrication to investigate novel tunable non-linear (negative differential resistance) carrier transport in core-shell nanowires; scanning/proximal probe microscopy; uses photoluminescence, photocurrent and inelastic light (Raman and Brillouin) scattering spectroscopy techniques to study electronic and optoelectronic properties and local electronic structure and defects. Developing new low-cost and low vacuum atomic layer deposition methods for producing oxide perovskite thin films of exceptionally high quality.

**ULTERIORI INFORMAZIONI /
ADDITIONAL INFORMATION**

Professor Spanier is the recipient of the prestigious US Presidential Early Career Award for Scientists and Engineers (PECASE), presented at the White House, and the US Army Research Office Young Investigator Award, an ONR Summer Faculty Fellowship, the Outstanding Alumni Award in the Sciences, Drew University, the Outstanding Research Award in MSE, the TMS Young Faculty Award Honorable Mention, and other honors (please refer to meso.materials.drexel.edu for full biography).

Professor Spanier was a co-chair of the E-MRS Centennial Meeting session in Warsaw celebrating the birth of C. V. Raman. He will be Co-Chair of an upcoming MRS Spring Symposium in 2014 in San Francisco on the topic of Semiconductor Nanowires.

Professor Spanier and his collaborators are inventors of new semiconducting ferroelectric materials for solar energy conversion, of new atomic layer deposition technology for producing heteroepitaxial perovskite oxides with coherency of atomic planes across the substrate-thin film interface, and nonlinear nanoscale devices for tuning negative differential resistance and device phase, at room temperature, based on semiconductor nanowires.

Professor Spanier currently serves as Associate Dean of the College of Engineering, leading in strategic planning and in the core instrumentation facilities for materials characterization and micro/nano-fabrication. He leads an international faculty and student mobility program (US Dept of Education and EU ATLANTIS) Engineers as Global Leaders in Energy Sustainability, with the Universidad Politecnica de Madrid and the Politecnico di Milano.

His work is currently supported by the National Science Foundation (NSF), the US Army Research Office (ARO), the Defense Advanced Research Projects Agency (DARPA), the MITRE Corporation, Air Products Corporation, Structured Materials Industries, Inc., and the Department of Health of the Commonwealth of Pennsylvania.

Professor Spanier is a member of the American Physical Society, the American Chemical Society and the Materials Research Society.

**Pubblicazioni / Books and
Articles**

Publications (of the last 5 years)

39. G. Chen, G. Sun, Y. J. Ding, I. Maccoli, N. Lovergine, P. Prete and J. E. Spanier, "Direct measurement of band edge discontinuity in single core-shell nanowires by photocurrent spectroscopy," *in preparation* (2013).
38. G. Chen, T. McGuckin, E. M. Gallo, P. Prete, N. Lovergine, and **J. E. Spanier**, "Coupled carrier transport dynamics in GaAs/AlGaAs core-shell nanowires," *in preparation* (2013).
37. E. M. Gallo, A. Cola, F. Quaranta, and **J. E. Spanier**, "High speed photodetector based on a two-dimensional electron/hole gas heterostructure," *submitted to Appl. Phys. Lett.* (2013).
36. S. H. Johnson, M. Torres, G. Chen and J. E. Spanier "Probing the size-dependence of the ferroelectric phase transition temperature in individual BaTiO₃ nanocubes," *resubmitted*, (2013).
35. M. Golalikhani, Q. Y. Lei, G. Chen, **J. E. Spanier**, H. Ghassemi, C. L. Johnson, M. L. Taheri, and X. X. Xi, "Stoichiometry of LaAlO₃ films grown on SrTiO₃ by pulsed laser deposition," *J. Appl. Phys.* (2013), *in press*.
34. M. D. Scafetta, Y. Xie, M. Torres, **J. E. Spanier** and S. J. May, "Optical properties of La_{1-x}Sr_xFeO₃ epitaxial thin films," *Appl. Phys. Lett.*, (2013), *in press*.
33. F. Yan, G. Chen, L. Lu, P. Finkel and **J. E. Spanier**, "Spatially-resolved magnetoelectric coupling and magnetoelastic control of ferroelectric switching in BiFeO₃-CoFe₂O₄ nanocomposite thin film," *Appl. Phys. Lett.* (2013), *in press*.
32. M. A. Islam, J. M. Rondinelli, and **J. E. Spanier**, "Normal mode determination of perovskite crystal structures with octahedral rotations: theory and applications," <http://arxiv.org/abs/1208.1789>, and *J. Phys. Condensed Matter*, (2013), *in press*.
31. I. Grinberg, D. V. West, M. Torres, G. Gou, D. M. Stein, G. Chen, E. M. Gallo, P. K. Davies, **J. E. Spanier** and A. M. Rappe, "Semiconductor ferroelectrics for robust and efficient oxide photovoltaics," *submitted*, *in*

- revision (2012-3).
30. C. J. Hawley, T. McGuckin and **J. E. Spanier**, "Selective surface passivation of Ge nanowire segments via a hybrid oxide-stabilized/vapor-liquid-solid growth method," *Crystal Growth & Design*, ASAP (2012). DOI: 10.1021/cg3016595
 29. S. S. Nonnenmann, M. A. Islam, B. R. Beatty, E. M. Gallo, T. McGuckin and **J. E. Spanier**, "The ferroelectric field effect in an integrated core-shell nanowire," *Advanced Functional Mater.* (2012), DOI: 10.1002/afdm.201200865.
 28. C. J. Hawley, B. R. Beatty, G. Chen and **J. E. Spanier**, "Shape-controlled vapor transport growth of Te nanowires," *Crystal Growth & Design* 12, 2789 (2012)
 27. F. Yan, G. Chen, L. Lu, and **J. E. Spanier**, "Dynamics of photogenerated charge on BiFeO₃ films," *ACS Nano* 6, 2353 (2012).
 26. N. M. Sbrockey, M. Luong, E. M. Gallo, J. D. Sloppy, G. Chen, C. R. Winkler, S. H. Johnson, M. L. Taheri, G. S. Tompa and **J. E. Spanier**, "LaAlO₃/SrTiO₃ epitaxial heterostructures by atomic layer deposition," *J. Electron Mater.* 41, 819 (2012).
 25. G. Chen, E. M. Gallo, O. D. Leaffer, T. McGuckin, **P. Prete**, **N. Lovergine** and **J. E. Spanier**, "Tunable hot-electron transfer within a single core-shell nanowire," *Phys. Rev. Lett.* 107, 156802 (2011).
 24. S. H. Johnson. P. Finkel, S. S. Nonnenmann and **J. E. Spanier**, "Magneto-elastic tuning of ferroelectricity within a magnetoelectric nanowire," *Appl. Phys. Lett.* 99, 182901 (2011).
 23. E. M. Gallo, G. Chen, M. Currie, T. McGuckin, **P. Prete**, **N. Lovergine**, B. Nabet and **J. E. Spanier**, "Picosecond response times in GaAs/AlGaAs core/shell nanowire-based photodetectors," *Appl. Phys. Lett.* 98, 241113 (2011).
 22. B. I. Willner, S. Sun, **J. E. Spanier**, C. J. Hawley, A. Du Pasquier, R. E. Tompa, and G. S. Tompa, "Zinc Oxide Nanowire Growth In Rotating Disc Reactors," *submitted to J. Nano. Res.* (2010).
 21. T. McGuckin, E. M. Gallo and **J. E. Spanier**, "Evolution of the local potential profile in Schottky-contacted Ge nanowires," *submitted to Appl. Phys. Lett./in revision* (2013).
 20. S. S. Nonnenmann, E. M. Gallo, and **J. E. Spanier**, "Redox-based resistive switching in ferroelectric perovskite nanotubes," *Appl. Phys. Lett.* 97, 102904 (2010).
 19. D. Bruzzese,* K. Fahnestock,* C. L. Schauer, **J. E. Spanier**, C. Weiss, M. W. Cole, N. M. Sbrockey, and G. S. Tompa, "The optical dielectric function in monolithic Ba_xSr_{1-x}TiO₃ films," *Integr. Ferro.* 111, 27 (2010).
 18. G. Chen, E. M. Gallo, J. Burger,* B. Nabet, A. Cola, P. Prete, N. Lovergine, and **J. E. Spanier**, "On direct writing methods for electrically contacting GaAs and Ge nanowire devices," *Appl. Phys. Lett.* 96, 223107 (2010).
 17. G. R. Soja, B. R. Beatty,* D. G. Bruzzese,* K. J. Fahnestock,* J. D. Hettinger, S. E. Lofland, C. L. Schauer and **J. E. Spanier**, "Atomic layer deposition of Pb-Ti-O thin films using lead (ii) hexafluoroacetylacetonate," *submitted to Chem. Mater.* (2010).
 16. S. S. Nonnenmann, O. D. Leaffer, E. M. Gallo, M. T. Coster,* and **J. E. Spanier**, "Finite curvature-mediated ferroelectricity," *Nano Lett.* 10, 542-546 (2010).
 15. A. Ramanan, K. V. Ramanujachary, **J. E. Spanier**, and S. E. Lofland, "Magnetism in layered Cu-Mo cluster compounds," *submitted to Phys. Rev. B.*
 14. B. Garipcan, S. Odabas, G. Demirel, J. Burger*, S. S. Nonnenmann, M. T. Coster, E. M. Gallo, B. Nabet, **J. E. Spanier**, and E. Piskin, "In vitro biocompatibility of n-type and undoped Si nanowires," *Advanced Engineering Materials*, 2010.
 13. T. S. Kalkur, N. Sbrockey, G. S. Tompa, S. P. Alpay, **J. E. Spanier**, E. M. Gallo, and M. W. Cole, "Low-voltage tunable band-pass filters using barium strontium titanate parallel plate capacitors," *Integr. Ferro.* 112, 1 (2009).

12. S. S. Nonnenmann, E. M. Gallo, M. T. Coster*, G. R. Soja, R. S. Joseph,* and **J. E. Spanier**, "Piezoresponse through a ferroelectric nanotube wall," *Appl. Phys Lett.* 95, 223903 (2009).
11. S. H. Johnson, C. L. Johnson, S. J. May, S. Hirsch, M. W. Cole and **J. E. Spanier**, "Co@CoO@Au core-multi-shell nanocrystals," *J. Mater. Chem.* 20, 439 (2010).
10. B. Manoun, O. D. Leaffer, S. Gupta, E. N. Hoffman, S. K. Saxena, **J. E. Spanier** and M. W. Barsoum, "On the compression behavior of Ti₂InC (Ti_{0.5}Zr_{0.5})₂InC and M₂SnC (M = Ti, Nb, Hf) to quasi-hydrostatic pressures up to 50 GPa," *Solid State Commun.*, 149, 1978 (2009).
9. S. S. Nonnenmann and **J. E. Spanier**, "Ferroelectricity in chemical nanostructures: proximal probe characterization and the surface chemical environment," *J. Mater. Sci (invited review)* 44, 5205 (2009).
8. V. R. Binetti, J. D. Schiffman, O. D. Leaffer, **J. E. Spanier** and C. L. Schauer, "The natural transparency and piezoelectric response of the *Greta oto* butterfly wing," *Integrative Biology* 1, 1-9, **2009**.
7. J. A. Shackelford, R. Grote*, B. Nabet, M. Currie, and **J. E. Spanier**, "Integrated plasmonic lens photodetector," *Appl. Phys. Lett.* 94, 083501, **2009**.
6. T. H. Scabarozzi, S. Amini, O. Leaffer, A. Ganguly, **J. E. Spanier**, M. W. Barsoum, S. E. Lofland, J. D. Hettinger, "Thermal expansion of select MAX phases measured by high-temperature x-ray diffraction and dilatometry," *J. Appl. Phys.*, 105, 013543, **2009**.
5. B. Garipcan, J. Winters*, S. S. Nonnenmann, O. D. Leaffer, J. S. Atchison, E. Piskin, B. Nabet, and **J. E. Spanier**, "Controllable formation of nano-scale patterns on TiO₂ by conductive-AFM nanolithography," *Langmuir* 24, 8944, **2008**.
4. T. H. Scabarozzi, S. Amini, P. Finkel, O. D. Leaffer, **J. E. Spanier**, M. W. Barsoum, S. E. Lofland, J. D. Hettinger, "Electrical, thermal and elastic properties of Ti₂SC: an unusual MAX-phase material," *J. Appl. Phys.* 104, 033502, **2008**.
3. H. Drulis, O. D. Leaffer, **J. E. Spanier**, and M. W. Barsoum, "On the heat capacities of Ta₂AlC, Ti₂SC and Cr₂GeC," *J. Appl. Phys.* 104, 023526, **2008**.
2. L. Cao, B. Garipcan, E. Piskin, B. Nabet and **J. E. Spanier**, "Excitation of local field enhancement on silicon nanowires," *Nano Lett.*, 8, 601-605, **2008**.
1. X. Zhao, M. Currie, A. Cola, F. Quaranta, E. Gallo, **J. E. Spanier** and B. Nabet, "Two-dimensional-gas-based vertical field metal-semiconductor-metal photodetectors," *IEEE Trans. Electron. Dev. Lett.*, **2008**.

Peer-reviewed book chapters:

2. **J. E. Spanier**, "One-Dimensional Semiconductor and Oxide Nanostructures," *Chapter 9 in Handbook of Nanomaterials*, Y. Gogotsi, ed. CRC Press, Boca Raton, FL, **2005**.
1. **J. E. Spanier**, J. J. Urban, L. Ouyang, W. S. Yun and H. Park, "Ferroelectric Nanowires," in *Nanowires and Nanobelts, Volume II: Material Properties and Devices*, Z. L. Wang, ed., Kluwer Academic, **2003**.

Manuscripts published in peer-reviewed conference proceedings:

4. S. Odabas, B. Garipcan, G. Demirel, J. Burger, S. S. Nonnenmann, M. T. Coster, E. M. Gallo, B. Nabet, **J. E. Spanier**, and E. Piskin, "In vitro biocompatibility of plain and doped silicon nanowires," *Tissue Engineering Part A*, 14, 5, 863-864, P205, May 2008.
3. A. Cola, F. Quaranta, A. Persano, A. Taurino, M. Currie, E. Gallo, X. Zhao, **J. E. Spanier**, and B. Nabet, "Development of a new photodetector based on a two-dimensional hole gas," *accepted for presentation and publication*

at the 2007 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Salvador, Brazil, 2007.

2. X. Zhao, A. Cola, F. Quaranta, A. Persano, E. Gallo, **J. E. Spanier** and B. Nabet, "Modeling of A High-Sensitivity Heterostructure Varactor with Optical Modulation Capability," *accepted for presentation and publication at the 2007 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Salvador, Brazil, 2007.*
1. M. F. MacMillan, R. P. Devaty, W. J. Choyke, D. Goldstein, **J. E. Spanier**, and A. D. Kurtz, "Infrared reflectance of porous SiC layers," in *Silicon Carbide and Related Materials 1995*, (Institute of Physics, London, 1996), IOP Conf. Proc. Chap. 7, p. 1075, 1996.

Patents

7. "Semiconductor ferroelectric compositions and their use in photovoltaic devices (US Non-Provisional Application No. 61/545,932, filed Oct. 11, 2012), A. M. Rappe, P. K. Davies, **J. E. Spanier**, I. Grinberg, and D. V. West.
6. "Tunable hot-electron transfer within a nanostructure" (US Non-Provisional No. 61/539,075, filed , **J. E. Spanier**, G. Chen and E. M. Gallo.
5. "Low-vacuum atomic layer deposition and formation of hetero-epitaxial ABO₃ perovskite films" N. M. Sbrockey, **J. E. Spanier**, G. S. Tompa, and M. Aranguren, and B. R. Beatty, U.S. and International Provisional filing (2011).
4. "Integrated Semiconductor and Transition-Metal Oxide Nanostructures and Devices and Method for Preparing", **J. E. Spanier**, S. S. Nonnenmann, R. S. Joseph. U. S. Patent pending.
3. "Nanowire-Based Plasmonics," B. Nabet and **J. E. Spanier**, U. S. Patent pending.
2. "Vertical cavity-emitting porous silicon carbide light-emitting diode device and preparation thereof", **J. E. Spanier** and A. D. Kurtz, U.S. Patent No. 5,939,732, filed May 22, 1997, assigned to Kulite, Inc.
1. "Passivation of porous semiconductors for improved optoelectronic device performance and fabrication of light-emitting diode based on same", **J. E. Spanier** and A. D. Kurtz, U.S. Patent No. 5,834,378, filed Oct. 1, 1996, assigned to Kulite, Inc.

Selected Presentations and Lectures

Invited lectures/presentations

50. Title TBA, Department of Materials Science & Engineering Seminar, University of Pennsylvania, March 14, 2013.
49. "Meta-capacitance", Semiconductor Research Corporation, Nanoscale Research Initiative (NRI), National Meeting (invited), October, 2012.
48. "Finite curvature: ferroelectricity and electronic transport in single- and multi-component nanostructured materials," Weizmann Institute of Science, April 2012.
47. "Finite curvature: ferroelectricity and electronic transport in single- and multi-component nanostructured materials," Northeastern University, December, 2011.
46. "Finite curvature: ferroelectricity and electronic transport in single- and multi-component nanostructured materials," Princeton Institute for the Science & Technology of Materials (PRISM), Princeton University, Dec. 8, 2010.
45. "Finite curvature: ferroelectricity and electronic transport in single- and multi-component nanostructured materials," DARPA Advanced Materials Research Institute (AMRI), University of New Orleans, Oct. 21, 2010.
44. "Finite curvature: ferroelectricity and electronic transport in single- and multi-component nanostructures," MS&T Meeting, Houston, TX, Oct. 20,

2010

43. "Ferroelectricity, electroresistance, and field effects in multi-component nanostructures," IMRC Meeting, Cancun, Mexico, Aug. 17, 2010
42. "Finite size and finite curvature: ferroelectricity, piezoelectricity, and magnetoelectricity," US Naval Undersea Warfare Center, Newport, RI, 4 Aug, 2010.
41. "GaAs and AlGaAs/GaAs nanowire-based transistors and their carrier transport," ICST2010, Lecce, Italy, May, 2010.
40. "Finite curvature: ferroelectricity and electronic transport in single- and multi-component nanostructures," Columbia University, April 2010.
39. "Finite curvature: FE and electronic transport in single- and multi-component nanostructures," ARW Physics of Computer Technologies, PhysCompTech2009, Brazil, March 2010.
38. "Inorganic nanowires: finite size and shape," IBM Research, Albany, NY, Dec. 18, 2009.
37. "Inorganic nanowires: finite size and shape, and surface chemistry driven properties," Department of Chemistry Colloquium, Drexel University, Nov. 19, 2009.
36. "Scanning probe microscopy of individual ferroelectric nanostructures," presentation #333, Eastern Analytical Symposium and Exposition, Nov. 17, 2009.
35. "Finite curvature-driven giant ferroelectric response in co-axial cylindrical nanostructures," XVIII International Materials Research Congress, Cancun, Mexico, August 2009
34. "Raman scattering spectroscopy of semiconductor nanowires," Photonica 09: II International School and Conference on Photonics, Belgrade, August 2009.
33. "When beauty is only skin deep: molecular adsorbate and inorganic nanowire interactions," University of Maryland, May 2009.
32. "Towards probing and chemical control of nanostructures via molecular adsorbates," Washington State University, Nov. 18. 2008.
31. "Raman spectroscopy involving single- and multi-component nanowires", European Materials Research Society meeting, Warsaw, Poland, Sept. 15, 2008.
30. "Multicomponent nanowires," University di Salento, Lecce, Italy April, 2008.
29. "Toward chemical control of ferroelectrics via molecular adsorbates," Department of Chemistry, University of Buffalo, Buffalo, NY, orig. sched. Nov. 2, 2007, postponed to Oct. '08.
28. "On the crafting of fields within and near low-dimensional solids," Seminar Series in Nanoelectronics, Electromagnetics & Photonics (NEP), Department of Electrical and Computer Engineering, University of Delaware, Oct. 24, 2007.
27. "Hybrid semiconductor-ferroelectric and metal-ferroelectric nanostructures," Focus Session on Phase Transitions, Domains and Properties of Ferroelectric Nanostructures, Abstract A39.00001, American Physical Society March Meeting, Denver, CO, March, 2007.
26. "The growth and properties of tapered and helical nanostructures," Columbia Center for Integrated Science and Engineering (CISE), Columbia University, New York, NY, Dec. 13, 2006.
25. "Molecular adsorbates and ferroelectric nanostructures: a 'memorable' combination," First Annual Conference on the Physics, Chemistry and Biology of Water 2006, Brattleboro, VT, Oct. 2006.
24. "Surprises in the Chemistry and Physics of Inorganic Nanostructures," Institute of Materials Science, University of Connecticut, Storrs, CT, Oct. 4, 2006
23. "Synthesis and characterization of nano-scaled semiconductor- and metal-ferroelectric hybrid nanostructures," International Materials Research

- Congress, Cancun, Mexico, Aug. 2006.
22. "Controlling the optical properties in selected 2D and 1D-like materials and devices," Micron Technology Corporation, Boise, ID, Aug. 2006.
 21. "Surprises in the Chemistry and Physics of Inorganic Nanostructures," Department of Materials Science & Engineering, Drexel University, Philadelphia PA, May 16, 2006.
 20. "Adsorbate-induced ferroelectricity and finite-size scaling in perovskite nanostructures," Symposium on Transition Metal Oxides, ACS National Meeting, Washington DC and in Abstracts of Papers of the American Chemical Society 230: U2797-U2797 56-PHYS, 28 Aug, 2005.
 19. "Adsorbate-induced ferroelectricity," International Materials Research Congress, Cancun, Mexico, Aug., 2005.
 18. "Adsorbate-induced ferroelectricity and finite-size scaling in nanostructures," National Nanotechnology Laboratory, University of Lecce, Italy, May, 2005.
 17. "Adsorbate-induced ferroelectricity and finite-size scaling in nanostructures," Department of Physics, University of Arkansas, Fayetteville, AR, April 15, 2005.
 16. "Ferroelectricity in Nanowires: Finite-Size Scaling and Screening," Department of Physics, Queens College, Queens, NY, March 7, 2005.
 15. "Ferroelectricity in Nanowires: Finite-Size Scaling and Screening," Department of Physics, Condensed Matter Seminar Series, University of Pennsylvania, Feb. 2, 2005.
 14. "Interpretation of Heat Capacity and Raman Scattering in MAX Phases using MedeA-VASP-PHONON," Materials Design Workshop, Orcas Island, WA, June 19, 2004.
 13. "Finite-size scaling of ferroelectricity in single crystalline nanostructures," XIII International Materials Research Congress, Symposium 9, Ferroelectricity and Piezoelectricity, Cancun, Mexico, Aug., 2004.
 12. "Single-crystalline ferroelectric nanostructures and finite-size scaling," Pre-APS Workshop on Nanoscience and Nanostructured Materials, Montreal, Quebec, March, 2004.
 11. "Probing of finite-size scaling of ferroelectricity in individual nanowires," Materials Sciences Division, U. S. Naval Research Laboratory, Washington DC, Dec. 10, 2003.
 10. "Ferroelectric phase transition in individual barium titanate nanowires," 10th European Meeting on Ferroelectricity, UK, August 7, 2003.
 9. "Finite size scaling of ferroelectricity in individual barium titanate nanowires," Dept. of Materials Science and Metallurgy, Cambridge University, Cambridge UK, August 5, 2003.
 8. "Optical Properties of Nanoscale and Nanoparticle Oxide Materials," Department of Materials Science & Engineering, University of Delaware, February, 2003.
 7. "Optical Properties of Nanoscale and Nanoparticle Oxide Materials," Department of Materials Science & Engineering, Drexel University, January, 2003.
 6. "Optical Properties of Nanoscale and Nanoparticle Oxide Materials," Technion, Israel Inst. of Technology, Haifa, Israel, May 31, 2001.
 5. "Optical and Electrochemical Studies and Novel Applications of Porous SiC," Technion, May 24, 2001.
 4. "Optical and Electrochemical Properties of Nanoscale Materials," Dept. of Materials Science, Northwestern Univ., Evanston, IL, April, 2001.
 3. "Optical and Electrochemical Properties of Nanoscale Materials," Dept. of Physics, Univ. of Pennsylvania, Condensed Matter Groups, Phila., PA, April, 2001.
 2. "Optical and Electrochemical Properties of Nanoscale Materials," Harvard University Park Group, Cambridge MA, April, 2001.

1. "Properties of Luminescent Nanoporous Silicon Carbide," Dept. of Physics, Drew University, Madison, NJ, Nov. 11, 1997.

Selected contributed lectures/presentations

30. "Carrier transport in MOVPE-grown GaAs and core-shell GaAs/AlGaAs nanowires," poster presented by Guannan Chen, M11.55, MRS Fall Meeting, 2009.
29. "Finite curvature mediated ferroelectricity in co-axial nanowires," poster presented by PhD student Stephen Nonnenmann, presentation M16.33, MRS Fall Meeting, 2009.
28. "Co@CoO@Au core-multishell nanocrystals," poster presented by PhD student Stephanie Johnson.
27. "Photoluminescence spectroscopy of a 2D electron-hole gas heterostructure," talk presented by PhD student Eric Gallo, Presentation O5.5, MRS Fall Meeting, 2009.
26. "Electron beam induced current microscopy of Ge nanowires," talk presented by PhD student T.McGuckin, Presentation O6.4, MRS Fall Meeting, 2009.
25. "Characterization of monolithic and compositionally graded multilayer BST thin films," poster presentation at the XVIII International Materials Research Congress, Cancun Mexico 8/2009
24. "Ferroelectricity in ultrathin oxide perovskite nano-shells," contributed presentation at the Villa Conference on Complex Oxide Heterostructures, St. Thomas, US VI
23. "Atomic layer deposition of ferroelectric oxide perovskite thin films," poster presentation at the Villa Conference on Complex Oxide Heterostructures, St. Thomas US VI
22. "Finite curvature-driven giant ferroelectric response in co-axial cylindrical nanostructures," poster presentation at the Fall MRS Meeting Boston MA December, 2008.
21. "Instability and Transport of Metal Catalyst in the Growth of Silicon Nanostructures," Abstract No. L7.18, Materials Research Society Fall Meeting, Boston, MA, Nov. 29, 2006.
20. "Growth and characterisation of magnetron sputtered alumina – zirconia thin films", D. H. Trinh, M. Ottosson, M. Beckers, M. Collin, I. Reineck, S.S. Nonnenmann, J.E. Spanier, L. Hultman, H. Högberg, The 53rd Annual American Vacuum Society Symposium, San Francisco, Nov., 2006.
19. "Local Density of States in Nanoscale Systems Measured by Electrostatic Force Microscopy," APS March Meeting, Baltimore, MD, Abstract No. U31.00012, March 2006.
18. "Adsorbate-Induced Ferroelectricity in Nanostructures," APS March Meeting, Baltimore, MD, Abstract No. G37.00001, March 14, 2006.
17. "Enhanced Raman Scattering from Individual Semiconductor Nanocones and Nanowires," APS March Meeting, Baltimore, MD, Abstract No. D31.00001, March 13, 2006.
16. "Synthesis and Characterization of Diamond-Hexagonal Si and Ge Nanocones," (poster), Materials Research Society (MRS) Fall Meeting, Boston, MA, Abstract No. P3.15, 2005.
15. "Ferroelectricity in Nanowires: Finite-Size Scaling and Screening," 2005 Workshop on the Fundamental Physics of Ferroelectrics, Williamsburg, VA, February 7, 2005.
14. "Acquisition of a Zyvx L100 nanomanipulation device for biological, electronic, and optoelectronic samples and devices." Design, Service and Manufacturing Research and Grantees Conference, January 2005.
13. "First-order Raman scattering from the MAX phases," MRS Fall Meeting, Boston MA, Abstract No. FF4.9, November 30, 2004.
12. "Ferroelectricity in Individual Barium Titanate Nanowires," MRS Fall Meeting, Boston, MA, Abstract N12.10, Dec. 4, 2003.
11. "Ferroelectric phase transition of individual barium titanate nanowires," APS March Meeting, Austin, TX Abstract A19.014, March 3, 2003.

10. "Size-Dependent Properties of CeO_{2-y} Nanoparticles as Studied by Raman Scattering," Nanostructured Materials: Present Science and Future Technology, MRSEC/IGERT Symposium at Columbia Univ., New York, June 22, 2001.
9. "Size-Dependent Properties of Nanoparticle CeO_{2-y}," Nanoscience: Underlying Physical Concepts and Phenomena, Arthur M. Sackler Colloquia, National Academy of Sciences, Washington, DC, May 18, 2001.
8. "Application of Electrochemical Impedance Spectroscopy to the Study of *n* and *p*-type SiC Electrodes During Anodic Dissolution," 197th Meeting of the Electrochem. Soc., Toronto, Canada, Abstract 1302, May 17, 2000.
7. "Raman Scattering From Vapor Phase Epitaxial Growth of SiC on Porous 6H-SiC," 197th Meeting of the Electrochem. Soc., Toronto, Canada, Abstract 422, May 16, 2000.
6. "Mean-field Dielectric Function Modeling of Porous SiC Using a Statistical Approach," MRS Fall Meeting, 7. Boston, MA, Abstract F5.32, Dec. 1, 1998.
5. "Low Pressure Chemical Vapor Deposition Patterned Oxide Film Deposition in Mechanically Masked Systems," MRS Fall Meeting, Boston, MA, Abstract OO12.9, Dec. 2, 1998.
4. "Infrared Reflection Spectroscopy of As-Anodized and Passivated 6H and 4H Porous SiC," Porous Semiconductors: Science & Technology, Mallorca, Spain, Abstract O-44, March 17, 1998.
3. "Optical Properties of As-Anodized and Passivated 6H and 4H Porous SiC," MRS Fall Meeting, Boston, MA, Abstract H12.2, Dec. 3, 1997.
2. "Effects of Nanocrystalline Structure and Passivation on the Photoluminescent Properties of Porous SiC," MRS Fall Meeting, Boston, MA, Abstract Q20.28, Dec. 5, 1996.
1. "Experimental Investigation of Enhancements in Scattered Pressure Field of Fluid-Loaded Shell with Periodic Structure," 125th Meeting of the Acoustical Society of America, Ottawa, Canada, Abstract 5aSA10, May, 1993.

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