# Gary Rubloff – PUBLICATIONS

[1] U. Gerhardt and G. W. Rubloff, “A Normal Incidence Scanning Reflectometer of High Precision,” Appl Optics, vol. 8, no. 2, pp. 305-&, 1969.

[2] G. W. Rubloff, F. H, U. Gerhardt, and J. Freeouf, “Far Ultraviolet Spectroscopy of Solids in Range 6-36 eV Using Synchrotron Radiation from an Electron Storage Ring,” *Rev Sci Instrum*, vol. 42, no. 10, pp. 1507–&, 1971.

[3] G. W. Rubloff, J. Freeouf, F. H, and K. Murase, “Far-Ultraviolet Reflectance Spectra of Ionic Crystals,” *Phys Rev Lett*, vol. 26, no. 21, pp. 1317–&, 1971.

[4] G. W. Rubloff, “Normal-Incidence Reflectance, Optical Properties, and Electronic Structure of Zn,” *Phys Rev B*, vol. 3, no. 2, pp. 285–&, 1971.

[5] E. Anastassakis, F. H. Pollak, and G. W. Rubloff, “Effects of Uniaxial Stress on Resonance Raman Scattering near the E1 Gap in InSb,” *Proc. Eleventh Intl. Conf. Physics of Semiconductors*, p. 1188, 1972.

[6] F. H. Pollak and G. W. Rubloff, “Piezo-Optical Evidence for Lambda Transitions at 3.4-Ev Optical Structure of Silicon,” *Phys Rev Lett*, vol. 29, no. 12, pp. 789–&, 1972.

[7] G. W. Rubloff, “Far Ultraviolet Reflectance Spectra and Electronic-Structure of Ionic-Crystals,” *Phys Rev B*, vol. 5, no. 2, pp. 662–&, 1972.

[8] G. W. Rubloff, J. Anderson, and P. J. Stiles, “Optical Spectroscopy of Surfaces - Reflectance Studies of Chemisorption,” *Surf Sci*, vol. 37, no. 1, pp. 75–81, 1973.

[9] G. W. Rubloff, A. E, and F. H. Pollak, “Resonance Raman-Scattering in Inas near E1 Gap,” *Solid State Commun*, vol. 13, no. 11, pp. 1755–1759, 1973.

[10] J. Anderson, G. W. Rubloff, and P. J. Stiles, “Optical Reflectance Studies of Chemisorption on a Clean Metal Surface,” *Solid State Commun*, vol. 12, no. 9, pp. 825–828, 1973.

[11] T. K. Bergstresser and G. W. Rubloff, “Local-Field Effects in Optical Properties of Solids - Far Ultraviolet Spectra of Ionic-Crystals,” *Phys Rev Lett*, vol. 30, no. 17, pp. 794–797, 1973.

[12] J. Anderson, G. W. Rubloff, and P. J. Stiles, “Adsorbate-Induced Changes in Optical Reflectance of Metal-Surfaces in Ultrahigh-Vacuum,” *J Vac Sci Technol*, vol. 10, no. 1, pp. 295–&, 1973.

[13] G. W. Rubloff, J. Anderson, M. A. Passler, and P. J. Stiles, “Optical Reflectance Spectroscopy of Surface States in H2 Chemisorption on W(100),” *Phys Rev Lett*, vol. 32, no. 12, pp. 667–670, 1974.

[14] J. Anderson, G. W. Rubloff, M. A. Passler, and P. J. Stiles, “Surface Reflectance Spectroscopy Studies of Chemisorption on W(100),” *Phys Rev B*, vol. 10, no. 6, pp. 2401–2415, 1974.

[15] A. E, F. H. Pollak, and G. W. Rubloff, “Resonance Raman-Scattering under [111] Uniaxial Stress in Region of E1 Gap in Inas,” *Phys Rev B*, vol. 9, no. 2, pp. 551–553, 1974.

[16] J. Anderson, G. W. Rubloff, M. A. Passler, and P. J. Stiles, “Surface Reflectance Spectroscopy (Srs) Studies of Chemisorption on W(100),” *J Vac Sci Technol*, vol. 11, no. 1, pp. 271–271, 1974.

[17] H. Luth, G. W. Rubloff, and W. D. Grobman, “Ultraviolet-Photoemission Studies of Formic-Acid Decomposition on Zno Nonpolar Surfaces,” *Solid State Commun*, vol. 18, no. 11, pp. 1427–1430, 1976.

[18] G. W. Rubloff, W. D. Grobman, and H. Luth, “Unusual Extramolecular Relaxation Polarization Shifts of Low-Lying Orbitals in Uv Photoemission Spectra of Adsorbed Organic-Molecules,” *Phys Rev B*, vol. 14, no. 4, pp. 1450–1457, 1976.

[19] G. W. Rubloff, H. Luth, and W. D. Grobman, “Orbital Shifts Associated with Chemical Bonding of Organic-Molecules on Zno Nonpolar Surfaces,” *J Vac Sci Technol*, vol. 13, no. 1, pp. 333–333, 1976.

[20] G. W. Rubloff, H. Luth, and W. D. Grobman, “Orbital Energy Shifts Associated with Chemical Bonding of Organic-Molecules on Zno Nonpolar Surfaces,” *Chem Phys Lett*, vol. 39, no. 3, pp. 493–496, 1976.

[21] H. Luth, G. W. Rubloff, and W. D. Grobman, “Chemisorption and Decomposition Reactions of Oxygen-Containing Organic-Molecules on Clean Pd Surfaces Studied by Uv Photoemission,” *Surf Sci*, vol. 63, no. 1, pp. 325–338, 1977.

[22] G. W. Rubloff and J. E. Demuth, “Ultraviolet Photoemission and Flash-Desorption Studies of Chemisorption and Decomposition of Methanol on Ni(111),” *J Vac Sci Technol*, vol. 14, no. 1, pp. 419–423, 1977.

[23] H. Luth, G. W. Rubloff, and W. D. Grobman, “Chemisorption of Organic-Molecules on Zno(1100) Surfaces - C5h5n,(Ch3)2co, and (Ch3)2so,” *Surf Sci*, vol. 74, no. 2, pp. 365–372, 1978.

[24] G. W. Rubloff, “Selection Rule Effects in Electronic Excitations of Chemisorbed Molecules as Studied by Energy-Loss Spectroscopy,” *Solid State Commun*, vol. 26, no. 8, pp. 523–525, 1978.

[25] G. W. Rubloff, “Time-Resolved Spectroscopic Studies of Surface Reations,” *Proc. th Symp. on Fluid-Solid Surface*, p. 190, 1978.

[26] G. W. Rubloff and J. L. Freeouf, “Surface Optical Excitations Associated with Co Chemisorption on Ni(111),” *Phys Rev B*, vol. 17, no. 12, pp. 4680–4688, 1978.

[27] G. W. Rubloff, H. Luth, J. E. Demuth, and W. D. Grobman, “Cyclohexane Dehydrogenation on Clean Pd Surfaces Studied by Uv Photoemission,” *J Catal*, vol. 53, no. 3, pp. 423–427, 1978.

[28] Z. A. Weinberg and G. W. Rubloff, “Exciton Transport in SiO2 as a Possible Cause of Surface-State Generation in MOS Structures,” *Appl Phys Lett*, vol. 32, no. 3, pp. 184–186, 1978.

[29] Z. A. Weinberg and G. W. Rubloff, “Exciton Transport in SiO2,” in *The Physics of SiO and Its Interfaces*, S. T. Pantelides, Ed. Pergamon Press, NY, 1978, p. 24.

[30] G. W. Rubloff, “Photoemission-Studies of Time-Resolved Surface-Reactions - Isothermal Desorption of Co from Ni(111),” *Surf Sci*, vol. 89, no. 1, pp. 566–574, 1979.

[31] J. L. Freeouf, G. W. Rubloff, P. S. Ho, and T. S. Kuan, “Microscopic Compound Formation at the Pd-Si(111) Interface,” *Phys Rev Lett*, vol. 43, no. 24, pp. 1836–1839, 1979.

[32] Z. A. Weinberg, G. W. Rubloff, and E. Bassous, “Transmission, Photoconductivity, and the Experimental Band-Gap of Thermally Grown SiO2-Films,” *Phys Rev B*, vol. 19, no. 6, pp. 3107–3117, 1979.

[33] P. S. Ho, T. Y. Tan, J. E. Lewis, and G. W. Rubloff, “Chemical and Structural-Properties of the Pd-Si Interface during the Initial-Stages of Silicide Formation,” *J Vac Sci Technol*, vol. 16, no. 5, pp. 1120–1124, 1979.

[34] P. S. Ho, J. L. Freeouf, G. W. Rubloff, T. Y. Tan, J. E. Lewis, and T. S. Kuan, “Properties of the Pd-Si Interface during Initial Silicide Formation,” *J Electrochem Soc*, vol. 126, no. 8, pp. C343–C343, 1979.

[35] Z. A. Weinberg, D. R. Young, D. J. Dimaria, and G. W. Rubloff, “Exciton or Hydrogen Diffusion in SiO2,” *J Appl Phys*, vol. 50, no. 9, pp. 5757–5760, 1979.

[36] G. W. Rubloff, “Time-Resolved Spectroscopic Studies of Surface Reactions,” Proc Fourth Symposium of Fluid-Solild Surface Interactions (a program of the Scientific Data Exchange Agreement MWDDEA-N-72-G-4210 between the U Dept. of the Navy and the West Germany Federal Ministry of Defense), held at National Bureau of Standards, Gaithersburg, MD Oct 18-20, 1978., pp. 1–14, Feb. 1979.

[37] P. S. Ho, G. W. Rubloff, J. E. Lewis, V. L. Moruzzi, and A. R. Williams, “Chemical Bonding and Electronic Structure of Pd2Si,” *Thin Film Interfaces and Interactions, The Electrochemical Society*, p. 85, 1980.

[38] G. W. Rubloff, “Photoemission Studies of Chemical Bonding and Reacdtions at the Metal/Silicon Interface,” *Proc. Eighth Intl. Vacuum Congress*, vol. 1, p. 562, 1980.

[39] P. S. Ho, G. W. Rubloff, J. E. Lewis, V. L. Moruzzi, and A. R. Williams, “Chemical Bonding and Electronic-Structure of Pd2si,” *Phys Rev B*, vol. 22, no. 10, pp. 4784–4790, 1980.

[40] J. L. Freeouf, G. W. Rubloff, P. S. Ho, and T. S. Kuan, “Reactive Schottky-Barrier Formation - the Pd-Si Interface,” *J Vac Sci Technol*, vol. 17, no. 5, pp. 916–919, 1980.

[41] G. W. Rubloff, P. S. Ho, J. F. Freeouf, and J. E. Lewis, “Chemical Bonding and Reactions at the Pd-Si Interface,” *Phys Rev B*, vol. 23, no. 8, pp. 4183–4196, 1981.

[42] P. E. Schmid, P. S. Ho, H. Foll, and G. W. Rubloff, “Electronic States and Atomic-Structure at the Pd2si-Si Interface,” *J Vac Sci Technol*, vol. 18, no. 3, pp. 937–943, 1981.

[43] G. W. Rubloff and P. S. Ho, “Electronic-Structure of Silicide Silicon Interfaces,” *Thin Solid Films*, vol. 93, no. 1, pp. 21–40, 1982.

[44] P. S. Ho and G. W. Rubloff, “Electronic States and Microstructure at the Silicide-Silicon Interface,” *Thin Solid Films*, vol. 89, no. 4, pp. 433–446, 1982.

[45] G. W. Rubloff, “Interface States at the Pt Silicide-Si Interface,” *Phys Rev B*, vol. 25, no. 6, pp. 4307–4309, 1982.

[46] J. G. Clabes, G. W. Rubloff, B. Reihl, R. J. Purtell, P. S. Ho, A. Zartner, F. J. Himpsel, and D. E. Eastman, “The Formation of the Schottky-Barrier at the V/Si Interface,” *J Vac Sci Technol*, vol. 20, no. 3, pp. 684–687, 1982.

[47] R. Purtell, J. G. Clabes, G. W. Rubloff, P. S. Ho, B. Reihl, and F. J. Himpsel, “Schottky-Barrier Formation at Pd/Si(111) and V/Si(111) Interfaces,” *J Vac Sci Technol*, vol. 21, no. 2, pp. 615–616, 1982.

[48] R. Purtell, P. S. Ho, G. W. Rubloff, and G. Holinger, “Soft-X-Ray Photoemission Measurement of Schottky-Barrier Formation at the Pd-Si Interface,” *Thin Solid Films*, vol. 104, no. 3, pp. 337–337, 1983.

[49] G. W. Rubloff, “Microscopic Properties and Behavior of Silicide Interfaces,” *Surf Sci*, vol. 132, pp. 268–314, 1983.

[50] R. J. Purtell, P. S. Ho, G. W. Rubloff, and P. E. Schmid, “Formation of the Schottky-Barrier at the Pd/Si Interface,” *Physica B & C*, vol. 117, no. Mar, pp. 834–836, 1983.

[51] R. Purtell, G. Hollinger, G. W. Rubloff, and P. S. Ho, “Schottky-Barrier Formation at Pd, Pt, and Ni/Si(111) Interfaces,” *J Vac Sci Technol A*, vol. 1, no. 2, pp. 566–569, 1983.

[52] R. Butz, G. W. Rubloff, and P. S. Ho, “Chemical Bonding and Reactions at Ti/Si and Ti/Oxygen/Si Interfaces,” *J Vac Sci Technol A*, vol. 1, no. 2, pp. 771–775, 1983.

[53] G. W. Rubloff, “Microscopic Properties and Behavior of Metal-Semiconductor Interfaces,” *Festkor-Adv Solid St*, vol. 23, pp. 179–206, 1983.

[54] G. W. Rubloff, “Silicide Silicon Interface Bonding,” *Ultramicroscopy*, vol. 14, no. 1, pp. 107–119, 1984.

[55] J. G. Clabes, G. W. Rubloff, and T. Y. Tan, “Chemical-Reaction and Schottky-Barrier Formation at V/Si Interfaces,” *Phys Rev B*, vol. 29, no. 4, pp. 1540–1550, 1984.

[56] R. Butz, G. W. Rubloff, T. Y. Tan, and P. S. Ho, “Chemical and Structural Aspects of Reaction at the Ti Si Interface,” *Phys Rev B*, vol. 30, no. 10, pp. 5421–5429, 1984.

[57] J. C. Tsang, R. Matz, Y. Yokota, and G. W. Rubloff, “Raman-Spectroscopy of Silicide Formation at the Pt Crystalline Si Interface,” *J Vac Sci Technol A*, vol. 2, no. 2, pp. 556–560, 1984.

[58] R. Matz, R. J. Purtell, Y. Yokota, G. W. Rubloff, and P. S. Ho, “Chemical-Reaction and Silicide Formation at the Pt/Si Interface,” *J Vac Sci Technol A*, vol. 2, no. 2, pp. 253–258, 1984.

[59] P. O. Hahn, G. W. Rubloff, and P. S. Ho, “Chemical Bonding at the Polyimide Surface,” *J Vac Sci Technol A*, vol. 2, no. 2, pp. 756–760, 1984.

[60] J. C. Tsang, Y. Yokota, R. Matz, and G. Rubloff, “Raman-Spectroscopy of Ptsi Formation at the Pt/Si(100) Interface,” *Appl Phys Lett*, vol. 44, no. 4, pp. 430–432, 1984.

[61] R. Tromp, G. W. Rubloff, P. Balk, F. K. Legoues, and E. J. Vanloenen, “High-Temperature SiO2 Decomposition at the SiO2/Si Interface,” *Phys Rev Lett*, vol. 55, no. 21, pp. 2332–2335, 1985.

[62] R. Purtell, A. Levi, G. Rubloff, and P. S. Ho, “High-Resolution Synchrotron Photoemission-Study of Silicon Metal Interfaces,” *J Vac Sci Technol A*, vol. 3, no. 3, pp. 690–691, 1985.

[63] M. Liehr, F. K. Legoues, G. W. Rubloff, and P. S. Ho, “Chemical-Reactions at Pt/Oxide/Si and Ti/Oxide/Si Interfaces,” *J Vac Sci Technol A*, vol. 3, no. 3, pp. 983–986, 1985.

[64] P. S. Ho, P. O. Hahn, J. W. Bartha, G. W. Rubloff, F. K. Legoues, and B. D. Silverman, “Chemical Bonding and Reaction at Metal Polymer Interfaces,” *J Vac Sci Technol A*, vol. 3, no. 3, pp. 739–745, 1985.

[65] G. W. Rubloff, “Metal-Semiconductor Interfaces and Schottky Barriers,” p. 220, 1985.

[66] P. O. Hahn, G. W. Rubloff, J. W. Bartha, F. LeGoues, R. Tromp, and P. S. Ho, “Chemical Interactions at Metal-Polymer Interfaces,” vol. 40, p. 251, 1985.

[67] K. Hofmann, G. W. Rubloff, D. R. Young, and S. I. Raider, “Defect Generation in MOS Structures Correlated with the Interface Reaction of Si and SiO2,” *European MRS Symp A - Dielectric Layers in Semiconductors Novel Technologies and Devices*, 1986.

[68] H. Lefakis, M. Liehr, G. W. Rubloff, and P. S. Ho, “Alumina-Ti Interface Reactions studied by AES and UPS,” *MRS Symp E - Thin Films - Interfaces and Phenomena*, vol. 54, pp. 133–138, 1986.

[69] R. M. Tromp, G. W. Rubloff, and E. J. Vanloenen, “Low-Temperature Material Reaction at the Ti/Si(111) Interface,” *J Vac Sci Technol A*, vol. 4, no. 3, pp. 865–868, May-Jun 1986.

[70] G. W. Rubloff, R. M. Tromp, E. J. Vanloenen, P. Balk, and F. K. Legoues, “High-Temperature Decomposition of SiO2 at the Si/SiO2 Interface,” *J Vac Sci Technol A*, vol. 4, no. 3, pp. 1024–1025, May-Jun 1986.

[71] M. Liehr, H. Lefakis, F. K. Legoues, and G. W. Rubloff, “Influence of Thin SiO2 Interlayers on Chemical-Reaction and Microstructure at the Ni/Si(111) Interface,” *Phys Rev B*, vol. 33, no. 8, pp. 5517–5525, Apr. 1986.

[72] G. W. Rubloff, R. M. Tromp, and E. J. Vanloenen, “Material Reaction and Silicide Formation at the Refractory-Metal Silicon Interface,” *Appl Phys Lett*, vol. 48, no. 23, pp. 1600–1602, Jun. 1986.

[73] S. I. Raider, K. Hofmann, and G. W. Rubloff, “Void Formation in SiO2-Films Correlated with Crystalline Defects in the Substrate,” *J Electrochem Soc*, vol. 133, no. 8, pp. C318–C318, Aug. 1986.

[74] G. W. Rubloff, K. Hofmann, and D. R. Young, “High-Temperature Reaction and Defect Generation at the Si/SiO2interface,” *J Electron Mater*, vol. 15, no. 5, pp. 292–292, Sep. 1986.

[75] G. Margaritondo, L. J. Brillson, V. Brusic, J. R. Chelikowsky, R. W. Grant, and G. W. Rubloff, “Semiconductor Interfaces,” *Mater Sci Eng*, vol. 83, no. 2, pp. 227–237, Nov. 1986.

[76] D. L. Allara, F. M. Fowkes, J. Noolandi, G. W. Rubloff, and M. V. Tirrell, “Bonding and Adhesion of Polymer Interfaces,” *Mater Sci Eng*, vol. 83, no. 2, pp. 213–226, Nov. 1986.

[77] K. Hofmann, G. W. Rubloff, and R. A. Mccorkle, “Defect Formation in Thermal SiO2 by High-Temperature Annealing,” *Appl Phys Lett*, vol. 49, no. 22, pp. 1525–1527, Dec. 1986.

[78] G. W. Rubloff and H. Beha, “Fundamentals of Laser Photoemission for Testing High Speed Devices and Circuits,” *Proceedings of SPIE*, vol. 795, p. 256, 1987.

[79] M. Liehr, J. E. Lewis, and G. W. Rubloff, “Kinetics of High-Temperature Thermal-Decomposition of SiO2 on Si(100),” *J Vac Sci Technol A*, vol. 5, no. 4, pp. 1559–1562, Jul-Aug 1987.

[80] M. Renier, M. Liehr, S. M. Gates, J. O’Sullivan, G. W. Rubloff, and B. S. Meyerson, “Integrated System for Studies of Thin-Film Chemical Growth-Processes on Silicon-Wafers,” *J Vac Sci Technol A*, vol. 5, no. 4, pp. 2098–2099, Jul-Aug 1987.

[81] K. Hofmann, G. W. Rubloff, and D. R. Young, “Role of Oxygen in Defect-Related Breakdown in Thin SiO2-Films on Si (100),” *J Appl Phys*, vol. 61, no. 9, pp. 4584–4588, May 1987.

[82] G. W. Rubloff, K. Hofmann, M. Liehr, and D. R. Young, “Defect Microchemistry at the SiO2/Si Interface,” *Phys Rev Lett*, vol. 58, no. 22, pp. 2379–2382, Jun. 1987.

[83] K. Hofmann, D. R. Young, and G. W. Rubloff, “Hole Trapping in SiO2-Films Annealed in Low-Pressure Oxygen Atmosphere,” *J Appl Phys*, vol. 62, no. 3, pp. 925–930, Aug. 1987.

[84] K. Hofmann, G. W. Rubloff, M. Liehr, and D. R. Young, “High-Temperature Reaction and Defect Chemistry at the Si/SiO2 Interface,” *Appl Surf Sci*, vol. 30, no. 1, pp. 25–31, Oct. 1987.

[85] B. Nielsen, K. G. Lynn, D. O. Welch, T. C. Leung, G. J. van der Kolk, and G. W. Rubloff, “Variable-Energy Positron Beams as a Probe of Submicroscopic Defects at Interfaces,” *World Materials Congress interface Science and Engineering*, 1988.

[86] B. Nielsen, K. G. Lynn, T. C. Leung, D. O. Welch, and G. Rubloff, “The SiO2/Si Interface Probed With Positrons,” *MRS Symp on SiO2 and Its Interfaces*, vol. 105, 1988.

[87] G. W. Rubloff, “Defect Microchemistry at the SiO2/Si Interface,” *MRS Symp on SiO2 and Its Interfaces*, vol. 105, pp. 11–21, 1988.

[88] M. Liehr, H. Dallaporta, J. E. Lewis, G. B. Bronner, and G. W. Rubloff, “Defect Generation at SiO2/Si(100) Interfaces by Metal Contamination,” p. 209, 1988.

[89] G. S. Oehrlein, K. K. Chan, M. A. Jaso, and G. W. Rubloff, “Surface-Analysis of Realistic Semiconductor Microstructures,” *J Vac Sci Technol A*, vol. 7, no. 3, pp. 1030–1034, May-Jun 1989.

[90] G. W. Rubloff, “Maskless Selected Area Processing,” *J Vac Sci Technol B*, vol. 7, no. 6, pp. 1454–1461, Nov-Dec 1989.

[91] B. Nielsen, K. G. Lynn, D. O. Welch, T. C. Leung, and G. W. Rubloff, “Microvoids at the SiO2/Si Interface,” *Phys Rev B*, vol. 40, no. 2, pp. 1434–1437, Jul. 1989.

[92] G. W. Rubloff, B. Nielsen, K. G. Lynn, D. O. Welch, and T. C. Leung, “Microvoids and Defect Chemistry at the Si-SiO2 Interface Studied by Positron-Annihilation Depth Profiling,” *Vacuum*, vol. 41, no. 4, pp. 790–792, 1990.

[93] M. Liehr, M. Offenberg, S. R. Kasi, G. W. Rubloff, and K. Holloway, “HF surface passivation failure in integrated thermal oxidation processing,” *nd Conf on Solid state Devices and Materials*, pp. 1099–1102, 1990.

[94] M. Offenberg, M. Liehr, S. R. Kasi, and G. W. Rubloff, “Role of surface passivation in the integrated processing of MOS structures,” *Digest of Technical Papers.1990 Symposium on VLSI Technology*, vol. 10, pp. 117–118, 1990.

[95] S. M. Heald, J. K. D. Jayanetti, A. A. Bright, and G. W. Rubloff, “X-Ray Reflectivity Study of SiO2 on Si,” *J Vac Sci Technol A*, vol. 8, no. 3, pp. 2046–2048, May-Jun 1990.

[96] G. W. Rubloff, “Defect Microchemistry in SiO2/Si Structures,” *J Vac Sci Technol A*, vol. 8, no. 3, pp. 1857–1863, May-Jun 1990.

[97] M. Offenberg, M. Liehr, G. W. Rubloff, and K. Holloway, “Ultraclean, Integrated Processing of Thermal Oxide Structures,” *Appl Phys Lett*, vol. 57, no. 12, pp. 1254–1256, Sep. 1990.

[98] G. W. Rubloff, “Integrated Processing - from Research to Manufacturing,” pp. 2–3 – 2–11, Dec. 1990.

[99] M. Offenberg, M. Liehr, and G. W. Rubloff, “Surface Etching and Roughening in Integrated Processing of Thermal Oxide,” *J Vac Sci Technol A*, vol. 9, no. 3, pp. 1058–1065, May-Jun 1991.

[100] T. C. Leung, Y. Kong, K. G. Lynn, B. Nielsen, Z. A. Weinberg, and G. W. Rubloff, “Centroid Shift of Gamma-Rays from Positron-Annihilation in the Depletion Region of Metal-Oxide-Semiconductor Structures,” *Appl Phys Lett*, vol. 58, no. 1, pp. 86–88, Jan. 1991.

[101] P. Asokakumar, K. G. Lynn, T. C. Leung, B. Nielsen, G. W. Rubloff, and Z. A. Weinberg, “SiO2/Si Interface Properties Using Positrons,” *Phys Rev B*, vol. 44, no. 11, pp. 5885–5888, Sep. 1991.

[102] S. R. Kasi, G. W. Rubloff, S. A. Cohen, and L. C. Hsia, “Pre-Oxidation Si Cleaning and its Relation to MOS Reliability and Process-Induced Damage,” *Proc. MRS Symp. Chemical Surface Preparation, Passivation, and Cleaning for Semiconductor Growth and Processing*, vol. 259, pp. 125–130, 1992.

[103] G. Tas, R. J. Stoner, H. J. Maris, G. W. Rubloff, G. S. Oehrlein, and J. M. Halbout, “Detection of Thin Interfacial Layers by Picosecond Ultrasonsics,” *MRS Symp B - Chemical Surface Preparation, Passivation and Cleaning for Semiconductor Growth and Processing*, pp. 231–236, 1992.

[104] T. C. Leung, Z. A. Weinberg, P. Asokakumar, B. Nielsen, G. W. Rubloff, and K. G. Lynn, “Positron-Annihilation at the Si/SiO2 Interface,” *J Appl Phys*, vol. 71, no. 1, pp. 530–532, Jan. 1992.

[105] G. W. Rubloff and D. T. Bordonaro, “Integrated Processing for Microelectronics Science and Technology,” *Ibm J Res Dev*, vol. 36, no. 2, pp. 233–276, Mar. 1992.

[106] P. Asokakumar, T. C. Leung, K. G. Lynn, B. Nielsen, M. P. Forcier, Z. A. Weinberg, and G. W. Rubloff, “Positron-Annihilation Studies in the Field-Induced Depletion Regions of Metal-Oxide-Semiconductor Structures,” *J Appl Phys*, vol. 71, no. 11, pp. 5606–5609, Jun. 1992.

[107] S. P. Jeng, T. P. Ma, R. Canteri, M. Anderle, and G. W. Rubloff, “Anomalous Diffusion of Fluorine in Silicon,” *Appl Phys Lett*, vol. 61, no. 11, pp. 1310–1312, Sep. 1992.

[108] G. Tas, R. J. Stoner, H. J. Maris, G. W. Rubloff, G. S. Oehrlein, and J. M. Halbout, “Noninvasive Picosecond Ultrasonic-Detection of Ultrathin Interfacial Layers - Cfx at the Al/Si Interface,” *Appl Phys Lett*, vol. 61, no. 15, pp. 1787–1789, Oct. 1992.

[109] H. N. Lin, R. J. Stoner, H. J. Maris, J. M. E. Harper, C. Cabral, J. M. Halbout, and G. W. Rubloff, “Nondestructive Detection of Titanium Disilicide Phase-Transformation by Picosecond Ultrasonics,” *Appl Phys Lett*, vol. 61, no. 22, pp. 2700–2702, Nov. 1992.

[110] S. S. Dana, M. Liehr, M. Anderle, and G. W. Rubloff, “Kinetics of Nucleation and Growth of Si on SiO2 in Very Low-Pressure Sih4 Chemical Vapor-Deposition,” *Appl Phys Lett*, vol. 61, no. 25, pp. 3035–3037, Dec. 1992.

[111] S. S. Dana, M. Anderle, G. W. Rubloff, and A. Acovic, “Chemical-Vapor-Deposition of Rough-Morphology Silicon Films over a Broad Temperature-Range,” *Appl Phys Lett*, vol. 63, no. 10, pp. 1387–1389, Sep. 1993.

[112] C. Szeles, B. Nielsen, P. Asoka-Kumar, K. G. Lynn, M. Anderle, T. P. Ma, and G. W. Rubloff, “Role of Implantation-Induced Defects in Surface-Oriented Diffusion of Fluorine in Silicon,” *Proc. Tenth Intl. Conf. on Positron Annihilation Materials Science Forum, May -,*, 1994.

[113] M. Liehr and G. W. Rubloff, “Concepts in Competitive Microelectronics Manufacturing,” *J Vac Sci Technol B*, vol. 12, no. 4, pp. 2727–2740, Jul-Aug 1994.

[114] G. W. Rubloff, M. Offenberg, and M. Liehr, “Integrated Processing of MOS Gate Dielectric Structures,” *IEEE Trans Semi Manuf*, vol. 7, no. 1, pp. 96–100, Feb. 1994.

[115] Y. I. Nissim and G. W. Rubloff, “Special Issue - Integrated Processing for Micro and Optoelectronics - Proceedings of Symposium D of the 1993 E-Mrs Spring Meeting - Preface and Introduction,” *Microelectron Eng*, vol. 25, no. 2, pp. R3–R4, Aug. 1994.

[116] G. W. Rubloff, “Research for the Competitive Marketplace: AVS Establishes a Multidisciplinary Forum for Manufacturing Science and Technology,” *Semiconductor International*, p. 112, Sep-1994.

[117] C. Szeles, B. Nielsen, P. Asoka-Kumar, K. G. Lynn, M. Anderle, T. P. Ma, and G. W. Rubloff, “Role of implantation-induced defects in surface-oriented diffusion of fluorine in silicon,” *J Appl Phys*, vol. 76, no. 6, pp. 3403–3409, Sep. 1994.

[118] L. L. Tedder, G. B. Lu, B. F. Conaghan, and G. W. Rubloff, “Real-Time Gas Sensor and Simulation for RTCVD Metrology and Control,” *Rapid Thermal Processing*, 1995.

[119] I. A. Shareef, G. W. Rubloff, M. Anderle, W. N. Gill, J. Cotte, and D. H. Kim, “Subatmospheric Chemical-Vapor-Deposition Ozone/Teos Process for SiO2 Trench Filling,” *J Vac Sci Technol B*, vol. 13, no. 4, pp. 1888–1892, Jul-Aug 1995.

[120] L. L. Tedder, G. W. Rubloff, I. Shareef, M. Anderle, D. H. Kim, and G. N. Parsons, “Real-Time Process and Product Diagnostics in Rapid Thermal Chemical-Vapor-Deposition Using in-Situ Mass-Spectrometric Sampling,” *J Vac Sci Technol B*, vol. 13, no. 4, pp. 1924–1927, Jul-Aug 1995.

[121] G. W. Rubloff and M. Liehr, “Papers from the Topical Conference on Manufacturing Science and Technology - 24-27 October 1994, Colorado Convention Center, Denver, Colorado - Preface,” *J Vac Sci Technol B*, vol. 13, no. 4, pp. 1861–1861, Jul-Aug 1995.

[122] L. L. Tedder and G. W. Rubloff, “Real-Time Equipment, Process and Wafer State Sensing of PolySi RTCVD from SiH4 using Mass Spectrometry,” May 1995.

[123] G. W. Rubloff, G. B. Lu, and L. L. Tedder, “Real-Time In-Situ Sensors and Dynamic Simulation for the Flexible Semiconductor Factory,” *Government Microcircuit Applications Conference GOMAC*, 1996.

[124] G. B. Lu, M. Oveissi, D. Eckard, and G. W. Rubloff, “Education in semiconductor manufacturing processes through physically-based dynamic simulation,” *Frontiers in Education Conference, 1996. FIE '96. 26th Annual Conference., Proceedings of*, vol. 1, pp. 250–253, 1996.

[125] G. W. Rubloff, “Process Sensors, Simulation, and Control to Build In Reliability,”  *Integrated Reliability Workshop*, vol. 96, pp. 50–56, 1996.

[126] G. W. Rubloff, L. L. Tedder, and G. B. Lu, “Real-Time Sensing and Dynamic Simulation for CVD Optimization and Control,” *Proc. Thirteenth Intl. Conf. Chemical Vapor Deposition CVD-XIII*, vol. 96, pp. 163–170, 1996.

[127] I. A. Shareef, G. W. Rubloff, and W. N. Bill, “Role of gas phase reactions in subatmospheric chemical-vapor deposition ozone/TEOS processes for oxide deposition,” *J Vac Sci Technol B*, vol. 14, no. 2, pp. 772–774, Mar-Apr 1996.

[128] L. L. Tedder, G. W. Rubloff, B. F. Cohaghan, and G. N. Parsons, “Dynamic rate and thickness metrology during poly-Si rapid thermal chemical vapor deposition from SiH4 using real time in situ mass spectrometry,” *J Vac Sci Technol A*, vol. 14, no. 2, pp. 267–270, Mar-Apr 1996.

[129] N. Gupta, Y. Xu, L. Henn-Lecordier, T. Gougousi, J. J N Kidder, and G. W. Rubloff, “Dynamic Simulation of a Multichamber CVD Cluster Tool,” 97-21, 1997.

[130] A. I. Chowdhury, W. W. Read, G. W. Rubloff, L. L. Tedder, and G. N. Parsons, “Real-time process sensing and metrology in amorphous and selective area silicon plasma enhanced chemical vapor deposition using in situ mass spectrometry,” *J Vac Sci Technol B*, vol. 15, no. 1, pp. 127–132, Jan-Feb 1997.

[131] G. Q. Lu, M. Bora, and G. W. Rubloff, “Polysilicon RTCVD process optimization for environmentally-conscious manufacturing,” *IEEE Trans Semi Manuf*, vol. 10, no. 3, pp. 390–398, Aug. 1997.

[132] G. Q. Lu, G. W. Rubloff, and J. Durham, “Contamination control for gas delivery from a liquid source in semiconductor manufacturing,” *IEEE Trans Semi Manuf*, vol. 10, no. 4, pp. 425–432, Nov. 1997.

[133] A. Rose, D. Eckard, and G. W. Rubloff, “An Application Framework for Creating Simulation-Based Learning Environments,” *UMIACS Technical Report*, vol. 98, 1998.

[134] G. Q. Lu, M. Bora, L. L. Tedder, and G. W. Rubloff, “Integrated dynamic simulation of rapid thermal chemical vapor deposition of polysilicon,” *IEEE Trans Semi Manuf*, vol. 11, no. 1, pp. 63–74, Feb. 1998.

[135] C. Plaisant, A. Rose, G. W. Rubloff, R. Salter, and B. Shneiderman, “The Design of History Mechanisms and Their Use in Collaborative Educational Simulations,” *Computer Support for Collaborative Learning CSCL*, pp. 348–359, 1999.

[136] R. Sreenivasan, W. S. Levine, and G. W. Rubloff, “Some Experiments in Dynamic-Simulator-Based Control Education,” vol. 1, pp. 485–489, 1999.

[137] G. Q. Lu, L. L. Tedder, and G. W. Rubloff, “Process sensing and metrology in gate oxide growth by rapid thermal chemical vapor deposition from SiH4 and N2O,” *J Vac Sci Technol B*, vol. 17, no. 4, pp. 1417–1423, Jul-Aug 1999.

[138] D. S. Green, J. P. Looney, and G. W. Rubloff, “Application of CW-CRDS to monitor and control chemical vapor deposition,” *LEOS Summer Topical Meetings*, pp. 1115–1116, 2000.

[139] T. Gougousi, R. Sreenivasan, Y. Xu, L. Henn-Lecordier, J. N. Kidder Jr, G. W. Rubloff, and E. Zafiriou, “In-situ Sensing using Mass Spectrometry and its Use for Run-to-Run Control on a W CVD Cluster Tool,” *Characterization and Metrology for ULSI Technology*, vol. 550, pp. 249–253, 2000.

[140] A. Rose, R. Salter, S. Keswani, N. Kositsyna, C. Plaisant, G. Rubloff, and B. Shneiderman, “Simulation Based Learning Environments and the Use of Learning Histories,” *ACM Conf. on Human Factors and Computing Systems CHI*, 2000.

[141] R. Sreenivasan, W. S. Levine, and G. W. Rubloff, “Some Dynamic-Simulator-Based Control Education Modules,” vol. %, pp. 3458–3462, 2000.

[142] T. Gougousi, Y. H. Xu, J. N. Kidder, G. W. Rubloff, and C. R. Tilford, “Process diagnostics and thickness metrology using in situ mass spectrometry for the chemical vapor deposition of W from H-2/WF6,” *J Vac Sci Technol B*, vol. 18, no. 3, pp. 1352–1363, May-Jun 2000.

[143] J. W. Herrmann, N. Chandrasekaran, B. F. Conaghan, M. Q. Nguyen, G. W. Rubloff, and R. Z. Shi, “Evaluating the impact of process changes on cluster tool performance,” *IEEE Trans Semi Manuf*, vol. 13, no. 2, pp. 181–192, May 2000.

[144] J. W. Herrmann, B. F. Conaghan, L. Henn-Lecordier, P. Mellacheruvu, M. Q. Nguyen, G. W. Rubloff, and R. Z. Shi, “Understanding the Impact of Equipment and Process Changes with a Heterogeneous Semiconductor Manufacturing Simulation Environment,” *Proc. Two-Thousand Winter Simulation Conference, Dec. -,*, vol. 2, pp. 1491–1498, Dec. 2000.

[145] H. Y. Chang, R. A. Adomaitis, J. N. Kidder, and G. W. Rubloff, “Influence of gas composition on wafer temperature in a tungsten chemical vapor deposition reactor: Experimental measurements, model development, and parameter identification,” *J Vac Sci Technol B*, vol. 19, no. 1, pp. 230–238, Jan-Feb 2001.

[146] L. Henn-Lecordier, J. N. Kidder, G. W. Rubloff, C. A. Gogol, and A. Wajid, “Real-time growth rate metrology for a tungsten chemical vapor deposition process by acoustic sensing,” *J Vac Sci Technol A*, vol. 19, no. 2, pp. 621–626, Mar-Apr 2001.

[147] R. Sreenivasan, T. Gougousi, Y. H. Xu, J. Kidder, E. Zafiriou, and G. W. Rubloff, “Run to run control in tungsten chemical vapor deposition using H-2/WF6 at low pressures,” *J Vac Sci Technol B*, vol. 19, no. 5, pp. 1931–1941, Sep-Oct 2001.

[148] Y. Xu, T. Gougousi, L. Henn-Lecordier, Y. Liu, S. Cho, and G. W. Rubloff, “Thickness metrology and end point control in W chemical vapor deposition process from SiH4/WF6 using in situ mass spectrometry,” *J Vac Sci Technol B*, vol. 20, no. 6, pp. 2351–2360, Nov-Dec 2002.

[149] L. Q. Wu, A. P. Gadre, H. M. Yi, M. J. Kastantin, G. W. Rubloff, W. E. Bentley, G. F. Payne, and R. Ghodssi, “Voltage-dependent assembly of the polysaccharide chitosan onto an electrode surface,” *Langmuir*, vol. 18, no. 22, pp. 8620–8625, Oct. 2002.

[150] M. J. Kastantin, S. Li, A. P. Gadre, L. Q. Wu, W. E. Bentley, G. F. Payne, G. W. Rubloff, and R. Ghodssi, “Integrated fabrication of polymeric devices for biological applications,” *Sensor Mater*, vol. 15, no. 6, pp. 295–311, 2003.

[151] T. Chen, D. A. Small, L.-Q. Wu, G. W. Rubloff, R. Ghodssi, R. Vazquez-Duhalt, W. E. Bentley, and G. F. Payne, “Nature-Inspired Creation of Protein-Polysaccharide Conjugate,” *Langmuir*, vol. 19, pp. 9382–9386, 2003.

[152] L. Q. Wu, R. Fernandes, H. Yi, D. A. Small, G. W. Rubloff, R. Ghodssi, W. E. Bentley, and G. F. Payne, “Chitosan at the Interface of Microfabrication and Biotechnology,” *Advances in Chitin Science, European Chitin Society EUCHIS*, vol. VI, pp. 78–82, 2003.

[153] P. Lazzeri, L. Vanzetti, E. Iacob, M. Bersani, M. Anderle, J. J. Park, Z. Lin, R. M. Briber, G. W. Rubloff, and R. D. Miller, “Material Characterization and the Formation of Nanoporous PMSSQ Low-K Dielectrics,” vol. 683, pp. 551–555, 2003.

[154] G. W. Rubloff, “In-Situ Metrology: the Path to Real-Time Advanced Process Control,” vol. 683, pp. 583–591, 2003.

[155] L. Henn-Lecordier, J. N. Kidder, G. W. Rubloff, C. A. Gogol, and A. Wajid, “Real-time, in situ film thickness metrology in a 10 Torr W chemical vapor deposition process using an acoustic sensor,” *J Vac Sci Technol B*, vol. 21, no. 3, pp. 1055–1063, May-Jun 2003.

[156] G. Lucovsky and G. Rubloff, “American Vacuum Society leadership in electronic materials processing: Past, present, and future,” *J Vac Sci Technol A*, vol. 21, no. 5, pp. S175–S181, Sep-Oct 2003.

[157] L. Q. Wu, H. M. Yi, S. Li, G. W. Rubloff, W. E. Bentley, R. Ghodssi, and G. F. Payne, “Spatially selective deposition of a reactive polysaccharide layer onto a patterned template,” *Langmuir*, vol. 19, no. 3, pp. 519–524, Feb. 2003.

[158] R. Fernandes, L.-Q. Wu, T. Chen, H. Yi, G. W. Rubloff, R. Ghodssi, W. E. Bentley, and G. F. Payne, “Electrochemically induced deposition of a polysaccharide hydrogel onto a patterned surface,” *Langmuir*, vol. (in press), no. 10, pp. 4058–4062, May 2003.

[159] L.-Q. Wu, H. Yi, S. Li, D. A. Small, J. J. Park, G. W. Rubloff, R. Ghodssi, W. E. Bentley, and G. F. Payne, *Voltage-programmable biofunctionality in MEMS environments using electrodeposition of a reactive polysaccharide*, vol. 2. IEEE, 2004, pp. 1871–1874 vol.2.

[160] S. Cho, L. Henn-Lecordier, Y. J. Liu, and G. W. Rubloff, “In situ mass spectrometry in a 10 Torr W chemical vapor deposition process for film thickness metrology and real-time advanced process control,” *J Vac Sci Technol B*, vol. 22, no. 3, pp. 880–887, May-Jun 2004.

[161] L. Henn-Lecordier, J. N. Kidder, and G. W. Rubloff, “Real-time acoustic sensing and control of metalorganic chemical vapor deposition precursor concentrations delivered from solid phase sources,” *J Vac Sci Technol A*, vol. 22, no. 5, pp. 1984–1991, Sep-Oct 2004.

[162] H. M. Yi, L. Q. Wu, R. Ghodssi, G. W. Rubloff, G. F. Payne, and W. E. Bentley, “A robust technique for assembly of nucleic acid hybridization chips based on electrochemically templated chitosan,” *Anal Chem*, vol. 76, no. 2, pp. 365–372, Jan. 2004.

[163] R. Fernandes, H. M. Yi, L. Q. Wu, G. W. Rubloff, R. Ghodssi, W. E. Bentley, and G. F. Payne, “Thermo-biolithography: A technique for patterning nucleic acids and proteins,” *Langmuir*, vol. 20, no. 3, pp. 906–913, Feb. 2004.

[164] J. W. Herrmann, B. F. Conaghan, L. Henn-Lecordier, P. Mellacheruvu, M.-Q. Nguyen, G. W. Rubloff, and R. Z. Shi, “Understanding the Impact of Equipment and Process Changews with a Heterogeneous Semiconductor Manufacturing SImulation Environment,” presented at the Winter Simulation Conference, 2004, pp. 1491–1498.

[165] P. Lazzeri, G. W. Rubloff, L. Vanzetti, R. M. Briber, M. Anderle, M. Bersani, J. J. Park, H. C. Kim, W. Volksen, R. D. Miller, and Z. Lin, “ToF-SIMS studies of nanoporous PMSSQ materials: kinetics and reactions in the processing of low-K dielectrics for ULSI applications,” *Surf Interface Anal*, vol. 36, no. 4, pp. 304–310, Apr. 2004.

[166] S. Cho, W. Lei, A. Melvin, and G. W. Rubloff, “Dynamic simulation and optimization of CuCVD unit process for environmentally benign manufacturing,” *IEEE Trans Semi Manuf*, vol. 17, no. 3, pp. 455–469, Aug. 2004.

[167] S. Li, J. J. Park, J. C. Day, G. W. Rubloff, C. P. Cadou, and R. Ghodssi, “Development of a fast-response microfluidic gas concentrating device,” *Proc. Eurosensors XIX*, vol. 2, no. 10, 2005.

[168] M. A. Powers, S. T. Koev, A. Schleunitz, H. M. Yi, V. Hodzic, W. E. Bentley, G. F. Payne, G. W. Rubloff, and R. Ghodssi, “A fabrication platform for electrically mediated optically active biofunctionalized sites in BioMEMS,” *Lab Chip*, vol. 5, no. 6, pp. 583–586, 2005.

[169] J.-O. Choo, R. A. Adomaitis, G. W. Rubloff, L. Henn-Lecordier, and Y. Cai, “A New Approach to Spatially Controllable CVD,”  *American Control Conference*, pp. 287–292, 2005.

[170] M. A. Powers, S. T. Koev, A. Scheunitz, H. Yi, V. Hodzic, W. E. Bentley, G. F. Payne, G. W. Rubloff, and R. Ghodssi, “Toward a Biophotonic MEMS Cell Sensor,” 2005.

[171] S. Cho, G. W. Rubloff, M. E. Aumer, D. B. Thomson, D. P. Partlow, R. Parikh, and R. A. Adomaitis, “In situ chemical sensing in AlGaN/GaN high electron mobility transistor metalorganic chemical vapor-deposition process for real-time prediction of product crystal quality and advanced process control,” *J Vac Sci Technol B*, vol. 23, no. 4, pp. 1386–1397, Jul-Aug 2005.

[172] P. Lazzeri, L. Vanzetti, M. Anderle, M. Bersani, J. J. Park, Z. Lin, R. M. Briber, G. W. Rubloff, H. C. Kim, and R. D. Miller, “Thin-film transformations and volatile products in the formation of nanoporous low-k polymethylsilsesquioxane-based dielectric,” *J Vac Sci Technol B*, vol. 23, no. 3, pp. 908–917, May-Jun 2005.

[173] H. M. Yi, L. Q. Wu, W. E. Bentley, R. Ghodssi, G. W. Rubloff, J. N. Culver, and G. F. Payne, “Biofabrication with chitosan,” *Biomacromolecules*, vol. 6, no. 6, pp. 2881–2894, Nov-Dec 2005.

[174] S. Cho, G. W. Rubloff, M. E. Aumer, D. B. Thomson, and D. P. Partlow, “Real-time material quality prediction, fault detection, and contamination control in AlGaN/GaN high electron mobility transistor metalorganic chemical vapor deposition process using in situ chemical sensing,” *J Vac Sci Technol B*, vol. 23, no. 5, pp. 1849–1855, Sep-Oct 2005.

[175] S. Cho, D. S. Janiak, G. W. Rubloff, M. E. Aumer, D. B. Thomson, and D. P. Partlow, “In situ chemical sensing in AlGaN/GaN metal organic chemical vapor deposition process for precision film thickness metrology and real-time advanced process control,” *J Vac Sci Technol B*, vol. 23, no. 5, pp. 2007–2013, Sep-Oct 2005.

[176] J. O. Choo, R. A. Adomaitis, G. W. Rubloff, L. Henn-Lecordier, and Y. J. Liu, “Simulation-based design and experimental evaluation of a spatially controllable CVD reactor,” *Aiche J*, vol. 51, no. 2, pp. 572–584, Feb. 2005.

[177] H. M. Yi, L. Q. Wu, R. Ghodssi, G. W. Rubloff, G. F. Payne, and W. E. Bentley, “Signal-directed sequential assembly of biomolecules on patterned surfaces,” *Langmuir*, vol. 21, no. 6, pp. 2104–2107, Mar. 2005.

[178] J. O. Choo, R. A. Adomaitis, L. Henn-Lecordier, Y. Cai, and G. W. Rubloff, “Development of a spatially controllable chemical vapor deposition reactor with combinatorial processing capabilities,” *Rev Sci Instrum*, vol. 76, no. 6, pp. –, Jun. 2005.

[179] I. Takeuchi, C. J. Long, O. O. Famodu, M. Murakami, J. Hattrick-Simpers, G. W. Rubloff, M. Stukowski, and K. Rajan, “Data management and visualization of x-ray diffraction spectra from thin film ternary composition spreads,” *Rev Sci Instrum*, vol. 76, no. 6, pp. –, Jun. 2005.

[180] H. M. Yi, S. Nisar, S. Y. Lee, M. A. Powers, W. E. Bentley, G. F. Payne, R. Ghodssi, G. W. Rubloff, M. T. Harris, and J. N. Culver, “Patterned assembly of genetically modified viral nanotemplates via nucleic acid hybridization,” *Nano Lett*, vol. 5, no. 10, pp. 1931–1936, Oct. 2005.

[181] W. Lei, L. Henn-Lecordier, M. Anderle, G. W. Rubloff, M. Barozzi, and M. Bersani, “Real-time observation and optimization of tungsten atomic layer deposition process cycle,” *J. Vac. Sci. Technol. B*, vol. 24, no. 2, p. 780, 2006.

[182] S. T. Koev, M. A. Powers, V. Badilita, H. Yi, W. E. Bentley, G. F. Payne, G. W. Rubloff, and R. Ghodssi, “Chitosan for Biofunctionalization of Microsystems,” *2006 IEEE/NLM Life Science Systems and Applications Workshop*, pp. 1–2, 2006.

[183] R. Sreenivasan, R. A. Adomaitis, and G. W. Rubloff, “Demonstration of spatially programmable chemical vapor deposition: Model-based uniformity/nonuniformity control,” *J Vac Sci Technol B*, vol. 24, no. 6, pp. 2706–2715, Nov-Dec 2006.

[184] R. A. Zangmeister, J. J. Park, G. W. Rubloff, and M. J. Tarlov, “Electrochemical study of chitosan films deposited from solution at reducing potentials,” *Electrochim Acta*, vol. 51, no. 25, pp. 5324–5333, Jul. 2006.

[185] J. J. Park, X. L. Luo, H. M. Yi, T. M. Valentine, G. F. Payne, W. E. Bentley, R. Ghodssi, and G. W. Rubloff, “Chitosan-mediated in situ biomolecule assembly in completely packaged microfluidic devices,” *Lab Chip*, vol. 6, no. 10, pp. 1315–1321, Oct. 2006.

[186] J. Park, X. Luo, H. Yi, R. Ghodssi, and G. Rubloff, “In situ Biomolecule Assembly and Activity within Completely Packaged Microfluidic Devices,” *2006 IEEE/NLM Life Science Systems and Applications Workshop*, pp. 1–2, Oct. 2006.

[187] R. P. Parikh, R. A. Adomaitis, M. E. Aumer, D. P. Partlow, D. B. Thomson, and G. W. Rubloff, “Validating gallium nitride growth kinetics using a precursor delivery showerhead as a novel chemical reactor,” *J Cryst Growth*, vol. 296, no. 1, pp. 15–26, Oct. 2006.

[188] B. H. Ponczak, J. D. Oliver, S. Cho, and G. W. Rubloff, “In Situ Mass Spectrometry for Chemical Identification in SiC Epitaxial Deposition,” *MSF*, vol. 556, pp. 121–124, 2007.

[189] S. T. Koev, M. A. Powers, H. Yi, L. Q. Wu, W. E. Bentley, G. W. Rubloff, G. F. Payne, and R. Ghodssi, “Mechano-transduction of DNA hybridization and dopamine oxidation through electrodeposited chitosan network,” *Lab Chip*, vol. 7, no. 1, pp. 103–111, 2007.

[190] L. Henn-Lecordier, W. Lei, M. Anderle, and G. W. Rubloff, “Real-time sensing and metrology for atomic layer deposition processes and manufacturing,” *J. Vac. Sci. Technol. B*, vol. 25, no. 1, pp. 130–139, 2007.

[191] Y. Cai, L. Henn-Lecordier, G. W. Rubloff, R. Sreenivasan, J. O. Choo, and R. A. Adomaitis, “Multiplexed mass spectrometry for real-time sensing in a spatially programmable chemical vapor deposition reactor,” *J Vac Sci Technol B*, vol. 25, no. 4, pp. 1288–1297, Jul-Aug 2007.

[192] P. R. Leduc, M. S. Wong, P. M. Ferreira, R. E. Groff, K. Haslinger, M. P. Koonce, W. Y. Lee, J. C. Love, J. A. McCammon, N. A. Monteiro-Riviere, V. M. Rotello, G. W. Rubloff, R. Westervelt, and M. Yoda, “Towards an in vivo biologically inspired nanofactory,” *Nat Nanotechnol*, vol. 2, no. 1, pp. 3–7, Jan. 2007.

[193] G. W. Rubloff, “Competing Initial Reactions at Transition-Metal/Silicon Interfaces,” *Proc. MRS Symp. Thin Films - Interfaces and Phenomena*, vol. 54, pp. 3–12, Jan. 2007.

[194] H. Yi, G. W. Rubloff, and J. N. Culver, “TMV microarrays: Hybridization-based assembly of DNA-programmed viral nanotemplates,” *Langmuir*, vol. 23, no. 5, pp. 2663–2667, Feb. 2007.

[195] X. L. Luo, A. T. Lewandowski, H. M. Yi, G. F. Payne, R. Ghodssi, W. E. Bentley, and G. W. Rubloff, “Programmable assembly of a metabolic pathway enzyme in a pre-packaged reusable bioMEMS device,” *Lab Chip*, vol. 8, no. 3, pp. 420–430, 2008.

[196] A. T. Lewandowski, W. E. Bentley, H. Yi, G. W. Rubloff, G. F. Payne, and R. Ghodssi, “Towards Area-Based In Vitro Metabolic Engineering: Assembly of Pfs Enzyme onto Patterned Microfabricated Chips,” *Biotechnol Progr*, vol. 24, no. 5, pp. 1042–1051, 2008.

[197] R. Sreenivasan, R. A. Adomaltis, and G. W. Rubloff, “A comparative study of reactor designs for the production of graded films with applications to combinatorial CVD,” *J Cryst Growth*, vol. 310, no. 2, pp. 270–283, Jan. 2008.

[198] A. T. Lewandowski, H. M. Yi, X. L. Luo, G. F. Payne, R. Ghodssi, G. W. Rubloff, and W. E. Bentley, “Protein assembly onto patterned microfabricated devices through enzymatic activation of fusion pro-tag,” *Biotechnol Bioeng*, vol. 99, no. 3, pp. 499–507, Feb. 2008.

[199] X. W. Shi, Y. Liu, A. T. Lewandowski, L. Q. Wu, H. C. Wu, R. Ghodssi, G. W. Rubloff, W. E. Bentley, and G. F. Payne, “Chitosan biotinylation and electrodeposition for selective protein assembly,” *Macromol Biosci*, vol. 8, no. 5, pp. 451–457, May 2008.

[200] I. Perez, E. Robertson, P. Banerjee, L. Henn-Lecordier, S. J. Son, S. B. Lee, and G. W. Rubloff, “TEM-based metrology for HfO2 layers and nanotubes formed in anodic aluminum oxide nanopore structures,” *Small*, vol. 4, no. 8, pp. 1223–1232, Aug. 2008.

[201] X. Luo, D. L. Berlin, S. Buckhout-White, W. E. Bentley, G. F. Payne, R. Ghodssi, and G. W. Rubloff, “Design optimization for bioMEMS studies of enzyme-controlled metabolic pathways,” *Biomed Microdevices*, vol. 10, no. 6, pp. 899–908, Dec. 2008.

[202] S. L. Buckhout-White and G. W. Rubloff, “Spatial resolution in chitosan-based programmable biomolecular scaffolds,” *Soft Matter*, vol. 5, no. 19, pp. 3677–3681, 2009.

[203] P. Banerjee, W.-A. Chiou, and G. W. Rubloff, “Crystallization Behavior of HfO2 Nanotubes in Different Environments,” *MICROSCOPY AND MICROANALYSIS*, vol. 15, no. 2, pp. 1250–1251, 2009.

[204] P. Banerjee, I. Perez, L. Henn-Lecordier, S. B. Lee, and G. Rubloff, “ALD\_based Metal-insulator-metal (MIM) Nanocapacitors for Energy Storage,” *ECS Transactions*, vol. 25, no. 4, pp. 345–353, 2009.

[205] P. Banerjee, I. Perez, L. Henn-Lecordier, S. B. Lee, and G. W. Rubloff, “Nanotubular metal-insulator-metal capacitor arrays for energy storage,” *Nat Nanotechnol*, vol. 4, no. 5, pp. 292–296, May 2009.

[206] X. W. Shi, C. Y. Tsao, X. H. Yang, Y. Liu, P. Dykstra, G. W. Rubloff, R. Ghodssi, W. E. Bentley, and G. F. Payne, “Electroaddressing of Cell Populations by Co-Deposition with Calcium Alginate Hydrogels,” *Adv Funct Mater*, vol. 19, no. 13, pp. 2074–2080, Jul. 2009.

[207] Y. Cheng, X. L. Luo, J. Betz, S. Buckhout-White, O. Bekdash, G. F. Payne, W. E. Bentley, and G. W. Rubloff, “In situ quantitative visualization and characterization of chitosan electrodeposition with paired sidewall electrodes,” *Soft Matter*, vol. 6, no. 14, pp. 3177–3183, 2010.

[208] X. L. Luo, D. L. Berlin, J. Betz, G. F. Payne, W. E. Bentley, and G. W. Rubloff, “In situ generation of pH gradients in microfluidic devices for biofabrication of freestanding, semi-permeable chitosan membranes,” *Lab Chip*, vol. 10, no. 1, pp. 59–65, 2010.

[209] S. T. Koev, P. H. Dykstra, X. Luo, G. W. Rubloff, W. E. Bentley, G. F. Payne, and R. Ghodssi, “Chitosan: an integrative biomaterial for lab-on-a-chip devices (Critical Review),” *Lab Chip*, vol. 10, no. 22, pp. 3026–3042, 2010.

[210] R. Fernandes, X. L. Luo, C. Y. Tsao, G. F. Payne, R. Ghodssi, G. W. Rubloff, and W. E. Bentley, “Biological nanofactories facilitate spatially selective capture and manipulation of quorum sensing bacteria in a bioMEMS device,” *Lab Chip*, vol. 10, no. 9, pp. 1128–1134, 2010.

[211] P. Banerjee, W.-J. Lee, K.-R. Bae, S. B. Lee, and G. W. Rubloff, “Structural, electrical, and optical properties of atomic layer deposition Al-doped ZnO films,” *J Appl Phys*, vol. 108, no. 4, pp. 043504–8, 2010.

[212] R. Ghodssi, P. Dykstra, M. Meyer, S. Koev, K. Gerasopoulos, X. Luo, G. Rubloff, W. Bentley, G. Payne, and J. Culver, “Integration of Diverse Biological Materials in Micro/Nano Devices,” in *Advanced Materials and Technologies for Micro/Nano-Devices, Sensors and Actuators*, E. Gusev, E. Garfunkel, and A. Dideikin, Eds. Springer Netherlands, 2010, pp. 275–285.

[213] Y. Cheng, X. Luo, J. Betz, O. Bekdash, and G. Rubloff, “Mechanism and Direct Visualization of Electrodeposition of the Polysaccharide Chitosan,” in *26th Southern Biomedical Engineering Conference SBEC 2010, April 30 - May 2, 2010, College Park, Maryland, USA*, vol. 32, K. E. Herold, J. Vossoughi, W. E. Bentley, and R. Magjarevic, Eds. Springer Berlin Heidelberg, 2010, pp. 401–403.

[214] J. Betz, Y. Cheng, O. Bekdash, S. Buckhout-White, and G. W. Rubloff, “Formation of Dendritic Silver Substrates by Galvanic Displacement for Surface Enhanced Raman Spectroscopy,” in *26th Southern Biomedical Engineering Conference SBEC 2010, April 30 - May 2, 2010, College Park, Maryland, USA*, vol. 32, K. E. Herold, J. Vossoughi, W. E. Bentley, and R. Magjarevic, Eds. Springer Berlin Heidelberg, 2010, pp. 313–316.

[215] O. Bekdash, J. Betz, Y. Cheng, and G. W. Rubloff, “Applicability of Surface Enhanced Raman Spectroscopy for Determining the Concentration of Adenine and S-Adenosyl Homocysteine in a Microfluidic System,” in *26th Southern Biomedical Engineering Conference SBEC 2010, April 30 - May 2, 2010, College Park, Maryland, USA*, vol. 32, K. E. Herold, J. Vossoughi, W. E. Bentley, and R. Magjarevic, Eds. Springer Berlin Heidelberg, 2010, pp. 301–304.

[216] X. H. Yang, E. Kim, Y. Liu, X. W. Shi, G. W. Rubloff, R. Ghodssi, W. E. Bentley, Z. Pancer, and G. F. Payne, “In-Film Bioprocessing and Immunoanalysis with Electroaddressable Stimuli-Responsive Polysaccharides,” *Adv Funct Mater*, vol. 20, no. 10, pp. 1645–1652, May 2010.

[217] Y. Liu, E. Kim, R. Ghodssi, G. W. Rubloff, J. N. Culver, W. E. Bentley, and G. F. Payne, “Biofabrication to build the biology-device interface,” *Biofabrication*, vol. 2, no. 2, pp. 1–21, Jun. 2010.

[218] E. R. Cleveland, P. Banerjee, I. Perez, S. B. Lee, and G. W. Rubloff, “Profile Evolution for Conformal Atomic Layer Deposition over Nanotopography,” *Acs Nano*, vol. 4, no. 8, pp. 4637–4644, Aug. 2010.

[219] Y. Cheng, X. Luo, J. Betz, G. F. Payne, W. E. Bentley, and G. W. Rubloff, “Mechanism of anodic electrodeposition of calcium alginate,” *Soft Matter*, pp. 5677–5684, 2011.

[220] Y. Liu, Y. Cheng, H.-C. Wu, E. Kim, R. V. Ulijn, G. W. Rubloff, W. E. Bentley, and G. F. Payne, “Electroaddressing Agarose Using Fmoc-Phenylalanine as a Temporary Scaffold,” *Langmuir*, vol. 27, no. 12, pp. 7380–7384, 2011.

[221] Y. Cheng, X. Luo, C.-Y. Tsao, H.-C. Wu, J. Betz, G. F. Payne, W. E. Bentley, and G. W. Rubloff, “Biocompatible multi-address 3D cell assembly in microfluidic devices using spatially programmable gel formation,” *Lab Chip*, pp. 2316–2318, 2011.

[222] L. C. Haspert, P. Banerjee, L. Henn-Lecordier, and G. W. Rubloff, “Correlation of Raman, electrical, and optical properties of high-κ, atomic layer deposited Al-doped TiO[sub 2],” *J. Vac. Sci. Technol. B*, vol. 29, no. 4, p. 041807, 2011.

[223] L. Henn-Lecordier, “Impact of parasitic reactions on wafer-scale uniformity in water-based and ozone-based atomic layer deposition,” *J Vac Sci Technol A*, vol. 29, no. 5, p. 051509, 2011.

[224] Y. Liu, X. W. Shi, E. Kim, L. M. Robinson, C. K. Nye, R. Ghodssi, G. W. Rubloff, W. E. Bentley, and G. F. Payne, “Chitosan to electroaddress biological components in lab-on-a-chip devices,” *Carbohydrate Polymers*, vol. 84, no. 2, pp. 704–708, Mar. 2011.

[225] K. Gregorczyk, L. Henn-Lecordier, J. Gatineau, C. Dussarrat, and G. Rubloff, “Atomic Layer Deposition of Ruthenium Using the Novel Precursor bis(2,6,6-trimethyl-cyclohexadienyl)ruthenium,” *Chem Mater*, vol. 23, no. 10, pp. 2650–2656, May 2011.

[226] S. Deng, Y. Zhang, A. H. Brozena, M. L. Mayes, P. Banerjee, W.-A. Chiou, G. W. Rubloff, G. C. Schatz, and Y. Wang, “Confined propagation of covalent chemical reactions on single-walled carbon nanotubes,” *Nat Commun*, vol. 2, pp. 382–6, Jul. 2011.

[227] X. L. Luo, S. Buckhout-White, W. E. Bentley, and G. W. Rubloff, “Biofabrication of chitosan–silver composite SERS substrates enabling quantification of adenine by a spectroscopic shift,” *Biofabrication*, vol. 3, no. 3, p. 034108, Jul. 2011.

[228] S. A. Sherrill, J. Duay, Z. Gui, P. Banerjee, G. W. Rubloff, and S. B. Lee, “MnO2/TiN heterogeneous nanostructure design for electrochemical energy storage,” *Physical chemistry chemical physics : PCCP*, vol. 13, no. 33, pp. 15221–15226, Sep. 2011.

[229] Y. Wang, Y. Liu, Y. Cheng, E. Kim, G. W. Rubloff, W. E. Bentley, and G. F. Payne, “Coupling Electrodeposition with Layer-by-Layer Assembly to Address Proteins within Microfluidic Channels,” *Adv Mater*, vol. 23, no. 48, pp. 5817–5821, Nov. 2011.

[230] K. Gregorczyk, P. Banerjee, and G. W. Rubloff, “Conduction in ultrathin ruthenium electrodes prepared by atomic layer deposition,” *Materials Letters*, vol. 73, no. 0, pp. 43–46, 2012.

[231] Y. Cheng, K. M. Gray, L. David, I. Royaud, G. F. Payne, and G. W. Rubloff, “Characterization of the cathodic electrodeposition of semicrystalline chitosan hydrogel,” *Materials Letters*, vol. 87, no. 0, pp. 97–100, 2012.

[232] E. R. Cleveland, L. Henn-Lecordier, and G. W. Rubloff, “Role of surface intermediates in enhanced, uniform growth rates of TiO2 atomic layer deposition thin films using titanium tetraisopropoxide and ozone,” *J. Vac. Sci. Technol. A*, vol. 30, no. 1, pp. 01A150 1–6, 2012.

[233] Y. Cheng, X. Luo, G. F. Payne, and G. W. Rubloff, “Biofabrication: programmable assembly of polysaccharide hydrogels in microfluidics as biocompatible scaffolds,” *J. Mater. Chem.*, vol. 22, no. 7659, pp. 7659–7666, 2012.

[234] J. L. Terrell, T. Gordonov, Y. Cheng, H.-C. Wu, D. Sampey, X. Luo, C.-Y. Tsao, R. Ghodssi, G. W. Rubloff, G. F. Payne, and W. E. Bentley, “Integrated Biofabrication for Electro-addressed In-Film Bioprocessing,” *Biotechnology Journal*, vol. 7, no. 3, pp. 428–439, 2012.

[235] K. M. Gray, B. D. Liba, Y. Wang, Y. Cheng, G. W. Rubloff, W. E. Bentley, A. Montembault, I. Royaud, L. David, and G. F. Payne, “Electrodeposition of a Biopolymeric Hydrogel: Potential for One-step Protein Electroaddressing,” *Biomacromolecules*, vol. 13, no. 4, pp. 1181–1189, 2012.

[236] J. F. Betz, Y. Cheng, and G. W. Rubloff, “Direct SERS detection of contaminants in a complex mixture: rapid, single step screening for melamine in liquid infant formula,” *The Analyst*, vol. 137, no. 4, pp. 826–828, 2012.

[237] Y. Liu, J. L. Terrell, C.-Y. Tsao, H.-C. Wu, V. Javvaji, E. Kim, Y. Cheng, Y. Wang, R. V. Ulijn, S. R. Raghavan, G. W. Rubloff, W. E. Bentley, and G. F. Payne, “Biofabricating Multifunctional Soft Matter with Enzymes and Stimuli-Responsive Materials,” *Adv Funct Mater*, vol. 22, no. 14, pp. 3004–3012, 2012.

[238] Y. Cheng, C. Y. Tsao, H. C. Wu, X. L. Luo, J. L. Terrell, J. Betz, G. F. Payne, W. E. Bentley, and G. W. Rubloff, “Electroaddressing Functionalized Polysaccharides as Model Biofilms for Interrogating Cell Signaling,” *Adv Funct Mater*, vol. 22, no. 3, pp. 519–528, Feb. 2012.

[239] X. Chen, E. Pomerantseva, P. Banerjee, K. Gregorczyk, R. Ghodssi, and G. Rubloff, “Ozone-Based Atomic Layer Deposition of Crystalline V 2O 5Films for High Performance Electrochemical Energy Storage,” *Chem Mater*, vol. 24, no. 7, pp. 1255–1261, Apr. 2012.

[240] L. C. Haspert, S. B. Lee, and G. W. Rubloff, “Nanoengineering strategies for metal-insulator-metal electrostatic nanocapacitors,” *Acs Nano*, vol. 6, no. 4, pp. 3528–3536, Apr. 2012.

[241] B. D. Liba, K. M. Gray, Y. Cheng, G. W. Rubloff, W. E. Bentley, and G. F. Payne, “Integrating biology and electronics: Electroaddressing biopolymer hydrogels within a microfabricated fluidic channel,” presented at the 2012 Microsystems for Measurement and Instrumentation (MAMNA), Annapolis, MD, Mar 27, 2012, 2012, pp. 1–3.

[242] E. Pomerantseva, K. Gerasopoulos, X. Chen, G. Rubloff, and R. Ghodssi, “Electrochemical performance of the nanostructured biotemplated V2O5 cathode for lithium-ion batteries,” *J Power Sources*, vol. 206, pp. 282–287, May 2012.

[243] X. L. Luo, H. C. Wu, C. Y. Tsao, Y. Cheng, J. Betz, G. F. Payne, G. W. Rubloff, and W. E. Bentley, “Biofabrication of stratified biofilm mimics for observation and control of bacterial signaling,” *Biomaterials*, vol. 33, no. 20, pp. 5136–5143, Jul. 2012.

[244] X. Chen, H. Zhu, Y.-C. Chen, Y. Shang, A. Cao, L. Hu, and G. W. Rubloff, “MWCNT/V2O5 Core/Shell Sponge for High Areal Capacity and Power Density Li-Ion Cathodes,” *Acs Nano*, vol. 6, no. 9, pp. 7948–7955, Sep. 2012.

[245] Y. Liu, B. Zhang, K. M. Gray, Y. Cheng, E. Kim, G. W. Rubloff, W. E. Bentley, Q. Wang, and G. F. Payne, “Electrodeposition of a weak polyelectrolyte hydrogel: remarkable effects of salt on kinetics, structure and properties,” *Soft Matter*, vol. 9, no. 9, p. 2703, 2013.

[246] G. F. Payne, E. Kim, Y. Cheng, H.-C. Wu, R. Ghodssi, G. W. Rubloff, S. R. Raghavan, J. N. Culver, and W. E. Bentley, “Accessing biology's toolbox for the mesoscale biofabrication of soft matter,” *Soft Matter*, vol. 9, no. 26, p. 6019, 2013.

[247] X. Chen, E. Pomerantseva, K. Gregorczyk, R. Ghodssi, and G. Rubloff, “Cathodic ALD V2O5 thin films for high-rate electrochemical energy storage,” RSC Adv., vol. 3, no. 13, pp. 4294–9, 2013.

[248] J. F. Betz, Y. Cheng, C.-Y. Tsao, A. Zargar, H.-C. Wu, X. Luo, G. F. Payne, W. E. Bentley, and G. W. Rubloff, “Optically clear alginate hydrogels for spatially controlled cell entrapment and culture at microfluidic electrode surfaces,” *Lab Chip*, vol. 13, no. 10, p. 1854, 2013.

[249] G. W. Rubloff, A. C. Kozen, and S. Bok Lee, “From nanoscience to solutions in electrochemical energy storage,” *J. Vac. Sci. Technol. A*, vol. 31, no. 5, pp. 058503–21, 2013.

[250] X. Chen, H. Zhu, C. Liu, Y.-C. Chen, N. Weadock, G. Rubloff, and L. Hu, “Role of mesoporosity in cellulose fibers for paper-based fast electrochemical energy storage,” *J. Mater. Chem. A*, vol. 1, no. 28, pp. 8201–8, 2013.

[251] L. C. Haspert, E. Gillette, S. B. Lee, and G. W. Rubloff, “Perspective: hybrid systems combining electrostatic and electrochemical nanostructures for ultrahigh power energy storage,” *Energ Environ Sci*, vol. 6, no. 9, pp. 2578–13, 2013.

[252] A. Marquardt, E. Breitung, T. Weisser, G. Gates, G. Rubloff, and R. Phaneuf, “Atomic Layer Deposition Diffusion Barriers for Silver Art and Cultural Heritage Objects,” Electrochemical Society Transactions, 2013, 58, 277-286.

[253] A. C. Kozen, M. A. Schroeder, K. D. Osborn, C. J. Lobb, and G. W. Rubloff, “Examining the role of hydrogen in the electrical performance of in situ fabricated metal-insulator-metal trilayers using an atomic layer deposited Al2O3 dielectric,” *Appl Phys Lett*, vol. 102, no. 17, p. 173501, 2013.

[254] M. S. Khalil, M. J. A. Stoutimore, S. Gladchenko, A. M. Holder, C. B. Musgrave, A. C. Kozen, G. Rubloff, Y. Q. Liu, R. G. Gordon, J. H. Yum, S. K. Banerjee, C. J. Lobb, and K. D. Osborn, “Evidence for hydrogen two-level systems in atomic layer deposition oxides,” *Appl Phys Lett*, vol. 103, no. 16, p. 162601, 2013.

[255] H.-C. Wu, C.-Y. Tsao, D. N. Quan, Y. Cheng, M. D. Servinsky, K. K. Carter, K. J. Jee, J. L. Terrell, A. Zargar, G. W. Rubloff, G. F. Payne, J. J. Valdes, and W. E. Bentley, “Autonomous bacterial localization and gene expression based on nearby cell receptor density,” *Molecular Systems Biology*, vol. 9, pp. 1–8, Jan. 2013.

[256] C.-F. Sun, K. Karki, Z. Jia, H. Liao, Y. Zhang, T. Li, Y. Qi, J. Cumings, G. W. Rubloff, and Y. Wang, “A Beaded-String Silicon Anode,” *Acs Nano*, vol. 7, no. 3, pp. 2717–2724, Mar. 2013.

[257] Z. Gui, H. Zhu, E. Gillette, X. Han, G. W. Rubloff, L. Hu, and S. B. Lee, “Natural Cellulose Fiber as Substrate for Supercapacitor,” *Acs Nano*, vol. 7, no. 7, pp. 6037–6046, Jul. 2013.

[258] K. E. Gregorczyk, Y. liu, J. P. Sullivan, and G. W. Rubloff, “In Situ Transmission Electron Microscopy Study of Electrochemical Lithiation and Delithiation Cycling of the Conversion Anode RuO 2,” *Acs Nano*, vol. 7, no. 7, pp. 6354–6360, Jul. 2013.

[259] A. Marquardt, E. M. Breitung, T. Drayman-Weisser, G. Gates, G. W. Rubloff, and R. J. Phaneuf, “(Invited) Characterization of Atomic Layer Deposited Films as Diffusion Barriers for Silver Art Objects,” *ECS Transactions*, vol. 58, no. 10, pp. 277–286, Oct. 2013.

[260] X. Han, Y. Xu, X. Chen, Y.-C. Chen, N. Weadock, J. Wan, H. Zhu, Y. Liu, H. Li, G. Rubloff, C. Wang, and L. Hu, “Reactivation of dissolved polysulfides in Li–S batteries based on atomic layer deposition of Al2O3 in nanoporous carbon cloth,” *Nano Energy*, vol. 2, no. 6, pp. 1–10, Oct. 2013.

[261] M. Gnerlich, E. Pomerantseva, K. Gregorczyk, D. Ketchum, G. Rubloff, and R. Ghodssi, “Solid flexible electrochemical supercapacitor using Tobacco mosaicvirus nanostructures and ALD ruthenium oxide,” *JOURNAL OF MICROMECHANICS AND MICROENGINEERING*, vol. 23, no. 11, pp. 114014–7, Oct. 2013.

[262] X. Luo, H.-C. Wu, J. Betz, G. W. Rubloff, and W. E. Bentley, “Air bubble-initiated biofabrication of freestanding, semi-permeable biopolymer membranes in PDMS microfluidics,” *Biochemical Engineering Journal*, vol. 89, pp. 2–9, Aug. 2014.

[263] I. E. Rauda, V. Augustyn, L. C. Saldarriaga-Lopez, X. Chen, L. T. Schelhas, G. W. Rubloff, B. Dunn, and S. H. Tolbert, “Nanostructured Pseudocapacitors Based on Atomic Layer Deposition of V2O5 onto Conductive Nanocrystal-based Mesoporous ITO Scaffolds,” *Adv Funct Mater*, vol. 24, no. 42, pp. 6717–6728, Sep. 2014.

[264] C. Liu, E. I. Gillette, X. Chen, A. J. Pearse, A. C. Kozen, M. A. Schroeder, K. E. Gregorczyk, S. B. Lee, and G. W. Rubloff, “An all-in-one nanopore battery array,” *Nat Nanotechnol*, vol. 9, no. 12, pp. 1–9, Nov. 2014. DOI: 10.1038/NNANO.2014.247.

[265] A. C. Kozen, A. J. Pearse, C.-F. Lin, M. A. Schroeder, M. Noked, S. B. Lee, and G. W. Rubloff, “Atomic Layer Deposition and in Situ Characterization of Ultraclean Lithium Oxide and Lithium Hydroxide,” *J Phys Chem C*, vol. 118, no. 48, pp. 27749–27753, Dec. 2014. DOI: 10.1021/jp509298r.

[266] E. Kim, Y. Xiong, Y. Cheng, H.-C. Wu, Y. Liu, B. Morrow, H. Ben-Yoav, R. Ghodssi, G. Rubloff, J. Shen, W. Bentley, X. Shi, and G. Payne, “Chitosan to Connect Biology to Electronics: Fabricating the Bio-Device Interface and Communicating Across This Interface,” *Polymers*, vol. 7, no. 1, pp. 1–46, Jan. 2015.

[267] E. Gillette, S. Wittenberg, L. Graham, K. Lee, G. Rubloff, P. Banerjee, and S. B. Lee, “Anodization control for barrier-oxide thinning and 3D interconnected pores and direct electrodeposition of nanowire networks on native aluminium substrates,” *Physical chemistry chemical physics : PCCP*, vol. 17, no. 5, pp. 3873–3879, Jan. 2015.

[268] J. Song, M. Noked, E. Gillette, J. Duay, G. Rubloff, and S. B. Lee, “Activation of a MnO2 cathode by water-stimulated Mg2+ insertion for a magnesium ion battery,” *Physical chemistry chemical physics : PCCP*, pp. 1–9, Jan. 2015.

[269] K. E. Gregorczyk, A. C. Kozen, X. Chen, M. A. Schroeder, M. Noked, A. Cao, L. Hu, and G. W. Rubloff, “Fabrication of 3D Core–Shell Multiwalled Carbon Nanotube@RuO 2Lithium-Ion Battery Electrodes through a RuO2 Atomic Layer Deposition Process,” *Acs Nano*, vol. 9, no. 1, pp. 464–473, Jan. 2015.

[270] M. A. Schroeder, N. Kumar, A. J. Pearse, C. Liu, S. B. Lee, G. W. Rubloff, K. Leung, and M. Noked, “DMSO–Li2O2 Interface in the Rechargeable Li–O2 Battery Cathode: Theoretical and Experimental Perspectives on Stability,” *ACS Appl. Mater. Interfaces*, vol. 7, no. 21, pp. 11402–11411, Jun. 2015.

[271] A. C. Kozen, C.-F. Lin, A. J. Pearse, M. A. Schroeder, X. Han, L. Hu, S. B. Lee, G. W. Rubloff, and M. Noked, “Next-Generation Lithium Metal Anode Engineering via Atomic Layer Deposition,” *ACS Nano*, vol. 9, no. 6, pp. 5884–5892, Jun. 2015. DOI: 10.1021/acsnano.5b02166.

[272] G. W. Rubloff and S. B. Lee, “New science at the meso frontier: Dense nanostructure architectures for electrical energy storage,” Invited article, *Current Opinion in Solid State and Materials Science*, vol. 19, no. 4, pp. 227–234, Aug. 2015.

[273] M. A. Schroeder, A. J. Pearse, A. C. Kozen, X. Chen, K. Gregorczyk, X. Han, A. Cao, L. Hu, S. B. Lee, G. W. Rubloff, and M. Noked, “Investigation of the Cathode–Catalyst–Electrolyte Interface in Aprotic Li–O2 Batteries,” *Chem Mater*, vol. 27, no. 15, pp. 5305–5313, Aug. 2015.

[274] A. C. Kozen, A. J. Pearse, C.-F. Lin, M. Noked, and G. W. Rubloff, “Atomic Layer Deposition of the Solid Electrolyte LiPON,” *Chem Mater*, vol. 27, no. 15, pp. 5324–5331, Aug. 2015. DOI: 10.1021/acs.chemmater.5b01654.

[275] M. A. Schroeder, A. J. Pearse, A. C. Kozen, S. B. Lee, G. W. Rubloff, and M. Noked, “Electrode Degradation Study of Vertically Aligned Carbon Nanotubes on a 3D Integrated Current Collector,” *J Electrochem Soc*, vol. 162, no. 12, pp. A2372–A2377 (2015).

[276] T. Gao, M. Noked, A. J. Pearse, E. Gillette, X. Fan, Y. Zhu, C. Luo, L. Suo, M. A. Schroeder, K. Xu, S. B. Lee, G. W. Rubloff, and C. Wang, “Enhancing the Reversibility of Mg/S Battery Chemistry through Li+ Mediation,” *Journal of the American Chemical Society*, vol. 137, no. 38, pp. 12388–12392, Sep. 2015.

[277] C. Gong, D. Ruzmetov, A. Pearse, D. Ma, J. N. Munday, G. Rubloff, A. A. Talin, and M. S. Leite, “Surface/Interface Effects on High-Performance Thin-Film All-Solid-State Li-Ion Batteries,” *ACS Appl. Mater. Interfaces*, 7 (47), 26007-26011 (2015).

[278] C. Liu, E. Gillette, X. Chen, A.J. Pearse, A.C. Kozen, M.A. Schroeder, K. Gregorczyk, S.B. Lee, G.W. Rubloff, “A Rational Design for Batteries at Nanoscale by Atomic Layer Deposition” (Invited), ECS Trans. 69 (7), 23-30 (2015). DOI: 10.1149/06907.0023ecst.

[279] C. Liu, X. Han, W. Bao, A.J. Pearse, L. Hu, G.W. Rubloff, “Improving Graphene Conductivity through Selective Atomic Layer Deposition” ECS Trans. 69 (7), 133-138 (2015). DOI: 10.1149/06907.0133ecst.

[280] M. Noked, M. A. Schroder, A. Pearse, G. Rubloff, S.B. Lee, “Invited: Protocols for Evaluating and Reporting Li-O2 Cell Performance”, Viewpoint article, J. Phys. Chem. Lett 7, 211-215 (2016). DOI: 10.1021/acs.jpclett.5b02613.

[281] C-F Lin, A.C. Kozen, M. Noked, C. Liu, and G.W. Rubloff, “ALD Protection of Li-Metal Anode Surfaces – Quantifying and Preventing Chemical and Electrochemical Corrosion in Organic Solvent”, ACS Adv. Mater. Interfaces 1600426 (2016). DOI:10.1002/admi.201600426.

[282] T. Gao, X. Li, X. Wwang, J.Hu, F. Han, X. Fan, L. Suo, A.J. Pearse, S.B. Lee, G.W. Rubloff, K.J. Gaskell, M. Noked, C. Wang, “A Rechargeable Al/S Battery with an Ionic-Liquid Electrolyte”, Angewandte Chemie 128 (34), 10052-10055 (Aug 16, 2016). DOI: 10.1002/ange.201603531.

[283] C-F Lin, M. Noked, A.C. Kozen, C. Liu, O. Zhao, K. Gregorczyk, L. Hu, S.B. Lee, G.W. Rubloff, “Solid Electrolyte Lithium Phosphorous Oxynitride as a Protective Nanocladding Layer for 3D High-Capacity Conversion Electrodes”, ACS Nano, vol. 10, no. 2, pp 2693-2701 (2016). DOI:10.1021/acsnano.5b07757.

[284] W. Luo, C-F Lin, O. Zhao, M. Noked, Y. Zhang, G.W. Rubloff, L. Hu, “Ultrathin Surface Coating Enables Stable Sodium Metal Anode”, Adv. Energy Mater. 1601526 (2016). DOI: 10.1002/aenm.201601526.

[285] M. Noked, C. Liu, J. Hu, K. Gregorczyk, G.W. Rubloff, S.B. Lee, “Electrochemical Thin Layers in Nanostructures for Energy Storage”, Acc. Chem. Res. 49 (10), 2336-2346 (2016). DOI: 10.1021/acs.accounts.6b000315.

[286] C. J. Wolfram, G.W. Rubloff, X. Luo, “Perspectives in flow-based microfluidic gradient generators for characterizing bacterial chemotaxis”, Biomicrofluidics 10 (6), 061301 (2016). DOI: 10.1063/1.4967777.

[287] Xiaogang Han, Yunhui Gong, Kun (Kelvin) Fu, Xingfeng He, Gregory T. Hitz, Jiaqi Dai, Alex Pearse, Boyang Liu, Howaard Wang, Gary Rubloff, Yifei Mo, Venkataraman Thangadurai, Eric D. Wachsman and Liangbing Hu, “Negating interfacial impedance in garnet-based solid-state Li metal batteries”, Nature Mater. Online 12 Dec 2016. DOI:10.1038/NMAT4821.

[288] A.J. Pearse, E. Gillette, S.B. Lee, G.W. Rubloff, “The reaction current distribution in battery electrode materials revealed by XPS-based state-of-charge mapping”, *Phys. Chem. Chem. Phys.* 18, 19093-19102 (2016). DOI: 10.1039/c6cp03271k.

[289] A.J. Pearse, T.E. Schmitt, E.J. Fuller, F. El-Gabaly, C-F Lin, K. Gerasopoulos, A.C. Kozen, A.A. Talin, G. Rubloff, K.E. Gregorczyk, “Nanoscale Solid State Batteries Enabled by Thermal Atomic Layer Deposition of a Lithium Polyphosphazene Solid State Electrolyte”, Chem. Mater. (March 30, 2017). DOI: 10.1021/acs.chemmater.7b00805.

[290] C. Liu, N. Kim. G.W. Rubloff, S.B. Lee, "High performance asymmetric V2O5-SnO2 nanopore battery by atomic layer deposition", Nanoscale 9, 11566 (2017), DOI: 10.1039/c7nr02151h.

[291] C.-F. Lin, X. Fan, A. Pearse, S-C Liou, K. Gregorczyk, M. Leskes, C. Wang, S.B. Lee, G.W. Rubloff, M. Noked, "Highly Reversible Conversion-Type FeOF Composite Electrode with Extended Lithium Insertion by Atomic Layer Depositioni LiPON Protection", Chem Mater (2017), DOI: 10.1021/acs.chemmater.7b03058.

[292] C.-F. Lin, Y. Qi, K. Gregorczyk, S.B. Lee, G. Rubloff, "Nanoscale Protection Layers to Mitigate Degradation in High Energy Electrochemical Interfaces", Accts Chem Res, invited special issue on Energy Storage: Complexities Among Materials and Interfaces at Multiple Length Scales, 51 (1), 97-106 (2018). DOI: 10.1021/acs.accounts.7b00524

[293] Alexander Pearse, Thomas Schmitt, Emily Sahadeo, David Stewart, Alexander Kozen, Konstantinos Gerasopoulos, A. Alec Talin, Sang Bok Lee, Gary Rubloff, Keith Gregorczyk, "Three-Dimensional Solid-State Lithium-Ion Batteries Fabricated by Conformal Vapor-Phase Chemistry", ACS Nano (2018, April 24). **DOI:** 10.1021/acsnano.7b08751

[294] David M. Stewart, Alexander J. Pearse, Nam S. Kim, Elliot J. Fuller, A. Alec Talin, Keith E. Gregorczyk, Sang Bok Lee, Gary W. Rubloff, “Tin Oxynitride Anodes by Atomic Layer Deposition for Solid State Batteries”, Chem Mater 30 (8), 2526-2534 (2018). DOI: 10.1021/acs.chemmater.7b04666

[295] Sylvia Xin Li, Nam Kim, Kim McKelvey, Chanyuan Liu, Henry S. White, Gary W. Rubloff, Sang Bok Lee, Mark A. Reed, “Nanofluidic battery with extreme confinement of electrolytes”, (in review).

[296] Emily Sahadeo, Jaehee Song, Karen Gaskell, Nam Kim, Gary Rubloff, and Sang Bok Lee, “Investigation of the water-stimulated Mg2+ insertion mechanism in an electrodeposited MnO2 cathode using X-ray photoelectron spectroscopy”, Phys Chem Chem Phys 20, 2517-2526 (2018).

[297] W. Luo, J. Hayden, S.-H. Jang, Y. Wang, Y. Zhang, Y. Kuang, Y. Wang, Y. Zhou, G. W. Rubloff, C.-F. Lin, L. Hu. “Highly Conductive, Light Weight, Robust, Corrosion-Resistant, Scalable, All-Fiber Based Current Collectors for Aqueous Acidic Batteries.” Advanced Energy Materials, 07Dec2017. <https://doi.org/10.1002/aenm.201702615>

[298] Kevin Leung, Alexander J. Pearse, Albert Alec Talin, Elliot J. Fuller, Gary W. Rubloff, and Normand A. Modine, “Kinetics-Controlled Degradation Reactions at Crystalline LiPON/LixCoO2 and Crystalline LiPON/Li-metal Interfaces”, ChemSusChem (2018, April 18). DOI: 10.1002/cssc.201800027

[299] Yang Wang, Chuan-Fu Lin, Jiancun Rao, Karen Gaskell, Gary Rubloff, and Sang Bok Lee, “Electrochemically Controlled Solid Electrolyte Interphase Layers Enable Superior Li–S Batteries,” ACS Appl. Mater. Interfaces, 2018, 10, pp 24554–24563. DOI: 10.1021/acsami.8b07248

[300] Yang Wang, Emily Sahadeo, Gary Rubloff, Chuan-Fu Lin, and Sang Bok Lee, “High-capacity lithium sulfur battery and beyond: a review of metal anode protection layers and perspective of solid-state electrolytes”, J. Mater. Sci. 1-23 (2018). DOI: 10.1007/s10853-018-3093-7