

## **Vitae of Michael F. Toney**

Stanford Synchrotron Radiation Lightsource  
SLAC National Accelerator Center  
2575 Sand Hill Rd, M/S 69  
Menlo Park, CA 94025  
Tele: 650-926-2056  
Email: [mftoney@slac.stanford.edu](mailto:mftoney@slac.stanford.edu)

### **EDUCATION**

- Ph.D. (1983), M.S. (1980), University of Washington, Seattle, WA
- B.S. with honors, 1979, California Institute of Technology, Pasadena, CA

### **EXPERIENCE**

- Chemistry and Materials Sciences Staff (CAMS) group leader
- Senior Staff Scientist. Stanford Synchrotron Radiation Laboratory, 2007-present
- Staff Scientist. Stanford Synchrotron Radiation Laboratory, 2003-2007
- Research Staff Member, IBM Almaden Research Center, 1984-2003
- Postdoctoral Fellow, Risoe National Laboratory, Roskilde, Denmark, 1983-1984

### **HONORS**

- Farrell W Lytle Award for fostering collaboration between SSRL users and staff, Stanford Synchrotron Radiation Lightsource, 2009
- SLAC National Accelerator Laboratory Employee Recognition Award, Sept 2009.
- IBM Research Division Award, 1999. For development of giant magnetoresistance head technology.
- IBM Outstanding Technical Achievement Award, 1997. For measurements of the near-surface orientation of polymer molecules.
- IBM Technical Group Award, 1996. For progress in understanding the molecular arrangement of water near electrified interfaces.
- IBM Outstanding Technical Achievement Award, 1988. For *in-situ* measurements of the structure of adsorbed monolayers at immersed electrodes.
- IBM Research Division Award, 1988. For contributions for solving hard disk drive contamination problems.
- IBM First Patent Application Achievement Award, 1988.
- NATO Postdoctoral Fellowship, 1983
- University of Washington Graduate Tuition Scholarship, 1983
- American Vacuum Society Scholarship, 1980 and 1981
- Sebastian Karrer Prize in Physics (University of Washington), 1980
- California Institute of Technology Merit Scholarship, 1978

### **RESEARCH AND TEACHING POSITIONS**

- Scientific Staff, Stanford Synchrotron Radiation Laboratory, 2003-present
- Visiting professor at Faculte des Sciences et Techniques, Université Henri Poincaré, Nancy, France, July, 2008.
- Research Staff Member, IBM Almaden Research Center, San Jose, Ca. 1984-2003

- Member of Technical Staff, Office of the Laboratory Director, IBM Almaden Research Center, San Jose, Ca. 1993-1994
- NATO Postdoctoral Fellow, Riso National Laboratory, Roskilde, Denmark. 1983-1984
- Research Associate, University of Washington, Seattle, Wa. 1979-1983
- Undergraduate Research Staff, California Institute of Technology, Pasadena, Ca. 1978-1979
- Teaching Assistant, California Institute of Technology, Pasadena, Ca. 1978-1979.

## **PROFESSIONAL ACTIVITIES**

- Member of NIST Center for Neutron Research Beam Time Allocation Committee, 2005 - 2010.
- Chair of Advanced Photon Source (APS) Scattering Applied Materials Proposal Review Panel (PRP), 2007-present.
- Member of the Science Team for Surfaces, Interfaces and Thin Films for the Advanced Photon Source (APS) renewal and upgrade, 2008.
- Co-chaired Materials Research Society Symposium on “Materials in Transition —Insights from Synchrotron and Neutron Sources”, Boston, Ma 2007.
- Co-organized “SSRL School on Hard X-ray Scattering: Techniques in Materials and Environmental Sciences,” at SSRL, May 16-17, 2006 and May 15-17, 2007.
- Guest Lecturer on “X-ray Diffraction and Scattering” at the Nanoscience and Nanotechnology Course, Pacific Northwest National Laboratory, Richland, Jan. 5, 2006
- Organized a workshop on “The Role of Small-Angle X-ray Scattering in Materials Science”, part of 32<sup>nd</sup> SSRL Users Meeting, Oct 19, 2005.
- Organized and co-chaired the 31<sup>st</sup> SSRL Users Meeting, Oct 20-22, 2004.
- Organized a workshop on “Experimental Methods of X-ray Scattering” part of 31<sup>st</sup> SSRL Users Meeting, Oct 20, 2004.
- Member of the Magnetism Reflectometer Instrument Advisor Team (IAT) for the Spallation neutron Source (SNS), 2000-2003.
- Special Award Judge for the American Physical Society and American Association of Physics Teachers for the Intel International Science & Engineering Fair. 5/8/2001, San Jose, CA.
- Member DOE sponsored meeting on "Research frontiers in artificially structured magnets and nanomagnetism at neutron scattering facilities", 9/30-31/2001.
- Member of DOE Workshop on Chemical Interactions at Metal Oxide-Aqueous Solution Interfaces, April, 1997.
- Organized and chaired a workshop on “Materials Characterization with Hard and Soft X-ray Reflectivity” at the National Synchrotron Light Source Users Meeting, 5/20/97.
- Chair of the committee to assess the future of X-ray science at the Stanford Synchrotron Radiation Laboratory, 1993-1994.
- Member of Stanford Synchrotron Radiation Laboratory Users Organization Executive Committee, 1992-1994.
- Chair (1992) and member (1991) for a review panel of the DOE University Research Instrumentation Program.

## INVITED TALKS AT CONFERENCES AND MEETINGS

- “Resources for X-Ray Scattering at the Stanford Synchrotron Radiation Lightsource”, 2009 Annual Meeting of The American Institute of Chemical Engineers, Nashville, Tn, Nov 9, 2009.
- “Size and Composition Dynamics of Nanoparticle Electrocatalysts”, Workshop on Modeling of Fuel Cell Electrocatalysts, University of California at Santa Barbara, July 16, 2009.
- “Structure-Property Relationships in Organic Electronics: Thin Film Transistors and Solar Cells”, Advanced Materials and Nanotechnology 4, Dunedin, New Zealand, 2/11/2009.
- “Grazing Incidence Small Angle X-ray Scattering Studies of Two-Phase Thin Films: Organic Photovoltaics”, 2008 Materials Research Society Fall Meeting, Boston, MA, 12/3/2008.
- “Use of Anomalous X-ray Scattering for Probing the Structure, Composition and Size of Binary Alloy Nanoparticle Electrocatalysts” 214<sup>th</sup> Meeting of the Electrochemical Society, Honolulu, Hi, 10/14/ 2008.
- “Physical Origins of the Orientation Ratio in Recording Media”, Magnetism and Magnetic Materials 2002, Tampa Bay, Fl, 11/13/2002.
- “Update on X-ray Scattering Capabilities at SSRL”, SSRL Annual users meeting, 10/1/2007.
- “Nanoscale Structure in Magnetic Recording Media”, Symposium on Nanoscale Science and Neutron Scattering, Knoxville, TN, 6/23/2002.
- “Small Angle Neutron Scattering and Polarized Neutron Reflectivity Applied to Magnetic Recording Technology”, Oak Ridge Chapter of ASM 2002 Educational Symposium on Applications of Neutron Scattering in Materials Science and Engineering, 4/11/2002.
- “Roughness of Thin Perfluoropolyether Lubricant Films: Influence on Recording Limits”, DiskCon Intermag/MMM review session, 10/18/2001, San Jose, Ca.
- “Porosity Characterization with Small Angle X-ray Scattering and X-ray Reflectivity”, Short Course on Porosity Characterization in low-k dielectric films at the Advanced Metallization Conference, 10/8/2001, Montreal, Canada.
- “Texture in Magnetic Recording”, Workshop on Texture in Electronic Applications, National Institute of Standards and Technology, Gaithersburg, MD, 10/10/2000.
- “Hard Disk magnetic recording technology and the SNS magnetism reflectometer”, Workshop on Scientific Opportunities at the Spallation Neutron Source, Argonne National Laboratory, 4/28/2000.
- “X-ray Diffraction Measurements of Electrochemically Formed Oxide Films on Iron”, Workshop on Surface and Interface Study using Synchrotron Radiation, SPring8, Koentoshi, Japan, 3/20/2000.
- “The Structure of the Passive Film on Iron: A Nanocrystalline Spinel Oxide”, 1997 Joint International Meeting of the Electrochemical Society and the International Society for Electrochemistry, Paris, France 9/1/1997.
- “Study of Electrochemical Interfaces With In Situ X-ray Scattering: Reduction and Oxidation”, 5th International Conference on Surface X-ray and Neutron Scattering, Oxford, UK, 7/17/1997.

- “Underpotential Deposition of Copper on Gold (111) in Sulfuric Acid: A Surface X-ray Scattering Study”, 191st meeting of the Electrochemical Society, Montreal, Canada, 5/7/1997.
- “Distribution of Water Molecules at the Silver(111)-Electrolyte Interface as Studied with X-ray Scattering”, DOE Workshop on Chemical Interactions at Metal Oxide-Aqueous Solution Interfaces, Santa Fe, NM, 4/28/1997.
- “X-Ray Scattering Studies of Metal-Electrolyte Interfaces: Application to the Passive Film Formed on Fe(001) & Fe(110)”, San Francisco Local Electrochemical Society Section Meeting, San Jose, CA, 11/19/1997.
- “Applications of X-ray Scattering to Electrode-Electrolyte Interfaces: Adsorbed Layers, Passive Oxide Films and the Inner Layer”, 212th American Chemical Society National Meeting, Orlando, FL, 8/26/1996.
- “X-ray Scattering Studies of the Passive Film On Fe(001) and Fe(110)”, Aqueous Corrosion Gordon Research Conference, New London, NH, 7/7/1996.
- “X-ray Scattering Studies of the Passive Film On Fe(110)”, Research in Progress Symposium, 51st Annual NACE Conference, Denver, CO 3/17/1996.
- “The Near Surface Structure of Rubbed Polyimide (PBDA-PDA) Films”, 42nd National Symposium of the American Vacuum Society, Minneapolis, MN, 10/19/1995.
- “In Situ X-ray Scattering Studies of Atomic Structure at Electrode/Electrolyte Interfaces”, Fall 1995 TMS/ASM Meeting, Cleveland, OH, 10/29/1995.
- “Interfacial Roughness and Giant Magnetoresistance in Magnetic Multilayers as Studied with X-Ray Scattering”, Stanford Synchrotron Radiation Laboratory Users Meeting, Stanford, CA, 10/13/1995.
- “Structural Characterization of Magnetic Materials with Synchrotron X-Ray Scattering”, International Conference on Advanced Materials, Cancun, Mexico, 8/30/1995.
- “Applications of X-ray Scattering to Electrified Interfaces: Structure of Adsorbed Layers and Interfacial Distribution of Water”, 78th Canadian Society for Chemistry Conference, Guelph, Ontario, Canada, 5/31/1995.
- “Polymers in the Buff: The Near Surface Alignment of Polymers in Rubbed Films”, National Synchrotron Light Source Users Meeting, Brookhaven National Laboratory, NY, 5/10/1995.
- “The Distribution of Water Molecules at the Ag(111)-Electrolyte Interface as Studied with X-ray Scattering”, IUVESTA Workshop on ‘Surface Science and Electrochemistry’, San Benedetto del Tronto, Italy, 9/14/1994.
- “The Distribution of Water Molecules at Electrode-Electrolyte Interfaces”, Interactions of Water with Solid Surfaces Gordon Research Conference, Plymouth, NH 7/22/1994.
- “Structure of the Double Layer at Ag(111) as Measured with Surface X-ray Scattering”, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL 3/2/1994
- “X-ray Scattering and Reflectivity of Thin Polymer Films Used in the Computer Industry”, Workshop on Industrial Applications of Synchrotron Radiation at NC STAR, Raleigh, NC 4/8/1994.
- “In-Situ Synchrotron X-Ray Scattering Studies of the Atomic Structure of Metal Monolayers Formed by Underpotential Deposition”, the 185th meeting of the Electrochemical Society, San Francisco, CA 5/24/1994.

- “The Distribution of Water at an Aqueous-Ag(111) Interface as Studied with Surface X-ray Scattering”, National Institute of Standards and Technology Workshop on Neutron Reflectivity, Gaithersburg, MD, 12/10/1993.
- "In Situ X-ray Scattering Studies of Atomic Structure at Electrode Surfaces”, American Chemical Society National Meeting, Symposium on Chemically Sensitive Interfaces, Chicago, IL, 8/26/1993.
- “Structure of the Double Layer at Ag(111) as Measured with Surface X-ray Scattering”, American Chemical Society National Meeting, Symposium on Atomic and Molecular Views of the Electrode-Electrolyte Interface, Chicago, IL, 8/22/1993.
- “In-situ X-ray Scattering and Reflectivity of Atomic Structure at Electrode/Electrolyte Interfaces”, the 183th meeting of the Electrochemical Society, Honolulu, 5/17/1993.
- “X-ray Scattering Studies of Monolayer Formation on Electrode Surfaces”, American Physical Society March Meeting, Seattle, WA, 3/24/1993.
- “Studies of Electrodes by In Situ X-ray Scattering”, NATO Advanced Research Workshop on Synchrotron Radiation Techniques in Interfacial Electrochemistry, Madeira, Portugal, 12/16/1992.
- “In Situ Grazing Incidence X-ray Diffraction Studies of Metal Monolayers Adsorbed at Solid-Liquid Interfaces”, American Crystallographic Association 1992 Annual Meeting, Pittsburgh, PA, 8/11/1992.
- “Water Layers Adjacent to Ag(111) Electrodes”, Physical Electrochemistry Gordon conference, New London, NH, 8/5/1992.
- “In Situ X-ray Diffraction”, Workshop on Structural Effects in Electrocatalysis and Oxygen Electrochemistry, Case Western Reserve University, Cleveland, 10/30/1991.
- “X-ray Scattering and Reflectivity in Interfacial Electrochemistry, Corrosion, and Electrodeposition”, 180th meeting of the Electrochemical Society, Phoenix, 10/13/1991.
- “In Situ Surface X-ray Scattering of Metal Monolayers Adsorbed at Solid-Liquid Interfaces”, SPIE Symposium, Conference on X rays in Materials Analysis, San Diego, 7/26/1991.
- “In Situ Surface X-ray Scattering of Electrochemically Deposited Metal Monolayers”, Surface Structure Workshop at the National Synchrotron Light Source Users Meeting, New York, 5/20/1991.
- “In Situ Surface X-ray Scattering of Metal Monolayers Adsorbed at Solid-Liquid Interfaces”, New Mexico American Vacuum Society Symposium, Albuquerque, 4/23/1991.
- “In-Situ Synchrotron X-ray Diffraction of Electrochemical Interfaces”, the 178th meeting of the Electrochemical Society, Seattle, WA, 10/15/1990.
- “In Situ X-ray Scattering of Monolayers Adsorbed at Solid-Liquid Interfaces”, Gordon Conference on Electrochemistry, Ventura, CA, 1/16/1989.

#### **INVITED TALKS AT UNIVERSITIES AND NATIONAL LABS**

- “Structure, composition and activity of bimetallic electrocatalysts”, UniCat Lecture at the Technical University, Berlin, Jun 30, 2010.
- “High Strength Interpenetrating Network Hydrogels: Small Angle Scattering”, Massey University, Palmerston North, New Zealand, Mar 4, 2010.

- “Nanoscale Three Dimensional Morphology of Bulk Heterojunctions in Organic Photovoltaics”, Industrial Research, Limited, Lower Hutt, New Zealand, Mar 3, 2010.
- “Nanoscale Morphology of Bulk Heterojunctions in Organic Photovoltaics”, Columbia University, Jan 20, 2010.
- “Use of Synchrotron X-ray Diffraction in Materials Research for Renewable Energy” NREL, Golden Co, Dec 7, 2009.
- “Size and composition dynamics of nanoparticle electrocatalysts”, University of Washington Center for Nanotechnology Honoring the Memory of Sam Fain, Nov 17, 2009.
- “Nanoscale Morphology of Bulk Heterojunctions in Organic Photovoltaics”, University of California at Berkeley, Sept 25, 2009.
- “Size and composition dynamics of nanoparticle electrocatalysts”, Imperial College, London, Sept 11, 2009.
- “Nanoscale Morphology of Bulk Heterojunctions in Organic Photovoltaics”, Imperial College, London, Sept 10, 2009.
- “X-Ray Diffraction Studies of Charge Density Wave Formation in Rare-Earth Tellurides”, Industrial Research, Limited, Lower Hutt, New Zealand, 2/20/2009.
- “X-ray scattering for probing the structure, composition and size of binary alloy nanoparticle electrocatalysts”, at Hitachi Global Storage Technologies, San Jose, Ca, 10/29/2008.
- “Use of X-ray scattering for probing the structure, composition and size of binary alloy nanoparticle electrocatalysts”, at Faculte des Sciences et Techniques, Université Henri Poincaré, Nancy, France, 7/18/2008.
- “Structure of Pentacene Thin Films on Amorphous SiO<sub>2</sub>”, National Institute for Standards and Technology, 8/29/2006.
- “X-ray Diffraction from Organics Semiconductor Thin Films: Pentacene”, Pacific Northwest National Laboratory, Richland, 1/6/2006.
- “X-ray Diffraction from Technologically Important Interfaces: What A Physicist Can Do in the Computer Industry”, Department of Physics, Sonoma State University, 12/02/1997.
- “X-Ray Scattering Studies of Ultrathin Films: Application to the Passive Film Formed on Fe(001) & Fe(110)”, Department of Materials Science, University of California at Berkeley, Berkeley, CA 10/17/1996.
- “X-Ray Scattering Studies of Messy Interfaces: The near surface structure of rubbed polymers and the distribution of water near an Ag(111) electrode”, Department of Applied Sciences Colloquium, Brookhaven National Laboratory, 8/19/1995.
- “X-Ray Scattering Studies of the Atomic Structure at Electrode-Electrolyte Interfaces”, Surface Science seminar, Lawrence Berkeley Laboratory, Berkeley, CA, 1/26/1995.
- “X-Ray Scattering Studies of the Atomic Structure of Metal Monolayers Formed by Underpotential Deposition on Electrode Surfaces”, Materials Science Department, John's Hopkins University, 12/8/1993.
- “Structure of the Double Layer at Ag(111) as Measured with Surface X-ray Scattering”, Chemical Technology Division, Argonne National Laboratory, Argonne, IL, 8/25/1993.
- “Distribution of Water Molecules at Ag(111) Electrodes as Measured with Surface X-ray Scattering”, Chemistry Department, University of Washington, Seattle, WA, 8/20/1993.

- “Distribution of Water Molecules at Ag(111) Electrodes’, Chemistry Department, San Jose State University, 9/15/1993.
- “Structure of the Double Layer at Ag(111) Measured with Surface X-ray Scattering”, Geology Department, Stanford, CA, 5/10/1993
- “Water Layers Adjacent to Ag(111) Electrodes’, Lawrence Berkeley Laboratory, Berkeley, CA, 4/12/93.
- “Atomic Structure of Co-Pt Multilayers”, National Synchrotron Light Source Seminar, 8/21/1992.
- “In Situ Surface X-ray Scattering Studies of Electrochemically Deposited Metal Monolayers”, Physical Sciences Colloquium, IBM Almaden Research Center, 5/31/1991.
- “On the Interpretation of Low Angle X-ray Scattering from Metallic Multilayers”, Sandia National Laboratory, Albuquerque, 4/22/1991.
- “In Situ Surface X-ray Scattering of Metal Monolayers Adsorbed at Solid-Liquid Interfaces”, Physics Department, Brookhaven National Laboratory, 1/23/1991.
- “On the Interpretation of Low Angle X-ray Scattering from Metallic Multilayers: Fe/Cr”, Stanford Synchrotron Radiation Laboratory, 1/9/1991.
- “In Situ Surface X-ray Scattering of Monolayers Adsorbed at Solid-Liquid Interfaces”, Center for X-ray Optics, Lawrence Berkeley Laboratory, 4/26/1990.
- “In Situ Surface X-ray Scattering of Monolayers Adsorbed at Solid-Liquid Interfaces”, Polytechnic University, Brooklyn, NY, 2/28/1990.
- “In Situ Surface X-ray Scattering of Monolayers Adsorbed at Solid-Liquid Interfaces”, IBM T.J. Watson Research Center, Yorktown Heights, NY, 1/24/1990.
- “Synchrotron X-ray Scattering at Electrochemical Interfaces”, Materials Science/Chemical Technology Seminar, Argonne National Laboratory, 10/11/1989.

## **SHORT COURSES AND WORKSHOPS**

- “X-ray Diffraction” and “X-ray Scattering” at the 2008 Berkeley-Stanford Summer School on Synchrotron Radiation and Its Applications in Physical Science, 7/19/2008.
- “X-ray Scattering: Basics and Applications”, at Faculte des Sciences et Techniques, Université Henri Poincaré, Nancy, France, 7/15/2008.
- “Polycrystalline thin film scattering” and “Textured polycrystalline thin film scattering and reflectivity” at SSRL School on Hard X-ray Scattering Techniques in Materials and Environmental Sciences, 5/15-17/2007.
- “X-ray Diffraction” and “X-ray Scattering” at the 2006 Berkeley-Stanford Summer School on Synchrotron Radiation and Its Applications, 6/27/2006.
- “Introduction to SR-based scattering techniques” and “Reflectivity and thin films” at SSRL Workshop First Annual SSRL Workshop on Synchrotron X-ray Scattering Techniques in Materials and Environmental Sciences: Theory and Application, 5/16-17/2006.
- “X-ray Diffraction: Basics and a Few Applications” and “X-ray Diffraction: SAXS & Examples” at the Fabrication and Characterization of Nano-Materials Short Course, Pacific Northwest National Lab, 1/6/2006.
- “X-ray Diffraction” and “X-ray Scattering” at the 2005 Berkeley-Stanford Summer School on Synchrotron Radiation and Its Applications, 6/15/2005.

## BOOK CHAPTERS

- “Organics Solar Cells: How X-ray Scattering Has Improved our understanding of morphology”, Synchrotron Radiation News, **23(4)**, 16 (2010).
- “Structure and Magnetic Properties of Chemically Ordered Magnetic Binary Alloys in Thin Film Form”, A. Cebollada, R.C.F. Farrow, M.F. Toney, in *Magnetic Nanostructures*, (American Scientific Publishers, Stevenson Ranch, Ca, 2002), pp. 93-123.
- ”Porous Organosilicates for On-Chip Applications: Dielectric Generational Extendibility by the Introduction of Porosity”, W. Volksen, C.J. Hawker, J.L. Hedrick, V.Y. Lee, T. Magbitang, M.F. Toney, R.D. Miller, E. Huang, J. Liu, M. Petkov, K. Rodbell, M.H. Weber, in *Low Dielectric Constant Materials for IC Applications*, P.S. Ho, J. Leu, W.W. Lee, eds., (Springer-Verlag, Berlin, 2002), pp.167-202.
- “X-ray Diffraction”, M.F. Toney, in *The Encyclopedia of Materials Characterization Techniques: Instrumental Analytical Surfaces, Interfaces, and Thin Films*, C.R. Brundle, C.A. Evans, and S. Wilson, eds., (Manning, Greenwich, 1992), p. 198.
- “Surface X-ray Scattering”, M.F. Toney and O.R. Melroy, in *Electrochemical Interfaces: Modern Techniques for In-Situ Interface Characterization*, H.D. Abruna, ed. (VCH Verlag Chemical, Berlin, 1991), p.55.

## PATENTS

- “Magnetoresistive read transducer and method for making the improved transducer”, J.K. Howard, M.F. Toney, C.H. Tsang, US patent number 4,809,109, 2/28/1989.

## REFEREED JOURNAL PUBLICATIONS

1. “Correlating the scattered intensities of P3HT and PCBM to the current densities of polymer solar cells”, E.D. Gomez, K.P. Barteau, H. Wang, M.F. Toney, Y.-L. Loo, submitted to Chem.Commun. (2010).
2. “Soft-contact lamination: a modular approach for non-invasive fabrication and characterization of bulk-heterojunction and bilayer organic solar cells”, J.B. Kim, S. Lee, M.F. Toney, Z. Chen, A. Facchetti, Y.S. Kim, Y.-L. Loo, Chem. Materials, in press.
3. “Morphology of Photopolymerized End-linked Poly(ethylene glycol) Hydrogels by Small Angle X-ray Scattering”, D.J. Waters, K. Engberg, R. Parke-Houben, L. Hartmann, C.N. Ta, M.F. Toney, C.W. Frank, Macromolecules., in press.
4. “Molecular Characterization of Organic Electronic Films”, D.M. DeLongchamp, R.J. Kline, D.A. Fischer, L.J. Richter, M.F. Toney, Adv. Mat., submitted (2010).
5. “Synthesis of 2,9- and 2,10-Dibromo Pentacene Derivatives and Regioregular Pentacene-containing Conjugated Polymers”, T Okamoto, Y Jiang, HA Becerril, S Hong, ML Senatore, ML Tang, MF Toney, T Siegrist, Z Bao, submitted (2010).
6. “Effects of Thermal Annealing Upon the Morphology of Polymer–Fullerene Blends”, E. Verploegen, R. Mondal, C.J. Bettinger, S. Sok, M.F. Toney, Z. Bao, Adv Func. Mat, in press, (2010).
7. “Influence of substrate on crystallization in polythiophene/fullerene blends”, C. He, D.S. Germack, R.J. Kline, D.M. DeLongchamp, D.A. Fischer, C.R. Snyder, J.G. Kushmerick, M.F. Toney, Lee J. Richter, submitted to Macromolecules.
8. “Synthesis, Properties, and Electronic Applications of Size-Controlled Poly(3-hexylthiophene) Nanoparticles”, J.E. Millstone, D.F.J. Kavulak, C.H. Woo, T.W.

- Holcombe, E.J. Westling, A.L. Briseno, M.F. Toney, J.M.J. Frechet, Langmuir, in press (2010).
9. "Morphology of Photopolymerized End-linked Poly(ethylene glycol) Hydrogels by Small Angle X-ray Scattering", D. Waters, K. Engberg, R. Parke-Houben, L. Hartmann, C. Ta, M.F. Toney, C.W. Frank, *Macromolecules*, **in press** (2010).
  10. "Unconventional Face-on Texture and Exceptional In-plane Order of a High Mobility n-type Polymer", J. Rivnay, M.F. Toney, Y. Zheng, I.V. Kauvar, Z. Chen, V. Wagner, A. Facchetti, A. Salleo, *Adv. Materials*, **in press**, (2010).
  11. "X-ray Probes for *In Situ* Studies of Interfaces", D.D. Fong, C.A. Lucas, M.-I. Richard, M.F. Toney, *MRS Bulletin* **35**(July), (2010).
  12. "Thickness changes in polythiophene gas sensors exposed to vapor", F. Liao, M.F. Toney, V. Subramanian, *Sensors and Actuators: B. Chemical* **148**, 74-80 (2010).
  13. "Physical Discrimination of Amine Vapor Mixtures Using Polythiophene Gas Sensor Arrays", F. Liao, S Yin, M.F. Toney, V. Subramanian, *Sensors and Actuators: B Chemical* **in press**, (2010).
  14. "In-situ evolution of stress gradients in Cu films induced by capping layers", C.E. Murray, P.R. Besser, C. Witt, M. Toney, *Appl., Phys. Lett.* **96**, 261903 (2010).
  15. "High Efficiency Amine Functionalization of Cycloolefin Polymer Surfaces for Biodiagnostics", R.P. Gandhiraman, C. Volcke, V. Gubala, C. Doyle, L. Basabe-Desmonts, C.J. Dotzler, M.F. Toney, M. Iacono, R.I. Nooney, S. Daniels, B. James, D.E. Williams, *J. Materials Chem.* **20**, 4116-4127 (2010).
  16. "Thiophene Rich Fused-aromatic Thienopyrazine Acceptor for Donor-acceptor Low Band-gap Polymers for OTFT and Polymer Solar Cell Applications" R. Mondal, H.A. Becerril, E. Verploegen, D. Kim, J.E. Norton, S. Ko, N. Miyaki, S. Lee, M.F. Toney, J.L. Brédas, M.D. McGehee, Z. Bao, *J. Materials Chem.* (2010).
  17. "Quantification of thin film crystallographic orientation using X-ray diffraction with an area detector", J.L. Baker, L.H. Jimison, S.M.M. Mannsfeld, S. Volkman, S. Yin, V. Subramanian, A. Salleo, A.P. Alivisatos, M.F. Toney, *Langmuir* **26**, 9146–9151, (2010).
  18. "Surface and grain boundary scattering in nanometric Cu films", T. Sun, B. Yao, A.P. Warren, K. Barmak, M.F. Toney, R.E. Peale, K.R. Coffey, *Phys Rev B* **81**, 155454 (2010).
  19. "Lattice-strain control of exceptional activity in dealloyed fuel cell catalysts", P. Strasser, S. Koh, T. Anniyev, J. Greeley, K. More, C. Yu, Z. Liu, S. Kaya, D. Nordlund, H. Ogasawara, M.F. Toney, A. Nilsson, *Nature Chemistry* **2**, 454-460 (2010).
  20. "Interfacial Segregation in Polymer/Fullerene Blends Films for Photovoltaic Devices", D.S. Germack, C.K. Chan, R.J. Kline, D.A. Fischer, D.J. Gundlach, M.F. Toney, L.J. Richter, D.M. DeLongchamp, *Macromolecules* **43**, 3828-3836, (2010).
  21. "Photovoltaic Universal Joints: Ball-and-Socket Interfaces in Molecular Photovoltaic Cells", N.J. Tremblay, A.A. Gorodetsky, M.P. Cox, T. Schiros, B. Kim, R. Steiner, Z. Bullard, A. Sattler, W.Y. So, Y. Itoh, M.F. Toney, H. Ogasawara, A.P. Ramirez, I. Kymissis, M. Steigerwald, C. Nuckolls, *ChemPhysChem* **11**, 799-803, (2010).
  22. "Strain in metallic nanoparticles with oxide shells", B. Ingham, S.C. Hendy, D.D. Fong, P.H. Fuoss, J.A. Eastman, A. Lassesson, K.C. Tee, P.Y. Convers, S.A. Brown, M.P. Ryan, M.F. Toney, *Journal Physics D: Applied Physics* **43**, 075301, (2010).

23. "Ultra-fast Growth of Highly Branched Palladium Nanostructures for Catalysis", J. Watt, S. Cheong, M.F. Toney, B. Ingham, J. Cookson, P.T. Bishop, R.D. Tilley, *ACS Nano* **4**, 396 (2010).
24. "Structural properties of epitaxial SrHfO<sub>3</sub> thin films on Si (001)", M. Sawkar-Mathur, C. Marchiori, J. Fompeyrine, M.F. Toney, J. Bargar, J.P. Chang, *Thin Solid Films* **518**, S118-S122 (2010).
25. "Synthesis and Characterization of K<sub>8-x</sub>(H<sub>2</sub>)<sub>y</sub>Si<sub>46</sub>", D. Neiner, N.L. Okamoto, P. Yu, S. Leonard, C.L. Condon, M.F. Toney, Q.M. Ramasse, N.D. Browning, S.M. Kauzlarich, *Inorganic Chemistry* **49**, 815–822 (2009).
26. "Device-scale perpendicular alignment of colloidal nanorods", J.L. Baker, A. Widmer-Cooper, M.F. Toney, P.L. Geissler, A.P. Alivisatos, *NanoLetters* **10**, 195(2009).
27. "Tuning the properties of polymer bulk heterojunction solar cells by adjusting fullerene size to control intercalation", N.C. Cates, R. Gysel, Z. Beiley, C.E. Miller, M.F. Toney, M. Heeney, I. McCulloch, M.D. McGehee, *NanoLetters* **9**, 4153-4157 (2009).
28. "Large Modulation of Carrier Transport by Grain-Boundary Molecular Packing and Microstructure in Organic Thin Films", J. Rivnay, L.H. Jimison, J.E. Northrup, M.F. Toney, R. Noriega, T.J. Marks, A. Facchetti, A. Salleo, *Nature Materials* **8**, 952 (2009).
29. "Interplay between Energetic and Kinetic Factors on the Ambient Stability of n-Channel Organic Transistors Based on Perylene Diimide Derivatives", J.H. Oh, Y.S. Sun, R. Schmidt, M.F. Toney, D Nordlund, M. Könemann, F. Würthner, Z. Bao, *Chem. Mater.* **21** 5508–5518 (2009).
30. "Observation of two separate charge density wave transitions in Gd<sub>2</sub>Te<sub>5</sub> via transmission electron microscopy and high-resolution x-ray diffraction", K.Y. Shin, N. Ru, I.R. Fisher, C.L. Condon, M.F. Toney, Y.Q. Wu, M.J. Kramer, *J. Alloys Compounds* **489**, 332-225 (2009).
31. "In Situ and Ex Situ Studies of Platinum Nanocrystals: Growth and Evolution in Solution", S. Cheong, J. Watt, B. Ingham, M.F. Toney, R.D. Tilley, *J. Amer. Chem. Soc.* **131**, 14590–14595 (2009).
32. "Improved Efficiency in Poly(3-hexylthiophene)/Zinc Oxide Solar Cells via Lithium Incorporation", M. Lloyd, Y.J. Lee, R. Davis, E. Fang, R. Fleming, R.J. Kline, M.F. Toney, J. Hsu, *Journal of Physical Chemistry C* **113**, 17608-17612 (2009)
33. "Molecular design for improved photovoltaic efficiency: band gap and absorption coefficient engineering", R. Mondal, S.W. Ko, J.E. Norton, N. Miyaki, H.A. Becerril, E. Verploegen, M.F. Toney, J.L. Brédas, M.D. McGehee, Z. Bao, *J. Materials Chem.* **19**, 7195-7197 (2009).
34. "Crystalline Ultra Smooth Self-Assembled Monolayers of Alkylsilanes for Organic Field-Effect Transistors", Y Ito, A.A. Virkar, S. Mannsfeld, J.H. Oh, M.F. Toney, J. Locklin, Z. Bao, *J. Amer. Chem. Soc.* **131**, 9396-9404 (2009).
35. "In-situ USAXS measurements of titania colloidal paint films during the drying process", B. Ingham, S. Dickie, H. Nanjo, M.F. Toney, *J. Colloid Inter. Sci.* **336**, 612–615 (2009).
36. "Controlling Nucleation and Crystallization in Solution-Processed Organic Semiconductors for Thin-Film Transistors", S.S. Lee, C.S. Kim, E.D. Gomez, M.F. Toney, C. Wang, A. Hexemer, J.E. Anthony, Y-L Loo, *Adv. Mater.* **21**, 3605 (2009).
37. "Structure of Pentacene Monolayers on Amorphous Silicon Oxide and Relation to Charge Transport", S.C.B. Mannsfeld, A. Virkar, C. Reese, Z. Bao, M.F. Toney, *Adv Mater.* **21**, 2294–2298 (2009).

38. "The role of OTS density on pentacene and C60 nucleation, thin film growth and transistor performance", A. Virkar, S. Mannsfeld, M.F. Toney, Y. Horng Tan, G.Y. Liu, J.C. Scott, R. Miller, Z. Bao, *Adv. Func. Mater.* **19**, 2294–2298 (2009).
39. "Pressure-induced quenching of the charge-density-wave state in rare-earth tritellurides observed by x-ray diffraction", A. Sacchetti, C.L. Condon, S.N. Gvasaliya, F. Pfune, M. Lavagnini, M. Baldini, M.F. Toney, M. Merlini, M. Hanfland, J. Mesot, J.-H. Chu, I.R. Fisher, P. Postorino, L. Degiorgi, *Phys Rev. B* **79**, 201101(R) (2009).
40. "A neutron scattering study of the interplay between structure and magnetism in Ba(FeCo)<sub>2</sub>As<sub>2</sub>", C. Lester, Jiun-Haw Chu, J.G. Analytis, S. Capelli, A.S. Erickson, C.L. Condon, M.F. Toney, I.R. Fisher, S.M. Haydenkyon, *Phys Rev B* **79**, 144523 (2009).
41. "Solution Processible  $\alpha,\omega$ -Distyryl Oligothiophene Semiconductors with Enhanced Environmental Stability", C.E. Mauldin, K. Puntambekar, A.R. Murphy, F. Laio, J.M.J. Fréchet, V. Subramanian, D.M. DeLongchamp, D.A. Fischer, M.F. Toney, *Chem. Mat.* **21**, 1927-1938 (2009).
42. "Influence of Interfacial Layer Between Nanoparticles and Polymeric Matrix on Viscoelastic Properties of Hydrogel Nanocomposites", M. Yanagioka, M.F. Toney, C.W. Frank, *Macromolecules* **42**, 1331-1343 (2009).
43. "Controlling the orientation of terraced nanoscale ribbons of a thiophene-based copolymer", DM. DeLongchamp, R.J. Kline, Y. Jung, D.S. Germack, E.K. Lin, A.J. Moad, L.J. Richter, M.F. Toney, M. Heeney, I. McCulloch, *ACS Nano* **3**, 780 (2009).
44. "Solid-State Supramolecular Organization of Polythiophene Chains Containing Thienothiophene Units", P. Brocorens, A. Van Vooren, M. Chabiny, M.F. Toney, M. Shkunov, M. Heeney, I. McCulloch, J. Cornil, R. Lazzaroni, *Adv. Mater.* **21**, 1193-1198 (2009).
45. "Charge Transport Anisotropy Due to Grain Boundaries in Directionally Crystallized Thin Films of Regio-Regular Poly(3-hexylthiophene)", L.H. Jimison, M.F. Toney, I. McCulloch, M. Heeney, A. Salleo, *Adv. Materials.* **21**, 1568-1572 (2009).
46. "Bimolecular crystals of fullerenes in conjugated polymers and the implications of molecular mixing for solar cells", A.C. Mayer, M.F. Toney, S.R. Scully, J. Rivnay, C.J. Brabec, M. Scharber, M. Koppe, M. Heeney, I. McCulloch, M.D. McGehee, *Adv. Func. Mater.* **19**, 1173-1179 (2009).
47. "Enhanced superconducting pairing interaction in indium-doped tin telluride", A.S. Erickson, J.-H. Chu, M.F. Toney, T.H. Geballe, I.R. Fisher, *Phys. Rev. B* **79**, 024520 (2009).
48. "Dominant role of grain boundary scattering in the resistivity of nanometric Cu films", T. Sun, B. Yao, A.P. Warren, K. Barmak, M.F. Toney, R.E. Peale, K.R. Coffey, *Phys Rev B.* **79**, 041402(R) (2009).
49. "Particle size effect of hydrogen-induced lattice expansion of palladium nanoclusters", B. Ingham, M.F. Toney, S.C. Hendy, T. Cox, D.D. Fong, J.A. Eastman, P.H. Fuoss, K.J. Stevens, A. Lassesson, S.A. Brown, M.P. Ryan, *Phys Rev B* **78**, 245408-245413 (2008).
50. "Langmuir Monolayers of Straight-Chain and Branched Hexadecanol and Eicosanol Mixtures", R.E. Kurtz, M.F. Toney, J.A. Pople, B. Lin, M. Meron, J. Majewski, A. Lange, G.G. Fuller, *Langmuir* **24**, 14005-14014 (2008).
51. "Size and composition distribution dynamics of alloy nanoparticle electrocatalysts probed by anomalous Small Angle X-ray Scattering (ASAXS)", C. Yu, S. Koh, J.E. Leisch, M.F. Toney, P. Strasser, *Faraday Discussion* **140**, 283-296 (2008).

52. "The Influence of Poly(3-hexylthiophene) Regioregularity on Fullerene-Composite Solar Cell Performance", C. Woo, B. Thompson, B. Kim, M.F. Toney, J.C.H. Frechet, *J. Amer. Chem. Soc.* **130**, 16324-16329 (2008).
53. "Correlating the microstructure of thin films of poly[5,5'-bis(3-dodecyl-2-thienyl)-2,2'-bithiophene] with charge transport: Effect of dielectric surface energy and thermal annealing", L.H. Jimison, A. Salleo, M.L. Chabiny, D.P. Bernstein, M.F. Toney, *Phys. Rev. B* **78**, 125319 (2008).
54. "In situ synchrotron x-ray diffraction experiments on electrochemically deposited ZnO nanostructures", B. Ingham, B.N. Illy, M.F. Toney, M.L. Howdyshe, M.P. Ryan, *J. Phys. Chem. C* **112**, 14863 (2008).
55. "Interfacial Effects in Thin Films of Polymeric Semiconductors", J. Rivnay, L.H. Jimison, M.F. Toney, M. Preiner, N.A. Melosh, A. Salleo, *J. Vac. Sci. Technol. B* **26**, 1454 (2008).
56. "Molecular basis of mesophase ordering in a Thiophene-Based Copolymer", D.M. DeLongchamp, R.J. Kline, Y. Jung, E.K. Lin, D.A. Fischer, D.J. Gundlach, S.K. Cotts, A.J. Moad, L.J. Richter, M.F. Toney, M. Heeney, I. McCulloch, *Macromolecules* **41**, 5709-5715 (2008).
57. "Correlation between luminescent properties and local coordination environment for erbium dopant in yttrium oxide nanotubes", Y. Mao, J. Bargar, M. Toney, J.P. Chang, *J. Appl. Phys.* **103**, 094316 (2008).
58. "Magneto-structural behavior in (110) Europium films", K. Dumesnil, C. Dufour, M.F. Toney, *J. Appl. Phys.* **103**, 07B332 (2008).
59. "Charge density wave formation in  $R_2Te_5$  (R=Nd, Sm and Gd)", K.Y. Shin, J. Laverock, Y.Q. Wu, C. Condon, M.F. Toney, S.B. Dugdale, M.J. Kramer, I.R. Fisher, *Phys. Rev. B* **77**, 165101 (2008).
60. "The microstructure of oligofluorene asymmetric derivatives in organic thin film transistors", Q. Yuan, S.C. B. Mannsfeld, J. Lüning, M. Tang, M. Roberts, M.F. Toney, D.M. DeLongchamp, Z. Bao, *Chem Mat.* **20**, 2763-2772 (2008).
61. "Thin film structure of tetraceno[2,3-b]thiophene characterized by grazing incidence X-ray scattering and near-edge X-ray absorption fine structure analysis", Q Yuan, S.C.B. Mannsfeld, M. Tang, M.F. Toney, J. Lüning, Z. Bao, *J. Amer. Chem. Soc.* **130**, 3502 (2008).
62. "Square Grains in Asymmetric Rod-Coil Block Copolymers", B.D. Olsen, M. F. Toney, R.A. Segalman, *Langmuir* **24**, 1604-1607 (2008).
63. "Strain development in nanoporous metallic foils formed by dealloying", E.J. Schofield, B. Ingham, A. Turnbull, M.F. Toney, M.P. Ryan, *Appl. Phys. Lett.* **92**, 043118 (2008).
64. "Structure of Palladium Nanoclusters for Hydrogen Gas Sensors", K.J. Stevens, B. Ingham, M.F. Toney, S.A. Brown, A. Lassesson, *Current Applied Phys.* **8**, 443-336 (2008).
65. "Effect of chemical pressure on the charge density wave transition in rare earth tritellurides  $RTe_3$ ", N. Ru, C.L. Condon, G.Y. Margulis, K.Y. Shin, J. Laverock, S.B. Dugdale, M.F. Toney, I.R. Fisher, *Phys. Rev. B* **77**, 035114 (2008).
66. "Crystalline Structure in Thin Films of DEH-PPV Homopolymer and PPV-b-PI Rod-Coil Block Copolymers", B.D. Olsen, D. Alcazar, V. Krikorian, M.F. Toney, E.L. Thomas, R.A. Segalman, *Macromolecules* **41**, 58-66 (2008).

67. "Engineering epitaxial  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> gate dielectric films on 4H-SiC", C.M. Tanner, M.F. Toney, J. Lu, H.-O. Blom, M.Sawkar-Mathur, M.A. Tafesse, J.P. Chang, *J. Appl. Phys.* **102**, 104112 (2007).
68. "Enrichment of Deuterium Oxide at Hydrophilic Interfaces in Aqueous Solutions", J.J.R. Stålgren, K. Boschkova, J.-C. Ericsson, C.W. Frank, W. Knoll, S. Satija, M.F. Toney, *Langmuir* **23**, 11943 (2007).
69. "The Critical Role of Side-Chain Attachment Density on the Order and Device Performance of Polythiophenes", R.J. Kline, D.M. DeLongchamp, D.A. Fischer, E.K. Lin, L.J. Richter, M.L. Chabiny, M.F. Toney, M. Heeney, I. McCulloch, *Macromolecules* **40**, 7960 (2007).
70. "Structure of Palladium Nanoclusters for Hydrogen Gas Sensors", K.J. Stevens, B. Ingham, M.F. Toney, S.A. Brown, A. Lassesson, J. van Lith, S.C. Hendy, *Materials at High Temperatures* **24**, 211-216 (2007).
71. "Structure of Oxidised Bismuth Nanoclusters", K.J. Stevens, B. Ingham, M.F. Toney, S.A. Brown, J. Partridge, A. Ayes, F. Natali, *Acta Crystal. B* **63**, 569 (2007).
72. "Effects of the Surface Roughness of plastic compatible Inorganic Dielectrics on Polymeric Thin Film Transistors", M.L. Chabiny, R. Lujan, F. Endicott, M.F. Toney, I. McCulloch, M. Heeney, *Appl. Phys. Lett.* **90**, 233508 (2007).
73. "Thin Film Transistors Based on Alkylphenyl Quaterthiophenes: Structure and Electrical Transport Properties", S.E. Fritz, S. Mohapatra, B.T. Holmes, A.M. Anderson, C.F. Prendergast, C.D. Frisbie, M.D. Ward, M.F. Toney, *Chem. Mater.* **19**, 1355 (2007).
74. "X-ray Scattering Study of Thin-Films of Poly(2,5-bis(3-alkylthiophen-2-yl)thieno[3,2-b]thiophene)", M.L. Chabiny, M.F. Toney, R.J. Kline, I. McCulloch, M. Heeney, *J. Amer. Chem. Soc.* **129**, 3226-3237 (2007).
75. "A significant dependence of morphology and charge carrier mobility on substrate surface chemistry in high performance polythiophene semiconductor films", R. J. Kline, D.M. DeLongchamp, D.A. Fischer, E.K. Lin, M. Heeney, I. McCulloch, M.F. Toney, *Appl. Phys. Lett.* **90**, 062117 (2007).
76. "Structural properties of epitaxial  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> (111) thin films on 4H-SiC (0001)", C.M. Tanner, M. Sawkar-Mathur, J. Lu, H.-O. Blom, M.F. Toney, J.P. Chang, *Appl. Phys. Lett.* **90**, 061916 (2007).
77. "Structure-Activity-Stability Relationships Pt-Co Alloy Electrocatalysts in Gas Diffusion Electrode Layers", S. Koh, J. Leisch, M.F. Toney, P. Strasser, *J. Phys. Chem. C* **111**, 3744-3752 (2007).
78. "Activity - Stability Relationships of Ordered and Disordered Alloy Phases of Pt<sub>3</sub>Co Electrocatalysts for the Oxygen Reduction Reaction (ORR)", S. Koh, M.F. Toney, P. Strasser, *Electrochimica Acta* **52**, 2765-2774 (2007).
79. "Magnetic properties of epitaxial Co-doped anatase TiO<sub>2</sub> thin films with excellent structural quality", T.C. Kaspar, T. Droubay, D.E. McCready, S.M. Heald, C.M. Wang, A.S. Lea, V. Shutthanandan, S.A. Chambers, M.F. Toney, *J. Vac. Sci. Technol. B* **24**(4), 2012-2017 (2006).
80. "Liquid crystalline semiconducting polymers with high charge carrier mobility", I. McCulloch, M. Heeney, C. Bailey, K. Genevicius, I. MacDonald, M. Shkunov, D. Sparrowe, S. Tierney, R. Wagner, W. Zhang, M.L. Chabiny, R.J. Kline, M.D. McGehee, M.F. Toney, *Nature Materials* **5**, 328-333 (2006).

81. "Ferromagnetism and Structure in Epitaxial Cr-doped Anatase TiO<sub>2</sub> thin films", T.C. Kaspar, T. Droubay, V. Shutthanandan, S.M. Heald, C.M. Wang, D.E. McCready, S. Thevuthasan, J.D. Bryan, D.R. Gamelin, A.J. Kellock, M.F. Toney, X. Hong, C.H. Ahn, S.A. Chambers, *Phys. Rev. B* **73** 155327 (2006).
82. "Structural Effect of RuPt-WO<sub>3</sub> alloy nanostructures on methanol electrooxidation", K.-W. Park, Y.-E. Sung, M.F. Toney, *Electrochem. Comm.* **8**, 359-363, (2006).
83. "Microstructural origin of orientation ratio in magnetic recording media", M.F. Toney, E.E. Marinero, J.A. Hedstrom, *J. Appl. Phys.* **99**, 033907 (2006).
84. "Highly Oriented Crystals at the Buried Interface in Polythiophene Thin Film Transistors", R.J. Kline, M.D. McGehee, M.F. Toney, *Nature Materials* **5**, 222-228 (2006).
85. "Applications of Synchrotron X-rays in Microelectronics Industry Research", J.L. Jordan-Sweet, C. Detaverniera, C. Lavoie, P. M. Mooney, M. F. Toney, *Nucl. Instrm. Meth. B* **241**, 247-252 (2005).
86. "Agglomeration and sintering in Annealed FePt nanoparticle assemblies studied by small angle neutron scattering and x-ray diffraction", T. Thomson, S.L. Lee, M.F. Toney, C.D. Dewhurst, F.Y. Ogrin, C.J. Oates, S. Sun, *Phys. Rev. B* **72**, 064441 (2005).
87. "Structure and Electrocatalysis of Sputtered RuPt Thin-Film Electrodes", T.-W. Wook, S.-J. Park, L.E. Jones, M.F. Toney, K.-W. Park, Y.-E. Sung, *J. Phys. Chem. B* **109**, 12845 (2005).
88. "On the Relationship of Magnetocrystalline Anisotropy and Stoichiometry in Epitaxial L1<sub>0</sub> CoPt(001) and FePt(001) Thin Films", K. Barmak, J. Kim, L.H. Lewis, K.R. Coffey, M.F. Toney, A.J. Kellock, J.-U. Thiele, *J. Appl. Phys.* **98**, 033904 (2005).
89. "Local Atomic structure of Partially Ordered NiMn in NiMn/NiFe Exchange Coupled Layers", F.J. Espinosa-Faller, R.C. Howell, A.J. Garcia-Adeva, S.D. Conradson, A.Y. Ignatov, T.A. Tyson, R.F.C. Farrow, M.F. Toney, *J. Chem. Phys. B* **109**, 10406 (2005).
90. "Magnetization profile in antiferromagnetically coupled recording media", M.F. Toney, J.A. Borchers, K.V. O'Donovan, C.F. Majkrzak, D.T. Margulies, E.E. Fullerton, *Appl. Phys. Lett.* **86**, 162506 (2005).
91. "P-Channel Organic Semiconductors Based on Hybrid Acene-Thiophene Molecules for Thin Film Transistor Applications", J.A. Merlo, C.R. Newman, C.P. Gerlach, T.W. Kelley, D.V. Muires, S.E. Fritz, M.F. Toney, C.D. Frisbie, *J. Am. Chem. Soc.* **127**, 3997 (2005).
92. "The Effect of Molecular Weight of Regioregular Poly(3-hexylthiophene) on Its Film Morphology and Field-Effect Mobility", R.J. Kline, M. D. McGehee, E. N. Kadnikova, J. Liu, J.M.J. Fréchet, M.F. Toney, *Macromolecules*, **38**, 3312 (2005).
93. "Templating Organosilicate Vittrification using Unimolecular Self-Organizing Polymers: Evolution of Morphology and Nanoporosity Development with Network Formation", T. Magbitang, V.Y. Lee, R.D. Miller, M.F. Toney, Z. Lin, R.M. Briber, H.-C. Kim, J.L. Hedrick, *Adv. Materials.* **17**, 1031 (2005).
94. "Microstructural Comparisons of Cu Films deposited by Ion-beam and DC-Magnetron Sputtering", W.L. Prater, Emily L. Allen, W.-Y. Lee, M.F. Toney, A. Kellock, J. Daniels, J.A. Hedstrom, T. Harrell, *J. Appl. Phys.* **97** 093301 (2005).
95. "Coverage effects on the magnetism of Fe/MgO(001) ultrathin films", C. Martínez Boubeta, C. Clavero, J.M. García-Martín, G. Armelles, A. Cebollada, Ll. Balcells, J. L. Menéndez., F. Peiró, A. Cornet, M.F. Toney, *Phys. Rev. B* **70**, 014407 (2005).

96. "Electrochemical and Electrochromic Properties of Nanoworm-shaped Ta<sub>2</sub>O<sub>5</sub>-Pt Thin-Films", K.-W. Park, M.F. Toney, *Electrochem. Comm.* **7**, 151-155 (2005).
97. "Supercritical CO<sub>2</sub> extraction of porogen phase: An alternative route to nanoporous dielectrics", J.A. Lubguban, S. Gangopadhyay, B. Lahlouh, T. Rajagopalan, N. Biswas, J. Sun, D.H. Huang, S.L. Simon, A. Mallikarjunan, H.-C. Kim, J. Hedstrom, W. Volksen, R.D. Miller, M.F. Toney, *J. Mater. Res.* **19**, 3224 (2004).
98. "Stoichiometry–Anisotropy Connections in Epitaxial L1<sub>0</sub> FePt(001) Films", K. Barmak, J. Kim, L.H. Lewis, K.R. Coffey, M.F. Toney, A.J. Kellock, J.-U. Thiele, *J. Appl. Phys.* **95**, 7501 (2004).
99. "Origin of low-friction behavior in graphite investigated by surface x-ray diffraction", B.K. Yen, B.E. Schwickert, M.F. Toney, *Appl. Phys. Lett.* **84**, 4702 (2004).
100. "Structural and magnetic model of self-assembled FePt nanoparticle arrays", T. Thomson, M.F. Toney, S. Raoux, S.L. Lee, S. Sun, C.B. Murray, B.D. Terris, *J. Appl. Phys.* **96**, 1197 (2004).
101. "Structural Characterization of a Pentacene Monolayer on an Amorphous SiO<sub>2</sub> Substrate with Grazing Incidence X-ray Diffraction", S.E. Fritz, S.M. Martin, C.D. Frisbie, M.D. Ward, M.F. Toney, *J. Amer. Chem. Soc.* **126**, 4084 (2004).
102. "Silicide formation and particle size growth in high temperature annealed, self-assembled FePt nanoparticles", T. Thomson, B.D. Terris, M.F. Toney, S. Raoux, J.E.E. Baglin, S.L. Lee, S. Sun, *J. Appl. Phys.* **95**, 6738 (2004).
103. "Reduction of Resistivity in Cu Thin Films by Partial Oxidation: Microstructural Mechanisms", W.L. Prater, E.L. Allen, W.-Y. Lee, M.F. Toney, J. Daniels, and J.A. Hedstrom, *Appl. Phys. Lett.* **84**, 2518 (2004).
104. "Pore Morphologies in Disordered Nanoporous Thin Films", J.A. Hedstrom, M.F. Toney, E. Huang, H.-C. Kim, W. Volksen, T. Magbitang, R.D. Miller, *Langmuir* **20**, 1535 (2004).
105. "Neutron scattering studies of nanomagnetism and artificially structured materials", M.R. Fitzsimmon, S.D. Bader, J.A. Borchers, G.P. Felcher, J.K. Furdyna, A. Hoffmann, J.B. Kortright, Ivan K. Schuller, T.C. Schulthess, S.K. Sinha, M.F. Toney, D. Weller, S. Wolf, *J. Magn. Magn. Mater.* **271**, 103-146 (2004).
106. "Ion Beam Stabilization of FePt Nanoparticle Arrays for Magnetic Storage", J.E.E. Baglin, S. Sun, A.J. Kellock, T. Thomson, M.F. Toney, B.D. Terris, C.B. Murray, *MRS Proc.* **777**, (2003).
107. "Microstructure and properties of ultra-thin amorphous silicon nitride protective coating", B.K. Yen, R.L. White, J. Waltman, Q. Dai, D.C. Miller, A.J. Kellock, B. Marchon, P.H. Kasi, M.F. Toney, B.R. York, H. Deng, Q.-F. Xiao, V. Raman, *J. Vac. Sci. Technol. A* **21**, 1895-1904 (2003).
108. "High Anisotropy CoPtCrB Magnetic Recording Media", M.F. Toney, E.E. Marinero, M.F. Doerner, P.M. Rice *J. Appl. Phys.* **94**, 4018 (2003).
109. "Porosity in plasma enhanced chemical vapor deposited SiCOH dielectrics: A comparative study", A. Grill, V. Patel, K. P. Rodbell, E. Huang, M. R. Baklanov, K. P. Mogilnikov, M. Toney, H.-C. Kim, *J. Appl. Phys.* **94**, 3427 (2003).
110. "Supercritical carbon dioxide extraction of porogens for the preparation of ultralow-dielectric-constant films", T. Rajagopalan, B. Lahlouh, J.A. Lubguban, N. Biswas, S. Gangopadhyay, J. Sun., D.H. Huang, S.L. Simon, A. Mallikarjunan, H.-C. Kim, W. Volksen, M.F. Toney, E. Huang, P.M. Rice, E. Delenia, R.D. Miller, *Appl. Phys. Lett.* **82**, 4328 (2003).

111. "Thickness and Growth Temperature Dependence of Structure and Magnetism in FePt Thin Films", M.F. Toney, W.Y. Lee, J.A. Hedstrom, A. Kellock, J. Appl. Phys. **93**, 9902 (2003).
112. "Controlled Synthesis and Assembly of FePt Nanoparticles", S. Sun, S. Anders, T. Thomson, J.E.E. Baglin, M.F. Toney, H.F. Hamann, C.B. Murray, B.D. Terris, J. Phys. Chem. **107**, 5419 (2003).
113. "X-ray Studies of Magnetic Nanoparticle Assemblies", S. Anders, M.F. Toney, T. Thomson, J.-U. Thiele, B.D. Terris, S. Sun, C.B. Murray, J. Appl. Phys. **93**, 7343 (2003).
114. "X-ray Absorption and Diffraction Studies of Magnetic Nanoparticle Assemblies", S. Anders, M.F. Toney, T. Thomson, R.F. Farrow, J.-U. Thiele, B.D. Terris, J. Appl. Phys. **93**, 6299 (2003).
115. "Nanoscale Phase Separation in Fe<sub>3</sub>O<sub>4</sub>(111) Films on Sapphire(0001) Grown by Oxygen-Plasma-Assisted Molecular Beam Epitaxy", R.F.C. Farrow, P.M. Rice, M.F. Toney, R.F. Marks, J. Hedstrom, R. Stephenson, M.J. Carey, J. Appl. Phys. **93**, 5626 (2003).
116. "Small-Angle Neutron Scattering Measurements of Magnetic Cluster Sizes in Magnetic Recording Disks", M.F. Toney, K.A. Rubin, S.-M. Choi, C.J. Glinka, Appl. Phys. Lett. **82**, 3050 (2003).
117. "Thickness Dependence of Exchange Bias and Structure in PtMn and NiMn Spin Valves", M.F. Toney, M.G. Samant, T. Lin, D. Mauri, Appl. Phys. Lett. **81**, 4565 (2002).
118. "Pore Size Distributions in Nanoporous Methylsilsequioxanes (MSSQ) Films as Determined by Small Angle X-Ray Scattering (SAXS)", E. Huang, M.F. Toney, L.B. Lurio, W. Volksen, D. Mecerreyes, P. Brock, H.-C. Kim, C.J. Hawker, J.L. Hedrick, V.Y. Lee, T. Magbitang, R.D. Miller, Appl. Phys. Lett. **81**, 2232 (2002).
119. "Molecular Beam Epitaxial Growth and Properties of CoFe<sub>2</sub>O<sub>4</sub> on MgO(001)", S.A. Chambers, R.F.C. Farrow, S. Maat, M.F. Toney, L. Folks, J.G. Catalano, T.P. Trainor and G.E. Brown, Jr., J. Magn. and Magn. Mater. **246**, 124 (2002).
120. "Structure and Interaction of Organic/Inorganic Hybrid Nanocomposites for Microelectronic Applications. 1. MSSQ/P(MMA-*co*-DMAEMA) Nanocomposites", Q. R. Huang, W. Volksen, E. Huang, M. Toney, C.W. Frank, R.D. Miller, Chem. Mater. **14**, 3676-3685 (2002).
121. "Effects of Mn Concentration and Deposition Temperature on the Giantmagnetoresistance Properties of Ion Beam Deposited PtMn Spin Valves", W.Y. Lee, M.F. Toney, A. Kellock, D. Mauri, M. Carey, and J. Hedstrom, IEEE Trans. Magn. **38**, 3536 (2002).
122. "Temperature dependent magnetic properties of highly chemically ordered Fe<sub>55-x</sub>NixPt<sub>45</sub>L1<sub>0</sub> films", J.-U. Thiele, K.R. Coffey, M.F. Toney, J.A. Hedstrom, and A.J. Kellock, J. Appl. Phys. **91**, 6595 (2002).
123. "Spontaneous chemical ordering and exchange bias in epitaxial Mn<sub>0.52</sub>Pd<sub>0.48</sub>/Fe (001) bilayers prepared at room temperature", R.F.C. Farrow, R.F. Marks, M.F. Toney, S. David, A.J. Kellock, J.A. Borchers, K.V. O'Donovan, Appl. Phys. Lett. **80**, 808, (2002).
124. "Elastic properties of chemically ordered Co<sub>3</sub>Pt thin films", R.S. Bandhu, R. Sooryakumar, R.F.C. Farrow, D. Weller, M.F. Toney, T.A. Rabedeau, J. Appl. Phys. **91**, 2737 (2002).
125. "Demonstration of 35 Gbit/in<sup>2</sup> media on a glass substrate", M. Doerner, X. Bian, M. Madison, K. Tang, Q. Peng, A Polcyn, T. Arnoldussen, M.F. Toney, M. Mirzamaani, K.

- Takano, E. Fullerton, D. Margulies, M. Schabes, K. Rubin, M. Pinarbasi, S. Yuan, M. Parker, D. Weller, IEEE Trans. Magn. **37**, 1052 (2001).
126. "Grain Size Control in FePt thin films by Ar-ion etched Pt seed layers", J.-U. Thiele, M.E. Best, M.F. Toney, D. Weller, IEEE Trans. Magn. **37**, 1271 (2001).
  127. "Roughness of Thin Perfluoropolyether Lubricant Films: Influence on Disk Drive Technology", C. Mathew Mate, Michael F. Toney, and K. Amanda Leach, IEEE Trans. Magn. **37**, 1821 (2001).
  128. "Effect of N Doping on structure and properties of DLC films produced by plasma beam deposition", B.K. Yen, J.U. Thiele, M. Geisler, P.H. Kasai, R.L. White, B.R. York, H. Zadoori, A.J. Kellock, W.C. Tang, T.-W. Wu, M.F. Toney, B. Marchon, IEEE Trans. Magn. **37**, 1786 (2001).
  129. "Oxygen-enhanced IrMn spin valves deposited by ion-beam and magnetron sputtering", W.Y. Lee, M. Carey, M.F. Toney, P. Rice, B. Gurney, H.-C. Chang, E. Allen. D. Mauri, J. Appl. Phys. **89**, 6925 (2001).
  130. "Roughness of Molecularly Thin Perfluoropolyether Polymer Films" M.F. Toney, C.M. Mate, K.A. Leach, Appl. Phys. Lett. **77**, 3296 (2000).
  131. "Magnetoresistance of self-assembled lateral multilayers", E.D. Tober, R.F. Marks, D.D. Chambliss, K.P. Roche, M.F. Toney, A.J. Kellock, R.F.C. Farrow, Appl. Phys. Lett. **77**, 2728 (2000).
  132. "The Structure of the passive film that forms on iron in Aqueous Environments", A.J. Davenport, L.J. Oblonsky, M.P. Ryan, M.F. Toney, J. Electrochem. Soc. **147**, 2162 (2000).
  133. "Direct observation of the alignment of ferromagnetic spins by antiferromagnetic spins", F. Nolting, A. Scholl, J. Stohr, J.W. Seo, J. Fompeyrine, H. Siegwart, J.-P. Locquet, S. Anders, J. Luning, E.E. Fullerton, M.F. Toney, M.R. Scheinfein, H.A. Padmore, Nature **405**, 767 (2000).
  134. "Thickness Measurements of Thin Perfluoropolyether Polymer Films on Silicon and Amorphous-Hydrogenated Carbon with X-ray Reflectivity, ESCA and Optical Ellipsometry," M.F. Toney, C.M. Mate, K.A. Leach, D Pocker, J. Collid. Inter. Sci. **225**, 219 (2000).
  135. "High  $K_u$  Materials Approach to 100 Gbit/in<sup>2</sup>", D. Weller, A. Moser, L. Folks, M.E. Best, W. Lee, M.F. Toney, M. Schwickert, J.U. Thiele, M.F. Doerner, IEEE Trans. Magn. **36**, 10 (2000).
  136. "Temperature Dependent Chemical Ordering in FePt(001) and FePt(110) films", M.M. Schwickert, K.A. Hannibal, M.F. Toney, M.E. Best, J.U. Thiele, L Folks, D.K. Weller, J. Appl. Phys. **87**, 6959 (2000).
  137. "Ion induced magnetization reorientation in Co/Pt multilayers for patterned media", D Weller, J.E.E.E. Baglin, A.J. Kellock, K.A. Hannibal, M.F. Toney, G Kusinski, S Lang, L Folks, M.E. Best, B.D. Terris, J. Appl. Phys. **87**, 5768 (2000).
  138. "High Magnetoresistance Permalloy Films deposited on a thin NiFeCr or NiCr Underlayer", W.Y. Lee, M.F. Toney, P. Tameerug, E. Allen, D. Mauri, J. Appl. Phys. **87**, 6992 (2000).
  139. "New Methodologies of Measuring Film Thickness, Coverage, and Topography," C.M. Mate, B.K. Yen, D.C. Miller, M.F. Toney, M. Scarpulla, J.E. Frommer, IEEE Trans. Magn. **36**, 110 (2000).

140. "Microstructure and Thermal Stability of Advanced Longitudinal media", M.F. Doerner, K. Tang, T. Arnoldussen, H. Zeng, M.F. Toney, D. Weller, IEEE Trans. Magn. **36**, 43 (2000).
141. "High Magnetoresistance in Sputtered Permalloy Thin Films Through Growth on Seedlayers of  $(\text{Ni}_{0.81}\text{Fe}_{0.19})_{(1-x)}\text{Cr}_x$ ", W.Y. Lee, M.F. Toney, D. Mauri, IEEE Trans. Magn. **36**, 381 (2000).
142. "Low-Dielectric Constant, Nanoporous Organosilicate Films Prepared via Organic/Inorganic Polymer Hybrid Templates", C.V. Nguyen, K.R. Carter, C.J. Hawker, J.L. Hedrick, R.L. Jaffe, R.D. Miller, J.F. Remenar, H.-W. Rhee, P.M. Rice, M.F. Toney, M. Trollsas, D.Y. Yoon, Chem. of Materials **11**, 3080-3085 (1999).
143. "In-Situ X-ray Diffraction Studies of Passive Oxide Films", M.P. Ryan, M.F. Toney, L.J. Oblonsky, A.J. Davenport, MRS Bulletin **24**(7), 29 (1999).
144. "10 Gbit/in<sup>2</sup> longitudinal media on a glass substrate", J. Li, M. Mirzamaani, X. Bian, M. Doerner, S. Duan, K. Tang, M. Toney, T. Arnoldussen and M. Madison, J. Appl. Phys. **85**, 4286 (1999).
145. "Effects of Stacking Faults on Magnetic Viscosity in Thin Film Magnetic Recording Media", P. Dova, H. Laidler, K. O'Grady, M.F. Toney, M.F. Doerner, J. Appl. Phys. **85**, 2775 (1999).
146. "Metal Oxide Surfaces and Their Interactions with Aqueous Solutions and Microbial Organisms", G.E. Brown, V.E. Heinrich, W.H. Casey, D.L. Clark, C. Eggleston, A. Felmy, D.W. Goodman, M. Graetzel, G. Maciel, M.I. McCarthy, K.H. Nealson, D.A. Sverjensky, M.F. Toney, J.M. Zachara, Chem. Reviews **99**, 77-174 (1999).
147. "Perpendicular Magnetic Anisotropy and Magnetic Domain Structure in Sputtered Epitaxial FePt (001) L1<sub>0</sub> Films." J.-U. Thiele, L. Folks, M.F. Toney, D.K. Weller, J. Appl. Phys. **84**, 5686 (1998).
148. "Calibrating ESCA and Ellipsometry Measurement of Perfluoropolyether Lubricant Thickness", M.F. Toney, C.M. Mate, and D. Pocker, IEEE Trans Magn. **34**, 1774 (1998).
149. "Magnetic Anisotropy and Microstructure in Molecular Beam Epitaxial FePt (110)/MgO (110)", R.F.C. Farrow, D. Weller, M.F. Toney, R.F. Marks, D.J. Smith, M.R. McCartney, J. Appl. Phys. **84**, 934 (1998).
150. "Structure and chemical order in sputtered epitaxial FePd alloys", P. Caro, A. Cebollada, F. Briones, M.F. Toney, J. Cryst. Growth **187**, 426 (1998).
151. "X-ray scattering studies of the passive oxide film formed on iron", M.F. Toney, M.P. Ryan, L.J. Oblonsky, A.J. Davenport, Synchrotron Radiation News **11**(3), 5 (1998).
152. "Atomic Structure of the Passive Oxide Film Formed on Iron", M.F. Toney, A.J. Davenport, L.J. Oblonsky, M.P. Ryan, C.M. Vitus, Physical Review Letters **79**, 4282 (1997).
153. "Origin of Strong Intrinsic Kerr Effect in FePt and FePd Ordered Compounds", G. Armelles, D. Weller, B. Rellinghaus, R.F.C. Farrow, M.F. Toney, P. Caro, A. Cebollada, M.I. Alonso, IEEE Trans. Mag. **33**, 3220 (1997).
154. "Growth Temperature Dependence of Long-range Alloy Order and Magnetic Properties of Epitaxial Fe<sub>x</sub>Pt<sub>1-x</sub> (x=0.5) Films", R.F.C. Farrow, D. Weller, R.F. Marks, M.F. Toney, S. Hom, G.R. Harp, A. Cebollada, Appl. Phys. Lett. **69**, 1166 (1996).
155. "Applications of Electron Microscopy in Collaborative Industrial Research", F.M. Ross, K.M. Krishnan, N. Thangaraj, R.F.C. Farrow, R.F. Marks, A. Cebollada, S.S.P. Parkin,

- M.F. Toney, M. Huffman, C.A. Paz De Araujo, L.D. McMillan, J. Cuchiaro, M.C. Scott, C. Echer, F. Ponce, M.A. O'Keefe, E.C. Nelson, *MRS Bulletin* **21(5)**, 17, (1996).
156. "Near Surface Structure of Solvent-Free Processed Polyimide Thin Film", R.F. Saraf, C. Dimitrakopoulos, M.F. Toney, S.P. Kowalczyk, *Langmuir* **12**, 2802 (1996).
  157. "Control of the Axis of Chemical Ordering and Magnetic Anisotropy in Epitaxial FePt Films", R.F.C. Farrow, D. Weller, R.F. Marks, M.F. Toney, A. Cebollada, G.R. Harp, *J. Appl. Phys.* **79**, 5967 (1996).
  158. "The Near Surface Alignment of Polymers", M.F. Toney, T.P. Russell, J.A. Logan, H. Kikuchi, J. Sands, S.K. Kumar, *Nature* **374**, 709 (1995).
  159. "Electrochemical Deposition of Copper on a Gold Electrode in Sulfuric Acid: Resolution of the Interfacial Structure", M.F. Toney, J.N. Howard, J. Richer, G.L. Borges, J.G. Gordon, O.R. Melroy, D. Yee, L.B. Sorensen, *Phys. Rev. Lett.* **75**, 4472 (1995).
  160. "Distribution of Water Molecules at Ag(111)/Electrolyte Interface as Studied with Surface X-ray Scattering", M.F. Toney, J.N. Howard, J. Richer, G.L. Borges, J.G. Gordon, O.R. Melroy, D.G. Wiesler, D. Yee, L.B. Sorensen, *Surf. Sci.* **335**, 326 (1995).
  161. "Magnetic Superlattices: MBE Growth and Properties of Artificially and Naturally-Layered Structures", R.F.C. Farrow, R.F. Marks, A Cebollada, G.R. Harp, T.A. Rabedeau, M.F. Toney, D. Weller, S.S.P. Parkin, *J. Cryst. Growth* **150**, 1126 (1995).
  162. "The In Situ Atomic Structure of Underpotentially Deposited Monolayers of Pb and Tl on Au(111) and Ag(111): A surface x-ray scattering study", M.F. Toney, J.G. Gordon, M.G. Samant, G.L. Borges, O.R. Melroy, D. Yee, L.B. Sorensen, *J. Phys. Chem.* **99**, 4733 (1995)
  163. "Structure of Metal-Electrolyte Interfaces: Copper on Gold(111) & Water on Silver(111)", J.G. Gordon, O.R. Melroy, M.F. Toney, *Electrochim. Acta* **40**, 3 (1995).
  164. "Structural Transitions and Magnetic Anisotropy in Ultrathin Co Wedges on Pt(111) Investigated with the Magneto-Optical Kerr Effect", D. Weller, A. Carl, R.J. Savoy, T.C. Huang, M.F. Toney, C. Chappert, *J. Phys. Chem. Solids* **56**, 1563 (1995).
  165. "Voltage-Dependent Distribution of Water Molecules at the Electrode-Electrolyte Interface", M.F. Toney, J.N. Howard, J. Richer, G.L. Borges, J.G. Gordon, O.R. Melroy, D.G. Wiesler, D. Yee, L.B. Sorensen, *Nature* **368**, 444 (1994).
  166. "The Near Surface Structure of Aromatic Polyimides: The Effect of Precursor Isomers", B.J. Factor, T.P. Russell, M.F. Toney, *Faraday Disc.* **98**, 319 (1994).
  167. "Giant Magnetoresistance at Low Fields in NiFeAg/Ag-Ag Multilayers Prepared by Molecular Beam Epitaxy", R.F.C. Farrow, R.F. Marks, T.A. Rabedeau, M.F. Toney, D. Dobbartin, R. Beyers, S.S.P. Parkin, *J. Appl. Phys.* **76**, 3688 (1994).
  168. "Surface Orientation of Liquid Crystalline Poly(Alkylsilanes)", B.J. Factor, T.P. Russell, M.F. Toney, *Acta Polymerica* **46**, 60 (1995).
  169. "Comment on 'Superstructures of Pb Monolayers Electrochemically Deposited on Ag(111)'", M.F. Toney, J.G. Gordon, G.L. Borges, O.R. Melroy D. Yee, L.B. Sorensen, *Phys. Rev. B* **49**, 7793 (1994).
  170. "X-ray Diffraction from Anodic TiO<sub>2</sub> Films: In Situ and Ex Situ Comparison of the Ti (0001) Face", D.G. Wiesler, M.F. Toney, O.R. Melroy, C.S. McMillan, W.H. Smyrl, *Surf. Sci.* **302**, 341 (1994).
  171. "Atomic Structure at Electrode Interfaces", M.F. Toney and B.M. Ocko, *Synchrotron Radiation News* **6(5)**, (special issue on electrochemistry), 1993, 28.

172. "In-Situ Synchrotron X-ray Techniques for Determining Atomic Structure at Electrode/Electrolyte Interfaces", M.F. Toney, J. McBreen, *The Electrochemical Society Interface*, Spring 1993, 22.
173. "Giant Magnetoresistance and Co Cluster Structure in Phase-Separated Co-Cu Granular Alloys", T.A. Rabedeau, M.F. Toney, R.F. Marks, S.S.P. Parkin, R.F.C. Farrow, G.R. Harp, *Phys. Rev. B* **48**, 16810 (1993).
174. "Magneto-Optical Kerr Spectroscopy of a New Chemically Ordered Alloy:  $\text{Co}_3\text{Pt}$ ", G.R. Harp, D. Weller, T.A. Rabedeau, R.F.C. Farrow, M.F. Toney, *Phys. Rev. Lett.* **71**, 2493 (1993).
175. "MBE Growth of Artificially-Layered Magnetic Metal Structures on Semiconductors and Insulators", R.F.C. Farrow, R.F. Marks, G.R. Harp, D. Weller, T.A. Rabedeau, M.F. Toney, S.S.P. Parkin, *Mater. Sci. Eng.* **R11**, 155 (1993).
176. "Epitaxial Growth of Pt on Basal-Plane Sapphire: A Seed Film for Artificially Layered Magnetic Metal Structures", R.F.C. Farrow, G.R. Harp, R.F. Marks, T.A. Rabedeau, M.F. Toney, R.J. Savoy, D. Weller, S.S.P. Parkin, *J. Cryst. Growth*, **133**, 47 (1993).
177. "Giant Magnetoresistance in As-Grown Epitaxial Films of Phase-Separated Co-Cu and Co-Ag", S.S.P. Parkin, R.F.C. Farrow, T.A. Rabedeau, R.F. Marks, G.R. Harp, Q.H. Lam, C. Chappert, M.F. Toney, R. Savoy, *Europhys. Lett.* **22**, 455 (1993).
178. "Grazing Incidence X-Ray Scattering Studies of Thin Films of an Aromatic Polyimide", B.J. Factor, T.P. Russell, M.F. Toney, *Macromolecules* **26**, 2847 (1993).
179. "Instrumental Effects for Out-of-Plane Measurements in Surface X-ray Scattering: Resolution Function and Sample Area Corrections", M.F. Toney, D.G. Wiesler, *Acta Crystallographica A* **49**, 624 (1993).
180. "Growth Temperature Dependence of Magnetoresistance in Co/Cu(111) Wedged Superlattices", G.R. Harp, S.S.P. Parkin, R.F.C. Farrow, R.F. Marks, M.F. Toney, Q.H. Lam, T.A. Rabedeau, R.J. Savoy, *Phys. Rev. B* **47**, 8721 (1993).
181. "An Investigation of Underpotentially Deposited Thallium on Silver (111) by In-Situ Surface X-ray Scattering", M.F. Toney, J.G. Gordon, M.G. Samant, G.L. Borges, O.R. Melroy, D. Yee, L.B. Sorensen, *Phys. Rev. B* **45**, 9362 (1992).
182. "Structure and Epitaxy of Anodic  $\text{TiO}_2/\text{Ti}(11\bar{2}0)$ ", D.G. Wiesler, M.F. Toney, M.G. Samant, O.R. Melroy, C.S. McMillan, W.H. Smyrl, *Surf. Sci.* **268**, 57 (1992).
183. "Thermal Annealing Study of Exchanged Biased NiFe-FeMn Films", M.F. Toney, C. Tsang, J.K. Howard, *J. Appl. Phys.* **70**, 6227 (1991).
184. "Synchrotron X-ray Diffraction Studies of the Lattice and Magnetic Structure of Epitaxial Dy Films in  $\text{LaF}_3/\text{Dy}/\text{LaF}_3$  Sandwiches", R.F.C. Farrow, M.F. Toney, B.D. Hermsmeier, S.S.P. Parkin, D.G. Wiesler, *J. Appl. Phys.* **70**, 4465 (1991).
185. "In-situ Surface X-ray Scattering Measurements of Electrochemically Deposited Bi on Ag(111): Structure, Compressibility, and Comparison with Ex Situ LEED Measurements", M.F. Toney, J.G. Gordon, M.G. Samant, G.L. Borges, D.G. Wiesler, L.B. Sorensen, D. Yee, *Langmuir* **7**, 796 (1991).
186. "Surface-Induced Ordering of an Aromatic Polyimide", B.J. Factor, T.P. Russell, M.F. Toney, *Phys. Rev. Lett.* **66**, 1181 (1991).
187. "Surface X-ray Scattering Measurements of the Substrate Induced Spatial Modulation of an Incommensurate Adsorbed Monolayer", M.F. Toney, J.G. Gordon, M.G. Samant, G.L. Borges, O.R. Melroy, L.S. Kau, D.G. Wiesler, D. Yee, L.B. Sorensen, *Phys. Rev. B* **42**, 5594 (1990).

188. "X-ray Reflectivity on Perfluoropolyether Polymer Molecules on Amorphous Carbon", M.F. Toney, C. Thompson, *J. Chem. Phys.* **92**, 3781 (1990).
189. "Electrochemically Adsorbed Lead on Silver (111) Studied with Grazing Incidence X-ray Scattering", J. Kortright, P.N. Ross, O.R. Melroy, M.F. Toney, G.L. Borges, M.G. Samant, *J. de Phys.* **C7**-153 (1989).
190. "Measurements of Carbon Thin Films Using X-ray Reflectivity", M.F. Toney, S. Brennan, *J. Appl. Phys.* **66**, 1861 (1989).
191. "Structural Depth Profiling of Iron Oxide Thin Films Using Grazing Incidence Asymmetric Bragg X-ray Diffraction", M.F. Toney, S. Brennan, *J. Appl. Phys.* **65**, 4763 (1989).
192. "Observation of the Effect of Refraction on X-rays Diffracted in a Grazing Incidence Asymmetric Bragg Geometry", M.F. Toney, S. Brennan, *Phys. Rev.* **B 39**, 7963 (1989).
193. "Roughness and Porosity Characterization of Carbon Films through Adsorption Isotherm Measurements", J. Krim, C.L. Wang, M.F. Toney, *J. Vac. Sci. Technol.* **A 7**, 2481 (1989).
194. "An In-Situ Grazing Incidence X-ray Scattering Study of the Initial Stages of Electrochemical Growth of Lead on Silver (111)", O.R. Melroy, M.F. Toney, G.L. Borges, M.G. Samant, J. Kortright, P.N. Ross, L. Blum, *J. Electroanal. Chem.* **258**, 403 (1989).
195. "Two Dimensional Compressibility of Electrochemically Adsorbed Lead on Silver (111)", O.R. Melroy, M.F. Toney, G.L. Borges, M.G. Samant, J. Kortright, P.N. Ross, L. Blum, *Phys. Rev. B* **38**, 10962 (1988).
196. "X-ray Depth Profiling of Iron Oxide Thin Films", M.F. Toney, T.C. Huang, S. Brennan, *Z. Rek, J. Mater. Res.* **3**, 351 (1988).
197. "In-Situ Grazing Incidence X-ray Diffraction Study of Electrochemically Deposited Lead Monolayers on Silver (111) and Gold (111)", M.G. Samant, M.F. Toney, G.L. Borges, L. Blum, O.R. Melroy, *Surf. Sci.* **193**, L29 (1988).
198. "Grazing Incidence X-ray Diffraction of Lead Monolayers at a Silver (111) and Gold (111) Electrode/Electrolyte Interface", M.G. Samant, M.F. Toney, G.L. Borges, L. Blum, O.R. Melroy, *J. Phys. Chem.* **92**, **220** (1988).
199. "Analysis of Co-doped Iron Oxide Thin Films by Synchrotron Radiation", T.C. Huang, M.F. Toney, S. Brennan, *Z. Rek, Thin Sol. Films* **154**, 439 (1987).
200. "Low-Energy Electron Diffraction Study of Molecular Oxygen Physisorbed on Graphite", M.F. Toney, S.C. Fain, *Phys. Rev. B* **36**, 1248 (1987).
201. "Reply to Comment on 'Model Independent Determination of the InSb(111)2x2 Surface Using Synchrotron X-ray Diffraction'", J. Bohr, R. Feidenhans'l, M. Nielsen, M. Toney, R.L. Johnson, I.K. Robinson, *Phys. Rev. Lett.* **54**, 2878 (1986).  
"Model Independent Determination of the InSb(111)2x2 Surface Using Synchrotron X-ray Diffraction", J. Bohr, R. Feidenhans'l, M. Nielsen, M. Toney, R.L. Johnson, I.K. Robinson, *Phys. Rev. Lett.* **54**, 1275 (1985).
202. "Solving Surface Structure with X-ray Diffraction", R. Feidenhans'l, J. Bohr, M. Nielsen, M. Toney, R.L. Johnson, F. Gray, I.K. Robinson, *Festkorperprobleme* **25**, 545 (1985).
203. "Low-Energy Electron Diffraction Determination of the Structure of the Zeta Phase of Oxygen Physisorbed on Graphite", M.F. Toney and S.C. Fain, *Phys. Rev. B* **30**, 1115 (1984).

204. "Low-Energy Electron Diffraction Study of the Phases and Phase Transitions of Oxygen Physisorbed on Graphite", M.F. Toney and S.C. Fain, *J. Vac. Sci. Technol. A* **2**, 898 (1984).
205. "Rotational Epitaxy of a Non-Triangular Structure: the Delta Phase of Oxygen Physisorbed on Graphite", M.F. Toney, R.D. Diehl, S.C. Fain, *Phys. Rev. B* **27**, 6413 (1983).
206. "Orientational Ordering of Nitrogen Molecular Axes for a Commensurate Monolayer Physisorbed on Graphite", R.D. Diehl, M.F. Toney, S.C. Fain, *Phys. Rev. Lett.* **48**, 177 (1982).
207. "Overlayer-Substrate Spacing for Argon and Krypton on Graphite Determined by LEED Intensity Analysis", C.G. Shaw, S.C. Fain, M.D. Chinn, M.F. Toney, *Surf. Sci.* **97**, 128 (1980).

#### **REFEREED CONFERENCE PROCEEDINGS**

208. "Quantitative analysis of the impact of surface and grain boundary scattering on the resistivity of nanometric Cu films", T Sun, B Yao, AP Warren, K Barmak, MF Toney, RE Peale, KR Coffey, *Advanced Metallization Conference proceedings*, 2009
209. "Microstructure of Pentacene Films from a Pentacene Precursor", D.C. Huang, S. Yin, K. Puntambekar, M. Toney, V. Subramanian, *Materials Research Society Symposium Proceedings Volume 1114E*, submitted (2008).
210. "Use of Anomalous X-ray Scattering for Probing the Structure, Composition and Size of Binary Alloy Nanoparticle Electrocatalysts", M.F. Toney, S. Koh, C. Yu, P. Strasser, *Transactions of the 214<sup>th</sup> Electrochemical Society Meeting, Proton Exchange Membrane Fuel Cells 8*, **16(2)**, 595 (2008).
211. "Micro-structural effects on the performance of poly(thiophene) field-effect transistors", A. Salleo, L.H. Jimison, M.M. Donovan, M.L. Chabinyc, M.F. Toney, *Proc. SPIE Vol. 6336, Organic Field-Effect Transistors V*, Z. Bao, D.J. Gundlach, eds., 63360C (2006).
212. "Crystallization behavior of phase change nanostructures", S. Raoux, C.T. Rettner, J.L. Jordan-Sweet, M. Salinga, M.F. Toney, *Proc. European Symp. Phase Change & Ovonic Sci. 2005*. [http://www.epcos.org/pdf\\_2005/Raoux.pdf](http://www.epcos.org/pdf_2005/Raoux.pdf) (2005).
213. "Porous low-k dielectrics: Material properties", C. Tyberg, E. Huang, J.L. Hedrick, E. Simonyi, S. Gates, S. Cohen, K. Malone, H. Wickland, M. Sankarapandian, M.F. Toney, H.-C. Kim, R.D. Miller, W. Volksen, P. Rice, L.B. Lurio, *ACS Symposium Series* **874**, 'Polymers for Microelectronics', pp.161-172, (2004).
214. "Nanoporous low-dielectric constant organosilicate materials derived from inorganic polymer blends", R.D. Miller, W. Volksen, V.Y. Lee, E. Conner, T. Magbitang, R. Zafran, L. Sundberg, C.J. Hawker, J.L. Hedrick, E. Huang, M.F. Toney, Q.R. Huang, C.W. Franks, H.-C. Kim, *ACS Symposium Series* **874**, "Polymers for Microelectronics", pp.144-160, (2004).
215. "Ion Beam Stabilization of FePt Nanoparticle Arrays for Magnetic Storage", J.E.E. Baglin, S.Sun, A.J. Kellock, T. Thomson, M.F. Toney, B.D. Terris, C.B. Murray, *Materials Research Society Symposium Proceedings* **777**, (2003).
216. "In-situ XRD Study of the passive film that forms on iron in borate buffer over a range of potentials", L.J. Oblonsky, A.J. Davenport, M.P. Ryan, M.F. Toney, *Passivity of Metals and Semiconductors, Proceedings of 8th International Conference on Passivity of Metals*

- and Semiconductors 1999, Jasper, Canada, eds. M. B. Ives, J. L. Luo, and J. R. Rodda, (The Electrochemical Society) pp. 173-179, (2001).
217. "The Structure of the passive film that forms on iron in Aqueous Environments", M.P. Ryan, M.F. Toney, L.J. Oblonsky, A.J. Davenport in *Solid-Liquid Interface Theory*, J.W. Halley, ed., (American Chemical Society, Washington, 2001), p. 85.
  218. "Structure-Property Relationships for Nanoporous Poly(Methyl-Silsequioxane) Films with Low-Dielectric Constants Prepared via Organic/Inorganic Polymer Hybrid", C.V. Nguyen, C.J. Hawker, J.L. Hedrick, R.L. Jaffe, R.D. Miller, J.F. Remenar, H.-W. Rhee, M.F. Toney, M. Trollsæes, W. Volksen, D.Y. Yoon, in *Low and High Dielectric Constant Materials: Materials Science, Processing and Reliability Issues*, R. Singh, H.S. Rathore, R. Thakur, S.S. Ang, M.J. Loboda and R.K. Ulrich, eds., (The Electrochemical Society, Pennington, 1999), p. 38.
  219. "Thickness Dependent Perpendicular Magnetic Domain Patterns in Sputtered Epitaxial FePt (001) L<sub>10</sub> Films", J.-U. Thiele, L. Folks, M.F. Toney, D.K. Weller, Materials Research Society Symposium Proceedings **517**, 319 (1998).
  220. "MBE Growth of Artificially-Layered Magnetic Metal Structures", R.F.C. Farrow, R.F. Marks, G.R. Harp, D. Weller, T.A. Rabedeau, M.F. Toney, S.S.P. Parkin, in *Molecular Beam Epitaxy: Applications to Key Materials*, R.F.C. Farrow, ed., (Noyes, New York, 1995), pp. 623-744.
  221. "Studies of Electrodes by In Situ X-ray Scattering", M.F. Toney, in *Synchrotron Techniques in Interfacial Electrochemistry*, edited by C. Melendres and A. Tadjeddine, NATO ASI Series Vol. 432, (Kluwer Academic, Dordrecht, 1994), p. 109.
  222. "MBE-Growth of Chemically Ordered Co-Pt and Fe-Pt Alloy Phases", R.F.C. Farrow, G.R. Harp, D. Weller, R.F. Marks, M.F. Toney, A. Cebollada, and T.A. Rabedeau, SPIE Proceeding Vol. 2140, 106 (1994).
  223. "Microstructure and Chemical Ordering in UHV-Deposited, Polycrystalline Co<sub>x</sub>Pt<sub>1-x</sub> Alloy Films for Magneto-Optic Recording", R.F.C. Farrow, D. Weller, M.F. Toney, T.A. Rabedeau, J. Hurst, G.R. Harp, R.F. Marks, R.H. Geiss, H. Notarys, Materials Research Society Symposium Proceedings Vol. 343, 375 (1994).
  224. "Magnetic Alloy Films: New Developments in Structure-Property Relations", R.F.C. Farrow, D. Weller, G.R. Harp, R.F. Marks, T.A. Rabedeau, M.F. Toney, A. Cebollada, in *Magnetic Alloys: Experimental and Theoretical Perspectives*, J.S. Faulkner and R.G. Jordan, eds., (Kluwer Academic, Dordrecht, 1993).
  225. "Growth Temperature Dependence of Magnetoresistance in Co/Cu(111) Wedged Superlattices", G.R. Harp, S.S.P. Parkin, R.F.C. Farrow, R.F. Marks, M.F. Toney, Q.H. Lam, T.A. Rabedeau, A. Cebollada, R.J. Savoy, Materials Research Society Symposium Proceedings Vol. 313, 411 (1993).
  226. "Giant Magnetoresistance and Structure of Phase-Segregated Epitaxial Metals", R.F. Marks, R.F.C. Farrow, G. Harp, S.S.P. Parkin, T.A. Rabedeau, M.F. Toney, A. Cebollada, N. Thangaraj, K.M. Krishnan, Materials Research Society Symposium Proceedings Vol. 313, 411 (1993).
  227. "Chemical Ordering and Magnetic Anisotropy in MBE-Grown Co/Pt Multilayers", R.F.C. Farrow, C.H. Lee, R.F. Marks, G.R. Harp, M.F. Toney, T.A. Rabedeau, D. Weller, H. Braendle, in *Magnetism and Structure in Systems of Reduced Dimension*, NATO ASI Series B309, R.F.C. Farrow, B. Dieny, Donath, A. Fert, B. Hermsmeier, eds., (Plenum, New York, 1993), pg 215.

228. "Observation of the Ordered CoPt<sub>3</sub> Alloy in Co-Pt Multilayers", M.F. Toney, R.F.C. Farrow, R.F. Marks, G. Harp, T.A. Rabedeau, Materials Research Society Symposium Proceedings Vol. 263, 237 (1992).
229. "In-situ X-ray Scattering in Interfacial Electrochemistry and Corrosion", M.F. Toney, Proceedings of the Workshop on Structural Effects in Electrocatalysis and Oxygen Electrochemistry, D. Scherson, D. Tryk, M. Daroux, and X. Xing, eds., (The Electrochemical Society, Pennington, 1992), p. 121.
230. "A Surface X-ray Diffraction Study of the Structure, Epitaxy, and Growth of Anodic TiO<sub>2</sub> Films", D.G. Wiesler, M.F. Toney, O.R. Melroy, C.S. McMillan, W.H. Smyrl, in X-rays Methods in *Interfacial Electrochemistry and Corrosion*, A.J. Davenport and J.G. Gordon, eds., (The Electrochemical Society, Pennington, 1992), p. 89.
231. "In-situ Surface X-ray Crystallography of Electrochemically Deposited Bi on Ag(111): Structure, Compressibility, and Anisotropy", D. Yee, M.F. Toney, M.G. Samant, D.G. Wiesler, L.B. Sorensen, J.G. Gordon, G.L. Borges, in X-rays Methods in *Interfacial Electrochemistry and Corrosion*, A.J. Davenport and J.G. Gordon, eds., (The Electrochemical Society, Pennington, 1992), p. 115.
232. "In-situ X-ray Scattering During Electrodeposition Under Controlled Hydrodynamics", M.J. Armstrong, G.M. Whitney, M.F. Toney, in X-rays Methods in *Interfacial Electrochemistry and Corrosion*, A.J. Davenport and J.G. Gordon, eds., (The Electrochemical Society, Pennington, 1992), p. 62.
233. "Structural and Magnetic X-ray Scattering Measurements of Epitaxial Dy Thin Films", M.F. Toney, D.G. Wiesler, B.D. Hermsmeier, R.F.C. Farrow, Materials Research Society Symposium Proceedings, Vol. 231, 119 (1992).
234. "In Situ Surface X-ray Scattering of Metal Monolayers Adsorbed at Solid-Liquid Interfaces", M.F. Toney, J.G. Gordon, O.R. Melroy, SPIE Proceedings, Vol. 1550, 140 (1991).
235. "In-situ Synchrotron X-ray Diffraction of Electrochemical Interfaces", M.F. Toney, in *The Application of Surface Analysis Methods to Environmental/Materials Interactions*, D.R. Baer, C.R. Clayton, and G.D. Davis, eds., (The Electrochemical Society, Pennington, 1991) p. 200. Also published in X-rays Methods in *Interfacial Electrochemistry and Corrosion*, A.J. Davenport and J.G. Gordon, eds., (The Electrochemical Society, Pennington, 1992), p. 1.
236. "Interfacial Density Profiles of Anodic Oxides of Tantalum and Niobium Measured by X-ray Reflectivity", D.G. Wiesler, M.F. Toney, C.S. McMillan, W.H. Smyrl, in *The Application of Surface Analysis Methods to Environmental/Materials Interactions*, D.R. Baer, C.R. Clayton, and G.D. Davis, eds., (The Electrochemical Society, Pennington, 1991) p. 440.
237. "In-Situ X-ray Scattering of Monolayers Adsorbed at Electrochemical Interfaces", M.F. Toney O.R. Melroy, Materials Research Society Symposium Proceedings, Vol. 143 (1989), p.37.
238. "Structural Depth Profiling of Iron Oxide Thin Films Using Grazing Incidence Asymmetric Bragg X-ray Diffraction", M.F. Toney, S. Brennan, J. Appl. Phys. **65**, 4763 (1989).
239. "X-ray Diffraction from the (3x3) Reconstructed (111)B Surface of InSb", R.L. Johnson, J.H. Fock, I.K. Robinson, J. Bohr, R. Feidenhans'l, J. Als-Nielsen, M. Nielsen, M. Toney,

- Proceedings of the First International Conference on the Structure of Surfaces*, (Springer, 1984) p. 313.
240. "Structure and Phase Transitions in Physically Adsorbed Films of Nitrogen and Oxygen Molecules on Graphite", S.C. Fain, M.F. Toney, R.D. Diehl, *Proceedings of the Ninth International Vacuum Congress and Fifth International Conference on Solid Surface.*, J.L. de Segovia, ed. (Imprenta Moderna, Madrid, 1983) 129.
  241. "Orientational Ordering of Nitrogen Molecular Axes for a Commensurate Monolayer Physisorbed on Graphite", R.D Diehl, M.F. Toney, S.C. Fain, *Phys. Rev. Lett.* **48**, 177 (1982).
  242. "Low-Energy Electron Diffraction Results for Physisorbed Nitrogen on Graphite", R.D Diehl, C.G. Shaw, S.C. Fain, M.F. Toney, *Ordering in Two Dimensions*, S.K. Sinha, ed. (Elsevier North Holland, New York, 1980), p.199.