Petro Maksymovych

Center for Nanophase Materials Sciences
Oak Ridge National Laboratory
Oak Ridge, TN, 37831
Phone: (865) 368-0936
E-mail: 5nm@ornl.gov

Education

Taras Shevchenko University, Kiev, Ukraine	B.S.	2001	Physical Chemistry
University of Pittsburgh, Pittsburgh, PA	Ph.D.	2007	Physical Chemistry

Professional Experience

2014 – present	Research Scientist, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory
2009–2013	Research & Development Associate, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory
2007–2009	Eugene P Wigner Fellow, Center for Nanophase Materials Sciences, ORNL
2001–2007	Graduate student, University of Pittsburgh, Pittsburgh, Penn.
2000	Visiting student, University of Pittsburgh, Pittsburgh, Penn.
1998–2001	Undergraduate student, Taras Shevchenko University, Kiev, Ukraine

Awards

2015 Peter Mark Award from the American Vacuum Society
2011 ORNL Director's Award for Outstanding Accomplishment in Science and Technology
2011 ORNL Early Career Award for Individual Scientific Accomplishment
2010 Martin and Beathe Block Prize from the Aspen Center for Physics
2007 Eugene P. Wigner Fellowship, Oak Ridge National Laboratory, Oak Ridge, TN
2007 Wayne B. Nottingham Prize from the Physical Electronics Conference
2006 Morton Traum Award from the American Vacuum Society
2001 Outstanding performance on entrance exams in four chemistry disciplines, Department of Chemistry, University of Pittsburgh

Symposium organization

2011 International Materials Research Congress, Cancun, Mexico (Fundamentals and Applications of Complex Oxides for Information and Energy;
2012 Materials Research Society Congress (“Oxide Nanoelectronics and Multifunctional Dielectrics”)

Research areas

1. Material manipulation using electrical and stress fields

new approaches to reversible manipulation of complex materials and their phase transitions using non-thermal stimuli that can be localized down to the nanoscale

2. Chemical reactions in self-organized molecular systems:

emergent chemical and electronic properties in molecular assemblies; mechanisms of hot-electron induced reactions engineering; hot-electron transport on metal surfaces and molecular overlayers

3. Molecular architectures for correlated-electron physics with specific focus on nanostructured charge-transfer and cation-radical organic complexes

4. Complex ionic materials:

Electronic and ionic transport in perovskite oxides; incipient ionic conductivity in layered materials for future 2D and quasi-2D multifunctional dielectrics.

5. Development of scanning probe microscopy methods

Thermoelectric energy conversion in nanoscale junctions; near-field thermal transport; hybrid force-conductive force microscopy in contact and non-contact regimes; microwave microscopy methods; novel data acquisition and analysis methods.

Professional Activities

2011 MRS proceedings editor for "Oxide nanoelectronics" symposium
2011 International Materials Research Congress, Cancun, Mexico (Fundamentals and Applications of Complex Oxides for Information and Energy
2012 Materials Research Society Congress ("Oxide Nanoelectronics and Multifunctional Dielectrics")

Peer-Reviewed Publications: Total > 67, ISI Knowledge h-index 26, 2 book chapters

Select invited talks: (20 total)

1. "*Epitaxial growth of ionic molecules: our quest for electron spectroscopy of superatoms*", Gordon Research Conference on Conductivity & Magnetism in Molecular Materials, Lewiston, ME, August 2014.
2. *"Taking control of the nanoscale with scanning programming microscopy"*, Peter Mark Memorial Award Lecture, 62nd Symposium of the American Vacuum Society, *San Jose, CA*, October, 2015.
3. "*Electrostatic Control of Low Dimensional Molecular Ionic Assemblies*", *11th* International Symposium on Crystalline Organic Metals, Superconductors and Magnets, Bad Goegging, Germany, September, 2015.
4. "*To Switch or not to Switch: A Probe Microscopy Perspective*", Materials Sceince & Technology Conference, MS&T 2013, Montreal, Canada, October 2013
5. "*A Transport perspective on Local Manipulation of Ferroelectric and Complex Oxide Surfaces*", American Physical Society March Meeting, 2013, Baltimore, MD

Invention disclosures

A. Tselev, S. V. Kalinin, P. Maksymovych, "Methods for Detection and Quantification of Conductance and Dielectric Permittivity", Disclousre # 201503548, September 2015.

P. Maksymovych, S. V. Kalinin, A. Tselev, "Method of Creating Electronically Conducting Ferroelectric Domain Wall Circuits", Disclousre # 201503547, September, 2015.

P. Maksymovych, "*Electronic Thermometry in Tunable Tunnel Junction*", Patent application ID-2930-1, BHGL 13490-213; June 2013

P. Maksymovych, "*Single Contact Tunneling Thermometry*", Patent application ID 2874.1; BHGL 13489-225, May 2013

P. Maksymovych, M. A. Fuentes-Cabrera, B. G. Sumpter, M. Pan, Q. Li, "*Electron-induced Tautomerization for Patterning of Organic Molecules on Solid Surfaces*", Patent application 2834.1 BHGL 13489.234, March 2013.

S. V. Kalinin, N. Balke, Albina Y. Borisevich, Stephen Jesse, P. Maksymovych, Y. Kim, E. Strelcov, "*Real space mapping of oxygen vacancy diffusion and electrochemical transformations by hysteretic current reversal curve measurements"*, BHGL 13489.205, August 2011.

Collaborators:

D. C. Sorescu, National Energy Technology Laboratory; J. I. Cerda, Instituto de Ciencia de Materiales de Madrid; L. Q. Chen, Pennsylvania State University; M. Huijben, University of Twente; S. V. Kalinin, Oak Ridge Nat'l Laboratory; A. N. Morozovska, V. Lashkaryov, Institute for Semiconductor Physics, Ukraine; M. Pan, Oak Ridge Nat'l Laboratory; R. Ramesh, UC-Berkeley; O. Voznyy, University of Toronto, Cananda; C. B. Eom, University of Wisconsin Madison; Lane W. Martin, University of California, Berkeley; John A. Schlueter, Argonne National Laboratory

Graduate and Postdoctoral Advisors:
Graduate Advisors:

Ph.D	Prof. John T. Yates, Jr., University of Pittsburgh, PA
B.Sc.	Prof. V. Yatsimirsky, Taras Shevchenko University, Kiev, Ukraine

Postdoctoral Scholars Advised: Geoffrey Rojas, Ph. D. U Nebraska; Simon Kelly, Ph. D. Leiden University; Seokmin Jeon, Ph. D. CalTech; Alexei Belianinov, Ph. D. Iowa State Univ; Marius Chyasnavichus, Ph. D. Clemson University; Jun Wang, Ph. D. University of New Hampshire

Professional Membership
American Physical Society, American Vacuum Society, Materials Research Society

Reviewing activities
- Review board of the Seed Money Fund at Oak Ridge National Laboratory: 2010-2012
- NSF review panel (2015)
- Referee in Nature (Nanotechnology, Communications, Scientific Reports), Science, Journal of the American Chemical Society, Physical Review Letters, Physical Review B, Advanced Functional Materials, Surface Science, Nanotechnology, Physical Chemistry Chemical Physics, Physica Status Solidi, Journal of Physics D, Chemical Reviews, Langmuir and others

Bibliography

Published

1. M. A. Susner, A. Belianinov, A. Y. Borisevich, Q. He, H. Demir, D. S. Sholl, P. Ganesh, D. L. Abernathy, M. A. McGuire, and P. Maksymovych, "*High T_c layered ferrielectric crystals by coherent spinodal decomposition*", **ACS Nano, 2015**, *in press*.

2. A. Ievlev, M. Susner, M. A. McGuire, P. Maksymovych, S. V. Kalinin, "*Quantitative analysis of the local phase transitions induced by laser heating*", **ACS Nano**, **2015,** DOI 10.1021/acsnano.5b05818.

3. P. Maksymovych, "*Electrostatic Doping by Domain Walls*", **Nature Nanotechnology**, ***2015***, 10, 571.

4. Y. Cao, A. V. Ievlev, A. N. Morozovska, L. Q. Chen, S. V. Kalinin, P. Maksymovych, "*Intrinsic space charge layers and field enhancement in ferroelectric nanojunctions*", **Applied Physics Letters**, ***2015***, 107, 022903.

5. J. Xu, A. Buin, A. H. Ip, W. Li, O. Voznyy, R. Comin, M. Yuan, S. Jeon, Z. Ning, J. McDowell, P. Kanjaaboos, J. Sun, X. Lan, L. Quan, P. Maksymovych, E. H. Sargent, "*Perovskite-fullerene hybrid materials suppress hysteresis in planar diodes*", **Nature Communications**, ***2015***, 6, 7081.

6. Q. Li, Y. Cao, P. Yu, R.K. Vasudevan, N. Laanait, A. Tselev, L.Q. Chen, P. Maksymovych, S.V. Kalinin, N. Balke' "*Giant elastic tunability in strained $BiFeO_3$ near an electrically-induced phase transition*", **Nature Communications, *2015***, in press.

7. N. Balke, S. Jesse, Q. Li, P. Maksymovych, M. B. Okatan, E. Strelcov, A. Tselev, S. V. Kalinin, "*Current and surface charge modified hysteresis loops in ferroelectric thin films*", **Journal Applied Physics**, ***2015***, 118, 042001.

8. A. Belianinov, Q. He, A. Dziaugys, P. Maksymovych, E. Eliseev, A. Borisevich, A. Morozovska, J. Banys, Y. Vysochanskii, S.V. Kalinin, "*$CuInP_2S_6$ - Room Temperature Layered Ferroelectric*", **Nano Letters**, ***2015***, 15, 3808-3814.

9. Maksymovych, P.; Kelly, S. J., Cerda, J. I., "Surface-State Enhancement of Tunneling Thermopower on the Ag(111) Surface", **ACS Nano, *2014***, 8 ,12110.

10. Kelly, S. J.; Kim, Y.; Eliseev, E.; Morozovska, A; Jesse, S; Biegalski, M. D.; Mitchell, J. F.; Zheng, H.; Aarts, J.; Hwang, I.; Oh, S.; Choi, J. S.; Choi, T.; Park, B. H.; Kalinin, S. V.; Maksymovych, P., "Controlled mechanical modification of manganite surface with nanoscale resolution", **Nanotechnology, *2014***, *25*, 475302.

11. N. Balke, P. Maksymovych, S. Jesse, I. Kravchenko, Q. Li, Qian, S. V. Kalinin, "*Exploring local electrostatic effects with scanning probe microscopy: implications for piezoresponse force microscopy and triboelectricity*", **ACS Nano**, ***2014***, 8, 10229 .

12. Balke, N.; Maksymovych, P.; Jesse, S.; Kravchenko, I. I.; Li, Q.; Kalinin, S. V., "Exploring Local Electrostatic Effects with Scanning Probe Microscopy: Implications for Piezoresponse Force Microscopy and Triboelectricity", **ACS Nano, *2014***, *8*, 10229.

13. Park, C; Rojas, G. A.; Jeon, S.; Kelly, S. J.; Smith, S. C; Sumpter, B. G; Yoon, M.; Maksymovych, P. "Weak competing interactions control assembly of strongly bonded TCNQ ionic acceptor molecules on silver surfaces", **Physical Review B**, ***2014***, *90*, 125432.

14. Seidel, J.; Trassin, M.; Zhang, Y.; Maksymovych, P.; Uhlig, T.; Milde, P.; Kohler, D.; Baddorf, A. P.; Kalinin, S. V.; Eng, L. M.; Pan, X. Q.; Ramesh, R., "Electronic Properties of Isosymmetric Phase Boundaries in Highly Strained Ca-Doped $BiFeO_3$", **Advanced Materials**, ***2014***, *26*, 4376.

15. Eliseev, EA; Morozovska, AN; Ievlev, AV; Balke, N; Maksymovych, P; Tselev, A; Kalinin, SV, "Electrostrictive and electrostatic responses in contact mode voltage modulated scanning probe microscopies", **Applied Physics Letters**, ***2014***, *104*, 232901.

16. Beekman, C; Siemons, W; Ward, TZ; Chi, M; Howe, J; Biegalski, MD; Balke, N; Maksymovych, P; Farrar, AK; Romero, JB; Gao, P; Pan, XQ; Tenne, DA; Christen, HM, "Phase Transitions, Phase Coexistence, and Piezoelectric Switching Behavior in Highly Strained $BiFeO_3$ Films", **Advanced Materials**, ***2013***, 25, 5561.

17. Vasudevan, R. K.; Wu, W.; Guest, J. R.; Baddorf, A. P.; Morozovska, A. N.; Eliseev, E. A.; Balke, N.; Nagarajan, V.; Maksymovych, P.; Kalinin, S. V. "Domain Wall Conduction

and Polarization-Mediated Transport in Ferroelectrics." **Advanced Functional Materials**, **2013**, *23*, 2592.

18. Rojas, G. A.; Ganesh, P.; Kelly, S. J.; Sumpter, B. G.; Schlueter, J. A.; Maksymovych, P. "Ionic Disproportionation of Charge Transfer Salt Driven by Surface Epitaxy." **Journal of Physical Chemistry C**, **2013**, *117*, 19402.

19. Maksymovych, P.; Sorescu, D. C.; Voznyy, O.; Yates, J. T., Jr. "Hybridization of Phenylthiolate- and Methylthiolate-Adatom Species at Low Coverage on the Au(111) Surface." **Journal of the American Chemical Society**, **2013**, *135*, 4922.

20. Maksymovych, P. "Distance Dependence of Tunneling Thermovoltage on Metal Surfaces." **Journal of Vacuum Science & Technology B, 2013**, *31*, 031804.

21. Li, Q.; Owens, J. R.; Han, C.; Sumpter, B. G.; Lu, W.; Bernholc, J.; Meunier, V.; Maksymovych, P.; Fuentes-Cabrera, M.; Pan, M. "Self-Organized and Cu-Coordinated Surface Linear Polymerization." **Nature Scientific Reports, 2013**, *3*, 2102.

22. Kim, Y.; Kelly, S. J.; Morozovska, A.; Rahani, E. K.; Strelcov, E.; Eliseev, E.; Jesse, S.; Biegalski, M. D.; Balke, N.; Benedek, N.; Strukov, D.; Aarts, J.; Hwang, I.; Oh, S.; Choi, J. S.; Choi, T.; Park, B. H.; Shenoy, V. B.; Maksymovych, P.; Kalinin, S. V. "Mechanical Control of Electroresistive Switching." **Nano Letters**, **2013**, *13*, 4068.

23. Beekman, C.; Siemons, W.; Ward, T. Z.; Chi, M.; Howe, J.; Biegalski, M. D.; Balke, N.; Maksymovych, P.; Farrar, A. K.; Romero, J. B.; Gao, P.; Pan, X. Q.; Tenne, D. A.; Christen, H. M. "Phase Transitions, Phase Coexistence, and Piezoelectric Switching Behavior in Highly Strained $BiFeO_3$ Films." **Advanced Materials, 2013**, *25*, 5561.

24. Vasudevan, R. K.; Morozovska, A. N.; Eliseev, E. A.; Britson, J.; Yang, J. C.; Chu, Y. H.; Maksymovych, P.; Chen, L. Q.; Nagarajan, V.; Kalinin, S. V. "Domain Wall Geometry Controls Conduction in Ferroelectrics." **Nano Letters, 2012**, *12*, 5524.

25. Stolichnov, I.; Maksymovych, P.; Mikheev, E.; Kalinin, S. V.; Tagantsev, A. K.; Setter, N. "Cold-Field Switching in PVDF-TRFE Ferroelectric Polymer Nanomesas." **Physical Review Letters**, **2012**, *108, 027603.*

26. Morozovska, A. N.; Vasudevan, R. K.; Maksymovych, P.; Kalinin, S. V.; Eliseev, E. A. "Anisotropic Conductivity of Uncharged Domain Walls in $BiFeO_3$." **Physical Review B 2012**, *86*, 085315.

27. Maksymovych, P.; Morozovska, A. N.; Yu, P.; Eliseev, E. A.; Chu, Y.-H.; Ramesh, R.; Baddorf, A. P.; Kalinin, S. V. "Tunable Metallic Conductance in Ferroelectric Nanodomains." **Nano Letters**, **2012**, *12*, 209.

28. Maksymovych, P.; Huijben, M.; Pan, M.; Jesse, S.; Balke, N.; Chu, Y.-H.; Chang, H. J.; Borisevich, A. Y.; Baddorf, A. P.; Rijnders, G.; Blank, D. H. A.; Ramesh, R.; Kalinin, S. V. "Ultrathin Limit and Dead-Layer Effects in Local Polarization Switching of $BiFeO_3$." **Physical Review B, 2012**, *85*.

29. Li, Q.; Han, C.; Horton, S. R.; Fuentes-Cabrera, M.; Sumpter, B. G.; Lu, W.; Bernholc, J.; Maksymovych, P.; Pan, M. "Supramolecular Self-Assembly of Pi-Conjugated Hydrocarbons Via 2d Cooperative CH/π Interaction." **ACS Nano, 2012**, *6*, 566.

30. Li, Q.; Han, C.; Fuentes-Cabrera, M.; Terrones, H.; Sumpter, B. G.; Lu, W.; Bernholc, J.; Yi, J.; Gai, Z.; Baddorf, A. P.; Maksymovych, P.; Pan, M. "Electronic Control over Attachment and Self-Assembly of Alkyne Groups on Gold." **ACS Nano**, **2012**, *6*, 9267.

31. Eliseev, E. A.; Morozovska, A. N.; Svechnikov, G. S.; Maksymovych, P.; Kalinin, S. V. "Domain Wall Conduction in Multiaxial Ferroelectrics." **Physical Review B**, **2012**, *85*, 045312

32. Balke, N.; Winchester, B.; Ren, W.; Chu, Y. H.; Morozovska, A. N.; Eliseev, E. A.; Huijben, M.; Vasudevan, R. K.; Maksymovych, P.; Britson, J.; Jesse, S.; Kornev, I.; Ramesh, R.; Bellaiche, L.; Chen, L. Q.; Kalinin, S. V. "Enhanced Electric Conductivity at Ferroelectric Vortex Cores in $BiFeO_3$." **Nature Physics**, **2012**, *8*, 81.

33. Maksymovych, P.; Seidel, J.; Chu, Y. H.; Wu, P.; Baddorf, A. P.; Chen, L.-Q.; Kalinin, S. V.; Ramesh, R. "Dynamic Conductivity of Ferroelectric Domain Walls in $BiFeO_3$." **Nano Letters**, **2011**, *11*, 1906.

34. P. Maksymovych, "*Excitation and Mechanisms of Single Molecule Reactions in Scanning Tunneling Microscopy*", book chapter in **Scanning Probe Microscopy of Functional Materials**, Springer 2011, Part1, 3-37, DOI: 10.1007/978-1-4419-7167-8_1

35. Maksymovych, P.; Pan, M.; Yu, P.; Ramesh, R.; Baddorf, A. P.; Kalinin, S. V. "Scaling and Disorder Analysis of Local I-V Curves from Ferroelectric Thin Films of Lead Zirconate Titanate." **Nanotechnology**, **2011**, *22*, 254031.

36. Seidel, J.; Maksymovych, P.; Batra, Y.; Katan, A.; Yang, S. Y.; He, Q.; Baddorf, A. P.; Kalinin, S. V.; Yang, C. H.; Yang, J. C.; Chu, Y. H.; Salje, E. K. H.; Wormeester, H.; Salmeron, M.; Ramesh, R. "Domain Wall Conductivity in La-Doped $BiFeO_3$." **Physical Review Letters, 2010**, *105*, 197603.

37. Morozovska, A. N.; Eliseev, E. A.; Svechnikov, S. V.; Krutov, A. D.; Shur, V. Y.; Borisevich, A. Y.; Maksymovych, P.; Kalinin, S. V. "Finite Size and Intrinsic Field Effect on the Polar-Active Properties of Ferroelectric-Semiconductor Heterostructures." **Physical Review B**, **2010**, *81*, 205308.

38. Maksymovych, P.; Voznyy, O.; Dougherty, D. B.; Sorescu, D. C.; Yates, J. T., Jr. "Gold Adatom as a Key Structural Component in Self-Assembled Monolayers of Organosulfur Molecules on Au(111)." **Progress in Surface Science, 2010**, *85*, 206.

39. Kalinin, S. V.; Rodriguez, B. J.; Borisevich, A. Y.; Baddorf, A. P.; Balke, N.; Chang, H. J.; Chen, L.-Q.; Choudhury, S.; Jesse, S.; Maksymovych, P.; Nikiforov, M. P.; Pennycook, S.

J. "Defect-Mediated Polarization Switching in Ferroelectrics and Related Materials: From Mesoscopic Mechanisms to Atomistic Control." **Advanced Materials, 2010**, *22*, 314.

40. Jang, H. W.; Kumar, A.; Denev, S.; Biegalski, M. D.; Maksymovych, P.; Bark, C. W.; Nelson, C. T.; Folkman, C. M.; Baek, S. H.; Balke, N.; Brooks, C. M.; Tenne, D. A.; Schlom, D. G.; Chen, L. Q.; Pan, X. Q.; Kalinin, S. V.; Gopalan, V.; Eom, C. B. "Ferroelectricity in Strain-Free $SrTiO_3$ Thin Films." **Physical Review Letters**, **2010**, *104*.

41. Yang, C. H.; Seidel, J.; Kim, S. Y.; Rossen, P. B.; Yu, P.; Gajek, M.; Chu, Y. H.; Martin, L. W.; Holcomb, M. B.; He, Q.; Maksymovych, P.; Balke, N.; Kalinin, S. V.; Baddorf, A. P.; Basu, S. R.; Scullin, M. L.; Ramesh, R. "Electric Modulation of Conduction in Multiferroic Ca-Doped $BiFeO_3$ Films." **Nature Materials**, **2009**, *8*, 485.

42. Voznyy, O.; Dubowski, J. J.; Yates, J. T., Jr.; Maksymovych, P. "The Role of Gold Adatoms and Stereochemistry in Self-Assembly of Methylthiolate on Au(111)." **Journal of the American Chemical Society, 2009**, *131*, 12989.

43. Seidel, J.; Martin, L. W.; He, Q.; Zhan, Q.; Chu, Y. H.; Rother, A.; Hawkridge, M. E.; Maksymovych, P.; Yu, P.; Gajek, M.; Balke, N.; Kalinin, S. V.; Gemming, S.; Wang, F.; Catalan, G.; Scott, J. F.; Spaldin, N. A.; Orenstein, J.; Ramesh, R. "Conduction at Domain Walls in Oxide Multiferroics." **Nature Materials**, **2009**, *8*, 229.

44. Morozovska, A. N.; Eliseev, E. A.; Li, Y.; Svechnikov, S. V.; Maksymovych, P.; Shur, V. Y.; Gopalan, V.; Chen, L.-Q.; Kalinin, S. V. "Thermodynamics of Nanodomain Formation and Breakdown in Scanning Probe Microscopy: Landau-Ginzburg-Devonshire Approach." **Physical Review B**, **2009**, *80*.

45. Maksymovych, P.; Jesse, S.; Yu, P.; Ramesh, R.; Baddorf, A. P.; Kalinin, S. V. "Polarization Control of Electron Tunneling into Ferroelectric Surfaces." **Science**, **2009**, *324*, 1421.

46. Maksymovych, P.; Jesse, S.; Huijben, M.; Ramesh, R.; Morozovska, A.; Choudhury, S.; Chen, L.-Q.; Baddorf, A. P.; Kalinin, S. V. "Intrinsic Nucleation Mechanism and Disorder Effects in Polarization Switching on Ferroelectric Surfaces." **Physical Review Letters**, **2009**, *102*.

47. Maksymovych, P.; Balke, N.; Jesse, S.; Huijben, M.; Ramesh, R.; Baddorf, A. P.; Kalinin, S. V. "Defect-Induced Asymmetry of Local Hysteresis Loops on $BiFeO_3$ Surfaces." **Journal of Materials Science**, **2009**, *44*, 5095.

48. Maksymovych, P.; Yates, J. T., Jr. "Au Adatoms in Self-Assembly of Benzenethiol on the Au(111) Surface." **Journal of the American Chemical Society**, **2008**, *130*, 7518.

49. Maksymovych, P.; Sorescu, D. C.; Jordan, K. D.; Yates, J. T., Jr. "Collective Reactivity of Molecular Chains Self-Assembled on a Surface." **Science**, **2008**, *322*, 1664.

50. Maksymovych, P.; Dougherty, D. B. "Molecular Self-Assembly Guided by Surface Reconstruction: CH_3SH Monolayer on the Au(111) Surface." **Surface Science**, **2008**, *602*, 2017.

51. Kalinin, S. V.; Rodriguez, B. J.; Jesse, S.; Maksymovych, P.; Seal, K.; Nikiforov, M.; Baddorf, A. P.; Kholkin, A. L.; Proksch, R. "**Local Bias-Induced Phase Transitions**." **Materials Today**, **2008**, *11*, 16.

52. Jesse, S.; Maksymovych, P.; Kalinin, S. V. "Rapid Multidimensional Data Acquisition in Scanning Probe Microscopy Applied to Local Polarization Dynamics and Voltage Dependent Contact Mechanics." **Applied Physics Letters**, **2008**, *93*, 112903.

53. Maksymovych, P.; Dougherty, D. B.; Zhu, X. Y.; Yates, J. T., Jr. "Nonlocal Dissociative Chemistry of Adsorbed Molecules Induced by Localized Electron Injection into Metal Surfaces." **Physical Review Letters**, **2007**, *99*, 016101.

54. Dougherty, D. B.; Maksymovych, P.; Lee, J.; Feng, M.; Petek, H.; Yates, J. T., Jr. "Tunneling Spectroscopy of Stark-Shifted Image Potential States on Cu and Au Surfaces." **Physical Review B**, **2007**, *76*, 125428

55. Suzuki, T.; Maksymovych, P.; Levy, J.; Yates, J. T. "Formation of Carbon-Induced Dimer Vacancy Defects on Si(001)-2 X 1 by Thermal Decomposition of Organic Molecules-Lack of Dependence on the Molecules' Structure." **Surface Science, 2006**, *600*, 366.

56. Maksymovych, P.; Yates, J. T. "Unexpected Spontaneous Formation of Co Clusters on the Au(111) Surface." **Chemical Physics Letters**, **2006**, *421*, 473.

57. Maksymovych, P.; Yates, J. T., Jr. "Propagation of Conformation in the Surface-Aligned Dissociation of Single Ch3ssch3 Molecules on Au(111)." **Journal of the American Chemical Society**, **2006**, *128*, 10642.

58. Maksymovych, P.; Sorescu, D. C.; Yates, J. T., Jr. "Gold-Adatom-Mediated Bonding in Self-Assembled Short-Chain Alkanethiolate Species on the Au(111) Surface." **Physical Review Letters**, **2006**, *97*, 146103.

59. Maksymovych, P.; Sorescu, D. C.; Yates, J. T., Jr. "Methanethiolate Adsorption Site on Au(111): A Combined Stm/Dft Study at the Single-Molecule Level." **Journal of Physical Chemistry B**, **2006**, *110*, 21161.

60. Dougherty, D. B.; Maksymovych, P.; Yates, J. T., Jr. "Direct STM Evidence for Cu-Benzoate Surface Complexes on Cu(110)." **Surface Science, 2006**, *600*, 4484.

61. Dougherty, D. B.; Maksymovych, P.; Lee, J.; Yates, J. T., Jr. "Stark-Shifted Image Potential States of Benzene Bilayers on Cu(110) and Cu(111)." **Chemical Physics Letters, 2006**, *431*, 303.

62. Dougherty, D. B.; Maksymovych, P.; Lee, J.; Yates, J. T., Jr. "Local Spectroscopy of Image-Potential-Derived States: From Single Molecules to Monolayers of Benzene on Cu(111)." **Physical Review Letters, 2006**, *97*, 236806.

63. Rzeznicka, II; Lee, J. S.; Maksymovych, P.; Yates, J. T., Jr. "Nondissociative Chemisorption of Short Chain Alkanethiols on Au(111)." **Journal of Physical Chemistry B**, **2005**, *109*, 15992.

64. Maksymovych, P.; Sorescu, D. C.; Dougherty, D.; Yates, J. T., Jr. "Surface Bonding and Dynamical Behavior of the CH_3SH Molecule on Au(111)." **Journal of Physical Chemistry B**, **2005**, *109*, 22463.

65. Maksymovych, P.; Gasmire, T.; Ohno, S.; Yates, J. T. "Improved Crystal Grinding and Polishing Holder for Metal Single Crystal Preparations." **Journal of Vacuum Science & Technology A**, **2005**, *23*, 362.

66. Thompson, L.; Lee, J. G.; Maksymovych, P.; Ahner, J.; Yates, J. T., Jr. "Construction and Performance of an Ultrahigh Vacuum-Compatible High Temperature Vapor Dosing System for Low Vapor Pressure Compounds." **Journal of Vacuum Science & Technology A, 2003**, *21*, 491.

67. Mezhenny, S.; Maksymovych, P.; Thompson, T. L.; Diwald, O.; Stahl, D.; Walck, S. D.; Yates, J. T., Jr. "Stm Studies of Defect Production on the TiO_2(110)-(1 X 1) and TiO_2(110)-(1 X 2) Surfaces Induced by UV Irradiation." **Chemical Physics Letters, 2003**, *369*, 152.

68. Maksymovych, P.; Mezhenny, S.; Yates, J. T. "Stm Study of Water Adsorption on the TiO_2(110)-(1 X 2) Surface." **Chemical Physics Letters, 2003**, *382*, 270.

69. Mezhenny, S.; Sorescu, D. C.; Maksymovych, P.; Yates, J. T., Jr. "Dissociation of CH_3I on the Al(111) Surface - an Stm and Density Functional Theory Study." **Journal of the American Chemical Society**, **2002**, *124*, 14202.

70. Lee, J. G.; Ahner, J.; Maksymovych, P.; Yates, J. T. "Molecular Triangulation - Finding the Conformation of Adsorbed Self-Assembled Organic Monolayers." **Chemical Physics Letters**, **2001**, *340*, 21.

Invited talks:

6. *"Taking control of the nanoscale with scanning programming microscopy"*, Peter Mark Memorial Award Lecture, 62nd Symposium of the American Vacuum Society, *San Jose, CA*, October, 2015.

7. "*Electrostatic Control of Low Dimensional Molecular Ionic Assemblies*", *11th* International Symposium on Crystalline Organic Metals, Superconductors and Magnets, Bad Goegging, Germany, September, 2015.

8. "*Local Manipulation of Electronic Transport and Atomic Structure in Ferroelectric and Complex Oxides*", 42nd Conference on the Physics and Chemistry of Surfaces and Interfaces (PSCI-42), Snow Bird, Utah, January 2015.

9. "*Taking control of the nanoscale with scanning programming microscopy*", Drexel University, February 2015.

10. "*Epitaxial growth of ionic molecules: our quest for electron spectroscopy of superatoms*", Gordon Research Conference on Conductivity & Magnetism in Molecular Materials, Lewiston, ME, August 2014.

11. "*Novel properties of topological defects in proper and improper ferroelectrics*", CIMTEC 2014, Montecatini-Terme, Italy, June, 2014.

12. "*To Switch or not to Switch: A Probe Microscopy Perspective*", Materials Sceince & Technology Conference, MS&T 2013, Montreal, Canada, October 2013

13. "*A Transport perspective on Local Manipulation of Ferroelectric and Complex Oxide Surfaces*", American Physical Society March Meeting, 2013, Baltimore, MD

14. "*A Transport perspective on Local Manipulation of Ferroelectric and Complex Oxide Surfaces*", XXI International Materials Research Congress (IMRC) 2012, Cancun, Mexico, August 2012

15. "*Nanoscale Transport through Ferroelectric and Metal Surfaces*", Nanoscience colloquim at Vanderbilt University, Nashville, TN

16. "*Topological Size-effects in Polarization-controlled Transport through Ferroelectric Surfaces*", 2011 Spring Meeting of the Materials Research Society, San Francisco, CA

17. "*Local Polarization-dependent Electron Transport Through Ferroelectric and Multiferroic Surfaces*", 2010 Spring Meeting of the Materials Research Society, San Francisco, CA

18. "Local Ferroelectric Switching and Size-effect of $BiFeO_3$ Films in Ultra-High Vacuum Down to 4 Unit Cells", 2010 Spring Meeting of the Materials Research Society, San Francisco, CA

19. "*Polarization-dependent Electron Tunneling into Ferroelectric Surfaces*", 2009 International Symposium on Integrated Ferroelectrics, Colorado Springs, CO

20. "*Polarization-dependent Electron Transport Through Ferroelectric and Multiferroic Surfaces* ", 2009 physical sciences colloquim at the North Carolina State University, Raleigh, NC

21. "*Intrinsic Polarization Dynamics and Disorder Effects by Ultra-High Vacuum Piezoresponse Force Microscopy*", 2009 Spring Meeting of the Materials Research Society, San Francisco, CA

22. "*Imaging Hot-electron Transport using Scanning Tunneling Microscopy*", physical sciences colloquium at the University of Tennessee, Knoxville, 2008.

23. "*Imaging Hot-electron Transport using Chemical Reactions in Scanning Tunneling Microscopy*", American Physical Society March Meeting, New Orleans 2008.

24. "*The Role of Au(111) Herringbone Reconstruction as a Stress-landscape and Source of Adatoms*", Center for Individual Nanoparticle Functionality, Technical University of Denmark, Lyngby, Denmark, 2006.

25. "*Adatom-mediated Chemistry in Self-assembled Monolayers of Alkanethiols on Au(111)*", University of Toronto, Canada 2006.