ANTON V. IEVLEV

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Education

Ural Federal University, Ekaterinburg, Russia	Physics	PhD, 2012
Ural State University, Ekaterinburg, Russia	Physics	M.S., 2009
Ural State University, Ekaterinburg, Russia	Physics	B.S., 2007

Professional Experience

2017 – present	Staff Scientist; Nanofabrication Research Group, Center for Nanophase Materials Science, Oak Ridge National Laboratory
2013 - 2017	Postdoctoral Research Associate; Scanning Probe Microscopy Group, Center for Nanophase Materials Science, Oak Ridge National Laboratory
2012 – 2013	Researcher, Institute of Natural Sciences, Ural Federal University, Ekaterinburg, Russia
2006 – 2012	Junior Researcher, Institute of Physics and Applied Mathematics, Ural State University, Ekaterinburg, Russia

Awards and Honors

- 2012: Scholarship of the Government of Russian Federation
- 2011: Scholarship of the Government of Russian Federation
- 2010: Scholarship of the Governor of the Sverdlovsk Region

Research Accomplishments

- Papers in peer-reviewed journals: **51** published articles, h-index: **14** (Google Scholar); sum of the times cited: **612** (Google Scholar); average citation per article: **12.**

Research Synopsis

- **Multimodal chemical imaging** using combined capabilities of Atomic Force Microscopy, confocal Raman spectroscopy and Secondary Ion Mass Spectrometry for investigation of the coupling between chemical phenomena and physical functional response in wide range of systems (functional materials, soft materials, biological systems, etc.)
- **Tip-induced polarization reversal in ferroelectric materials:** Experimental study and numerical simulation of the polarization reversal processes in ferroelectric single crystals and thin film using tip of Scanning Probe Microscope (SPM).

- **Data analytics** for automated interpretation of the multidimensional data in Physics, Chemistry and Material Sciences.

Professional Service

Reviewed manuscripts for: Journal of Applied Physics, Journal of Electronic Materials, Nature Scientific Reports, ACS Nano, etc.

Served as a chair for the 23rd International joint IEEE-ISAF-IWATMD-PFM symposium session "PFM-III".

Organizing of the 1st International Workshop "Nanoscale Electromechanical phenomena in functional materials. Piezoresponse Force & Electrochemical Strain Microscopies".

PUBLICATIONS

51. **Ievlev A.V.**, Brown C., Burch M.J., Agar J.C., Velarde G.A., Martin L.W., Maksymovych P., Kalinin S.V., and Ovchinnikova O.S., Chemical Phenomena of Atomic Force Microscopy Scanning, **Analytical Chemistry**, 90, 3475 (2018).

50. **Ievlev A.V.**, Chyasnavichyus M., Leonard D., Agar J.C., Velarde G.A., Martin L.W., Kalinin S.V., Maksymovych P. and Ovchinnikova O.S., *Subtractive fabrication of ferroelectric thin films with precisely controlled thickness*, **Nanotechnology**, **29**, 155302 (2018).

49. Burch M.J., **Ievlev A.V.**, Mahady K., Hysmith H., Rack P.D., Belianinov A., Ovchinnikova O.S., Helium Ion Microscopy for Imaging and Quantifying Porosity at the Nanoscale, **Analytical Chemistry**, 90, 1370 (2017).

48. Bennett S.P., Herklotz A., Cress C.D., **Ievlev A.**, Rouleau C.M., Mazin I.I., Lauter V., Magnetic order multilayering in FeRh thin films by He-Ion irradiation, **Materials Research Letters**, 6(1), 106 (2018).

47. **Ievlev A.V.,** Belianinov A., Jesse S., Allison D., Doktycz M., Retterer S., Kalinin S.V. and Ovchinnikova O.S., *Automated Interpretation and Extraction of Topographic Information from Time of Flight Secondary Ion Mass Spectrometry Data*, **Scientific Reports**, 7:17099 (2017).

46. Belianinov A., Burch M.J., Hysmith H.E., **Ievlev A.V.**, Iberi V., Susner M.A., McGuire M.A., Maksymovych P., Chyasnavichyus M., Jesse S., Ovchinnikova O.S., Chemical Changes in Layered Ferroelectric Semiconductors Induced by Helium Ion Beam, **Scientific Reports**, 7:16619 (2017).

45. Lee D., Jacobs R., Jee Y., Seo A., Sohn Ch., **Ievlev A.V.**, Ovchinnikova O.S., Huang K., Morgan D., Lee H.N., Stretching Epitaxial La0.6Sr0.4CoO3-δ for Fast Oxygen Reduction, **Journal of Physical Chemistry C**, 121 (46), 25651(2017).

44. Guo W., Reese C.M., Xiong L., Logan P.K., Thompson B.J., Stafford C.M., **Ievlev A.V.**, Lokitz B.S., Ovchinnikova O.S., and Patton D.L., Buckling Instabilities in Polymer Brush Surfaces via Postpolymerization Modification, **Macromolecules**, 50 (21) 8670 (2017).

43. Vasudevan R.K., Cao N., **Ievlev A.V.**, Li L., Yang J.-C., Chu Y.-H., Chen L.-Q., Kalinin S.V. and Maksymovych P., Field enhancement of electronic conductance at ferroelectric domain walls, **Nature Communications**, 8:1318 (2017).

42. Brady M.P., **Ievlev A.V.**, Fayek M, Leonard D.N., Frith M.G., Meyer H.M., Ramirez-Cuesta A.J., Daemen L.L., Cheng Y., Guo W., Poplawsky J.D., Ovchinnikova O.S., Thomson J., Anovitz L.M., Rother G., Shin D., Song G.-L., and Davis D., Rapid Diffusion and Nanosegregation of Hydrogen in Magnesium Alloys from Exposure to Water, **ACS Applied Materials and Interfaces,** 9 (43), 38125 (2017).

41. Stanford M.G., Noh J.H., Mahady K., **Ievlev A.V.**, Maksymovych P., Ovchinnikova O.S., and Rack P.D., Room-Temperature Activation of InGaZnO Thin-Film Transistors via He^+ Irradiation, **ACS Applied Materials and Interfaces,** 9 (40), 35125 (2017).

40. **Ievlev A.V.**, Jakowski J., Iberi V., Hysmith H., Joy D.C., Sumpter B.G., Belianinov A., Unocic R.R., Ovchinnikova O.S., *Building with Ions: Direct Write of 3D Platinum Nanostructures using In-Situ Liquid Cell Helium Ion Microscopy*, **NANOSCALE**, 9, 12949 (2017).

39. Jacobs C.B., Maksov A.B., Muckley E.S., Collins L., Mahjouri-Samani M., **Ievlev A.V.**, Rouleau C.M., Moon J.-W., Graham D.E., Sumpter B.G., Ivanov I.N., *UV-activated ZnO films on a flexible substrate for room temperature O_2 and H_2O sensing*, **SCIENTIFIC REPORTS**, 7:6053 (2017).

38. Jacobs C.B., Wang K., **Ievlev A.V.**, Collins L., Muckley E.S., Ivanov I.N., *Functional two/three-dimensional assembly of monolayer WS2 and nickel oxide*, **JOURNAL OF PHOTONICS FOR ENERGY**, 7(1), 014001 (2017)

37. Yang N., Orgiani P., Di Bartolomeo E., Foglietti V., Torelli P., **Ievlev A.V.**, Rossi G., Licoccia S., Balestrino G., Kalinin S.V., and Aruta C., *Effects of Dopant Ionic Radius on Cerium Reduction in Epitaxial Cerium Oxide Thin Films*, **THE JOURNAL OF PHYSICAL CHEMISTRY C**, 121 (16), 8841 (2017)

36. Chyasnavichyus M, Susner M.A., **Ievlev A.V.**, Eliseev E.A., Kalinin S.V., Balke N., Morozovska A.N., McGuire M.A., Maksymovych P., *Size-effect in layered ferrielectric $CuInP_2S_6$*, **APPLIED PHYSICS LETTERS**, 109 (17), 172901 (2016)

35. **Ievlev A.V.**, Maksymovych P., Trassin M., Seidel J., Ramesh R., Kalinin S.V., Ovchinnikova O.S., *Chemical state evolution in ferroelectric films during tip-induced polarization and electroresistive switching*, **ACS APPLIED MATERIALS & INTERFACES**, 8(43), 29588 (2016)

34. Peng R., Liang L., Hood Z.D., Boulesbaa A., Puretzky A, **Ievlev A.V.**, Come J, Ovchinnikova O.S., Wang H., Ma C., Chi M., Sumpter B.G., Wu Z., *In-Plane Heterojunctions Enable Multiphasic Two-Dimensional (2D) MoS_2 Nanosheets as Efficient Photocatalysts for Hydrogen Evolution from Water Reduction*, **ACS CATALYSIS**, 6 6723 (2016)

33. Jacobs C.B., **Ievlev A.V.**, Collins, L.F., Muckley E.S., Joshi P.C., Ivanov I.N., *Imaging of electrical response of NiO_x under controlled environment with sub-25-nm resolution*, **JOURNAL OF PHOTONICS FOR ENERGY**, 6 (3) 038001 (2016)

32. Iberi V., Liang L., **Ievlev A.V.**, Stanford M.G., Lin M.-W., Li X., Samani M.-M., Jesse S., Sumpter B.G., Kalinin S.V., Joy D.C., Xiao K., Belianinov A., Ovchinnikova O.S., *Nanoforging Single Layer $MoSe_2$ Through Defect Engineering with Focused Helium Ion Beams*, **SCIENTIFIC REPORTS**, 6:30481 (2016)

31. Strelcov E., **Ievlev A.V.**, Belianinov A., Tselev A., Kolmakov A., Kalinin S.V., *Local coexistence of VO_2 phases revealed by deep data analysis*, **SCIENTIFIC REPORTS,** 6:29216 (2016)

30. Morozovska A.N., **Ievlev A.V.**, Obukhovskii V.V., Fomichov Y., Varenyk O.V., Shur V.Ya., Kalinin S.V., Eliseev E.A., *Self-consistent theory of nanodomain formation on nonpolar surfaces of ferroelectrics*, **PHYSICAL REVIEW B**, 93, 165439 (2016).

29. Alikin D.O., **Ievlev A.V.**, Luchkin S.Yu., Turigin A.P., Shur V.Ya., Kalinin S.V., Kholkin A.L., *Characterization of $LiMn_2O_4$ cathodes by electrochemical strain microscopy*, **APPLIED PHYSICS LETTERS**, 108 (11), 113106 (2016).

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27. Tselev A., Velmurugan J., **Ievlev A.V.**, Kalinin S.V., Kolmokov A., *Seeing through Walls at the Nanoscale: Microwave Microscopy of Enclosed Objects and Processes in Liquids*, **ACS NANO**, 10, 3562 (2016).

26. Li C., Ding Y., Soliman M., Lorenzo J., Dhasmana N., Chantharasupawong P., **Ievlev A.V.**, Gesquiere A.J., Tetard L. and Thomas J., *Probing Ternary Solvent Effect in*

High V_{oc} Polymer Solar Cells Using Advanced AFM Techniques, **ACS APPLIED MATERIALS & INTERFACES**, 8(7), 4730 (2016).

25. **Ievlev A.V.**, Susner M.A., McGuire M.A., Maksymovych P and Kalinin S.V., *Quantitative analysis of the local phase transitions induced by laser heating*, **ACS NANO**, 9 (12), 12442 (2015).

24. **Ievlev A.V.**, Jesse S., Cochell T.J. Unocic R.R., Protopopescu V.A. and Kalinin S.V., *Quantitative Description of Crystal Nucleation and Growth from In situ Liquid Scanning Transmission Electron Microscopy*, **ACS NANO**, 9 (12), 11784 (2015).

23. Cao Y., **Ievlev A.V.**, Morozovska A.N., Chen L.-Q., Kalinin S.V. and Maksymovych P., *Intrinsic space charge layers and field enhancement in ferroelectric nanojunctions*, **APPLIED PHYSICS LETTERS**, 107 (2), 022903 (2015).

22. **Ievlev A.V.**, Morozovska A.N., Shur V.Ya. and Kalinin S.V., *Ferroelectric Switching by the Grounded Scanning Probe Microscopy Tip*, **PHYSICAL REVIEW B**, 91, 214109 (2015).

21. Belianinov A., Vasudevan R., Strelcov E., **Ievlev A.**, Steed C., Yang S.M., Tselev A., Jesse S., Biegalski M., Shipman G., Symons C., Borisevich A., Archibald R. and Kalinin S., *Big data and deep data in scanning and electron microscopies: deriving functionality from multidimensional data sets*, **ADVANCED STRUCTURAL AND CHEMICAL IMAGING,** 1:6 (2015).

20. **Ievlev A.V.** and Kalinin S.V., *Data encoding based on the shape of the ferroelectric domains produced by a scanning probe microscopy tip*, **NANOSCALE**, 7, 11040 (2015).

19. Alikin D.O., **Ievlev A.V.**, Turygin A.P, Lobov A.I., Kalinin S.V. and Shur V.Ya., *Tip-induced domain growth on the non-polar cuts of lithium niobate single-crystals,* **APPLIED PHYSICS LETTERS,** 106 (18), 182902 (2015).

18. **Ievlev A.V.**, Alikin D.O., Morozovska A.N., Varenyk O.V., Eliseev E.A., Kholkin A.L., Shur V.Ya. and Kalinin S.V., *Symmetry breaking and electrical frustration during tip-induced polarization switching in the non-polar cut of lithium niobate single crystals*, **ACS NANO,** 9 (1), 769 (2015).

17. Morozovska A.N., Eliseev E.A., **Ievlev A.V.**, Varenyk O.V., Pusenkova A.S., Chu Y.-H., Strikha M.V., Shur V.Ya. and Kalinin S.V., *Ferroelectric domain triggers the charge modulation in semiconductors*, **JOURNAL OF APPLIED PHYSICS** 106 (6), 066817 (2014).

16. **Ievlev A.V.**, Morozovska A.N., Eliseev E.A., Shur V.Ya. and Kalinin S.V., Ionic field effect and memristive phenomena in single-point ferroelectric domain switching, **NATURE COMMUNICATIONS** 5:4545 doi:10.1038/ncomms5545 (2014).

15. Eliseev E.A., Morozovska A.N., **Ievlev A.V.**, Balke N., Maksymovych P., Tselev A. and Kalinin S.V., *Electrostrictive and electrostatic responses in contact mode voltage modulated Scanning Probe Microscopies*, **APPLIED PHYSICS LETTERS** 104 (23), 232901 (2014).

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13. Strelcov E., **Ievlev A.V.**, Jesse S., Kravchenko I.I., Shur V.Ya., and Kalinin S.V., *Direct Probing of Charge Injection and Polarization-Controlled Ionic Mobility on Ferroelectric $LiNbO_3$ Surfaces*, **ADVANCED MATERIALS**, *26*, 958-963 (2014)

12. **Ievlev A.V.**, Jesse S., Morozovska A., Strelcov E., Eliseev E., Pershin Y., Kumar A., Shur V.Ya. and Kalinin S.V., *Intermittency, Quasiperiodicity, and Chaos during Scanning Probe Microscopy Tip-Induced Ferroelectric Domain Switching*, **NATURE PHYSICS**, *10*, 59-66 (2014).

11. Zelenovskiy, P.S., Shikhova V.A., **Ievlev A.V.,** Neradovskiy M.M. and Shur V.Ya., *Micro-Raman Visualization of Domain Structure in Strontium Barium Niobate Single Crystals*, **FERROELECTRICS** 439 (1), 33-39 (2012).

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9. Shur V.Ya. Shikhova V.A., **Ievlev A.V.**, Zelenovskiy P.S., Neradovskiy M.M., Pelegov D.V. and Ivleva L.I., *Nanodomain structures formation during polarization reversal in uniform electric field in strontium barium niobate single crystals*, **JOURNAL OF APPLIED PHYSICS** 112 (6), 064117 (2012).

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7**.** Shur V.Ya., Shikhova V.A, Pelegov D.V., **Ievlev A.V.** and Ivleva L.I., *Formation of nanodomain ensembles during polarization reversal in Sr0.61Ba0.39Nb2O6: Ce single crystals*, **PHYSICS OF THE SOLID STATE**, 53 (11), 2311-2315 (2011).

6. Shur V.Ya., Kuznetsov D.K., Mingaliev E.A., Yakunina E.M., Lobov A.I. and **Ievlev A.V.**, *In situ investigation of formation of self-assembled nanodomain structure in lithium niobate after pulse laser irradiation*, **APPLIED PHYSICS LETTERS** 99 (8), 082901 (2011).

5. Shur V.Ya., **Ievlev A.V.**, Nikolaeva E.V., Shishkin E.I. and Neradovskiy M.M., *Influence of adsorbed surface layer on domain growth in the field produced by conductive tip of scanning probe microscope in lithium niobate*, **JOURNAL OF APPLIED PHYSICS** 110 (5), 052017 (2011).

4. Shur V.Ya., Zelenovskiy P.S., Nebogatikov M.S., Alikin D.O., Sarmanova M.F., **Ievlev A.V.**, Mingaliev E.A. and Kuznetsov D.K., *Investigation of the nanodomain structure formation by piezoelectric force microscopy and Raman confocal microscopy in $LiNbO_3$ and $LiTaO_3$ crystals*, **JOURNAL OF APPLIED PHYSICS** 110 (5), 052013 (2011).

3. Alikin D.O., Shishkin E.I., Nikolaeva E.V., Shur V.Ya., Sarmanova M.F., **Ievlev A.V.**, Nebogatikov M.S. and Gavrilov N.V., *Formation of Self-Assembled Domain Structures in Lithium Niobate Modified by Ar Ions Implantation,* **FERROELECTRICS** 399 (1), 35-42 (2010).

2. **Ievlev A.V.**, Nikolaeva E.V., Shishkin E.I. and Shur V.Ya. Shape of Local *Hysteresis Loops Measured by Means of Piezoresponse Force Microscopy*, **FERROELECTRICS** 398 (1), 26-33 (2010)

1. Shishkin E.I., **Ievlev A.V.**, Nikolaeva E.V., Nebogatikov M.S. and Shur V.Ya., *Local Study of Polarization Reversal Kinetics in Ferroelectric Crystals Using Scanning Probe Microscopy,* **FERROELECTRICS** 374 (1), 26-32 (2008).

Professional References:

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