R K Vasudevan

List of Publications by Year
in descending order

#	Article	IF	Citations
1	Enhanced electric conductivity at ferroelectric vortex cores in BiFeO3. Nature Physics, 2012, 8, 81-88.	6.5	324
2	Deep Learning of Atomically Resolved Scanning Transmission Electron Microscopy Images: Chemical Identification and Tracking Local Transformations. ACS Nano, 2017, 11, 12742-12752.	7.3	282
3	Ferroelectric or non-ferroelectric: Why so many materials exhibit â€œferroelectricityâ€•on the nanoscale. Applied Physics Reviews, 2017, 4, .	5.5	240
4	Domain Wall Geometry Controls Conduction in Ferroelectrics. Nano Letters, 2012, 12, 5524-5531.	4.5	125
5	Exploring Topological Defects in Epitaxial BiFeO₃ Thin Films. ACS Nano, 2011, 5, 879-887.	7.3	118
6	Domain Wall Conduction and Polarizationâ€Mediated Transport in Ferroelectrics. Advanced Functional Materials, 2013, 23, 2592-2616.	7.8	113
7	Materials science in the artificial intelligence age: high-throughput library generation, machine learning, and a pathway from correlations to the underpinning physics. MRS Communications, 2019, 9, 821-838.	0.8	109
8	Big, Deep, and Smart Data in Scanning Probe Microscopy. ACS Nano, 2016, 10, 9068-9086.	7.3	103
9	Highly mobile ferroelastic domain walls in compositionally graded ferroelectric thin films. Nature Materials, 2016, 15, 549-556.	13.3	98
10	Mixed electrochemicalâ€“ferroelectric states in nanoscale ferroelectrics. Nature Physics, 2017, 13, 812-818.	6.5	98
11	Band Excitation in Scanning Probe Microscopy: Recognition and Functional Imaging. Annual Review of Physical Chemistry, 2014, 65, 519-536.	4.8	97
12	Single-domain multiferroic BiFeO3 films. Nature Communications, 2016, 7, 12712.	5.8	92
13	Topological Structures in Multiferroics â€“ Domain Walls, Skyrmions and Vortices. Advanced Electronic Materials, 2016, 2, 1500292.	2.6	84
14	Nanoscale Control of Phase Variants in Strain-Engineered BiFeO₃. Nano Letters, 2011, 11, 3346-3354.	4.5	76
15	Carrier density modulation in a germanium heterostructure by ferroelectric switching. Nature Communications, 2015, 6, 6067.	5.8	75
16	Big data and deep data in scanning and electron microscopies: deriving functionality from multidimensional data sets. Advanced Structural and Chemical Imaging, 2015, 1, 6.	4.0	74
17	Threeâ€State Ferroelastic Switching and Large Electromechanical Responses in PbTiO₃ Thin Films. Advanced Materials, 2017, 29, 1702069.	11.1	74
18	Dimensionality Controlled Octahedral Symmetry-Mismatch and Functionalities in Epitaxial LaCoO₃/SrTiO₃ Heterostructures. Nano Letters, 2015, 15, 4677-4684.	4.5	71

#	Article	IF	Citations
19	Building and exploring libraries of atomic defects in graphene: Scanning transmission electron and scanning tunneling microscopy study. Science Advances, 2019, 5, eaaw8989.	4.7	70
20	Scaling Behavior of Resistive Switching in Epitaxial Bismuth Ferrite Heterostructures. Advanced Functional Materials, 2014, 24, 3962-3969.	7.8	68
21	Anisotropic conductivity of uncharged domain walls in BiFeO<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:msub><mml:mrow /><mml:mn>3</mml:mn></mml:msub></mml:math>. Physical Review B, 2012, 86, .	1.1	64
22	Machine learningâ€œenabled identification of material phase transitions based on experimental data: Exploring collective dynamics in ferroelectric relaxors. Science Advances, 2018, 4, eaap8672.	4.7	54
23	Electrical Control of Multiferroic Orderings in Mixedâ€Phase BiFeO₃ Films. Advanced Materials, 2012, 24, 3070-3075.	11.1	53
24	Automated and Autonomous Experiments in Electron and Scanning Probe Microscopy. ACS Nano, 2021, 15, 12604-12627.	7.3	49
25	A bridge for accelerating materials by design. Npj Computational Materials, 2015, 1, .	3.5	47
26	Deep data analysis via physically constrained linear unmixing: universal framework, domain examples, and a community-wide platform. Advanced Structural and Chemical Imaging, 2018, 4, 6.	4.0	45
27	Giant elastic tunability in strained BiFeO3 near an electrically induced phase transition. Nature Communications, 2015, 6, 8985.	5.8	43
28	Controlling magnetoelectric coupling by nanoscale phase transformation in strain engineered bismuth ferrite. Nanoscale, 2012, 4, 3175.	2.8	42
29	Machine learning for materials design and discovery. Journal of Applied Physics, 2021, 129, .	1.1	41
30	Phases and Interfaces from Real Space Atomically Resolved Data: Physics-Based Deep Data Image Analysis. Nano Letters, 2016, 16, 5574-5581.	4.5	40
31	Spectroscopic imaging in piezoresponse force microscopy: New opportunities for studying polarization dynamics in ferroelectrics and multiferroics. MRS Communications, 2012, 2, 61-73.	0.8	36
32	Deterministic arbitrary switching of polarization in a ferroelectric thin film. Nature Communications, 2014, 5, 4971.	5.8	35
33	Big data in reciprocal space: Sliding fast Fourier transforms for determining periodicity. Applied Physics Letters, 2015, 106, .	1.5	35
34	Anisotropic epitaxial stabilization of a low-symmetry ferroelectric with enhanced electromechanical response. Nature Materials, 2022, 21, 74-80.	13.3	35
35	Big-Data Reflection High Energy Electron Diffraction Analysis for Understanding Epitaxial Film Growth Processes. ACS Nano, 2014, 8, 10899-10908.	7.3	34
36	Revealing ferroelectric switching character using deep recurrent neural networks. Nature Communications, 2019, 10, 4809.	5.8	34

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37	Field enhancement of electronic conductance at ferroelectric domain walls. Nature Communications, 2017, 8, 1318.	5.8	32
38	Mapping mesoscopic phase evolution during E-beam induced transformations via deep learning of atomically resolved images. Npj Computational Materials, 2018, 4, .	3.5	31
39	Knowledge Extraction from Atomically Resolved Images. ACS Nano, 2017, 11, 10313-10320.	7.3	30
40	Unraveling the origins of electromechanical response in mixed-phase bismuth ferrite. Physical Review B, 2013, 88, .	1.1	29
41	Data mining for better material synthesis: The case of pulsed laser deposition of complex oxides. Journal of Applied Physics, 2018, 123, .	1.1	29
42	Acoustic Detection of Phase Transitions at the Nanoscale. Advanced Functional Materials, 2016, 26, 478-486.	7.8	28
43	Off-the-shelf deep learning is not enough, and requires parsimony, Bayesianity, and causality. Npj Computational Materials, 2021, 7, .	3.5	28
44	Surface Control of Epitaxial Manganite Films <i>via</i> Oxygen Pressure. ACS Nano, 2015, 9, 4316-4327.	7.3	27
45	Solid-state electrochemistry on the nanometer and atomic scales: the scanning probe microscopy approach. Nanoscale, 2016, 8, 13838-13858.	2.8	27
46	Effect of surface ionic screening on the polarization reversal scenario in ferroelectric thin films: Crossover from ferroionic to antiferroionic states. Physical Review B, 2017, 96, .	1.1	26
47	Thickness and strain dependence of piezoelectric coefficient in <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:msub><mml:mi>BaTiO</mml:mi><mml:mn>3</mml:mn></mml:msub>< thin films. Physical Review Materials, 2020, 4, .	0.9	26
48	Learning from Imperfections: Predicting Structure and Thermodynamics from Atomic Imaging of Fluctuations. ACS Nano, 2019, 13, 718-727.	7.3	24
49	Machine Detection of Enhanced Electromechanical Energy Conversion in PbZr_{0.2}Ti_{0.8}O₃ Thin Films. Advanced Materials, 2018, 30, e1800701.	11.1	23
50	Autonomous Experiments in Scanning Probe Microscopy and Spectroscopy: Choosing Where to Explore Polarization Dynamics in Ferroelectrics. ACS Nano, 2021, 15, 11253-11262.	7.3	23
51	Polarization Dynamics in Ferroelectric Capacitors: Local Perspective on Emergent Collective Behavior and Memory Effects. Advanced Functional Materials, 2013, 23, 2490-2508.	7.8	22
52	Nanoscale Origins of Nonlinear Behavior in Ferroic Thin Films. Advanced Functional Materials, 2013, 23, 81-90.	7.8	20
53	Surface Chemistry Controls Anomalous Ferroelectric Behavior in Lithium Niobate. ACS Applied Materials & Interfaces, 2018, 10, 29153-29160.	4.0	20
54	Building ferroelectric from the bottom up: The machine learning analysis of the atomic-scale ferroelectric distortions. Applied Physics Letters, 2019, 115, .	1.5	20

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55	Higher order harmonic detection for exploring nonlinear interactions with nanoscale resolution. Scientific Reports, 2013, 3, 2677.	1.6	17
56	Multidimensional dynamic piezoresponse measurements: Unraveling local relaxation behavior in relaxor-ferroelectrics via big data. Journal of Applied Physics, 2015, 118, .	1.1	17
57	Atomic-scale electrochemistry on the surface of a manganite by scanning tunneling microscopy. Applied Physics Letters, 2015, 106, .	1.5	17
58	Room temperature multiferroicity and magnetodielectric coupling in 0â€“3 composite thin films. Journal of Applied Physics, 2020, 127, .	1.1	16
59	Reconstructing phase diagrams from local measurements via Gaussian processes: mapping the temperature-composition space to confidence. Npj Computational Materials, 2018, 4, .	3.5	15
60	Probing atomic-scale symmetry breaking by rotationally invariant machine learning of multidimensional electron scattering. Npj Computational Materials, 2021, 7, .	3.5	15
61	Deep Bayesian local crystallography. Npj Computational Materials, 2021, 7, .	3.5	15
62	Consistent Integration of Experimental and Ab Initio Data into Effective Physical Models. Journal of Chemical Theory and Computation, 2017, 13, 5179-5194.	2.3	14
63	Ultrafast current imaging by Bayesian inversion. Nature Communications, 2018, 9, 513.	5.8	14
64	Dynamic Manipulation in Piezoresponse Force Microscopy: Creating Nonequilibrium Phases with Large Electromechanical Response. ACS Nano, 2020, 14, 10569-10577.	7.3	14
65	Growth Mode Transition in Complex Oxide Heteroepitaxy: Atomically Resolved Studies. Crystal Growth and Design, 2016, 16, 2708-2716.	1.4	13
66	Studies on dielectric, optical, magnetic, magnetic domain structure, and resistance switching characteristics of highly c-axis oriented NZFO thin films. Journal of Applied Physics, 2017, 122, 033902.	1.1	13
67	Separating Physically Distinct Mechanisms in Complex Infrared Plasmonic Nanostructures via Machine Learning Enhanced Electron Energy Loss Spectroscopy. Advanced Optical Materials, 2021, 9, 2001808.	3.6	13
68	Ferroelectric and electrical characterization of multiferroic BiFeO3 at the single nanoparticle level. Applied Physics Letters, 2011, 99, 252905.	1.5	11
69	Towards automating structural discovery in scanning transmission electron microscopy [*]. Machine Learning: Science and Technology, 2022, 3, 015024.	2.4	11
70	Visualizing Charge Transport and Nanoscale Electrochemistry by Hyperspectral Kelvin Probe Force Microscopy. ACS Applied Materials & Interfaces, 2020, 12, 33361-33369.	4.0	10
71	Mesoscopic harmonic mapping of electromechanical response in a relaxor ferroelectric. Applied Physics Letters, 2015, 106, 222901.	1.5	9
72	Nanoscale Probing of Elasticâ€“Electronic Response to Vacancy Motion in NiO Nanocrystals. ACS Nano, 2017, 11, 8387-8394.	7.3	9

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73	Guided search for desired functional responses via Bayesian optimization of generative model: Hysteresis loop shape engineering in ferroelectrics. Journal of Applied Physics, 2020, 128, .	1.1	9
74	The Ehrlichâ€“Schwoebel barrier on an oxide surface: a combined Monte-Carlo and<i>in situ</i>scanning tunneling microscopy approach. Nanotechnology, 2015, 26, 455705.	1.3	8
75	Analysis of citation networks as a new tool for scientific research. MRS Bulletin, 2016, 41, 1009-1016.	1.7	8
76	Contradictory nature of Co doping in ferroelectricBaTiO3. Physical Review B, 2016, 94, .	1.1	8
77	Exploring phase transitions and magnetoelectric coupling of epitaxial asymmetric multilayer heterostructures. Journal of Materials Chemistry C, 2020, 8, 12113-12122.	2.7	8
78	Bayesian inference in band excitation scanning probe microscopy for optimal dynamic model selection in imaging. Journal of Applied Physics, 2020, 128, 054105.	1.1	8
79	Bayesian Learning of Adatom Interactions from Atomically Resolved Imaging Data. ACS Nano, 2021, 15, 9649-9657.	7.3	8
80	Exploration of lattice Hamiltonians for functional and structural discovery via Gaussian process-based explorationâ€“exploitation. Journal of Applied Physics, 2020, 128, 164304.	1.1	8
81	Localised nanoscale resistive switching in GaP thin films with low power consumption. Journal of Materials Chemistry C, 2017, 5, 2153-2159.	2.7	7
82	Direct Imaging of the Relaxation of Individual Ferroelectric Interfaces in a Tensileâ€Strained Film. Advanced Electronic Materials, 2017, 3, 1600508.	2.6	7
83	Predictability as a probe of manifest and latent physics: The case of atomic scale structural, chemical, and polarization behaviors in multiferroic Sm-doped BiFeO3. Applied Physics Reviews, 2021, 8, .	5.5	7
84	Investigating phase transitions from local crystallographic analysis based on statistical learning of atomic environments in 2D MoS2-ReS2. Applied Physics Reviews, 2021, 8, 011409.	5.5	7
85	Effect of silver doping on the surface of La5/8Ca3/8MnO3 epitaxial films. Applied Physics Letters, 2014, 105, .	1.5	6
86	Exotic Long-Range Surface Reconstruction on La_{0.7}Sr_{0.3}MnO₃ Thin Films. ACS Applied Materials & Interfaces, 2021, 13, 9166-9173.	4.0	6
87	Gaussian process analysis of electron energy loss spectroscopy data: multivariate reconstruction and kernel control. Npj Computational Materials, 2021, 7, .	3.5	6
88	Probing Metastable Domain Dynamics <i>via</i> Automated Experimentation in Piezoresponse Force Microscopy. ACS Nano, 2021, 15, 15096-15103.	7.3	6
89	Deep learning of interface structures from simulated 4D STEM data: cation intermixing vs. roughening ^{^{âˆ—}}. Machine Learning: Science and Technology, 2020, 1, 04LT01.	2.4	6
90	Electrocatalysis-induced elasticity modulation in a superionic proton conductor probed by band-excitation atomic force microscopy. Nanoscale, 2015, 7, 20089-20094.	2.8	5

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91	Enhancing hyperspectral EELS analysis of complex plasmonic nanostructures with pan-sharpening. Journal of Chemical Physics, 2021, 154, 014202.	1.2	5
92	Strain-driven autonomous control of cation distribution for artificial ferroelectrics. Science Advances, 2021, 7, .	4.7	5
93	Decoding the shift-invariant data: applications for band-excitation scanning probe microscopy [*]. Machine Learning: Science and Technology, 2021, 2, 045028.	2.4	5
94	Probing polarization dynamics at specific domain configurations: Computer-vision based automated experiment in piezoresponse force microscopy. Applied Physics Letters, 2021, 119, .	1.5	5
95	Electronic switching by metastable polarization states in <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mrow><mml:mi>BiFe</mml:mi><mml:msub><mml:mi mathvariant="normal">O</mml:mi><mml:mn>3</mml:mn></mml:msub></mml:mrow></mml:math> thin films. Physical Review Materials, 2018, 2, .	0.9	5
96	Piezoelectric response enhancement in the proximity of grain boundaries of relaxor-ferroelectric thin films. Applied Physics Letters, 2016, 108, 242908.	1.5	4
97	Domains and Topological Defects in Layered Ferrielectric Materials: Implications for Nanoelectronics. ACS Applied Nano Materials, 2020, 3, 8161-8166.	2.4	4
98	Exploring electron beam induced atomic assembly via reinforcement learning in a molecular dynamics environment. Nanotechnology, 2021, , .	1.3	4
99	Correlation between piezoresponse nonlinearity and hysteresis in ferroelectric crystals at the nanoscale. Applied Physics Letters, 2016, 108, .	1.5	3
100	Polarization-dependent local conductivity and activation energy in KTiOPO4. Applied Physics Letters, 2019, 114, .	1.5	3
101	Selfâ€Assembled NiO Nanocrystal Arrays as Memristive Elements. Advanced Electronic Materials, 2020, 6, 1901153.	2.6	3
102	Propagation of priors for more accurate and efficient spectroscopic functional fits and their application to ferroelectric hysteresis. Machine Learning: Science and Technology, 2021, 2, 045002.	2.4	2
103	Reconstruction and uncertainty quantification of lattice Hamiltonian model parameters from observations of microscopic degrees of freedom. Journal of Applied Physics, 2020, 128, 214103.	1.1	2
104	Adapting Reinforcement Learning Treatment Policies Using Limited Data to Personalize Critical Care. INFORMS Journal on Data Science, 2022, 1, 27-49.	0.7	2
105	Bias assisted scanning probe microscopy direct write lithography enables local oxygen enrichment of lanthanum cuprates thin films. Nanotechnology, 2015, 26, 325302.	1.3	1
106	Thermodynamics of order and randomness in dopant distributions inferred from atomically resolved imaging. Npj Computational Materials, 2021, 7, .	3.5	1
107	Phase determination from atomically resolved images: physics-constrained deep data analysis through an unmixing approach. Microscopy and Microanalysis, 2016, 22, 1452-1453.	0.2	0