R K Vasudevan

List of Publications by Year
in descending order

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107 papers	3,970 citations	117453 34 h-index	128067 60 g-index
111 all docs	111 docs citations	111 times ranked	4671 citing authors

#	Article	IF	Citations
1	Anisotropic epitaxial stabilization of a low-symmetry ferroelectric with enhanced electromechanical response. Nature Materials, 2022, 21, 74-80.	13.3	35
2	Towards automating structural discovery in scanning transmission electron microscopy [*]. Machine Learning: Science and Technology, 2022, 3, 015024.	2.4	11
3	Adapting Reinforcement Learning Treatment Policies Using Limited Data to Personalize Critical Care. INFORMS Journal on Data Science, 2022, 1, 27-49.	0.7	2
4	Off-the-shelf deep learning is not enough, and requires parsimony, Bayesianity, and causality. Npj Computational Materials, 2021, 7, .	3.5	28
5	Enhancing hyperspectral EELS analysis of complex plasmonic nanostructures with pan-sharpening. Journal of Chemical Physics, 2021, 154, 014202.	1.2	5
6	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
7	Machine learning for materials design and discovery. Journal of Applied Physics, 2021, 129, .	1.1	41
8	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
9	Thermodynamics of order and randomness in dopant distributions inferred from atomically resolved imaging. Npj Computational Materials, 2021, 7, .	3.5	1
10	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
11	Strain-driven autonomous control of cation distribution for artificial ferroelectrics. Science Advances, 2021, 7, .	4.7	5
12	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
13	Probing atomic-scale symmetry breaking by rotationally invariant machine learning of multidimensional electron scattering. Npj Computational Materials, 2021, 7, .	3.5	15
14	Bayesian Learning of Adatom Interactions from Atomically Resolved Imaging Data. ACS Nano, 2021, 15, 9649-9657.	7.3	8
15	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
16	Automated and Autonomous Experiments in Electron and Scanning Probe Microscopy. ACS Nano, 2021, 15, 12604-12627.	7.3	49
17	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
18	Decoding the shift-invariant data: applications for band-excitation scanning probe microscopy [*]. Machine Learning: Science and Technology, 2021, 2, 045028.	2.4	5

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19	Gaussian process analysis of electron energy loss spectroscopy data: multivariate reconstruction and kernel control. Npj Computational Materials, 2021, 7, .	3.5	6
20	Probing polarization dynamics at specific domain configurations: Computer-vision based automated experiment in piezoresponse force microscopy. Applied Physics Letters, 2021, 119, .	1.5	5
21	Probing Metastable Domain Dynamics via Automated Experimentation in Piezoresponse Force Microscopy. ACS Nano, 2021, 15, 15096-15103.	7.3	6
22	Exploring electron beam induced atomic assembly via reinforcement learning in a molecular dynamics environment. Nanotechnology, 2021, , .	1.3	4
23	Deep Bayesian local crystallography. Npj Computational Materials, 2021, 7, .	3.5	15
24	Dynamic Manipulation in Piezoresponse Force Microscopy: Creating Nonequilibrium Phases with Large Electromechanical Response. ACS Nano, 2020, 14, 10569-10577.	7.3	14
25	Exploring phase transitions and magnetoelectric coupling of epitaxial asymmetric multilayer heterostructures. Journal of Materials Chemistry C, 2020, 8, 12113-12122.	2.7	8
26	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
27	Room temperature multiferroicity and magnetodielectric coupling in 0â€“3 composite thin films. Journal of Applied Physics, 2020, 127, .	1.1	16
28	Selfâ€Assembled NiO Nanocrystal Arrays as Memristive Elements. Advanced Electronic Materials, 2020, 6, 1901153.	2.6	3
29	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
30	Visualizing Charge Transport and Nanoscale Electrochemistry by Hyperspectral Kelvin Probe Force Microscopy. ACS Applied Materials & Interfaces, 2020, 12, 33361-33369.	4.0	10
31	Domains and Topological Defects in Layered Ferrielectric Materials: Implications for Nanoelectronics. ACS Applied Nano Materials, 2020, 3, 8161-8166.	2.4	4
32	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
33	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
34	Deep learning of interface structures from simulated 4D STEM data: cation intermixing vs. roughening ^{^{â^—}}. Machine Learning: Science and Technology, 2020, 1, 04LT01.	2.4	6
35	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><in thin films. Physical Review Materials, 2020, 4, .	0.9	26
36	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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37	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
38	Revealing ferroelectric switching character using deep recurrent neural networks. Nature Communications, 2019, 10, 4809.	5.8	34
39	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
40	Polarization-dependent local conductivity and activation energy in KTiOPO4. Applied Physics Letters, 2019, 114, .	1.5	3
41	Learning from Imperfections: Predicting Structure and Thermodynamics from Atomic Imaging of Fluctuations. ACS Nano, 2019, 13, 718-727.	7.3	24
42	Reconstructing phase diagrams from local measurements via Gaussian processes: mapping the temperature-composition space to confidence. Npj Computational Materials, 2018, 4, .	3.5	15
43	Ultrafast current imaging by Bayesian inversion. Nature Communications, 2018, 9, 513.	5.8	14
44	Machine learningâ€“enabled identification of material phase transitions based on experimental data: Exploring collective dynamics in ferroelectric relaxors. Science Advances, 2018, 4, eaap8672.	4.7	54
45	Data mining for better material synthesis: The case of pulsed laser deposition of complex oxides. Journal of Applied Physics, 2018, 123, .	1.1	29
46	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
47	Mapping mesoscopic phase evolution during E-beam induced transformations via deep learning of atomically resolved images. Npj Computational Materials, 2018, 4, .	3.5	31
48	Surface Chemistry Controls Anomalous Ferroelectric Behavior in Lithium Niobate. ACS Applied Materials & Interfaces, 2018, 10, 29153-29160.	4.0	20
49	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
50	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
51	Localised nanoscale resistive switching in GaP thin films with low power consumption. Journal of Materials Chemistry C, 2017, 5, 2153-2159.	2.7	7
52	Mixed electrochemicalâ€“ferroelectric states in nanoscale ferroelectrics. Nature Physics, 2017, 13, 812-818.	6.5	98
53	Ferroelectric or non-ferroelectric: Why so many materials exhibit â€œferroelectricityâ€•on the nanoscale. Applied Physics Reviews, 2017, 4, .	5.5	240
54	Direct Imaging of the Relaxation of Individual Ferroelectric Interfaces in a Tensileâ€Strained Film. Advanced Electronic Materials, 2017, 3, 1600508.	2.6	7

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55	Knowledge Extraction from Atomically Resolved Images. ACS Nano, 2017, 11, 10313-10320.	7.3	30
56	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
57	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
58	Nanoscale Probing of Elasticâ€“Electronic Response to Vacancy Motion in NiO Nanocrystals. ACS Nano, 2017, 11, 8387-8394.	7.3	9
59	Threeâ€Šstate Ferroelastic Switching and Large Electromechanical Responses in PbTiO₃ Thin Films. Advanced Materials, 2017, 29, 1702069.	11.1	74
60	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
61	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
62	Field enhancement of electronic conductance at ferroelectric domain walls. Nature Communications, 2017, 8, 1318.	5.8	32
63	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
64	Analysis of citation networks as a new tool for scientific research. MRS Bulletin, 2016, 41, 1009-1016.	1.7	8
65	Piezoelectric response enhancement in the proximity of grain boundaries of relaxor-ferroelectric thin films. Applied Physics Letters, 2016, 108, 242908.	1.5	4
66	Correlation between piezoresponse nonlinearity and hysteresis in ferroelectric crystals at the nanoscale. Applied Physics Letters, 2016, 108, .	1.5	3
67	Topological Structures in Multiferroics â€“ Domain Walls, Skyrmions and Vortices. Advanced Electronic Materials, 2016, 2, 1500292.	2.6	84
68	Solid-state electrochemistry on the nanometer and atomic scales: the scanning probe microscopy approach. Nanoscale, 2016, 8, 13838-13858.	2.8	27
69	Big, Deep, and Smart Data in Scanning Probe Microscopy. ACS Nano, 2016, 10, 9068-9086.	7.3	103
70	Phases and Interfaces from Real Space Atomically Resolved Data: Physics-Based Deep Data Image Analysis. Nano Letters, 2016, 16, 5574-5581.	4.5	40
71	Contradictory nature of Co doping in ferroelectricBaTiO3. Physical Review B, 2016, 94, .	1.1	8
72	Single-domain multiferroic BiFeO3 films. Nature Communications, 2016, 7, 12712.	5.8	92

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73	Acoustic Detection of Phase Transitions at the Nanoscale. Advanced Functional Materials, 2016, 26, 478-486.	7.8	28
74	Growth Mode Transition in Complex Oxide Heteroepitaxy: Atomically Resolved Studies. Crystal Growth and Design, 2016, 16, 2708-2716.	1.4	13
75	Highly mobile ferroelastic domain walls in compositionally graded ferroelectric thin films. Nature Materials, 2016, 15, 549-556.	13.3	98
76	A bridge for accelerating materials by design. Npj Computational Materials, 2015, 1, .	3.5	47
77	Multidimensional dynamic piezoresponse measurements: Unraveling local relaxation behavior in relaxor-ferroelectrics via big data. Journal of Applied Physics, 2015, 118, .	1.1	17
78	Atomic-scale electrochemistry on the surface of a manganite by scanning tunneling microscopy. Applied Physics Letters, 2015, 106, .	1.5	17
79	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
80	The Ehrlichâ€“Schwoebel barrier on an oxide surface: a combined Monte-Carlo andin situscanning tunneling microscopy approach. Nanotechnology, 2015, 26, 455705.	1.3	8
81	Electrocatalysis-induced elasticity modulation in a superionic proton conductor probed by band-excitation atomic force microscopy. Nanoscale, 2015, 7, 20089-20094.	2.8	5
82	Carrier density modulation in a germanium heterostructure by ferroelectric switching. Nature Communications, 2015, 6, 6067.	5.8	75
83	Surface Control of Epitaxial Manganite Films via Oxygen Pressure. ACS Nano, 2015, 9, 4316-4327.	7.3	27
84	Bias assisted scanning probe microscopy direct write lithography enables local oxygen enrichment of lanthanum cuprates thin films. Nanotechnology, 2015, 26, 325302.	1.3	1
85	Dimensionality Controlled Octahedral Symmetry-Mismatch and Functionalities in Epitaxial LaCoO₃/SrTiO₃ Heterostructures. Nano Letters, 2015, 15, 4677-4684.	4.5	71
86	Big data in reciprocal space: Sliding fast Fourier transforms for determining periodicity. Applied Physics Letters, 2015, 106, .	1.5	35
87	Mesoscopic harmonic mapping of electromechanical response in a relaxor ferroelectric. Applied Physics Letters, 2015, 106, 222901.	1.5	9
88	Giant elastic tunability in strained BiFeO3 near an electrically induced phase transition. Nature Communications, 2015, 6, 8985.	5.8	43
89	Effect of silver doping on the surface of La5/8Ca3/8MnO3 epitaxial films. Applied Physics Letters, 2014, 105, .	1.5	6
90	Scaling Behavior of Resistive Switching in Epitaxial Bismuth Ferrite Heterostructures. Advanced Functional Materials, 2014, 24, 3962-3969.	7.8	68

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91	Big-Data Reflection High Energy Electron Diffraction Analysis for Understanding Epitaxial Film Growth Processes. ACS Nano, 2014, 8, 10899-10908.	7.3	34
92	Deterministic arbitrary switching of polarization in a ferroelectric thin film. Nature Communications, 2014, 5, 4971.	5.8	35
93	Band Excitation in Scanning Probe Microscopy: Recognition and Functional Imaging. Annual Review of Physical Chemistry, 2014, 65, 519-536.	4.8	97
94	Domain Wall Conduction and Polarizationâ€Mediated Transport in Ferroelectrics. Advanced Functional Materials, 2013, 23, 2592-2616.	7.8	113
95	Polarization Dynamics in Ferroelectric Capacitors: Local Perspective on Emergent Collective Behavior and Memory Effects. Advanced Functional Materials, 2013, 23, 2490-2508.	7.8	22
96	Nanoscale Origins of Nonlinear Behavior in Ferroic Thin Films. Advanced Functional Materials, 2013, 23, 81-90.	7.8	20
97	Higher order harmonic detection for exploring nonlinear interactions with nanoscale resolution. Scientific Reports, 2013, 3, 2677.	1.6	17
98	Unraveling the origins of electromechanical response in mixed-phase bismuth ferrite. Physical Review B, 2013, 88, .	1.1	29
99	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
100	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
101	Domain Wall Geometry Controls Conduction in Ferroelectrics. Nano Letters, 2012, 12, 5524-5531.	4.5	125
102	Controlling magnetoelectric coupling by nanoscale phase transformation in strain engineered bismuth ferrite. Nanoscale, 2012, 4, 3175.	2.8	42
103	Enhanced electric conductivity at ferroelectric vortex cores in BiFeO3. Nature Physics, 2012, 8, 81-88.	6.5	324
104	Electrical Control of Multiferroic Orderings in Mixedâ€Phase BiFeO₃ Films. Advanced Materials, 2012, 24, 3070-3075.	11.1	53
105	Exploring Topological Defects in Epitaxial BiFeO₃ Thin Films. ACS Nano, 2011, 5, 879-887.	7.3	118
106	Nanoscale Control of Phase Variants in Strain-Engineered BiFeO₃. Nano Letters, 2011, 11, 3346-3354.	4.5	76
107	Ferroelectric and electrical characterization of multiferroic BiFeO3 at the single nanoparticle level. Applied Physics Letters, 2011, 99, 252905.	1.5	11