R K Vasudevan

List of Publications by Citations

102 papers	2,949 citations	29 h-index	51 g-index
111 ext. papers	3,510 ext. citations	9.8 avg, IF	5.18 L-index

#	Paper	IF	Citations
102	Enhanced electric conductivity at ferroelectric vortex cores in BiFeO3. *Nature Physics*, **2012**, 8, 81-88	16.2	271
101	Ferroelectric or non-ferroelectric: Why so many materials exhibit ferroelectricity on the nanoscale. *Applied Physics Reviews*, **2017**, 4, 021302	17.3	195
100	Deep Learning of Atomically Resolved Scanning Transmission Electron Microscopy Images: Chemical Identification and Tracking Local Transformations. *ACS Nano*, **2017**, 11, 12742-12752	16.7	183
99	Domain wall geometry controls conduction in ferroelectrics. *Nano Letters*, **2012**, 12, 5524-31	11.5	103
98	Exploring topological defects in epitaxial BiFeO3 thin films. *ACS Nano*, **2011**, 5, 879-87	16.7	102
97	Domain Wall Conduction and Polarization-Mediated Transport in Ferroelectrics. *Advanced Functional Materials*, **2013**, 23, 2592-2616	15.6	96
96	Band excitation in scanning probe microscopy: recognition and functional imaging. *Annual Review of Physical Chemistry*, **2014**, 65, 519-36	15.7	88
95	Highly mobile ferroelastic domain walls in compositionally graded ferroelectric thin films. *Nature Materials*, **2016**, 15, 549-56	27	85
94	Big, Deep, and Smart Data in Scanning Probe Microscopy. *ACS Nano*, **2016**, 10, 9068-9086	16.7	79
93	Single-domain multiferroic BiFeO3 films. *Nature Communications*, **2016**, 7, 12712	17.4	74
92	Mixed electrochemical ferroelectric states in nanoscale ferroelectrics. *Nature Physics*, **2017**, 13, 812-818	16.2	72
91	Nanoscale control of phase variants in strain-engineered BiFeO. *Nano Letters*, **2011**, 11, 3346-54	11.5	70
90	Topological Structures in Multiferroics Domain Walls, Skyrmions and Vortices. *Advanced Electronic Materials*, **2016**, 2, 1500292	6.4	66
89	Carrier density modulation in a germanium heterostructure by ferroelectric switching. *Nature Communications*, **2015**, 6, 6067	17.4	64
88	Big data and deep data in scanning and electron microscopies: deriving functionality from multidimensional data sets. *Advanced Structural and Chemical Imaging*, **2015**, 1, 6	3.9	63
87	Dimensionality Controlled Octahedral Symmetry-Mismatch and Functionalities in Epitaxial LaCoO/SrTiO Heterostructures. *Nano Letters*, **2015**, 15, 4677-84	11.5	58
86	Materials Science in the AI age: high-throughput library generation, machine learning and a pathway from correlations to the underpinning physics. *MRS Communications*, **2019**, 9, 821	2.7	56

85	Scaling Behavior of Resistive Switching in Epitaxial Bismuth Ferrite Heterostructures. *Advanced Functional Materials*, **2014**, 24, 3962-3969	15.6	56
84	Three-State Ferroelastic Switching and Large Electromechanical Responses in PbTiO Thin Films. *Advanced Materials*, **2017**, 29, 1702069	24	53
83	Anisotropic conductivity of uncharged domain walls in BiFeO3. *Physical Review B*, **2012**, 86,	3.3	53
82	Electrical control of multiferroic orderings in mixed-phase BiFeO films. *Advanced Materials*, **2012**, 24, 3070-5	24	49
81	Building and exploring libraries of atomic defects in graphene: Scanning transmission electron and scanning tunneling microscopy study. *Science Advances*, **2019**, 5, eaaw8989	14.3	41
80	Machine learning-enabled identification of material phase transitions based on experimental data: Exploring collective dynamics in ferroelectric relaxors. *Science Advances*, **2018**, 4, eaap8672	14.3	37
79	Giant elastic tunability in strained BiFeO3 near an electrically induced phase transition. *Nature Communications*, **2015**, 6, 8985	17.4	35
78	Controlling magnetoelectric coupling by nanoscale phase transformation in strain engineered bismuth ferrite. *Nanoscale*, **2012**, 4, 3175-83	7.7	34
77	Spectroscopic imaging in piezoresponse force microscopy: New opportunities for studying polarization dynamics in ferroelectrics and multiferroics. *MRS Communications*, **2012**, 2, 61-73	2.7	34
76	A bridge for accelerating materials by design. *Npj Computational Materials*, **2015**, 1,	10.9	33
75	Deterministic arbitrary switching of polarization in a ferroelectric thin film. *Nature Communications*, **2014**, 5, 4971	17.4	31
74	Big data in reciprocal space: Sliding fast Fourier transforms for determining periodicity. *Applied Physics Letters*, **2015**, 106, 091601	3.4	29
73	Unraveling the origins of electromechanical response in mixed-phase bismuth ferrite. *Physical Review B*, **2013**, 88,	3.3	28
72	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	3.9	27
71	Surface Control of Epitaxial Manganite Films via Oxygen Pressure. *ACS Nano*, **2015**, 9, 4316-27	16.7	26
70	Phases and Interfaces from Real Space Atomically Resolved Data: Physics-Based Deep Data Image Analysis. *Nano Letters*, **2016**, 16, 5574-81	11.5	26
69	Acoustic Detection of Phase Transitions at the Nanoscale. *Advanced Functional Materials*, **2016**, 26, 478-486	15.6	25
68	Knowledge Extraction from Atomically Resolved Images. *ACS Nano*, **2017**, 11, 10313-10320	16.7	24

67	Mapping mesoscopic phase evolution during E-beam induced transformations via deep learning of atomically resolved images. *Npj Computational Materials*, **2018**, 4,	10.9	24
66	Big-data reflection high energy electron diffraction analysis for understanding epitaxial film growth processes. *ACS Nano*, **2014**, 8, 10899-908	16.7	22
65	Field enhancement of electronic conductance at ferroelectric domain walls. *Nature Communications* , **2017**, 8, 1318	17.4	22
64	Solid-state electrochemistry on the nanometer and atomic scales: the scanning probe microscopy approach. *Nanoscale*, **2016**, 8, 13838-58	7.7	22
63	Revealing ferroelectric switching character using deep recurrent neural networks. *Nature Communications*, **2019**, 10, 4809	17.4	21
62	Polarization Dynamics in Ferroelectric Capacitors: Local Perspective on Emergent Collective Behavior and Memory Effects. *Advanced Functional Materials*, **2013**, 23, 2490-2508	15.6	21
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,	3.3	20
60	Learning from Imperfections: Predicting Structure and Thermodynamics from Atomic Imaging of Fluctuations. *ACS Nano*, **2019**, 13, 718-727	16.7	19
59	Data mining for better material synthesis: The case of pulsed laser deposition of complex oxides. *Journal of Applied Physics*, **2018**, 123, 115303	2.5	18
58	Nanoscale Origins of Nonlinear Behavior in Ferroic Thin Films. *Advanced Functional Materials*, **2013**, 23, 81-90	15.6	18
57	Thickness and strain dependence of piezoelectric coefficient in BaTiO3 thin films. *Physical Review Materials*, **2020**, 4,	3.2	18
56	Multidimensional dynamic piezoresponse measurements: Unraveling local relaxation behavior in relaxor-ferroelectrics via big data. *Journal of Applied Physics*, **2015**, 118, 072003	2.5	15
55	Higher order harmonic detection for exploring nonlinear interactions with nanoscale resolution. *Scientific Reports*, **2013**, 3, 2677	4.9	15
54	Machine Detection of Enhanced Electromechanical Energy Conversion in PbZr Ti O Thin Films. *Advanced Materials*, **2018**, 30, e1800701	24	14
53	Ultrafast current imaging by Bayesian inversion. *Nature Communications*, **2018**, 9, 513	17.4	13
52	Surface Chemistry Controls Anomalous Ferroelectric Behavior in Lithium Niobate. *ACS Applied Materials & Interfaces*, **2018**, 10, 29153-29160	9.5	13
51	Building ferroelectric from the bottom up: The machine learning analysis of the atomic-scale ferroelectric distortions. *Applied Physics Letters*, **2019**, 115, 052902	3.4	13
50	Consistent Integration of Experimental and Ab Initio Data into Effective Physical Models. *Journal of Chemical Theory and Computation*, **2017**, 13, 5179-5194	6.4	13

49	Growth Mode Transition in Complex Oxide Heteroepitaxy: Atomically Resolved Studies. *Crystal Growth and Design*, **2016**, 16, 2708-2716	3.5	12
48	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	2.5	12
47	Atomic-scale electrochemistry on the surface of a manganite by scanning tunneling microscopy. *Applied Physics Letters*, **2015**, 106, 143107	3.4	12
46	Reconstructing phase diagrams from local measurements via Gaussian processes: mapping the temperature-composition space to confidence. *Npj Computational Materials*, **2018**, 4,	10.9	11
45	Automated and Autonomous Experiments in Electron and Scanning Probe Microscopy. *ACS Nano*, **2021**,	16.7	11
44	Room temperature multiferroicity and magnetodielectric coupling in 0□ composite thin films. *Journal of Applied Physics*, **2020**, 127, 194104	2.5	10
43	Anisotropic epitaxial stabilization of a low-symmetry ferroelectric with enhanced electromechanical response. *Nature Materials*, **2021**,	27	10
42	Ferroelectric and electrical characterization of multiferroic BiFeO3 at the single nanoparticle level. *Applied Physics Letters*, **2011**, 99, 252905	3.4	9
41	Mesoscopic harmonic mapping of electromechanical response in a relaxor ferroelectric. *Applied Physics Letters*, **2015**, 106, 222901	3.4	8
40	Autonomous Experiments in Scanning Probe Microscopy and Spectroscopy: Choosing Where to Explore Polarization Dynamics in Ferroelectrics. *ACS Nano*, **2021**,	16.7	8
39	Direct Imaging of the Relaxation of Individual Ferroelectric Interfaces in a Tensile-Strained Film. *Advanced Electronic Materials*, **2017**, 3, 1600508	6.4	7
38	Contradictory nature of Co doping in ferroelectric BaTiO3. *Physical Review B*, **2016**, 94,	3.3	7
37	Nanoscale Probing of Elastic-Electronic Response to Vacancy Motion in NiO Nanocrystals. *ACS Nano* , **2017**, 11, 8387-8394	16.7	7
36	Dynamic Manipulation in Piezoresponse Force Microscopy: Creating Nonequilibrium Phases with Large Electromechanical Response. *ACS Nano*, **2020**, 14, 10569-10577	16.7	7
35	Separating Physically Distinct Mechanisms in Complex Infrared Plasmonic Nanostructures via Machine Learning Enhanced Electron Energy Loss Spectroscopy. *Advanced Optical Materials*, **2021**, 9, 2001808	8.1	7
34	Effect of silver doping on the surface of La5/8Ca3/8MnO3 epitaxial films. *Applied Physics Letters*, **2014**, 105, 101602	3.4	6
33	Probing atomic-scale symmetry breaking by rotationally invariant machine learning of multidimensional electron scattering. *Npj Computational Materials*, **2021**, 7,	10.9	6
32	Analysis of citation networks as a new tool for scientific research. *MRS Bulletin*, **2016**, 41, 1009-1016	3.2	6

31	Localised nanoscale resistive switching in GaP thin films with low power consumption. *Journal of Materials Chemistry C*, **2017**, 5, 2153-2159	7.1	5
30	Visualizing Charge Transport and Nanoscale Electrochemistry by Hyperspectral Kelvin Probe Force Microscopy. *ACS Applied Materials & Interfaces*, **2020**, 12, 33361-33369	9.5	5
29	The Ehrlich-Schwoebel barrier on an oxide surface: a combined Monte-Carlo and in situ scanning tunneling microscopy approach. *Nanotechnology*, **2015**, 26, 455705	3.4	5
28	Electrocatalysis-induced elasticity modulation in a superionic proton conductor probed by band-excitation atomic force microscopy. *Nanoscale*, **2015**, 7, 20089-94	7.7	5
27	Deep Bayesian local crystallography. *Npj Computational Materials*, **2021**, 7,	10.9	5
26	Guided search for desired functional responses via Bayesian optimization of generative model: Hysteresis loop shape engineering in ferroelectrics. *Journal of Applied Physics*, **2020**, 128, 024102	2.5	4
25	Electronic switching by metastable polarization states in BiFeO3 thin films. *Physical Review Materials*, **2018**, 2,	3.2	4
24	Exploration of lattice Hamiltonians for functional and structural discovery via Gaussian process-based exploration□exploitation. *Journal of Applied Physics*, **2020**, 128, 164304	2.5	4
23	Exploring phase transitions and magnetoelectric coupling of epitaxial asymmetric multilayer heterostructures. *Journal of Materials Chemistry C*, **2020**, 8, 12113-12122	7.1	4
22	Bayesian inference in band excitation scanning probe microscopy for optimal dynamic model selection in imaging. *Journal of Applied Physics*, **2020**, 128, 054105	2.5	4
21	Off-the-shelf deep learning is not enough, and requires parsimony, Bayesianity, and causality. *Npj Computational Materials*, **2021**, 7,	10.9	4
20	Polarization-dependent local conductivity and activation energy in KTiOPO4. *Applied Physics Letters* , **2019**, 114, 192901	3.4	3
19	Deep learning of interface structures from simulated 4D STEM data: cation intermixing vs. roughening. *Machine Learning: Science and Technology*, **2020**, 1, 04LT01	5.1	3
18	Piezoelectric response enhancement in the proximity of grain boundaries of relaxor-ferroelectric thin films. *Applied Physics Letters*, **2016**, 108, 242908	3.4	3
17	Exotic Long-Range Surface Reconstruction on LaSrMnO Thin Films. *ACS Applied Materials & Interfaces*, **2021**, 13, 9166-9173	9.5	3
16	Probing polarization dynamics at specific domain configurations: Computer-vision based automated experiment in piezoresponse force microscopy. *Applied Physics Letters*, **2021**, 119, 132902	3.4	3
15	Self-Assembled NiO Nanocrystal Arrays as Memristive Elements. *Advanced Electronic Materials*, **2020**, 6, 1901153	6.4	2
14	Domains and Topological Defects in Layered Ferrielectric Materials: Implications for Nanoelectronics. *ACS Applied Nano Materials*, **2020**, 3, 8161-8166	5.6	2

13	Strain-driven autonomous control of cation distribution for artificial ferroelectrics. *Science Advances*, **2021**, 7,	14.3	2
12	Bayesian Learning of Adatom Interactions from Atomically Resolved Imaging Data. *ACS Nano*, **2021**, 15, 9649-9657	16.7	2
11	Correlation between piezoresponse nonlinearity and hysteresis in ferroelectric crystals at the nanoscale. *Applied Physics Letters*, **2016**, 108, 172905	3.4	2
10	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, 011403	17.3	2
9	Gaussian process analysis of electron energy loss spectroscopy data: multivariate reconstruction and kernel control. *Npj Computational Materials*, **2021**, 7,	10.9	2
8	Probing Metastable Domain Dynamics Automated Experimentation in Piezoresponse Force Microscopy. *ACS Nano*, **2021**, 15, 15096-15103	16.7	2
7	Bias assisted scanning probe microscopy direct write lithography enables local oxygen enrichment of lanthanum cuprates thin films. *Nanotechnology*, **2015**, 26, 325302	3.4	1
6	Reconstruction and uncertainty quantification of lattice Hamiltonian model parameters from observations of microscopic degrees of freedom. *Journal of Applied Physics*, **2020**, 128, 214103	2.5	1
5	Thermodynamics of order and randomness in dopant distributions inferred from atomically resolved imaging. *Npj Computational Materials*, **2021**, 7,	10.9	1
4	Investigating phase transitions from local crystallographic analysis based on statistical learning of atomic environments in 2D MoS2-ReS2. *Applied Physics Reviews*, **2021**, 8, 011409	17.3	1
3	Enhancing hyperspectral EELS analysis of complex plasmonic nanostructures with pan-sharpening. *Journal of Chemical Physics*, **2021**, 154, 014202	3.9	1
2	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	5.1	0
1	Phase determination from atomically resolved images: physics-constrained deep data analysis through an unmixing approach. *Microscopy and Microanalysis*, **2016**, 22, 1452-1453	0.5	