

Stephan Menzel

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150
papers

3,913
citations

33
h-index

58
g-index

170
ext. papers

4,839
ext. citations

5.7
avg. IF

5.75
L-index

#	Paper	IF	Citations
150	Origin of the Ultra-nonlinear Switching Kinetics in Oxide-Based Resistive Switches. <i>Advanced Functional Materials</i> , 2011 , 21, 4487-4492	15.6	267
149	Understanding the switching-off mechanism in Ag ⁺ migration based resistively switching model systems. <i>Applied Physics Letters</i> , 2007 , 91, 133513	3.4	193
148	Physics of the Switching Kinetics in Resistive Memories. <i>Advanced Functional Materials</i> , 2015 , 25, 6306-6335	6.3	187
147	Towards Oxide Electronics: a Roadmap. <i>Applied Surface Science</i> , 2019 , 482, 1-93	6.7	160
146	Evidence for oxygen vacancies movement during wake-up in ferroelectric hafnium oxide. <i>Applied Physics Letters</i> , 2016 , 108, 032903	3.4	142
145	Anomalous Resistance Hysteresis in Oxide ReRAM: Oxygen Evolution and Reincorporation Revealed by In Situ TEM. <i>Advanced Materials</i> , 2017 , 29, 1700212	24	129
144	Simulation of multilevel switching in electrochemical metallization memory cells. <i>Journal of Applied Physics</i> , 2012 , 111, 014501	2.5	129
143	Switching kinetics of electrochemical metallization memory cells. <i>Physical Chemistry Chemical Physics</i> , 2013 , 15, 6945-52	3.6	126
142	Nanoionic Resistive Switching Memories: On the Physical Nature of the Dynamic Reset Process. <i>Advanced Electronic Materials</i> , 2016 , 2, 1500233	6.4	110
141	Realization of Boolean Logic Functionality Using Redox-Based Memristive Devices. <i>Advanced Functional Materials</i> , 2015 , 25, 6414-6423	15.6	109
140	Impact of oxygen exchange reaction at the ohmic interface in TaO-based ReRAM devices. <i>Nanoscale</i> , 2016 , 8, 17774-17781	7.7	92
139	A Complementary Resistive Switch-Based Crossbar Array Adder. <i>IEEE Journal on Emerging and Selected Topics in Circuits and Systems</i> , 2015 , 5, 64-74	5.2	75
138	Spectroscopic proof of the correlation between redox-state and charge-carrier transport at the interface of resistively switching Ti/PCMO devices. <i>Advanced Materials</i> , 2014 , 26, 2730-5	24	73
137	Multidimensional Simulation of Threshold Switching in NbO ₂ Based on an Electric Field Triggered Thermal Runaway Model. <i>Advanced Electronic Materials</i> , 2016 , 2, 1600169	6.4	73
136	Quantifying redox-induced Schottky barrier variations in memristive devices via in operando spectromicroscopy with graphene electrodes. <i>Nature Communications</i> , 2016 , 7, 12398	17.4	68
135	Understanding filamentary growth in electrochemical metallization memory cells using kinetic Monte Carlo simulations. <i>Nanoscale</i> , 2015 , 7, 12673-81	7.7	66
134	Applicability of Well-Established Memristive Models for Simulations of Resistive Switching Devices. <i>IEEE Transactions on Circuits and Systems I: Regular Papers</i> , 2014 , 61, 2402-2410	3.9	66

133	Redox processes in silicon dioxide thin films using copper microelectrodes. <i>Applied Physics Letters</i> , 2011 , 99, 203103	3.4	61
132	Subfilamentary Networks Cause Cycle-to-Cycle Variability in Memristive Devices. <i>ACS Nano</i> , 2017 , 11, 6921-6929	16.7	55
131	Improved Switching Stability and the Effect of an Internal Series Resistor in HfO ₂ /TiO _x Bilayer ReRAM Cells. <i>IEEE Transactions on Electron Devices</i> , 2018 , 65, 3229-3236	2.9	53
130	Memory Devices: Energy-Space-Time Tradeoffs. <i>Proceedings of the IEEE</i> , 2010 , 98, 2185-2200	14.3	45
129	Understanding the Coexistence of Two Bipolar Resistive Switching Modes with Opposite Polarity in Pt/TiO/Ti/Pt Nanosized ReRAM Devices. <i>ACS Applied Materials & Interfaces</i> , 2018 , 10, 29766-29778	9.5	44
128	3-Bit Multilevel Switching by Deep Reset Phenomenon in Pt/W/TaOX/Pt-ReRAM Devices. <i>IEEE Electron Device Letters</i> , 2016 , 37, 564-567	4.4	43
127	Insights into Nanoscale Electrochemical Reduction in a Memristive Oxide: the Role of Three-Phase Boundaries. <i>Advanced Functional Materials</i> , 2014 , 24, 4466-4472	15.6	43
126	A HfO ₂ -Based Complementary Switching Crossbar Adder. <i>Advanced Electronic Materials</i> , 2015 , 1, 15001384	3.4	43
125	Uniting Gradual and Abrupt set Processes in Resistive Switching Oxides. <i>Physical Review Applied</i> , 2016 , 6,	4.3	43
124	Origin of the SET Kinetics of the Resistive Switching in Tantalum Oxide Thin Films. <i>IEEE Electron Device Letters</i> , 2014 , 35, 259-261	4.4	42
123	Oxygen Exchange Processes between Oxide Memristive Devices and Water Molecules. <i>Advanced Materials</i> , 2018 , 30, e1800957	24	41
122	Analysis of Transient Currents During Ultrafast Switching of TiO_2 Nanocrossbar Devices. <i>IEEE Electron Device Letters</i> , 2011 , 32, 1116-1118	4.4	40
121	SET kinetics of electrochemical metallization cells: influence of counter-electrodes in SiO/Ag based systems. <i>Nanotechnology</i> , 2017 , 28, 135205	3.4	37
120	Pulse wake-up and breakdown investigation of ferroelectric yttrium doped HfO ₂ . <i>Journal of Applied Physics</i> , 2017 , 121, 154102	2.5	37
119	Exploiting the switching dynamics of HfO ₂ -based ReRAM devices for reliable analog memristive behavior. <i>APL Materials</i> , 2019 , 7, 091105	5.7	37
118	Standards for the Characterization of Endurance in Resistive Switching Devices. <i>ACS Nano</i> , 2021 ,	16.7	36
117	Analytical analysis of the generic SET and RESET characteristics of electrochemical metallization memory cells. <i>Nanoscale</i> , 2013 , 5, 11003-10	7.7	32
116	Stateful Three-Input Logic with Memristive Switches. <i>Scientific Reports</i> , 2019 , 9, 14618	4.9	31

115	Modeling of Quantized Conductance Effects in Electrochemical Metallization Cells. <i>IEEE Nanotechnology Magazine</i> , 2015 , 14, 505-512	2.6	30
114	Compact modeling of CRS devices based on ECM cells for memory, logic and neuromorphic applications. <i>Nanotechnology</i> , 2013 , 24, 384008	3.4	29
113	The ultimate switching speed limit of redox-based resistive switching devices. <i>Faraday Discussions</i> , 2019 , 213, 197-213	3.6	27
112	Experimental Demonstration of Memristor-Aided Logic (MAGIC) Using Valence Change Memory (VCM). <i>IEEE Transactions on Electron Devices</i> , 2020 , 67, 3115-3122	2.9	26
111	Investigation of the Impact of High Temperatures on the Switching Kinetics of Redox-Based Resistive Switching Cells using a High-Speed Nanoheater. <i>Advanced Electronic Materials</i> , 2017 , 3, 1700294	6.4	26
110	Determination of the electrostatic potential distribution in Pt/Fe:SrTiO ₃ /Nb:SrTiO ₃ thin-film structures by electron holography. <i>Scientific Reports</i> , 2014 , 4, 6975	4.9	24
109	A Theoretical and Experimental View on the Temperature Dependence of the Electronic Conduction through a Schottky Barrier in a Resistively Switching SrTiO ₃ -Based Memory Cell. <i>Advanced Electronic Materials</i> , 2018 , 4, 1800062	6.4	24
108	A new test facility for efficient evaluation of MEMS contact materials. <i>Journal of Micromechanics and Microengineering</i> , 2007 , 17, 1788-1795	2	24
107	2022 roadmap on neuromorphic computing and engineering. <i>Neuromorphic Computing and Engineering</i> ,		24
106	Avalanche-Discharge-Induced Electrical Forming in Tantalum Oxide-Based Metal/Insulator/Metal Structures. <i>Advanced Functional Materials</i> , 2015 , 25, 7154-7162	15.6	23
105	Field-enhanced route to generating anti-Frenkel pairs in HfO ₂ . <i>Physical Review Materials</i> , 2018 , 2,	3.2	23
104	Compact Modeling of Complementary Switching in Oxide-Based ReRAM Devices. <i>IEEE Transactions on Electron Devices</i> , 2019 , 66, 1268-1275	2.9	22
103	Effect of RESET Voltage on Distribution of SET Switching Time of Bipolar Resistive Switching in a Tantalum Oxide Thin Film. <i>IEEE Transactions on Electron Devices</i> , 2015 , 62, 1561-1567	2.9	21
102	A Simulation Model of Resistive Switching in Electrochemical Metallization Memory Cells (ECM). <i>Materials Research Society Symposia Proceedings</i> , 2009 , 1160, 1		21
101	Spectroscopic Indications of Tunnel Barrier Charging as the Switching Mechanism in Memristive Devices. <i>Advanced Functional Materials</i> , 2017 , 27, 1702282	15.6	20
100	Simulation of TaOx-based complementary resistive switches by a physics-based memristive model 2014 ,		20
99	In-Gap States and Band-Like Transport in Memristive Devices. <i>Nano Letters</i> , 2019 , 19, 54-60	11.5	19
98	Physical simulation of dynamic resistive switching in metal oxides using a Schottky contact barrier model 2015 ,		18

97	Processes and Limitations during Filament Formation and Dissolution in GeSx-based ReRAM Memory Cells. <i>Journal of Physical Chemistry C</i> , 2015 , 119, 18678-18685	3.8	18
96	3-bit Resistive RAM Write-Read Scheme Based on Complementary Switching Mechanism. <i>IEEE Electron Device Letters</i> , 2017 , 38, 449-452	4.4	17
95	Introduction to new memory paradigms: memristive phenomena and neuromorphic applications. <i>Faraday Discussions</i> , 2019 , 213, 11-27	3.6	17
94	Low-current operations in 4F(2)-compatible Ta2O5-based complementary resistive switches. <i>Nanotechnology</i> , 2015 , 26, 415202	3.4	17
93	Role of the Electrode Material on the RESET Limitation in Oxide ReRAM Devices. <i>Advanced Electronic Materials</i> , 2018 , 4, 1700243	6.4	17
92	Interrelation of Sweep and Pulse Analysis of the SET Process in SrTiO3 Resistive Switching Memories. <i>IEEE Electron Device Letters</i> , 2014 , 35, 924-926	4.4	17
91	Variability-Aware Modeling of Filamentary Oxide-Based Bipolar Resistive Switching Cells Using SPICE Level Compact Models. <i>IEEE Transactions on Circuits and Systems I: Regular Papers</i> , 2020 , 67, 4618-4630	2.9	17
90	Field-Driven Hopping Transport of Oxygen Vacancies in Memristive Oxide Switches with Interface-Mediated Resistive Switching. <i>Physical Review Applied</i> , 2018 , 10,	4.3	17
89	Comprehensive modeling of electrochemical metallization memory cells. <i>Journal of Computational Electronics</i> , 2017 , 16, 1017-1037	1.8	15
88	Picosecond multilevel resistive switching in tantalum oxide thin films. <i>Scientific Reports</i> , 2020 , 10, 16391	4.9	15
87	Current channeling along extended defects during electroreduction of SrTiO. <i>Scientific Reports</i> , 2019 , 9, 2502	4.9	14
86	Simulation and comparison of two sequential logic-in-memory approaches using a dynamic electrochemical metallization cell model. <i>Microelectronics Journal</i> , 2014 , 45, 1416-1428	1.8	14
85	On the universality of the I-V switching characteristics in non-volatile and volatile resistive switching oxides. <i>Faraday Discussions</i> , 2019 , 213, 183-196	3.6	13
84	HRS Instability in Oxide-Based Bipolar Resistive Switching Cells. <i>IEEE Transactions on Electron Devices</i> , 2020 , 67, 4208-4215	2.9	13
83	Dependence of the SET switching variability on the initial state in HfOx-based ReRAM. <i>Physica Status Solidi (A) Applications and Materials Science</i> , 2016 , 213, 316-319	1.6	13
82	KMC Simulation of the Electroforming, Set and Reset Processes in Redox-Based Resistive Switching Devices. <i>IEEE Nanotechnology Magazine</i> , 2018 , 17, 1181-1188	2.6	13
81	Memristive Device Modeling and Circuit Design Exploration for Computation-in-Memory 2019 ,		12
80	In-memory adder functionality in 1S1R arrays 2015 ,		12

79	On the SET/RESET current asymmetry in electrochemical metallization memory cells. <i>Physica Status Solidi - Rapid Research Letters</i> , 2014 , 8, 540-544	2.5	12
78	Impact of the Ohmic Electrode on the Endurance of Oxide-Based Resistive Switching Memory. <i>IEEE Transactions on Electron Devices</i> , 2021 , 68, 1024-1030	2.9	12
77	Correlation between the transport mechanisms in conductive filaments inside Ta ₂ O ₅ -based resistive switching devices and in substoichiometric TaO _x thin films. <i>Applied Physics Letters</i> , 2018 , 112, 213504	3.4	12
76	Nonlinearity analysis of TaOX redox-based RRAM. <i>Microelectronic Engineering</i> , 2016 , 154, 38-41	2.5	11
75	Metallic filamentary conduction in valence change-based resistive switching devices: the case of TaO thin film with $x \sim 1$. <i>Nanoscale</i> , 2019 , 11, 16978-16990	7.7	10
74	A 2D axisymmetric dynamic drift-diffusion model for numerical simulation of resistive switching phenomena in metal oxides 2016 ,		10
73	Exploring the Dynamics of Real-World Memristors on the Basis of Circuit Theoretic Model Predictions. <i>IEEE Circuits and Systems Magazine</i> , 2018 , 18, 48-76	3.2	10
72	Sklansky tree adder realization in 1S1R resistive switching memory architecture. <i>European Physical Journal: Special Topics</i> , 2019 , 228, 2269-2285	2.3	10
71	Trade-Off Between Data Retention and Switching Speed in Resistive Switching ReRAM Devices. <i>Advanced Electronic Materials</i> , 2021 , 7, 2000815	6.4	10
70	Critical ReRAM Stack Parameters Controlling Complimentary versus Bipolar Resistive Switching 2015 ,		9
69	Simulation of polarity independent RESET in electrochemical metallization memory cells 2013 ,		9
68	Modeling Complementary Resistive Switches by nonlinear memristive systems 2011 ,		9
67	Comprehensive Model of Electron Conduction in Oxide-Based Memristive Devices. <i>ACS Applied Electronic Materials</i> , 2021 , 3, 3674-3692	4	9
66	Study of the SET switching event of VCM-based memories on a picosecond timescale. <i>Journal of Applied Physics</i> , 2020 , 127, 204501	2.5	8
65	Internal Cell Resistance as the Origin of Abrupt Reset Behavior in HfO ₂ -Based Devices Determined from Current Compliance Series 2016 ,		8
64	Requirements and Challenges for Modelling Redox-based Memristive Devices 2018 ,		8
63	Volatile HRS asymmetry and subloops in resistive switching oxides. <i>Nanoscale</i> , 2017 , 9, 14414-14422	7.7	8
62	Physical modeling of the electroforming process in resistive-switching devices 2017 ,		8

61	(Keynote) Atomic Scale and Interface Interactions in Redox-Based Resistive Switching Memories. <i>ECS Transactions</i> , 2014 , 64, 3-18	1	8
60	Utilizing the Switching Stochasticity of HfO/TiO-Based ReRAM Devices and the Concept of Multiple Device Synapses for the Classification of Overlapping and Noisy Patterns. <i>Frontiers in Neuroscience</i> , 2021 , 15, 661856	5.1	8
59	The influence of non-stoichiometry on the switching kinetics of strontium-titanate ReRAM devices. <i>Journal of Applied Physics</i> , 2016 , 120, 244502	2.5	8
58	Forming-free metal-oxide ReRAM by oxygen ion implantation process 2016 ,		8
57	Crossover From Deterministic to Stochastic Nature of Resistive-Switching Statistics in a Tantalum Oxide Thin Film. <i>IEEE Transactions on Electron Devices</i> , 2018 , 65, 4320-4325	2.9	8
56	Effect of the Threshold Kinetics on the Filament Relaxation Behavior of Ag-Based Diffusive Memristors. <i>Advanced Functional Materials</i> , 2111242	15.6	8
55	An atomistic view on the Schottky barrier lowering applied to SrTiO ₃ /Pt contacts. <i>AIP Advances</i> , 2019 , 9, 045116	1.5	7
54	The role of the interface reactions in the electroforming of redox-based resistive switching devices using KMC simulations 2015 ,		7
53	Design rules for threshold switches based on a field triggered thermal runaway mechanism. <i>Journal of Computational Electronics</i> , 2017 , 16, 1175-1185	1.8	7
52	Comprehensive model for the electronic transport in Pt/SrTiO ₃ analog memristive devices. <i>Physical Review B</i> , 2020 , 102,	3.3	7
51	Study of Memristive Associative Capacitive Networks for CAM Applications. <i>IEEE Journal on Emerging and Selected Topics in Circuits and Systems</i> , 2015 , 5, 153-161	5.2	6
50	Recent progress in redox-based resistive switching 2012 ,		6
49	Ultrafast switching in Ta ₂ O ₅ -based resistive memories 2016 ,		6
48	Mechanism of memristive switching in OxRAM 2019 , 137-170		5
47	Effect of Cationic Interface Defects on Band Alignment and Contact Resistance in Metal/Oxide Heterojunctions. <i>Advanced Electronic Materials</i> , 2020 , 6, 1900808	6.4	5
46	2018 ,		5
45	Analyses of a 1-layer neuromorphic network using memristive devices with non-continuous resistance levels. <i>APL Materials</i> , 2019 , 7, 091110	5.7	4
44	Spectroscopic elucidation of ionic motion processes in tunnel oxide-based memristive devices. <i>Faraday Discussions</i> , 2019 , 213, 215-230	3.6	4

43	Statistical Modeling and Understanding of HRS Retention in 2.5 Mb HfO ₂ based ReRAM 2020 ,		4
42	Studying the switching variability in redox-based resistive switching devices. <i>Journal of Computational Electronics</i> , 2020 , 19, 1426-1432	1.8	4
41	Energy dissipation during pulsed switching of strontium-titanate based resistive switching memory devices 2016 ,		4
40	SET and RESET Kinetics of SrTiO ₃ -based Resistive Memory Devices. <i>Materials Research Society Symposia Proceedings</i> , 2015 , 1790, 7-12		4
39	Statistical modeling of electrochemical metallization memory cells 2014 ,		4
38	Energy-efficient redox-based non-volatile memory devices and logic circuits 2013 ,		4
37	Dynamics of the spatial separation of electrons and mobile oxygen vacancies in oxide heterostructures. <i>Physical Review Materials</i> , 2020 , 4,	3.2	4
36	Theory and experimental verification of configurable computing with stochastic memristors. <i>Scientific Reports</i> , 2021 , 11, 4218	4.9	4
35	KMC simulation of the electroforming, set and reset processes in redox-based resistive switching devices 2016 ,		3
34	Simulation of threshold switching based on an electric field induced thermal runaway 2016 ,		3
33	Redox-based Resistive Memory 2014 , 137-161		3
32	Random telegraph noise analysis in redox-based resistive switching devices using KMC simulations 2017 ,		3
31	In-Memory Binary Vector Matrix Multiplication Based on Complementary Resistive Switches. <i>Advanced Intelligent Systems</i> , 2020 , 2, 2000134	6	3
30	Towards Simplified Physics-based Memristor Modeling of Valence Change Mechanism Devices. <i>IEEE Transactions on Circuits and Systems II: Express Briefs</i> , 2022 , 1-1	3.5	3
29	Chemical Structure of Conductive Filaments in Tantalum Oxide Memristive Devices and Its Implications for the Formation Mechanism. <i>Advanced Electronic Materials</i> , 2100936	6.4	3
28	Intrinsic RESET Speed Limit of Valence Change Memories. <i>ACS Applied Electronic Materials</i> , 2021 , 3, 556345572	3	3
27	Compact Modelling of Resistive Switching Devices based on the Valence Change Mechanism 2019 ,		2
26	Resistive switching memories 2020 , 17-61		2

25	Modeling the VCM- and ECM-Type Switching Kinetics 2016 , 395-436		2
24	Resistive Switching Memory: Nanoionic Resistive Switching Memories: On the Physical Nature of the Dynamic Reset Process (Adv. Electron. Mater. 1/2016). <i>Advanced Electronic Materials</i> , 2016 , 2,	6.4	2
23	Kogge-Stone Adder Realization using 1S1R Resistive Switching Crossbar Arrays. <i>ACM Journal on Emerging Technologies in Computing Systems</i> , 2018 , 14, 1-14	1.7	2
22	Switching Speed Analysis and Controlled Oscillatory Behavior of a Cr-Doped V2O3 Threshold Switching Device for Memory Selector and Neuromorphic Computing Application 2019 ,		2
21	On the origin of the fading memory effect in ReRAMs 2017 ,		2
20	Kinetic Monte Carlo modeling of the charge transport in a HfO2-based ReRAM with a rough anode 2017 ,		2
19	Quantum size effects and non-equilibrium states in nanoscale silicon dioxide based resistive switches 2014 ,		2
18	3-bit read scheme for single layer Ta2O5 ReRAM 2014 ,		2
17	A Consistent Model for Short-Term Instability and Long-Term Retention in Filamentary Oxide-Based Memristive Devices. <i>ACS Applied Materials & Interfaces</i> , 2021 , 13, 58066-58075	9.5	2
16	The influence of interfacial (sub)oxide layers on the properties of pristine resistive switching devices 2018 ,		2
15	Application of the Quantum-Point-Contact Formalism to Model the Filamentary Conduction in Ta 2 O. <i>Physical Review Applied</i> , 2022 , 17,	4.3	2
14	Overcoming the RESET Limitation in Tantalum Oxide-Based ReRAM Using an Oxygen-Blocking Layer 2017 ,		1
13	ReRAM: Role of the Electrode Material on the RESET Limitation in Oxide ReRAM Devices (Adv. Electron. Mater. 2/2018). <i>Advanced Electronic Materials</i> , 2018 , 4, 1870011	6.4	1
12	Universal Switching Behavior 2016 , 317-340		1
11	Thermal effects on the I-V characteristics of filamentary VCM based ReRAM-cells using a nanometer-sized heater 2017 ,		1
10	MNEMOSENE: Tile Architecture and Simulator for Memristor-based Computation-in-memory. <i>ACM Journal on Emerging Technologies in Computing Systems</i> , 2022 , 18, 1-24	1.7	1
9	Review of Manufacturing Process Defects and Their Effects on Memristive Devices. <i>Journal of Electronic Testing: Theory and Applications (JETTA)</i> , 2021 , 37, 427	0.7	1
8	Atomistic Investigation of the Schottky Contact Conductance Limits at SrTiO3 based Resistive Switching Devices 2018 ,		1

7	Determining the Electrical Charging Speed Limit of ReRAM Devices. <i>IEEE Journal of the Electron Devices Society</i> , 2021 , 9, 667-678	2.3	1
6	A Voltage-Controlled, Oscillation-Based ADC Design for Computation-in-Memory Architectures Using Emerging ReRAMs. <i>ACM Journal on Emerging Technologies in Computing Systems</i> , 2022 , 18, 1-25	1.7	1
5	Oxygen Diffusion in Platinum Electrodes: A Molecular Dynamics Study of the Role of Extended Defects. <i>Advanced Materials Interfaces</i> , 2022 , 9, 2101257	4.6	0
4	Nanosession: Valence Change Memories - Redox Mechanism and Modelling 2013 , 219-231		
3	Modeling of Complementary Resistive Switches 2017 , 315-325		
2	Poster: Memristive Systems 523-587		
1	Comments on Experimental Demonstration of Memristor-Aided Logic (MAGIC) Using Valence Change Memory (VCM) <i>IEEE Transactions on Electron Devices</i> , 2021 , 1-1	2.9	