Ilia Valov

List of Publications by Citations

123 papers	6,900 citations	41 h-index	81 g-index
134 ext. papers	7,863 ext. citations	8.2 avg, IF	6.29 L-index

#	Paper	IF	Citations
123	Electrochemical metallization memories--fundamentals, applications, prospects. *Nanotechnology*, **2011**, 22, 254003	3.4	565
122	Nanoscale cation motion in TaO(x), HfO(x) and TiO(x) memristive systems. *Nature Nanotechnology*, **2016**, 11, 67-74	28.7	419
121	Electrochemical dynamics of nanoscale metallic inclusions in dielectrics. *Nature Communications*, **2014**, 5, 4232	17.4	411
120	Nanobatteries in redox-based resistive switches require extension of memristor theory. *Nature Communications*, **2013**, 4, 1771	17.4	395
119	Recommended Methods to Study Resistive Switching Devices. *Advanced Electronic Materials*, **2019**, 5, 1800143	6.4	297
118	Effects of Moisture on the Switching Characteristics of Oxide-Based, Gapless-Type Atomic Switches. *Advanced Functional Materials*, **2012**, 22, 70-77	15.6	217
117	Electrochemical metallization memories—fundamentals, applications, prospects. *Nanotechnology*, **2011**, 22, 289502	3.4	193
116	Atomically controlled electrochemical nucleation at superionic solid electrolyte surfaces. *Nature Materials*, **2012**, 11, 530-5	27	187
115	Generic relevance of counter charges for cation-based nanoscale resistive switching memories. *ACS Nano*, **2013**, 7, 6396-402	16.7	183
114	Coexistence of Grain-Boundaries-Assisted Bipolar and Threshold Resistive Switching in Multilayer Hexagonal Boron Nitride. *Advanced Functional Materials*, **2017**, 27, 1604811	15.6	149
113	Cation-based resistance change memory. *Journal Physics D: Applied Physics*, **2013**, 46, 074005	3	147
112	A chemically driven insulator-metal transition in non-stoichiometric and amorphous gallium oxide. *Nature Materials*, **2008**, 7, 391-8	27	136
111	Multibit memory operation of metal-oxide bi-layer memristors. *Scientific Reports*, **2017**, 7, 17532	4.9	133
110	Redox Reactions at Cu,Ag/Ta2O5 Interfaces and the Effects of Ta2O5 Film Density on the Forming Process in Atomic Switch Structures. *Advanced Functional Materials*, **2015**, 25, 6374-6381	15.6	133
109	Switching kinetics of electrochemical metallization memory cells. *Physical Chemistry Chemical Physics*, **2013**, 15, 6945-52	3.6	126
108	Graphene-Modified Interface Controls Transition from VCM to ECM Switching Modes in Ta/TaOx Based Memristive Devices. *Advanced Materials*, **2015**, 27, 6202-7	24	120
107	Redox-Based Resistive Switching Memories (ReRAMs): Electrochemical Systems at the Atomic Scale. *ChemElectroChem*, **2014**, 1, 26-36	4.3	119

106	Quantum conductance and switching kinetics of AgI-based microcrossbar cells. *Nanotechnology*, **2012**, 23, 145703	3.4	118
105	Silicon Oxide (SiO): A Promising Material for Resistance Switching?. *Advanced Materials*, **2018**, 30, e1801187	21.4	105
104	Nanoscale electrochemistry using dielectric thin films as solid electrolytes. *Nanoscale*, **2016**, 8, 13828-37	7.7	102
103	Nanoionic transport and electrochemical reactions in resistively switching silicon dioxide. *Nanoscale* , **2012**, 4, 3040-3	7.7	93
102	Self-limited single nanowire systems combining all-in-one memristive and neuromorphic functionalities. *Nature Communications*, **2018**, 9, 5151	17.4	83
101	Resistive Switching Mechanisms on TaOx and SrRuO3 Thin-Film Surfaces Probed by Scanning Tunneling Microscopy. *ACS Nano*, **2016**, 10, 1481-92	16.7	79
100	Electrocatalysts for bifunctional oxygen/air electrodes. *Journal of Power Sources*, **2008**, 185, 727-733	8.9	78
99	Nucleation and growth phenomena in nanosized electrochemical systems for resistive switching memories. *Journal of Solid State Electrochemistry*, **2013**, 17, 365-371	2.6	75
98	Interfacial Metal-Oxide Interactions in Resistive Switching Memories. *ACS Applied Materials & Interfaces*, **2017**, 9, 19287-19295	9.5	74
97	Effects of moisture and redox reactions in VCM and ECM resistive switching memories. *Journal Physics D: Applied Physics*, **2018**, 51, 413001	3	72
96	Interfacial interactions and their impact on redox-based resistive switching memories (ReRAMs). *Semiconductor Science and Technology*, **2017**, 32, 093006	1.8	72
95	Impact of the Counter-Electrode Material on Redox Processes in Resistive Switching Memories. *ChemElectroChem*, **2014**, 1, 1287-1292	4.3	68
94	Processes and Effects of Oxygen and Moisture in Resistively Switching TaOx and HfOx. *Advanced Electronic Materials*, **2018**, 4, 1700458	6.4	65
93	Redox processes in silicon dioxide thin films using copper microelectrodes. *Applied Physics Letters*, **2011**, 99, 203103	3.4	61
92	Recent Developments and Perspectives for Memristive Devices Based on Metal Oxide Nanowires. *Advanced Electronic Materials*, **2019**, 5, 1800909	6.4	58
91	Oxide nitrides: From oxides to solids with mobile nitrogen ions. *Progress in Solid State Chemistry*, **2009**, 37, 81-131	8	58
90	Volatile resistance states in electrochemical metallization cells enabling non-destructive readout of complementary resistive switches. *Nanotechnology*, **2014**, 25, 425202	3.4	55
89	Electrochemical Tantalum Oxide for Resistive Switching Memories. *Advanced Materials*, **2017**, 29, 1703357	21	52

88	Nanobattery Effect in RRAMs—Implications on Device Stability and Endurance. *IEEE Electron Device Letters*, **2014**, 35, 208-210	4.4	51
87	Defect chemistry of the cage compound, Ca(12)Al(14)O(33-delta)-understanding the route from a solid electrolyte to a semiconductor and electride. *Physical Chemistry Chemical Physics*, **2009**, 11, 3105-14	3.6	49
86	Electrochemical deposition of thin zirconia films on stainless steel 316 L. *Materials Chemistry and Physics*, **2000**, 65, 222-225	4.4	47
85	Electrochemical processes and device improvement in conductive bridge RAM cells. *Physica Status Solidi (A) Applications and Materials Science*, **2016**, 213, 274-288	1.6	44
84	Faradaic currents during electroforming of resistively switching Ag-Ge-Se type electrochemical metallization memory cells. *Physical Chemistry Chemical Physics*, **2009**, 11, 5974-9	3.6	43
83	Humidity effects on the redox reactions and ionic transport in a Cu/Ta2O5/Pt atomic switch structure. *Japanese Journal of Applied Physics*, **2016**, 55, 06GJ09	1.4	41
82	Oxygen Exchange Processes between Oxide Memristive Devices and Water Molecules. *Advanced Materials*, **2018**, 30, e1800957	24	41
81	Bond nature of active metal ions in SiO2-based electrochemical metallization memory cells. *Nanoscale*, **2013**, 5, 1781-4	7.7	41
80	Active Electrode Redox Reactions and Device Behavior in ECM Type Resistive Switching Memories. *Advanced Electronic Materials*, **2019**, 5, 1800933	6.4	40
79	Ag/GeSx/Pt-based complementary resistive switches for hybrid CMOS/nanoelectronic logic and memory architectures. *Scientific Reports*, **2013**, 3, 2856	4.9	40
78	Direct Probing of the Dielectric Scavenging-Layer Interface in Oxide Filamentary-Based Valence Change Memory. *ACS Applied Materials & Interfaces*, **2017**, 9, 10820-10824	9.5	39
77	Direct observation of charge transfer in solid electrolyte for electrochemical metallization memory. *Advanced Materials*, **2012**, 24, 4552-6	24	39
76	An associative capacitive network based on nanoscale complementary resistive switches for memory-intensive computing. *Nanoscale*, **2013**, 5, 5119-28	7.7	39
75	Capacity based nondestructive readout for complementary resistive switches. *Nanotechnology*, **2011**, 22, 395203	3.4	39
74	SET kinetics of electrochemical metallization cells: influence of counter-electrodes in SiO/Ag based systems. *Nanotechnology*, **2017**, 28, 135205	3.4	37
73	Nanoarchitectonics for Controlling the Number of Dopant Atoms in Solid Electrolyte Nanodots. *Advanced Materials*, **2018**, 30, 1703261	24	37
72	Rate-limiting processes in the fast SET operation of a gapless-type Cu-Ta2O5 atomic switch. *AIP Advances*, **2013**, 3, 032114	1.5	37
71	Electrode activation and degradation: Morphology changes of platinum electrodes on YSZ during electrochemical polarisation. *Solid State Ionics*, **2008**, 179, 1835-1848	3.3	36

70	Standards for the Characterization of Endurance in Resistive Switching Devices. *ACS Nano*, **2021**,	16.7	36
69	Electrochemical growth of thin La2O3 films on oxide and metal surfaces. *Materials Science and Engineering C*, **2003**, 23, 123-128	8.3	34
68	Design of defect-chemical properties and device performance in memristive systems. *Science Advances*, **2020**, 6, eaaz9079	14.3	31
67	Non-volatile memories: Organic memristors come of age. *Nature Materials*, **2017**, 16, 1170-1172	27	30
66	Ordering and Phase Control in Epitaxial Double-Perovskite Catalysts for the Oxygen Evolution Reaction. *ACS Catalysis*, **2017**, 7, 7029-7037	13.1	30
65	Modeling of Quantized Conductance Effects in Electrochemical Metallization Cells. *IEEE Nanotechnology Magazine*, **2015**, 14, 505-512	2.6	30
64	Comment on real-time observation on dynamic growth/dissolution of conductive filaments in oxide-electrolyte- based ReRAM. *Advanced Materials*, **2013**, 25, 162-4	24	30
63	Thermodynamics, structure and kinetics in the system GaON. *Progress in Solid State Chemistry*, **2009**, 37, 132-152	8	30
62	Ionic and electronic conductivity of nitrogen-doped YSZ single crystals. *Solid State Ionics*, **2009**, 180, 1463-1470	3.3	28
61	Brain-Inspired Structural Plasticity through Reweighting and Rewiring in Multi-Terminal Self-Organizing Memristive Nanowire Networks. *Advanced Intelligent Systems*, **2020**, 2, 2000096	6	27
60	Chemical composition and corrosion resistance of passive chromate films formed on stainless steels 316 L and 1.4301. *Materials Chemistry and Physics*, **2002**, 73, 252-258	4.4	26
59	Stability and Degradation of Perovskite Electrocatalysts for Oxygen Evolution Reaction. *Electrochimica Acta*, **2016**, 218, 156-162	6.7	26
58	Physical origins and suppression of Ag dissolution in GeS(x)-based ECM cells. *Physical Chemistry Chemical Physics*, **2014**, 16, 18217-25	3.6	25
57	Proton mobility in SiO2 thin films and impact of hydrogen and humidity on the resistive switching effect. *Materials Research Society Symposia Proceedings*, **2011**, 1330, 30201		24
56	2022 roadmap on neuromorphic computing and engineering. *Neuromorphic Computing and Engineering*,		24
55	Study of the kinetics of processes during electrochemical deposition of zirconia from nonaqueous electrolytes. *Electrochimica Acta*, **2002**, 47, 4419-4431	6.7	23
54	Electrochemically prepared oxides for resistive switching memories. *Faraday Discussions*, **2019**, 213, 165-181	3.6	22
53	Preparation and characterization of GeSx thin-films for resistive switching memories. *Thin Solid Films*, **2013**, 527, 299-302	2.2	20

52	Processes and Limitations during Filament Formation and Dissolution in GeSx-based ReRAM Memory Cells. *Journal of Physical Chemistry C*, **2015**, 119, 18678-18685	3.8	18
51	Chemically-inactive interfaces in thin film Ag/AgI systems for resistive switching memories. *Scientific Reports*, **2013**, 3, 1169	4.9	18
50	Electrochemically prepared oxides for resistive switching devices. *Electrochimica Acta*, **2018**, 274, 103-116	6.7	17
49	Electrochemical activation of molecular nitrogen at the Ir/YSZ interface. *Physical Chemistry Chemical Physics*, **2011**, 13, 3394-410	3.6	17
48	Preparation of nitrogen-doped YSZ thin films by pulsed laser deposition and their characterization. *Journal of Materials Science*, **2007**, 42, 1931-1941	4.3	17
47	PrxBa1-xCoO3Oxide Electrodes for Oxygen Evolution Reaction in Alkaline Solutions by Chemical Solution Deposition. *Journal of the Electrochemical Society*, **2016**, 163, F166-F170	3.9	16
46	Ionic Modulation of Electrical Conductivity of ZnO Due to Ambient Moisture. *Advanced Materials Interfaces*, **2019**, 6, 1900803	4.6	16
45	Degradation Kinetics during Oxygen Electrocatalysis on Perovskite-Based Surfaces in Alkaline Media. *Langmuir*, **2018**, 34, 1347-1352	4	15
44	Electrolysis of Water at Atomically Tailored Epitaxial Cobaltite Surfaces. *Chemistry of Materials*, **2019**, 31, 2337-2346	9.6	14
43	Electrochemical Metallization Memories **2016**, 483-514		14
42	Understanding the conductive channel evolution in Na:WO(3-x)-based planar devices. *Nanoscale*, **2015**, 7, 6023-30	7.7	13
41	Water-Mediated Ionic Migration in Memristive Nanowires with a Tunable Resistive Switching Mechanism. *ACS Applied Materials & Interfaces*, **2020**, 12, 48773-48780	9.5	13
40	Electrochemical Incorporation of Nitrogen into a Zirconia Solid Electrolyte. *Electrochemical and Solid-State Letters*, **2006**, 9, F23		12
39	Kinetic studies of the electrochemical nitrogen reduction and incorporation into yttria stabilized zirconia. *Solid State Ionics*, **2006**, 177, 1619-1624	3.3	11
38	Nitrogen Tracer Diffusion in Yttria Doped Zirconium Oxonitride. *Defect and Diffusion Forum*, **2005**, 237-240, 479-484	0.7	11
37	(Invited) Mobile Ions, Transport and Redox Processes in Memristive Devices. *ECS Transactions*, **2016**, 75, 27-39	1	11
36	Comment on Dynamic Processes of Resistive Switching in Metallic Filament-Based Organic Memory Devices *Journal of Physical Chemistry C*, **2013**, 117, 11878-11880	3.8	10
35	Simulation of polarity independent RESET in electrochemical metallization memory cells **2013**,		9

34	Spring-Like Pseudoelectroelasticity of Monocrystalline CuS Nanowire. *Nano Letters*, **2018**, 18, 5070-5077	11.5	9
33	(Keynote) Atomic Scale and Interface Interactions in Redox-Based Resistive Switching Memories. *ECS Transactions*, **2014**, 64, 3-18	1	8
32	An EMF cell with a nitrogen solid electrolyte--on the transference of nitrogen ions in yttria-stabilized zirconia. *Physical Chemistry Chemical Physics*, **2011**, 13, 1239-42	3.6	8
31	Electrochemical Reactions in Nanoionics - Towards Future Resistive Switching Memories. *ECS Transactions*, **2009**, 25, 431-437	1	7
30	Resistivity control by the electrochemical removal of dopant atoms from a nanodot. *Faraday Discussions*, **2019**, 213, 29-40	3.6	6
29	Ionic conductivity of low yttria-doped cubic zirconium oxide nitride single crystals. *Solid State Ionics*, **2016**, 296, 42-46	3.3	6
28	Memristors with alloyed electrodes. *Nature Nanotechnology*, **2020**, 15, 510-511	28.7	5
27	Design of Materials Configuration for Optimizing Redox-Based Resistive Switching Memories. *Advanced Materials*, **2021**, e2105022	24	5
26	Electrochemical metallization ReRAMs (ECM) - Experiments and modelling: general discussion. *Faraday Discussions*, **2019**, 213, 115-150	3.6	4
25	Influence of Graphene Interlayers on Electrode-Electrolyte Interfaces in Resistive Random Accesses Memory Cells. *Materials Research Society Symposia Proceedings*, **2015**, 1729, 29-34		4
24	Physics and Chemistry of Nanoionic Cells **2016**, 253-288		4
23	Editorial for the JECR special issue on resistive switching: Oxide materials, mechanisms, and devices. *Journal of Electroceramics*, **2017**, 39, 1-3	1.5	4
22	Statistical modeling of electrochemical metallization memory cells **2014**,		4
21	Structure-Dependent Influence of Moisture on Resistive Switching Behavior of ZnO Thin Films. *Advanced Materials Interfaces*, **2021**, 8, 2100915	4.6	4
20	Quantum conductance in memristive devices: fundamentals, developments, and applications.. *Advanced Materials*, **2022**, e2201248	24	4
19	Phase-change memories (PCM) - Experiments and modelling: general discussion. *Faraday Discussions*, **2019**, 213, 393-420	3.6	3
18	New insights into redox based resistive switches **2013**,		3
17	Quantum size effects and non-equilibrium states in nanoscale silicon dioxide based resistive switches **2014**,		2

16	(Invited) The Role of Electrochemical Interfaces in ReRAM Memory Cells. *ECS Transactions*, **2013**, 58, 189-196	1	2
15	A Study of the Kinetics of the Electrochemical Deposition of Ce3+/Ce4+ Oxides. *NATO Science for Peace and Security Series B: Physics and Biophysics*, **2011**, 167-172	0.2	2
14	Brain-Inspired Structural Plasticity through Reweighting and Rewiring in Multi-Terminal Self-Organizing Memristive Nanowire Networks. *Advanced Intelligent Systems*, **2020**, 2, 2080071	6	2
13	Impact of moisture absorption on the resistive switching characteristics of a polyethylene oxide-based atomic switch. *Journal of Materials Chemistry C*, **2021**, 9, 11198-11206	7.1	2
12	Synaptic and neuromorphic functions: general discussion. *Faraday Discussions*, **2019**, 213, 553-578	3.6	1
11	Live demonstration: An associative capacitive network based on nanoscale complementary resistive switches **2014**,		1
10	Electrocatalysts and Electrode Design for Bifunctional Oxygen/Air Electrodes. *NATO Science for Peace and Security Series B: Physics and Biophysics*, **2008**, 305-310	0.2	1
9	Impact of Zr top electrode on tantalum oxide-based electrochemical metallization resistive switching memory: towards synaptic functionalities.. *RSC Advances*, **2022**, 12, 14235-14245	3.7	1
8	Copper facilitated nickel oxy-hydroxide films as efficient synergistic oxygen evolution electrocatalyst. *Journal of Catalysis*, **2020**, 384, 189-198	7.3	0
7	Memristive devices based on single ZnO nanowires from material synthesis to neuromorphic functionalities. *Semiconductor Science and Technology*, **2022**, 37, 034002	1.8	0
6	Forming-Free Resistive Switching of Electrochemical Titanium Oxide Localized Nanostructures: Anodization, Chemical Composition, Nanoscale Size Effects, and Memristive Storage. *Advanced Electronic Materials*,2200215	6.4	0
5	Defect Chemistry and Transport Properties of Nitrogen-Doped YSZ. *Zeitschrift Fur Anorganische Und Allgemeine Chemie*, **2008**, 634, 2011-2011	1.3	
4	Nanoscale Electrochemical Studies: How Can We Use the Atomic Switch. *Advances in Atom and Single Molecule Machines*, **2020**, 73-93	0	
3	Poster: Memristive Systems523-587		
2	Nanosession: Electrochemical Metallization Memories207-217		
1	Oxide Thin Films for Memristive Devices **2018**, 346-356		