Joel B Varley

List of Publications by Year
in descending order

109 papers	8,659 citations	71004 43 h-index	49824 91 g-index
116 all docs	116 docs citations	116 times ranked	11117 citing authors

#	Article	IF	Citations
1	Persistent Room-Temperature Photodarkening in Cu-Doped <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mrow><mml:mi>Î²</mml:mi><mml:mtext>â^’</mml:mtext><mml:msub><mml:mrow><mml:mi>Ga</mml:mi></mml:mrow><mml:mrow><mml:mi mathvariant="normal">O</mml:mi></mml:mrow><mml:mrow><mml:mn>3</mml:mn></mml:mrow></mml:msub></mml:mrow></mml:math> Physical Review Letters, 2022, 128, 077402.	2.9	7
2	Crystallographic Effects of GaN Nanostructures in Photoelectrochemical Reaction. Nano Letters, 2022, 22, 2236-2243.	4.5	12
3	Influence of heat treatments in H2 and Ar on the E1 center in Î²-Ga2O3. Journal of Applied Physics, 2022, 131, .	1.1	11
4	Role of carbon and hydrogen in limiting <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mi>n</mml:mi></mml:math> -type doping of monoclinic <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mrow><mml:mo>(</mml:mo><mml:msub><mml:mi>Al</mml:mi><mml:mi> ma. Physical Review B, 2022, 105, .	1.1	18
5	Wide bandgap semiconductor materials and devices. Journal of Applied Physics, 2022, 131, .	1.1	12
6	A Hybrid Quantumâ€“Classical Study of Ion Adsorption at the Copper Electrode. Journal of Physical Chemistry C, 2022, 126, 12413-12423.	1.5	1
7	Cu₂O/CuS Nanocomposites Show Excellent Selectivity and Stability for Formate Generation via Electrochemical Reduction of Carbon Dioxide. , 2021, 3, 100-109.		65
8	Analysis of defects in In2O3:H synthesized in presence of water vapor and hydrogen gas mixture. Journal of Applied Physics, 2021, 129, .	1.1	5
9	Performance and limits of 2.0 eV bandgap CuInGaS₂ solar absorber integrated with CdS buffer on F:SnO₂ substrate for multijunction photovoltaic and photoelectrochemical water splitting devices. Materials Advances, 2021, 2, 5752-5763.	2.6	4
10	Indium Gallium Oxide Alloys: Electronic Structure, Optical Gap, Surface Space Charge, and Chemical Trends within Common-Cation Semiconductors. ACS Applied Materials & Interfaces, 2021, 13, 2807-2819.	4.0	50
11	Multistability of isolated and hydrogenated Gaâ€“O divacancies in <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mi>Î²</mml:mi><mml:mo>â^’</mml:mo><mml:msub><mml:mrow><mml:mi mathvariant="normal">O</mml:mi></mml:mrow><mml:mrow><mml:mn>3</mml:mn></mml:mrow></mml:msub></mml:math>. Physical Review Materials, 2021, 5, .	0.9	28
12	Development of a Multiphase Beryllium Equation of State and Physics-based Variations. Journal of Physical Chemistry A, 2021, 125, 1610-1636.	1.1	16
13	Atomic scale investigation of aluminum incorporation, defects, and phase stability in Î²-(AlxGa1â^’x)2O3 films. APL Materials, 2021, 9, .	2.2	35
14	Electronic and optical properties of Zn-doped Î²-Ga2O3 Czochralski single crystals. Journal of Applied Physics, 2021, 129, .	1.1	23
15	Deep level study of chlorine-based dry etched Î²â€‰â^’â€‰Ga2O3. Journal of Applied Physics, 2021, 130, .	1.1	8
16	Electrolyte-Guided Design of Electroreductive CO Coupling on Copper Surfaces. ACS Applied Energy Materials, 2021, 4, 8201-8210.	2.5	6
17	First-principles calculations of structural, electrical, and optical properties of ultra-wide bandgap (Al$$_x$$Ga$$_{1-x}$$)$$_2$$O$$_3$$ alloys. Journal of Materials Research, 2021, 36, 4790-4803.	1.2	25
18	Evaluating the stability and activity of dilute Cu-based alloys for electrochemical CO2 reduction. Journal of Chemical Physics, 2021, 155, 114702.	1.2	11

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19	Chemical Modifications of Ag Catalyst Surfaces with Imidazolium Ionomers Modulate H₂ Evolution Rates during Electrochemical CO₂ Reduction. Journal of the American Chemical Society, 2021, 143, 14712-14725.	6.6	44
20	Paradigms of frustration in superionic solid electrolytes. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2021, 379, 20190467.	1.6	16
21	Comparative Techno-Economic and Life Cycle Analysis of Water Oxidation and Hydrogen Oxidation at the Anode in a CO₂ Electrolysis to Ethylene System. ACS Sustainable Chemistry and Engineering, 2021, 9, 14678-14689.	3.2	9
22	Influence of Polymorphism on the Electronic Structure of Ga₂O₃. Chemistry of Materials, 2020, 32, 8460-8470.	3.2	35
23	The role of water vapor during the synthesis of hydrogen doped In2O3. Applied Physics Letters, 2020, 117, .	1.5	4
24	Split Ga vacancies and the unusually strong anisotropy of positron annihilation spectra in <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mi>Î²</mml:mi><mml:mtext>â^'</mml:mtext><mml:mrow><mml:msub><mml:mathvariant="normal">O</mml:mi><mml:mn>3</mml:mn></mml:msub></mml:mrow></mml:math>. Physical Review B, 2020, 102, .	1.1	30
25	Combining steady-state photo-capacitance spectra with first-principles calculations: the case of Fe and Ti in Î²-Ga2O3. New Journal of Physics, 2020, 22, 063033.	1.2	10
26	Ti- and Fe-related charge transition levels in Î²â^'Ga2O3. Applied Physics Letters, 2020, 116, .	1.5	37
27	Assessing the roles of Cu- and Ag-deficient layers in chalcopyrite-based solar cells through first principles calculations. Journal of Applied Physics, 2020, 127, .	1.1	23
28	Degenerate doping in Î²-Ga₂O₃ single crystals through Hf-doping. Semiconductor Science and Technology, 2020, 35, 04LT01.	1.0	43
29	Self-trapped hole and impurity-related broad luminescence in Î²-Ga2O3. Journal of Applied Physics, 2020, 127, .	1.1	87
30	Quantifying Large Lattice Relaxations in Photovoltaic Devices. Physical Review Applied, 2020, 13, .	1.5	7
31	Understanding Superionic Conductivity in Lithium and Sodium Salts of Weakly Coordinating Closo-Hexahalocarbaborate Anions. Chemistry of Materials, 2020, 32, 1475-1487.	3.2	35
32	Prospects for n-type doping of (AlxGa1â^'x)2O3 alloys. Applied Physics Letters, 2020, 116, .	1.5	44
33	Toward Engineering of Solution Microenvironments for the CO₂ Reduction Reaction: Unraveling pH and Voltage Effects from a Combined Density-Functionalâ€“Continuum Theory. Journal of Physical Chemistry Letters, 2020, 11, 4113-4118.	2.1	49
34	Formation and control of the E2âˆ— center in implanted Î²-Ga 2 O 3 by reverse-bias and zero-bias annealing. Journal Physics D: Applied Physics, 2020, 53, 464001.	1.3	18
35	Boron phosphide as a <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mi>p</mml:mi></mml:math> -type transparent conductor: Optical absorption and transport through electron-phonon coupling. Physical Review Materials, 2020, 4, .	0.9	11
36	Primary intrinsic defects and their charge transition levels in <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mi>Î²</mml:mi><mml:mtext>â€“</mml:mtext><mml:mi>Ga</mml:mi><mml:mn>2</mml:mn></mml:msub><mml:mi mathvariant="normal">O</mml:mi><mml:msub><mml:mrow><mml:mn>3</mml:mn></mml:msub></mml:math>. Physical Review Materials, 2020, 4, .	0.9	21

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37	First-Principles Calculations 2. Springer Series in Materials Science, 2020, , 329-348.	0.4	4
38	High-throughput computational discovery of In2Mn2O7 as a high Curie temperature ferromagnetic semiconductor for spintronics. Npj Computational Materials, 2019, 5, .	3.5	28
39	Wide-Bandgap Cu(In,Ga)S₂ Photocathodes Integrated on Transparent Conductive F:SnO₂ Substrates for Chalcopyrite-Based Water Splitting Tandem Devices. ACS Applied Energy Materials, 2019, 2, 5515-5524.	2.5	21
40	Si-doped Î²-(Al_{0.26}Ga_{0.74})₂O₃ thin films and heterostructures grown by metalorganic vapor-phase epitaxy. Applied Physics Express, 2019, 12, 111004.	1.1	47
41	Unusual Formation of Point-Defect Complexes in the Ultrawide-Band-Gap Semiconductor <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mrow><mml:mi>Î²</mml:mi><mml:mtext>â^'</mml:mtext><mml:msub><mml:mrow><mml:mi>Ga</mml:mi></mml:mrow><mml:mrow><mml:mn>2</mml:mn></mml:mrow></mml:msub><mml:msub><mml:mrow><mml:mi mathvariant="normal">O</mml:mi></mml:mrow><mml:mrow><mml:mn>3</mml:mn></mml:mrow></mml:msub></mml:mrow></mml:math>. Physical Review X, 2019, 9, .	2.8	62
42	Optical absorption of Fe in doped Ga2O3. Journal of Applied Physics, 2019, 126, .	1.1	28
43	Deep acceptors and their diffusion in Ga2O3. APL Materials, 2019, 7, .	2.2	143
44	Electrical and optical properties of Zr doped Î²-Ga₂O₃ single crystals. Applied Physics Express, 2019, 12, 085502.	1.1	38
45	Transition from electron accumulation to depletion at Î²-Ga2O3 surfaces: The role of hydrogen and the charge neutrality level. APL Materials, 2019, 7, .	2.2	62
46	Influence of neutron irradiation on deep levels in Ge-doped (010) Î²-Ga2O3 layers grown by plasma-assisted molecular beam epitaxy. APL Materials, 2019, 7, .	2.2	31
47	The role of oxygen doping on elemental intermixing at the PVDâ€CdS/Cu (InGa)Se 2 heterojunction. Progress in Photovoltaics: Research and Applications, 2019, 27, 255-263.	4.4	10
48	Impact of proton irradiation on conductivity and deep level defects in Î²-Ga2O3. APL Materials, 2019, 7, .	2.2	143
49	Role of point defects in the electrical and optical properties of <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mrow><mml:msub><mml:mi>In</mml:mi><mml:mn>2</mml:mn></mml:msub><mml:msub><mml:mrow><mml:mi mathvariant="normal">O</mml:mi></mml:mrow><mml:mrow><mml:mn>3</mml:mn></mml:mrow></mml:msub></mml:mrow></mml:math>. Physical Review Materials, 2019, 3, .	0.9	37
50	Carbon Incorporation and Anion Dynamics as Synergistic Drivers for Ultrafast Diffusion in Superionic LiCB₁₁H₁₂ and NaCB₁₁H₁₂. Advanced Energy Materials, 2018, 8, 1703422.	10.2	72
51	Assessing the role of hydrogen in Fermi-level pinning in chalcopyrite and kesterite solar absorbers from first-principles calculations. Journal of Applied Physics, 2018, 123, .	1.1	14
52	Iron and intrinsic deep level states in Ga2O3. Applied Physics Letters, 2018, 112, .	1.5	196
53	Water ingress mapping in photovoltaic module packaging materials. , 2018, , .		3
54	Baseline Models for Three Types of CIGS Cells: Effects of Buffer Layer and Na Content. , 2018, , .		7

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55	Impurity-derived p-type conductivity in cubic boron arsenide. Applied Physics Letters, 2018, 113, .	1.5	39
56	Incident wavelength and polarization dependence of spectral shifts in Î²-Ga2O3 UV photoluminescence. Scientific Reports, 2018, 8, 18075.	1.6	62
57	Compensation and hydrogen passivation of magnesium acceptors in Î²-Ga2O3. Applied Physics Letters, 2018, 113, .	1.5	77
58	Structural and electronic properties of Ga2O3-Al2O3 alloys. Applied Physics Letters, 2018, 112, .	1.5	198
59	First-principles calculations of optical transitions at native defects and impurities in ZnO. , 2018, , .		1
60	Cd doping at PVD-CdS/CuInGaSe2 heterojunctions. Solar Energy Materials and Solar Cells, 2017, 164, 128-134.	3.0	16
61	Magnetic stability of oxygen defects on the SiO2 surface. AIP Advances, 2017, 7, .	0.6	12
62	Stability of Cd_{1â€“x}Zn_xO_yS_{1â€“y} Quaternary Alloys Assessed with First-Principles Calculations. ACS Applied Materials & Interfaces, 2017, 9, 5673-5677.	4.0	8
63	A comparison of point defects in Cd1â^'xZnxTe1â^'ySey crystals grown by Bridgman and traveling heater methods. Journal of Applied Physics, 2017, 121, .	1.1	32
64	Understanding Ionic Conductivity Trends in Polyborane Solid Electrolytes from Ab Initio Molecular Dynamics. ACS Energy Letters, 2017, 2, 250-255.	8.8	75
65	High-Throughput Design of Non-oxide p-Type Transparent Conducting Materials: Data Mining, Search Strategy, and Identification of Boron Phosphide. Chemistry of Materials, 2017, 29, 2568-2573.	3.2	109
66	Descriptor-Based Approach for the Prediction of Cation Vacancy Formation Energies and Transition Levels. Journal of Physical Chemistry Letters, 2017, 8, 5059-5063.	2.1	26
67	Structural, Chemical, and Dynamical Frustration: Origins of Superionic Conductivity in closo-Borate Solid Electrolytes. Chemistry of Materials, 2017, 29, 9142-9153.	3.2	126
68	First-principles characterization of native-defect-related optical transitions in ZnO. Journal of Applied Physics, 2017, 122, .	1.1	88
69	Exploring Cd-Zn-O-S alloys for improved buffer layers in thin-film photovoltaics. Physical Review Materials, 2017, 1, .	0.9	5
70	First principles calculations of point defect diffusion in CdS buffer layers: Implications for Cu(In,Ga)(Se,S)2 and Cu2ZnSn(Se,S)4-based thin-film photovoltaics. Journal of Applied Physics, 2016, 119, .	1.1	19
71	Intermixing and Formation of Cu-Rich Secondary Phases at Sputtered CdS/CuInGaSe₂Heterojunctions. IEEE Journal of Photovoltaics, 2016, 6, 1308-1315.	1.5	7
72	Defects in AlN as candidates for solid-state qubits. Physical Review B, 2016, 93, .	1.1	50

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73	Effect of chlorination on the TlBr band edges for improved room temperature radiation detectors (Phys. Status Solidi B 6/2015). Physica Status Solidi (B): Basic Research, 2015, 252, n/a-n/a.	0.7	0
74	<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:mrow><mml:msub><mml:mrow><mml:mo>(</mml:mo> <mml:msub><mm for transparent electronics. Physical Review B, 2015, 92, .	1.1	130
75	Cu rich domains and secondary phases in PVD-CdS / PVD-CuIn1â^'xGaxSe2 heterojunctions. , 2015, , .		2
76	Effect of chlorination on the TlBr band edges for improved room temperature radiation detectors. Physica Status Solidi (B): Basic Research, 2015, 252, 1266-1271.	0.7	4
77	Sulfur doping of AlN and AlGaN for improved n-type conductivity. Physica Status Solidi - Rapid Research Letters, 2015, 9, 462-465.	1.2	12
78	Betheâ€“Salpeter calculation of optical-absorption spectra of In₂O₃and Ga₂O₃. Semiconductor Science and Technology, 2015, 30, 024010.	1.0	38
79	The Mechanism of CO and CO₂ Hydrogenation to Methanol over Cuâ€Based Catalysts. ChemCatChem, 2015, 7, 1105-1111.	1.8	424
80	Mechanistic insights into nitrogen fixation by nitrogenase enzymes. Physical Chemistry Chemical Physics, 2015, 17, 29541-29547.	1.3	84
81	Hydrogenated vacancies and hidden hydrogen in SrTiO3. Physical Review B, 2014, 89, .	1.1	36
82	Intermixing at the absorber-buffer layer interface in thin-film solar cells: The electronic effects of point defects in Cu(In,Ga)(Se,S)2 and Cu2ZnSn(Se,S)4 devices. Journal of Applied Physics, 2014, 116, .	1.1	25
83	Lithium and oxygen vacancies and their role in Li₂O₂charge transport in Liâ€“O₂batteries. Energy and Environmental Science, 2014, 7, 720-727.	15.6	84
84	Vacancies and small polarons in<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:msub><mml:mi mathvariant="normal">SrTiO</mml:mi><mml:mn>3</mml:mn></mml:msub></mml:math>. Physical Review B, 2014, 90, .	1.1	192
85	Electronic structure and defect properties of <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML"><mml:msub><mml:mrow><mml:mi mathvariant="normal">B</mml:mi></mml:mrow><mml:mn>6</mml:mn></mml:msub><mml:mi mathvariant="normal">O</mml:mi></mml:math> from hybrid functional and many-body perturbation theory calculations: A possible ambipolar transparent conductor. Physical Review B, 2014, 90, .	1.1	30
86	Tunneling and Polaron Charge Transport through Li₂O₂ in Liâ€“O₂ Batteries. Journal of Physical Chemistry Letters, 2013, 4, 3494-3499.	2.1	156
87	Niâ€“Feâ€“S Cubanes in CO₂ Reduction Electrocatalysis: A DFT Study. ACS Catalysis, 2013, 3, 2640-2643.	5.5	68
88	Electrical properties of point defects in CdS and ZnS. Applied Physics Letters, 2013, 103, .	1.5	62
89	Ambipolar doping in SnO. Applied Physics Letters, 2013, 103, .	1.5	94
90	Understanding Trends in the Electrocatalytic Activity of Metals and Enzymes for CO₂ Reduction to CO. Journal of Physical Chemistry Letters, 2013, 4, 388-392.	2.1	604

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91	CO and CO2 Hydrogenation to Methanol Calculated Using the BEEF-vdW Functional. Catalysis Letters, 2013, 143, 71-73.	1.4	148
92	Firstâ€Principles Calculations of Fischerâ€“Tropsch Processes Catalyzed by Nitrogenase Enzymes. ChemCatChem, 2013, 5, 732-736.	1.8	16
93	Dual behavior of excess electrons in rutile TiO₂. Physica Status Solidi - Rapid Research Letters, 2013, 7, 199-203.	1.2	140
94	Conductivity and transparency of TiO2from first principles. , 2013, , .		2
95	Quantum computing with defects. MRS Bulletin, 2013, 38, 802-807.	1.7	44
96	Role of self-trapping in luminescence and<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mi>p</mml:mi></mml:math>-type conductivity of wide-band-gap oxides. Physical Review B, 2012, 85, .	1.1	440
97	Controlling the Conductivity in Oxide Semiconductors. Springer Series in Materials Science, 2012, , 23-35.	0.4	8
98	Hydrogenated cation vacancies in semiconducting oxides. Journal of Physics Condensed Matter, 2011, 23, 334212.	0.7	237
99	Experimental electronic structure of In₂O₃and Ga₂O₃. New Journal of Physics, 2011, 13, 085014.	1.2	273
100	Tin dioxide from first principles: Quasiparticle electronic states and optical properties. Physical Review B, 2011, 83, .	1.1	145
101	Defects in SiC for quantum computing. Journal of Applied Physics, 2011, 109, .	1.1	66
102	Mechanism of Visibleâ€Light Photocatalysis in Nitrogenâ€Doped TiO₂. Advanced Materials, 2011, 23, 2343-2347.	11.1	160
103	Oxygen vacancies and donor impurities in Î²-Ga2O3. Applied Physics Letters, 2010, 97, .	1.5	733
104	Quantum computing with defects. Proceedings of the National Academy of Sciences of the United States of America, 2010, 107, 8513-8518.	3.3	588
105	Hybrid functional studies of the oxygen vacancy in<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mrow><mml:msub><mml:mrow><mml:mtext>TiO</mml:mtext></mml:mrow><mml:mn>2</mml:mn></mml:msub></mml:mrow></mml:math>: Physical Review B, 2010, 81, .	1.1	554
106	Group-V impurities in<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mrow><mml:msub><mml:mrow><mml:mtext>SnO</mml:mtext></mml:mrow><mml:mn>2</mml:mn></mml:msub></mml:mrow></mml:math>: first-principles calculations. Physical Review B, 2010, 81, .	1.1	52
107	Hydrogen donors in<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mrow><mml:msub><mml:mrow><mml:mtext>SnO</mml:mtext></mml:mrow><mml:mn>2</mml:mn></mml:msub></mml:mrow></mml:math> by infrared spectroscopy and first-principles calculations. Physical Review B, 2010, 82, .	1.1	50
108	The electronic structure of Î²-Ga2O3. Applied Physics Letters, 2010, 97, .	1.5	146

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109	Hydrogen interactions with acceptor impurities in<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" display="inline"><mml:mrow><mml:msub><mml:mrow><mml:mtext>SnO</mml:mtext></mml:mrow><mml:mn>2</mml:mn></mml:msub></mml:mrow></mml:math>: First-principles calculations. Physical Review B, 2009, 79, .	1.1	63