

# Bernd Witzigmann

## List of Publications by Year in descending order

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154  
papers

3,084  
citations

279487

23  
h-index

168136

53  
g-index

154  
all docs

154  
docs citations

154  
times ranked

3772  
citing authors

#	ARTICLE	IF	CITATIONS
1	InP Nanowire Array Solar Cells Achieving 13.8% Efficiency by Exceeding the Ray Optics Limit. Science, 2013, 339, 1057-1060.	6.0	1,093
2	The 2020 UV emitter roadmap. Journal Physics D: Applied Physics, 2020, 53, 503001.	1.3	289
3	Light absorption and emission in nanowire array solar cells. Optics Express, 2010, 18, 27589.	1.7	143
4	Vertically emitting microdisk lasers. Nature Photonics, 2009, 3, 46-49.	15.6	119
5	Signature of the ideality factor in III-nitride multi quantum well light emitting diodes. Optical and Quantum Electronics, 2018, 50, 1.	1.5	111
6	On the uncertainty of the Auger recombination coefficient extracted from InGaN/GaN light-emitting diode efficiency droop measurements. Applied Physics Letters, 2015, 106, .	1.5	93
7	Ellipticity and the spurious solution problem of $\hat{k}^{\text{TM}}$ envelope equations. Physical Review B, 2007, 76, .	1.1	71
8	Plasmonic Perfect Absorbers for Biosensing Applications. Plasmonics, 2014, 9, 1265-1270.	1.8	63
9	GaN nanowire arrays with nonpolar sidewalls for vertically integrated field-effect transistors. Nanotechnology, 2017, 28, 095206.	1.3	58
10	Effect of Auger recombination and leakage on the droop in InGaN/GaN quantum well LEDs. Optics Express, 2014, 22, A1440.	1.7	50
11	Core-shell InGaN nanorod light emitting diodes: Electronic and optical device properties. Physica Status Solidi (A) Applications and Materials Science, 2012, 209, 2304-2312.	0.8	46
12	Unified simulation of transport and luminescence in optoelectronic nanostructures. Journal of Computational Electronics, 2008, 7, 509-520.	1.3	43
13	Large linewidth reduction in semiconductor lasers based on atom-like gain material. Optica, 2019, 6, 1071.	4.8	41
14	Substrate Modes of (Al,In)GaN Semiconductor Laser Diodes on SiC and GaN Substrates. IEEE Journal of Quantum Electronics, 2007, 43, 16-24.	1.0	40
15	Computational study of an InGaN/GaN nanocolumn light-emitting diode. Physical Review B, 2010, 81, .	1.1	37
16	Study of photocurrent generation in InP nanowire-based p+i-n+ photodetectors. Nano Research, 2014, 7, 544-552.	5.8	37
17	Normally Off Vertical 3-D GaN Nanowire MOSFETs With Inverted $\text{p}^+$ GaN Channel. IEEE Transactions on Electron Devices, 2018, 65, 2439-2445.	1.6	32
18	Top-down GaN nanowire transistors with nearly zero gate hysteresis for parallel vertical electronics. Scientific Reports, 2019, 9, 10301.	1.6	32

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19	Analysis of surface recombination in nanowire array solar cells. Journal of Photonics for Energy, 2012, 2, 028002-1.	0.8	29
20	Reliable $k$ -p band structure calculation for nanostructures using finite elements. Journal of Computational Electronics, 2008, 7, 521-529.	1.3	28
21	Investigation of the Purcell effect in photonic crystal cavities with a 3D Finite Element Maxwell Solver. Optical and Quantum Electronics, 2007, 39, 341-352.	1.5	27
22	Spectral and spatial properties of the spontaneous emission enhancement in photonic crystal cavities. Journal of the Optical Society of America B: Optical Physics, 2008, 25, 31.	0.9	26
23	Auger carrier leakage in III-nitride quantum well light emitting diodes. Physica Status Solidi - Rapid Research Letters, 2012, 6, 418-420.	1.2	23
24	Multidimensional Electro-Opto-Thermal Modeling of Broad-Band Optical Devices. IEEE Journal of Quantum Electronics, 2008, 44, 505-514.	1.0	21
25	All-InGaN Phosphorless White Light Emitting Diodes: An Efficiency Estimation. Journal of Lightwave Technology, 2012, 30, 2853-2862.	2.7	20
26	Computational electromagnetics for nanowire solar cells. Journal of Computational Electronics, 2012, 11, 153-165.	1.3	20
27	Polarization of eigenmodes in laser diode waveguides on semipolar and nonpolar GaN. Physica Status Solidi - Rapid Research Letters, 2010, 4, 1-3.	1.2	18
28	Simulation of an indium gallium nitride quantum well light-emitting diode with the non-equilibrium Green's function method. Physica Status Solidi (B): Basic Research, 2016, 253, 158-163.	0.7	16
29	Bandstructure calculation using the $k^{\text{TM}}$ method for arbitrary potentials with open boundary conditions. Journal of Applied Physics, 2005, 97, 046104.	1.1	15
30	Acceptor activation model for III-nitride LEDs. Journal of Computational Electronics, 2015, 14, 456-463.	1.3	14
31	Performance analysis and simulation of vertical gallium nitride nanowire transistors. Solid-State Electronics, 2018, 144, 73-77.	0.8	13
32	High Responsivity of InP/InAsP Nanowire Array Broadband Photodetectors Enhanced by Optical Gating. Nano Letters, 2019, 19, 8424-8430.	4.5	13
33	Vertical 3D gallium nitride field-effect transistors based on fin structures with inverted p-doped channel. Semiconductor Science and Technology, 2021, 36, 014002.	1.0	13
34	Luminescence and efficiency optimization of InGaN/GaN core-shell nanowire LEDs by numerical modelling. Proceedings of SPIE, 2012, , .	0.8	12
35	A TCAD methodology for high-speed photodetectors. Solid-State Electronics, 2005, 49, 1002-1008.	0.8	11
36	Full-band Monte Carlo simulation of high-energy carrier transport in single photon avalanche diodes: Computation of breakdown probability, time to avalanche breakdown, and jitter. Journal of Applied Physics, 2011, 110, .	1.1	11

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37	Modelling surface effects in nano wire optoelectronic devices. Journal of Computational Electronics, 2012, 11, 431-439.	1.3	11
38	A high efficiency dual-junction solar cell implemented as a nanowire array. Optics Express, 2013, 21, A167.	1.7	11
39	Comprehensive Simulation of Vertical Cavity Surface Emitting Lasers: Inclusion of a Many-Body Gain Model. Journal of Computational Electronics, 2005, 4, 7-10.	1.3	10
40	Operator ordering, ellipticity and spurious solutions in $k \cdot p$ calculations of III-nitride nanostructures. Optical and Quantum Electronics, 2008, 40, 1169-1174.	1.5	10
41	Full-band Monte Carlo simulation of high-energy carrier transport in single photon avalanche diodes with multiplication layers made of InP, InAlAs, and GaAs. Journal of Applied Physics, 2012, 111, 104508.	1.1	10
42	Auger recombination and leakage in InGaN/GaN quantum well LEDs. , 2014, , .		10
43	Non equilibrium Greenâ€™s function quantum transport for green multi-quantum well nitride light emitting diodes. Optical and Quantum Electronics, 2018, 50, 1.	1.5	10
44	Calculation of optical gain in AlGaIn quantum wells for ultraviolet emission. AIP Advances, 2020, 10, .	0.6	10
45	Effect of Inhomogeneous Broadening in Ultraviolet III-Nitride Light-Emitting Diodes. Materials, 2021, 14, 7890.	1.3	10
46	Temperature-dependent investigation of carrier transport, injection, and densities in AlGaAs-based multi-quantum-well active layers for vertical-cavity surface-emitting lasers. Optical Engineering, 2015, 54, 016107.	0.5	9
47	Determination of polarization fields in group III-nitride heterostructures by capacitance-voltage-measurements. Journal of Applied Physics, 2016, 119, .	1.1	9
48	Electroluminescence from a Quantum-Well LED using NEGF. , 2009, , .		8
49	Towards nanorod LEDs: Numerical predictions and controlled growth. Physica Status Solidi C: Current Topics in Solid State Physics, 2011, 8, 2305-2307.	0.8	8
50	Ge(Sn) nano-island/Si heterostructure photodetectors with plasmonic antennas. Nanotechnology, 2020, 31, 345203.	1.3	8
51	Harmonic balance analysis for semiconductor lasers under large-signal modulation. Optical and Quantum Electronics, 2007, 38, 1039-1044.	1.5	7
52	Impact ionization scattering model based on the random-k approximation for GaAs, InP, InAlAs, and InGaAs. Journal of Applied Physics, 2012, 111, 073714.	1.1	7
53	Optimization of 1.55- $\mu$ m quantum dot edge-emitting lasers for narrow spectral linewidth. Optical and Quantum Electronics, 2016, 48, 1.	1.5	7
54	Germanium Plasmon Enhanced Resonators for Label-Free Terahertz Protein Sensing. Frequenz, 2018, 72, 113-122.	0.6	7

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55	Analysis of Gain and Luminescence in Violet and Blue GaInNâ€“GaN Quantum Wells. IEEE Journal of Quantum Electronics, 2008, 44, 144-149.	1.0	6
56	Comprehensive modeling of optoelectronic nanostructures. Journal of Computational Electronics, 2009, 8, 389-397.	1.3	6
57	Frequency domain analysis of guided resonances and polarization selectivity in photonic crystal membranes. Journal of the Optical Society of America B: Optical Physics, 2011, 28, 69.	0.9	6
58	Auger recombination and carrier transport effects in III-nitride quantum well light emitting diodes. Proceedings of SPIE, 2013, , .	0.8	6
59	CMOS-compatible optical switching concept based on strain-induced refractive-index tuning. Optics Express, 2015, 23, 5930.	1.7	6
60	Gain and bandwidth of InP nanowire array photodetectors with embedded photogated InAsP quantum discs. Nanoscale, 2021, 13, 6227-6233.	2.8	6
61	Simulation and design of optical gain in In(Al)GaN/GaN short wavelength lasers. , 2006, , .		5
62	Efficiency Analysis of IIIâ€“V Axial and Coreâ€“Shell Nanowire Solar Cells. Journal of Computational and Theoretical Nanoscience, 2012, 9, 688-695.	0.4	5
63	Simulation of InGaN quantum well LEDs with reduced internal polarization. Physica Status Solidi (A) Applications and Materials Science, 2012, 209, 487-490.	0.8	5
64	Acceptor impurity activation in III-nitride light emitting diodes. Applied Physics Letters, 2015, 106, .	1.5	5
65	Effect of oxygen impurities in semipolar IIIâ€“nitride light emitting diodes. Physica Status Solidi (A) Applications and Materials Science, 2017, 214, 1600297.	0.8	5
66	Accurate determination of polarization fields in (0â€“1) <i>c</i>-plane InAlN/GaN heterostructures with capacitance-voltage-measurements. Journal Physics D: Applied Physics, 2018, 51, 485103.	1.3	5
67	Demonstration of UV-Induced Threshold Voltage Instabilities in Vertical GaN Nanowire Array-Based Transistors. IEEE Transactions on Electron Devices, 2019, 66, 2119-2124.	1.6	5
68	Inhomogeneous spectral broadening in deep ultraviolet light emitting diodes. , 2019, , .		5
69	Physics and Simulation of Vertical-Cavity Surface-Emitting Lasers. Journal of Computational and Theoretical Nanoscience, 2008, 5, 1058-1071.	0.4	5
70	Device simulation and statistical analysis in industrial laser design (Invited Paper). , 2005, , .		4
71	tdkp/AQUA: Unified modeling of electroluminescence in nanostructures. Optical and Quantum Electronics, 2009, 41, 551-557.	1.5	4
72	Electromagnetic analysis of polarization and frequency selective tunable optical MEMS. , 2010, , .		4

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73	Computational study of carrier injection in III-nitride core-shell nanowire-LEDs. , 2011, , .		4
74	Toward Frequency-Domain Modeling of Mode Locking in Semiconductor Lasers. IEEE Journal of Selected Topics in Quantum Electronics, 2011, 17, 1280-1291.	1.9	4
75	Local near field assisted ablation of fused silica. Applied Physics A: Materials Science and Processing, 2013, 110, 743-749.	1.1	4
76	Narrow-linewidth 1.5 $\mu$ m quantum dot distributed feedback lasers. Proceedings of SPIE, 2016, , .	0.8	4
77	A TCAD-based yield and reliability analysis for VCSELs. , 2006, , .		3
78	Accurate modeling of gain and amplified spontaneous emission in super-luminescent LEDs. , 2006, 6115, 360.		3
79	Investigation of the optical farfield of photonic crystal microcavities. , 2007, , .		3
80	Luminescence and absorption analysis of undoped organic materials. Applied Physics Letters, 2007, 90, 221107.	1.5	3
81	A TCAD approach to robust ESD design in oxide-confined VCSELs. , 2007, , .		3
82	Investigation of optical far-field stability in long-wavelength VCSELs: thermal and carrier-induced effects. , 2007, , .		3
83	The Ultra Weak Variational Formulation Applied to Radiation Problems With Macroscopic Sources in Inhomogeneous Domains. IEEE Journal of Selected Topics in Quantum Electronics, 2009, 15, 1144-1155.	1.9	3
84	Full-band Monte Carlo simulation of single photon avalanche diodes. , 2013, , .		3
85	Luminescence distribution in the multi-quantum well region of III-nitride light emitting diodes. Proceedings of SPIE, 2017, , .	0.8	3
86	Precise determination of polarization fields in c-plane GaN/Al <sub>x</sub> Ga <sub>1-x</sub> N/GaN heterostructures with capacitance-voltage-measurements. Japanese Journal of Applied Physics, 2019, 58, SCCB08.	0.8	3
87	Three-Dimensional Interfacing of Cells with Hierarchical Silicon Nano/Microstructures for Midinfrared Interrogation of In Situ Captured Proteins. ACS Applied Materials & Interfaces, 2021, 13, 8049-8059.	4.0	3
88	Multidimensional noise model and simulation of VCSEL devices. , 2005, 5722, 211.		2
89	Optical Properties of Edge-Emitting Lasers: Measurement and Simulation. , 0, , 405-422.		2
90	Performance analysis of 1300Ånm SLEDs - impact of temperature and length scaling. Optical and Quantum Electronics, 2007, 38, 1069-1075.	1.5	2

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91	Combined analytical-finite difference time-domain full wave simulation of mode-locked vertical-extended-cavity semiconductor lasers. Journal of the Optical Society of America B: Optical Physics, 2008, 25, 1118.	0.9	2
92	Transverse optical mode analysis of long-wavelength VCSELs for high single-mode power operation. , 2008, , .		2
93	Investigation of bandwidth limitations in separate absorption, charge and multiplication (SACM) avalanche photodiodes (APD). , 2008, , .		2
94	GaN-based nanocolumn LEDs: Impact of strain engineering on the electro-optical performance. Physica Status Solidi C: Current Topics in Solid State Physics, 2009, 6, S506-S509.	0.8	2
95	Zonal efficiency limit calculation for nanostructured solar cells. , 2010, , .		2
96	Electro-optical modeling of InP nanowire solar cells: Core-shell vs. axial structure. , 2010, , .		2
97	Design and simulation of electrically pumped mode-locked VCSELs. Proceedings of SPIE, 2011, , .	0.8	2
98	Design and analysis of polarization selective tunable photonic crystal filters. , 2011, , .		2
99	Current confinement in EP-VCSELs for high power single-mode operation suitable for passive mode-locking. Proceedings of SPIE, 2012, , .	0.8	2
100	Analysis of surface recombination in nanowire array solar cells. , 2012, , .		2
101	Electromagnetic study of magneto-optic surface plasmon resonance effects for biosensing applications. , 2013, , .		2
102	Thermal performance analysis of GaN nanowire and fin-shaped power transistors based on self-consistent electrothermal simulations. Microelectronics Reliability, 2018, 91, 227-231.	0.9	2
103	Surface-emitting Micro-Mirror Superluminescent Diodes: Investigation of Tilt Accuracy Via Far-Field Analysis. Physica Status Solidi (B): Basic Research, 2019, 256, 1800494.	0.7	2
104	Extended micromagnetic model for the detection of superparamagnetic labels using a GMR vortex sensor. Journal of Physics Communications, 2021, 5, 075017.	0.5	2
105	Simulation of temperature-dependent modulation response in multi-quantum-well lasers. , 2002, 4646, 313.		1
106	Internal device physics of 1.3- $\mu$ m vertical-cavity surface-emitting laser. , 2005, , .		1
107	Analysis of the static and dynamic characteristics of 1310 nm vertical-cavity surface-emitting lasers. , 2006, , .		1
108	Large-Signal Modeling on Device Level: Intermodulation Distortion and Eye-Diagrams of Semiconductor Lasers. , 2007, , .		1

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109	Large-signal simulation of semiconductor lasers on device level: numerical aspects of the harmonic balance method. <i>Optical and Quantum Electronics</i> , 2008, 40, 355-360.	1.5	1
110	Ellipticity and spurious solutions in $k$ -calculations of III-nitride nanostructures. , 2008, , .		1
111	tdkp/AQUA: Unified modelling of electroluminescence in nanostructures. , 2009, , .		1
112	Physics-based simulation of a core-multishell nanowire light emitting diode. , 2010, , .		1
113	Computational study of multi-color InGaN/GaN nanowire LEDs with continuously varied indium composition. <i>Proceedings of SPIE</i> , 2012, , .	0.8	1
114	Computational modelling of surface effects in InGaN/GaN quantum disk nano wire LEDs. , 2013, , .		1
115	Optimized VCSELs for high-power arrays. <i>Proceedings of SPIE</i> , 2014, , .	0.8	1
116	Temperature dependent investigation of carrier transport, injection, and densities in 808 nm AlGaAs multi-quantum-well active layers for VCSELs. , 2014, , .		1
117	Efficiency optimization and analysis of 808nm VCSELs with a full electro-thermal-optical numerical model. <i>Proceedings of SPIE</i> , 2015, , .	0.8	1
118	Investigation of Relative Intensity Noise in Asymmetric External Cavity Semiconductor Laser Sensors: Influence of Dual-Line Spectral Separation and Linewidth Enhancement Factor. <i>IEEE Sensors Journal</i> , 2015, 15, 6619-6624.	2.4	1
119	Spectral Characteristics of Narrow Linewidth InAs/InP Quantum Dot Distributed Feedback Lasers. , 2018, , .		1
120	Electro-Optical Performance of Surface-Emitting Micromirror Superluminescent Diodes. <i>Physica Status Solidi - Rapid Research Letters</i> , 2019, 13, 1900221.	1.2	1
121	Micromagnetic Simulations of Submicron Vortex Structures for the Detection of Superparamagnetic Labels. <i>Sensors</i> , 2020, 20, 5819.	2.1	1
122	Numerical analysis of subwavelength field effects in photonic crystal slab cavities. <i>JPhys Photonics</i> , 2020, 2, 015001.	2.2	1
123	Technology CAD based design of semiconductor optical microcavities for single photon emitters. , 2005, , .		0
124	Super-Luminescent LEDs Modeling of Emission Spectra and LI-Characteristics. , 2006, , .		0
125	Harmonic Balance Analysis for Semiconductor Lasers under Large-Signal Modulation. , 2006, , .		0
126	Analysis of substrate modes in GaN/InGaN lasers. , 2007, , .		0



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127	Single-mode performance analysis for vertical-cavity surface-emitting lasers. Journal of Computational Electronics, 2007, 6, 263-266.	1.3	0
128	Introduction to the OQE special issue on "Numeric Simulation of Optoelectronic Devices". Optical and Quantum Electronics, 2008, 40, 293-294.	1.5	0
129	Introduction to the OQE special issue on numerical simulation of optoelectronic devices (2008). Optical and Quantum Electronics, 2008, 40, 1075-1076.	1.5	0
130	A novel finite-element formulation applied to wave propagation in optically large structures. , 2008, , .		0
131	Designing emission spectra of photonic crystal microcavities. Proceedings of SPIE, 2008, , .	0.8	0
132	Physics and simulation of photonic crystal Purcell light emitters. , 2008, , .		0
133	Electroluminescence in nanostructures of different dimensionalities: a comparative simulation study. , 2009, , .		0
134	Computational optoelectronics as analysis and design tool. , 2010, , .		0
135	Analysis of semiconductor nanowire arrays for photovoltaics. , 2011, , .		0
136	InGaN nanorod LEDs: A performance assessment. , 2012, , .		0
137	Frequency domain analysis of modes in a photonic crystal micro-opto-electro-mechanical system with periodically arranged circular holes. Optical and Quantum Electronics, 2012, 44, 273-277.	1.5	0
138	Introduction to the Issue on Numerical Simulation of Optoelectronic Devices. IEEE Journal of Selected Topics in Quantum Electronics, 2013, 19, 0200602-0200602.	1.9	0
139	VCSEL design for high power, densely packed arrays. , 2013, , .		0
140	Efficiency analysis of nano light emitting diodes. , 2014, , .		0
141	Simulation of water photo electrolysis with III-nitride semiconductor nano wires. , 2014, , .		0
142	Effect of doping and impurities on the efficiency of III-nitride light emitting diodes. , 2015, , .		0
143	Simulation and analysis of 1.55µm quantum dot lasers designed for ultra-narrow spectral linewidth. , 2015, , .		0
144	NEGF quantum transport for green MQW nitride LEDs. , 2017, , .		0

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145	Carrier transport in the multi quantum well region of III-nitride light emitting diodes. , 2017, , .		0
146	Planar Semiconductor THz Antennas Using Spoof Plasmons for Surface Sensing. , 2018, , .		0
147	Impedance Matching of THz Plasmonic Antennas. Journal of Infrared, Millimeter, and Terahertz Waves, 2019, 40, 929-942.	1.2	0
148	Surface-Emitting Superluminescent Diode Arrays. , 2019, , .		0
149	Sub-50 kHz Linewidth $1.55 \mu\text{m}$ Quantum Dot Distributed Feedback Lasers. , 2019, , .		0
150	Luminescence and Internal Quantum Efficiency of Deep UV Light Emitting Diodes. , 2020, , .		0
151	Quantum Information Interface on a Photonic Crystal Chip. , 2021, , .		0
152	Effect of Inhomogeneous Broadening in Deep Ultraviolet Light Emitting Diodes. , 2021, , .		0
153	Analysis of surface-emitting thin-film superluminescent diodes with high efficiency. , 2019, , .		0
154	Carrier injection efficiency in III-nitride light emitting diodes: effective potential correction. , 2020, , .		0