

Jochen Friedrich

List of Publications by Year in descending order

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132
papers

2,059
citations

293460

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388640

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135
all docs

135
docs citations

135
times ranked

1142
citing authors

#	ARTICLE	IF	CITATIONS
1	Material evaluation for engineering a novel crucible setup for the growth of oxygen free Czochralski silicon crystals. Journal of Crystal Growth, 2022, 584, 126582.	0.7	2
2	Lifetime limiting defects in 4H-SiC epitaxial layers: The influence of substrate originated defects. Journal of Crystal Growth, 2021, 560-561, 126033.	0.7	3
3	Influence of crucible properties and Si ₃ N ₄ -coating composition on the oxygen concentration in multi-crystalline silicon ingots. Journal of Crystal Growth, 2021, 568-569, 126178.	0.7	6
4	Factors influencing the gas bubble evolution and the cristobalite formation in quartz glass Cz crucibles for Czochralski growth of silicon crystals. Journal of Crystal Growth, 2021, 570, 126231.	0.7	3
5	High-Performance n-Type Ge-Free Silicon Thermoelectric Material from Silicon Waste. ACS Applied Materials & Interfaces, 2021, 13, 47912-47920.	4.0	4
6	Impact of silicon feedstock contamination by gas phase diffusion on material quality of cast silicon ingots. Journal of Crystal Growth, 2021, 570, 126224.	0.7	4
7	Numerical forecast of redzone extension in cast silicon ingots in dependence on the purity level of crucible, coating and feedstock. Journal of Crystal Growth, 2021, 574, 126304.	0.7	2
8	Physically-based, lumped-parameter models for the prediction of oxygen concentration during Czochralski growth of silicon crystals. Journal of Crystal Growth, 2021, 576, 126384.	0.7	3
9	Erlangen – An Important Center of Crystal Growth and Epitaxy: Major Scientific Results and Technological Solutions of the Last Four Decades. Crystal Research and Technology, 2020, 55, 1900053.	0.6	2
10	Investigation of gas bubble growth in fused silica crucibles for silicon Czochralski crystal growth. Journal of Crystal Growth, 2020, 533, 125470.	0.7	5
11	Vertical breakdown of GaN on Si due to V-pits. Journal of Applied Physics, 2020, 127, .	1.1	24
12	Stress evolution in thick GaN layers grown by HVPE. Journal of Crystal Growth, 2020, 550, 125887.	0.7	2
13	The impact of dislocations on AlGaIn/GaN Schottky diodes and on gate failure of high electron mobility transistors. Scientific Reports, 2020, 10, 17252.	1.6	29
14	Interplay between C-doping, threading dislocations, breakdown, and leakage in GaN on Si HEMT structures. AIP Advances, 2020, 10, .	0.6	15
15	Considerations on the limitations of the growth rate during pulling of silicon crystals by the Czochralski technique for PV applications. Journal of Crystal Growth, 2019, 524, 125168.	0.7	17
16	Deeper insight into lifetime-engineering in 4H-SiC by ion implantation. Journal of Applied Physics, 2019, 126, .	1.1	9
17	Production of high performance multi-crystalline silicon ingots for PV application by using contamination-free Si ₃ N ₄ seed particles. Journal of Crystal Growth, 2019, 522, 151-159.	0.7	7
18	Theoretical aspects and microstructural investigations on V-pit defects in HVPE grown GaN. Journal of Crystal Growth, 2019, 518, 51-58.	0.7	3

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19	Evaluation of improvement strategies of grain structure properties in high performance multi-crystalline silicon ingots. Journal of Crystal Growth, 2019, 514, 114-123.	0.7	8
20	Methodology for the investigation of threading dislocations as a source of vertical leakage in AlGaIn/GaN-HEMT heterostructures for power devices. Journal of Applied Physics, 2019, 125, .	1.1	30
21	Analysis of the geometry of the growth ridges and correlation to the thermal gradient during growth of silicon crystals by the Czochralski-method. Journal of Crystal Growth, 2019, 515, 26-31.	0.7	4
22	Thermoelectric properties of silicon and recycled silicon sawing waste. Journal of Materiomics, 2019, 5, 15-33.	2.8	24
23	Grain Boundaries in Multicrystalline Silicon. , 2019, , 589-636.		1
24	Grain Boundaries in Multicrystalline Silicon. , 2019, , 1-48.		0
25	Edge facet dynamics during the growth of heavily doped n-type silicon by the Czochralski-method. Journal of Crystal Growth, 2018, 491, 57-65.	0.7	12
26	Influence of different nucleation layers on the initial grain structure of multicrystalline silicon ingots. Journal of Crystal Growth, 2017, 465, 18-26.	0.7	20
27	A quantitative model with new scaling for silicon carbide particle engulfment during silicon crystal growth. Journal of Crystal Growth, 2017, 463, 100-109.	0.7	7
28	Dislocation formation in heavily As-doped Czochralski grown silicon. Crystal Research and Technology, 2017, 52, 1600373.	0.6	9
29	Dynamic Modeling of Critical Velocities for the Pushing/Engulfment Transition in the Si-SiC System Under Gravity Conditions. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2017, 48, 342-353.	1.1	6
30	Engulfment and pushing of Si ₃ N ₄ and SiC particles during directional solidification of silicon under microgravity conditions. Journal of Crystal Growth, 2017, 475, 33-38.	0.7	13
31	Particle engulfment dynamics under oscillating crystal growth conditions. Journal of Crystal Growth, 2017, 468, 24-27.	0.7	10
32	Evolution of grain structure and recombination active dislocations in extraordinary tall conventional and high performance multi-crystalline silicon ingots. Journal of Crystal Growth, 2017, 459, 67-75.	0.7	24
33	A Practical Example of GaN-LED Failure Cause Analysis by Application of Combined Electron Microscopy Techniques. Materials, 2017, 10, 1202.	1.3	2
34	Interaction of SiC particles with moving solid-liquid interface during directional solidification of silicon. Journal of Crystal Growth, 2016, 447, 18-26.	0.7	22
35	Phase-field simulations of particle capture during the directional solidification of silicon. Journal of Crystal Growth, 2016, 446, 12-26.	0.7	21
36	Correlation of carbon doping variations with the vertical breakdown of GaN-on-Si for power electronics. Microelectronics Reliability, 2016, 66, 16-21.	0.9	19

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37	Dislocation formation in seed crystals induced by feedstock indentation during growth of quasimono crystalline silicon ingots. <i>Journal of Crystal Growth</i> , 2016, 454, 6-14.	0.7	17
38	Clarification of the relation between the grain structure of industrial grown mc-Si and the area fraction of electrical active defects by means of statistical grain structure evaluation. <i>Acta Materialia</i> , 2016, 106, 98-105.	3.8	28
39	Nitride bonded silicon nitride as a reusable crucible material for directional solidification of silicon. <i>Crystal Research and Technology</i> , 2016, 51, 74-86.	0.6	14
40	Wetting and infiltration of nitride bonded silicon nitride by liquid silicon. <i>Journal of Crystal Growth</i> , 2016, 440, 31-37.	0.7	9
41	Influence of different seed materials on multi-crystalline silicon ingot properties. <i>Journal of Crystal Growth</i> , 2016, 434, 88-95.	0.7	28
42	Influence of grain boundaries intentionally induced between seed plates on the defect generation in quasi-mono-crystalline silicon ingots. <i>Crystal Research and Technology</i> , 2015, 50, 124-132.	0.6	36
43	Response of as grown dislocation structure to temperature and stress treatment in multi-crystalline silicon. <i>Acta Materialia</i> , 2015, 93, 129-137.	3.8	9
44	Guest Editors' Preface. <i>Crystal Research and Technology</i> , 2015, 50, 1-1.	0.6	3
45	Optical in-situ monitoring system for simultaneous measurement of thickness and curvature of thick layer stacks during hydride vapor phase epitaxy growth of GaN. <i>Journal of Crystal Growth</i> , 2015, 427, 99-103.	0.7	3
46	Investigation of iron contamination of seed crystals and its impact on lifetime distribution in Quasimono silicon ingots. <i>Journal of Crystal Growth</i> , 2015, 429, 56-62.	0.7	23
47	Czochralski Growth of Silicon Crystals. , 2015, , 45-104.		20
48	Defect formation induced by seed-joints during directional solidification of quasi-mono-crystalline silicon ingots. <i>Journal of Crystal Growth</i> , 2014, 405, 131-141.	0.7	62
49	Laue scanner: A new method for determination of grain orientations and grain boundary types of multicrystalline silicon on a full wafer scale. <i>Acta Materialia</i> , 2014, 69, 1-8.	3.8	37
50	Preferred grain orientations in silicon ribbons grown by the string ribbon and the edge-defined film-fed growth methods. <i>Journal of Crystal Growth</i> , 2014, 395, 74-79.	0.7	5
51	Numerical time-dependent 3D simulation of flow pattern and heat distribution in an ammonothermal system with various baffle shapes. <i>Journal of Crystal Growth</i> , 2014, 403, 96-104.	0.7	21
52	Unsteady coupled 3D calculations of melt flow, interface shape, and species transport for directional solidification of silicon in a traveling magnetic field. <i>Journal of Crystal Growth</i> , 2013, 367, 77-87.	0.7	26
53	Step-controlled homoepitaxial growth of 4H-SiC on vicinal substrates. <i>Journal of Crystal Growth</i> , 2013, 381, 127-133.	0.7	21
54	Numerical parameter studies of 3D melt flow and interface shape for directional solidification of silicon in a traveling magnetic field. <i>Journal of Crystal Growth</i> , 2013, 381, 169-178.	0.7	18

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55	Combined global 2D–local 3D modeling of the industrial Czochralski silicon crystal growth process. <i>Journal of Crystal Growth</i> , 2013, 368, 72-80.	0.7	18
56	Non-isothermal model experiments and numerical simulations for directional solidification of multicrystalline silicon in a traveling magnetic field. <i>Journal of Crystal Growth</i> , 2013, 372, 145-156.	0.7	27
57	Constitutional Supercooling in Czochralski Growth of Heavily Doped Silicon Crystals. <i>Acta Physica Polonica A</i> , 2013, 124, 219-226.	0.2	18
58	Experimental verification of the model by Klapper for 4H-SiC homoepitaxy on vicinal substrates. <i>Journal of Applied Physics</i> , 2013, 114, 183507.	1.1	9
59	Considerations on the Effect of Interstitial and Precipitated Fe in Intentionally Fe-Doped mc-Silicon. <i>Materials Science Forum</i> , 2012, 725, 145-148.	0.3	0
60	Doping induced lattice misfit in 4H-SiC homoepitaxy. <i>Journal of Crystal Growth</i> , 2012, 349, 43-49.	0.7	11
61	Cathodoluminescence imaging for the determination of dislocation density in differently doped HVPE GaN. <i>Journal of Crystal Growth</i> , 2012, 340, 78-82.	0.7	19
62	Analysis of the growth conditions of long single crystalline basal-plane-faceted sapphire ribbons by the Stepanov/EFG technique. <i>Journal of Crystal Growth</i> , 2012, 344, 38-44.	0.7	9
63	Mono-crystalline growth in directional solidification of silicon with different orientation and splitting of seed crystals. <i>Journal of Crystal Growth</i> , 2012, 351, 131-140.	0.7	88
64	Systematic characterization of multi-crystalline silicon String Ribbon wafer. <i>Journal of Crystal Growth</i> , 2012, 361, 38-43.	0.7	13
65	Model experiments and numerical simulations for directional solidification of multicrystalline silicon in a traveling magnetic field. <i>Journal of Crystal Growth</i> , 2011, 333, 7-15.	0.7	32
66	Threading dislocations in n- and p-type 4H-SiC material analyzed by etching and synchrotron X-ray topography. <i>Journal of Crystal Growth</i> , 2011, 314, 21-29.	0.7	45
67	Numerical study of the influence of different types of magnetic fields on the interface shape in directional solidification of multi-crystalline silicon ingots. <i>Journal of Crystal Growth</i> , 2011, 318, 293-297.	0.7	20
68	Liquid phase epitaxy (LPE) of GaN on c- and r-faces of AlN substrates. <i>Journal of Crystal Growth</i> , 2011, 322, 74-77.	0.7	3
69	Modeling of incorporation of O, N, C and formation of related precipitates during directional solidification of silicon under consideration of variable processing parameters. <i>Journal of Crystal Growth</i> , 2010, 312, 878-885.	0.7	74
70	About the formation and avoidance of C and N related precipitates during directional solidification of multi-crystalline silicon from contaminated feedstock. <i>Journal of Crystal Growth</i> , 2010, 312, 1510-1516.	0.7	52
71	The influence of growth rate on the formation and avoidance of C and N related precipitates during directional solidification of multi-crystalline silicon. <i>Journal of Crystal Growth</i> , 2010, 312, 1517-1524.	0.7	69
72	Selective etching of dislocations in GaN grown by low-pressure solution growth. <i>Journal of Crystal Growth</i> , 2010, 312, 3040-3045.	0.7	14

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73	Optimization and Modeling of Photovoltaic Silicon Crystallization Processes. AIP Conference Proceedings, 2010, , .	0.3	13
74	Low Pressure Solution Growth of Gallium Nitride. Springer Series in Materials Science, 2010, , 245-273.	0.4	4
75	Influence of forced convection on the directional solidification of AlSi alloys: comparison of experiments and simulation. Progress in Computational Fluid Dynamics, 2009, 9, 357.	0.1	0
76	Vapor phase growth of GaN using GaN powder sources and thermogravimetric investigations of the evaporating behaviour of the source material. Crystal Research and Technology, 2008, 43, 14-21.	0.6	6
77	Simulation of dislocation density: Global modeling of bulk crystal growth by a quasi-steady approach of the Alexander-Haasen concept. Journal of Crystal Growth, 2008, 310, 501-507.	0.7	9
78	Low-pressure solution growth (LPSG) of GaN templates with diameters up to 3 inch. Journal of Crystal Growth, 2008, 310, 738-747.	0.7	22
79	Reduction of the dislocation density in GaN during low-pressure solution growth. Journal of Crystal Growth, 2008, 310, 3351-3357.	0.7	16
80	On the influence of solution density on the formation of macroscopic defects in the liquid phase epitaxy of GaN. Journal of Crystal Growth, 2008, 311, 62-65.	0.7	8
81	Numerical study on the prediction of microstructure parameters by multi-scale modeling of directional solidification of binary aluminum-silicon alloys. Computational Materials Science, 2008, 43, 872-885.	1.4	7
82	Crystal growth of compound semiconductors with low dislocation densities. , 2008, , .		1
83	The importance of convective heat and mass transfer for controlling material properties in ingot casting of multi-crystalline-silicon for photovoltaic applications. , 2008, , .		3
84	3D time-dependent numerical study of the influence of the melt flow on the interface shape in a silicon ingot casting process. Journal of Crystal Growth, 2007, 303, 231-235.	0.7	51
85	A new hybrid method for the global modeling of convection in CZ crystal growth configurations. Journal of Crystal Growth, 2007, 303, 124-134.	0.7	30
86	Influence of different types of magnetic fields on the interface shape in a 200mm Si-EMCZ configuration. Journal of Crystal Growth, 2007, 303, 221-225.	0.7	12
87	Study on the kinetics of the formation reaction of GaN from Ga-solutions under ammonia atmosphere. Journal of Crystal Growth, 2007, 305, 326-334.	0.7	11
88	Study on the sublimation growth of GaN using different powder sources and investigation on the sublimation behaviour of GaN powder by means of thermogravimetry. Physica Status Solidi C: Current Topics in Solid State Physics, 2007, 4, 2264-2267.	0.8	7
89	Characterisation of the electrical properties of solution-grown GaN crystals by reflectivity and Hall measurements. Physica Status Solidi C: Current Topics in Solid State Physics, 2006, 3, 575-578.	0.8	9
90	Morphologies of GaN single crystals grown from Ga solutions under flowing ammonia. Journal of Crystal Growth, 2006, 292, 201-205.	0.7	10

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91	Large modification of crystal–melt interface shape during Si crystal growth by using electromagnetic Czochralski method (EMCZ). Journal of Crystal Growth, 2006, 292, 252-256.	0.7	18
92	Considerations on facetting and on the atomic structure of the phase boundary in low-pressure solution growth of GaN. Journal of Crystal Growth, 2006, 297, 133-137.	0.7	8
93	Simulation of ESA's msl Furnace Inserts and Sample-Cartridge Assemblies Using the Thermal Modeling Tool Crysvun. Materials Science Forum, 2006, 508, 151-156.	0.3	2
94	A Combined Numerical and Experimental Study of the Effects of Controlled Fluid Flow on Alloy Solidification. Materials Science Forum, 2006, 519-521, 1753-1758.	0.3	1
95	Study of the oxygen incorporation during growth of large CaF ₂ -crystals. Journal of Crystal Growth, 2005, 273, 629-637.	0.7	19
96	Modeling of industrial bulk crystal growth—state of the art and challenges. Journal of Crystal Growth, 2005, 275, 240-250.	0.7	11
97	Macrosegregation in binary AlSi ₇ alloys resulting from the application of time dependent magnetic fields. Microgravity Science and Technology, 2005, 16, 59-63.	0.7	1
98	MICAST – The effect of magnetically controlled fluid flow on microstructure evolution in cast technical Al-alloys. Microgravity Science and Technology, 2005, 16, 99-103.	0.7	6
99	Characterisation of GaN crystals and epilayers grown from a solution at room pressure. Physica Status Solidi C: Current Topics in Solid State Physics, 2005, 2, 2040-2043.	0.8	15
100	Simulation of ESA's™s MSL Furnace Inserts and Sample-Cartridge Assemblies: Model Development and Correlation with Experimental Data. , 2005, , .		0
101	Growth and characterization of 2" and 4" low EPD InP substrate crystals by the vertical gradient freeze (VGF)-method. , 2005, , .		0
102	Numerical study on directional solidification of AlSi alloys with rotating magnetic fields under microgravity conditions. Journal of Materials Science, 2004, 39, 2011-2015.	1.7	37
103	A matrix based correction scheme of the liquid fraction during columnar solidification. International Journal of Heat and Mass Transfer, 2004, 47, 2883-2887.	2.5	2
104	Comparative numerical study of the effects of rotating and travelling magnetic fields on the interface shape and thermal stress in the VGF growth of InP crystals. Journal of Crystal Growth, 2004, 266, 224-228.	0.7	47
105	Challenges in modeling of bulk crystal growth. Journal of Crystal Growth, 2004, 266, 1-19.	0.7	48
106	Three-dimensional modeling of melt flow and interface shape in the industrial liquid-encapsulated Czochralski growth of GaAs. Journal of Crystal Growth, 2004, 266, 396-403.	0.7	25
107	Numerical modeling of crystal growth and solidification experiments carried out under microgravity conditions. Crystal Research and Technology, 2003, 38, 726-733.	0.6	13
108	Experimental Verification of the Numerical Model for a CaF ₂ Crystal Growth Process. Crystal Research and Technology, 2002, 37, 77-82.	0.6	25

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109	Systematic study of the influence of the Czochralski hot zone design on the point defect distribution with respect to a "perfect" crystal. <i>Materials Science in Semiconductor Processing</i> , 2002, 5, 361-367.	1.9	8
110	Numerical simulation of formation of grain structure and global heat transport during solidification of technical alloys in MSL inserts. <i>Advances in Space Research</i> , 2002, 29, 549-552.	1.2	2
111	Equipment and Process Modelling of Industrial Crystal Growth Using the Finite Volume Codes CrysVUn and STHAMAS. <i>Mathematics in Industry</i> , 2002, , 218-222.	0.1	3
112	Comparison of the predictions from 3D numerical simulation with temperature distributions measured in Si Czochralski melts under the influence of different magnetic fields. <i>Journal of Crystal Growth</i> , 2001, 230, 73-80.	0.7	58
113	3D numerical simulation of melt flow in the presence of a rotating magnetic field. <i>International Journal of Numerical Methods for Heat and Fluid Flow</i> , 2000, 10, 366-384.	1.6	15
114	On void engulfment in shaped sapphire crystals using 3D modelling. <i>Journal of Crystal Growth</i> , 2000, 218, 74-80.	0.7	17
115	The use of time-dependent magnetic fields for control of convective flows in melt growth configurations. <i>Journal of Crystal Growth</i> , 1999, 198-199, 170-175.	0.7	23
116	Experimental and numerical study of Rayleigh-Bénard convection affected by a rotating magnetic field. <i>Physics of Fluids</i> , 1999, 11, 853-861.	1.6	42
117	Experimental and Numerical Analysis of the Influence of a Rotating Magnetic Field on Convection in Rayleigh-Bénard Configurations. <i>Fluid Mechanics and Its Applications</i> , 1999, , 279-294.	0.1	4
118	Experimental and theoretical analysis of convection and segregation in vertical Bridgman growth under high gravity on a centrifuge. <i>Journal of Crystal Growth</i> , 1996, 167, 45-63.	0.7	30
119	Optical cross-sections and distribution of Fe ²⁺ and Fe ³⁺ in semi-insulating liquid encapsulated Czochralski grown InP:Fe. <i>Materials Science and Engineering B: Solid-State Materials for Advanced Technology</i> , 1993, 21, 321-324.	1.7	17
120	Influence of Substrate Preparation and Epitaxial Growth Parameters on the Dislocation Densities in 4H-SiC Epitaxial Layers. <i>Materials Science Forum</i> , 0, 600-603, 143-146.	0.3	12
121	Influence of Growth Rate and C/Si-Ratio on the Formation of Point and Extended Defects in 4H-SiC Homoepitaxial Layers Investigated by DLTS. <i>Materials Science Forum</i> , 0, 615-617, 393-396.	0.3	4
122	Dislocation Conversion and Propagation during Homoepitaxial Growth of 4H-SiC. <i>Materials Science Forum</i> , 0, 645-648, 299-302.	0.3	11
123	4H-SiC Homoepitaxial Growth on Substrates with Different Off-Cut Directions. <i>Materials Science Forum</i> , 0, 679-680, 55-58.	0.3	6
124	Influence of Epilayer Thickness and Structural Defects on the Minority Carrier Lifetime in 4H-SiC. <i>Materials Science Forum</i> , 0, 740-742, 633-636.	0.3	5
125	SXRT Investigations on Electrically Stressed 4H-SiC PiN Diodes for 6.5 kV. <i>Materials Science Forum</i> , 0, 740-742, 899-902.	0.3	3
126	HCl Assisted Growth of Thick 4H-SiC Epilayers for Bipolar Devices. <i>Materials Science Forum</i> , 0, 778-780, 210-213.	0.3	1

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127	Electrically Inactive Dopants in Heavily Doped As-Grown Czochralski Silicon. Solid State Phenomena, 0, 242, 10-14.	0.3	2
128	Imaging Defect Luminescence of 4H-SiC by Ultraviolet-Photoluminescence. Solid State Phenomena, 0, 242, 484-489.	0.3	14
129	Investigations of Critical Structural Defects in Active Layers of GaN-on-Si for Power Electronic Devices. Solid State Phenomena, 0, 242, 417-420.	0.3	1
130	Modelling of Effective Minority Carrier Lifetime in 4H-SiC n-Type Epilayers. Materials Science Forum, 0, 858, 341-344.	0.3	2
131	Optical Stressing of 4H-SiC Material and Devices. Materials Science Forum, 0, 924, 196-199.	0.3	2
132	Influence and Mutual Interaction of Process Parameters on the $Z^{1/2}$ Defect Concentration during Epitaxy of 4H-SiC. Materials Science Forum, 0, 924, 112-115.	0.3	4