Ingo Steinbach

List of Publications by Year
in descending order

148 papers	7,872 citations	66234 42 h-index	51492 86 g-index
153 all docs	153 docs citations	153 times ranked	3448 citing authors

#	Article	IF	Citations
1	Phase-field models in materials science. Modelling and Simulation in Materials Science and Engineering, 2009, 17, 073001.	0.8	963
2	A phase field concept for multiphase systems. Physica D: Nonlinear Phenomena, 1996, 94, 135-147.	1.3	778
3	Modeling Melt Convection in Phase-Field Simulations of Solidification. Journal of Computational Physics, 1999, 154, 468-496.	1.9	545
4	A generalized field method for multiphase transformations using interface fields. Physica D: Nonlinear Phenomena, 1999, 134, 385-393.	1.3	466
5	Multiphase-field approach for multicomponent alloys with extrapolation scheme for numerical application. Physical Review E, 2006, 73, 066122.	0.8	411
6	The multiphase-field model with an integrated concept for modelling solute diffusion. Physica D: Nonlinear Phenomena, 1998, 115, 73-86.	1.3	367
7	Multi phase field model for solid state transformation with elastic strain. Physica D: Nonlinear Phenomena, 2006, 217, 153-160.	1.3	215
8	Phase-Field Model for Microstructure Evolution at the Mesoscopic Scale. Annual Review of Materials Research, 2013, 43, 89-107.	4.3	215
9	Phase field simulation of equiaxed solidification in technical alloys. Acta Materialia, 2006, 54, 2697-2704.	3.8	206
10	Phase-field model with finite interface dissipation. Acta Materialia, 2012, 60, 2689-2701.	3.8	148
11	Phase-field model with finite interface dissipation: Extension to multi-component multi-phase alloys. Acta Materialia, 2012, 60, 2702-2710.	3.8	110
12	Simulation of convection and ripening in a binary alloy mush using the phase-field method. Acta Materialia, 1999, 47, 3663-3678.	3.8	105
13	On the formation and growth of Mo-rich Laves phase particles during long-term creep of a 12% chromium tempered martensite ferritic steel. Scripta Materialia, 2009, 61, 1068-1071.	2.6	100
14	Roadmap on multiscale materials modeling. Modelling and Simulation in Materials Science and Engineering, 2020, 28, 043001.	0.8	100
15	The role of carbon diffusion in ferrite on the kinetics of cooperative growth of pearlite: A multi-phase field study. Acta Materialia, 2006, 54, 3665-3672.	3.8	94
16	Atomic mobilities and diffusivities in the fcc, L1₂and B2 phases of the Ni-Al system. International Journal of Materials Research, 2010, 101, 1461-1475.	0.1	91
17	CALPHAD and Phase-Field Modeling: A Successful Liaison. Journal of Phase Equilibria and Diffusion, 2007, 28, 101-106.	0.5	87
18	Diffusivities of an Alâ€“Feâ€“Ni melt and their effects on the microstructure during solidification. Acta Materialia, 2010, 58, 3664-3675.	3.8	86

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19	3-D phase-field simulation of grain growth: Topological analysis versus mean-field approximations. Acta Materialia, 2012, 60, 2719-2728.	3.8	84
20	Incorporating the CALPHAD sublattice approach of ordering into the phase-field model with finite interface dissipation. Acta Materialia, 2015, 88, 156-169.	3.8	81
21	Pattern formation in constrained dendritic growth with solutal buoyancy. Acta Materialia, 2009, 57, 2640-2645.	3.8	78
22	Concentration-dependent atomic mobilities in FCC CoCrFeMnNi high-entropy alloys. Acta Materialia, 2019, 166, 357-370.	3.8	74
23	Phase-field modelling of as-cast microstructure evolution in nickel-based superalloys. Acta Materialia, 2009, 57, 5862-5875.	3.8	71
24	Three-dimensional modeling of equiaxed dendritic growth on a mesoscopic scale. Acta Materialia, 1999, 47, 971-982.	3.8	67
25	Diffuse-interface modeling of solute trapping in rapid solidification: Predictions of the hyperbolic phase-field model and parabolic model with finite interface dissipation. Acta Materialia, 2013, 61, 4155-4168.	3.8	64
26	Effect of interface anisotropy on spacing selection in constrained dendrite growth. Acta Materialia, 2008, 56, 4965-4971.	3.8	61
27	The influence of lattice strain on pearlite formation in Feâ€“C. Acta Materialia, 2007, 55, 4817-4822.	3.8	57
28	Phase-field modeling for 3D grain growth based on a grain boundary energy database. Modelling and Simulation in Materials Science and Engineering, 2014, 22, 034004.	0.8	56
29	Topological phase inversion after long-term thermal exposure of nickel-base superalloys: Experiment and phase-field simulation. Acta Materialia, 2017, 124, 151-158.	3.8	55
30	Phase-field simulation of diffusion couples in the Niâ€“Al system. International Journal of Materials Research, 2011, 102, 371-380.	0.1	54
31	Why Solidification? Why Phase-Field?. Jom, 2013, 65, 1096-1102.	0.9	54
32	Phase-field modelling of microstructure evolution in solids: Perspectives and challenges. Current Opinion in Solid State and Materials Science, 2011, 15, 87-92.	5.6	53
33	Grain Growth Simulations Including Particle Pinning Using the Multiphase-field Concept. ISIJ International, 2009, 49, 1024-1029.	0.6	52
34	On the effect of superimposed external stresses on the nucleation and growth of Ni4Ti3 particles: A parametric phase field study. Acta Materialia, 2011, 59, 3287-3296.	3.8	52
35	Phase-field study of zener drag and pinning of cylindrical particles in polycrystalline materials. Acta Materialia, 2016, 106, 59-65.	3.8	52
36	2D and 3D phase-field simulations of lamella and fibrous eutectic growth. Journal of Crystal Growth, 2002, 237-239, 154-158.	0.7	50

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37	Small droplets on superhydrophobic substrates. Physical Review E, 2010, 81, 051606.	0.8	50
38	History effects during the selection of primary dendrite spacing. Comparison of phase-field simulations with experimental observations. Journal of Crystal Growth, 2002, 237-239, 149-153.	0.7	48
39	Dendritic solidification in undercooled Niâ€“Zrâ€“Al melts: Experiments and modeling. Acta Materialia, 2009, 57, 6166-6175.	3.8	48
40	Combined phase-field crystal plasticity simulation of P- and N-type rafting in Co-based superalloys. Acta Materialia, 2019, 175, 21-34.	3.8	48
41	Parallel multiphase field simulations with OpenPhase. Computer Physics Communications, 2017, 215, 173-187.	3.0	47
42	Investigation of eutectic island formation in SX superalloys. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2005, 413-414, 267-271.	2.6	44
43	Controlling Microstructure in Magnesium Alloys: A Combined Thermodynamic, Experimental and Simulation Approach. Advanced Engineering Materials, 2006, 8, 241-247.	1.6	43
44	Upgrading CALPHAD to microstructure simulation: the phase-field method. International Journal of Materials Research, 2009, 100, 128-134.	0.1	43
45	Roughness-gradientâ€“induced spontaneous motion of droplets on hydrophobic surfaces: A lattice Boltzmann study. Europhysics Letters, 2010, 89, 26006.	0.7	42
46	Role of inclination dependence of grain boundary energy on the microstructure evolution during grain growth. Acta Materialia, 2020, 188, 641-651.	3.8	42
47	Transient growth and interaction of equiaxed dendrites. Journal of Crystal Growth, 2005, 275, 624-638.	0.7	41
48	Phase-Field Simulation of Solidification and Solid-State Transformations in Multicomponent Steels. Steel Research International, 2008, 79, 608-616.	1.0	40
49	Simulating Mobile Dendrites in a Flow. Procedia Computer Science, 2013, 18, 2512-2520.	1.2	40
50	Geometrical grounds of mean field solutions for normal grain growth. Acta Materialia, 2015, 90, 252-258.	3.8	39
51	On the evolution of cast microstructures during processing of single crystal Ni-base superalloys using a Bridgman seed technique. Materials and Design, 2017, 128, 98-111.	3.3	38
52	Modeling of Gibbs energies of pure elements down to 0 K using segmented regression. Calphad: Computer Coupling of Phase Diagrams and Thermochemistry, 2016, 55, 165-180.	0.7	37
53	On Crystal Mosaicity in Single Crystal Ni-Based Superalloys. Crystals, 2019, 9, 149.	1.0	36
54	Simulation of the Î³-Î±-transformation using the phase-field method. Steel Research = Archiv FÃ¼r Das EisenhÃ¼ttenwesen, 2001, 72, 354-360.	0.2	34

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55	Viscous coalescence of droplets: A lattice Boltzmann study. Physics of Fluids, 2013, 25, .	1.6	32
56	45-degree rafting in Ni-based superalloys: A combined phase-field and strain gradient crystal plasticity study. International Journal of Plasticity, 2020, 128, 102659.	4.1	32
57	Phase-field simulation of martensite microstructure in low-carbon steel. Acta Materialia, 2019, 175, 415-425.	3.8	28
58	Modeling the flow in diffuse interface methods of solidification. Physical Review E, 2015, 92, 023303.	0.8	26
59	Stability and dynamics of droplets on patterned substrates: insights from experiments and lattice Boltzmann simulations. Journal of Physics Condensed Matter, 2011, 23, 184112.	0.7	25
60	Virtual dilatometer curves and effective Youngâ€™s modulus of a 3D multiphase structure calculated by the phase-field method. Computational Materials Science, 2009, 45, 589-592.	1.4	24
61	Contact angle dependence of the velocity of sliding cylindrical drop on flat substrates. Europhysics Letters, 2011, 95, 44003.	0.7	24
62	Phase-field modeling of grain-boundary premelting using obstacle potentials. Physical Review E, 2014, 90, 012401.	0.8	24
63	Role of coherency loss on rafting behavior of Ni-based superalloys. Computational Materials Science, 2020, 171, 109279.	1.4	24
64	Effect of Î³â€² precipitate size on hardness and creep properties of Ni-base single crystal superalloys: Experiment and simulation. Materialia, 2020, 12, 100692.	1.3	24
65	Divorced Eutectic Solidification of Mg-Al Alloys. Jom, 2015, 67, 1805-1811.	0.9	22
66	Large strain elasto-plasticity for diffuse interface models. Modelling and Simulation in Materials Science and Engineering, 2014, 22, 034008.	0.8	20
67	Integrated Approach for the Development of Advanced, Coated Gas Turbine Blades. Advanced Engineering Materials, 2006, 8, 535-562.	1.6	19
68	An analytical study of the static state of multi-junctions in a multi-phase field model. Physica D: Nonlinear Phenomena, 2011, 240, 382-388.	1.3	19
69	Numerical simulations for silicon crystallization processesâ€"examples from ingot and ribbon casting. Solar Energy Materials and Solar Cells, 2002, 72, 59-68.	3.0	18
70	Texture evolution in deformed AZ31 magnesium sheets: Experiments and phase-field study. Computational Materials Science, 2015, 104, 193-199.	1.4	17
71	Simulation of viscous sintering using the lattice Boltzmann method. Modelling and Simulation in Materials Science and Engineering, 2013, 21, 025003.	0.8	16
72	Phase-field simulation of rapid crystallization of silicon on substrate. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2007, 449-451, 95-98.	2.6	15

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73	Multiscale simulations on the grain growth process in nanostructured materials. International Journal of Materials Research, 2010, 101, 1332-1338.	0.1	15
74	Solutal gradients in strained equilibrium. Philosophical Magazine Letters, 2013, 93, 680-687.	0.5	15
75	Computationally Efficient Phase-field Simulation Studies Using RVE Sampling and Statistical Analysis. Computational Materials Science, 2018, 147, 204-216.	1.4	15
76	Numerical Benchmark of Phase-Field Simulations with Elastic Strains: Precipitation in the Presence of Chemo-Mechanical Coupling. Computational Materials Science, 2018, 155, 541-553.	1.4	15
77	First Evidence for Mechanism of Inverse Ripening from In-situ TEM and Phase-Field Study of Î´â€² Precipitation in an Al-Li Alloy. Scientific Reports, 2019, 9, 3981.	1.6	15
78	Modeling of Hot Ductility During Solidification of Steel Grades in Continuous Casting â€“ Part I. Advanced Engineering Materials, 2010, 12, 94-100.	1.6	14
79	DFT-supported phase-field study on the effect of mechanically driven fluxes in Ni₄Ti₃precipitation. Modelling and Simulation in Materials Science and Engineering, 2014, 22, 034003.	0.8	14
80	Gamma-channel stabilization mechanism in Ni-base superalloys. Philosophical Magazine Letters, 2015, 95, 519-525.	0.5	14
81	Interaction of Interdendritic Convection and Dendritic Primary Spacing: Phase-Field Simulation and Analytical Modeling. Materials Science Forum, 2006, 508, 145-150.	0.3	13
82	Modelling of Hot Ductility during Solidification of Steel Grades in Continuous Casting â€“ Part II. Advanced Engineering Materials, 2010, 12, 101-109.	1.6	13
83	Multi-phase field study of the equilibrium state of multi-junctions. International Journal of Materials Research, 2010, 101, 480-485.	0.1	13
84	Microsegregation and Secondary Phase Formation During Directional Solidification of the Single-Crystal Ni-Based Superalloy LEK94. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2012, 43, 5153-5164.	1.1	12
85	Solute trapping in non-equilibrium solidification: A comparative model study. Materialia, 2019, 6, 100256.	1.3	12
86	Pair-exchange diffusion model for multicomponent alloys revisited. Materialia, 2021, 16, 101047.	1.3	12
87	Microstructure analyses and phase-field simulation of partially divorced eutectic solidification in hypoeutectic Mg-Al Alloys. Journal of Magnesium and Alloys, 2022, 10, 1672-1679.	5.5	12
88	Simulation of the crystallisation of silicon ribbons on substrate. Solar Energy Materials and Solar Cells, 2002, 72, 201-208.	3.0	11
89	Primary combination of phase-field and discrete dislocation dynamics methods for investigating athermal plastic deformation in various realistic Ni-base single crystal superalloy microstructures. Modelling and Simulation in Materials Science and Engineering, 2015, 23, 075003.	0.8	11
90	Comparative study of different anisotropy and potential formulations of phase-field models for dendritic solidification. Computational Materials Science, 2019, 170, 109197.	1.4	11

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91	Recent Advances in Understanding Diffusion in Multiprincipal Element Systems. Annual Review of Materials Research, 2022, 52, 383-409.	4.3	11
92	Large scale 3-D phase-field simulation of coarsening in Ni-base superalloys. MATEC Web of Conferences, 2014, 14, 11001.	0.1	10
93	Microstructure Design of Tempered Martensite by Atomistically Informed Full-Field Simulation: From Quenching to Fracture. Materials, 2016, 9, 673.	1.3	10
94	Multi-phase-field model for surface and phase-boundary diffusion. Physical Review E, 2017, 96, 012801.	0.8	10
95	Multi-phase-field simulation of microstructure evolution in metallic foams. Scientific Reports, 2020, 10, 19987.	1.6	10
96	Automated assessment of a kinetic database for fcc Coâ€“Crâ€“Feâ€“Mnâ€“Ni high entropy alloys. Modelling and Simulation in Materials Science and Engineering, 2021, 29, 055007.	0.8	10
97	Automated image analysis for quantification of materials microstructure evolution. Modelling and Simulation in Materials Science and Engineering, 2021, 29, 055012.	0.8	10
98	Finite element integration for the control volume method. Communications in Numerical Methods in Engineering, 1996, 12, 543-555.	1.3	9
99	Large deformation framework for phase-field simulations at the mesoscale. Computational Materials Science, 2015, 108, 367-373.	1.4	9
100	On the numerical evaluation of local curvature for diffuse interface models of microstructure evolution. Procedia Computer Science, 2017, 108, 1852-1862.	1.2	9
101	Modelling of Microstructure Formation in Metal Additive Manufacturing: Recent Progress, Research Gaps and Perspectives. Metals, 2021, 11, 1425.	1.0	9
102	Numerical Determination of Heat Distribution and Castability Simulations of as Cast Mgâ€”Al Alloys. Advanced Engineering Materials, 2009, 11, 162-168.	1.6	8
103	Phase-field model with plastic flow for grain growth in nanocrystalline material. Philosophical Magazine, 2010, 90, 485-499.	0.7	8
104	Morphologies of small droplets on patterned hydrophobic substrates. Modelling and Simulation in Materials Science and Engineering, 2011, 19, 045005.	0.8	8
105	Multi-phase-field method for surface tension induced elasticity. Physical Review B, 2018, 97, .	1.1	8
106	Controlling bubble coalescence in metallic foams: A simple phase field-based approach. Computational Materials Science, 2020, 173, 109437.	1.4	8
107	Simulation of Ideal Grain Growth Using the Multi-Phase-Field Model. Materials Science Forum, 2007, 558-559, 1177-1181.	0.3	7
108	Phase-field modeling of pores and precipitates in polycrystalline systems. Modelling and Simulation in Materials Science and Engineering, 2018, 26, 065003.	0.8	7

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109	Microstructural analysis of the crystallization of silicon ribbons produced by the RGS process. , 0, , .		6
110	Pearlite revisited. Continuum Mechanics and Thermodynamics, 2012, 24, 665-673.	1.4	6
111	Dual-scale phase-field simulation of Mg-Al alloy solidification. IOP Conference Series: Materials Science and Engineering, 2015, 84, 012069.	0.3	6
112	Atomistically Informed Extended Gibbs Energy Description for Phase-Field Simulation of Tempering of Martensitic Steel. Materials, 2016, 9, 669.	1.3	6
113	Phase-field simulation of liquid phase migration in the WCâ€"Co system during liquid phase sintering. International Journal of Materials Research, 2016, 107, 309-314.	0.1	6
114	Quantitative simulations of microstructure evolution in single crystal superalloys during solution heat treatment. International Heat Treatment and Surface Engineering, 2009, 3, 40-44.	0.2	5
115	A permeation model for the electrochemical interface. Modelling and Simulation in Materials Science and Engineering, 2013, 21, 074006.	0.8	5
116	From wetting to melting along grain boundaries using phase field and sharp interface methods. Computational Materials Science, 2015, 108, 293-300.	1.4	5
117	Quantum-Phase-Field Concept of Matter: Emergent Gravity in the Dynamic Universe. Zeitschrift Fur Naturforschung - Section A Journal of Physical Sciences, 2017, 72, 51-58.	0.7	5
118	The modelling of Ostwald-ripening during non-isothermal heat treatments resulting in temperature dependent matrix solubility of the precipitate forming elements: A further development of the LSW-theory. Computational Materials Science, 1996, 7, 94-97.	1.4	4
119	Phase-Field Simulation of Cooperative Growth of Pearlite. Materials Science Forum, 2007, 558-559, 1013-1020.	0.3	4
120	Second Symposium on Phase-Field Modelling in Materials Science. International Journal of Materials Research, 2010, 101, 455-455.	0.1	4
121	Tertiary dendritic instability in late stage solidification of Ni-based superalloys. Modelling and Simulation in Materials Science and Engineering, 2014, 22, 025026.	0.8	4
122	Macroscopic and microscopic modeling of the growth of YBaCuO bulk material. IEEE Transactions on Applied Superconductivity, 1997, 7, 1739-1742.	1.1	3
123	Modelling of flow behaviour and dynamic recrystallization during hot deformation of MS-W 1200 using the phase field framework. MATEC Web of Conferences, 2016, 80, 01003.	0.1	3
124	Grain boundary energy landscape from the shape analysis of synthetically stabilized embedded grains. Computational Materials Science, 2021, 193, 110384.	1.4	3
125	Quantum-Phase-Field: From de Broglieâ€"Bohm Double-Solution Program to Doublon Networks. Zeitschrift Fur Naturforschung - Section A Journal of Physical Sciences, 2020, 75, 155-170.	0.7	3
126	Numerical Study of Epitaxial Growth after Partial Remelting during Selective Electron Beam Melting in the Context of Niâ€"Al. Metals, 2021, 11, 2012.	1.0	3

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127	Model for non-equilibrium vacancy diffusion applied to study the Kirkendall effect in high-entropy alloys. Acta Materialia, 2022, 232, 117966.	3.8	3
128	A continuum mechanical, bi-phasic, two-scale model for thermal driven phase transition during solidification. Proceedings in Applied Mathematics and Mechanics, 2015, 15, 409-410.	0.2	2
129	Full-field simulation of solidification and forming of polycrystals. MATEC Web of Conferences, 2016, 80, 02014.	0.1	2
130	Martensitic transformation in a twoâ€dimensional polycrystalline shape memory alloys using a multiâ€phaseâ€field elasticity model based on pairwise rankâ€one convexified energies at small strain. Proceedings in Applied Mathematics and Mechanics, 2021, 20, e202000200.	0.2	2
131	Dendritic Solidification in the Diffuse Regime and under the Influence of Buoyancy-Driven Melt Convection. , 0, , 373-385.		2
132	Microstructure property classification of nickel-based superalloys using deep learning. Modelling and Simulation in Materials Science and Engineering, 2022, 30, 025009.	0.8	2
133	Modeling of Free Surfaces in Casting Processes. Notes on Numerical Fluid Mechanics, 1998, , 168-186.	0.1	2
134	Phase Field Modeling of the Growth of mc-Silicon from the Melt. Solid State Phenomena, 1999, 67-68, 453-458.	0.3	1
135	Dual Scale Simulation of Grain Growth Using a Multi Phase Field Model. Materials Research Society Symposia Proceedings, 2001, 677, 7141.	0.1	1
136	Efficient and reliable finite element techniques for phase field models. International Journal of Materials Research, 2010, 101, 498-502.	0.1	1
137	Benchmark for the Coupled Magneto-Mechanical Boundary Value Problem in Magneto-Active Elastomers. Materials, 2021, 14, 2380.	1.3	1
138	Interaction of Interdendritic Convection and Dendritic Primary Spacing: Phase-Field Simulation and Analytical Modeling. Materials Science Forum, 0, , 145-150.	0.3	1
139	Grain Refinement of Î³-TiAl Based Alloys by Inoculation. Materials Research Society Symposia Proceedings, 2008, 1128, 30201.	0.1	0
140	Microstructure evolution and phase transitions in metals simulated by the multi-phase-field method. Revue De Metallurgie, 2008, 105, 637-640.	0.3	0
141	Simulation of the External Pressure Influence on the Micro-Structural Evolution of a Single Crystal Ni-Based Superalloy. Advanced Materials Research, 0, 278, 247-252.	0.3	0
142	Applications of scale-bridging to computational materials design. Modelling and Simulation in Materials Science and Engineering, 2014, 22, 030201.	0.8	0
143	Multi-Scale and Multi-Component Approach for Solidification Processes. Proceedings in Applied Mathematics and Mechanics, 2014, 14, 465-466.	0.2	0
144	Simulations of the Eutectic Transformations in the Platinumâ€"Carbon System. International Journal of Thermophysics, 2015, 36, 3366-3383.	1.0	0

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145	Phase field modeling of intercalation kinetics: a finite interface dissipation approach. MRS Communications, 2016, 6, 270-282.	0.8	0
146	Fundamentals: alloy thermodynamics and kinetics of diffusion. , 2022, , 21-40.		0
147	Is There a Difference Between Dendrites of a Binary or a Ternary Alloy? Some Answers by Phase-Field Simulations. , 2002, , .		0
148	Modeling of Free Surfaces in Casting Processes. , 1998, , 168-186.		0