Jeffrey J Derby

List of Publications by Year
in descending order

137 papers	3,041 citations	136950 32 h-index	223800 46 g-index
145 all docs	145 docs citations	145 times ranked	1229 citing authors

#	Article	IF	Citations
1	Heat transfer and interface inversion during the Czochralski growth of yttrium aluminum garnet and gadolinium gallium garnet. Journal of Crystal Growth, 1994, 139, 147-157.	1.5	113
2	Modeling the vertical Bridgman growth of cadmium zinc telluride I. Quasi-steady analysis of heat transfer and convection. Journal of Crystal Growth, 1995, 155, 93-102.	1.5	90
3	Effect of accelerated crucible rotation on melt composition in high-pressure vertical Bridgman growth of cadmium zinc telluride. Journal of Crystal Growth, 2000, 209, 734-750.	1.5	88
4	Permeability calculations in three-dimensional isotropic and oriented fiber networks. Physics of Fluids, 2008, 20, 123601.	4.0	85
5	Viscous Sintering of Spherical Particles via Finite Element Analysis. Journal of the American Ceramic Society, 1995, 78, 645-649.	3.8	83
6	The role of internal radiation and melt convection in Czochralski oxide growth: deep interfaces, interface inversion, and spiraling. Journal of Crystal Growth, 1993, 128, 188-194.	1.5	81
7	Modeling the vertical Bridgman growth of cadmium zinc telluride II. Transient analysis of zinc segregation. Journal of Crystal Growth, 1995, 155, 103-111.	1.5	72
8	Three-dimensional melt flows in Czochralski oxide growth: high-resolution, massively parallel, finite element computations. Journal of Crystal Growth, 1995, 152, 169-181.	1.5	69
9	Transport mechanisms and densification during sintering: I. Viscous flow versus vacancy diffusion. Chemical Engineering Science, 2009, 64, 3799-3809.	3.8	66
10	Designing thermal environments to promote convex interface shapes during the vertical Bridgman growth of cadmium zinc telluride. Journal of Crystal Growth, 1997, 172, 350-360.	1.5	64
11	Ab InitioMolecular Dynamics Simulation of Liquid CdTe and GaAs: Semiconducting versus Metallic Behavior. Physical Review Letters, 1998, 81, 4959-4962.	7.8	64
12	Effect of steady crucible rotation on segregation in high-pressure vertical Bridgman growth of cadmium zinc telluride. Journal of Crystal Growth, 1999, 203, 87-102.	1.5	62
13	Anomalous segregation during electrodynamic gradient freeze growth of cadmium zinc telluride. Journal of Crystal Growth, 2011, 325, 10-19.	1.5	56
14	Transient polymeric drop extension and retraction in uniaxial extensional flows. Journal of Non-Newtonian Fluid Mechanics, 2001, 98, 141-168.	2.4	54
15	Analysis of capillary-driven viscous flows during the sintering of ceramic powders. AICHE Journal, 1994, 40, 1794-1803.	3.6	48
16	Analysis of interrupted growth strategies for cadmium telluride in an unseeded vertical Bridgman system. Journal of Crystal Growth, 1996, 158, 459-470.	1.5	45
17	Threeâ€Dimensional Finiteâ€Element Analysis of Viscous Sintering. Journal of the American Ceramic Society, 1998, 81, 533-540.	3.8	45
18	Modeling the spontaneous ignition of coal stockpiles. AICHE Journal, 1994, 40, 991-1004.	3.6	44

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19	A diffusionâ€“reaction model for DNA microarray assays. Journal of Biotechnology, 2004, 114, 31-45.	3.8	44
20	Buoyancy and rotation in small-scale vertical Bridgman growth of cadmium zinc telluride using accelerated crucible rotation. Journal of Crystal Growth, 2001, 233, 599-608.	1.5	42
21	Three-dimensional computations of solution hydrodynamics during the growth of potassium dihydrogen phosphate I. Spin up and steady rotation. Journal of Crystal Growth, 1997, 180, 497-509.	1.5	41
22	Three-dimensional imperfections in a model vertical Bridgman growth system for cadmium zinc telluride. Journal of Crystal Growth, 2004, 263, 629-644.	1.5	40
23	On the effects of ampoule tilting during vertical Bridgman growth: three-dimensional computations via a massively parallel, finite element method. Journal of Crystal Growth, 1996, 167, 292-304.	1.5	38
24	First-principles calculations of liquid CdTe at temperatures above and below the melting point. Physical Review B, 1999, 60, 8640-8649.	3.2	38
25	Analysis of the growth of cadmium zinc telluride in an electrodynamic gradient freeze furnace via a self-consistent, multi-scale numerical model. Journal of Crystal Growth, 2005, 276, 133-147.	1.5	38
26	Three-dimensional computations of solution hydrodynamics during the growth of potassium dihydrogen phosphate. Journal of Crystal Growth, 1998, 191, 206-224.	1.5	37
27	Modeling the coupled effects of interfacial and bulk phenomena during solution crystal growth. Journal of Crystal Growth, 2001, 230, 328-335.	1.5	37
28	Transport mechanisms and densification during sintering: II. Grain boundaries. Chemical Engineering Science, 2009, 64, 3810-3816.	3.8	37
29	Massively parallel finite element computations of three-dimensional, time-dependent, incompressible flows in materials processing systems. Computer Methods in Applied Mechanics and Engineering, 1994, 119, 139-156.	6.6	35
30	A fully implicit method for simulation of the one-dimensional solidification of a binary alloy. Chemical Engineering Science, 1986, 41, 37-46.	3.8	34
31	An analysis of flow and mass transfer during the solution growth of potassium titanyl phosphate. Journal of Crystal Growth, 2000, 210, 704-718.	1.5	34
32	Mass Transfer Limitations at Crystallizing Interfaces in an Atomic Force Microscopy Fluid Cell:â€‰ A Finite Element Analysis. Langmuir, 2006, 22, 6578-6586.	3.5	33
33	The role of fluid flow and convective steering during the assembly of colloidal crystals. Journal of Crystal Growth, 2008, 310, 131-139.	1.5	33
34	The cathode design problem in electrochemical machining. Chemical Engineering Science, 1995, 50, 2679-2689.	3.8	32
35	On crucible effects during the growth of cadmium zinc telluride in an electrodynamic gradient freeze furnace. Journal of Crystal Growth, 2009, 311, 2327-2335.	1.5	31
36	Ab initiosimulations of liquid semiconductors using the pseudopotential-density functional method. Journal of Physics Condensed Matter, 2001, 13, R817-R854.	1.8	29

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37	Time-dependent, three-dimensional flow and mass transport during solution growth of potassium titanyl phosphate. Journal of Crystal Growth, 2005, 281, 391-406.	1.5	29
38	Understanding horizontal Bridgman shelf growth of cadmium telluride and cadmium zinc telluride. I. Heat and momentum transfer. Journal of Crystal Growth, 1997, 179, 120-132.	1.5	27
39	Analysis of the traveling heater method for the growth of cadmium telluride. Journal of Crystal Growth, 2016, 454, 45-58.	1.5	27
40	Transient effects during the horizontal Bridgman growth of cadmium zinc telluride. Journal of Crystal Growth, 1999, 206, 37-50.	1.5	26
41	An assessment of a parallel, finite element method for three-dimensional, moving-boundary flows driven by capillarity for simulation of viscous sintering. International Journal for Numerical Methods in Fluids, 2001, 36, 841-865.	1.6	26
42	On the effects of furnace gradients on interface shape during the growth of cadmium zinc telluride in EDG furnaces. Journal of Crystal Growth, 2006, 290, 35-43.	1.5	26
43	Maintaining convex interface shapes during electrodynamic gradient freeze growth of cadmium zinc telluride using a dynamic, bell-curve furnace profile. Journal of Crystal Growth, 2012, 355, 113-121.	1.5	25
44	An approximate block Newton method for coupled iterations of nonlinear solvers: Theory and conjugate heat transfer applications. Journal of Computational Physics, 2009, 228, 8566-8588.	3.8	24
45	Large-scale numerical analysis of materials processing systems: High-temperature crystal growth and molten glass flows. Computer Methods in Applied Mechanics and Engineering, 1994, 112, 69-89.	6.6	23
46	Bulk-flow versus thermal-capillary models for Czochralski growth of semiconductors. Journal of Crystal Growth, 1993, 129, 593-609.	1.5	22
47	Thermal-capillary analysis of the horizontal ribbon growth of silicon crystals. Journal of Crystal Growth, 2012, 355, 129-139.	1.5	22
48	Theoretical Modeling of Czochralski Crystal Growth. MRS Bulletin, 1988, 13, 29-35.	3.5	21
49	FINITE-ELEMENT FORMULATIONS FOR ACCURATE CALCULATION OF RADIANT HEAT TRANSFER IN DIFFUSE-GRAY ENCLOSURES. Numerical Heat Transfer, Part B: Fundamentals, 1993, 24, 431-454.	0.9	21
50	Theoretical analysis and design considerations for float-zone refinement of electronic grade silicon sheets. Journal of Crystal Growth, 1995, 152, 51-64.	1.5	21
51	On the formation of rotational spoke patterns during the Czochralski growth of bismuth silicon oxide. Journal of Crystal Growth, 1999, 198-199, 154-160.	1.5	21
52	Steady-state and dynamic models for particle engulfment during solidification. Journal of Computational Physics, 2016, 315, 238-263.	3.8	21
53	Understanding horizontal Bridgman shelf growth of cadmium telluride and cadmium zinc telluride. II. Thermoelastic stresses. Journal of Crystal Growth, 1997, 179, 133-143.	1.5	20
54	Analysis of limits for sapphire growth in a micro-pulling-down system. Journal of Crystal Growth, 2011, 335, 148-159.	1.5	20

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55	Existence, stability, and nonlinear dynamics of detached Bridgman growth states under zero gravity. Journal of Crystal Growth, 2011, 314, 310-323.	1.5	20
56	Stability limits for the horizontal ribbon growth of silicon crystals. Journal of Crystal Growth, 2013, 363, 132-140.	1.5	20
57	Parallel computation of incompressible flows in materials processing: Numerical experiments in diagonal preconditioning. Parallel Computing, 1997, 23, 1379-1400.	2.1	19
58	The diffusion and P1 approximations for modeling buoyant flow of an optically thick fluid. International Journal of Heat and Mass Transfer, 1998, 41, 1405-1415.	4.8	19
59	In-Situ Observation of Phase Separation During Growth of Cs₂LiLaBr₆:Ce Crystals Using Energy-Resolved Neutron Imaging. Crystal Growth and Design, 2017, 17, 6372-6381.	3.0	19
60	Assessing a flow-based finite element model for the sintering of viscoelastic particles. Chemical Engineering Science, 2000, 55, 5733-5746.	3.8	18
61	Decreasing lateral segregation in cadmium zinc telluride via ampoule tilting during vertical Bridgman growth. Journal of Crystal Growth, 2006, 291, 348-357.	1.5	18
62	Fixed-point convergence of modular, steady-state heat transfer models coupling multiple scales and phenomena for meltâ€“crystal growth. International Journal for Numerical Methods in Engineering, 2006, 67, 1768-1789.	2.8	18
63	Strategies for the coupling of global and local crystal growth models. Journal of Crystal Growth, 2007, 303, 114-123.	1.5	18
64	Simulation of heat transfer and convection during sapphire crystal growth in a modified heat exchanger method. Journal of Crystal Growth, 2013, 367, 27-34.	1.5	18
65	First-principles simulations of liquid ZnTe. Physical Review B, 2001, 65, .	3.2	16
66	Fluid dynamics in crystal growth: The good, the bad, and the ugly. Progress in Crystal Growth and Characterization of Materials, 2016, 62, 286-301.	4.0	16
67	Dynamics of three-dimensional convection in microgravity crystal growth: g-jitter with steady magnetic fields. Journal of Crystal Growth, 2004, 263, 40-52.	1.5	15
68	Assessing the dynamics of liquid-phase solution growth via step growth models: From BCF to FEM. Progress in Crystal Growth and Characterization of Materials, 2007, 53, 167-206.	4.0	15
69	Influence of thermal phenomena on crystal reattachment during dewetted Bridgman growth. Journal of Crystal Growth, 2009, 311, 2572-2579.	1.5	15
70	Parallel finite element calculation of flow in a three-dimensional lid-driven cavity using the CM-5 and T3D. International Journal for Numerical Methods in Fluids, 1997, 24, 1449-1461.	1.6	14
71	A comparison of boundary element and finite element methods for modeling axisymmetric polymeric drop deformation. International Journal for Numerical Methods in Fluids, 2001, 37, 837-864.	1.6	14
72	An analysis of segregation during horizontal ribbon growth of silicon. Journal of Crystal Growth, 2014, 390, 80-87.	1.5	14

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73	Analysis of the accelerated crucible rotation technique applied to the gradient freeze growth of cadmium zinc telluride. Journal of Crystal Growth, 2017, 468, 630-634.	1.5	14
74	Three-dimensional heat transfer effects during the growth of LiCaAlF6 in a modified Bridgman furnace. Journal of Crystal Growth, 1993, 132, 261-279.	1.5	13
75	A heat shield to control thermal gradients, melt convection, and interface shape during shouldering in Czochralski oxide growth. Journal of Crystal Growth, 1999, 200, 329-334.	1.5	13
76	On stable algorithms and accurate solutions for convection-dominated mass transfer in crystal growth modeling. Journal of Crystal Growth, 2001, 230, 202-209.	1.5	12
77	Feasibility study of cadmium zinc telluride growth using a submerged heater in a vertical bridgman system. Journal of Electronic Materials, 2004, 33, 488-497.	2.2	12
78	On favorable thermal fields for detached Bridgman growth. Journal of Crystal Growth, 2009, 311, 3337-3346.	1.5	12
79	Computer Modelling of Bulk Crystal Growth. , 0, , 73-119.		12
80	The prospects for traveling magnetic fields to affect interface shape in the vertical gradient freeze growth of cadmium zinc telluride. Journal of Crystal Growth, 2013, 364, 133-144.	1.5	12
81	Analysis of particle engulfment during the growth of crystalline silicon. Journal of Crystal Growth, 2016, 452, 1-5.	1.5	12
82	A fundamental limitation on growth rates in the traveling heater method. Journal of Crystal Growth, 2016, 452, 12-16.	1.5	12
83	Massively parallel finite element analysis of coupled, incompressible flows: A benchmark computation of baroclinic annulus waves. International Journal for Numerical Methods in Fluids, 1995, 21, 1007-1014.	1.6	11
84	Hopf bifurcation and solution multiplicity in a model for destabilized Bridgman crystal growth. Chemical Engineering Science, 2005, 60, 1323-1336.	3.8	11
85	Heat Transfer Analysis and Design for Bulk Crystal Growth: Perspectives on the Bridgman Method. , 2015, , 793-843.		11
86	On setting a pressure datum when computing incompressible flows. International Journal for Numerical Methods in Fluids, 1999, 29, 19-34.	1.6	10
87	On equilibration and sparse factorization of matrices arising in finite element solutions of partial differential equations. Numerical Methods for Partial Differential Equations, 2000, 16, 11-29.	3.6	10
88	Construction of Solution Curves for Large Two-Dimensional Problems of Steady-State Flows of Incompressible Fluids. SIAM Journal of Scientific Computing, 2000, 22, 285-311.	2.8	10
89	Development of model-based control for Bridgman crystal growth. Journal of Crystal Growth, 2004, 266, 182-189.	1.5	10
90	Ab Initio simulations of nonstoichiometric CdxTe1â^'x liquids. Journal of Chemical Physics, 2005, 123, 084508.	3.0	10

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91	Analysis of the effects of a rotating magnetic field on the growth of cadmium zinc telluride by the traveling heater method under microgravity conditions. Journal of Crystal Growth, 2016, 452, 17-21.	1.5	10
92	Particle engulfment dynamics under oscillating crystal growth conditions. Journal of Crystal Growth, 2017, 468, 24-27.	1.5	10
93	Modeling of Crystal Growth Processes. , 2004, , 143-167.		9
94	Improved radial segregation via the destabilizing vertical Bridgman configuration. Journal of Crystal Growth, 2004, 260, 263-276.	1.5	9
95	Modeling insights on the melt growth of cadmium zinc telluride. Journal of Crystal Growth, 2013, 379, 28-33.	1.5	9
96	Macroscopic Transport Processes During the Growth of Single Crystals from the Melt. , 1995, , 97-110.		8
97	The feedback control of the vertical Bridgman crystal growth process by crucible rotation: two case studies. Computers and Chemical Engineering, 2005, 29, 887-896.	3.8	8
98	Modeling the Crystal Growth of Cadmium Zinc Telluride: Accomplishments and Future Challenges. Materials Research Society Symposia Proceedings, 2009, 1164, 1.	0.1	8
99	Towards optimization of ACRT schedules applied to the gradient freeze growth of cadmium zinc telluride. Journal of Crystal Growth, 2017, 480, 126-131.	1.5	8
100	Stabilizing detached Bridgman melt crystal growth: Model-based nonlinear feedback control. Journal of Crystal Growth, 2012, 361, 16-24.	1.5	7
101	A quantitative model with new scaling for silicon carbide particle engulfment during silicon crystal growth. Journal of Crystal Growth, 2017, 463, 100-109.	1.5	7
102	An axial temperature profile curvature criterion for the engineering of convex crystal growth interfaces in Bridgman systems. Journal of Crystal Growth, 2017, 468, 899-904.	1.5	7
103	In-situ observation and analysis of solid-state diffusion and liquid migration in a crystal growth system: A segregation-driven diffusion couple. Acta Materialia, 2020, 186, 434-442.	7.9	7
104	The effects of ACRT on melt undercooling during the growth of CZT via the traveling heater method: Ekman versus Taylor-GÃ¶rtler flows. Journal of Crystal Growth, 2022, 577, 126409.	1.5	7
105	On the validity of boundary layer analysis for flow and mass transfer caused by rotation during the solution growth of large, single crystals. Journal of Crystal Growth, 2005, 283, 479-489.	1.5	6
106	Developing Quantitative, Multiscale Models for Microgravity Crystal Growth. Annals of the New York Academy of Sciences, 2006, 1077, 124-145.	3.8	6
107	Large-Scale Numerical Modeling of Melt and Solution Crystal Growth. AIP Conference Proceedings, 2007, , .	0.4	6
108	Multi-scale crystal growth computations via an approximate block Newton method. Journal of Crystal Growth, 2010, 312, 1463-1467.	1.5	6

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109	Stabilizing detached Bridgman melt crystal growth: Proportional-integral feedback control. Journal of Crystal Growth, 2012, 356, 33-45.	1.5	6
110	Advances in CdMnTe Nuclear Radiation Detectors Development. , 2018, , .		6
111	Proteinâ^'Saltâ^'Water Solution Phase Diagram Determination by a Combined Experimentalâ^'Computational Scheme. Crystal Growth and Design, 2008, 8, 4208-4214.	3.0	5
112	Parametric sensitivity and temporal dynamics of sapphire crystal growth via the micro-pulling-down method. Journal of Crystal Growth, 2012, 359, 99-106.	1.5	5
113	The synergy of modeling and novel experiments for melt crystal growth research. IOP Conference Series: Materials Science and Engineering, 2018, 355, 012001.	0.6	5
114	Computational modeling and neutron imaging to understand interface shape and solute segregation during the vertical gradient freeze growth of BaBrCl:Eu. Journal of Crystal Growth, 2020, 536, 125572.	1.5	5
115	Optimizing ACRT to reduce inclusion formation during the VGF growth of cadmium zinc telluride: II. Application to experiments. Journal of Crystal Growth, 2021, 576, 126385.	1.5	5
116	Experimental and numerical analysis of coupled interfacial kinetics and heat transport during the axial heat flux close to the phase interface growth of BGO single crystals. Journal of Crystal Growth, 2004, 266, 246-256.	1.5	4
117	Control of interface shape of cadmium zinc telluride grown via an electrodynamic gradient freeze furnace. , 2007, , .		4
118	Analysis of scintillator crystal production via the edge-defined film-fed growth method. , 2013, , .		4
119	Analysis of chemical stress and the propensity for cracking during the vertical Bridgman growth of BaBrCl:Eu. Journal of Crystal Growth, 2020, 546, 125794.	1.5	4
120	Stability-based optimization of ACRT for the growth of CZT by the traveling heater method. Journal of Crystal Growth, 2022, 579, 126446.	1.5	4
121	Finite Element Modeling of 3D Fluid Dynamics in Crystal Growth Systems. International Journal of Computational Fluid Dynamics, 1999, 12, 225-240.	1.2	3
122	Computational Simulations of the Growth of Crystals from Liquids. , 0, , 115-137.		3
123	Computational Models for Crystal Growth of Radiation Detector Materials: Growth of CZT by the EDG Method. Materials Research Society Symposia Proceedings, 2007, 1038, 1.	0.1	3
124	A Schur complement formulation for solving free-boundary, Stefan problems of phase change. Journal of Computational Physics, 2010, 229, 7942-7955.	3.8	3
125	Modeling and bulk crystal growth processes: What is to be learned?. , 2010, , .		3
126	Physically-based, lumped-parameter models for the prediction of oxygen concentration during Czochralski growth of silicon crystals. Journal of Crystal Growth, 2021, 576, 126384.	1.5	3

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127	Effects of a traveling magnetic field on vertical gradient freeze growth of cadmium zinc telluride. Proceedings of SPIE, 2011, , .	0.8	2
128	The engulfment of a precipitated particle in a saturated melt during solidification. Journal of Crystal Growth, 2022, 577, 126400.	1.5	2
129	Optimizing ACRT to reduce inclusion formation during the VGF growth of cadmium zinc telluride: I. Computational approach. Journal of Crystal Growth, 2021, 576, 126386.	1.5	2
130	Modeling optical floating zone crystal growth in a high-pressure, single-lamp furnace. Journal of Crystal Growth, 2022, 591, 126723.	1.5	2
131	Modeling the growth of CZT by the EDG process. Proceedings of SPIE, 2008, , .	0.8	1
132	Improving the growth of CZT crystals for radiation detectors: a modeling perspective. Proceedings of SPIE, 2012, , .	0.8	1
133	Theoretical analysis of 3D, transient convection and segregation in microgravity Bridgman crystal growth. AIP Conference Proceedings, 2000, , .	0.4	0
134	Complex dynamics within the vertical Bridgman crystal growth process. IFAC Postprint Volumes IPPV / International Federation of Automatic Control, 2001, 34, 517-522.	0.4	0
135	Title is missing!. Journal of Crystal Growth, 2006, 287, 213.	1.5	0
136	Segregation and interface shape control during EDG growth of CZT crystals. , 2011, , .		0
137	Mechanistic study of the accelerated crucible rotation technique applied to vertical Bridgman growth of cadmium zinc telluride. , 2017, , .		0