Jeffrey J Derby

List of Publications by Citations

132 papers	2,575 citations	30 h-index	42 g-index
145 ext. papers	2,822 ext. citations	2.3 avg, IF	5.03 L-index

#	Paper	IF	Citations
132	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	1.6	108
131	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	1.6	80
130	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	1.6	77
129	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	1.6	76
128	Viscous Sintering of Spherical Particles via Finite Element Analysis. *Journal of the American Ceramic Society*, **1995**, 78, 645-649	3.8	70
127	Permeability calculations in three-dimensional isotropic and oriented fiber networks. *Physics of Fluids*, **2008**, 20, 123601	4.4	68
126	Modeling the vertical Bridgman growth of cadmium zinc telluride II. Transient analysis of zinc segregation. *Journal of Crystal Growth*, **1995**, 155, 103-111	1.6	67
125	Three-dimensional melt flows in Czochralski oxide growth: high-resolution, massively parallel, finite element computations. *Journal of Crystal Growth*, **1995**, 152, 169-181	1.6	65
124	Ab Initio Molecular Dynamics Simulation of Liquid CdTe and GaAs: Semiconducting versus Metallic Behavior. *Physical Review Letters*, **1998**, 81, 4959-4962	7.4	60
123	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	1.6	55
122	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	1.6	54
121	Transport mechanisms and densification during sintering: I. Viscous flow versus vacancy diffusion. *Chemical Engineering Science*, **2009**, 64, 3799-3809	4.4	50
120	Transient polymeric drop extension and retraction in uniaxial extensional flows. *Journal of Non-Newtonian Fluid Mechanics*, **2001**, 98, 141-168	2.7	50
119	Analysis of capillary-driven viscous flows during the sintering of ceramic powders. *AICHE Journal*, **1994**, 40, 1794-1803	3.6	44
118	A diffusion-reaction model for DNA microarray assays. *Journal of Biotechnology*, **2004**, 114, 31-45	3.7	42
117	Three-Dimensional Finite-Element Analysis of Viscous Sintering. *Journal of the American Ceramic Society*, **2005**, 81, 533-540	3.8	41
116	Anomalous segregation during electrodynamic gradient freeze growth of cadmium zinc telluride. *Journal of Crystal Growth*, **2011**, 325, 10-19	1.6	40

115	Modeling the spontaneous ignition of coal stockpiles. *AICHE Journal*, **1994**, 40, 991-1004	3.6	39
114	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	1.6	38
113	Analysis of interrupted growth strategies for cadmium telluride in an unseeded vertical Bridgman system. *Journal of Crystal Growth*, **1996**, 158, 459-470	1.6	38
112	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	1.6	37
111	Three-dimensional imperfections in a model vertical Bridgman growth system for cadmium zinc telluride. *Journal of Crystal Growth*, **2004**, 263, 629-644	1.6	37
110	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	1.6	35
109	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	5.7	35
108	Three-dimensional computations of solution hydrodynamics during the growth of potassium dihydrogen phosphate. *Journal of Crystal Growth*, **1998**, 191, 206-224	1.6	34
107	First-principles calculations of liquid CdTe at temperatures above and below the melting point. *Physical Review B*, **1999**, 60, 8640-8649	3.3	32
106	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	1.6	32
105	The role of fluid flow and convective steering during the assembly of colloidal crystals. *Journal of Crystal Growth*, **2008**, 310, 131-139	1.6	31
104	Mass transfer limitations at crystallizing interfaces in an atomic force microscopy fluid cell: a finite element analysis. *Langmuir*, **2006**, 22, 6578-86	4	30
103	An analysis of flow and mass transfer during the solution growth of potassium titanyl phosphate. *Journal of Crystal Growth*, **2000**, 210, 704-718	1.6	30
102	A fully implicit method for simulation of the one-dimensional solidification of a binary alloy. *Chemical Engineering Science*, **1986**, 41, 37-46	4.4	30
101	Modeling the coupled effects of interfacial and bulk phenomena during solution crystal growth. *Journal of Crystal Growth*, **2001**, 230, 328-335	1.6	28
100	The cathode design problem in electrochemical machining. *Chemical Engineering Science*, **1995**, 50, 2679-2689	4.4	27
99	Ab initiosimulations of liquid semiconductors using the pseudopotential-density functional method. *Journal of Physics Condensed Matter*, **2001**, 13, R817-R854	1.8	26
98	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	1.9	24

97	Transport mechanisms and densification during sintering: II. Grain boundaries. *Chemical Engineering Science*, **2009**, 64, 3810-3816	4.4	23
96	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	1.6	23
95	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	5.7	23
94	Transient effects during the horizontal Bridgman growth of cadmium zinc telluride. *Journal of Crystal Growth*, **1999**, 206, 37-50	1.6	22
93	Bulk-flow versus thermal-capillary models for Czochralski growth of semiconductors. *Journal of Crystal Growth*, **1993**, 129, 593-609	1.6	22
92	On crucible effects during the growth of cadmium zinc telluride in an electrodynamic gradient freeze furnace. *Journal of Crystal Growth*, **2009**, 311, 2327-2335	1.6	21
91	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	1.6	20
90	Time-dependent, three-dimensional flow and mass transport during solution growth of potassium titanyl phosphate. *Journal of Crystal Growth*, **2005**, 281, 391-406	1.6	20
89	Theoretical analysis and design considerations for float-zone refinement of electronic grade silicon sheets. *Journal of Crystal Growth*, **1995**, 152, 51-64	1.6	20
88	Analysis of the traveling heater method for the growth of cadmium telluride. *Journal of Crystal Growth*, **2016**, 454, 45-58	1.6	20
87	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	4.1	19
86	Parallel computation of incompressible flows in materials processing: Numerical experiments in diagonal preconditioning. *Parallel Computing*, **1997**, 23, 1379-1400	1	19
85	On the formation of rotational spoke patterns during the Czochralski growth of bismuth silicon oxide. *Journal of Crystal Growth*, **1999**, 198-199, 154-160	1.6	19
84	FINITE-ELEMENT FORMULATIONS FOR ACCURATE CALCULATION OF RADIANT HEAT TRANSFER IN DIFFUSE-GRAY ENCLOSURES. *Numerical Heat Transfer, Part B: Fundamentals*, **1993**, 24, 431-454	1.3	19
83	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	1.6	18
82	Thermal-capillary analysis of the horizontal ribbon growth of silicon crystals. *Journal of Crystal Growth*, **2012**, 355, 129-139	1.6	18
81	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	4.9	18
80	Analysis of limits for sapphire growth in a micro-pulling-down system. *Journal of Crystal Growth*, **2011**, 335, 148-159	1.6	17

79	Existence, stability, and nonlinear dynamics of detached Bridgman growth states under zero gravity. *Journal of Crystal Growth*, **2011**, 314, 310-323	1.6	17
78	Theoretical Modeling of Czochralski Crystal Growth. *MRS Bulletin*, **1988**, 13, 29-35	3.2	17
77	Steady-state and dynamic models for particle engulfment during solidification. *Journal of Computational Physics*, **2016**, 315, 238-263	4.1	17
76	Understanding horizontal Bridgman shelf growth of cadmium telluride and cadmium zinc telluride. II. Thermoelastic stresses. *Journal of Crystal Growth*, **1997**, 179, 133-143	1.6	16
75	Strategies for the coupling of global and local crystal growth models. *Journal of Crystal Growth*, **2007**, 303, 114-123	1.6	16
74	Fixed-point convergence of modular, steady-state heat transfer models coupling multiple scales and phenomena for melt crystal growth. *International Journal for Numerical Methods in Engineering*, **2006**, 67, 1768-1789	2.4	16
73	Stability limits for the horizontal ribbon growth of silicon crystals. *Journal of Crystal Growth*, **2013**, 363, 132-140	1.6	15
72	First-principles simulations of liquid ZnTe. *Physical Review B*, **2001**, 65,	3.3	15
71	Simulation of heat transfer and convection during sapphire crystal growth in a modified heat exchanger method. *Journal of Crystal Growth*, **2013**, 367, 27-34	1.6	14
70	Assessing a flow-based finite element model for the sintering of viscoelastic particles. *Chemical Engineering Science*, **2000**, 55, 5733-5746	4.4	14
69	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	3.5	13
68	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	1.9	13
67	Decreasing lateral segregation in cadmium zinc telluride via ampoule tilting during vertical Bridgman growth. *Journal of Crystal Growth*, **2006**, 291, 348-357	1.6	13
66	Dynamics of three-dimensional convection in microgravity crystal growth: g-jitter with steady magnetic fields. *Journal of Crystal Growth*, **2004**, 263, 40-52	1.6	13
65	Three-dimensional heat transfer effects during the growth of LiCaAlF6 in a modified Bridgman furnace. *Journal of Crystal Growth*, **1993**, 132, 261-279	1.6	13
64	Fluid dynamics in crystal growth: The good, the bad, and the ugly. *Progress in Crystal Growth and Characterization of Materials*, **2016**, 62, 286-301	3.5	13
63	An analysis of segregation during horizontal ribbon growth of silicon. *Journal of Crystal Growth*, **2014**, 390, 80-87	1.6	12
62	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	1.6	12

61	Influence of thermal phenomena on crystal reattachment during dewetted Bridgman growth. *Journal of Crystal Growth*, **2009**, 311, 2572-2579	1.6	12
60	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	3.5	11
59	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	1.9	11
58	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	1.6	11
57	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	1.6	10
56	Feasibility study of cadmium zinc telluride growth using a submerged heater in a vertical bridgman system. *Journal of Electronic Materials*, **2004**, 33, 488-497	1.9	10
55	Development of model-based control for Bridgman crystal growth. *Journal of Crystal Growth*, **2004**, 266, 182-189	1.6	10
54	Hopf bifurcation and solution multiplicity in a model for destabilized Bridgman crystal growth. *Chemical Engineering Science*, **2005**, 60, 1323-1336	4.4	10
53	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	1.9	10
52	On stable algorithms and accurate solutions for convection-dominated mass transfer in crystal growth modeling. *Journal of Crystal Growth*, **2001**, 230, 202-209	1.6	9
51	Towards optimization of ACRT schedules applied to the gradient freeze growth of cadmium zinc telluride. *Journal of Crystal Growth*, **2017**, 480, 126-131	1.6	8
50	Analysis of particle engulfment during the growth of crystalline silicon. *Journal of Crystal Growth*, **2016**, 452, 1-5	1.6	8
49	A fundamental limitation on growth rates in the traveling heater method. *Journal of Crystal Growth*, **2016**, 452, 12-16	1.6	8
48	Modeling insights on the melt growth of cadmium zinc telluride. *Journal of Crystal Growth*, **2013**, 379, 28-33	1.6	8
47	Computer Modelling of Bulk Crystal Growth **2010**, 73-119		8
46	Improved radial segregation via the destabilizing vertical Bridgman configuration. *Journal of Crystal Growth*, **2004**, 260, 263-276	1.6	8
45	Ab Initio simulations of nonstoichiometric Cd(x)Te(1-x) liquids. *Journal of Chemical Physics*, **2005**, 123, 084508	3.9	8
44	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	2.5	8

43	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	2.6	8
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41	Particle engulfment dynamics under oscillating crystal growth conditions. *Journal of Crystal Growth* , **2017**, 468, 24-27	1.6	7
40	Stabilizing detached Bridgman melt crystal growth: Model-based nonlinear feedback control. *Journal of Crystal Growth*, **2012**, 361, 16-24	1.6	7
39	On favorable thermal fields for detached Bridgman growth. *Journal of Crystal Growth*, **2009**, 311, 3337-3346	1.6	7
38	The feedback control of the vertical Bridgman crystal growth process by crucible rotation: two case studies. *Computers and Chemical Engineering*, **2005**, 29, 887-896	4	7
37	On setting a pressure datum when computing incompressible flows. *International Journal for Numerical Methods in Fluids*, **1999**, 29, 19-34	1.9	7
36	A quantitative model with new scaling for silicon carbide particle engulfment during silicon crystal growth. *Journal of Crystal Growth*, **2017**, 463, 100-109	1.6	6
35	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	1.6	6
34	Stabilizing detached Bridgman melt crystal growth: Proportional-integral feedback control. *Journal of Crystal Growth*, **2012**, 356, 33-45	1.6	6
33	Parametric sensitivity and temporal dynamics of sapphire crystal growth via the micro-pulling-down method. *Journal of Crystal Growth*, **2012**, 359, 99-106	1.6	5
32	Modeling the Crystal Growth of Cadmium Zinc Telluride: Accomplishments and Future Challenges. *Materials Research Society Symposia Proceedings*, **2009**, 1164, 1		5
31	Multi-scale crystal growth computations via an approximate block Newton method. *Journal of Crystal Growth*, **2010**, 312, 1463-1467	1.6	5
30	Macroscopic Transport Processes During the Growth of Single Crystals from the Melt **1995**, 97-110		5
29	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	1.6	4
28	Analysis of scintillator crystal production via the edge-defined film-fed growth method **2013**,		4
27	Protein⬚Salt⬚Water Solution Phase Diagram Determination by a Combined Experimental⬚Computational Scheme⬚*Crystal Growth and Design*, **2008**, 8, 4208-4214	3.5	4
26	Large-Scale Numerical Modeling of Melt and Solution Crystal Growth. *AIP Conference Proceedings*, **2007**,	0	4

25	Developing quantitative, multiscale models for microgravity crystal growth. *Annals of the New York Academy of Sciences*, **2006**, 1077, 124-45	6.5	4
24	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	1.6	4
23	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	1.6	4
22	The synergy of modeling and novel experiments for melt crystal growth research. *IOP Conference Series: Materials Science and Engineering*, **2018**, 355, 012001	0.4	4
21	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	8.4	3
20	A Schur complement formulation for solving free-boundary, Stefan problems of phase change. *Journal of Computational Physics*, **2010**, 229, 7942-7955	4.1	3
19	Control of interface shape of cadmium zinc telluride grown via an electrodynamic gradient freeze furnace **2007**,		3
18	Modeling of Crystal Growth Processes **2004**, 143-167		3
17	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	1.6	3
16	The effects of ACRT on melt undercooling during the growth of CZT via the traveling heater method: Ekman versus Taylor-Görtler flows. *Journal of Crystal Growth*, **2021**, 577, 126409	1.6	3
15	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	1.6	3
14	Advances in CdMnTe Nuclear Radiation Detectors Development **2018**,		3
13	Modeling and bulk crystal growth processes: What is to be learned? **2010**,		2
12	Finite Element Modeling of 3D Fluid Dynamics in Crystal Growth Systems. *International Journal of Computational Fluid Dynamics*, **1999**, 12, 225-240	1.2	2
11	Stability-based optimization of ACRT for the growth of CZT by the traveling heater method. *Journal of Crystal Growth*, **2022**, 579, 126446	1.6	2
10	Effects of a traveling magnetic field on vertical gradient freeze growth of cadmium zinc telluride **2011**,		1
9	Modeling the growth of CZT by the EDG process **2008**,		1
8	Computational Models for Crystal Growth of Radiation Detector Materials: Growth of CZT by the EDG Method. *Materials Research Society Symposia Proceedings*, **2007**, 1038, 1		1

LIST OF PUBLICATIONS

7	Computational Simulations of the Growth of Crystals from Liquids115-137		1
6	Optimizing ACRT to reduce inclusion formation during the VGF growth of cadmium zinc telluride: I. Computational approach. *Journal of Crystal Growth*, **2021**, 576, 126386	1.6	1
5	Analysis of chemical stress and the propensity for cracking during the vertical Bridgman growth of BaBrCl:Eu. *Journal of Crystal Growth*, **2020**, 546, 125794	1.6	1
4	Modeling optical floating zone crystal growth in a high-pressure, single-lamp furnace. *Journal of Crystal Growth*, **2022**, 591, 126723	1.6	1
3	The engulfment of a precipitated particle in a saturated melt during solidification. *Journal of Crystal Growth*, **2022**, 577, 126400	1.6	0
2	Physically-based, lumped-parameter models for the prediction of oxygen concentration during Czochralski growth of silicon crystals. *Journal of Crystal Growth*, **2021**, 576, 126384	1.6	0
1	Complex dynamics within the vertical Bridgman crystal growth process. *IFAC Postprint Volumes IPPV / International Federation of Automatic Control*, **2001**, 34, 517-522		