Peter Harrowell

List of Publications by Year
in descending order

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152 papers	5,795 citations	101543 36 h-index	76900 74 g-index
158 all docs	158 docs citations	158 times ranked	3552 citing authors

#	Article	IF	Citations
1	Perspective: Supercooled liquids and glasses. Journal of Chemical Physics, 2012, 137, 080901.	3.0	427
2	Crystal structure analyses of reduced (CuI) poplar plastocyanin at six pH values. Journal of Molecular Biology, 1986, 192, 361-387.	4.2	404
3	Irreversible reorganization in a supercooled liquid originates from localized soft modes. Nature Physics, 2008, 4, 711-715.	16.7	367
4	How Reproducible Are Dynamic Heterogeneities in a Supercooled Liquid?. Physical Review Letters, 2004, 93, 135701.	7.8	322
5	Crystal growth kinetics exhibit a fragility-dependent decoupling from viscosity. Journal of Chemical Physics, 2008, 128, 034709.	3.0	272
6	Kinetic structure of a two-dimensional liquid. Physical Review E, 1995, 52, 1694-1698.	2.1	264
7	Predicting the Long-Time Dynamic Heterogeneity in a Supercooled Liquid on the Basis of Short-Time Heterogeneities. Physical Review Letters, 2006, 96, 185701.	7.8	257
8	Anomalously slow crystal growth of the glass-forming alloy CuZr. Nature Materials, 2013, 12, 507-511.	27.5	188
9	A molecular theory of crystal nucleation from the melt. Journal of Chemical Physics, 1984, 80, 1639-1646.	3.0	150
10	Spatiotemporal Hierarchy of Relaxation Events, Dynamical Heterogeneities, and Structural Reorganization in a Supercooled Liquid. Physical Review Letters, 2010, 105, 135702.	7.8	149
11	Stability and structure of a supercooled liquid mixture in two dimensions. Physical Review E, 1999, 59, 5721-5743.	2.1	109
12	Relaxation dynamics and their spatial distribution in a two-dimensional glass-forming mixture. Journal of Chemical Physics, 1999, 111, 5441-5454.	3.0	104
13	Geometry of Slow Structural Fluctuations in a Supercooled Binary Alloy. Physical Review Letters, 2010, 104, 105701.	7.8	100
14	On the interaction between order and a moving interface: Dynamical disordering and anisotropic growth rates. Journal of Chemical Physics, 1987, 86, 2932-2942.	3.0	96
15	The origin of glassy dynamics in the 2D facilitated kinetic Ising model. Journal of Chemical Physics, 1991, 95, 4454-4465.	3.0	93
16	Nonâ€Gaussian behavior and the dynamical complexity of particle motion in a dense twoâ€dimensional liquid. Journal of Chemical Physics, 1996, 105, 10521-10526.	3.0	89
17	On the study of collective dynamics in supercooled liquids through the statistics of the isoconfigurational ensemble. Journal of Chemical Physics, 2007, 126, 154503.	3.0	88
18	Localized soft modes and the supercooled liquidâ€™s irreversible passage through its configuration space. Journal of Chemical Physics, 2009, 131, 194508.	3.0	83

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19	Macroscopic facilitation of glassy relaxation kinetics: Ultrastable glass films with frontlike thermal response. Journal of Chemical Physics, 2010, 133, 244502.	3.0	82
20	Origin of the Difference in the Temperature Dependences of Diffusion and Structural Relaxation in a Supercooled Liquid. Physical Review Letters, 1998, 81, 120-123.	7.8	70
21	The mechanism of the ultrafast crystal growth of pure metals from their melts. Nature Materials, 2018, 17, 881-886.	27.5	67
22	Factors determining crystalâ€“liquid coexistence under shear. Nature, 2002, 415, 1008-1011.	27.8	64
23	Free volume cannot explain the spatial heterogeneity of Debyeâ€“Waller factors in a glass-forming binary alloy. Journal of Non-Crystalline Solids, 2006, 352, 5098-5102.	3.1	64
24	On the relationship between structure and dynamics in a supercooled liquid. Journal of Physics Condensed Matter, 2005, 17, S4025-S4034.	1.8	62
25	Very Low Friction State of a Dodecane Film Confined between Mica Surfaces. Physical Review Letters, 2005, 94, 126103.	7.8	61
26	Consequences of kinetic inhomogeneities in glasses. Physical Review E, 1996, 54, 1652-1662.	2.1	60
27	The effect of density change on crystal growth rates from the melt. Journal of Chemical Physics, 1992, 96, 3834-3843.	3.0	58
28	On the equilibrium calculation of the friction coefficient for liquid slip against a wall. Journal of Chemical Physics, 2007, 127, 174706.	3.0	58
29	Visualizing the collective motions responsible for the Î± and Î² relaxations in a model glass. Physical Review E, 1993, 48, 4359-4363.	2.1	55
30	The Densest Packing of AB Binary Hard-Sphere Homogeneous Compounds across all Size Ratios. Journal of Physical Chemistry B, 2008, 112, 10773-10776.	2.6	54
31	Kinetics of crystallization in a shearing colloidal suspension. Physical Review E, 1995, 52, 6424-6430.	2.1	51
32	Crystal phases of a glass-forming Lennard-Jones mixture. Physical Review E, 2003, 67, 011403.	2.1	51
33	Glassy relaxation at surfaces: The correlation length of cooperative motion in the facilitated kinetic Ising model. Journal of Chemical Physics, 1991, 95, 4466-4470.	3.0	46
34	Radiation-induced densification in amorphous silica: A computer simulation study. Journal of Chemical Physics, 2001, 115, 3336-3341.	3.0	46
35	Crystal Bridge Formation Marks the Transition to Rigidity in a Thin Lubrication Film. Physical Review Letters, 2006, 96, 206102.	7.8	38
36	Molecular Engineering of the Glass Transition: Glass-Forming Ability across a Homologous Series of Cyclic Stilbenes. Journal of Physical Chemistry B, 2011, 115, 4696-4702.	2.6	38

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37	Low friction lubrication between amorphous walls: Unraveling the contributions of surface roughness and in-plane disorder. Journal of Chemical Physics, 2006, 125, 034703.	3.0	37
38	A two dimensional glass: microstructure and dynamics of a 2D binary mixture. Journal of Non-Crystalline Solids, 1998, 235-237, 314-319.	3.1	34
39	The structural origin of the complex rheology in thin dodecane films: Three routes to low friction. Tribology International, 2007, 40, 1574-1586.	5.9	34
40	Assessing the utility of structure in amorphous materials. Journal of Chemical Physics, 2019, 150, 114502.	3.0	34
41	The spatial distribution of relaxation times in a model glass. Journal of Chemical Physics, 1993, 98, 5069-5073.	3.0	33
42	Simulation of the coexistence of a shearing liquid and a strained crystal. Journal of Chemical Physics, 2003, 118, 4115-4126.	3.0	33
43	The shear induced disordering transition in a colloidal crystal: Nonequilibrium Brownian dynamic simulations. Journal of Chemical Physics, 1995, 103, 4653-4671.	3.0	32
44	The origin of persistent shear stress in supercooled liquids. Journal of Chemical Physics, 2012, 137, 014506.	3.0	30
45	Long range stress correlations in the inherent structures of liquids at rest. Journal of Chemical Physics, 2016, 144, 124508.	3.0	29
46	Linear response theory for thermal conductivity and viscosity in terms of boundary fluctuations. Physical Review E, 2005, 71, 061201.	2.1	28
47	Ordered binary crystal phases of Lennard-Jones mixtures. Journal of Chemical Physics, 2004, 120, 9222-9232.	3.0	25
48	Crystal Bridges, Tetratic Order, and Elusive Equilibria:Â The Role of Structure in Lubrication Films. Journal of Physical Chemistry B, 2007, 111, 11354-11365.	2.6	25
49	A Van der Waals model of chiral mixtures using a chiral Lennard-Jones potential. Applications to the Pasteur Experiment and phenomena in chiral solvents. Journal of the American Chemical Society, 1983, 105, 723-730.	13.7	24
50	The boundary fluctuation theory of transport coefficients in the linear-response limit. Journal of Chemical Physics, 2006, 124, 014103.	3.0	24
51	Measuring diffusion in supercooled liquids: The effect of kinetic inhomogeneities. Journal of Chemical Physics, 1996, 104, 2369-2375.	3.0	23
52	Rigidity in Condensed Matter and Its Origin in Configurational Constraint. Physical Review Letters, 2016, 116, 137801.	7.8	23
53	Shear induced ordering in simulations of colloidal suspensions: Oscillatory shear and computational artefacts. Journal of Chemical Physics, 1996, 105, 605-613.	3.0	22
54	Inorganic Nanotubes Stabilized by Ion Size Asymmetry:â€‰ Energy Calculations for AgI Clusters. Journal of Physical Chemistry B, 2004, 108, 8412-8418.	2.6	22

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55	Dense Packings of Hard Spheres of Different Sizes Based on Filling Interstices in Uniform Three-Dimensional Tilings. Journal of Physical Chemistry B, 2008, 112, 8139-8143.	2.6	19
56	Rigidity percolation and the spatial heterogeneity of soft modes in disordered materials. Proceedings of the National Academy of Sciences of the United States of America, 2009, 106, 15136-15141.	7.1	19
57	Interfacial properties and phase transitions of a system of anisotropic molecules. Molecular Physics, 1985, 54, 1325-1333.	1.7	18
58	The shear melting of colloidal crystals: A long wavelength driven transition. Journal of Chemical Physics, 1987, 87, 4154-4161.	3.0	17
59	Monte Carlo simulations of a layering transition in hard parallelepipeds. Journal of Chemical Physics, 1995, 103, 6143-6150.	3.0	17
60	Solute-Enhanced Diffusion in a Dense Two-Dimensional Liquid. Physical Review Letters, 1998, 80, 4446-4449.	7.8	17
61	Monte Carlo simulations of smectic phase transitions in flexibleâ€“rigidâ€“flexible molecules. Journal of Chemical Physics, 1999, 110, 12183-12192.	3.0	17
62	Predicting the solid state phase diagram for glass-forming alloys of copper and zirconium. Journal of Physics Condensed Matter, 2012, 24, 245102.	1.8	17
63	Kinetics of Dissolution of an Amorphous Solid. Journal of Physical Chemistry B, 2018, 122, 2425-2433.	2.6	17
64	Suppression of crystalline fluctuations by competing structures in a supercooled liquid. Physical Review E, 2017, 96, 042602.	2.1	16
65	Central role of thermal collective strain in the relaxation of structure in a supercooled liquid. Physical Review E, 2009, 80, 061501.	2.1	15
66	Spatial Dependence of Viscosity and Thermal Conductivity through a Planar Interface. Journal of Physical Chemistry B, 2009, 113, 2059-2065.	2.6	15
67	The variety of ordering transitions in liquids characterized by a locally favoured structure. Europhysics Letters, 2011, 96, 36005.	2.0	15
68	Dynamic Monte Carlo simulations of freezing and melting at the 100 and 111 surfaces of the simple cubic phase in the faceâ€centeredâ€cubic lattice gas. Journal of Chemical Physics, 1994, 100, 7630-7639.	3.0	14
69	Structural Origin of Enhanced Dynamics at the Surface of a Glassy Alloy. Physical Review Letters, 2017, 119, 245501.	7.8	14
70	Composition dependence of the solid state transitions in NaNO3/KNO3 mixtures. Thermochimica Acta, 2009, 486, 27-31.	2.7	13
71	Structural searches using isopointal sets as generators: densest packings for binary hard sphere mixtures. Journal of Physics Condensed Matter, 2011, 23, 194103.	1.8	13
72	Can a stable glass be superheated? Modelling the kinetic stability of coated glassy films. Journal of Chemical Physics, 2013, 138, 12A516.	3.0	13

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73	Organization of Coordination Polyhedra in an Amorphous Binary Alloy. Journal of Physical Chemistry B, 2004, 108, 6850-6855.	2.6	12
74	Inversion of defect interactions due to ordering inSr1â˜3xâ•2LaxTiO3perovskites: An atomistic simulation study. Physical Review B, 2006, 74, .	3.2	12
75	Crystallization of the Lewisâ€“WahnstrÃ¶mortho-terphenyl model. Journal of Chemical Physics, 2011, 134, 114501.	3.0	12
76	Role of interfacial inherent structures in the fast crystal growth from molten salts and metals. Physical Review Materials, 2019, 3, .	2.4	12
77	Structure and stability of the interface between a strained crystal and a shearing liquid. Physical Review E, 2003, 67, 051503.	2.1	11
78	Folding behavior of model proteins with weak energetic frustration. Journal of Chemical Physics, 2004, 120, 11292-11303.	3.0	11
79	Equilibrium calculations of viscosity and thermal conductivity across a solid-liquid interface using boundary fluctuations. Journal of Chemical Physics, 2008, 128, 194710.	3.0	11
80	The displacement field associated with the freezing of a melt and its role in determining crystal growth kinetics. Proceedings of the National Academy of Sciences of the United States of America, 2020, 117, 3421-3426.	7.1	11
81	Anisotropic surface free energy and the roughening transition of the diffuse crystal-liquid interface. Physical Review B, 1986, 33, 6293-6303.	3.2	10
82	Density-functional theory of the kinetics of crystallization of hard-sphere suspensions: Single conserved order parameter. Physical Review E, 1997, 56, 3265-3273.	2.1	10
83	Resolving the structural relaxation of a two-dimensional liquid using apertured cross correlation functions. Journal of Chemical Physics, 1997, 107, 8586-8593.	3.0	10
84	Glass transitions in plane view. Nature Physics, 2006, 2, 157-158.	16.7	10
85	Factors Contributing to the Glass-Forming Ability of a Simulated Molecular Liquid. Journal of Physical Chemistry B, 2011, 115, 14205-14209.	2.6	10
86	Favoured local structures in liquids and solids: a 3D lattice model. Soft Matter, 2015, 11, 3322-3331.	2.7	10
87	Quantum theory of the full pressure dependence of collision induced intersystem crossing. Journal of Chemical Physics, 1985, 83, 6288-6300.	3.0	9
88	Orientation dependent interface mobilities in a kinetic mean field theory of freezing and melting. Journal of Chemical Physics, 1993, 99, 3998-4010.	3.0	9
89	Geometry and the entropic cost of locally favoured structures in a liquid. Journal of Chemical Physics, 2012, 136, 134504.	3.0	9
90	Nonaffine displacements and the nonlinear response of a strained amorphous solid. Physical Review E, 2016, 94, 022606.	2.1	9

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91	Local symmetry predictors of mechanical stability in glasses. Science Advances, 2022, 8, eabn0681.	10.3	9
92	On the positivity of the density in molecular theories of freezing. Journal of Chemical Physics, 1985, 83, 6058-6059.	3.0	8
93	Unconstrained motions, dynamic heterogeneities, and relaxation in disordered solids. Physical Review E, 2009, 80, 041503.	2.1	8
94	The relaxation of structural fluctuations in a lattice model of a simple liquid. Journal of Chemical Physics, 1994, 101, 9894-9902.	3.0	7
95	Amorphous ground states and collective dynamics in a 2D glass-forming mixture. Journal of Physics Condensed Matter, 2000, 12, A399-A402.	1.8	7
96	Density functional theory of the kinetics of crystallization of a hard sphere suspension: Coupling structure to density. Journal of Chemical Physics, 2001, 114, 9059-9068.	3.0	7
97	The Structure and Thermodynamic Stability of Reverse Micelles in Dry AOTâˆ•Alkane Mixtures. AIP Conference Proceedings, 2008, , .	0.4	7
98	Fast and Slow Components in the Crystallization of a Model Multicomponent System, NaKCa(NO3): The Role of Composition Fluctuations. Journal of Physical Chemistry A, 2011, 115, 6260-6268.	2.5	7
99	From liquid structure to configurational entropy: introducing structural covariance. Journal of Statistical Mechanics: Theory and Experiment, 2016, 2016, 084002.	2.3	7
100	Mechanical instability of colloidal crystals under shear flow. Physical Review A, 1990, 42, 3427-3431.	2.5	6
101	Stalking the collective process: establishing a dialogue between simulation and speculation. Journal of Physics Condensed Matter, 2000, 12, 6305-6310.	1.8	6
102	An equilibrium calculation of the thermal transport coefficients between two planes of arbitrary separation in a condensed phase. Journal of Chemical Physics, 2006, 124, 044512.	3.0	6
103	Dense amorphous packing of binary hard sphere mixtures with chemical order: The stability of a solute ordered approximant. Journal of Non-Crystalline Solids, 2008, 354, 3171-3178.	3.1	6
104	Noncrystalline compact packings of hard spheres of two sizes: Bipyramids and the geometry of common neighbors. Journal of Chemical Physics, 2009, 130, 114505.	3.0	6
105	On the existence of a structural instability in sub-critical crystalline fluctuations in a supercooled liquid. Journal of Physics Condensed Matter, 2010, 22, 364106.	1.8	6
106	Structural phases in non-additive soft-disk mixtures: Glasses, substitutional order, and random tilings. Journal of Chemical Physics, 2011, 135, 224515.	3.0	6
107	Multiple Ordering Transitions in a Liquid Stabilized by Low Symmetry Structures. Physical Review Letters, 2014, 112, 017801.	7.8	6
108	Chemical ordering and crystal nucleation at the liquid surface: A comparison of Cu50Zr50 and Ni50Al50 alloys. Journal of Chemical Physics, 2018, 148, 044509.	3.0	6

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109	How a supercooled liquid borrows structure from the crystal. Journal of Chemical Physics, 2021, 154, 054503.	3.0	6
110	Influence of liquid structure on the thermodynamics of freezing. Physical Review E, 2013, 87, 052313.	2.1	5
111	Packing concave molecules in crystals and amorphous solids: on the connection between shape and local structure. Molecular Physics, 2015, 113, 2755-2769.	1.7	5
112	The stabilization of tubular crystals in mixtures of spherical particles. Soft Matter, 2017, 13, 1344-1351.	2.7	5
113	Local and global order in a simulated two-dimensional liquid under steady shear. Physical Review E, 1996, 54, 457-462.	2.1	4
114	Incomplete symmetry breaking and anomolous crystallization kinetics at close-packed crystal-liquid interfaces. Physical Review E, 1997, 56, 1910-1917.	2.1	4
115	Elementary excitations and the specific heat peak in a supercooled mixture: simulation studies. Journal of Non-Crystalline Solids, 2002, 307-310, 436-441.	3.1	4
116	A systematic enumeration of local topological relaxation mechanisms in amorphous networks and their efficiency in network relaxation. Journal of Chemical Physics, 2007, 126, 184502.	3.0	4
117	Controlling Adsorbate Diffusion on a High-Symmetry Surface through Molecular Shape Selection. Journal of Physical Chemistry C, 2011, 115, 9526-9534.	3.1	4
118	Density and glass forming ability in amorphous atomic alloys: The role of the particle softness. Journal of Chemical Physics, 2016, 144, 144502.	3.0	4
119	Shear melting at the crystal-liquid interface: Erosion and the asymmetric suppression of interface fluctuations. Physical Review E, 2016, 93, 042608.	2.1	4
120	Orientationally ordered glasses via controlled deposition. Proceedings of the National Academy of Sciences of the United States of America, 2019, 116, 21341-21342.	7.1	4
121	The structural difference between strong and fragile liquids. Journal of Non-Crystalline Solids: X, 2022, 13, 100080.	1.2	4
122	A general structural order parameter for the amorphous solidification of a supercooled liquid. Journal of Chemical Physics, 2022, 157, .	3.0	4
123	Length scales of dynamic heterogeneities in a network of fluctuating mechanical constraints. Physical Review E, 2011, 83, 011501.	2.1	3
124	Defect-mediated relaxation in the random tiling phase of a binary mixture: Birth, death and mobility of an atomic zipper. Journal of Chemical Physics, 2014, 140, 104503.	3.0	3
125	Formation of Ultrastable Glasses via Precipitation: A Modeling Study. Physical Review Letters, 2019, 122, 088003.	7.8	3
126	Polyhedral ground states in clusters of asymmetric hard sphere ions. Journal of Chemical Physics, 2004, 121, 7440-7442.	3.0	2

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127	Crystal-melt coexistence under shear: Interpreting the nonlinear rheology. Journal of Chemical Physics, 2006, 125, 124502.	3.0	2
128	The free energy of a liquid when viewed as a population of overlapping clusters. Molecular Simulation, 2016, 42, 1149-1156.	2.0	2
129	Rotational relaxation in a 2D crystal of soft-core diatomic molecules. The Journal of Physical Chemistry, 1992, 96, 4040-4046.	2.9	1
130	Selection of interfacial velocity in the presence of multiple relaxation rates. Physical Review A, 1992, 46, 5284-5287.	2.5	1
131	On the Microscopic Nature of Stickâ€"Slip Behavior in Lubricating Films. ACS Symposium Series, 1999, , 104-126.	0.5	1
132	Fluctuations near the Onset of Rigidity in a 2D Supercooled Liquid. Progress of Theoretical Physics Supplement, 2000, 138, 199-204.	0.1	1
133	Thermodynamics of a soft disk glass: The role of configurational constraints. Journal of Chemical Physics, 2002, 116, 4232-4239.	3.0	1
134	Crystallisation and Local Order in Glass-Forming Binary Mixtures. AIP Conference Proceedings, 2004, , .	0.4	1
135	What Stabilizes the Intermediate Structure of an Amorphous Alloy?. AIP Conference Proceedings, 2006, , .	0.4	1
136	Structurally determined directionality identifies the boundary between mobile and immobile domains in a disordered material. Journal of Chemical Physics, 2012, 136, 054507.	3.0	1
137	The geometric mean squared displacement and the Stokes-Einstein scaling in a supercooled liquid. Journal of Chemical Physics, 2015, 143, 244502.	3.0	1
138	Composition susceptibility and the role of one, two, and three-body interactions in glass forming alloys: Cu50Zr50 vs Ni50Al50. Journal of Chemical Physics, 2018, 148, 224502.	3.0	1
139	Crystal growth rates and liquid dynamics at the crossover between stable crystal phases. Journal of Chemical Physics, 2020, 152, 164505.	3.0	1
140	Translationalâ€"rotational coupling during the scattering of a frictional sphere from a flat surface. Journal of Chemical Physics, 2021, 155, 054303.	3.0	1
141	Deposition control of model glasses with surface-mediated orientational order. Journal of Chemical Physics, 2021, 155, 124502.	3.0	1
142	Influence on crystal nucleation of an order-disorder transition among the subcritical clusters. Physical Review E, 2022, 105, .	2.1	1
143	On the importance of kinetic inhomogeneities in understanding glassy dynamics. AIP Conference Proceedings, 1992, , .	0.4	0
144	Theoretical problems in the crystallization of hard sphere colloidal particles. AIP Conference Proceedings, 2000, , .	0.4	0

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145	Liquid crystal phase transitions in clusters of spherocylinders. Journal of Chemical Physics, 2000, 112, 465-470.	3.0	0
146	Crystal Phases of Glass-Forming Mixtures. Materials Research Society Symposia Proceedings, 2002, 754, 1.	0.1	0
147	How reproducible is the structure of dynamic heterogeneity in glass forming liquids?. AIP Conference Proceedings, 2004, , .	0.4	0
148	The chemically ordered glass: the limiting composition for chemical order in amorphous packings of hard-sphere mixtures. Molecular Simulation, 2011, 37, 293-298.	2.0	0
149	The influence of overconstraint on the spatial distribution of mobility in an amorphous network. Journal of Chemical Physics, 2011, 135, 194505.	3.0	0
150	Molecular shape and the energetics of chemisorption: From simple to complex energy landscapes. Physical Review E, 2012, 86, 011606.	2.1	0
151	How real are liquid groundstates? Ultra-fast crystal growth and the susceptibility of energy minima in liquids. Journal of Chemical Physics, 2021, 154, 154503.	3.0	0
152	193nm photosensitivity in silica and local laser-induced femtosecond heating and cooling. , 2003, , .		0