Francis W Starr

List of Publications by Year
in descending order

131 papers	9,836 citations	38660 50 h-index	34900 98 g-index
132 all docs	132 docs citations	132 times ranked	6543 citing authors

#	Article	IF	Citations
1	Current issues in research on structureâ€"property relationships in polymer nanocomposites. Polymer, 2010, 51, 3321-3343.	1.8	773
2	Molecular Dynamics Simulation of a Polymer Melt with a Nanoscopic Particle. Macromolecules, 2002, 35, 4481-4492.	2.2	464
3	Spatially heterogeneous dynamics investigated via a time-dependent four-point density correlation function. Journal of Chemical Physics, 2003, 119, 7372-7387.	1.2	391
4	Diamond family of nanoparticle superlattices. Science, 2016, 351, 582-586.	6.0	331
5	Configurational entropy and diffusivity of supercooled water. Nature, 2000, 406, 166-169.	13.7	323
6	What Do We Learn from the Local Geometry of Glass-Forming Liquids?. Physical Review Letters, 2002, 89, 125501.	2.9	251
7	Effects of a nanoscopic filler on the structure and dynamics of a simulated polymer melt and the relationship to ultrathin films. Physical Review E, 2001, 64, 021802.	0.8	247
8	The relationship of dynamical heterogeneity to the Adam-Gibbs and random first-order transition theories of glass formation. Journal of Chemical Physics, 2013, 138, 12A541.	1.2	224
9	Appearance of a fractional Stokesâ€"Einstein relation in water and a structural interpretation ofÂits onset. Nature Physics, 2009, 5, 565-569.	6.5	219
10	Dynamics of simulated water under pressure. Physical Review E, 1999, 60, 6757-6768.	0.8	213
11	Origin of particle clustering in a simulated polymer nanocomposite and its impact on rheology. Journal of Chemical Physics, 2003, 119, 1777-1788.	1.2	213
12	Fast and Slow Dynamics of Hydrogen Bonds in Liquid Water. Physical Review Letters, 1999, 82, 2294-2297.	2.9	211
13	Thermodynamics, structure, and dynamics of water confined between hydrophobic plates. Physical Review E, 2005, 72, 051503.	0.8	206
14	Interfacial mobility scale determines the scale of collective motion and relaxation rate in polymer films. Nature Communications, 2014, 5, 4163.	5.8	202
15	The effect of nanoparticle shape on polymer-nanocomposite rheology and tensile strength. Journal of Polymer Science, Part B: Polymer Physics, 2007, 45, 1882-1897.	2.4	198
16	Modifying Fragility and Collective Motion in Polymer Melts with Nanoparticles. Physical Review Letters, 2011, 106, 115702.	2.9	187
17	Quantitative relations between cooperative motion, emergent elasticity, and free volume in model glass-forming polymer materials. Proceedings of the National Academy of Sciences of the United States of America, 2015, 112, 2966-2971.	3.3	171
18	Connection of translational and rotational dynamical heterogeneities with the breakdown of the Stokes-Einstein and Stokes-Einstein-Debye relations in water. Physical Review E, 2007, 76, 031203.	0.8	166

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19	Relation between the Widom line and the breakdown of the Stokes-Einstein relation in supercooled water. Proceedings of the National Academy of Sciences of the United States of America, 2007, 104, 9575-9579.	3.3	164
20	Fragility and cooperative motion in a glass-forming polymerâ€"nanoparticle composite. Soft Matter, 2013, 9, 241-254.	1.2	159
21	Fractional Stokes-Einstein and Debye-Stokes-Einstein Relations in a Network-Forming Liquid. Physical Review Letters, 2006, 97, 055901.	2.9	158
22	Hydrogen-bond dynamics for the extended simple point-charge model of water. Physical Review E, 2000, 62, 579-587.	0.8	154
23	Static and dynamic properties of stretched water. Journal of Chemical Physics, 2001, 115, 344-348.	1.2	136
24	Prediction of entropy and dynamic properties of water below the homogeneous nucleation temperature. Physica A: Statistical Mechanics and Its Applications, 2003, 323, 51-66.	1.2	129
25	Polymer-specific effects of bulk relaxation and stringlike correlated motion in the dynamics of a supercooled polymer melt. Journal of Chemical Physics, 2003, 119, 5290-5304.	1.2	123
26	Connection between Adam-Gibbs Theory and Spatially Heterogeneous Dynamics. Physical Review Letters, 2003, 90, 085506.	2.9	120
27	Relation between Rotational and Translational Dynamic Heterogeneities in Water. Physical Review Letters, 2006, 96, 057803.	2.9	120
28	String model for the dynamics of glass-forming liquids. Journal of Chemical Physics, 2014, 140, 204509.	1.2	120
29	A unifying framework to quantify the effects of substrate interactions, stiffness, and roughness on the dynamics of thin supported polymer films. Journal of Chemical Physics, 2015, 142, 234907.	1.2	118
30	Local variation of fragility and glass transition temperature of ultra-thin supported polymer films. Journal of Chemical Physics, 2012, 137, 244901.	1.2	112
31	Spatially correlated dynamics in a simulated glass-forming polymer melt: Analysis of clustering phenomena. Physical Review E, 2001, 64, 051503.	0.8	110
32	Slow Dynamics of Water under Pressure. Physical Review Letters, 1999, 82, 3629-3632.	2.9	108
33	Bound Layers â€œCloakâ€•Nanoparticles in Strongly Interacting Polymer Nanocomposites. ACS Nano, 2016, 10, 10960-10965.	7.3	96
34	Growing correlation length on cooling below the onset of caging in a simulated glass-forming liquid. Physical Review E, 2002, 66, 030101.	0.8	90
35	Local structural heterogeneities in liquid water under pressure. Chemical Physics Letters, 1998, 294, 9-12.	1.2	87
36	Model for assembly and gelation of four-armed DNA dendrimers. Journal of Physics Condensed Matter, 2006, 18, L347-L353.	0.7	84

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37	The puzzling behavior of water at very low temperature. Physical Chemistry Chemical Physics, 2000, 2, 1551-1558.	1.3	81
38	Instantaneous Normal Mode Analysis of Supercooled Water. Physical Review Letters, 2000, 84, 4605-4608.	2.9	80
39	Interplay of the Glass Transition and the Liquid-Liquid Phase Transition in Water. Scientific Reports, 2012, 2, 390.	1.6	80
40	Thermodynamic and structural aspects of the potential energy surface of simulated water. Physical Review E, 2001, 63, 041201.	0.8	78
41	Structure of supercooled and glassy water under pressure. Physical Review E, 1999, 60, 1084-1087.	0.8	75
42	Dynamical Behavior Near a Liquidâ€“Liquid Phase Transition in Simulations of Supercooled Water. Journal of Physical Chemistry B, 2011, 115, 14176-14183.	1.2	75
43	Self-Assembling DNA Dendrimers:Â A Numerical Study. Langmuir, 2007, 23, 5896-5905.	1.6	73
44	Hierarchies of networked phases induced by multiple liquidâ€“liquid critical points. Proceedings of the National Academy of Sciences of the United States of America, 2008, 105, 13711-13715.	3.3	67
45	Effect of water-wall interaction potential on the properties of nanoconfined water. Physical Review E, 2007, 75, 011202.	0.8	66
46	Relation between structural and dynamical anomalies in supercooled water. Physica A: Statistical Mechanics and Its Applications, 2002, 314, 470-476.	1.2	60
47	Dynamic Heterogeneities in Supercooled Water. Journal of Physical Chemistry B, 2004, 108, 6655-6662.	1.2	59
48	Free energy surface of supercooled water. Physical Review E, 2000, 62, 8016-8020.	0.8	58
49	Transitions between inherent structures in water. Physical Review E, 2002, 65, 041502.	0.8	57
50	Diminishing Interfacial Effects with Decreasing Nanoparticle Size in Polymer-Nanoparticle Composites. Physical Review Letters, 2018, 121, 207801.	2.9	53
51	String-like collective motion in the <i>Î±</i>- and <i>Î²</i>-relaxation of a coarse-grained polymer melt. Journal of Chemical Physics, 2018, 148, 104508.	1.2	51
52	Why we need to look beyond the glass transition temperature to characterize the dynamics of thin supported polymer films. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, 5641-5646.	3.3	50
53	Static and dynamic heterogeneities in water. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2005, 363, 509-523.	1.6	49
54	Stability of DNA-linked nanoparticle crystals I: Effect of linker sequence and length. Soft Matter, 2011, 7, 2085.	1.2	49

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55	Predictive relation for the Î±-relaxation time of a coarse-grained polymer melt under steady shear. Science Advances, 2020, 6, eaaz0777.	4.7	45
56	Internal Structure of Nanoparticle Dimers Linked by DNA. ACS Nano, 2012, 6, 6793-6802.	7.3	43
57	Clusters of mobile molecules in supercooled water. Physical Review E, 2005, 72, 011202.	0.8	42
58	Polarizable contributions to the surface tension of liquid water. Journal of Chemical Physics, 2006, 125, 094712.	1.2	42
59	Dynamic heterogeneity and collective motion in star polymer melts. Journal of Chemical Physics, 2020, 152, 054904.	1.2	41
60	The puzzling statistical physics of liquid water. Physica A: Statistical Mechanics and Its Applications, 1998, 257, 213-232.	1.2	40
61	The puzzle of liquid water: a very complex fluid. Physica D: Nonlinear Phenomena, 1999, 133, 453-462.	1.3	40
62	Cooperative molecular motions in water: The liquid-liquid critical point hypothesis. Physica A: Statistical Mechanics and Its Applications, 1997, 236, 19-37.	1.2	39
63	Theoretical Description of a DNA-Linked Nanoparticle Self-Assembly. Physical Review Letters, 2010, 105, 055502.	2.9	38
64	Model for reversible nanoparticle assembly in a polymer matrix. Journal of Chemical Physics, 2008, 128, 024902.	1.2	37
65	Valency Dependence of Polymorphism and Polyamorphism in DNA-Functionalized Nanoparticles. Langmuir, 2010, 26, 3601-3608.	1.6	37
66	Spatially Heterogeneous Dynamics and the Adamâˆ'Gibbs Relation in the Dzugutov Liquid. Journal of Physical Chemistry B, 2005, 109, 15068-15079.	1.2	35
67	Pressure-induced transformations in computer simulations of glassy water. Journal of Chemical Physics, 2013, 139, 184504.	1.2	35
68	Dynamics of supercooled water in configuration space. Physical Review E, 2001, 64, 036102.	0.8	34
69	Weak Correlations between Local Density and Dynamics near the Glass Transition. Journal of Physical Chemistry B, 2005, 109, 21235-21240.	1.2	34
70	Stability of DNA-linked nanoparticle crystals: Effect of number of strands, core size, and rigidity of strand attachment. Journal of Chemical Physics, 2011, 134, 244701.	1.2	34
71	The interfacial zone in thin polymer films and around nanoparticles in polymer nanocomposites. Journal of Chemical Physics, 2019, 151, 124705.	1.2	33
72	Statistical physics and liquid water at negative pressures. Physica A: Statistical Mechanics and Its Applications, 2002, 315, 281-289.	1.2	32

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73	Morphology and Transport Properties of Two-Dimensional Sheet Polymers. Macromolecules, 2010, 43, 3438-3445.	2.2	32
74	Universal two-step crystallization of DNA-functionalized nanoparticles. Soft Matter, 2010, 6, 6130.	1.2	32
75	Effects of a â€œboundâ€•substrate layer on the dynamics of supported polymer films. Journal of Chemical Physics, 2017, 147, 044901.	1.2	32
76	Collective Motion in the Interfacial and Interior Regions of Supported Polymer Films and Its Relation to Relaxation. Journal of Physical Chemistry B, 2019, 123, 5935-5941.	1.2	32
77	Translational and rotational diffusion in stretched water. Journal of Molecular Liquids, 2002, 101, 159-168.	2.3	31
78	Rapid Transport of Water via a Carbon Nanotube Syringe. Journal of Physical Chemistry C, 2010, 114, 3737-3742.	1.5	29
79	High-speed, high-purity separation of gold nanoparticleâ€“DNA origami constructs using centrifugation. Soft Matter, 2014, 10, 7370.	1.2	29
80	Molecular rigidity and enthalpyâ€“entropy compensation in DNA melting. Soft Matter, 2017, 13, 8309-8330.	1.2	28
81	Potential energy landscape of the apparent first-order phase transition between low-density and high-density amorphous ice. Journal of Chemical Physics, 2016, 145, 224501.	1.2	27
82	â€œCrystal-clearâ€•liquidâ€“liquid transition in a tetrahedral fluid. Soft Matter, 2014, 10, 9413-9422.	1.2	25
83	What does the instantaneous normal mode spectrum tell us about dynamical heterogeneity in glass-forming fluids?. Journal of Chemical Physics, 2019, 151, 184904.	1.2	25
84	Coupling of isotropic and directional interactions and its effect on phase separation and self-assembly. Journal of Chemical Physics, 2016, 144, 074901.	1.2	24
85	Unsolved mysteries of water in its liquid and glassy phases. Journal of Physics Condensed Matter, 2000, 12, A403-A412.	0.7	23
86	Statistical physics and liquid water: â€œWhat mattersâ€• Physica A: Statistical Mechanics and Its Applications, 2002, 306, 230-242.	1.2	23
87	Application of Statistical Physics to Understand Static and Dynamic Anomalies in Liquid Water. Journal of Statistical Physics, 2003, 110, 1039-1054.	0.5	23
88	Localization transition of instantaneous normal modes and liquid diffusion. Journal of Chemical Physics, 2012, 136, 144504.	1.2	23
89	Dynamical clustering and a mechanism for raft-like structures in a model lipid membrane. Soft Matter, 2014, 10, 3036.	1.2	23
90	Recent results on the connection between thermodynamics and dynamics in supercooled water. Biophysical Chemistry, 2003, 105, 573-583.	1.5	22

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91	Dynamical heterogeneity in a vapor-deposited polymer glass. Journal of Chemical Physics, 2017, 146, 203310.	1.2	22
92	Heating-induced glass-glass and glass-liquid transformations in computer simulations of water. Journal of Chemical Physics, 2014, 140, 114504.	1.2	21
93	Reconciling computational and experimental trends in the temperature dependence of the interfacial mobility of polymer films. Journal of Chemical Physics, 2020, 152, 124703.	1.2	20
94	Structural Properties of Bound Layer in Polymerâ€"Nanoparticle Composites. Macromolecules, 2020, 53, 7845-7850.	2.2	19
95	Valence, loop formation and universality in self-assembling patchy particles. Soft Matter, 2018, 14, 1622-1630.	1.2	18
96	Holliday Junction Thermodynamics and Structure: Coarse-Grained Simulations and Experiments. Scientific Reports, 2016, 6, 22863.	1.6	17
97	Dimensional reduction of duplex DNA under confinement to nanofluidic slits. Soft Matter, 2015, 11, 8273-8284.	1.2	16
98	Quantifying the Heterogeneous Dynamics of a Simulated Dipalmitoylphosphatidylcholine (DPPC) Membrane. Journal of Physical Chemistry B, 2016, 120, 5172-5182.	1.2	15
99	Influence of sample preparation on the transformation of low-density to high-density amorphous ice: An explanation based on the potential energy landscape. Journal of Chemical Physics, 2017, 147, 044501.	1.2	15
100	Activation free energy gradient controls interfacial mobility gradient in thin polymer films. Journal of Chemical Physics, 2021, 155, 174901.	1.2	15
101	State variables for glasses: The case of amorphous ice. Journal of Chemical Physics, 2019, 150, 224502.	1.2	14
102	Structure and Dynamics of Star Polymer Films from Coarse-Grained Molecular Simulations. Macromolecules, 2021, 54, 5344-5353.	2.2	14
103	Effects of Chain Length on the Structure and Dynamics of Semidilute Nanoparticleâ€"Polymer Composites. Macromolecules, 2021, 54, 3041-3051.	2.2	11
104	Interaction of Water with Cap-Ended Defective and Nondefective Small Carbon Nanotubes. Journal of Physical Chemistry C, 2007, 111, 18899-18905.	1.5	10
105	Explaining the Sensitivity of Polymer Segmental Relaxation to Additive Size Based on the Localization Model. Physical Review Letters, 2021, 127, 277802.	2.9	10
106	Water and its energy landscape. European Physical Journal E, 2002, 9, 233-237.	0.7	8
107	Interface Roughening in a Hydrodynamic Lattice-Gas Model with Surfactant. Physical Review Letters, 1996, 77, 3363-3366.	2.9	7
108	Computer simulation of dynamical anomalies in stretched water. Brazilian Journal of Physics, 2004, 34, 24-31.	0.7	7

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109	Crystal-clear transition. Nature Physics, 2014, 10, 628-629.	6.5	7
110	How Does Monomer Structure Affect the Interfacial Dynamics of Supported Ultrathin Polymer Films?. Macromolecules, 2020, 53, 9654-9664.	2.2	7
111	Interpenetration as a mechanism for liquid-liquid phase transitions. Physical Review E, 2009, 79, 041502.	0.8	6
112	Hydrodynamic radius fluctuations in model DNAâ€“grafted nanoparticles. AIP Conference Proceedings, 2016, 1736, .	0.3	5
113	The Stability of a Nanoparticle Diamond Lattice Linked by DNA. Nanomaterials, 2019, 9, 661.	1.9	5
114	Detecting bound polymer layers in attractive polymerâ€“nanoparticle hybrids. Nanoscale, 2021, 13, 12910-12915.	2.8	5
115	Simulations of Filled Polymers on Multiple Length Scales. Materials Research Society Symposia Proceedings, 2000, 661, KK4.1.1.	0.1	4
116	Chain conformation in ultrathin polymer films. , 2002, 4690, 342.		4
117	What does the Tg of thin polymer films really tell us?. AIP Conference Proceedings, 2018, , .	0.3	4
118	Reactive Molecular Dynamics Simulations of the Depolymerization of Polyethylene Using Graphene-Oxide-Supported Platinum Nanoparticles. Journal of Physical Chemistry A, 2022, 126, 3167-3173.	1.1	4
119	Conformational nature of DNAâ€“grafted chains on spherical gold nanoparticles. AIP Conference Proceedings, 2016, , .	0.3	3
120	Cooperative dynamics in a model DPPC membrane arise from membrane layer interactions. Emergent Materials, 2019, 2, 1-10.	3.2	3
121	Glass-forming liquids and polymers: with a little help from computational statistical physics. Computer Physics Communications, 2002, 146, 24-29.	3.0	2
122	Dynamic Heterogeneities in Liquid Water. AIP Conference Proceedings, 2004, , .	0.3	2
123	Quantitative Model for Clusters of String-like Cooperative Motion in a Coarse-Grained Glass-Forming Polymer Melt. Materials Research Society Symposia Proceedings, 2014, 1622, 95-111.	0.1	2
124	The Interfacial Layers Around Nanoparticle and Its Impact onÂStructural Relaxation and Glass Transition in Model Polymer Nanocomposites. Springer Series in Materials Science, 2021, , 101-131.	0.4	2
125	Holliday Junction Thermodynamics and Structure: Comparisons of Coarse-Grained Simulations and Experiments. Biophysical Journal, 2016, 110, 178a.	0.2	1
126	Desalination by dragging water using a low-energy nano-mechanical device of porous graphene. RSC Advances, 2017, 7, 53729-53739.	1.7	1

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127	Cooperative Molecular Motions in Water. Progress of Theoretical Physics Supplement, 1997, 126, 201-206.	0.2	1
128	Cooperative motion as an organizing principle for understanding relaxation in supported thin polymer films. , 2016, , 267-300.		1
129	Investigation of the Melting Thermodynamics of a DNA 4-Way Junction: One Base at a Time. Biophysical Journal, 2017, 112, 69a-70a.	0.2	0
130	Heterogeneities in the Dynamics of Supercooled Water. , 2004, , 145-161.		0
131	Science and Engineering of Nanoparticleâ€"Polymer Composites. , 2004, , 107-124.		0