Francis W Starr

List of Publications by Citations

125 papers	8,642 citations	49 h-index	92 g-index
132 ext. papers	9,195 ext. citations	5.3 avg, IF	6.22 L-index

#	Paper	IF	Citations
125	Current issues in research on structure–property relationships in polymer nanocomposites. *Polymer* , **2010**, 51, 3321-3343	3.9	673
124	Molecular Dynamics Simulation of a Polymer Melt with a Nanoscopic Particle. *Macromolecules*, **2002** , 35, 4481-4492	5.5	435
123	Spatially heterogeneous dynamics investigated via a time-dependent four-point density correlation function. *Journal of Chemical Physics*, **2003**, 119, 7372-7387	3.9	349
122	Configurational entropy and diffusivity of supercooled water. *Nature*, **2000**, 406, 166-9	50.4	308
121	Diamond family of nanoparticle superlattices. *Science*, **2016**, 351, 582-6	33.3	265
120	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	2.4	227
119	What do we learn from the local geometry of glass-forming liquids?. *Physical Review Letters*, **2002**, 89, 125501	7.4	220
118	Dynamics of simulated water under pressure. *Physical Review E*, **1999**, 60, 6757-68	2.4	205
117	Fast and Slow Dynamics of Hydrogen Bonds in Liquid Water. *Physical Review Letters*, **1999**, 82, 2294-2297	7.4	201
116	Appearance of a fractional Stokes–Einstein relation in water and a structural interpretation of its onset. *Nature Physics*, **2009**, 5, 565-569	16.2	199
115	Origin of particle clustering in a simulated polymer nanocomposite and its impact on rheology. *Journal of Chemical Physics*, **2003**, 119, 1777-1788	3.9	199
114	Thermodynamics, structure, and dynamics of water confined between hydrophobic plates. *Physical Review E*, **2005**, 72, 051503	2.4	192
113	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	3.9	179
112	Interfacial mobility scale determines the scale of collective motion and relaxation rate in polymer films. *Nature Communications*, **2014**, 5, 4163	17.4	176
111	The effect of nanoparticle shape on polymer-nanocomposite rheology and tensile strength. *Journal of Polymer Science, Part B: Polymer Physics*, **2007**, 45, 1882-1897	2.6	175
110	Modifying fragility and collective motion in polymer melts with nanoparticles. *Physical Review Letters*, **2011**, 106, 115702	7.4	170
109	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	11.5	147

108	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	2.4	140
107	Fragility and cooperative motion in a glass-forming polymer-nanoparticle composite. *Soft Matter*, **2013**, 9, 241-254	3.6	139
106	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, 2966-71	11.5	138
105	Fractional Stokes-Einstein and Debye-Stokes-Einstein relations in a network-forming liquid. *Physical Review Letters*, **2006**, 97, 055901	7.4	136
104	Hydrogen-bond dynamics for the extended simple point-charge model of water. *Physical Review E*, **2000**, 62, 579-87	2.4	135
103	Static and dynamic properties of stretched water. *Journal of Chemical Physics*, **2001**, 115, 344-348	3.9	124
102	Prediction of entropy and dynamic properties of water below the homogeneous nucleation temperature. *Physica A: Statistical Mechanics and Its Applications*, **2003**, 323, 51-66	3.3	120
101	Connection between Adam-Gibbs theory and spatially heterogeneous dynamics. *Physical Review Letters*, **2003**, 90, 085506	7.4	116
100	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	3.9	115
99	Relation between rotational and translational dynamic heterogeneities in water. *Physical Review Letters*, **2006**, 96, 057803	7.4	109
98	Spatially correlated dynamics in a simulated glass-forming polymer melt: analysis of clustering phenomena. *Physical Review E*, **2001**, 64, 051503	2.4	103
97	Slow Dynamics of Water under Pressure. *Physical Review Letters*, **1999**, 82, 3629-3632	7.4	103
96	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	3.9	100
95	String model for the dynamics of glass-forming liquids. *Journal of Chemical Physics*, **2014**, 140, 204509	3.9	100
94	Local variation of fragility and glass transition temperature of ultra-thin supported polymer films. *Journal of Chemical Physics*, **2012**, 137, 244901	3.9	99
93	Growing correlation length on cooling below the onset of caging in a simulated glass-forming liquid. *Physical Review E*, **2002**, 66, 030101	2.4	82
92	Local structural heterogeneities in liquid water under pressure. *Chemical Physics Letters*, **1998**, 294, 9-12	2.5	79
91	Bound Layers "Cloak" Nanoparticles in Strongly Interacting Polymer Nanocomposites. *ACS Nano*, **2016**, 10, 10960-10965	16.7	79

90	Thermodynamic and structural aspects of the potential energy surface of simulated water. *Physical Review E*, **2001**, 63, 041201	2.4	75
89	Instantaneous normal mode analysis of supercooled water. *Physical Review Letters*, **2000**, 84, 4605-8	7.4	75
88	Dynamical behavior near a liquid-liquid phase transition in simulations of supercooled water. *Journal of Physical Chemistry B*, **2011**, 115, 14176-83	3.4	73
87	Model for assembly and gelation of four-armed DNA dendrimers. *Journal of Physics Condensed Matter*, **2006**, 18, L347-53	1.8	73
86	The puzzling behavior of water at very low temperature. Invited Lecture. *Physical Chemistry Chemical Physics*, **2000**, 2, 1551-1558	3.6	72
85	Structure of supercooled and glassy water under pressure. *Physical Review E*, **1999**, 60, 1084-7	2.4	68
84	Interplay of the glass transition and the liquid-liquid phase transition in water. *Scientific Reports*, **2012**, 2, 390	4.9	67
83	Self-assembling DNA dendrimers: a numerical study. *Langmuir*, **2007**, 23, 5896-905	4	65
82	Effect of water-wall interaction potential on the properties of nanoconfined water. *Physical Review E*, **2007**, 75, 011202	2.4	60
81	Hierarchies of networked phases induced by multiple liquid-liquid critical points. *Proceedings of the National Academy of Sciences of the United States of America*, **2008**, 105, 13711-5	11.5	59
80	Relation between structural and dynamical anomalies in supercooled water. *Physica A: Statistical Mechanics and Its Applications*, **2002**, 314, 470-476	3.3	58
79	Free energy surface of supercooled water. *Physical Review E*, **2000**, 62, 8016-20	2.4	54
78	Dynamic Heterogeneities in Supercooled Water *Journal of Physical Chemistry B*, **2004**, 108, 6655-6662	3.4	52
77	Transitions between inherent structures in water. *Physical Review E*, **2002**, 65, 041502	2.4	50
76	Static and dynamic heterogeneities in water. *Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences*, **2005**, 363, 509-23	3	44
75	Polarizable contributions to the surface tension of liquid water. *Journal of Chemical Physics*, **2006**, 125, 094712	3.9	40
74	Clusters of mobile molecules in supercooled water. *Physical Review E*, **2005**, 72, 011202	2.4	40
73	Internal structure of nanoparticle dimers linked by DNA. *ACS Nano*, **2012**, 6, 6793-802	16.7	38

72	The puzzling statistical physics of liquid water. *Physica A: Statistical Mechanics and Its Applications*, **1998**, 257, 213-232	3.3	38
71	Cooperative molecular motions in water: The liquid-liquid critical point hypothesis. *Physica A: Statistical Mechanics and Its Applications*, **1997**, 236, 19-37	3.3	37
70	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	11.5	37
69	Model for reversible nanoparticle assembly in a polymer matrix. *Journal of Chemical Physics*, **2008**, 128, 024902	3.9	36
68	Theoretical description of a DNA-linked nanoparticle self-assembly. *Physical Review Letters*, **2010**, 105, 055502	7.4	35
67	Valency dependence of polymorphism and polyamorphism in DNA-functionalized nanoparticles. *Langmuir*, **2010**, 26, 3601-8	4	35
66	Spatially heterogeneous dynamics and the Adam-Gibbs relation in the Dzugutov liquid. *Journal of Physical Chemistry B*, **2005**, 109, 15068-79	3.4	35
65	The puzzle of liquid water: a very complex fluid. *Physica D: Nonlinear Phenomena*, **1999**, 133, 453-462	3.3	35
64	Diminishing Interfacial Effects with Decreasing Nanoparticle Size in Polymer-Nanoparticle Composites. *Physical Review Letters*, **2018**, 121, 207801	7.4	35
63	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	3.9	34
62	Weak correlations between local density and dynamics near the glass transition. *Journal of Physical Chemistry B*, **2005**, 109, 21235-40	3.4	33
61	Stability of DNA-linked nanoparticle crystals I: Effect of linker sequence and length. *Soft Matter*, **2011**, 7, 2085	3.6	32
60	Dynamics of supercooled water in configuration space. *Physical Review E*, **2001**, 64, 036102	2.4	32
59	Pressure-induced transformations in computer simulations of glassy water. *Journal of Chemical Physics*, **2013**, 139, 184504	3.9	31
58	Statistical physics and liquid water at negative pressures. *Physica A: Statistical Mechanics and Its Applications*, **2002**, 315, 281-289	3.3	31
57	String-like collective motion in the □and ♯relaxation of a coarse-grained polymer melt. *Journal of Chemical Physics*, **2018**, 148, 104508	3.9	29
56	Effects of a "bound" substrate layer on the dynamics of supported polymer films. *Journal of Chemical Physics*, **2017**, 147, 044901	3.9	29
55	Universal two-step crystallization of DNA-functionalized nanoparticles. *Soft Matter*, **2010**, 6, 6130	3.6	29

54	Morphology and Transport Properties of Two-Dimensional Sheet Polymers. *Macromolecules*, **2010**, 43, 3438-3445	5.5	28
53	Translational and rotational diffusion in stretched water. *Journal of Molecular Liquids*, **2002**, 101, 159-168	3	28
52	Rapid Transport of Water via a Carbon Nanotube Syringe. *Journal of Physical Chemistry C*, **2010**, 114, 3737-3742	3.8	27
51	Dynamic heterogeneity and collective motion in star polymer melts. *Journal of Chemical Physics*, **2020**, 152, 054904	3.9	25
50	The interfacial zone in thin polymer films and around nanoparticles in polymer nanocomposites. *Journal of Chemical Physics*, **2019**, 151, 124705	3.9	24
49	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	3.4	24
48	High-speed, high-purity separation of gold nanoparticle-DNA origami constructs using centrifugation. *Soft Matter*, **2014**, 10, 7370-8	3.6	23
47	Statistical physics and liquid water: What matters *Physica A: Statistical Mechanics and Its Applications*, **2002**, 306, 230-242	3.3	22
46	Application of Statistical Physics to Understand Static and Dynamic Anomalies in Liquid Water. *Journal of Statistical Physics*, **2003**, 110, 1039-1054	1.5	22
45	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	3.9	22
44	Dynamical heterogeneity in a vapor-deposited polymer glass. *Journal of Chemical Physics*, **2017**, 146, 203310	3.9	21
43	Coupling of isotropic and directional interactions and its effect on phase separation and self-assembly. *Journal of Chemical Physics*, **2016**, 144, 074901	3.9	21
42	Dynamical clustering and a mechanism for raft-like structures in a model lipid membrane. *Soft Matter*, **2014**, 10, 3036-47	3.6	21
41	"Crystal-clear" liquid-liquid transition in a tetrahedral fluid. *Soft Matter*, **2014**, 10, 9413-22	3.6	21
40	Heating-induced glass-glass and glass-liquid transformations in computer simulations of water. *Journal of Chemical Physics*, **2014**, 140, 114504	3.9	18
39	Recent results on the connection between thermodynamics and dynamics in supercooled water. *Biophysical Chemistry*, **2003**, 105, 573-83	3.5	18
38	Unsolved mysteries of water in its liquid and glassy phases. *Journal of Physics Condensed Matter*, **2000**, 12, A403-A412	1.8	18
37	Molecular rigidity and enthalpy-entropy compensation in DNA melting. *Soft Matter*, **2017**, 13, 8309-8330	3.6	17

36	Reconciling computational and experimental trends in the temperature dependence of the interfacial mobility of polymer films. *Journal of Chemical Physics*, **2020**, 152, 124703	3.9	17
35	What does the instantaneous normal mode spectrum tell us about dynamical heterogeneity in glass-forming fluids?. *Journal of Chemical Physics*, **2019**, 151, 184904	3.9	16
34	Predictive relation for the □-relaxation time of a coarse-grained polymer melt under steady shear. *Science Advances*, **2020**, 6, eaaz0777	14.3	15
33	Quantifying the Heterogeneous Dynamics of a Simulated Dipalmitoylphosphatidylcholine (DPPC) Membrane. *Journal of Physical Chemistry B*, **2016**, 120, 5172-82	3.4	15
32	Localization transition of instantaneous normal modes and liquid diffusion. *Journal of Chemical Physics*, **2012**, 136, 144504	3.9	15
31	Dimensional reduction of duplex DNA under confinement to nanofluidic slits. *Soft Matter*, **2015**, 11, 8273-84	3.8	13
30	Valence, loop formation and universality in self-assembling patchy particles. *Soft Matter*, **2018**, 14, 1622-1630	3.8	13
29	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	3.9	13
28	Structural Properties of Bound Layer in Polymer□Nanoparticle Composites. *Macromolecules*, **2020**, 53, 7845-7850	5.5	13
27	Holliday Junction Thermodynamics and Structure: Coarse-Grained Simulations and Experiments. *Scientific Reports*, **2016**, 6, 22863	4.9	12
26	State variables for glasses: The case of amorphous ice. *Journal of Chemical Physics*, **2019**, 150, 224502	3.9	10
25	Interaction of Water with Cap-Ended Defective and Nondefective Small Carbon Nanotubes. *Journal of Physical Chemistry C*, **2007**, 111, 18899-18905	3.8	8
24	Water and its energy landscape. *European Physical Journal E*, **2002**, 9, 233-7	1.5	8
23	Computer simulation of dynamical anomalies in stretched water. *Brazilian Journal of Physics*, **2004**, 34, 24-31	1.2	6
22	Interpenetration as a mechanism for liquid-liquid phase transitions. *Physical Review E*, **2009**, 79, 041502	2.4	5
21	The Stability of a Nanoparticle Diamond Lattice Linked by DNA. *Nanomaterials*, **2019**, 9,	5.4	4
20	What does the Tg of thin polymer films really tell us? **2018**,		4
19	Chain conformation in ultrathin polymer films **2002**, 4690, 342		4

18	Interface Roughening in a Hydrodynamic Lattice-Gas Model with Surfactant. *Physical Review Letters* , **1996**, 77, 3363-3366	7.4	4
17	How Does Monomer Structure Affect the Interfacial Dynamics of Supported Ultrathin Polymer Films?. *Macromolecules*, **2020**, 53, 9654-9664	5.5	4
16	Simulations of Filled Polymers on Multiple Length Scales. *Materials Research Society Symposia Proceedings*, **2000**, 661, KK4.1.1		3
15	Effects of Chain Length on the Structure and Dynamics of Semidilute Nanoparticle–Polymer Composites. *Macromolecules*, **2021**, 54, 3041-3051	5.5	3
14	Hydrodynamic Radius Fluctuations in Model DNA-Grafted Nanoparticles. *AIP Conference Proceedings*, **2016**, 1736,	0	3
13	Cooperative dynamics in a model DPPC membrane arise from membrane layer interactions. *Emergent Materials*, **2019**, 2, 1-10	3.5	2
12	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		2
11	Glass-forming liquids and polymers: with a little help from computational statistical physics. *Computer Physics Communications*, **2002**, 146, 24-29	4.2	2
10	Activation free energy gradient controls interfacial mobility gradient in thin polymer films. *Journal of Chemical Physics*, **2021**, 155, 174901	3.9	2
9	Structure and Dynamics of Star Polymer Films from Coarse-Grained Molecular Simulations. *Macromolecules*, **2021**, 54, 5344-5353	5.5	2
8	Conformational nature of DNA–grafted chains on spherical gold nanoparticles **2016**,		2
7	Desalination by dragging water using a low-energy nano-mechanical device of porous graphene. *RSC Advances*, **2017**, 7, 53729-53739	3.7	1
6	Cooperative motion as an organizing principle for understanding relaxation in supported thin polymer films **2016**, 267-300		1
5	The Interfacial Layers Around Nanoparticle and Its Impact on Structural Relaxation and Glass Transition in Model Polymer Nanocomposites. *Springer Series in Materials Science*, **2021**, 101-131	0.9	1
4	Detecting bound polymer layers in attractive polymer-nanoparticle hybrids. *Nanoscale*, **2021**, 13, 12910-12915	7.7	1
3	Explaining the Sensitivity of Polymer Segmental Relaxation to Additive Size Based on the Localization Model.. *Physical Review Letters*, **2021**, 127, 277802	7.4	1
2	Heterogeneities in the Dynamics of Supercooled Water **2004**, 145-161		
1	Science and Engineering of Nanoparticle–Polymer Composites **2004**, 107-124		