Michael J Shelley

List of Publications by Year
in descending order

159 papers	11,790 citations	26630 56 h-index	29157 104 g-index
169 all docs	169 docs citations	169 times ranked	7109 citing authors

#	Article	IF	Citations
1	A multiscale biophysical model gives quantized metachronal waves in a lattice of beating cilia. Proceedings of the National Academy of Sciences of the United States of America, 2022, 119, .	7.1	27
2	Hyperuniformity and phase enrichment in vortex and rotor assemblies. Nature Communications, 2022, 13, 804.	12.8	14
3	A fast Chebyshev method for the Bingham closure with application to active nematic suspensions. Journal of Computational Physics, 2022, 457, 110937.	3.8	6
4	Motile dislocations knead odd crystals into whorls. Nature Physics, 2022, 18, 212-218.	16.7	35
5	How Cross-Link Numbers Shape the Large-Scale Physics of Cytoskeletal Materials. Annual Review of Condensed Matter Physics, 2022, 13, 365-384.	14.5	2
6	Enhanced clamshell swimming with asymmetric beating at low Reynolds number. Soft Matter, 2022, 18, 3605-3612.	2.7	3
7	Weakly nonlinear analysis of pattern formation in active suspensions. Journal of Fluid Mechanics, 2022, 942, .	3.4	5
8	Thermodynamically consistent coarse-graining of polar active fluids. Physical Review Fluids, 2022, 7, .	2.5	5
9	The many behaviors of deformable active droplets. Mathematical Biosciences and Engineering, 2021, 18, 2849-2881.	1.9	13
10	Metallic microswimmers driven up the wall by gravity. Soft Matter, 2021, 17, 6597-6602.	2.7	12
11	Comparison of explicit and mean-field models of cytoskeletal filaments with crosslinking motors. European Physical Journal E, 2021, 44, 45.	1.6	5
12	A stable and accurate scheme for solving the Stefan problem coupled with natural convection using the Immersed Boundary Smooth Extension method. Journal of Computational Physics, 2021, 432, 110162.	3.8	13
13	LÃ©vy Walks and Path Chaos in the Dispersal of Elongated Structures Moving across Cellular Vortical Flows. Physical Review Letters, 2021, 127, 074503.	7.8	2
14	A design framework for actively crosslinked filament networks. New Journal of Physics, 2021, 23, 013012.	2.9	14
15	Swirling Instability of the Microtubule Cytoskeleton. Physical Review Letters, 2021, 126, 028103.	7.8	24
16	Tissue fluidity mediated by adherens junction dynamics promotes planar cell polarity-driven ommatidial rotation. Nature Communications, 2021, 12, 6974.	12.8	16
17	A Compact Eulerian Representation of Axisymmetric Inviscid Vortex Sheet Dynamics. Communications on Pure and Applied Mathematics, 2020, 73, 239-256.	3.1	1
18	Droplet breakup in a stagnation-point flow. Journal of Fluid Mechanics, 2020, 901, .	3.4	2

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19	Ultra-sharp pinnacles sculpted by natural convective dissolution. Proceedings of the National Academy of Sciences of the United States of America, 2020, 117, 23339-23344.	7.1	16
20	A scalable computational platform for particulate Stokes suspensions. Journal of Computational Physics, 2020, 416, 109524.	3.8	23
21	Stoichiometric interactions explain spindle dynamics and scaling across 100 million years of nematode evolution. ELife, 2020, 9, .	6.0	26
22	Current approaches for the analysis of spindle organization. Current Opinion in Structural Biology, 2019, 58, 269-277.	5.7	8
23	Lattices of Hydrodynamically Interacting Flapping Swimmers. Physical Review X, 2019, 9, .	8.9	17
24	Relating Rheotaxis and Hydrodynamic Actuation using Asymmetric Gold-Platinum Phoretic Rods. Physical Review Letters, 2019, 123, 178004.	7.8	38
25	Self-straining of actively crosslinked microtubule networks. Nature Physics, 2019, 15, 1295-1300.	16.7	37
26	The stormy fluid dynamics of the living cell. Physics Today, 2019, 72, 32-38.	0.3	20
27	The odd free surface flows of a colloidal chiral fluid. Nature Physics, 2019, 15, 1188-1194.	16.7	174
28	Rotating Membrane Inclusions Crystallize Through Hydrodynamic and Steric Interactions. Physical Review Letters, 2019, 123, 148101.	7.8	32
29	Active matter invasion of a viscous fluid: Unstable sheets and a no-flow theorem. Physical Review Letters, 2019, 122, 098002.	7.8	15
30	Computing collision stress in assemblies of active spherocylinders: Applications of a fast and generic geometric method. Journal of Chemical Physics, 2019, 150, 064109.	3.0	14
31	Dynamics of Flexible Fibers in Viscous Flows and Fluids. Annual Review of Fluid Mechanics, 2019, 51, 539-572.	25.0	130
32	From cytoskeletal assemblies to living materials. Current Opinion in Cell Biology, 2019, 56, 109-114.	5.4	15
33	Coarse graining the dynamics of immersed and driven fiber assemblies. Physical Review Fluids, 2019, 4, .	2.5	14
34	Bistability in the synchronization of actuatedÂmicrofilaments. Journal of Fluid Mechanics, 2018, 836, 304-323.	3.4	39
35	Activity-induced instability of phonons in 1D microfluidic crystals. Soft Matter, 2018, 14, 945-950.	2.7	7
36	Flexibly imposing periodicity in kernel independent FMM: A multipole-to-local operator approach. Journal of Computational Physics, 2018, 355, 214-232.	3.8	13

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37	Nonlinear concentration patterns and bands in autochemotactic suspensions. Physical Review E, 2018, 98, .	2.1	18
38	Extensile motor activity drives coherent motions in a model of interphase chromatin. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, 11442-11447.	7.1	83
39	Directed Migration of Microscale Swimmers by an Array of Shaped Obstacles: Modeling and Shape Optimization. SIAM Journal on Applied Mathematics, 2018, 78, 2370-2392.	1.8	9
40	Universal image systems for non-periodic and periodic Stokes flows above a no-slip wall. Journal of Computational Physics, 2018, 375, 263-270.	3.8	13
41	Equilibrium Shapes and Their Stability for Liquid Films in Fast Flows. Physical Review Letters, 2018, 121, 094501.	7.8	5
42	Measuring and modeling polymer concentration profiles near spindle boundaries argues that spindle microtubules regulate their own nucleation. New Journal of Physics, 2018, 20, 055012.	2.9	20
43	Guiding microscale swimmers using teardrop-shaped posts. Soft Matter, 2017, 13, 4681-4688.	2.7	47
44	C. elegans chromosomes connect to centrosomes by anchoring into the spindle network. Nature Communications, 2017, 8, 15288.	12.8	101
45	A computational model of the flight dynamics and aerodynamics of a jellyfish-like flyingÂmachine. Journal of Fluid Mechanics, 2017, 819, 621-655.	3.4	22
46	Cytoplasmic flows as signatures for the mechanics of mitotic positioning. Molecular Biology of the Cell, 2017, 28, 3261-3270.	2.1	49
47	Forces positioning the mitotic spindle: Theories, and now experiments. BioEssays, 2017, 39, 1600212.	2.5	34
48	A fast platform for simulating semi-flexible fiber suspensions applied to cell mechanics. Journal of Computational Physics, 2017, 329, 173-209.	3.8	65
49	Connecting macroscopic dynamics with microscopic properties in active microtubule network contraction. New Journal of Physics, 2017, 19, 125011.	2.9	14
50	Analytical structure, dynamics, and coarse graining of a kinetic model of an active fluid. Physical Review Fluids, 2017, 2, .	2.5	50
51	Dynamic self-assembly of microscale rotors and swimmers. Soft Matter, 2016, 12, 4584-4589.	2.7	69
52	The Dynamics of Microtubule/Motor-Protein Assemblies in Biology and Physics. Annual Review of Fluid Mechanics, 2016, 48, 487-506.	25.0	79
53	Transport and buckling dynamics of an elastic fibre in a viscous cellular flow. Journal of Fluid Mechanics, 2015, 769, 387-402.	3.4	44
54	Multiscale modeling and simulation of microtubuleâ€“motor-protein assemblies. Physical Review E, 2015, 92, 062709.	2.1	33

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55	Theory of Active Suspensions. Biological and Medical Physics Series, 2015, , 319-355.	0.4	41
56	Multiscale Polar Theory of Microtubule and Motor-Protein Assemblies. Physical Review Letters, 2015, 114, 048101.	7.8	119
57	Hydrodynamic schooling of flapping swimmers. Nature Communications, 2015, 6, 8514.	12.8	95
58	Elastic Fibers in Flows. RSC Soft Matter, 2015, , 168-192.	0.4	14
59	Active contraction of microtubule networks. ELife, 2015, 4, .	6.0	112
60	Hydrodynamic capture of microswimmers into sphere-bound orbits. Soft Matter, 2014, 10, 1784.	2.7	198
61	Collective Surfing of Chemically Active Particles. Physical Review Letters, 2014, 112, 128304.	7.8	46
62	Instabilities and nonlinear dynamics of concentrated active suspensions. Physics of Fluids, 2013, 25, .	4.0	77
63	Active suspensions and their nonlinear models. Comptes Rendus Physique, 2013, 14, 497-517.	0.9	206
64	Optimization of Chiral Structures for Microscale Propulsion. Nano Letters, 2013, 13, 531-537.	9.1	86
65	On the rotation of porous ellipsoids in simple shear flows. Journal of Fluid Mechanics, 2013, 733, .	3.4	20
66	On a roll. Nature, 2013, 503, 43-44.	27.8	3
67	Dispersion of Self-Propelled Rods Undergoing Fluctuation-Driven Flips. Physical Review Letters, 2013, 110, 038301.	7.8	83
68	Self-similar evolution of a body eroding in a fluid flow. Physics of Fluids, 2013, 25, .	4.0	34
69	Emergence of coherent structures and large-scale flows in motile suspensions. Journal of the Royal Society Interface, 2012, 9, 571-585.	3.4	138
70	Experiments and theory of undulatory locomotion in a simple structured medium. Journal of the Royal Society Interface, 2012, 9, 1809-1823.	3.4	62
71	Collective chemotactic dynamics in the presence of self-generated fluid flows. Physical Review E, 2012, 86, 040902.	2.1	47
72	Sculpting of an erodible body by flowing water. Proceedings of the National Academy of Sciences of the United States of America, 2012, 109, 19606-19609.	7.1	43

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73	Fluidâ€Structure Interactions: Research in the Courant Institute's Applied Mathematics Laboratory. Communications on Pure and Applied Mathematics, 2012, 65, 1697-1721.	3.1	3
74	A weak-coupling expansion for viscoelastic fluids applied to dynamic settling of a body. Journal of Non-Newtonian Fluid Mechanics, 2012, 183-184, 25-36.	2.4	13
75	Oscillations of a layer of viscoelastic fluid under steady forcing. Journal of Non-Newtonian Fluid Mechanics, 2012, 175-176, 38-43.	2.4	5
76	Slithering Locomotion. The IMA Volumes in Mathematics and Its Applications, 2012, , 117-135.	0.5	13
77	Flapping and Bending Bodies Interacting with Fluid Flows. Annual Review of Fluid Mechanics, 2011, 43, 449-465.	25.0	321
78	A Stokesian viscoelastic flow: Transition to oscillations and mixing. Physica D: Nonlinear Phenomena, 2011, 240, 1602-1614.	2.8	26
79	Applying a second-kind boundary integral equation for surface tractions in Stokes flow. Journal of Computational Physics, 2011, 230, 2141-2159.	3.8	41
80	Modeling and simulation of liquid-crystal elastomers. Physical Review E, 2011, 83, 051703.	2.1	41
81	A model of cytoplasmically driven microtubule-based motion in the single-celled <i>Caenorhabditis elegans</i> embryo. Proceedings of the National Academy of Sciences of the United States of America, 2011, 108, 10508-10513.	7.1	57
82	Dynamics of complex biofluids. , 2011, , 65-94.		23
83	Modeling simple locomotors in Stokes flow. Journal of Computational Physics, 2010, 229, 958-977.	3.8	32
84	LFP spectral peaks in V1 cortex: network resonance and cortico-cortical feedback. Journal of Computational Neuroscience, 2010, 29, 495-507.	1.0	69
85	Correlation between spatial frequency and orientation selectivity in V1 cortex: Implications of a network model. Vision Research, 2010, 50, 2261-2273.	1.4	20
86	Shape optimization of peristaltic pumping. Journal of Computational Physics, 2010, 229, 1260-1291.	3.8	42
87	Viscoelastic Fluid Response Can Increase the Speed and Efficiency of a Free Swimmer. Physical Review Letters, 2010, 104, 038101.	7.8	222
88	Focused Force Transmission through an Aqueous Suspension of Granules. Physical Review Letters, 2010, 105, 188301.	7.8	38
89	Searching for Autocoherence in the Cortical Network with a Time-Frequency Analysis of the Local Field Potential. Journal of Neuroscience, 2010, 30, 4033-4047.	3.6	54
90	Surprising behaviors in flapping locomotion with passive pitching. Physics of Fluids, 2010, 22, .	4.0	105

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91	Stability of active suspensions. Physical Review E, 2010, 81, 046311.	2.1	95
92	Hydrodynamic mobility of chiral colloidal aggregates. Physical Review E, 2009, 79, 051405.	2.1	12
93	Transition to Mixing and Oscillations in a Stokesian Viscoelastic Flow. Physical Review Letters, 2009, 103, 094501.	7.8	51
94	The mechanics of slithering locomotion. Proceedings of the National Academy of Sciences of the United States of America, 2009, 106, 10081-10085.	7.1	302
95	Shape-changing bodies in fluid: Hovering, ratcheting, and bursting. Physics of Fluids, 2009, 21, .	4.0	36
96	A neuronal network model of primary visual cortex explains spatial frequency selectivity. Journal of Computational Neuroscience, 2009, 26, 271-287.	1.0	23
97	Theoretical analysis of reverse-time correlation for idealized orientation tuning dynamics. Journal of Computational Neuroscience, 2008, 25, 401-438.	1.0	1
98	Retinal and cortical nonlinearities combine to produce masking in V1 responses to plaids. Journal of Computational Neuroscience, 2008, 25, 390-400.	1.0	7
99	Flapping States of a Flag in an Inviscid Fluid: Bistability and the Transition to Chaos. Physical Review Letters, 2008, 100, 074301.	7.8	213
100	Instabilities, pattern formation, and mixing in active suspensions. Physics of Fluids, 2008, 20, .	4.0	270
101	Peristaltic pumping and irreversibility of a Stokesian viscoelastic fluid. Physics of Fluids, 2008, 20, .	4.0	49
102	Instabilities and Pattern Formation in Active Particle Suspensions: Kinetic Theory and Continuum Simulations. Physical Review Letters, 2008, 100, 178103.	7.8	366
103	Liquid crystal droplet production in a microfluidic device. Liquid Crystals, 2007, 34, 861-870.	2.2	56
104	Rotational dynamics of a superhelix towed in a Stokes fluid. Physics of Fluids, 2007, 19, 103105.	4.0	41
105	Surface waves on a semitoroidal water ring. Physics of Fluids, 2007, 19, 058105.	4.0	2
106	Emergence of singular structures in Oldroyd-B fluids. Physics of Fluids, 2007, 19, .	4.0	72
107	Orientational Order and Instabilities in Suspensions of Self-Locomoting Rods. Physical Review Letters, 2007, 99, 058102.	7.8	277
108	Stretch-Coil Transition and Transport of Fibers in Cellular Flows. Physical Review Letters, 2007, 99, 058303.	7.8	90

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109	Mooreâ€™s law and the Saffmanâ€“Taylor instability. Journal of Computational Physics, 2006, 212, 1-5.	3.8	30
110	Orientation selectivity in visual cortex by fluctuation-controlled criticality. Proceedings of the National Academy of Sciences of the United States of America, 2006, 103, 12911-12916.	7.1	35
111	Dynamics of a Deformable Body in a Fast Flowing Soap Film. Physical Review Letters, 2006, 97, 134502.	7.8	23
112	Course 5 Some useful numerical techniques for simulating integrate-and-fire networks. Les Houches Summer School Proceedings, 2005, 80, 179-196.	0.2	0
113	Computing Microstructural Dynamics for Complex Fluids. , 2005, , 1371-1388.		0
114	Heavy Flags Undergo Spontaneous Oscillations in Flowing Water. Physical Review Letters, 2005, 94, 094302.	7.8	182
115	Coherent locomotion as an attracting state for a free flapping body. Proceedings of the National Academy of Sciences of the United States of America, 2005, 102, 11163-11166.	7.1	143
116	Falling cards. Journal of Fluid Mechanics, 2005, 540, 393.	3.4	67
117	Computing Microstructural Dynamics for Complex Fluids. , 2005, , 1371-1388.		0
118	An egalitarian network model for the emergence of simple and complex cells in visual cortex. Proceedings of the National Academy of Sciences of the United States of America, 2004, 101, 366-371.	7.1	129
119	An effective kinetic representation of fluctuation-driven neuronal networks with application to simple and complex cells in visual cortex. Proceedings of the National Academy of Sciences of the United States of America, 2004, 101, 7757-7762.	7.1	111
120	How flexibility induces streamlining in a two-dimensional flow. Physics of Fluids, 2004, 16, 1694-1713.	4.0	100
121	Fast liquid-crystal elastomer swims into the dark. Nature Materials, 2004, 3, 307-310.	27.5	894
122	A moving overset grid method for interface dynamics applied to non-Newtonian Heleâ€“Shaw flow. Journal of Computational Physics, 2004, 195, 117-142.	3.8	36
123	Simulating the dynamics and interactions of flexible fibers in Stokes flows. Journal of Computational Physics, 2004, 196, 8-40.	3.8	314
124	Large-scale modeling of the primary visual cortex: influence of cortical architecture upon neuronal response. Journal of Physiology (Paris), 2003, 97, 237-252.	2.1	24
125	Mexican hats and pinwheels in visual cortex. Proceedings of the National Academy of Sciences of the United States of America, 2003, 100, 2848-2853.	7.1	92
126	Drag reduction through self-similar bending of a flexible body. Nature, 2002, 420, 479-481.	27.8	225

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127	Coarse-grained reduction and analysis of a network model of cortical response: I. Drifting grating stimuli. Journal of Computational Neuroscience, 2002, 12, 97-122.	1.0	34
128	States of high conductance in a large-scale model of the visual cortex. Journal of Computational Neuroscience, 2002, 13, 93-109.	1.0	75
129	Dynamic Patterns and Self-Knotting of a Driven Hanging Chain. Physical Review Letters, 2001, 87, 114301.	7.8	57
130	Pattern formation in non-Newtonian Heleâ€“Shaw flow. Physics of Fluids, 2001, 13, 1191-1212.	4.0	77
131	How Simple Cells Are Made in a Nonlinear Network Model of the Visual Cortex. Journal of Neuroscience, 2001, 21, 5203-5211.	3.6	101
132	Boundary Integral Methods for Multicomponent Fluids and Multiphase Materials. Journal of Computational Physics, 2001, 169, 302-362.	3.8	175
133	Efficient and accurate time-stepping schemes for integrate-and-fire neuronal networks. Journal of Computational Neuroscience, 2001, 11, 111-119.	1.0	84
134	Instability of Elastic Filaments in Shear Flow Yields First-Normal-Stress Differences. Physical Review Letters, 2001, 87, 198301.	7.8	107
135	The Stokesian hydrodynamics of flexing, stretching filaments. Physica D: Nonlinear Phenomena, 2000, 146, 221-245.	2.8	63
136	Flexible filaments in a flowing soap film as a model for one-dimensional flags in a two-dimensional wind. Nature, 2000, 408, 835-839.	27.8	604
137	Computational modeling of orientation tuning dynamics in monkey primary visual cortex. Journal of Computational Neuroscience, 2000, 8, 143-159.	1.0	37
138	A neuronal network model of macaque primary visual cortex (V1): Orientation selectivity and dynamics in the input layer 4Calpha. Proceedings of the National Academy of Sciences of the United States of America, 2000, 97, 8087-8092.	7.1	228
139	Domain of convergence of perturbative solutions for Hele-Shaw flow near interface collapse. Physics of Fluids, 1999, 11, 2809-2811.	4.0	10
140	Spirals, Jets, and Pinches. , 1999, , 119-128.		0
141	Instabilities and singularities in Heleâ€“Shaw flow. Physics of Fluids, 1998, 10, 2701-2723.	4.0	46
142	Non-Newtonian Hele-Shaw Flow and the Saffman-Taylor Instability. Physical Review Letters, 1998, 80, 1433-1436.	7.8	134
143	Hele - Shaw flow and pattern formation in a time-dependent gap. Nonlinearity, 1997, 10, 1471-1495.	1.4	109
144	Models of non-Newtonian Hele-Shaw flow. Physical Review E, 1996, 54, R4536-R4539.	2.1	86

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145	Self-focussed optical structures in a nematic liquid crystal. Physica D: Nonlinear Phenomena, 1996, 97, 471-497.	2.8	86
146	A paraxial model for optical self-focussing in a nematic liquid crystal. Physica D: Nonlinear Phenomena, 1995, 88, 55-81.	2.8	48
147	Attracting Manifold for a Viscous Topology Transition. Physical Review Letters, 1995, 75, 3665-3668.	7.8	29
148	Removing the stiffness from interfacial flows with surface tension. Journal of Computational Physics, 1994, 114, 312-338.	3.8	448
149	Light interacting with liquid crystals. Physica D: Nonlinear Phenomena, 1993, 68, 116-126.	2.8	8
150	A numerical study of the effect of surface tension and noise on an expanding Heleâ€“Shaw bubble. Physics of Fluids A, Fluid Dynamics, 1993, 5, 2131-2146.	1.6	44
151	Dynamical aspects of vortex reconnection of perturbed anti-parallel vortex tubes. Journal of Fluid Mechanics, 1993, 246, 613-652.	3.4	82
152	Filamentation and Undulation of Self-Focused Laser Beams in Liquid Crystals. Europhysics Letters, 1993, 23, 239-244.	2.0	47
153	The collapse of an axi-symmetric, swirling vortex sheet. Nonlinearity, 1993, 6, 843-867.	1.4	29
154	Topology transitions and singularities in viscous flows. Physical Review Letters, 1993, 70, 3043-3046.	7.8	93
155	Droplet breakup in a model of the Hele-Shaw cell. Physical Review E, 1993, 47, 4169-4181.	2.1	148
156	A study of singularity formation in vortex-sheet motion by a spectrally accurate vortex method. Journal of Fluid Mechanics, 1992, 244, 493.	3.4	128
157	Boundary integral techniques for multi-connected domains. Journal of Computational Physics, 1986, 64, 112-132.	3.8	37
158	Toward the cellular-scale simulation of motor-driven cytoskeletal assemblies. ELife, 0, 11, .	6.0	9
159	Active Condensation of Filaments Under Spatial Confinement. Frontiers in Physics, 0, 10, .	2.1	0