Donald L Koch

List of Publications by Year
in descending order

143 papers	7,504 citations	61984 43 h-index	58581 82 g-index
143 all docs	143 docs citations	143 times ranked	4745 citing authors

#	Article	IF	Citations
1	Moderate-Reynolds-number flows in ordered and random arrays of spheres. Journal of Fluid Mechanics, 2001, 448, 243-278.	3.4	419
2	The first effects of fluid inertia on flows in ordered and random arrays of spheres. Journal of Fluid Mechanics, 2001, 448, 213-241.	3.4	352
3	Collective Hydrodynamics of Swimming Microorganisms: Living Fluids. Annual Review of Fluid Mechanics, 2011, 43, 637-659.	25.0	336
4	INERTIAL EFFECTS IN SUSPENSION AND POROUS-MEDIA FLOWS. Annual Review of Fluid Mechanics, 2001, 33, 619-647.	25.0	314
5	Moderate Reynolds number flows through periodic and random arrays of aligned cylinders. Journal of Fluid Mechanics, 1997, 349, 31-66.	3.4	237
6	Stabilizing electrodeposition in elastic solid electrolytes containing immobilized anions. Science Advances, 2016, 2, e1600320.	10.3	228
7	Clustering of aerosol particles in isotropic turbulence. Journal of Fluid Mechanics, 2005, 536, 219-251.	3.4	227
8	Particle pressure and marginal stability limits for a homogeneous monodisperse gas-fluidized bed: kinetic theory and numerical simulations. Journal of Fluid Mechanics, 1999, 400, 229-263.	3.4	214
9	Stability Analysis of Electrodeposition across a Structured Electrolyte with Immobilized Anions. Journal of the Electrochemical Society, 2014, 161, A847-A855.	2.9	198
10	Kinetic theory for a monodisperse gasâ€“solid suspension. Physics of Fluids A, Fluid Dynamics, 1990, 2, 1711-1723.	1.6	193
11	Observations of fibre orientation in simple shear flow of semi-dilute suspensions. Journal of Fluid Mechanics, 1992, 238, 277-296.	3.4	179
12	A non-local description of advection-diffusion with application to dispersion in porous media. Journal of Fluid Mechanics, 1987, 180, 387.	3.4	156
13	Screening in sedimenting suspensions. Journal of Fluid Mechanics, 1991, 224, 275-303.	3.4	142
14	Observations of high Reynolds number bubbles interacting with a rigid wall. Physics of Fluids, 1997, 9, 44-56.	4.0	135
15	The instability of a dispersion of sedimenting spheroids. Journal of Fluid Mechanics, 1989, 209, 521-542.	3.4	134
16	The effect of order on dispersion in porous media. Journal of Fluid Mechanics, 1989, 200, 173-188.	3.4	128
17	Rheology of suspensions with high particle inertia and moderate fluid inertia. Journal of Fluid Mechanics, 2003, 480, 95-118.	3.4	127
18	Measurements of the average properties of a suspension of bubbles rising in a vertical channel. Journal of Fluid Mechanics, 2001, 429, 307-342.	3.4	125

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19	Simple shear flows of dense gas-solid suspensions at finite Stokes numbers. Journal of Fluid Mechanics, 1996, 313, 309-341.	3.4	121
20	The effect of hydrodynamic interactions on the orientation distribution in a fiber suspension subject to simple shear flow. Physics of Fluids, 1995, 7, 487-506.	4.0	117
21	Inertial effects on fibre motion in simple shear flow. Journal of Fluid Mechanics, 2005, 535, 383-414.	3.4	108
22	Rheology of non-Brownian rigid fiber suspensions with adhesive contacts. Journal of Rheology, 2001, 45, 369-382.	2.6	99
23	Hydrodynamic tracer diffusion in suspensions of swimming bacteria. Physics of Fluids, 2014, 26, .	4.0	96
24	A model for orientational diffusion in fiber suspensions. Physics of Fluids, 1995, 7, 2086-2088.	4.0	95
25	Rotational and translational dispersion of fibres in isotropic turbulent flows. Journal of Fluid Mechanics, 2005, 540, 143.	3.4	95
26	Emergence of Upstream Swimming via a Hydrodynamic Transition. Physical Review Letters, 2015, 114, 108102.	7.8	91
27	Bubble-size dependence of the critical electrolyte concentration for inhibition of coalescence. Journal of Colloid and Interface Science, 2004, 275, 290-297.	9.4	81
28	Turbulent coagulation of colloidal particles. Journal of Fluid Mechanics, 1998, 364, 81-113.	3.4	76
29	Simple shear flows of dilute gasâ€“solid suspensions. Journal of Fluid Mechanics, 1995, 296, 211-245.	3.4	71
30	Numerical simulations of the effect of hydrodynamic interactions on diffusivities of integral membrane proteins. Journal of Fluid Mechanics, 1995, 293, 147-180.	3.4	70
31	Particle clustering due to hydrodynamic interactions. Physics of Fluids, 2000, 12, 964-970.	4.0	69
32	Structure of Solvent-Free Nanoparticleâ˜Organic Hybrid Materials. Langmuir, 2010, 26, 16801-16811.	3.5	68
33	Non-continuum lubrication flows between particles colliding in a gas. Journal of Fluid Mechanics, 1996, 313, 283-308.	3.4	61
34	Inertial effects on the transfer of heat or mass from neutrally buoyant spheres in a steady linear velocity field. Physics of Fluids, 2006, 18, 073302.	4.0	58
35	The stress in a dilute suspension of spheres suspended in a second-order fluid subject to a linear velocity field. Journal of Non-Newtonian Fluid Mechanics, 2006, 138, 87-97.	2.4	57
36	Coalescence and bouncing of small aerosol droplets. Journal of Fluid Mechanics, 2004, 518, 157-185.	3.4	55

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37	Numerical simulations of a sphere settling through a suspension of neutrally buoyant fibres. Journal of Fluid Mechanics, 1999, 388, 355-388.	3.4	52
38	Structure of solvent-free grafted nanoparticles: Molecular dynamics and density-functional theory. Journal of Chemical Physics, 2011, 135, 114901.	3.0	49
39	Dynamics of solvent-free grafted nanoparticles. Journal of Chemical Physics, 2012, 136, 044902.	3.0	49
40	The transition from steady to weakly turbulent flow in a close-packed ordered array of spheres. Journal of Fluid Mechanics, 2002, 465, 59-97.	3.4	48
41	Electroconvection in a Viscoelastic Electrolyte. Physical Review Letters, 2019, 122, 124501.	7.8	48
42	Collisions of slightly deformable, high Reynolds number bubbles with shortâ€•range repulsive forces. Physics of Fluids, 1994, 6, 2591-2605.	4.0	47
43	Hydrodynamic diffusion in a suspension of sedimenting point particles with periodic boundary conditions. Physics of Fluids, 1994, 6, 2894-2900.	4.0	46
44	Collision and rebound of small droplets in an incompressible continuum gas. Journal of Fluid Mechanics, 2002, 454, 145-201.	3.4	45
45	Pseudo-turbulent heat flux and average gasâ€“phase conduction during gasâ€“solid heatÂtransfer: flow past random fixed particleÂassemblies. Journal of Fluid Mechanics, 2016, 798, 299-349.	3.4	45
46	Orientational dispersion of fibers in extensional flows. Physics of Fluids A, Fluid Dynamics, 1990, 2, 1077-1093.	1.6	44
47	Finite-Weber-number motion of bubbles through a nearly inviscid liquid. Journal of Fluid Mechanics, 2002, 460, 241-280.	3.4	44
48	Evolution of clusters of sedimenting low-Reynolds-number particles with Oseen interactions. Journal of Fluid Mechanics, 2008, 603, 63-100.	3.4	44
49	Interfacial Tension at the Boundary Between Nematic and Isotropic Phases of a Hard Rod Solution. Macromolecules, 1999, 32, 219-226.	4.8	43
50	Hydrodynamic diffusion in dilute sedimenting suspensions at moderate Reynolds numbers. Physics of Fluids A, Fluid Dynamics, 1993, 5, 1141-1155.	1.6	42
51	The average rotation rate of a fiber in the linear flow of a semidilute suspension. Physics of Fluids A, Fluid Dynamics, 1990, 2, 2093-2102.	1.6	41
52	Simple shear flow of a suspension of fibres in a dilute polymer solution at high Deborah number. Journal of Fluid Mechanics, 1993, 252, 187-207.	3.4	41
53	Rheology of dense bubble suspensions. Physics of Fluids, 1997, 9, 1540-1561.	4.0	41
54	Numerical and theoretical solutions for a drop spreading below a free fluid surface. Journal of Fluid Mechanics, 1995, 287, 251-278.	3.4	38

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55	Interactions between contacting fibers. Physics of Fluids, 1998, 10, 2111-2113.	4.0	37
56	Velocity fluctuations and hydrodynamic diffusion in finite-Reynolds-number sedimenting suspensions. Physics of Fluids, 2008, 20, .	4.0	36
57	Hydrodynamic, translational diffusion in fiber suspensions subject to simple shear flow. Physics of Fluids A, Fluid Dynamics, 1993, 5, 849-862.	1.6	34
58	Rheology of dilute suspensions of charged fibers. Physics of Fluids, 1996, 8, 2792-2807.	4.0	34
59	Observations of coagulation in isotropic turbulence. Journal of Fluid Mechanics, 1998, 371, 81-107.	3.4	33
60	The effect of hydrodynamic interactions on the tracer and gradient diffusion of integral membrane proteins in lipid bilayers. Journal of Fluid Mechanics, 1994, 258, 167-190.	3.4	31
61	Moderate-Reynolds-number flow in a wall-bounded porous medium. Journal of Fluid Mechanics, 2002, 453, 315-344.	3.4	28
62	Rheology of particle suspensions with low to moderate fluid inertia at finite particle inertia. Physics of Fluids, 2006, 18, 083303.	4.0	28
63	Structure factor of blends of solvent-free nanoparticleâ€“organic hybrid materials: density-functional theory and small angle X-ray scattering. Soft Matter, 2014, 10, 9120-9135.	2.7	28
64	The resistivity and mobility functions for a model system of two equal-sized proteins in a lipid bilayer. Journal of Fluid Mechanics, 1992, 243, 679.	3.4	27
65	The effect of hydrodynamic interactions on the average properties of a bidisperse suspension of high Reynolds number, low Weber number bubbles. Physics of Fluids A, Fluid Dynamics, 1993, 5, 1123-1134.	1.6	27
66	Structure and dynamics of dilute suspensions of finite-Reynolds-number settling fibers. Physics of Fluids, 2009, 21, .	4.0	27
67	Hyperdiffusive Dynamics in Newtonian Nanoparticle Fluids. ACS Macro Letters, 2015, 4, 1149-1153.	4.8	27
68	Equilibrium Modeling of the Mechanics and Structure of the Cancer Glycocalyx. Biophysical Journal, 2019, 116, 694-708.	0.5	27
69	Lubrication flows between spherical particles colliding in a compressible non-continuum gas. Journal of Fluid Mechanics, 1997, 344, 245-269.	3.4	25
70	The influence of the inertially dominated outer region on the rheology of a dilute dispersion of low-Reynolds-number drops or rigid particles. Journal of Fluid Mechanics, 2011, 674, 307-358.	3.4	25
71	Clustering in Eulerâ€“Euler and Eulerâ€“Lagrange simulations of unbounded homogeneous particle-laden shear. Journal of Fluid Mechanics, 2019, 859, 174-203.	3.4	25
72	Electroconvection and Morphological Instabilities in Potentiostatic Electrodeposition across Liquid Electrolytes with Polymer Additives. Journal of the Electrochemical Society, 2018, 165, A3697-A3713.	2.9	24

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73	Hydrodynamic and boundary-layer dispersion in bidisperse porous media. Journal of Fluid Mechanics, 1999, 385, 359-379.	3.4	22
74	Bacterial collective motion near the contact line of an evaporating sessile drop. Physics of Fluids, 2014, 26, .	4.0	22
75	A stochastic model for the relative motion of high Stokes number particles in isotropic turbulence. Journal of Fluid Mechanics, 2014, 756, 870-902.	3.4	22
76	Stress in a dilute suspension of spheres in a dilute polymer solution subject to simple shear flow at finite Deborah numbers. Physical Review Fluids, 2016, 1, .	2.5	22
77	Isotropicâ€“nematic phase transitions in aqueous solutions of weakly charged, rodlike polyelectrolytes. Journal of Chemical Physics, 1996, 104, 359-374.	3.0	21
78	Clusters of sedimenting high-Reynolds-number particles. Journal of Fluid Mechanics, 2009, 625, 371-385.	3.4	21
79	Mass/heat transfer from a neutrally buoyant sphere in simple shear flow at finite Reynolds and Peclet numbers. AICHE Journal, 2011, 57, 1419-1433.	3.6	21
80	The effect of shear flow on the rotational diffusion of a single axisymmetric particle. Journal of Fluid Mechanics, 2015, 772, 42-79.	3.4	21
81	Inertial torques and a symmetry breaking orientational transition in the sedimentation of slender fibres. Journal of Fluid Mechanics, 2019, 875, 576-596.	3.4	21
82	On hydrodynamic diffusion and drift in sheared suspensions. Physics of Fluids A, Fluid Dynamics, 1989, 1, 1742-1745.	1.6	20
83	Averagedâ€equation and diagrammatic approximations to the average concentration of a tracer dispersed by a Gaussian random velocity field. Physics of Fluids A, Fluid Dynamics, 1992, 4, 887-894.	1.6	20
84	Polymer stretch in dilute fixed beds of fibres or spheres. Journal of Fluid Mechanics, 1992, 244, 17.	3.4	20
85	Properties of a bidisperse particleâ€“gas suspension Part 1. Collision time small compared with viscous relaxation time. Journal of Fluid Mechanics, 1993, 247, 623-641.	3.4	20
86	The rate of coalescence in a suspension of high Reynolds number, low Weber number bubbles. Physics of Fluids A, Fluid Dynamics, 1993, 5, 1135-1140.	1.6	19
87	Hydrodynamic diffusion and mass transfer across a sheared suspension of neutrally buoyant spheres. Physics of Fluids, 2009, 21, .	4.0	18
88	Dynamics of droplet rebound from a weakly deformable gasâ€“liquid interface. Physics of Fluids, 2001, 13, 3526-3532.	4.0	17
89	A pseudospectral method to evaluate the fluid velocity produced by an array of translating slender fibers. Physics of Fluids, 2006, 18, 063301.	4.0	17
90	Rigid ring-shaped particles that align in simple shear flow. Journal of Fluid Mechanics, 2013, 722, 121-158.	3.4	17

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91	Electrophoresis in dilute polymer solutions. Journal of Fluid Mechanics, 2020, 884, .	3.4	17
92	The inhomogeneous structure of a bidisperse sedimenting gasâ€“solid suspension. Physics of Fluids, 1999, 11, 3283-3305.	4.0	16
93	Noncontinuum drag force on a nanowire vibrating normal to a wall: Simulations and theory. Physics of Fluids, 2010, 22, 103101.	4.0	16
94	An analytical thermohydraulic model for discretely fractured geothermal reservoirs. Water Resources Research, 2016, 52, 6792-6817.	4.2	16
95	An algorithm for solving the Navierâ€“Stokes equations with shear-periodic boundary conditions and its application to homogeneouslyÂsheared turbulence. Journal of Fluid Mechanics, 2017, 833, 687-716.	3.4	16
96	Coagulation-induced particle-concentration fluctuations in homogeneous, isotropic turbulence. Physics of Fluids, 2002, 14, 2447.	4.0	15
97	An efficient direct simulation Monte Carlo method for low Mach number noncontinuum gas flows based on the Bhatnagarâ€“Grossâ€“Krook model. Physics of Fluids, 2009, 21, 033103.	4.0	15
98	Rotational motion of a thin axisymmetric disk in a low Reynolds number linear flow. Physics of Fluids, 2014, 26, .	4.0	15
99	The AC Electrical Impedance of a Fractal Boundary to an Electrolytic Solution. Journal of the Electrochemical Society, 1991, 138, 475-484.	2.9	14
100	The combined effects of hydrodynamic interactions and Brownian motion on the orientation of particles flowing through fixed beds. Physics of Fluids, 1988, 31, 2769.	1.4	13
101	Hydrodynamic diffusion near solid boundaries with applications to heat and mass transport into sheared suspensions and fixed-fibre beds. Journal of Fluid Mechanics, 1996, 318, 31.	3.4	13
102	Instability of an inhomogeneous bacterial suspension subjected to a chemo-attractant gradient. Journal of Fluid Mechanics, 2014, 741, 619-657.	3.4	13
103	Preferential concentration driven instability of sheared gasâ€“solid suspensions. Journal of Fluid Mechanics, 2015, 770, 85-123.	3.4	13
104	Multiscale Simulation and Modeling of Multilayer Heteroepitactic Growth of C₆₀ on Pentacene. Langmuir, 2016, 32, 3045-3056.	3.5	13
105	Predictive Inverse Model for Advective Heat Transfer in a Shortâ€Circuited Fracture: Dimensional Analysis, Machine Learning, and Field Demonstration. Water Resources Research, 2020, 56, e2020WR027065.	4.2	13
106	Observations of axisymmetric tracer particle orientation during flow through a dilute fixed bed of fibers. Physics of Fluids A, Fluid Dynamics, 1991, 3, 2516-2528.	1.6	12
107	Hydrodynamic interactions between two equal spheres in a highly rarefied gas. Physics of Fluids, 1999, 11, 2772-2787.	4.0	12
108	Intrinsic viscosity of a suspension of cubes. Physical Review E, 2013, 88, 052302.	2.1	12

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109	Predicting the Disorderâ€“Order Transition of Solvent-Free Nanoparticleâ€“Organic Hybrid Materials. Langmuir, 2013, 29, 8197-8202.	3.5	12
110	Shear flow of a suspension of bubbles rising in an inclined channel. Journal of Fluid Mechanics, 2004, 515, 261-292.	3.4	11
111	Stochastic theory and direct numerical simulations of the relative motion of high-inertia particle pairs in isotropic turbulence. Journal of Fluid Mechanics, 2017, 813, 205-249.	3.4	11
112	Collision rate of bidisperse, hydrodynamically interacting spheres settling in a turbulent flow. Journal of Fluid Mechanics, 2021, 912, .	3.4	11
113	Slender body theory for particles with non-circular cross-sections with application to particle dynamics in shear flows. Journal of Fluid Mechanics, 2019, 877, 1098-1133.	3.4	10
114	Collision rate of bidisperse spheres settling in a compressional non-continuum gas flow. Journal of Fluid Mechanics, 2021, 910, .	3.4	10
115	Electroconvection near an ion-selective surface with Butlerâ€“Volmer kinetics. Journal of Fluid Mechanics, 2022, 930, .	3.4	10
116	The rapid distortion of two-way coupled particle-laden turbulence. Journal of Fluid Mechanics, 2019, 877, 82-104.	3.4	9
117	A method for calculating hydrodynamic interactions between two bodies in low Mach number free-molecular flows with application to the resistivity functions for two aligned cylinders. Physics of Fluids, 1997, 9, 3550-3565.	4.0	8
118	Flow of power-law fluids in fixed beds of cylinders or spheres. Journal of Fluid Mechanics, 2012, 713, 491-527.	3.4	8
119	Brownian Dynamics of a Suspension of Particles with Constrained Voronoi Cell Volumes. Langmuir, 2015, 31, 6829-6841.	3.5	8
120	Analysis of a time dependent injection strategy to accelerate the residual trapping of sequestered CO 2 in the geologic subsurface. International Journal of Greenhouse Gas Control, 2016, 44, 185-198.	4.6	8
121	Clustering of rapidly settling, low-inertia particle pairs in isotropic turbulence. Part 1. Drift and diffusion flux closures. Journal of Fluid Mechanics, 2019, 871, 450-476.	3.4	8
122	Clustering of rapidly settling, low-inertia particle pairs in isotropic turbulence. Part 2. Comparison of theory and DNS. Journal of Fluid Mechanics, 2019, 871, 477-488.	3.4	8
123	Suppression of electroconvective and morphological instabilities by an imposed cross flow of the electrolyte. Physical Review Fluids, 2021, 6, .	2.5	8
124	Anomalous diffusion of momentum in a dilute gasâ€“solid suspension. Physics of Fluids A, Fluid Dynamics, 1992, 4, 1337-1346.	1.6	7
125	Extensional flow of a suspension of fibers in a dilute polymer solution. Physics of Fluids A, Fluid Dynamics, 1992, 4, 1070-1073.	1.6	6
126	The extensional viscosity and effective thermal conductivity of a dispersion of aligned disks. Physics of Fluids, 1994, 6, 1955-1962.	4.0	6

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127	Instability of Sedimenting Bidisperse Particle Gas Suspensions. Flow, Turbulence and Combustion, 1997, 58, 275-303.	0.2	6
128	A kinetic theory for particulate systems with bimodal and anisotropic velocity fluctuations. Physics of Fluids, 2008, 20, 123303.	4.0	6
129	Controlling rotation and migration of rings in a simple shear flow through geometric modifications. Journal of Fluid Mechanics, 2018, 840, 379-407.	3.4	6
130	Non-continuum tangential lubrication gas flow between two spheres. Journal of Fluid Mechanics, 2021, 920, .	3.4	6
131	Electrical conductivity of isotropic fibre suspensions. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 1999, 455, 1923-1930.	2.1	5
132	Dense, bounded shear flows of agitated solid spheres in a gas at intermediate Stokes and finite Reynolds numbers. Journal of Fluid Mechanics, 2009, 618, 181-208.	3.4	5
133	The hydrodynamic lift of a slender, neutrally buoyant fibre in a wall-bounded shear flow at small Reynolds number. Journal of Fluid Mechanics, 2019, 879, 121-146.	3.4	5
134	Kinetic theory for a mobile adsorbed gas. Journal of Chemical Physics, 1994, 101, 4391-4406.	3.0	4
135	The average stress in a suspension of cube-shaped magnetic particles subject to shear and magnetic fields. Physics of Fluids, 2015, 27, .	4.0	4
136	Heat/mass transfer from a neutrally buoyant sphere by mixed natural and forced convection in a simple shear flow. AICHE Journal, 2018, 64, 2816-2827.	3.6	4
137	The effects of fluid transport on the creation of a dense cluster of activated fractures in a porous medium. Journal of Fluid Mechanics, 2018, 847, 286-328.	3.4	4
138	The combined hydrodynamic and thermodynamic effects of immobilized proteinsÂon the diffusion of mobile transmembrane proteins. Journal of Fluid Mechanics, 2019, 877, 648-681.	3.4	4
139	The lift force on a bubble in a sheared suspension in a slightly inclined channel. Journal of Fluid Mechanics, 2008, 615, 27-51.	3.4	3
140	Slender-body theory for transient heat conduction: theoretical basis, numerical implementation and case studies. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2015, 471, 20150494.	2.1	3
141	Modeling the dynamics of remobilized CO2 within the geologic subsurface. International Journal of Greenhouse Gas Control, 2018, 70, 128-145.	4.6	3
142	Discrete fracture network model analysis of the effects of fluid transport on the morphology of a cluster of activated fractures. Physical Review E, 2021, 103, 053112.	2.1	0
143	Hydroshearing poorly connected preexisting fractures in the presence of stress anisotropy as a random percolation process. Physical Review Research, 2020, 2, .	3.6	0