Donald L Koch

List of Publications by Citations

139 papers	**6,268** citations	**41** h-index	**76** g-index
143 ext. papers	**6,901** ext. citations	**4.3** avg, IF	**6.07** L-index

#	Paper	IF	Citations
139	Moderate-Reynolds-number flows in ordered and random arrays of spheres. *Journal of Fluid Mechanics*, **2001**, 448, 243-278	3.7	354
138	The first effects of fluid inertia on flows in ordered and random arrays of spheres. *Journal of Fluid Mechanics*, **2001**, 448, 213-241	3.7	296
137	Collective Hydrodynamics of Swimming Microorganisms: Living Fluids. *Annual Review of Fluid Mechanics*, **2011**, 43, 637-659	22	279
136	INERTIAL EFFECTS IN SUSPENSION AND POROUS-MEDIA FLOWS. *Annual Review of Fluid Mechanics*, **2001**, 33, 619-647	22	246
135	Moderate Reynolds number flows through periodic and random arrays of aligned cylinders. *Journal of Fluid Mechanics*, **1997**, 349, 31-66	3.7	208
134	Clustering of aerosol particles in isotropic turbulence. *Journal of Fluid Mechanics*, **2005**, 536, 219-251	3.7	193
133	Stabilizing electrodeposition in elastic solid electrolytes containing immobilized anions. *Science Advances*, **2016**, 2, e1600320	14.3	183
132	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	3.7	180
131	Kinetic theory for a monodisperse gas–solid suspension. *Physics of Fluids A, Fluid Dynamics*, **1990**, 2, 1711-1723		167
130	Observations of fibre orientation in simple shear flow of semi-dilute suspensions. *Journal of Fluid Mechanics*, **1992**, 238, 277-296	3.7	164
129	Stability Analysis of Electrodeposition across a Structured Electrolyte with Immobilized Anions. *Journal of the Electrochemical Society*, **2014**, 161, A847-A855	3.9	159
128	A non-local description of advection-diffusion with application to dispersion in porous media. *Journal of Fluid Mechanics*, **1987**, 180, 387	3.7	142
127	Screening in sedimenting suspensions. *Journal of Fluid Mechanics*, **1991**, 224, 275-303	3.7	129
126	Observations of high Reynolds number bubbles interacting with a rigid wall. *Physics of Fluids*, **1997**, 9, 44-56	4.4	117
125	Rheology of suspensions with high particle inertia and moderate fluid inertia. *Journal of Fluid Mechanics*, **2003**, 480, 95-118	3.7	111
124	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	4.4	109
123	The effect of order on dispersion in porous media. *Journal of Fluid Mechanics*, **1989**, 200, 173-188	3.7	107

122	Measurements of the average properties of a suspension of bubbles rising in a vertical channel. *Journal of Fluid Mechanics*, **2001**, 429, 307-342	3.7	106
121	The instability of a dispersion of sedimenting spheroids. *Journal of Fluid Mechanics*, **1989**, 209, 521-542	3.7	106
120	Simple shear flows of dense gas-solid suspensions at finite Stokes numbers. *Journal of Fluid Mechanics*, **1996**, 313, 309-341	3.7	102
119	Rheology of non-Brownian rigid fiber suspensions with adhesive contacts. *Journal of Rheology*, **2001**, 45, 369-382	4.1	90
118	A model for orientational diffusion in fiber suspensions. *Physics of Fluids*, **1995**, 7, 2086-2088	4.4	87
117	Inertial effects on fibre motion in simple shear flow. *Journal of Fluid Mechanics*, **2005**, 535, 383-414	3.7	86
116	Rotational and translational dispersion of fibres in isotropic turbulent flows. *Journal of Fluid Mechanics*, **2005**, 540, 143	3.7	81
115	Hydrodynamic tracer diffusion in suspensions of swimming bacteria. *Physics of Fluids*, **2014**, 26, 081901	4.4	78
114	Numerical simulations of the effect of hydrodynamic interactions on diffusivities of integral membrane proteins. *Journal of Fluid Mechanics*, **1995**, 293, 147-180	3.7	69
113	Bubble-size dependence of the critical electrolyte concentration for inhibition of coalescence. *Journal of Colloid and Interface Science*, **2004**, 275, 290-7	9.3	68
112	Emergence of upstream swimming via a hydrodynamic transition. *Physical Review Letters*, **2015**, 114, 108102	7.4	65
111	Turbulent coagulation of colloidal particles. *Journal of Fluid Mechanics*, **1998**, 364, 81-113	3.7	63
110	Structure of solvent-free nanoparticle-organic hybrid materials. *Langmuir*, **2010**, 26, 16801-11	4	62
109	Particle clustering due to hydrodynamic interactions. *Physics of Fluids*, **2000**, 12, 964-970	4.4	61
108	Simple shear flows of dilute gas-solid suspensions. *Journal of Fluid Mechanics*, **1995**, 296, 211-245	3.7	55
107	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	4.4	54
106	Numerical simulations of a sphere settling through a suspension of neutrally buoyant fibres. *Journal of Fluid Mechanics*, **1999**, 388, 355-388	3.7	50
105	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	2.7	49

104	Structure of solvent-free grafted nanoparticles: molecular dynamics and density-functional theory. *Journal of Chemical Physics*, **2011**, 135, 114901	3.9	48
103	Coalescence and bouncing of small aerosol droplets. *Journal of Fluid Mechanics*, **2004**, 518, 157-185	3.7	47
102	Dynamics of solvent-free grafted nanoparticles. *Journal of Chemical Physics*, **2012**, 136, 044902	3.9	43
101	Interfacial Tension at the Boundary Between Nematic and Isotropic Phases of a Hard Rod Solution. *Macromolecules*, **1999**, 32, 219-226	5.5	42
100	Hydrodynamic diffusion in a suspension of sedimenting point particles with periodic boundary conditions. *Physics of Fluids*, **1994**, 6, 2894-2900	4.4	42
99	Collisions of slightly deformable, high Reynolds number bubbles with short-range repulsive forces. *Physics of Fluids*, **1994**, 6, 2591-2605	4.4	42
98	The transition from steady to weakly turbulent flow in a close-packed ordered array of spheres. *Journal of Fluid Mechanics*, **2002**, 465, 59-97	3.7	41
97	Non-continuum lubrication flows between particles colliding in a gas. *Journal of Fluid Mechanics*, **1996**, 313, 283-308	3.7	40
96	Finite-Weber-number motion of bubbles through a nearly inviscid liquid. *Journal of Fluid Mechanics*, **2002**, 460, 241-280	3.7	39
95	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		39
94	Orientational dispersion of fibers in extensional flows. *Physics of Fluids A, Fluid Dynamics*, **1990**, 2, 1077-1093		38
93	Rheology of dense bubble suspensions. *Physics of Fluids*, **1997**, 9, 1540-1561	4.4	37
92	Numerical and theoretical solutions for a drop spreading below a free fluid surface. *Journal of Fluid Mechanics*, **1995**, 287, 251-278	3.7	37
91	Hydrodynamic diffusion in dilute sedimenting suspensions at moderate Reynolds numbers. *Physics of Fluids A, Fluid Dynamics*, **1993**, 5, 1141-1155		37
90	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	3.7	36
89	Collision and rebound of small droplets in an incompressible continuum gas. *Journal of Fluid Mechanics*, **2002**, 454, 145-201	3.7	34
88	Evolution of clusters of sedimenting low-Reynolds-number particles with Oseen interactions. *Journal of Fluid Mechanics*, **2008**, 603, 63-100	3.7	33
87	Rheology of dilute suspensions of charged fibers. *Physics of Fluids*, **1996**, 8, 2792-2807	4.4	33

86	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	3.7	31
85	Pseudo-turbulent heat flux and average gas-phase conduction during gas-solid heat transfer: flow past random fixed particle assemblies. *Journal of Fluid Mechanics*, **2016**, 798, 299-349	3.7	31
84	Velocity fluctuations and hydrodynamic diffusion in finite-Reynolds-number sedimenting suspensions. *Physics of Fluids*, **2008**, 20, 043305	4.4	30
83	Interactions between contacting fibers. *Physics of Fluids*, **1998**, 10, 2111-2113	4.4	30
82	Electroconvection in a Viscoelastic Electrolyte. *Physical Review Letters*, **2019**, 122, 124501	7.4	29
81	Observations of coagulation in isotropic turbulence. *Journal of Fluid Mechanics*, **1998**, 371, 81-107	3.7	29
80	Hydrodynamic, translational diffusion in fiber suspensions subject to simple shear flow. *Physics of Fluids A, Fluid Dynamics*, **1993**, 5, 849-862		29
79	Structure factor of blends of solvent-free nanoparticle-organic hybrid materials: density-functional theory and small angle X-ray scattering. *Soft Matter*, **2014**, 10, 9120-35	3.6	27
78	Rheology of particle suspensions with low to moderate fluid inertia at finite particle inertia. *Physics of Fluids*, **2006**, 18, 083303	4.4	26
77	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	3.7	25
76	Hyperdiffusive Dynamics in Newtonian Nanoparticle Fluids. *ACS Macro Letters*, **2015**, 4, 1149-1153	6.6	23
75	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	3.7	23
74	Structure and dynamics of dilute suspensions of finite-Reynolds-number settling fibers. *Physics of Fluids*, **2009**, 21, 123304	4.4	23
73	Moderate-Reynolds-number flow in a wall-bounded porous medium. *Journal of Fluid Mechanics*, **2002**, 453, 315-344	3.7	22
72	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		21
71	The effect of shear flow on the rotational diffusion of a single axisymmetric particle. *Journal of Fluid Mechanics*, **2015**, 772, 42-79	3.7	20
70	Isotropic-nematic phase transitions in aqueous solutions of weakly charged, rodlike polyelectrolytes. *Journal of Chemical Physics*, **1996**, 104, 359-374	3.9	20
69	A stochastic model for the relative motion of high Stokes number particles in isotropic turbulence. *Journal of Fluid Mechanics*, **2014**, 756, 870-902	3.7	19

68	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	19
67	Hydrodynamic and boundary-layer dispersion in bidisperse porous media. *Journal of Fluid Mechanics*, **1999**, 385, 359-379	3.7	19
66	Averaged-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		19
65	On hydrodynamic diffusion and drift in sheared suspensions. *Physics of Fluids A, Fluid Dynamics*, **1989**, 1, 1742-1745		19
64	Hydrodynamic diffusion and mass transfer across a sheared suspension of neutrally buoyant spheres. *Physics of Fluids*, **2009**, 21, 033303	4.4	17
63	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		17
62	Polymer stretch in dilute fixed beds of fibres or spheres. *Journal of Fluid Mechanics*, **1992**, 244, 17	3.7	17
61	Electroconvection and Morphological Instabilities in Potentiostatic Electrodeposition across Liquid Electrolytes with Polymer Additives. *Journal of the Electrochemical Society*, **2018**, 165, A3697-A3713	3.9	17
60	Properties of a bidisperse particle‒gas suspension Part 1. Collision time small compared with viscous relaxation time. *Journal of Fluid Mechanics*, **1993**, 247, 623-641	3.7	16
59	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,	2.8	16
58	Equilibrium Modeling of the Mechanics and Structure of the Cancer Glycocalyx. *Biophysical Journal*, **2019**, 116, 694-708	2.9	15
57	Bacterial collective motion near the contact line of an evaporating sessile drop. *Physics of Fluids*, **2014**, 26, 111703	4.4	14
56	Noncontinuum drag force on a nanowire vibrating normal to a wall: Simulations and theory. *Physics of Fluids*, **2010**, 22, 103101	4.4	14
55	An efficient direct simulation Monte Carlo method for low Mach number noncontinuum gas flows based on the Bhatnagar‒Gross‒Krook model. *Physics of Fluids*, **2009**, 21, 033103	4.4	14
54	Lubrication flows between spherical particles colliding in a compressible non-continuum gas. *Journal of Fluid Mechanics*, **1997**, 344, 245-269	3.7	14
53	The inhomogeneous structure of a bidisperse sedimenting gas‒solid suspension. *Physics of Fluids*, **1999**, 11, 3283-3305	4.4	14
52	Clustering in Euler‒Euler and Euler‒Lagrange simulations of unbounded homogeneous particle-laden shear. *Journal of Fluid Mechanics*, **2019**, 859, 174-203	3.7	14
51	Rotational motion of a thin axisymmetric disk in a low Reynolds number linear flow. *Physics of Fluids*, **2014**, 26, 033303	4.4	13

50	A pseudospectral method to evaluate the fluid velocity produced by an array of translating slender fibers. *Physics of Fluids*, **2006**, 18, 063301	4.4	13
49	Rigid ring-shaped particles that align in simple shear flow. *Journal of Fluid Mechanics*, **2013**, 722, 121-158	3.7	12
48	Predicting the disorder-order transition of solvent-free nanoparticle-organic hybrid materials. *Langmuir*, **2013**, 29, 8197-202	4	12
47	Dynamics of droplet rebound from a weakly deformable gas❑liquid interface. *Physics of Fluids*, **2001**, 13, 3526-3532	4.4	12
46	Coagulation-induced particle-concentration fluctuations in homogeneous, isotropic turbulence. *Physics of Fluids*, **2002**, 14, 2447	4.4	12
45	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	3.7	12
44	The AC Electrical Impedance of a Fractal Boundary to an Electrolytic Solution. *Journal of the Electrochemical Society*, **1991**, 138, 475-484	3.9	12
43	The combined effects of hydrodynamic interactions and Brownian motion on the orientation of particles flowing through fixed beds. *Physics of Fluids*, **1988**, 31, 2769		12
42	An analytical thermohydraulic model for discretely fractured geothermal reservoirs. *Water Resources Research*, **2016**, 52, 6792-6817	5.4	11
41	Multiscale Simulation and Modeling of Multilayer Heteroepitactic Growth of C60 on Pentacene. *Langmuir*, **2016**, 32, 3045-56	4	11
40	Clusters of sedimenting high-Reynolds-number particles. *Journal of Fluid Mechanics*, **2009**, 625, 371-385	3.7	11
39	Hydrodynamic interactions between two equal spheres in a highly rarefied gas. *Physics of Fluids*, **1999**, 11, 2772-2787	4.4	11
38	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		11
37	Intrinsic viscosity of a suspension of cubes. *Physical Review E*, **2013**, 88, 052302	2.4	10
36	Inertial torques and a symmetry breaking orientational transition in the sedimentation of slender fibres. *Journal of Fluid Mechanics*, **2019**, 875, 576-596	3.7	9
35	Instability of an inhomogeneous bacterial suspension subjected to a chemo-attractant gradient. *Journal of Fluid Mechanics*, **2014**, 741, 619-657	3.7	9
34	An algorithm for solving the Navier❑Stokes equations with shear-periodic boundary conditions and its application to homogeneously sheared turbulence. *Journal of Fluid Mechanics*, **2017**, 833, 687-716	3.7	9
33	Shear flow of a suspension of bubbles rising in an inclined channel. *Journal of Fluid Mechanics*, **2004**, 515, 261-292	3.7	9

32	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	3.7	8
31	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	4.4	8
30	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	3.7	7
29	Anomalous diffusion of momentum in a dilute gas–solid suspension. *Physics of Fluids A, Fluid Dynamics*, **1992**, 4, 1337-1346		7
28	Electrophoresis in dilute polymer solutions. *Journal of Fluid Mechanics*, **2020**, 884,	3.7	7
27	Preferential concentration driven instability of sheared gas–solid suspensions. *Journal of Fluid Mechanics*, **2015**, 770, 85-123	3.7	6
26	Instability of Sedimenting Bidisperse Particle Gas Suspensions. *Flow, Turbulence and Combustion*, **1997**, 58, 275-303		6
25	A kinetic theory for particulate systems with bimodal and anisotropic velocity fluctuations. *Physics of Fluids*, **2008**, 20, 123303	4.4	6
24	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	4.2	6
23	Brownian Dynamics of a Suspension of Particles with Constrained Voronoi Cell Volumes. *Langmuir*, **2015**, 31, 6829-41	4	5
22	Controlling rotation and migration of rings in a simple shear flow through geometric modifications. *Journal of Fluid Mechanics*, **2018**, 840, 379-407	3.7	5
21	Flow of power-law fluids in fixed beds of cylinders or spheres. *Journal of Fluid Mechanics*, **2012**, 713, 491-527	3.7	5
20	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	3.7	5
19	Extensional flow of a suspension of fibers in a dilute polymer solution. *Physics of Fluids A, Fluid Dynamics*, **1992**, 4, 1070-1073		5
18	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	3.7	4
17	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
16	Electrical conductivity of isotropic fibre suspensions. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, **1999**, 455, 1923-1930	2.4	4
15	Kinetic theory for a mobile adsorbed gas. *Journal of Chemical Physics*, **1994**, 101, 4391-4406	3.9	4

14	The extensional viscosity and effective thermal conductivity of a dispersion of aligned disks. *Physics of Fluids*, **1994**, 6, 1955-1962	4.4	4
13	Predictive Inverse Model for Advective Heat Transfer in a Short-Circuited Fracture: Dimensional Analysis, Machine Learning, and Field Demonstration. *Water Resources Research*, **2020**, 56, e2020WR027065	5.4	4
12	The combined hydrodynamic and thermodynamic effects of immobilized proteins on the diffusion of mobile transmembrane proteins. *Journal of Fluid Mechanics*, **2019**, 877, 648-681	3.7	3
11	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	3.7	3
10	The rapid distortion of two-way coupled particle-laden turbulence. *Journal of Fluid Mechanics*, **2019**, 877, 82-104	3.7	3
9	The average stress in a suspension of cube-shaped magnetic particles subject to shear and magnetic fields. *Physics of Fluids*, **2015**, 27, 093101	4.4	3
8	The lift force on a bubble in a sheared suspension in a slightly inclined channel. *Journal of Fluid Mechanics*, **2008**, 615, 27-51	3.7	3
7	Suppression of electroconvective and morphological instabilities by an imposed cross flow of the electrolyte. *Physical Review Fluids*, **2021**, 6,	2.8	3
6	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	3.7	2
5	Modeling the dynamics of remobilized CO_2 within the geologic subsurface. *International Journal of Greenhouse Gas Control*, **2018**, 70, 128-145	4.2	2
4	Electroconvection near an ion-selective surface with Butler-Volmer kinetics. *Journal of Fluid Mechanics*, **2022**, 930,	3.7	2
3	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	3.7	2
2	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	2.4	1
1	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	2.4	