Guy Metcalfe

List of Publications by Year
in descending order

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88 papers	2,439 citations	172207 29 h-index	205818 48 g-index
91 all docs	91 docs citations	91 times ranked	1562 citing authors

#	Article	IF	Citations
1	Avalanche mixing of granular solids. Nature, 1995, 374, 39-41.	13.7	212
2	Experimental and computational studies of mixing in complex Stokes flows: the vortex mixing flow and multicellular cavity flows. Journal of Fluid Mechanics, 1994, 269, 199-246.	1.4	168
3	Frontiers of chaotic advection. Reviews of Modern Physics, 2017, 89, .	16.4	146
4	How well do discrete element granular flow models capture the essentials of mixing processes?. Applied Mathematical Modelling, 1998, 22, 995-1008.	2.2	113
5	Mixing of granular materials in slowly rotated containers. AICHE Journal, 1996, 42, 3351-3363.	1.8	102
6	Autocatalytic processes in mixing flows. Physical Review Letters, 1994, 72, 2875-2878.	2.9	75
7	Pattern formation during mixing and segregation of flowing granular materials. Physica A: Statistical Mechanics and Its Applications, 1996, 233, 709-717.	1.2	75
8	Granular Convection and Transport due to Horizontal Shaking. Physical Review Letters, 1997, 79, 4574-4576.	2.9	74
9	Is Chaotic Advection Inherent to Porous Media Flow?. Physical Review Letters, 2013, 111, 174101.	2.9	66
10	Composing chaos: An experimental and numerical study of an open duct mixing flow. AICHE Journal, 2006, 52, 9-28.	1.8	59
11	Isolated mixing regions: origin, robustness and control. Chemical Engineering Science, 1997, 52, 1623-1636.	1.9	58
12	A segregation mechanism in a vertically shaken bed. Granular Matter, 2001, 3, 205-214.	1.1	56
13	Multiplexed detection of cancer biomarkers using a microfluidic platform integrating single bead trapping and acoustic mixing techniques. Nanoscale, 2018, 10, 20196-20206.	2.8	55
14	Transport enhancement mechanisms in open cavities. Journal of Fluid Mechanics, 2002, 452, 199-229.	1.4	54
15	Insights from simulations into mechanisms for density segregation of granular mixtures in rotating cylinders. Granular Matter, 2011, 13, 53-74.	1.1	54
16	Toward enhanced subsurface intervention methods using chaotic advection. Journal of Contaminant Hydrology, 2012, 127, 15-29.	1.6	54
17	Granular friction, Coulomb failure, and the fluid-solid transition for horizontally shaken granular materials. Physical Review E, 2002, 65, 031302.	0.8	51
18	Using superfluid mixtures to probe convective instabilities. Physica D: Nonlinear Phenomena, 1991, 51, 520-530.	1.3	47

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19	Experimental and analytical study of the effect of contact angle on liquid convective heat transfer in microchannels. International Journal of Heat and Mass Transfer, 2006, 49, 4161-4170.	2.5	46
20	Low Reynolds number scalar transport enhancement in viscous and non-Newtonian fluids. International Journal of Heat and Mass Transfer, 2009, 52, 655-664.	2.5	42
21	Forces in piles of granular material: an analytic and 3D DEM study. Granular Matter, 2001, 3, 165-176.	1.1	40
22	Topological mixing study of non-Newtonian duct flows. Physics of Fluids, 2006, 18, 103103.	1.6	38
23	Kinematic considerations for mantle mixing. Geophysical Research Letters, 1995, 22, 743-746.	1.5	35
24	Rapid detection of Hendra virus antibodies: an integrated device with nanoparticle assay and chaotic micromixing. Lab on A Chip, 2017, 17, 169-177.	3.1	35
25	Mixing and heat transfer of highly viscous food products with a continuous chaotic duct flow. Journal of Food Engineering, 2009, 95, 21-29.	2.7	34
26	Experimental comparison between acoustic and pressure signals from a bubbling flow. Chemical Engineering Science, 2008, 63, 5860-5869.	1.9	33
27	Lagrangian topology of a periodically reoriented potential flow: Symmetry, optimization, and mixing. Physical Review E, 2009, 80, 036208.	0.8	33
28	Global parametric solutions of scalar transport. Journal of Computational Physics, 2008, 227, 3032-3057.	1.9	31
29	Measurement of particle motions within tumbling granular flows. Chaos, 1999, 9, 581-593.	1.0	30
30	Scalar dispersion in a periodically reoriented potential flow: Acceleration via Lagrangian chaos. Physical Review E, 2010, 81, 046319.	0.8	27
31	Beyond Passive. Advances in Applied Mechanics, 2012, , 109-188.	1.4	27
32	Anomalous transport and chaotic advection in homogeneous porous media. Physical Review E, 2014, 90, 063012.	0.8	26
33	A partially open porous media flow with chaotic advection: towards a model of coupled fields. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2010, 368, 217-230.	1.6	25
34	Field Trials of Chaotic Advection to Enhance Reagent Delivery. Ground Water Monitoring and Remediation, 2019, 39, 23-39.	0.6	22
35	An experimental and theoretical study of the mixing characteristics of a periodically reoriented irrotational flow. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2010, 368, 2147-2162.	1.6	21
36	The separate roles of shear rate and mixing on gibbsite precipitation. Chemical Engineering Science, 2001, 56, 2521-2530.	1.9	20

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37	Solidâ€“liquid separation by particle-flow-instability. Energy and Environmental Science, 2014, 7, 3982-3988.	15.6	18
38	Lagrangian Transport and Chaotic Advection in Three-Dimensional Laminar Flows. Applied Mechanics Reviews, 2021, 73, .	4.5	18
39	Heat-flow experiments in liquid 4He with a variable cylindrical geometry. Journal of Fluid Mechanics, 1987, 174, 209-231.	1.4	16
40	Mixing of discontinuously deforming media. Chaos, 2016, 26, 023113.	1.0	16
41	Chaotic advection at the pore scale: Mechanisms, upscaling and implications for macroscopic transport. Advances in Water Resources, 2016, 97, 175-192.	1.7	16
42	Temporal Fluctuations and Poroelasticity Can Generate Chaotic Advection in Natural Groundwater Systems. Water Resources Research, 2019, 55, 3347-3374.	1.7	16
43	Chaotic mixing processes: New problems and computational issues. Chaos, Solitons and Fractals, 1995, 6, 425-438.	2.5	15
44	Critical Rayleigh numbers for cryogenic experiments. Journal of Low Temperature Physics, 1990, 78, 231-246.	0.6	13
45	Convection inâ^'43He mixtures: Measurement of the superfluid effects. Physical Review A, 1990, 41, 5735-5738.	1.0	13
46	Experimental study of density segregation at end walls in a horizontal rotating cylinder saturated with fluid: friction to lubrication transition. Granular Matter, 2012, 14, 319-332.	1.1	12
47	Lagrangian transport characteristics of a class of three-dimensional inline-mixing flows with fluid inertia. Physics of Fluids, 2014, 26, .	1.6	12
48	Groundwater cooling of a supercomputer in Perth, Western Australia: hydrogeological simulations and thermal sustainability. Hydrogeology Journal, 2015, 23, 1831-1849.	0.9	12
49	Convection-Enhanced Transport into Open Cavities. Cardiovascular Engineering and Technology, 2015, 6, 352-363.	0.7	11
50	Creating analytically divergence-free velocity fields from grid-based data. Journal of Computational Physics, 2016, 323, 75-94.	1.9	11
51	On oscillating flows in randomly heterogeneous porous media. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2010, 368, 197-216.	1.6	9
52	Bifurcations and degenerate periodic points in a three dimensional chaotic fluid flow. Chaos, 2016, 26, 053106.	1.0	9
53	Control mechanisms for the global structure of scalar dispersion in chaotic flows. Physical Review E, 2014, 90, 022908.	0.8	8
54	Flow regime analysis of non-Newtonian duct flows. Physics of Fluids, 2006, 18, 013101.	1.6	7

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55	Transport in a partially open porous media flow. Proceedings of SPIE, 2007, , .	0.8	7
56	Stochastic relationships for periodic responses in randomly heterogeneous aquifers. Water Resources Research, 2011, 47, .	1.7	7
57	Experimental and computational study of scalar modes in a periodic laminar flow. International Journal of Thermal Sciences, 2015, 96, 102-118.	2.6	7
58	Visualization of the trapping of inertial particles in a laminar mixing tank. Chemical Engineering Science, 2016, 143, 99-104.	1.9	7
59	Impact of discontinuous deformation upon the rate of chaotic mixing. Physical Review E, 2017, 95, 022213.	0.8	7
60	Observation of chaotic bursting and attractor switching in a fluid. Physical Review A, 1992, 46, R711-R714.	1.0	6
61	Nonmixing vortex cores in wavy Taylor vortex flow. Physics of Fluids, 2008, 20, 063602.	1.6	6
62	Direct experimental visualization of the global Hamiltonian progression of two-dimensional Lagrangian flow topologies from integrable to chaotic state. Chaos, 2015, 25, 103106.	1.0	6
63	Experimental and numerical parametric analysis of a reoriented duct flow. European Journal of Mechanics, B/Fluids, 2016, 57, 1-14.	1.2	6
64	Localized shear generates three-dimensional transport. Chaos, 2017, 27, 043102.	1.0	6
65	Convection in 3Heâ€“superfluid-4He mixtures. Part 1. A Boussinesq analogue. Journal of Fluid Mechanics, 1996, 307, 269-296.	1.4	5
66	Convection in 3Heâ€“superfluid-4He mixtures. Part 2. A survey of instabilities. Journal of Fluid Mechanics, 1996, 307, 297-331.	1.4	5
67	Density segregation of granular material in a rotating cylindrical tumbler. Proceedings of SPIE, 2008, , .	0.8	5
68	Autocatalytic Processes in Mixing Flows. Physical Review Letters, 1994, 73, 212-212.	2.9	4
69	When Do Complex Transport Dynamics Arise in Natural Groundwater Systems?. Water Resources Research, 2020, 56, e2019WR025982.	1.7	4
70	Simultaneous optimisation of residence time, heat and mass transfer in laminar duct flows. Chemical Engineering Science, 2018, 191, 511-524.	1.9	3
71	Science in the Sandbox: Fluctuations, Friction and Instabilities. Lecture Notes in Physics, 2001, , 351-391.	0.3	3
72	Applied Fluid Chaos: Designing Advection with Periodically Reoriented Flows for Micro to Geophysical Mixing and Transport Enhancement. , 2010, , .		3

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73	A Primer on the Dynamical Systems Approach to Transport in Porous Media. Transport in Porous Media, 2023, 146, 55-84.	1.2	3
74	Superfluid effects at the onset of convection in3He-superfluid-4He mixtures. Journal of Low Temperature Physics, 1993, 90, 95-117.	0.6	2
75	CHAOTIC BURSTING IN A CONVECTING FLUID. International Journal of Bifurcation and Chaos in Applied Sciences and Engineering, 1993, 03, 677-684.	0.7	2
76	Complete parametric scalar dispersion. Proceedings of SPIE, 2007, , .	0.8	2
77	Lagrangian topology of reoriented potential flows. Proceedings of SPIE, 2008, , .	0.8	2
78	Chaos and the Flow Capture Problem: Polluting is Easy, Cleaning is Hard. Physical Review Applied, 2018, 10, .	1.5	2
79	The mathematics of market timing. PLoS ONE, 2018, 13, e0200561.	1.1	2
80	Push and pull: attractors and repellors of a dynamical system can localize inertial particles. Granular Matter, 2019, 21, 1.	1.1	2
81	Lagrangian Complexity Persists with Multimodal Flow Forcing in Compressible Porous Systems. Transport in Porous Media, 2020, 135, 555-586.	1.2	2
82	Global organization of three-dimensional, volume-preserving flows: Constraints, degenerate points, and Lagrangian structure. Chaos, 2020, 30, 033124.	1.0	2
83	PROSPECTS FOR EFFICIENT ENHANCED HEAT TRANSFER IN AN OPEN CHAOTIC FLOW. , 2006, , .		2
84	Transition to large aspect ratio convection. Physical Review E, 1994, 49, R3572-R3575.	0.8	1
85	Comment on â€œPlume spreading in groundwater by stretching and foldingâ€•by D. C. Mays and R. M. Neupauer. Water Resources Research, 2013, 49, 1189-1191.	1.7	1
86	Friction and Flow in Granular Materials. Materials Research Society Symposia Proceedings, 2000, 627, 1.	0.1	0
87	Unravelling Convective Heat Transfer in the Rotated Arc Mixer. , 2014, , .		0
88	Tracking Particles in Tumbling Containers. Solid Mechanics and Its Applications, 1997, , 287-298.	0.1	0