

# Colm-cille Caulfield

## List of Publications by Year in descending order

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131  
papers

3,471  
citations

147726

31  
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182361

51  
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137  
all docs

137  
docs citations

137  
times ranked

1689  
citing authors

#	ARTICLE	IF	CITATIONS
1	MIXING EFFICIENCY IN STRATIFIED SHEAR FLOWS. Annual Review of Fluid Mechanics, 2003, 35, 135-167.	10.8	351
2	The anatomy of the mixing transition in homogeneous and stratified free shear layers. Journal of Fluid Mechanics, 2000, 413, 1-47.	1.4	195
3	Layering, Instabilities, and Mixing in Turbulent Stratified Flows. Annual Review of Fluid Mechanics, 2021, 53, 113-145.	10.8	126
4	Efficiency of turbulent mixing in the abyssal ocean circulation. Geophysical Research Letters, 2017, 44, 6296-6306.	1.5	89
5	A laboratory study of explosive volcanic eruptions. Journal of Geophysical Research, 1992, 97, 6699-6712.	3.3	76
6	Multiple linear instability of layered stratified shear flow. Journal of Fluid Mechanics, 1994, 258, 255-285.	1.4	72
7	Triggering turbulence efficiently in plane Couette flow. Journal of Fluid Mechanics, 2012, 712, 244-272.	1.4	70
8	Time-dependent, non-monotonic mixing in stratified turbulent shear flows: implications for oceanographic estimates of buoyancy flux. Journal of Fluid Mechanics, 2013, 736, 570-593.	1.4	67
9	Optimal mixing in two-dimensional plane Poiseuille flow at finite Péclet number. Journal of Fluid Mechanics, 2014, 748, 241-277.	1.4	67
10	The Relationship between Flux Coefficient and Entrainment Ratio in Density Currents. Journal of Physical Oceanography, 2010, 40, 2713-2727.	0.7	64
11	Time-dependent plumes and jets with decreasing source strengths. Journal of Fluid Mechanics, 2006, 563, 443.	1.4	59
12	Mixing efficiency in high-aspect-ratio Rayleigh-Taylor experiments. Physics of Fluids, 2008, 20, .	1.6	59
13	Turbulent mixing due to the Holmboe wave instability at high Reynolds number. Journal of Fluid Mechanics, 2016, 803, 591-621.	1.4	59
14	Three dimensionalization of the stratified mixing layer. Physics of Fluids, 1994, 6, 3803-3805.	1.6	58
15	The intermittency boundary in stratified plane Couette flow. Journal of Fluid Mechanics, 2015, 781, 298-329.	1.4	57
16	Turbulent gravitational convection from a point source in a non-uniformly stratified environment. Journal of Fluid Mechanics, 1998, 360, 229-248.	1.4	56
17	Self-similar mixing in stratified plane Couette flow for varying Prandtl number. Journal of Fluid Mechanics, 2017, 820, 86-120.	1.4	48
18	Effect of aspect ratio on the energy extraction efficiency of three-dimensional flapping foils. Physics of Fluids, 2014, 26, .	1.6	45

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19	Transient perturbation growth in time-dependent mixing layers. <i>Journal of Fluid Mechanics</i> , 2013, 717, 90-133.	1.4	44
20	Role of overturns in optimal mixing in stratified mixing layers. <i>Journal of Fluid Mechanics</i> , 2017, 826, 522-552.	1.4	43
21	Plumes with non-monotonic mixing behaviour. <i>Geophysical and Astrophysical Fluid Dynamics</i> , 1995, 79, 173-199.	0.4	40
22	Layer formation in horizontally forced stratified turbulence: connecting exact coherent structures to linear instabilities. <i>Journal of Fluid Mechanics</i> , 2017, 832, 409-437.	1.4	39
23	Robust identification of dynamically distinct regions in stratified turbulence. <i>Journal of Fluid Mechanics</i> , 2016, 807, .	1.4	38
24	Confronting Grand Challenges in environmental fluid mechanics. <i>Physical Review Fluids</i> , 2021, 6, .	1.0	37
25	The structure and origin of confined Holmboe waves. <i>Journal of Fluid Mechanics</i> , 2018, 848, 508-544.	1.4	36
26	Self-organized criticality of turbulence in strongly stratified mixing layers. <i>Journal of Fluid Mechanics</i> , 2018, 856, 228-256.	1.4	35
27	Asymptotic Dynamics of High Dynamic Range Stratified Turbulence. <i>Physical Review Letters</i> , 2019, 122, 194504.	2.9	35
28	Spontaneous layering in stratified turbulent Taylor-Couette flow. <i>Journal of Fluid Mechanics</i> , 2013, 721, .	1.4	34
29	Three-dimensional transition after wake deflection behind a flapping foil. <i>Physical Review E</i> , 2015, 91, 043017.	0.8	34
30	Transient ventilation dynamics following a change in strength of a point source of heat. <i>Journal of Fluid Mechanics</i> , 2008, 614, 15-37.	1.4	33
31	Designing a more nonlinearly stable laminar flow via boundary manipulation. <i>Journal of Fluid Mechanics</i> , 2014, 738, .	1.4	33
32	Blocked natural ventilation: the effect of a source mass flux. <i>Journal of Fluid Mechanics</i> , 2003, 495, 119-133.	1.4	32
33	Seismic Imaging of Rapid Onset of Stratified Turbulence in the South Atlantic Ocean. <i>Journal of Physical Oceanography</i> , 2016, 46, 1023-1044.	0.7	32
34	Meandering due to large eddies and the statistically self-similar dynamics of quasi-two-dimensional jets. <i>Journal of Fluid Mechanics</i> , 2012, 692, 347-368.	1.4	31
35	Localization of flow structures using $\ell_1$ -norm optimization. <i>Journal of Fluid Mechanics</i> , 2013, 729, 672-701.	1.4	31
36	Diapycnal mixing in layered stratified plane Couette flow quantified in a tracer-based coordinate. <i>Journal of Fluid Mechanics</i> , 2017, 823, 198-229.	1.4	30

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37	The nonlinear development of three-dimensional disturbances at hyperbolic stagnation points: A model of the braid region in mixing layers. <i>Physics of Fluids</i> , 2000, 12, 1032-1043.	1.6	29
38	Transient growth in strongly stratified shear layers. <i>Journal of Fluid Mechanics</i> , 2014, 758, .	1.4	29
39	Mixing in forced stratified turbulence and its dependence on large-scale forcing. <i>Journal of Fluid Mechanics</i> , 2020, 898, .	1.4	28
40	Maximal mixing rate in turbulent stably stratified Couette flow. <i>Physics of Fluids</i> , 2001, 13, 894-900.	1.6	27
41	The mixing in a room by a localized finite-mass-flux source of buoyancy. <i>Journal of Fluid Mechanics</i> , 2002, 471, 33-50.	1.4	27
42	Time-dependent mixing in stratified Kelvin-Helmholtz billows: Experimental observations. <i>Geophysical Research Letters</i> , 2006, 33, .	1.5	27
43	Open questions in turbulent stratified mixing: Do we even know what we do not know?. <i>Physical Review Fluids</i> , 2020, 5, .	1.0	27
44	An experimental investigation of the instability of a shear flow with multilayered density stratification. <i>Physics of Fluids</i> , 1995, 7, 3028-3041.	1.6	26
45	Seismic imaging of a large horizontal vortex at abyssal depths beneath the Sub-Antarctic Front. <i>Nature Geoscience</i> , 2012, 5, 542-546.	5.4	26
46	Natural ventilation in interconnected chambers. <i>Journal of Fluid Mechanics</i> , 2006, 564, 139.	1.4	25
47	Goldilocks mixing in oceanic shear-induced turbulent overturns. <i>Journal of Fluid Mechanics</i> , 2021, 928, .	1.4	25
48	Turbulence in forced stratified shear flows. <i>Journal of Fluid Mechanics</i> , 2021, 910, .	1.4	23
49	Boussinesq plumes and jets with decreasing source strengths in stratified environments. <i>Journal of Fluid Mechanics</i> , 2006, 563, 463.	1.4	22
50	Spherical cap bubbles with a toroidal bubbly wake. <i>Physics of Fluids</i> , 2008, 20, .	1.6	22
51	Non-invasive turbulent mixing across a density interface in a turbulent Taylor-Couette flow. <i>Journal of Fluid Mechanics</i> , 2010, 663, 347-357.	1.4	22
52	Disruption of states by a stable stratification. <i>Journal of Fluid Mechanics</i> , 2015, 784, 548-564.	1.4	22
53	Anthropogenic Mixing in Seasonally Stratified Shelf Seas by Offshore Wind Farm Infrastructure. <i>Frontiers in Marine Science</i> , 2022, 9, .	1.2	22
54	Spatial Variation of Diapycnal Diffusivity Estimated From Seismic Imaging of Internal Wave Field, Gulf of Mexico. <i>Journal of Geophysical Research: Oceans</i> , 2017, 122, 9827-9854.	1.0	21

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55	Estimating Geostrophic Shear from Seismic Images of Oceanic Structure*. Journal of Atmospheric and Oceanic Technology, 2011, 28, 1149-1154.	0.5	20
56	Sensitivity of Deep Ocean Mixing to Local Internal Tide Breaking and Mixing Efficiency. Geophysical Research Letters, 2019, 46, 14622-14633.	1.5	20
57	The dynamics of stratified horizontal shear flows at low Péclet number. Journal of Fluid Mechanics, 2020, 903, .	1.4	20
58	Testing the Assumptions Underlying Ocean Mixing Methodologies Using Direct Numerical Simulations. Journal of Physical Oceanography, 2019, 49, 2761-2779.	0.7	19
59	Secondary instability and three-dimensionalization in a laboratory accelerating shear layer with varying density differences. Dynamics of Atmospheres and Oceans, 1996, 23, 125-138.	0.7	18
60	The effect of sudden source buoyancy flux increases on turbulent plumes. Journal of Fluid Mechanics, 2009, 635, 137-169.	1.4	18
61	Variational framework for flow optimization using seminorm constraints. Physical Review E, 2012, 86, 026306.	0.8	18
62	Dynamics of vorticity defects in stratified shear flow. Journal of Fluid Mechanics, 2012, 694, 292-331.	1.4	18
63	Turbulent buoyant convection from a maintained source of buoyancy in a narrow vertical tank. Journal of Fluid Mechanics, 2012, 701, 278-303.	1.4	18
64	Calibrated Seismic Imaging of Eddy-Dominated Warm Water Transport Across the Bellingshausen Sea, Southern Ocean. Journal of Geophysical Research: Oceans, 2018, 123, 3072-3099.	1.0	18
65	Mixing and entrainment are suppressed in inclined gravity currents. Journal of Fluid Mechanics, 2019, 873, 786-815.	1.4	18
66	Wake Induced Long Range Repulsion of Aqueous Dunes. Physical Review Letters, 2020, 124, 054501.	2.9	18
67	Entrainment model for fully-developed wind farms: Effects of atmospheric stability and an ideal limit for wind farm performance. Physical Review Fluids, 2018, 3, .	1.0	18
68	Time-dependent ventilation flows driven by opposing wind and buoyancy. Journal of Fluid Mechanics, 2011, 672, 33-59.	1.4	17
69	Optimal mixing in three-dimensional plane Poiseuille flow at high Péclet number. Journal of Fluid Mechanics, 2018, 850, 875-923.	1.4	16
70	Recent progress in modeling imbalance in the atmosphere and ocean. Physical Review Fluids, 2019, 4, .	1.0	16
71	Temporal variation of non-ideal plumes with sudden reductions in buoyancy flux. Journal of Fluid Mechanics, 2008, 600, 181-199.	1.4	15
72	Streamwise dispersion and mixing in quasi-two-dimensional steady turbulent jets. Journal of Fluid Mechanics, 2012, 711, 212-258.	1.4	15

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73	Bounds on dissipation in stress-driven flow. <i>Journal of Fluid Mechanics</i> , 2004, 510, 333-352.	1.4	14
74	Nonlinear evolution of linear optimal perturbations of strongly stratified shear layers. <i>Journal of Fluid Mechanics</i> , 2017, 825, 213-244.	1.4	14
75	Shear-induced breaking of internal gravity waves. <i>Journal of Fluid Mechanics</i> , 2021, 921, .	1.4	14
76	Nonlinear evolution of a layered stratified shear flow. <i>Dynamics of Atmospheres and Oceans</i> , 2001, 34, 103-124.	0.7	13
77	Testing linear marginal stability in stratified shear layers. <i>Journal of Fluid Mechanics</i> , 2018, 839, .	1.4	13
78	Detrainment of plumes from vertically distributed sources. <i>Environmental Fluid Mechanics</i> , 2018, 18, 3-25.	0.7	13
79	Optimal mixing in two-dimensional stratified plane Poiseuille flow at finite Péclet and Richardson numbers. <i>Journal of Fluid Mechanics</i> , 2018, 853, 359-385.	1.4	13
80	Time-lapse Seismic Imaging of Oceanic Fronts and Transient Lenses Within South Atlantic Ocean. <i>Journal of Geophysical Research: Oceans</i> , 2020, 125, e2020JC016293.	1.0	13
81	The influence of far field stratification on shear-induced turbulent mixing. <i>Journal of Fluid Mechanics</i> , 2021, 928, .	1.4	13
82	A new method for isolating turbulent states in transitional stratified plane Couette flow. <i>Journal of Fluid Mechanics</i> , 2016, 808, .	1.4	12
83	Dependence on aspect ratio of symmetry breaking for oscillating foils: implications for flapping flight. <i>Journal of Fluid Mechanics</i> , 2016, 787, 16-49.	1.4	12
84	Multiple instability of layered stratified plane Couette flow. <i>Journal of Fluid Mechanics</i> , 2017, 813, 250-278.	1.4	12
85	Local implications for self-similar turbulent plume models. <i>Journal of Fluid Mechanics</i> , 2007, 575, 257-265.	1.4	11
86	Transients in natural ventilation – A time-periodically-varying source. <i>Building Services Engineering Research and Technology</i> , 2008, 29, 119-135.	0.9	11
87	A prediction for the optimal stratification for turbulent mixing. <i>Journal of Fluid Mechanics</i> , 2009, 634, 487.	1.4	11
88	The structure of low-Froude-number lee waves over an isolated obstacle. <i>Journal of Fluid Mechanics</i> , 2011, 689, 3-31.	1.4	11
89	Irreversible mixing by unstable periodic orbits in buoyancy dominated stratified turbulence. <i>Journal of Fluid Mechanics</i> , 2017, 832, .	1.4	11
90	Adjoint-based optimization of displacement ventilation flow. <i>Building and Environment</i> , 2017, 124, 342-356.	3.0	10

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91	Horizontal locomotion of a vertically flapping oblate spheroid. <i>Journal of Fluid Mechanics</i> , 2018, 840, 688-708.	1.4	10
92	Evolution of a chemically reacting plume in a ventilated room. <i>Journal of Fluid Mechanics</i> , 2005, 537, 221.	1.4	9
93	Nonlinear optimal control strategies for buoyancy-driven flows in the built environment. <i>Computers and Fluids</i> , 2019, 194, 104313.	1.3	9
94	Layer formation and relaminarisation in plane Couette flow with spanwise stratification. <i>Journal of Fluid Mechanics</i> , 2019, 868, 97-118.	1.4	9
95	Time-lapse Acoustic Imaging of Mesoscale and Fine-scale Variability within the Faroe-Shetland Channel. <i>Journal of Geophysical Research: Oceans</i> , 2020, 125, e2019JC015861.	1.0	9
96	Reynolds number dependence of an upper bound for the long-time-averaged buoyancy flux in plane stratified Couette flow. <i>Journal of Fluid Mechanics</i> , 2004, 498, 315-332.	1.4	8
97	Effect of volumetric heat sources on hysteresis phenomena in natural and mixed-mode ventilation. <i>Building and Environment</i> , 2009, 44, 216-226.	3.0	8
98	Growth and instability of a laminar plume in a strongly stratified environment. <i>Journal of Fluid Mechanics</i> , 2011, 671, 184-206.	1.4	8
99	Bulldozing of granular material. <i>Journal of Fluid Mechanics</i> , 2014, 748, 143-174.	1.4	8
100	The viscous Holmboe instability for smooth shear and density profiles. <i>Journal of Fluid Mechanics</i> , 2020, 896, .	1.4	8
101	Coherent structures in interacting vortex rings. <i>Physical Review Fluids</i> , 2017, 2, .	1.0	8
102	Data-Driven Identification of Turbulent Oceanic Mixing From Observational Microstructure Data. <i>Geophysical Research Letters</i> , 2021, 48, .	1.5	8
103	A Marginal Stability Paradigm for Shear-Induced Diapycnal Turbulent Mixing in the Ocean. <i>Geophysical Research Letters</i> , 2022, 49, .	1.5	8
104	Entrainment and mixing dynamics of surface-stress-driven stratified flow in a cylinder. <i>Journal of Fluid Mechanics</i> , 2012, 691, 498-517.	1.4	7
105	The instantaneous Froude number and depth of unsteady gravity currents. <i>Journal of Hydraulic Research/De Recherches Hydrauliques</i> , 2013, 51, 432-445.	0.7	7
106	Advection and buoyancy-induced turbulent mixing in a narrow vertical tank. <i>Journal of Fluid Mechanics</i> , 2013, 724, 450-479.	1.4	7
107	Nonlinear effects in buoyancy-driven variable-density turbulence. <i>Journal of Fluid Mechanics</i> , 2017, 810, 362-377.	1.4	7
108	Kelvin's "Helmholtz billows above Richardson number. <i>Journal of Fluid Mechanics</i> , 2019, 879, .	1.4	7

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109	Exploiting self-organized criticality in strongly stratified turbulence. <i>Journal of Fluid Mechanics</i> , 2022, 933, .	1.4	7
110	Layering and vertical transport in sheared double-diffusive convection in the diffusive regime. <i>Journal of Fluid Mechanics</i> , 2022, 933, .	1.4	7
111	Entrainment and mixed layer dynamics of a surface-stress-driven stratified fluid. <i>Journal of Fluid Mechanics</i> , 2015, 765, 653-667.	1.4	6
112	Dynamics of migrating sand dunes interacting with obstacles. <i>Physical Review Fluids</i> , 2021, 6, .	1.0	6
113	Instabilities of interacting vortex rings generated by an oscillating disk. <i>Physical Review E</i> , 2016, 94, 033107.	0.8	5
114	Quantifying mixing and available potential energy in vertically periodic simulations of stratified flows. <i>Journal of Fluid Mechanics</i> , 2021, 914, .	1.4	5
115	Vertical Mixing and Heat Fluxes Conditioned by a Seismically Imaged Oceanic Front. <i>Frontiers in Marine Science</i> , 2021, 8, .	1.2	5
116	Effects of spanwise confinement on stratified shear instabilities. <i>Physical Review Fluids</i> , 2021, 6, .	1.0	5
117	Laboratory experiments on two coalescing axisymmetric turbulent plumes in a rotating fluid. <i>Physics of Fluids</i> , 2011, 23, 056601.	1.6	4
118	The effects of Prandtl number on the nonlinear dynamics of Kelvin-Helmholtz instability in two dimensions. <i>Journal of Fluid Mechanics</i> , 2021, 915, .	1.4	4
119	Stability of the Interaction between Two Sand Dunes in an Idealized Laboratory Experiment. <i>Physical Review Letters</i> , 2021, 127, 154501.	2.9	4
120	Stratified turbulent mixing in oscillating shear flows. <i>Journal of Fluid Mechanics</i> , 2022, 944, .	1.4	4
121	The coupled dynamics of internal waves and hairpin vortices in stratified plane Poiseuille flow. <i>Journal of Fluid Mechanics</i> , 2022, 934, .	1.4	3
122	Implications of inertial subrange scaling for stably stratified mixing. <i>Journal of Fluid Mechanics</i> , 2022, 939, .	1.4	3
123	Robust and efficient identification of optimal mixing perturbations using proxy multiscale measures. <i>Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences</i> , 2022, 380, 20210026.	1.6	3
124	Buoyancy flux bounds for surface-driven flow. <i>Journal of Fluid Mechanics</i> , 2005, 536, 367-376.	1.4	2
125	Buoyancy-induced turbulent mixing in a narrow tilted tank. <i>Journal of Fluid Mechanics</i> , 2015, 773, 267-297.	1.4	2
126	Optimal perturbation growth on a breaking internal gravity wave. <i>Journal of Fluid Mechanics</i> , 2021, 925, .	1.4	2



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127	Linear estimation of flux sensitivity to uncertainty in porous media. <i>Journal of Fluid Mechanics</i> , 2015, 768, 600-622.	1.4	1
128	Robust preconditioned one-shot methods and direct-adjoint-looping for optimizing Reynolds-averaged turbulent flows. <i>Computers and Fluids</i> , 2022, 238, 105390.	1.3	1
129	Bounds on dissipation in stress-driven flow in a rotating frame. <i>Journal of Fluid Mechanics</i> , 2005, 540, 373.	1.4	0
130	Spatially varying mixing of a passive scalar in a buoyancy-driven turbulent flow. <i>Journal of Fluid Mechanics</i> , 2014, 742, 701-719.	1.4	0
131	Optimal perturbation growth in axisymmetric intrusions. <i>Journal of Fluid Mechanics</i> , 2017, 811, .	1.4	0