

# 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  
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137  
docs citations

137  
times ranked

1689  
citing authors

#	ARTICLE	IF	CITATIONS
1	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
2	A Marginal Stability Paradigm for Shear-Induced Diapycnal Turbulent Mixing in the Ocean. <i>Geophysical Research Letters</i> , 2022, 49, .	1.5	8
3	Anthropogenic Mixing in Seasonally Stratified Shelf Seas by Offshore Wind Farm Infrastructure. <i>Frontiers in Marine Science</i> , 2022, 9, .	1.2	22
4	Implications of inertial subrange scaling for stably stratified mixing. <i>Journal of Fluid Mechanics</i> , 2022, 939, .	1.4	3
5	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
6	Exploiting self-organized criticality in strongly stratified turbulence. <i>Journal of Fluid Mechanics</i> , 2022, 933, .	1.4	7
7	Layering and vertical transport in sheared double-diffusive convection in the diffusive regime. <i>Journal of Fluid Mechanics</i> , 2022, 933, .	1.4	7
8	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
9	Stratified turbulent mixing in oscillating shear flows. <i>Journal of Fluid Mechanics</i> , 2022, 944, .	1.4	4
10	Layering, Instabilities, and Mixing in Turbulent Stratified Flows. <i>Annual Review of Fluid Mechanics</i> , 2021, 53, 113-145.	10.8	126
11	Turbulence in forced stratified shear flows. <i>Journal of Fluid Mechanics</i> , 2021, 910, .	1.4	23
12	Confronting Grand Challenges in environmental fluid mechanics. <i>Physical Review Fluids</i> , 2021, 6, .	1.0	37
13	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
14	Quantifying mixing and available potential energy in vertically periodic simulations of stratified flows. <i>Journal of Fluid Mechanics</i> , 2021, 914, .	1.4	5
15	Shear-induced breaking of internal gravity waves. <i>Journal of Fluid Mechanics</i> , 2021, 921, .	1.4	14
16	Optimal perturbation growth on a breaking internal gravity wave. <i>Journal of Fluid Mechanics</i> , 2021, 925, .	1.4	2
17	Vertical Mixing and Heat Fluxes Conditioned by a Seismically Imaged Oceanic Front. <i>Frontiers in Marine Science</i> , 2021, 8, .	1.2	5
18	Stability of the Interaction between Two Sand Dunes in an Idealized Laboratory Experiment. <i>Physical Review Letters</i> , 2021, 127, 154501.	2.9	4

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19	Effects of spanwise confinement on stratified shear instabilities. <i>Physical Review Fluids</i> , 2021, 6, .	1.0	5
20	The influence of far field stratification on shear-induced turbulent mixing. <i>Journal of Fluid Mechanics</i> , 2021, 928, .	1.4	13
21	Goldilocks mixing in oceanic shear-induced turbulent overturns. <i>Journal of Fluid Mechanics</i> , 2021, 928, .	1.4	25
22	Dynamics of migrating sand dunes interacting with obstacles. <i>Physical Review Fluids</i> , 2021, 6, .	1.0	6
23	Data-Driven Identification of Turbulent Oceanic Mixing From Observational Microstructure Data. <i>Geophysical Research Letters</i> , 2021, 48, .	1.5	8
24	The dynamics of stratified horizontal shear flows at low Péclet number. <i>Journal of Fluid Mechanics</i> , 2020, 903, .	1.4	20
25	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
26	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
27	The viscous Holmboe instability for smooth shear and density profiles. <i>Journal of Fluid Mechanics</i> , 2020, 896, .	1.4	8
28	Mixing in forced stratified turbulence and its dependence on large-scale forcing. <i>Journal of Fluid Mechanics</i> , 2020, 898, .	1.4	28
29	Wake Induced Long Range Repulsion of Aqueous Dunes. <i>Physical Review Letters</i> , 2020, 124, 054501.	2.9	18
30	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
31	Mixing and entrainment are suppressed in inclined gravity currents. <i>Journal of Fluid Mechanics</i> , 2019, 873, 786-815.	1.4	18
32	Testing the Assumptions Underlying Ocean Mixing Methodologies Using Direct Numerical Simulations. <i>Journal of Physical Oceanography</i> , 2019, 49, 2761-2779.	0.7	19
33	Nonlinear optimal control strategies for buoyancy-driven flows in the built environment. <i>Computers and Fluids</i> , 2019, 194, 104313.	1.3	9
34	Kelvin-Helmholtz billows above Richardson number. <i>Journal of Fluid Mechanics</i> , 2019, 879, .	1.4	7
35	Asymptotic Dynamics of High Dynamic Range Stratified Turbulence. <i>Physical Review Letters</i> , 2019, 122, 194504.	2.9	35
36	Layer formation and relaminarisation in plane Couette flow with spanwise stratification. <i>Journal of Fluid Mechanics</i> , 2019, 868, 97-118.	1.4	9

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37	Sensitivity of Deep Ocean Mixing to Local Internal Tide Breaking and Mixing Efficiency. <i>Geophysical Research Letters</i> , 2019, 46, 14622-14633.	1.5	20
38	Recent progress in modeling imbalance in the atmosphere and ocean. <i>Physical Review Fluids</i> , 2019, 4, .	1.0	16
39	Horizontal locomotion of a vertically flapping oblate spheroid. <i>Journal of Fluid Mechanics</i> , 2018, 840, 688-708.	1.4	10
40	Testing linear marginal stability in stratified shear layers. <i>Journal of Fluid Mechanics</i> , 2018, 839, .	1.4	13
41	Detrainment of plumes from vertically distributed sources. <i>Environmental Fluid Mechanics</i> , 2018, 18, 3-25.	0.7	13
42	Calibrated Seismic Imaging of Eddy-Dominated Warm Water Transport Across the Bellingshausen Sea, Southern Ocean. <i>Journal of Geophysical Research: Oceans</i> , 2018, 123, 3072-3099.	1.0	18
43	Self-organized criticality of turbulence in strongly stratified mixing layers. <i>Journal of Fluid Mechanics</i> , 2018, 856, 228-256.	1.4	35
44	Optimal mixing in three-dimensional plane Poiseuille flow at high Péclet number. <i>Journal of Fluid Mechanics</i> , 2018, 850, 875-923.	1.4	16
45	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
46	The structure and origin of confined Holmboe waves. <i>Journal of Fluid Mechanics</i> , 2018, 848, 508-544.	1.4	36
47	Entrainment model for fully-developed wind farms: Effects of atmospheric stability and an ideal limit for wind farm performance. <i>Physical Review Fluids</i> , 2018, 3, .	1.0	18
48	Multiple instability of layered stratified plane Couette flow. <i>Journal of Fluid Mechanics</i> , 2017, 813, 250-278.	1.4	12
49	Efficiency of turbulent mixing in the abyssal ocean circulation. <i>Geophysical Research Letters</i> , 2017, 44, 6296-6306.	1.5	89
50	Self-similar mixing in stratified plane Couette flow for varying Prandtl number. <i>Journal of Fluid Mechanics</i> , 2017, 820, 86-120.	1.4	48
51	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
52	Optimal perturbation growth in axisymmetric intrusions. <i>Journal of Fluid Mechanics</i> , 2017, 811, .	1.4	0
53	Nonlinear effects in buoyancy-driven variable-density turbulence. <i>Journal of Fluid Mechanics</i> , 2017, 810, 362-377.	1.4	7
54	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

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55	Irreversible mixing by unstable periodic orbits in buoyancy dominated stratified turbulence. Journal of Fluid Mechanics, 2017, 832, .	1.4	11
56	Nonlinear evolution of linear optimal perturbations of strongly stratified shear layers. Journal of Fluid Mechanics, 2017, 825, 213-244.	1.4	14
57	Adjoint-based optimization of displacement ventilation flow. Building and Environment, 2017, 124, 342-356.	3.0	10
58	Role of overturns in optimal mixing in stratified mixing layers. Journal of Fluid Mechanics, 2017, 826, 522-552.	1.4	43
59	Spatial Variation of Diapycnal Diffusivity Estimated From Seismic Imaging of Internal Wave Field, Gulf of Mexico. Journal of Geophysical Research: Oceans, 2017, 122, 9827-9854.	1.0	21
60	Coherent structures in interacting vortex rings. Physical Review Fluids, 2017, 2, .	1.0	8
61	Seismic Imaging of Rapid Onset of Stratified Turbulence in the South Atlantic Ocean. Journal of Physical Oceanography, 2016, 46, 1023-1044.	0.7	32
62	Robust identification of dynamically distinct regions in stratified turbulence. Journal of Fluid Mechanics, 2016, 807, .	1.4	38
63	Turbulent mixing due to the Holmboe wave instability at high Reynolds number. Journal of Fluid Mechanics, 2016, 803, 591-621.	1.4	59
64	A new method for isolating turbulent states in transitional stratified plane Couette flow. Journal of Fluid Mechanics, 2016, 808, .	1.4	12
65	Dependence on aspect ratio of symmetry breaking for oscillating foils: implications for flapping flight. Journal of Fluid Mechanics, 2016, 787, 16-49.	1.4	12
66	Instabilities of interacting vortex rings generated by an oscillating disk. Physical Review E, 2016, 94, 033107.	0.8	5
67	Linear estimation of flux sensitivity to uncertainty in porous media. Journal of Fluid Mechanics, 2015, 768, 600-622.	1.4	1
68	Buoyancy-induced turbulent mixing in a narrow tilted tank. Journal of Fluid Mechanics, 2015, 773, 267-297.	1.4	2
69	The intermittency boundary in stratified plane Couette flow. Journal of Fluid Mechanics, 2015, 781, 298-329.	1.4	57
70	Entrainment and mixed layer dynamics of a surface-stress-driven stratified fluid. Journal of Fluid Mechanics, 2015, 765, 653-667.	1.4	6
71	Disruption of states by a stable stratification. Journal of Fluid Mechanics, 2015, 784, 548-564.	1.4	22
72	Three-dimensional transition after wake deflection behind a flapping foil. Physical Review E, 2015, 91, 043017.	0.8	34

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73	Transient growth in strongly stratified shear layers. <i>Journal of Fluid Mechanics</i> , 2014, 758, .	1.4	29
74	Effect of aspect ratio on the energy extraction efficiency of three-dimensional flapping foils. <i>Physics of Fluids</i> , 2014, 26, .	1.6	45
75	Designing a more nonlinearly stable laminar flow via boundary manipulation. <i>Journal of Fluid Mechanics</i> , 2014, 738, .	1.4	33
76	Bulldozing of granular material. <i>Journal of Fluid Mechanics</i> , 2014, 748, 143-174.	1.4	8
77	Optimal mixing in two-dimensional plane Poiseuille flow at finite Péclet number. <i>Journal of Fluid Mechanics</i> , 2014, 748, 241-277.	1.4	67
78	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
79	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
80	Localization of flow structures using $\ell_1$ -norm optimization. <i>Journal of Fluid Mechanics</i> , 2013, 729, 672-701.	1.4	31
81	Transient perturbation growth in time-dependent mixing layers. <i>Journal of Fluid Mechanics</i> , 2013, 717, 90-133.	1.4	44
82	Time-dependent, non-monotonic mixing in stratified turbulent shear flows: implications for oceanographic estimates of buoyancy flux. <i>Journal of Fluid Mechanics</i> , 2013, 736, 570-593.	1.4	67
83	Spontaneous layering in stratified turbulent Taylor-Couette flow. <i>Journal of Fluid Mechanics</i> , 2013, 721, .	1.4	34
84	Advection and buoyancy-induced turbulent mixing in a narrow vertical tank. <i>Journal of Fluid Mechanics</i> , 2013, 724, 450-479.	1.4	7
85	Variational framework for flow optimization using seminorm constraints. <i>Physical Review E</i> , 2012, 86, 026306.	0.8	18
86	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
87	Triggering turbulence efficiently in plane Couette flow. <i>Journal of Fluid Mechanics</i> , 2012, 712, 244-272.	1.4	70
88	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
89	Streamwise dispersion and mixing in quasi-two-dimensional steady turbulent jets. <i>Journal of Fluid Mechanics</i> , 2012, 711, 212-258.	1.4	15
90	Dynamics of vorticity defects in stratified shear flow. <i>Journal of Fluid Mechanics</i> , 2012, 694, 292-331.	1.4	18

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91	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
92	Turbulent buoyant convection from a maintained source of buoyancy in a narrow vertical tank. <i>Journal of Fluid Mechanics</i> , 2012, 701, 278-303.	1.4	18
93	Laboratory experiments on two coalescing axisymmetric turbulent plumes in a rotating fluid. <i>Physics of Fluids</i> , 2011, 23, 056601.	1.6	4
94	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
95	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
96	Time-dependent ventilation flows driven by opposing wind and buoyancy. <i>Journal of Fluid Mechanics</i> , 2011, 672, 33-59.	1.4	17
97	Estimating Geostrophic Shear from Seismic Images of Oceanic Structure*. <i>Journal of Atmospheric and Oceanic Technology</i> , 2011, 28, 1149-1154.	0.5	20
98	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
99	The Relationship between Flux Coefficient and Entrainment Ratio in Density Currents. <i>Journal of Physical Oceanography</i> , 2010, 40, 2713-2727.	0.7	64
100	A prediction for the optimal stratification for turbulent mixing. <i>Journal of Fluid Mechanics</i> , 2009, 634, 487.	1.4	11
101	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
102	The effect of sudden source buoyancy flux increases on turbulent plumes. <i>Journal of Fluid Mechanics</i> , 2009, 635, 137-169.	1.4	18
103	Transients in natural ventilation – A time-periodically-varying source. <i>Building Services Engineering Research and Technology</i> , 2008, 29, 119-135.	0.9	11
104	Spherical cap bubbles with a toroidal bubbly wake. <i>Physics of Fluids</i> , 2008, 20, .	1.6	22
105	Mixing efficiency in high-aspect-ratio Rayleigh-Taylor experiments. <i>Physics of Fluids</i> , 2008, 20, .	1.6	59
106	Temporal variation of non-ideal plumes with sudden reductions in buoyancy flux. <i>Journal of Fluid Mechanics</i> , 2008, 600, 181-199.	1.4	15
107	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
108	Local implications for self-similar turbulent plume models. <i>Journal of Fluid Mechanics</i> , 2007, 575, 257-265.	1.4	11

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109	Time-dependent mixing in stratified Kelvin-Helmholtz billows: Experimental observations. <i>Geophysical Research Letters</i> , 2006, 33, .	1.5	27
110	Natural ventilation in interconnected chambers. <i>Journal of Fluid Mechanics</i> , 2006, 564, 139.	1.4	25
111	Time-dependent plumes and jets with decreasing source strengths. <i>Journal of Fluid Mechanics</i> , 2006, 563, 443.	1.4	59
112	Boussinesq plumes and jets with decreasing source strengths in stratified environments. <i>Journal of Fluid Mechanics</i> , 2006, 563, 463.	1.4	22
113	Bounds on dissipation in stress-driven flow in a rotating frame. <i>Journal of Fluid Mechanics</i> , 2005, 540, 373.	1.4	0
114	Evolution of a chemically reacting plume in a ventilated room. <i>Journal of Fluid Mechanics</i> , 2005, 537, 221.	1.4	9
115	Buoyancy flux bounds for surface-driven flow. <i>Journal of Fluid Mechanics</i> , 2005, 536, 367-376.	1.4	2
116	Bounds on dissipation in stress-driven flow. <i>Journal of Fluid Mechanics</i> , 2004, 510, 333-352.	1.4	14
117	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
118	MIXING EFFICIENCY IN STRATIFIED SHEAR FLOWS. <i>Annual Review of Fluid Mechanics</i> , 2003, 35, 135-167.	10.8	351
119	Blocked natural ventilation: the effect of a source mass flux. <i>Journal of Fluid Mechanics</i> , 2003, 495, 119-133.	1.4	32
120	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
121	Nonlinear evolution of a layered stratified shear flow. <i>Dynamics of Atmospheres and Oceans</i> , 2001, 34, 103-124.	0.7	13
122	Maximal mixing rate in turbulent stably stratified Couette flow. <i>Physics of Fluids</i> , 2001, 13, 894-900.	1.6	27
123	The anatomy of the mixing transition in homogeneous and stratified free shear layers. <i>Journal of Fluid Mechanics</i> , 2000, 413, 1-47.	1.4	195
124	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
125	Turbulent gravitational convection from a point source in a non-uniformly stratified environment. <i>Journal of Fluid Mechanics</i> , 1998, 360, 229-248.	1.4	56
126	Secondary instability and three-dimensionalization in a laboratory accelerating shear layer with varying density differences. <i>Dynamics of Atmospheres and Oceans</i> , 1996, 23, 125-138.	0.7	18

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127	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
128	Plumes with non-monotonic mixing behaviour. <i>Geophysical and Astrophysical Fluid Dynamics</i> , 1995, 79, 173-199.	0.4	40
129	Three dimensionalization of the stratified mixing layer. <i>Physics of Fluids</i> , 1994, 6, 3803-3805.	1.6	58
130	Multiple linear instability of layered stratified shear flow. <i>Journal of Fluid Mechanics</i> , 1994, 258, 255-285.	1.4	72
131	A laboratory study of explosive volcanic eruptions. <i>Journal of Geophysical Research</i> , 1992, 97, 6699-6712.	3.3	76