IX International Symposium on Stratified Flows
Department of Applied Mathematics and Theoretical Physics
University of Cambridge
29 August – 1 September, 2022

Hosted by Spain Water and IWHR, China

Monday, 29 August 2022

8:00 am – 9:00 am	Registration, Central Core, Centre for Mathematical Sciences	
9:00 am – 9:10 am 9:10 am – 9:45 am	**Welcome** **IAHR Fluid Mechanics Committee Lecture** Greg Ivey, Ocean mixing in shelf seas	
9:58 am – 11:10 am	**1A, Stratified shear flows, MR2** **9:58 am** – *Paul Linden, The stratified inclined duct* **10:16 am** – *Geopan Kong, A 'stratified inclined duct' (SID) for the acquisition of volumetric velocity and density data in stratified turbulence* **10:34 pm** – *Adrien Lefauve, Experimental properties of continuously-forced, shear-driven, stratified turbulence* **10:52 am** – *Xianyang Jiang, Vortical structures and the relationship between rotation, shear and stratification in an inclined duct*	**1B, Density staircases, MR3** **9:58 am (virtual)** – *Yuchen Ma, A stratified-turbulence-based theory for thermohaline staircase formation in the diffusive-convection regime and its numerical verification* **10:16 am** – *Remi Tailleaux, Negative APE dissipation, diffusive instability, and staircase formation in simple and double diffusive stratified fluids* **10:34 am** – *Nicolaos Petropoulos, Disruption of layering in stratified sheared flows by turbulence* **10:52 am** – *Paul Pruzina, Development and long-term evolution of density staircases in stirred stratified turbulence*
11:10 am – 11:35 am	Coffee Break	
11:38 am – 12:50 pm	**2A, Mixing in stratified flows, MR2** **11:38 am (virtual)** – *Mattieu Mercier, Mixing induced by settling objects in a stratified fluid* **11:56 am (virtual)** – *Pierre Augier, A comprehensive open dataset of stratified turbulence forced in vertical vorticity* **12:14 pm** – *Jeffrey Koseff, Underlying physics of mixing efficiency of stratified turbulence* **12:32 pm** – *John Craske, A decomposition and chain rule linking global and local available potential energy*	**2B, Geophysical flows, MR3** **11:38 am** –*Aaron Wienkers, Vertical transport and mixing driven by symmetric instability in strong ocean fronts* **11:56 am** –*Bruce Sutherland, The superharmonic cascade of oceanic internal tides* **12:14 pm** – *Fucent Hsu, Coastal bottom frictional layer response to down front wind circulation* **12:32 pm** – *Devang Falor, Convection enhanced mixing in the upper ocean during a tropical cyclone*
12:50 pm – 2:10 pm	Lunch at Churchill College	
2:10pm – 2:58 pm	Poster session lightning talks, MR2	
2:58 pm – 4:10 pm	**3A, Geophysical flows, MR2**	**3B, Mixing, MR3**

	2:58 pm (virtual) –*Georgi Sutryin, Eddy dynamics and transport in baroclinic turbulence* **3:16 pm (virtual)** – *Alexandre Delache, Interactions of waves and eddies in stratified turbulence* **3:34 pm** – *John Grue, Groups of short internal waves driven by interacting coastal current and internal tide at ridge-canyon topography* **3:52 pm** – *Henri Drake, Diapycnal motion, diffusion, and stretching of tracers in the ocean*	**2:58 pm** – *Alberto Scotti, A minimal ocean mixing system (MOMS): laboratory and numerical experiments* **3:16 pm** – *Madi Rosevear, Turbulent mixing in stratified tidal bottom boundary layers* **3:34 pm** – *Yohei Onuki, Simulating turbulent mixing caused by local instability of internal gravity waves* **3:52 pm** –*Miles Couchman, Scalar mixing patterns in forced simulations of stratified turbulence: the importance of extreme events*
4:10 pm – 4:35 pm	Afternoon tea break	
4:38 pm – 5:34 pm	**4A, Internal waves, MR2** **4:38 pm (virtual)** – *Magda Carr, Internal solitary wave shoaling; the effect of stratification* **4:56 pm** –*Peter Diamessis, Turbulence formation in the subsurface-recirculating core of a convectively breaking shoaling internal solitary wave of depression shoaling over gentle slopes* **5:16 pm** – *Andrew Lawrie, Waves from nowhere*	**4B, Stratified shear flows, MR3** **4:38 am** – *Lu Zhu, Numerical investigation of laminar-turbulence transition in stratified inclined ducts* **4:56 pm** – *Amir Atoufi, Stratified shear flow control by internal hydraulic effects* **5:16 pm** – *Matias Duran Matute, Explaining the regime transitions in stratified shear flows*
5:45pm – 7:15pm	Icebreaker reception and poster session (authors and titles below), central core	

Tuesday, 30 August 2022

9:10 am – 9:45 am	**Plenary lecture** Alexis Kaminski, Turbulent lengthscales in overturning and scouring stratified shear instabilities	
9:58 am – 11:10 am	**5A, Environmental flows, MR2** **9:58 am (virtual)** – *John Wells, Application of acoustic tomography to a deep stratified lake* **10:16 am (virtual)** – *Jin-Han Xie, Bolgiano-Obukhov scaling in two-dimensional isotropic convection* **10:34 am** – *Patrice Meunier, Baroclinic critical layer in the stratified boundary layer flow on an undulated tilted surface* **10:52 am** – *Peter Baines, The structure of density-stratified flow of finite depth over finite obstacles*	**5B, Fundamentals of stratified flows, MR3** **9:58 am** – *Ted Johnson, The decay of a dipolar vortex in a weakly dispersive environment* **10:16 am** – *Nicolas Mordant, Investigation of the spectral properties of stratified turbulence generated by waves in the Coriolis facility* **10:34 am** – *Chen Wang, Nonlinear dynamics of forced baroclinic critical layers* **10:52 am** – *Fabiola Trujano-Jimenez, Two-dimensional Ekman-inertial instability*
11:10 am – 11:35 am	Coffee Break	

11:38 am – 12:50 pm	**6A, Environmental flows, MR2** **11:38 am (virtual)**– *Gianluca Meneghello, Genesis and decay of mesoscale baroclinic eddies in the seasonally ice-covered interior Arctic Ocean* **11:56 am** – *John Taylor, Estimating kinetic energy dissipation rates associated with double diffusion in the ocean* **12:14 am** – *Dorel Valentin, Penetrative convection in gases* **12:32 pm** – *Jenny Dingwall, Modelling the accumulation of buoyant particles under wind-driven and convective turbulence using large-eddy simulations*	**6B, Fundamentals of stratified flows, MR3** **11:38 am** –*Anthony Bonfils, Short wave asymptotics for interfacial wind-waves* **11:56 am** – *Patrice Le Gal, And the diver becomes a swimmer* **12:14 pm** – *Oleg Kirillov, Diffusive McIntyre instability of Gaussian lenses* **12:32 pm** – *Iman Toghraei, Instability of a vortex in a stratified-rotating fluid under the complete Coriolis force*
12:50 pm – 2:10 pm	Lunch at Churchill College	
2:10pm – 2:45 pm	**Plenary lecture** Chantal Staquet, Resonant interactions among oceanic internal gravity waves	
2:58 pm – 4:10 pm	**7A, Environmental flows, MR2** **2:58 pm –** *Claudia Castro-Faccetti, Three-dimensional CFD modelling marine outfall discharges into stratified environments* **3:16 pm (virtual)** – *Edmund Tedford, Salt fingering during ice formation and ice melting* **3:34 pm (virtual)** – *Greg Lawrence, Stationary internal hydraulics jumps: Part 1* **3:52 pm (virtual)** – *Larry Armi, Stationary internal hydraulics jumps: Part 2*	**7B, Fundamentals of stratified flows, MR3** **2:58 pm** – *Nidia Reyes, Towards numerical simulation of stratified turbulent wakes at very high Reynolds numbers* **3:16 pm** – *Victor Shrira, Collapses in weakly stratified no-stress boundary layers* **3:34 pm** – *Vincent Labarre, Analysis of poloidal stratified turbulence* **3:52 pm** – *Nicolas Perez, Unidirectional Lamb and buoyant waves induced by nontraditional Coriolis force in stratified fluids*
4:10 pm – 4:35 pm	Afternoon tea break	
4:38 pm – 5:52 pm	**8A, Internal waves, MR2** **4:38 pm (virtual)** – *James Rottman, Tsunami-generated internal gravity waves propagating into the thermosphere* **4:56 pm (virtual)** – *Devin Conroy, Phase resolved LES simulations of the oceanic and atmospheric boundary layer* **5:16 pm** – *Sam Hartharn-Evans, The interaction of internal solitary waves and sea ice in the laboratory*	**8B, Stratified shear flows, MR3** **4:38 pm** – *Tom Eaves, Identification of stratified shear flow instabilities: an estuarine example* **4:56 pm** – *William Smyth, The butterfly effect and the transition to turbulence in a stratified shear layer* **5:16 pm** – *Chih-Lun Liu, Effects of boundary proximity on Kelvin-Helmholtz instability and turbulence*

Wednesday, 31 August 2022

9:10 am – 9:45 am	**Plenary lecture** Thomas Peacock, The fluid mechanics of deep seabed mining	
9:58 am – 11:10 am	**9A, Urban flows, MR2** **9:58 am (virtual)** – *Craig McConnochie, The transient interaction of gravity currents with obstacle arrays* **10:16 am** – *Sam Charlwood, The influence of buoyancy upon pollutant dispersion behind a backwards facing step* **10:34 am** – *Henry Burridge, Unbalanced exchange flows through doorways and the likeness of rooms to marginal seas* **10:52 am** – *Megan Davies Wykes, The effect of an indoor-outdoor temperature difference on transient cross-ventilation*	**9B, Internal waves, MR3** **9:58 am** – *Bruno Voisin, Added mass, density stratification and buoyancy oscillations* **10:16 am** – *Stephane Le Dizes, Internal wave singularities* **10:34 am** – *Saranraj Gururaj, Internal wave topography interactions in the presence of a steady surface current* **10:52 am** – *Divyanshu Gola, Effect of nonlinear stratification on wake turbulence and wake generated internal waves*
11:10 am – 11:35 am	Coffee Break	
11:38 am – 12:50 pm	**10A, Turbulence and internal waves, MR2** **11:38 am (virtual)** – *Keisuke Nakayama, Numerical analysis of breathers* **11:56 am (virtual)** – *John Shi, Turbulent structures generated by the grids in a stably-stratified two-layer fluid in the early period* **12:14 pm** *Aniban Guha, Internal wave triads in a vertically bounded domain with mild-slope bathymetry* **12:32 pm** – *Colm-cille Caulfield, Internal waves and hairpin vortices in stratified channel flow*	**10B, Urban flows, MR3** **11:38 am** – *Joshua Finneran, The effect of outlet height in displacement ventilated rooms* **11:56 am** – *Gael Kemp, Fluid mechanics of sash windows* **12:14 pm** – *Ular Palmiste, Modelling of odour dispersion from multiple point sources* **12:32 pm** – *Costanza Rodda, The creation and destruction of thermal stratification in an instrumented computer laboratory*
12:50 pm – 2:10 pm	Lunch at Churchill College	
2:10pm – 2:45 pm	**Plenary lecture** Catherine Noakes, The complexity of modelling airborne infection risks in indoor spaces	
2:58 pm – 4:10 pm	**11A, Stratified flows, MR2** **2:58 pm (virtual)** – *Dania Sheaib, On the dynamics and resonance of a stratified fluid in a vertical channel* **3:16 pm (virtual)** – *Prasoon Suchandra, Dynamics of multilayer Rayleigh-Taylor mixing at moderately high Atwood numbers: an experimental study using simultaneous PIV-PLIF* **3:34 pm** – *Stuart Dalziel, Rayleigh-Taylor instability between unequally stratified layers*	**11B, Internal waves, MR3** **2:58 pm** – *Katherine Grayson, The long term evolution of triadic resonance instability in finite-width internal gravity wave beams* **3:16 pm** – *Dheeraj Varma, Weak nonuniformity in stratification triggers new triadic resonances in internal wave modes* **3:34 pm** – *Samuel Boury, (Un)Confined cylindrical waves and triadic resonant instability*

	3:52 pm – *Raphael Ouillon, Advancing numerical simulations of deep-sea mining sediment plumes*	**3:52 pm** – *Jan Bert Flor, Focusing of internal waves generated by an oscillating torus*
4:10 pm – 4:35 pm	Afternoon tea break	
4:38 pm – 5:34 pm	**12A, Geophysical flows, MR2** **4:38 pm (virtual)** – *Justin Pringle, The dynamics of ocean microstructure: a South African case study* **4:56 pm** – *Kristen Davis, Large amplitude internal wave transformation between 500m and the surfzone* **5:16 pm** – *Geno Pawlak, Diurnal thermally-driven coastal exchange*	**12B, Stratified flows, MR3** **4:38 pm** – *Graham Hughes, Mixing efficiency of a gravity current on a slope* **4:56 pm** – *Thea Josephine Ellevold, Bottom boundary instability driven by internal solitary waves at a flat bottom* **5:16 pm** – *Jason Yalim, Complex instability in parametrically resonated stratified flows*

Thursday, 1 September 2022

9:10 am – 9:45 am	**Plenary lecture** Sutanu Sarkar, Stratified topographic wakes		
9:58 am – 11:10 am	**13A, Flow/structure interactions, MR2** **9:58 am (virtual)** – *Gao Gang, Numerical investigation on free surface signatures of a sphere in linearly stratified fluid* **10:16 am (virtual)** – *Fenglai Huang, Vortex shedding of a hydrofoil in the stratified flow* **10:34 am (virtual)** – *Panagiotis Prinos, Vegetation effects on natural convection induced by diurnal heating and cooling in sloping waterbodies* **10:52 am (virtual)** – *Janek Laanearu, Hydraulic study of stratified flows in varying sill geometries*	**13B, Stratified flows, MR3** **9:58 am** – *Joris Labarbe, Spatially localized turbulent layers in stratified Poiseuille flow* **10:16 am** – *Daniel Lecoanet, The flux of internal waves generated by turbulent convection* **10:34 am** – *Philippe Odier, Experimental study on superharmonic wave generation by resonant interaction between internal wave modes* **10:52 am** – *Kelsey Everard, Differential cooling and the timing of ice-on*	**13C, Geophysical flows, MR4** **9:58 am** – *Lois Baker, Upwelling of abyssal waters by boundary turbulence* **10:16 am** – *Han Wang, A deep learning approach to extract surface internal tidal signals scattered by geostrophic turbulence* **10:34 am (virtual)** – *Bahman Ghasemi, Influence of wind and buoyancy on upper ocean stratification in the north Atlantic Ocean* **10:52 am** – *Kelly Boden-Hawes, Identifying regions of thermal refugia within a tidally driven coral atoll*
11:10 am – 11:35 am	Coffee Break		
11:38 am – 12:50 pm	**14A, Ice, MR2** **11:56 am** – *Cat Vreugdenhil, The ocean boundary layer beneath a melting ice shelf: insights from large-eddy*	**14B, Oscillating flows and internal waves, MR3** **11:38 am** – *Sam Lewin, Stratified turbulent mixing in oscillating shear flows*	**14C, Jets, plumes, gravity currents, MR4** **11:38 am** – *Maarten Van Reeuwijk, Dissecting turbulent plumes in a crossflow*

	simulations with a near-wall model **12:14 pm** – *Eric Skyllingstad, Terminus slope effects on subglacial discharge plumes* **12:32 pm (virtual)** – *Ankit Bhadouriya, Dynamics of winter mixed layer under sea-ice*	**11:56 am** – *Vavara Zemskova, Energetics of internal tides at the coast: energy conversion from barotropic to baroclinic tides in the presence of supercritical shelf topography* **12:14 pm** – *Chris Whitwell, Observations of mixing in a diverse internal wave climate*	**11:56 am** – *Joel Sommeria, Free horizontal turbulent jet confined by a linear background stratification* **12:14 pm** – *Morris Flynn, Plume merger from area sources*
12:50 pm	Lunch at Churchill College		

Poster session, Monday 29 August, 5:45pm

Peter Baines	*Massed strandings of whales and dolphins – effects of wind, waves, and tides*
Stef Bardoel	*Interaction of a gravity current with coastal topography; its implications in mixing fog formation*
Tilemachos Bolioudakis	*Lagrangian transport by convectively breaking shoaling internal solitary waves with recirculating turbulent cores*
Arman Khoubani	*Mechanisms of oscillatory instability of sidewall convection in a rectangular cavity*
Griffin Modjeski	*Mountain wave observations during Sundowner Winds Experiment (SWEx*)
Ryan Newman	*Geostrophic adjustment within a rotating, stratified fluid*
Charles Powell	*Penetration of convective plumes into a strongly stratified region*
Daniel Robb	*Seiching, upwelling and particle settling in a stratified reservoir*
Madi Rosevear	*Regimes and transitions in the basal melting of Antarctic ice shelves*
Armand Vic	*Vortices in a 2-layer surface quasi-geostrophic model: some analytical and numerical results*
Bruno Welfert	*Stably-stratified square cavity subjected to small amplitude horizontal oscillations*
Leyu Yao	*Identifying ocean submesoscale activity from vertical density profiles using machine learning*
Adam Yang	*Holmboe instabilities in an arrested salt wedge*

Guilia Zerbini	*Towards a basin-scale map of submesoscale instabilities*
Kai Zhao	*Ebullition through the interface between a non-Newtonian and Newtonian fluid*