

23RD INTERNATIONAL COUETTE-TAYLOR WORKSHOP

ICTW 2025

PROGRAMME

DURHAM, 14 TO 16 JULY 2025

ORGANISED BY

Hossein Amini-Kafiabad ([Durham](#)) **Celine Guervilly** ([Newcastle](#))

Andrew Baggaley ([Newcastle](#)) **Oleg Kirillov** ([Chair](#), [Northumbria](#))

Laura Currie ([Durham](#)) **Daniel Ratliff** ([Northumbria](#))

Otti Croze ([Newcastle](#)) **Ciro Sempredon** ([Northumbria](#))



UNIVERSITIES FOR
**NORTH EAST
ENGLAND**



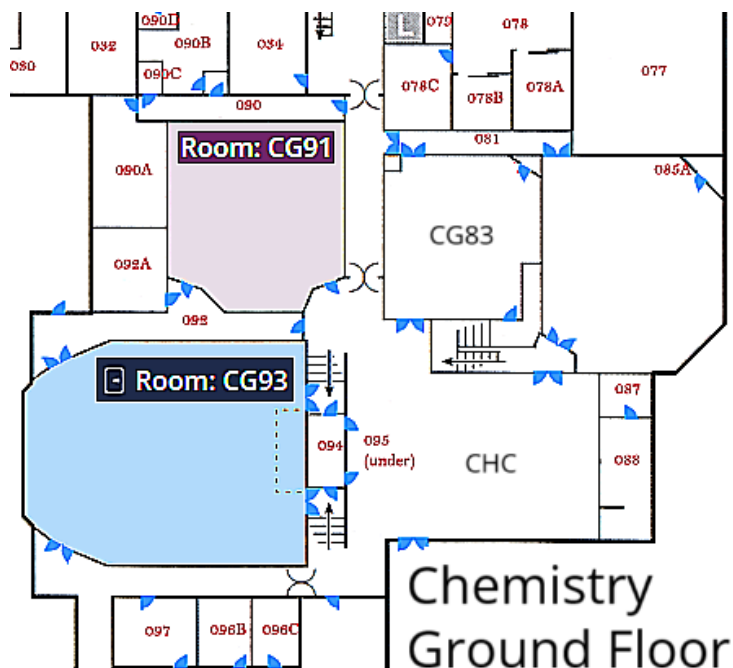
[Website](#)



**Northumbria
University**
NEWCASTLE



**Newcastle
University**



ICTW 2025

Welcome to the 23rd International Couette-Taylor Workshop (ICTW 2025), to be held at Durham University from 08:30 on Monday, 14 July 2025, to 18:00 on Wednesday, 16 July 2025!

The conference programme will include invited talks (30 minutes' presentation + 5 minutes' Q&A), regular oral presentations (15 minutes' presentation + 5 minutes' Q&A), lightning talks (3 minutes each), and a poster session. The venue for the conference is the Chemistry Building on the Lower Mountjoy campus of Durham University. The registration desk will be located in the Atrium (ATR) of the Chemistry Building. The main lecture theatre for the conference is the [Scarborough Lecture Theatre \(CG93\)](#) on the ground floor, where all official ceremonies, invited talks, and lightning talks will take place. Regular oral presentations will run in two parallel sessions: one in CG93, and the other in the neighbouring [Arthur Holmes Lecture Theatre \(CG91\)](#). A flat seminar room, CG83, can be used for practising talks and informal meetings by the participants on 14-15 July.

The poster session, along with coffee breaks and lunches, will be held in the Chemistry Café (CHC) and the Atrium (ATR) of the Chemistry Building.

SCIENTIFIC COMMITTEE

Meheboob Alam
Sebastian Altmeyer
Stavroula Balabani
Kengo Deguchi
Yohann Duguët
Christoph Egbers
Björn Hof
Hantao Ji

Rich Kerswell
Oleg Kirillov
Edgar Knobloch
Patrice Le Gal
Detlef Lohse
John Lopez
Rich Lueptow
Elena Marensi

Alexander Morozov
Innocent Mutabazi
Caroline Nore
Tobias Schneider
Eric Serre, Chao Sun
Steven Tobias
Laurette Tuckerman
Ashley Willis

CG93

8:30	REGISTRATION
9:10	WELCOME REMARKS Conference Chair O. N. Kirillov
	PLENARY SESSION 1 D. Lohse
9:30	O. Shishkina , Z. Yao, M. S. Emran, and A. Teimurazov <i>Centrifugal Convection</i>
10:05	N. Mordant , M. Magnier, T. Valran, S. Viboud, P. Augier, and J. Sommeria
10:40	<i>Stratified Turbulence Forced by Large Scale Waves</i>

CHC

10:40	COFFEE (& GROUP PHOTO IN CG93)
-------	--------------------------------

CG93

	CONVECTION 1 S. Tobias
11:10	C. Beaume , J. Tumelty, A. Rucklidge, A. Bergeon, and E. Knobloch, <i>Near Onset Dynamics in Natural Doubly Diffusive Convection</i>
11:30	G. Vacca , R. Yang, C. Howland, R. Verzicco, and D. Lohse, <i>AMOC in a Box: Heat and Salinity Transport in Horizontal Double-Diffusive Convection</i>
11:50	R. Hinz , C. Guervilly, and P. Bushby, <i>Simulating Large-Scale Vortices in Low Prandtl, Rapidly Rotating Convections</i>
12:10	A. Alonso , I. Mercader, O. Batiste, and A. Meseguer, <i>Instabilities and</i>
12:30	<i>Pattern Selection in Inclined Binary Convection</i>

CHC

12:30	LUNCH
-------	-------

CG93

	PLENARY SESSION 2 M. Oberlack
13:30	B. Favier , L. Terrien, and E. Knobloch, <i>Wall Modes in Rotating Rayleigh-Bénard Convection: Robustness and Breakdown</i>
14:05	D. Lohse , L. Blaauw, and S. G. Huisman, <i>Transition to Ultimate Taylor-Couette Turbulence</i>
14:25	

CG91

8:30

9:10

NO MORNING SESSION

Plenary Session in CG93

9:30

10:05

10:40

CHC

10:40 COFFEE (& GROUP PHOTO IN CG93)

CG91

SHEAR FLOWS 1

P. Le Gal

11:10 **J. Curbelo**, M. Reborido, A. Alonso, and A. Meseguer, *Exploring Bifurcation Structures in the Regularized Four-Sided Lid-Driven Cavity Flow*

11:30 **N. Taniguchi** and Y. Fukumoto
A Novel Instability of Gravity-Driven Compressible Plane-Poiseuille Flow Field

11:50 **A. Meseguer**, A. Alonso, O. Batiste, and F. Mellibovsky
Sensitivity of Bifurcation Scenarios of Time-Periodic Flows in a Cavity

12:10 **Y. Duguet**, A. Gesla, L. M. Witkowski, and P. Le Quéré

12:30 *Axisymmetric Rolls in Rotor-Stator Flow*

CHC

12:30 LUNCH

CG91

NO AFTERNOON SESSION

Plenary Session in CG93

13:30

14:05

14:25

CG93

14:25 LIGHTNING TALKS

J. Park

(See the full list of talks on p. 16)

14:55 POSTER SESSION (ATR)**15:30** (See the full list of posters on p. 16)

CHC

15:30 COFFEE

CG93

CONVECTION 2

H. Amini-Kafiabad

16:00 **J. S. Oishi**, G. M. Vasil, K. J. Burns, D. Lecoanet, B. P. Brown, and K. Julien
*Rapidly Rotating Wall-Mode Convection***16:20** **X. Zhu**, *Multiple States and Aspect Ratios of Rolls: An Analogy Between Taylor-Couette and Rayleigh-Bénard Flows***16:40** **A. Bhadra**, J. Wicht, and X. Zhu, *Angular Momentum Transport in Quasi-Keplerian Flow with Radial Convection***17:00** **L. Bessila** and S. Mathis, *Stochastic Excitation of Acoustic Waves by Turbulent Convection: Influence of Rotation and Magnetic Fields*
17:20

HAT

18:00 **Hatfield College, The Little Burt Room** – Evening Reception for all participants and guests**19:00** **Hatfield College, Main Dining Hall** – Served Dinner for all participants and guests
21:00

CG91

14:25

14:55 NO AFTERNOON SESSION

15:30 Poster Session in ATR

CHC

15:30 COFFEE

CG91

SHEAR FLOWS 2

Y. Duguet

16:00 **J. E. Wesfreid**, T. Liu, M. Etchevest, B. Semin, P. Dimitruk, and R. Godoy-Diana, *Self-Sustained Process in Couette-Poiseuille Flow*

16:20 **S. A. Altmeyer**
Forced Flow Reversal in Ferrofluidic Couette Flow

16:40 **E. Marensi**, S. Chu, and A.P. Willis
Optimal Body Force for Heat Transfer in Turbulent Vertical Heated Pipe Flow

17:00 **J. Sandoval** and T. Eaves, *Transition to Turbulence in the Stokes Boundary Layer: Edge States and the Periodic Self-Sustaining Process*

17:20

HAT

18:00 **Hatfield College, The Little Burt Room** – Evening Reception for all participants and guests

19:00 **Hatfield College, Main Dining Hall** – Servery Dinner for all participants and guests

21:00

CG93

	PLENARY SESSION 3 D. Ionescu-Kruse
9:00	S. Merbold , M. H. Hamede, C. Egbers <i>Flow Regimes in Turbulent Co- and Counter-Rotating Taylor–Couette Flows of Very Wide Gaps</i>
9:35	D. Lemasquerier , C. David, R. Monville, J. Aurnou, <i>Turbulent Zonal Jets Interacting With Local Topography: An Experimental Study</i>
10:10	O. Bühler , M. Shavit
10:45	<i>Theory and Simulation of Internal Wave Spectra in the Ocean</i>

CHC

10:45	COFFEE
--------------	---------------

CG93

	WAVES AND COHERENT STRUCTURES 1 A. Guseva
11:15	P. Le Gal , S. Gsell <i>Macroscopic Pilot-Wave Dynamics in Density-Stratified Fluids</i>
11:35	C. Rodda , C. Savaro, V. Bouillaut, P. Augier, J. Sommeria, T. Valran, S. Viboud, N. Mordant, <i>From Internal Waves to Turbulence in a Stably Stratified Fluid</i>
11:55	N. Kr Prasad , A. Doak, R. Barros, P. A. Milewski, M. Carr, <i>Experimental and Numerical Investigation of Multi-Humped Mode-2 Internal Solitary Waves</i>
12:15	S. S. Sampatirao , M. Allshouse, H. Vemulapalli, M. Mathur,
12:35	<i>Simultaneous Generation and Scattering of Internal Waves by Bottom Topography</i>

CHC

12:35	LUNCH
--------------	--------------

CG91

NO MORNING SESSION

Plenary Session in CG93

9:00

9:35

10:10

10:45

CHC

10:45 COFFEE

CG91

CONVECTION 3

C. Egbers

11:15 **P. S. B. Szabo**, Y. Gaillard, C. Egbers*Dielectrophoretic-Driven Convection in the Spherical Shell*11:35 **V. Travnikov**, C. Egbers*Influence of the Centrifugal Force on Convective Flow in a Central Force Field*11:55 **Y. Gaillard**, P. S. B. Szabo, C. Egbers*Dielectrophoretic-Driven Convection in Spherical Taylor-Couette Flow*12:15 **U. Harlander**, A. M. Mancho, G. Meletti, *Meridional Heat Flux Derived from the Eady Model and a Rotating Annulus Experiment: A Comparison*

12:35

CHC

12:35 LUNCH

CG93

WAVES AND COHERENT STRUCTURES 2

S. Huisman

13:35 J. Vanneste, H. A. Kafiabad, M. R. Cox
Scattering of Internal Waves by Turbulence

13:55 H. Kafiabad, J. Vanneste, W. R. Young
Interaction of Inertial Waves with Vortices in Rotating Stratified Flows

14:15 C. Maitland-Davies, H. Kafiabad
Particle Tracking and Tracer Evolution Using Lagrangian Means

14:35 A. Minz, H. Amini-Kafiabad, L. E. Baker, J. Vanneste
14:55 *On-the-fly Lagrangian Averaging*

CHC

14:55 COFFEE

CG93

INSTABILITIES 1

J. E. Wesfreid

15:25 D. Ionescu-Kruse
Exact Solutions and Instability for Geophysical Waves at Arbitrary Latitude

15:45 O. Kirillov, I. Mutabazi
Local Monotonic and Oscillatory Instabilities in Differentially Heated Visco-Diffusive Swirling Flows

16:05 K. Deguchi, M. Dong
Instability in Centrifugally Stable Shear Flows

16:25 Y. Fukumoto, R. Zou, K. Matsuura, N. Taniguchi, *Influence of Surface Tension and Gravity Force on Compressible Kelvin-Helmholtz Instability*
16:45

DUC

19:00 Great Hall of the Durham Castle – 3 Course Banquet Dinner

CG91

CONVECTION 4

I. Mutabazi

- 13:35** **A. Meyer**, A. Hiremath, A. Prigent, I. Mutabazi, *Experimental Investigation of the Thermoconvective Instability in a Cylindrical Annulus for a High Prandtl Number Fluid*
- 13:55** **M. H. Hamede**, J. Roller, A. Meyer, V. Heuveline, Ch. Egbers, *Dielectrophoretic Force Induced Convection Within a Cylindrical Annulus in Various Configurations*
- 14:15** **Y. Sliavin**, M. H. Hamede, V. Motuz, A. Meyer, Ch. Egbers, *Enhancement of Heat Transfer due to the Thermoelectrohydrodynamic (TEHD) Force in a Cylindrical Annulus under μg Conditions.*
- 14:35** **J. Roller**, M. H. Hamede, A. Meyer, Ch. Egbers, V. Heuveline, *Data-Driven Numerical Investigation of Dielectrophoretic Force-Enhanced Annular Flows*
- 14:55**

CHC

14:55 COFFEE

CG91

COUETTE-TAYLOR FLOWS

S. Altmeyer

- 15:25** **M. Nagata**
Spiral Vortex Flows of the Taylor-Couette System in the Narrow-Gap Limit
- 15:45** **A. P. Willis**, M.J. Burin, *Axially-Aligned Vortices in Unsteady Taylor-Couette Flow*
- 16:05** **J. P. Ananthu**, M. Sharma, A. Sameen, V. Narayanan
Bifurcations in Spherical Couette Flow
- 16:25** **A. Viallefont**, G. Lemoult, A. Prigent, *Experimental Study of the Linear Instability of the Featureless Turbulent Flow*
- 16:45**

DUC

19:00 Great Hall of the Durham Castle – 3 Course Banquet Dinner

CG93

	PLENARY SESSION 4 K. Deguchi
9:00	M. Alam , M. Ghosh <i>Suspension Rheology and Routes to Turbulence in Taylor-Couette Flow</i>
9:35	S. Eckert , T. Vogt, F. Schindler, N. Kim, S. Su, M. Sieger, T. Wondrak <i>Recent Activities in Experimental Research on Liquid Metal Rayleigh-Bénard Convection at HZDR</i>
10:10 10:45	F. Marcotte , P. Mannix, Y. Ponty, C. Skene, S. Tobias, <i>Blind Identification of Subcritical Dynamo Equilibria</i>

CHC

10:45	COFFEE
--------------	---------------

CG93

	COMPLEX AND MULTIPHASE FLOWS 1 R. Lueptow
11:15	T. Lacassagne , C. Carré, M. Moazzen, S. A. Bahrani, <i>Taylor-Couette Flow of Complex Suspensions: Particle-Polymer Interactions, Instability and Mixing</i>
11:35	I. Mutabazi , Y. Bai, F. Kelai, O. Crumeyrolle, N. Latrache, <i>Instability Modes in Viscoelastic Taylor-Couette Flow with Boger Fluids: Linear Stability Theory and Experiments</i>
11:55	A. Takano , Y. Tasaka, Y. Murai, <i>Effective Eddy Viscosity Profiles in Viscoelastic Taylor-Couette Flow</i>
12:15	S. Balabani , T. Boulafentis, T. Lacassagne, N. Cagney, <i>Emergence of Intermittency and Hibernation in Elastoinertia TC Flows</i>
12:35 12:55	M. Davoodi , A. Clarke, <i>Role of Elasticity and Inertia in Particle Migration: A Theoretical and Experimental Study in Complex Taylor Vortices</i>

CG91

9:00 9:35 10:10 10:45	NO MORNING SESSION Plenary Session in CG93
---	--

CHC

10:45	COFFEE
---------------------	----------------------

CG91

11:15 11:35 11:55 12:15 12:35 12:55	MHD FLOWS J. Oishi <u>Y. Wang</u>, F. Ebrahimi, H. Lu, J. Goodman, E. Gilson, H. Ji <i>Observation of Nonaxisymmetric Standard Magnetorotational Instability Induced by a Free-Shear Layer</i> <u>A. Guseva</u>, L. Manchon, L. Petitdemange, C. Pinçon, <i>Magnetic Fields in Protostars: Generation Mechanisms and Stability</i> <u>S. D. Griffiths</u>, S. P. Myers, S. M. Tobias <i>A Shear-Flow Instability Induced by a Localised Field in Ideal MHD</i> <u>A. T. Clarke</u>, C. J. Davies, S. Naskar, S. J. Mason <i>Accessing the Dipole-Multipole Transition in Rapidly Rotating Spherical Shell Dynamos</i> <u>H. Kobayashi</u>, T. Hasebe, K. Namba, T. Fujino, H. Takana <i>Emergence of Triplet Streaks Near the Inner Wall in MHD Turbulent Taylor-Couette Flow with End Walls</i>
---	--

CG93

CHC

12:55 LUNCH

CG93

	COMPLEX AND MULTIPHASE FLOWS 2 T. Lacassagne
13:55	P. Bera , and A. Aleria, <i>Finite Amplitude Analysis of Poiseuille Flow in Fluid Overlying Porous Domain</i>
14:15	C. Kang , I. Mutabazi, A. Meyer, <i>Numerical Study of Thermomagnetic Convection in a Ferrofluid Inside a Differentially Heated Taylor-Couette System</i>
14:35	S. Hartharn-Evans , C. Lloyd, M. Carr, A. Jenkins, <i>Insights Into the Shear Dynamics of the Ice Shelf Ocean Interface From Laboratory-Scale Simulations</i>
14:55	S. G. Huisman , S. T. Bootsma, D. Xu, D. Lohse, <i>Melting of a Vertical</i>
15:15	<i>Cylinder Including Salinity</i>

CG93

15:15 CLOSING CEREMONY

CHC

15:30 COFFEE

ATR

16:00 FREE DISCUSSION

CG91

CHC

12:55 LUNCH

CG91

INSTABILITIES 2

P. Bera, G. Sharma

13:55 **R. M. Lueptow**, U. D'Ortona, N. Thomas, *Rayleigh-Taylor Instability Drives Axial Band Formation in Granular Flow***14:15** **K. V. Wilhelm**, J. Conrad, S. Görtz, M. Oberlack, Y. Wang, *Oblique Modes & Spatio-Temporal Linear Stability of Plane Couette Flow***14:35** **J. Labarbe**, *Stability of a Material Interface in a Two-Phase System with a Free Surface***14:55** **J. Park**, A. Kumar, J. Gianfrani, *Non-Linear Instabilities in Stratified Taylor-Couette Flow*
15:15

CG91

15:15 NO AFTERNOON SESSION
Closing Ceremony in CG93

CHC

15:30 COFFEE

ATR

16:00 FREE DISCUSSION

A

Meheboob Alam, JNCASR, Bangalore, India
Arantxa Alonso, Universitat Politècnica de Catalunya, Spain
Sebastian Altmeyer, Universitat Politècnica de Catalunya, Spain
Hossein Amini-Kafiabad, Durham University, UK

B

Stavroula Balabani, University College London, UK
Ellen Bartle, University of Leeds, UK
Cedric Beaume, University of Leeds, UK
Premananda Bera, IIT Roorkee, India
Leila Bessila, CEA Paris-Saclay, France
Abhiroop Bhadra, MPI-SSR, Goettingen, Germany
Katharina Biesold, BTU Cottbus, Germany
Oliver Bühler, New York University, USA

C

Alexander Chefranov, Eastern Mediterranean University, Cyprus
Andrew Clarke, University of Leeds, UK
Jezabel Curbelo, Universitat Politècnica de Catalunya, Spain
Laura Currie, Durham University, UK

D

Abhiram D S, IIT Madras, India
Mahdi Davoodi, Schlumberger Cambridge Research, UK
Kengo Deguchi, Monash University, Australia
Yohann Duguet, LISN-CNRS, France

E

Tom Eaves, University of Dundee, UK
Sven Eckert, HZDR, Dresden, Germany
Christoph Egbers, BTU Cottbus, Germany

F

Benjamin Favier, IRPHE, Aix-Marseille University, France
Yasuhide Fukumoto, Kyushu University, Japan

G

Yann Gaillard, BTU Cottbus, Germany
Stephen Griffiths, University of Leeds, UK
Celine Guervilly, Newcastle University, UK
Anna Guseva, Paris Observatory, France

H

Uwe Harlander, BTU Cottbus, Germany
Sam Hartharn-Evans, Northumbria University, UK
Rose Hinz, Newcastle University, UK
Sander Huisman, University of Twente, Netherlands
Mohammed Hussein Hamede, BTU Cottbus, Germany

I

Delia Ionescu-Kruse, Romanian Academy, Romania
Muhammad Ishaq, Coventry University, UK

J

Oliver Jackson, University of Leeds, UK
Ananthu J P, IIT Gandhinagar, India

K

Changwoo Kang, Jeonbuk National University, Korea
Gregory King, Independent Scholar, UK
Oleg Kirillov, Northumbria University, UK
Hiromichi Kobayashi, Keio University, Japan
Niraj Kr Prasad, Newcastle University, UK
Olga Krivonosova, Moscow State University, Russia

L

Joris Labarbe, Université Côte d'Azur, France

Tom Lacassagne, IMT Nord Europe, France

Patrice Le Gal, Aix-Marseille University, IRPHE, France

Daphné Lemasquerier, Univ. of St Andrews, UK

Detlef Lohse, University of Twente, Netherlands

Rich Lueptow, Northwestern University, USA

M

Cai Maitland-Davies, Durham University, UK

Florence Marcotte, INRIA NICE, France

Elena Marensi, The University of Sheffield, UK

Carlos Martínez, Universitat Politècnica de Catalunya, Spain

Yuki Matsukawa, Tokyo University of Science, Japan

Sebastian Merbold, DLR, Cottbus, Germany

Alvaro Meseguer, Universitat Politècnica de Catalunya, Spain

Antoine Meyer, Université Le Havre Normandie, France

Abhijeet Minz, University of Edinburgh, UK

Rafael Mora, Red Bull Technology, UK

Nicolas Mordant, Université Grenoble-Alpes, France

Innocent Mutabazi, Université Le Havre Normandie, France

N

Masato Nagata, Kyoto University, Japan

O

Martin Oberlack, TU Darmstadt, Germany

Jeffrey Oishi, University of New Hampshire, USA

P

Junho Park, Coventry University, UK

R

Daniel Ratliff, Northumbria University, UK

Costanza Rodda, Imperial College London, UK

Jonas Roller, Heidelberg University, Germany

S

Sai Saandeep Sampatirao, IIT Madras, India

Jorge Sandoval, Univ. of Dundee/Edinburgh, UK

Ajay Sharma, IIT Roorkee, India

Gaurav Sharma, IIT Roorkee, India

Olga Shishkina, MPI-DS, Goettingen, Germany

Yaraslau Sliavin, BTU Cottbus, Germany

Peter Szabo, BTU Cottbus, Germany

T

Akihide Takano, Hokkaido University, Japan

Nobutaka Taniguchi, Tohoku University, Japan

Steven Tobias, University of Edinburgh, UK

Vadim Travnikov, BTU Cottbus, German

V

Giuseppe Vacca, University of Twente, Netherlands

Jacques Vanneste, University of Edinburgh, UK

Arthur Viallefont, Université Le Havre Normandie, France

Hai Duc Vu, Monash University, Australia

W

Yin Wang, PPPL, Princeton, USA

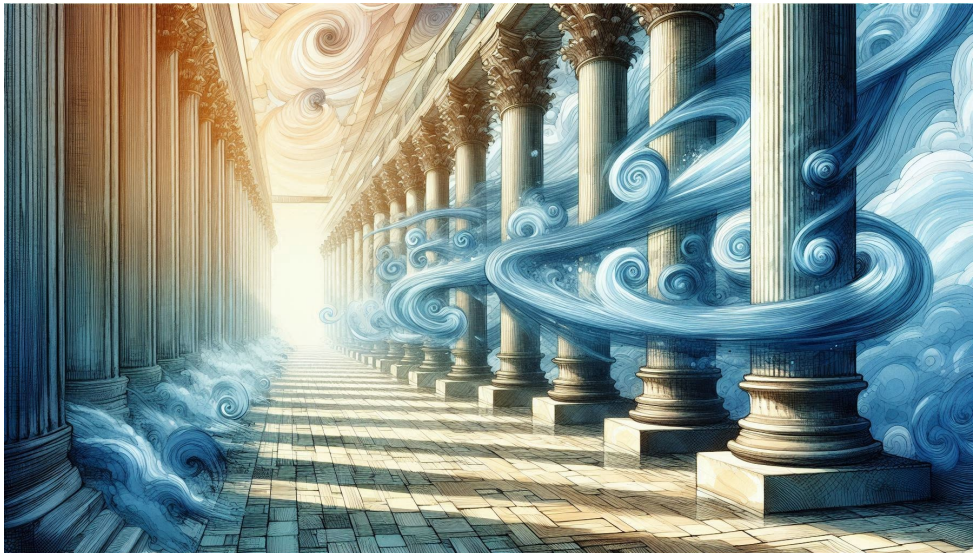
Kilian Vinzenz Wilhelm, TU Darmstadt, Germany

José Eduardo Wesfreid, ESPCI Paris, France

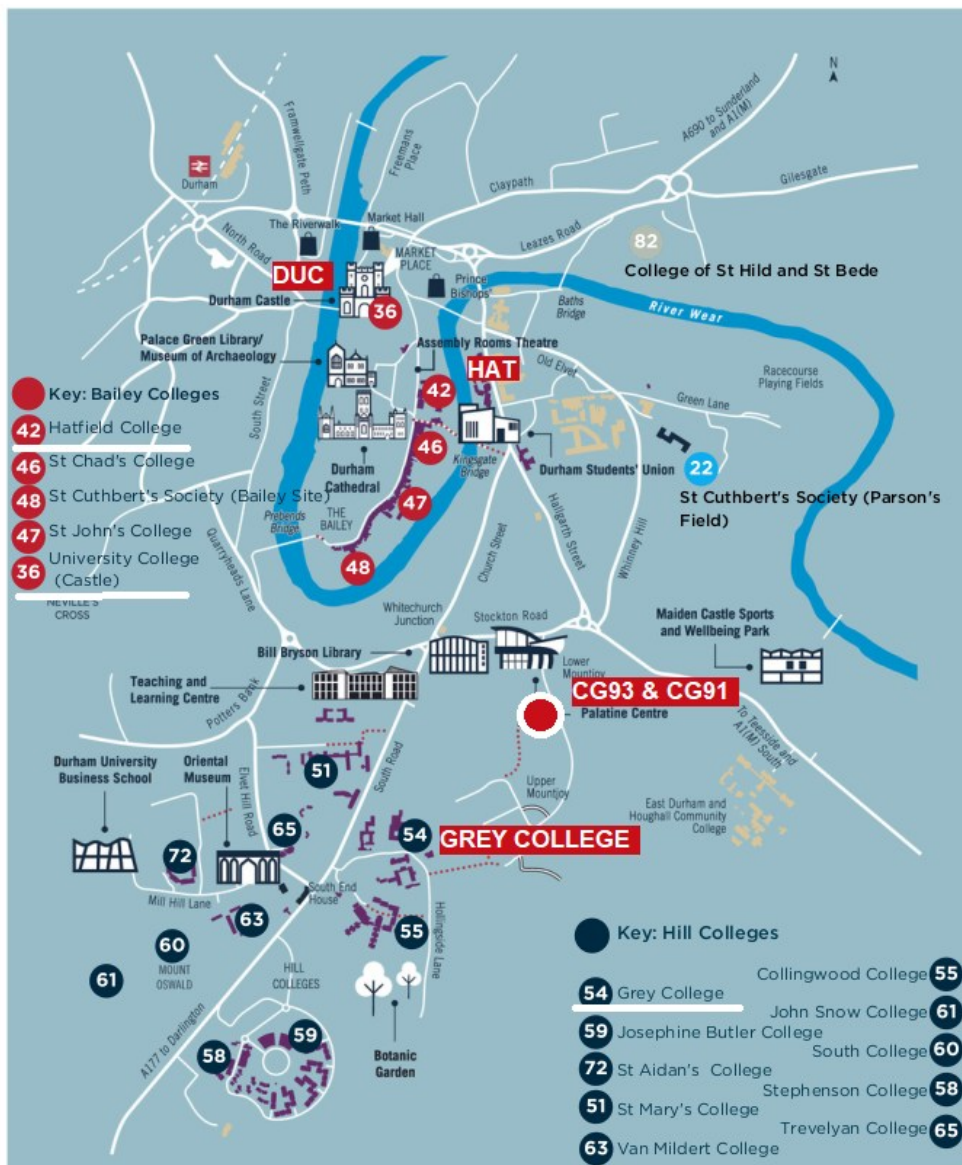
Ashley Willis, The University of Sheffield, UK

Z

Xiaojuan Zhu, MPI-SSR, Goettingen, Germany



1. **E. Bartle**, C. Beaume, N. Kapur, G. de Boer, *Spin-up and Spin-Down Flow Instabilities in Cylinders*
2. **A. Chefranov**, S. Chefranov, *Revision of the Linear Stability Paradox for Known Bounded Shear Flows*
3. **A. D S**, M. Mathur, Y. Onuki, *Small-Scale Instabilities in Inertia-Gravity Waves*
4. **M. Ishaq**, J. Priede, *Supercritical Nature of Helical Magnetorotational Instability in Taylor–Couette Flow*
5. **G. P. King**, B. Galperin, A. K. Nickerson, J. A. Zhang, *A Theory to Explain Tropical Cyclone Kinetic Energy Spectra*
6. **O. Krivonosova**, M. Gritsevich, D. Zhilenko, *Mean Flow Generation in Rotating Spherical Layers Under Colored Noise*
7. **A. Sharma**, P. Bera and G. Sharma, *Hagen-Poiseuille Flow in the Pipe Layered by Porous Medium is Linearly Unstable*
8. **G. Sharma**, N. Jain, M. Baingne, D. S. Tomar, *Role of Interfacial Surfactant and Wall Deformability on Linear Stability of Film Flows*
9. **H. D. Vu**, A. Slim, *The Fluid Dynamics of Intrusions*



DURHAM MAP

HAT—Hatfield College, Evening Reception & Served Dinner, 18:00, July 14

DUC—Durham Castle, Banquet Dinner, 19:00, July 15

CG93, CG91—Conference Venue, July 14-16



Website

W: <https://maths.dur.ac.uk/ICTW2025>

E: ictw-2025@durham.ac.uk

X: @ictw2025