



POLITECNICO
DI TORINO



UNIVERSITÀ
DEGLI STUDI
DI TORINO

17th European Turbulence Conference

TORINO • Italy

September 3-6, 2019

Scientific Programme

ETC17 • Scientific Programme		
Tuesday • September 3rd, 2019		
15:30	Opening ceremony	
16:00 17:30	AULA MAGNA	<p>16:00 - Invited speaker • Instabilities and high-resolution simulations of particle-laden flows. <i>Eckart Meiburg</i></p> <p>16:45 - Invited speaker • Enhanced mixing and entrainment in turbulent plumes and gravity currents. <i>Claudia Cenedese</i></p>
18:00	Welcome cocktail reception (<i>Campus Cittadella, Corte Interrata</i>)	

8:30 10:00		8:30 - Invited speaker • The subcritical route to turbulence. <i>Dwight Barkley</i> 9:15 - Invited speaker • Toward internal gravity wave turbulence: an experimental approach. <i>Sylvain Joubaud</i>															
10:00		COFFEE BREAK															
ROOM 1		ROOM 3		ROOM 5		ROOM 7		ROOM 9		ROOM 2		ROOM 8		ROOM 10		ROOM 4	
MULTIPHASE FLOWS Session 1 - Chair: Luca Brandt		INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS Session 1 - Chair: Yohann Duguet		WALL BOUNDED TURBULENCE Session 1 - Chair: Ugo Piomelli		TURBULENT CONVECTION Session 1 - Chair: Detlef Lohse		INTERMITTENCY AND SCALING Session 1 - Chair: Bérengère Dubrulle		ROTATING FLOWS Session 1 - Chair: Rudie P. J. Kunnen		NUMERICAL METHODS AND DATA ANALYSIS Session 1 - Chair: Antonella Abbà		TWO-DIMENSIONAL TURBULENCE Session 1 - Chair: Gregory Falkovich		COMPLEX AND ACTIVE FLOWS Chair: Massimo Cencini	
10:45	483 - Numerical and experimental investigation of regional deposition of glass fibres in the human respiratory airway. <i>Yan Cui</i>	33 - Optimal initial perturbations and the minimal seed of blasius boundary-layer flow. <i>Christos Vavalariis</i>	110 - Particle image velocimetry measurement on the turbulent boundary layer over convergent-divergent riblets. <i>Fang Xu</i>	117 - Plume statistics in a rough Rayleigh-Bénard convection cell. <i>Julien Salort</i>	218 - Experimental study of the bottleneck in fully developed turbulence. <i>Eberhard Bodenschatz</i>	49 - Subcritical turbulent condensate in rotating Rayleigh-Bénard convection. <i>Benjamin Favier</i>	372 - Temporal Large-Eddy Simulation with exact deconvolution. <i>Daniel Oberle</i>	29 - Effect of rotation on turbulent thermal convection on a hemisphere. <i>Patrick Fischer</i>	75 - Effects of large-scale turbulence on the preferential concentration of elongated gyrotactic swimmers. <i>Filippo De Lillo</i>								
11:00	103 - Drag reduction in turbulent channel flow of flexible fibers. <i>Arash Alizad Banaei</i>	136 - Transition in boundary layers with freestream turbulence. <i>Kristina Đurović</i>	222 - Diagnostic plot scaling accounting for adverse pressure gradient history effect. <i>Artur Dróżdź</i>	126 - Elusive transition to the ultimate regime of turbulent Rayleigh-Bénard convection. <i>Pavel Urban</i>	127 - 4D particle tracking velocimetry measurements in a von Karman turbulence experiment. <i>Yaşar Ostovan</i>	81 - Geostrophic turbulent regime of rotating Rayleigh-Bénard convection at different Prandtl numbers. <i>Andrés J. Aguirre-Guzmán</i>	565 - On a proper tensor-diffusivity model for Large-Eddy Simulations of Rayleigh-Bénard convection. <i>F. Xavier Trias</i>	135 - Condensate in quasi two-dimensional turbulence. <i>Stefano Musacchio</i>	39 - Surfacing and clustering of gyrotactic micro-swimmers in free-surface turbulence. <i>Harshit Bhatia</i>								
11:15	436 - Orientation dynamics of rigid fibres in a turbulent channel flow. <i>Subhani Shaik</i>	360 - Boundary layer transition induced by freestream turbulence subject to strong pressure gradient and high-curvature effects. <i>Yaomin Zhao</i>	407 - Turbulence dynamics in separated flows: the generalised Kolmogorov equation for inhomogeneous anisotropic conditions. <i>Jean-Paul Mollicone</i>	256 - The ultimate state of convection without the hot air. <i>Philippe-E. Roche</i>	4 - Inertial range skewness of the longitudinal velocity derivative in locally isotropic turbulence. <i>Semion Sukoriansky</i>	37 - Global flow structures in rotating Rayleigh-Bénard convection in pressured SF6. <i>Xuan Zhang</i>	36 - Controlled eddy simulation of complex wall bounded flows at large Reynolds numbers. <i>Yan Jinh</i>	170 - Condensates in thin-layer turbulence. <i>Adrian van Kan</i>	195 - Controlling active spinners using vortex lattices. <i>Horst Punzmann</i>								
11:30	335 - The Lumley triangle: a tool to analyse particle rotation anisotropies. <i>Helge I. Andersson</i>	428 - Invariant solutions of the filtered Navier-Stokes equations representative of Large-scale motions in the asymptotic suction boundary layer flow. <i>Sajjad Azimi</i>	597 - Experiments in non-equilibrium turbulent boundary layers with favorable pressure gradients. <i>Ralph Volino</i>	261 - Direct Numerical Simulations towards ultimate turbulence. <i>Richard J. A. M. Stevens</i>	8 - On a new symmetry-induced modeling framework applied to the closure problem of turbulence. <i>Dario Klingenberg</i>	131 - Rotating homogeneous Rayleigh-Bénard convection. <i>Francesco Toselli</i>	607 - Effects of spatial filtering on scale-to-scale energy flux. <i>Daniel Feldmann</i>	238 - Generalised flows and turbulent transport. <i>Simon Thalabard</i>	68 - Rotation rate and preferential alignment of rods in convective turbulence from experiments and simulations. <i>Enrico Calzavari</i>								
11:45	402 - Single-drop breakup in homogeneous isotropic turbulence. <i>Marc Avila</i>	543 - Transition to turbulence in görtler flows. <i>Jeremie Dagaut</i>	456 - The effect of momentum exchange by coherent structures on the friction factor and mean velocity profile at extreme Reynolds numbers. <i>Hamidreza Anbarlooei</i>	152 - Velocity structure functions of thermal convection and hydrodynamic turbulence follow similar scaling. <i>Shashwat Bhattacharya</i>	101 - Arrow of time in turbulent flows and its ramifications. <i>Mahendra Verma</i>	356 - Rotating turbulent Rayleigh-Bénard convection at very large Rayleigh numbers. <i>Marcel Wedi</i>	92 - Development and investigation of thermal subgrid-scale models for Large-Eddy Lattice Boltzmann methods. <i>Maximilian Gaedike</i>	200 - Turbulence-driven rotors in 2D turbulent flows. <i>Nicolas Francois</i>	230 - Kinematics of large buoyant ellipsoids rising in a quiescent fluid. <i>Jelle Will</i>								
12:00	449 - Modeling of coalescence and breakup of fluid particles in turbulent flows. <i>Antonio Buffo</i>	80 - Noise emission of sub- and super-sonic boundary layer flows. <i>Yi Zhang</i>	184 - Experimental investigation of spatially developing turbulent boundary layers over longitudinal grooves. <i>Michael Klaas</i>	488 - Unifying view on heat transport enhancement behaviour in confined Rayleigh-Bénard, rotating Rayleigh-Bénard, double diffusive convection and quasi-static magnetconvection. <i>Kai Leang Chong</i>	391 - Universality of power fluctuations in turbulence. <i>Rémi Zamansky</i>	628 - Tilted rotating Rayleigh-Bénard convection. <i>Lyuba Novi</i>	489 - Spectral simulations of quantum turbulence using the Gross-Pitaevskii equation. <i>Ionut Danaila</i>	561 - Sub-surface PIV measurements of velocity fields in Faraday flows. <i>Raffaele Colombi</i>	510 - Phase transitions to condensate formation in two-dimensional turbulence. <i>Matitz Linkmann</i>								
12:15	625 - Cloud-clear air interfaces: Population Balance Equation solutions by considering nucleation information from in-situ measurements, and by modeling the droplet growth on super-saturation fluctuation data from numerical simulation. <i>Mina Golshan</i>	504 - Spatial evolution of transition inside porous media. <i>Xu Chu</i>	579 - The quest for high Reynolds number turbulence: results from and future perspectives of cyclope. <i>Gabriele Bellani</i>	111 - Transition to the ultimate regime in 2D Rayleigh-Bénard convection. <i>Detlef Lohse</i>	322 - Non-locality of strain rate and vortex stretching in turbulent flows. <i>Dhawal Buaria</i>	121 - Explaining sharp transitions in turbulent rotating Rayleigh-Bénard convection with Lagrangian statistics. <i>Rudie P. J. Kunnen</i>	454 - A general formalism for scales interaction and their modelling in les. <i>Antonella Abbà</i>	5 - Turbulence appearance and non-appearance in thin fluid layers. <i>Gregory Falkovich</i>	46 - Orientation of non-spherical swimming particles in turbulence. <i>Massimo Cencini</i>								
12:30	34 - Dynamics of small flexible fibers in turbulent channel flow. <i>Cristian Marchioli</i>	375 - On the verge of laminarization in boundary layer flows. <i>Yohann Duguet</i>	16 - Numerical investigation of flow control by embedded vortices in a diffuser. <i>Ugo Piomelli</i>		27 - Eulerian vs Lagrangian irreversibility in an experimental turbulent von Karman flow. <i>Bérengère Dubrulle</i>												
12:45	LUNCH																

	ROOM 1	ROOM 3	ROOM 5	ROOM 7	ROOM 9	ROOM 2	ROOM 8	ROOM 10	ROOM 4
	MULTIPHASE FLOWS Session 2 - Chair: Alfredo Soldati	INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS Session 2 - Chair: Daniela Tordella	WALL BOUNDED TURBULENCE Session 2 - Chair: Paolo Luchini	TURBULENT CONVECTION Session 2 - Chair: Anne Sergent	BOUNDARY FREE TURBULENCE Session 1 - Chair: Alain Pumir	STRATIFIED FLOWS Session 1 - Chair: Alex Liberzon	TURBULENCE, WAVES AND INSTABILITIES IN PLASMAS Chair: William H. Matthaeus	TRANSPORT AND MIXING Session 1 - Chair: Joerg Schumacher	NON-NEWTONIAN FLOWS Session 1 - Chair: Rich Kerswell
14:00	443 - Droplet nucleation in turbulent steam jets. <i>Andrea Gallegati</i>	568 - Bursting and amplitude explosions at the onset of turbulent stripes in channel flow. <i>Bjorn Hof</i>	141 - Dynamics and evolution of turbulent Taylor rolls. <i>Francesco Sacco</i>	61 - How surface roughness reduces heat transport in turbulent Rayleigh-Bénard convection. <i>Quan Zhou</i>	196 - Dynamics of the tetrad-based velocity gradient in turbulent flows. <i>Ping-Fan Yang</i>	73 - DNS study on large-scale and small-scale flow structures of stably-stratified shear layers. <i>Tomooki Watanabe</i>	287 - Solar wind turbulence. <i>Renaud Ferrand</i>	9 - Turbulent mixing in a channel flow. <i>Dimitrios Papavassiliou</i>	199 - DNS-DEM simulation of turbulent non-newtonian suspension flow. <i>Enzu Zheng</i>
14:15	463 - Bubble break-up in turbulence. <i>Luc Deike</i>	440 - Unsteady localized wave packets in laminar shock-wave/boundary-layer interactions. <i>Sébastien Niessen</i>	96 - Turbulence: the view from the wall. <i>Miguel P. Encinar</i>	384 - About the influence of rough boundaries on the heat transport in highly turbulent thermal convection. <i>Stephan Weiss</i>	392 - Kinematics and dynamics of scale-local stress/strain alignment in turbulence. <i>Nicholas Ouellette</i>	63 - Entrainment zone properties in the atmospheric boundary layer conditioned on turbulent and non-turbulent regions. <i>Katherine Fodor</i>	525 - Shear flow instabilities in asymmetric magnetic reconnection. <i>Dario Borgogno</i>	70 - Two-point small-scale flow properties measured by means of Lagrangian rigid fiber tracking. <i>Mattia Cavaiola</i>	242 - Some mechanism processes concerning shear-thinning t-junction mixing with Direct Numerical Simulation. <i>Haining Luo</i>
14:30	613 - Experimental investigation of bubble breakup in strong turbulence. <i>Rui Ni</i>	393 - Experiments on large-scale flows around turbulent spots. <i>José Eduardo Westfreid</i>	151 - A realizable turbulence model for the Reynolds stress based on the square root tensor. <i>Kazuhiro Inagaki</i>	486 - Investigating Reynolds analogy over riblet roughened surfaces. <i>Amirreza Rouhi</i>	521 - Vortex stretching is not the main cause of the turbulent energy cascade. <i>Andrew Bragg</i>	166 - Signature and energetics of internal gravity waves in stratified turbulence. <i>Andrea Maffioli</i>	106 - Macrophysics and microphysics of energy transfer in kinetic plasma. <i>Yan Yang</i>	306 - Non-Gaussianity in turbulent relative dispersion. <i>Benjamin Devenish</i>	553 - Temporal statistics in two-dimensional elastic turbulence. <i>Himani Garg</i>
14:45	432 - Effect of soluble surfactant on turbulent bubbly channel flow undergoing topology changes. <i>Metin Mucradoglu</i>	460 - There and back again, build up and collapse of transitional plane Couette flow captured by rare events approaches. <i>Joran Rolland</i>	270 - Statistics of streamline geometry in wall-bounded turbulence. <i>Rina Perven</i>	513 - Boundary layer structure for different plate boundary conditions. <i>Najmeh Feroozani</i>	361 - Inverse cascade in 3D homogeneous isotropic turbulence. <i>Franck Plunian</i>	266 - Can implicit LES of gravity currents match the mixing efficiency of a DNS? <i>Ricardo André Schuh Frantz</i>	512 - Curvature of Lagrangian trajectories in turbulence with zonal flows. <i>Benjamin Kadach</i>	104 - A structural subgrid-scale model for Large-Eddy Simulation of relative dispersion of particles in isotropic turbulent flows. <i>Guodong Jin</i>	612 - Effects of numerical resolution on elasto-inertial turbulence. <i>Vincent Terrapon</i>
15:00	217 - Dynamics and fragmentation of small flexible fibers in turbulence. <i>Sofia Allende</i>	462 - Turbulence threshold for plane Poiseuille flow. <i>Sebastien Gomé</i>	471 - Hierarchy of vortices in a developed turbulent boundary layer. <i>Susumu Goto</i>	48 - Pore-scale-resolving Direct Numerical Simulations of turbulent natural convection in porous media. <i>Stefan Gasow</i>	522 - A Lagrangian model for the velocity gradient tensor in turbulent flows based on strain-rate eigenframe variables. <i>Maurizio Carbone</i>	244 - Turbulent entrainment in sheared convective boundary layers. <i>Armin Haghshenas</i>	24 - Simulation study of high magnetic Prandtl number magnetohydrodynamic turbulence under hall effects. <i>Hideaki Miura</i>	534 - Anisotropic passive scalar fluctuations with uniform mean gradient in statistically homogeneous isotropic turbulence. <i>Tatsuya Yasuda</i>	164 - Effects of viscoelasticity on turbulent bubbly flow. <i>Otu Tammisola</i>
15:15	82 - Fragmentation of fibres in turbulent flows. <i>Christophe Brouzet</i>	622 - Wave focusing and multiple dispersion transitions of perturbation waves in the plane Poiseuille flow. <i>Gabriele Nastro</i>	441 - How invariant solutions support the formation of oblique turbulent-laminar stripes. <i>Tobias M. Schneider</i>	330 - Heat transfer at the roughness scale in turbulent Rayleigh-Bénard convection. <i>Anne Sergent</i>	569 - Effects of synthetic low-level jet on scaled-down wind farm performance. <i>Luciano Castillo</i>	274 - A simple measure for predicting vortex pairing in shear layers. <i>Mahendra K. Verma</i>	616 - Magnetic turbulence anisotropy and cascade rates in the heliosheath and local interstellar medium as seen by the voyagers. <i>Federico Fraternali</i>	582 - Turbulent mixing in variable-density helium-air jet. <i>Yacine Brahami</i>	459 - Two-dimensional elasto-inertial coherent structures in viscoelastic channel flow. <i>Rich Kerswell</i>
15:30	620 - Droplet size distribution in surfactant-laden turbulent channel flow. <i>Alfredo Soldati</i>	300 - Nonlinear dynamics of bursting spots in subcritical inclined convection. <i>Florian Reetz</i>	365 - A one dimensional example of the contrasting behaviour of laminar and turbulent flow. <i>Paolo Luchini</i>		316 - How large can velocity gradients be in turbulent flows? <i>Alain Pumir</i>	144 - Particles crossing density interfaces. <i>Alex Liberzon</i>	409 - Solar wind and magnetosheath observations of energy transfer, intermittency and dissipation. <i>William H. Matthaeus</i>	181 - Lagrangian perspective on turbulent passive scalar mixing. <i>Joerg Schumacher</i>	
15:45	COFFEE BREAK								

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	MULTIPHASE FLOWS Session 3 Chair: Mikhael Gorokhovski	INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS Session 3 - Chair: Dan S. Henningson	WALL BOUNDED TURBULENCE Session 3 - Chair: Lipo Wang	TURBULENT CONVECTION Session 3 - Chair: Rodion Stepanov	BOUNDARY FREE TURBULENCE Session 2 Chair: Elisabetta De Angelis	STRATIFIED FLOWS Session 2 - Chair: Colm-cille Caulfield	NUMERICAL METHODS AND DATA ANALYSIS Session 2 - Chair: Luca Biferale	TRANSPORT AND MIXING Session 2 - Chair: Rahul Pandit	
16:15	125 - Evaporating droplets in homogeneous shear turbulence. <i>Philipp Weiss</i>	134 - Feedback stabilization of a plane Couette flow exact coherent structure. <i>Geoffroy C. P. Claisse</i>	203 - Bifurcations of turbulent patterns in channel flow. <i>Masaki Shimizu</i>	410 - The influence of spatial boundary heat distribution on turbulent convection. <i>Johanna Mader</i>	58 - Universality of enstrophy dynamics within the turbulent/non-turbulent interface layer. <i>Marco Zecchetto</i>	175 - Revisiting Bolgiano-Obukhov scaling for stably stratified turbulence. <i>Shadab Alam</i>	470 - Turbulence modeling using artificial neural network. <i>Yuji Hattori</i>	137 - Buoyancy regulation of non-motile phytoplankton in a turbulent flow. <i>Matteo Borgnino</i>	
16:30	528 - 3D-reconstruction of O ₂ bubble wake concentration fields of two consecutive bubbles. <i>Alexandra von Kameke</i>	226 - Optimal forcing to destabilise turbulence in a pipe flow. <i>Elena Marensi</i>	351 - Secondary flow generation mechanisms in turbulent sinusoidal channels. <i>Hassan Nagib</i>	390 - Transition to the ultimate regime in a radiatively driven convection experiment. <i>Basile Gallet</i>	268 - Entrainment and self-similarity in negatively buoyant turbulent jets. <i>Liam Milton-McGurk</i>	279 - Decaying turbulence in a stratified fluid generated by a high-Prandtl-number scalar. <i>Hideshi Hanazaki</i>	537 - Predictions of turbulent shear flows by neural networks and application to off-wall boundary conditions. <i>Luca Guastoni</i>	422 - Settling dynamics of inertial particle. <i>David De Souza</i>	
16:45	315 - Multiscale Lattice Boltzmann simulations of droplet dynamics in turbulent flows. <i>Felix Milan</i>	535 - Towards an extension of Barkley's pipe-flow model to transitional plane Couette flow. <i>Cristobal Arratia</i>	98 - Structure of the skin-friction drag fluctuations in turbulent channel flows. <i>Cheng Cheng</i>	173 - Dynamic heterogeneity and conditional statistics of non-gaussian temperature fluctuations in turbulent thermal convection. <i>Xiaozhou He</i>	318 - Statistics of the irrotational flow region near the turbulent/non-turbulent interface layer. <i>Ricardo P. Xavier</i>	293 - Kelvin-Helmholtz instability above Richardson number 1/4. <i>Jeremy Parker</i>	630 - From deep to physics-informed learning of turbulence: diagnostics. <i>Michael Chertkov</i>	552 - Turbophoresis of small heavy particles in homogeneous turbulence. <i>Robin Valle</i>	
17:00	524 - On the conservation of energy for interface-capturing techniques for multiphase flows. Application to falling films. <i>Nicolas Valle</i>	539 - Wavy Instability in pulsating pipe flow. <i>Atul Varshney</i>	241 - Mechanism of quasi-linear Orr burst in turbulent channel flows. <i>Yongseok Kwon</i>	631 - Dense Lagrangian particle tracking of turbulent Rayleigh-Bénard convection in a cylindrical sample using shake-the-box. <i>Johannes Bosbach</i>	347 - Velocity and scalar structure near the turbulent/non-turbulent interface compared to internal turbulence. <i>Gerrit Elsinga</i>	399 - Regime transitions and energetics of sustained stratified shear flows. <i>Adrien Lefauve</i>	62 - Can artificial neural networks trained through deep reinforcement learning become a tool in active flow control and turbulence? <i>Jean Rabault</i>	156 - Broadening of cloud droplet size distribution and liquid water content spectrum in turbulence. <i>Izumi Saito</i>	
17:15	183 - Analysis and modeling of evaporating dilute polydispersed sprays in isotropic turbulence. <i>Valentin Giddey</i>	545 - Interscale energy transport for turbulent stripe in rotating plane Couette flow. <i>Tomohiro Nimura</i>	380 - Data-driven quantification of nonlinear interactions in the resolvent analysis of turbulent channel flow. <i>Ryan M. McMullen</i>	13 - The influence of thermal boundary conditions on turbulent forced convection pipe flow. <i>Steffen Straub</i>	542 - Particle entrainment through a turbulent/non-turbulent interface. <i>Tai Wada</i>	314 - Sensitization of eddy-viscosity models to buoyancy effects for predicting natural convection flows. <i>Syed Mohd Saad Jameel</i>	157 - Optimal sub-grid-scale models for inertial range turbulence. <i>Michele Buzzicotti</i>	331 - Transport properties of quasi-neutrally-buoyant inertial particles. <i>Marco Martins Afonso</i>	
17:30	297 - On the momentum and heat exchange in wind-wave turbulent flows. <i>Federica Romoli</i>	162 - System identification using neural networks applied to experimental noise-amplifier flows characterized by real-time optical flow velocimetry. <i>Antonios Giannopoulos</i>	99 - Analysis of the skin-friction line structure in channel turbulence. <i>Lipo Wang</i>	584 - Numerical study of radiatively driven convection: influence of the Prandtl number on the heat flux in the mixing-length regime. <i>Miquel Benjamin</i>	558 - The statistical topology of a turbulent-non-turbulent interface. <i>John Craske</i>	78 - Subcritical and supercritical transitions for stratified fluid in a nearly semicircular pool. <i>Abhishek Kumar</i>	571 - Wavelet-convolutional LSTM: an efficient deep learning paradigm for high fidelity turbulence. <i>Arvind Mohan</i>	514 - Design, construction and characterization of instrumented particles for the Lagrangian characterization of turbulent flows. <i>Facundo Cabrera</i>	
17:45	439 - Two-phase homogeneous shear turbulence. <i>Marco E. Rosti</i>	265 - Mean flow analysis of a turbulent wind turbine wake. <i>Giovanni De Cillis</i>		374 - Design process of a vertical backward facing step experiment for forced- and mixed-convection low Prandtl number flows. <i>Christine Steiner</i>	577 - Scale-by-scale analysis of a turbulent temporal jet. <i>Elisabetta De Angelis</i>	587 - Experimental investigation of lock exchange flow using MTV/MTT. <i>Tanmay Agrawal</i>	155 - Data-driven investigations of scale interactions in turbulent flows. <i>Nikki Vercauteren</i>	339 - Spheroids in decaying turbulence from Taylor-Green vortex flow. <i>Rohith Jayaram</i>	
18:00	23 - The stochastic subgrid model for droplet vaporization in a highly turbulent flow. <i>Mikhael Gorokhovski</i>	138 - What can we learn from the Edge about bypass transition? <i>Dan S. Henningson</i>		564 - Mechanisms of helicity excitation in large-scale convection in closed volumes. <i>Rodion Stepanov</i>		366 - Asymptotic dynamics of high dynamic range stratified turbulence. <i>Colm-cille Caulfield</i>	76 - Inferring physical parameters in turbulence: from nudging to machine learning. <i>Luca Biferale</i>	290 - Path-planning smart swimmers in turbulent flows. <i>Rahul Pandit</i>	

8:30 10:00		8:30 - Invited speaker • Invited speaker • Structures and scalings in natural thermal convection. <i>Olga Shishkina</i> 9:15 - Invited speaker • Invited speaker • Experimental investigation of turbulence and complex flows. <i>Jerry Westerweel</i>							
10:00		COFFEE BREAK							
	ROOM 1	ROOM 3	ROOM 5	ROOM 7	ROOM 9	ROOM 2	ROOM 8	ROOM 10	ROOM 4
	MULTIPHASE FLOWS Session 4 - Chair: Caroline Nore	NON-NEWTONIAN FLOWS Session 2 Chair: Carlo Massimo Casciola	WALL BOUNDED TURBULENCE Session 4 - Chair: Jean-Philippe Laval	COMPRESSIBLE FLOWS Session 1 - Chair: Supratik Banerjee	BOUNDARY FREE TURBULENCE Session 3 - Chair: Juan Saenz	WAVE TURBULENCE Chair: Nicolas Mordant	VORTEX DYNAMICS AND STRUCTURE FORMATION Session 1 - Chair: Maurice Rossi	TWO-DIMENSIONAL TURBULENCE Session 2 - Chair: Michael Shats	
10:45	369 - Numerical study of gravity effects on the symmetry and development of particle-laden flows. <i>Matthew Xinchen Zhang</i>	17 - Direct Numerical Simulations of turbulent viscoelastic jets described by the FENE-P model. <i>Mateus C. Guimarães</i>	224 - Turbulent boundary layer of the flow past an infinite swept-back wing. <i>Carlo Alessio Suardi</i>	179 - Self-similar compressible turbulent boundary layers with pressure gradients. Part 1: DNS of sub- and supersonic flow. <i>Christoph Wenzel</i>	327 - Permanence of large eddies in variable-density homogeneous turbulence. <i>Olivier Soulard</i>	188 - Turbulence of capillary waves forced by steep gravity waves. <i>Michael Berhanu</i>	544 - On the geometry of coherent structures in channel flow turbulence. <i>Abhishek Paraswarar Hanikrishnan</i>	41 - Lagrangian pair dispersion in generalized two-dimensional turbulence. <i>Stefano Berti</i>	
11:00	319 - Modulation of very large scale motions by inertial particles. <i>David Richter</i>	108 - Elastic range scaling in turbulent flow of dilute polymer solution. <i>Yi-Bao Zhang</i>	379 - Experimental investigation of coherent structures in a flat plate turbulent boundary layer at $Re_{\Theta}=10,000$. <i>Christina Voß</i>	180 - Self-similar compressible turbulent boundary layers with pressure gradients. Part 2: Self-similarity analysis of the outer layer. <i>Tobias Gibis</i>	416 - What is a "Length Scale" in variable density turbulence? <i>Dongxiao Zhao</i>	169 - Experience of internal wave turbulence in the Coriolis facility. <i>Clément Savaro</i>	618 - On the energetics of separating and reattaching flows and their modeling. <i>Andrea Cimarelli</i>	311 - The decay of two-dimensional turbulence in soap-film flows. <i>Zeyou Zhou</i>	
11:15	325 - Direct Numerical Simulation of particle clustering in the wake of flow past a circular cylinder. <i>Zhaoyu Shi</i>	295 - The turbulent/non-turbulent interface layer in a viscoelastic fluid. <i>Hugo Abreu</i>	421 - DNS study on Reynolds stress anisotropy in a turbulent boundary layer with separation and reattachment. <i>Hiroyuki Abe</i>	485 - Detached-Eddy Simulation of transverse hydrogen injection into supersonic crossflow. <i>Alexey Troshin</i>	250 - Scale-space turbulence energy density in compressible mixing layer. <i>Abdulvahab Sameen</i>	249 - Early stage of integrable turbulence in 1D NLS equation: the semi-classical approach to statistics. <i>Giacomo Roberti</i>	282 - Large-Eddy Simulation of the fluidic oscillator jet. <i>Elizaveta Davengauer</i>	425 - Energy flux vector in a shell model of 2D rotating turbulence. <i>Masanori Takaoka</i>	
11:30	481 - Cluster of inertial particles and fluid acceleration in turbulence. <i>Sunao Oka</i>	567 - Mathematical modeling of non-newtonian geophysical flows. <i>Margarita Egilit</i>	588 - Embedded Large-Eddy Simulation of streamwise vortices within a spatially developing turbulent boundary layer. <i>Andrew Mole</i>	538 - Identification of Lagrangian Coherent Structures (LCS) in a flat-plate turbulent boundary layer with adverse pressure gradient. <i>Matthias Weischenk</i>	418 - Measuring the full velocity gradient and dissipation rate tensor in homogeneous turbulence using shake-the-box and flowfit. <i>Andreas Schroeder</i>	296 - Coexistence of solitons and extreme events in deep water surface waves. <i>Annette Cazaubiel</i>	345 - Direct Numerical Simulation of variable density starting turbulent jets. <i>Vladislav Ivashchenko</i>	507 - Sudden transition from non-swirling to swirling axisymmetric turbulence. <i>Wouter J. E. Bos</i>	
11:45	450 - Turbulence modification of a particle-laden flow in a rocket engine model. <i>Sabrina Kalenko</i>	589 - Experimental analysis of coherent structures in non-newtonian power law fluids. <i>Cristian M. Potasi Rosero</i>	299 - A comparison of surface roughness effect in channel and Taylor-Couette flows. <i>Pourya Ferooghi</i>	234 - Investigation of an unsteady shock wave in a Mach 2 boundary layer. <i>Rio Baidya</i>	560 - Unifying local and global descriptions of turbulent entrainment. <i>Maarten van Reeuwijk</i>	578 - On the convergence of the normal form transformation in discrete wave turbulence theory for the Charney-Hasegawa-Mima (CHM) equation. <i>Shane Walsh</i>	604 - Energy balance quantification and wake morphology description in collocated wind plants. <i>Sarah Smith</i>	490 - Mixing efficiency of laminar and turbulent wall-bounded flows. <i>Kai Schneider</i>	
12:00	555 - Effects of Stokes number on particle mechanics in a free-shear jet. <i>Raúl Boyaño Cal</i>	419 - Dynamics of elastic chains in turbulent pipe flow. <i>Carlo Massimo Casciola</i>	448 - Network-based characterization of passive-scalar plume dynamics in a turbulent boundary layer. <i>Stefania Scarsoglio</i>	491 - Effect of rarefaction on temporally developing compressible mixing layer. <i>Vishnu Mohan</i>	343 - Effect of high-order finite difference discretization of the nonlinear term on turbulence statistics. <i>Naoya Okamoto</i>	348 - Mean flow instability of surface gravity waves propagating in a rotating frame. <i>Kannabiran Seshasayanan</i>	334 - Magnetic dissipation of coherent structures and particle deposition in magnetohydrodynamic turbulence at low magnetic Reynolds numbers. <i>Bruno Magacho da Silva</i>	235 - Do shear layers spontaneously trigger turbulence? <i>Alexei A. Maitybaev</i>	
12:15	277 - Exact calculation of energy flux rate in turbulent ferrofluids. <i>Sukhdev Mouraya</i>		178 - Experimental and numerical investigation of attached flow structures in turbulent boundary layers. <i>Jean-Philippe Laval</i>	342 - Scale energetics in baroclinic-torque-driven turbulent mixing. <i>G. S. Sidharth</i>	457 - Filter-width dependence of the dynamics of homogeneous variable density turbulence. <i>Juan A. Saenz</i>	225 - Anomalous scaling in gravitational wave turbulence. <i>Sébastien Galtier</i>	442 - Turbulence dynamics transition of flow past a circular cylinder and the prediction of vortex-induced forces. <i>Bernat Font Garcia</i>	191 - Nonlinear evolution of a baroclinic wave and imbalanced dissipation. <i>William Riley Casper</i>	
12:30	280 - Electro-vortex flow in liquid metal batteries. <i>Caroline Nore</i>			367 - Energy transfer in compressible magnetohydrodynamic turbulence for self-gravitating fluids. <i>Supratik Banerjee</i>		337 - Integrable turbulence: experimental realization of a soliton gas. <i>Ivan Redar</i>	352 - Motion of helical vortices: a dynamical system approach. <i>Maurice Rossi</i>	145 - Inertial and anisotropic particles in 2D turbulence. <i>Michael Shats</i>	
12:45	LUNCH / INDUSTRY SYMPOSIUM								

	ROOM 1	ROOM 3	ROOM 5	ROOM 7	ROOM 9	ROOM 2	ROOM 8	ROOM 10	ROOM 4
	MULTIPHASE FLOWS Session 5 Chair: Alessandro Sozza	INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS Session 4 Chair: Shigeo Kida	WALL BOUNDED TURBULENCE Session 5 Chair: Woutijn Baars	TURBULENT CONVECTION Session 4 Chair: Janet Scheel	INTERMITTENCY AND SCALING Session 2 Chair: Alexandros Alexakis	ROTATING FLOWS Session 2 Chair: Geert Brethouwer	NUMERICAL METHODS AND DATA ANALYSIS Session 3 Chair: Patricio Clark Di Leoni	TRANSPORT AND MIXING Session 3 Chair: Patrice Le Gal	Minisymposium TURBULENCE IN THE HELIOSPHERE AND IN THE LOCAL INTERSTELLAR MEDIUM Convener: Daniela Tordella Co-convener: Federico Fraternali Session 1 - Chair: D. Tordella
14:00	338 - Inertial effects on the settling and collisions between spheroids in a turbulent flow. <i>Aurore Naso</i>	447 - Instability of flow subregions in three-dimensional wake transition. <i>Andrey Aleksyuk</i>	397 - Investigation of dynamics of secondary currents in marginally turbulent semi-filled pipe flow. <i>Julian Brasda</i>	44 - Convection in liquid sodium: a direct comparison of DNS and experiments. <i>Lukas Zwirner</i>	69 - Scale analysis of a numerical von Karman flow. <i>Hugues Faller</i>	94 - Heat transfer and temperature measurements in extreme rapidly rotating convection. <i>Matteo Madonia</i>	257 - Hybrid LES / RANS paradigm for 3D turbulent mixing. <i>Filipe Pereira Soares</i>	148 - Self-similarity of scalar spectra in a point-source plume released in a turbulent boundary layer. <i>Kapil A. Chauhan</i>	<u>14:00</u> Observing solar wind turbulence from fluid to kinetic scales. <i>R. Bruno</i>
14:15	580 - Settling of large particles in a turbulence column. <i>Yulia Akutina</i>	349 - Buoyancy-suppressed transition in pipe flow. <i>Ashley P. Willis</i>	413 - Slip and transpiration velocity to model textured surfaces in turbulent channel flow. <i>Simon Pasche</i>	57 - The evolution of the large-scale flow in magnetoconvection. <i>Till Zürner</i>	139 - Local estimates of Hölder exponents in turbulent vector fields. <i>Florian Nguyen</i>	310 - Influence of internal heating on convection in the rotating spherical gap. <i>Florian Zaussinger</i>	326 - Spatial hierarchy detection in large scale coherent structures. <i>Ido Ruhman</i>	251 - Multi-scalar mixing in a coaxial jet at different velocity ratios. <i>Alais Hewes</i>	
14:30	185 - Multiscale preferential sweeping of particles settling in turbulence. <i>Josin Tom</i>	158 - Linear stability of the far-jet: non-parallel effects. <i>Rustam Mullyadzhanov</i>	468 - Predicting particle phase velocity statistics in a sheared turbulent suspension using fluctuating force-fluctuating torque (F3TS) model. <i>SwagNIK Ghosh</i>	59 - Transition of the flow reversal in Turbulent thermal convection. <i>Xin Chen</i>	186 - On the fine structure of turbulence determined by entropy variation. <i>Joachim Peinke</i>	508 - Effects of thermal stratification on the axisymmetric state in spherical Couette flow. <i>Tomoaki Itano</i>	502 - Characterization of a hydrodynamic instability from experimental data using stochastic reduced order modeling. <i>Moritz Sieber</i>	423 - Non-Richardson turbulent particle pair diffusion. <i>Nadeem A. Malik</i>	<u>14:25</u> Turbulence and dissipation in the solar wind. <i>S. Galier</i>
14:45	603 - Effect of turbulence-induced inertial clustering on droplet arrival statistics in a polydisperse droplet field. <i>M. Shyam Kumar</i>	301 - Transient dynamics of the turbulent wake of a three-dimensional blunt body. <i>Yann Haffner</i>	472 - Structural effect on turbulent drag over porous media. <i>Yuki Okazaki</i>	385 - Direct measurements of the thermal dissipation rate in turbulent Rayleigh-Bénard convection. <i>Anna Hertlein</i>	213 - On the inertial range scaling in the high- R_λ limit. <i>Christian Küchler</i>	614 - Localized structures and solitary states in a vertical Taylor-Couette system with a radial temperature gradient. <i>Changwoo Kang</i>	14 - Statistical properties of the filtered turbulence. <i>Markus Klein</i>	453 - Direct Numerical Simulations of combined Rayleigh-Taylor/shear flow to late times. <i>Jon Baltzer</i>	
15:00	83 - Effect of mass loading on the collision rate of cloud droplets. <i>Bogdan Rosa</i>	313 - Stabilisation of vortex shedding flow past a square prism using slip surfaces. <i>K. Aswathy Nair</i>	503 - Investigation of the interaction between inner and outer region through the scaling of the streamwise turbulence intensity in a fully developed turbulent pipe flow. <i>Lucia Mascotelli</i>	414 - Velocimetry in a radiatively driven convection experiment. <i>Vincent Bouillaut</i>	246 - Analyzing and influencing the wake of an active turbulence grid. <i>Lisa Rademacher</i>	211 - Transition in rotating plane Couette flow, revisited. <i>Masato Nagata</i>	153 - Discrete adjoint based data assimilation for rans turbulence models. <i>Oliver Brenner</i>	479 - Small Peclet-small Mach number approximation and its implications on statistical turbulence models. <i>Jean-Cedric Chkair</i>	<u>14:50</u> Simulating solar wind dynamics across scales: the expanding box model. <i>M. E. Innocenti</i>
15:15	519 - Results from the Zugspitze experiment: an in-situ cloud-droplet particle-tracking experiment. <i>Guus Bertens</i>	376 - Numerical simulations of counter-current round jets. <i>Karol Wawrzak</i>	455 - Quantifying amplitude modulation in flows without clear scale separation. <i>Davide Gatti</i>	437 - Experimental investigation of a sheared thermally unstable boundary layer. <i>Gabriele Nunnari</i>	248 - High Reynolds number turbulence generation by active grid and wind tunnel control. <i>Lars Neuhaus</i>	272 - Effect of eccentricity in a counter-rotating Taylor-Couette flow. <i>Kameswararao Anupindi</i>	38 - Can we derive turbulent closure using lattice gas? <i>Vincent Labarre</i>	546 - The role of turbulence on the development and entrainment of a turbulent jet in cross-flow. <i>Graham Freedland</i>	
15:30	160 - Accumulation of sedimenting particles in turbulent flows. <i>Alessandro Sozza</i>	433 - Instability of steady flows in a precessing sphere and spheroid. <i>Shigeo Kida</i>	467 - Vertical coherence of turbulence in the atmospheric surface layer. <i>Woutijn Baars</i>	142 - Convective turbulence in liquid sodium. <i>Janet Scheel</i>	167 - Cascades and transitions in turbulent flows. <i>Alexandros Alexakis</i>	129 - Heat transfer in rotating wall-bounded flows. <i>Geert Brethouwer</i>	97 - Synchronizing turbulence via nudging. <i>Patricio Clark Di Leoni</i>	35 - Fragmentation of large aggregates in turbulence. <i>Patrice Le Gal</i>	<u>15:15</u> Generation of coherent structures in mhd and space plasmas: Reynolds number and system size effects. <i>W. H. Matthaeus</i>
15:45	COFFEE BREAK								

	ROOM 1	ROOM 3	ROOM 5	ROOM 7	ROOM 9	ROOM 2	ROOM 8	ROOM 10	ROOM 4
	MULTIPHASE FLOWS Session 6 Chair: Francesco Picano	INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS Session 5 Chair: Laurette S. Tuckerman	QUANTUM AND SUPERFLUID TURBULENCE Chair: Davide Proment	TURBULENT CONVECTION Session 5 Chair: Ronald du Puits	INTERMITTENCY AND SCALING Session 3 Chair: Jeremie Bec	ROTATING FLOWS Session 3 Chair: Stefania Espa	NUMERICAL METHODS AND DATA ANALYSIS Session 4 Chair: Fernando Grinstein	GEOPHYSICAL AND ASTROPHYSICAL TURBULENCE Session 1 Chair: Hussein Aluie	Minisymposium TURBULENCE IN THE HELIOSPHERE AND IN THE LOCAL INTERSTELLAR MEDIUM Convenor: Daniela Tordella Co-convenor: Federico Fraternali Session 2 - Chair: N. V. Pogorelov
16:15	557 - Sediment transport in a turbulent open-channel with macro-roughness elements. <i>Michele Trevisson</i>	237 - Turbulent drag reduction for a wall with a bump. <i>Jacopa Banchetti</i>	53 - Investigation on the occurrence of flight-crash events in turbulent flows of superfluid helium-4. <i>Marco La Mantia</i>	132 - Transitions of Reynolds numbers and temperature fluctuations in horizontal convection. <i>Hailong Huang</i>	353 - Using persistent accelerations to disentangle Lagrangian turbulence. <i>Michael Wilczek</i>	223 - Anisotropy without waves in rotating turbulence. <i>Jonathan A. Brans</i>	31 - Aero-optical investigation on turbulent mixing flow by high-order algorithm. <i>Sun Xi Wan</i>	119 - Effects of droplet sedimentation and wind shear on cloud-top entrainment. <i>Bernhard Schulz</i>	<u>16:15</u> Turbulence and instabilities at the heliospheric interface. <i>N. V. Pogorelov</i>
16:30	377 - Homogeneous shear turbulence laden with finite-size spheroidal particles. <i>Ali Yousefi</i>	480 - Statistical characterization of viscoelastic flows in extended domains. <i>Alessia Ferraro</i>	60 - Three-dimensional numerical simulations of two-fluid coupled dynamics in thermal counterflows of superfluid 4He. <i>Hirokichi Kobayashi</i>	133 - Transitions of heat transfer and temperature profiles in horizontal convection. <i>Bo Yan</i>	554 - Extension of Lagrangian multifractal formalism to inertial particle dynamics. <i>Bianca Viggiano</i>	431 - On the complex behavior of the lateral wall boundary layer in an experimental co-rotating split-cylinder flow. <i>Jesús Oscar Rodríguez-García</i>	406 - Parallel 2D and 3D numerical simulations of melting with convection. <i>Georges Sadaka</i>	329 - Scale invariant diffusion parameterization in a mechanistic general circulation model. <i>Serhat Can</i>	
16:45	412 - Interface-resolved investigation of particle-laden turbulent channel flow in the point-particle limit. <i>Pedro Costa</i>	586 - Numerical investigation of turbulence development in the channel with a small cone angles. <i>Vladimir V. Trifonov</i>	283 - Persistence-time problem in the three-dimensional HVBK model for superfluid turbulence. <i>Akhilesh Kumar Verma</i>	216 - Heat transport in classical and symmetrical horizontal convection. <i>Philipp Reiter</i>	47 - Lagrangian velocity and power structure functions from 4D particle tracking velocimetry measurements of a turbulent swirling flow. <i>Valentina Valori</i>	505 - Instability of steady flow in precessing spheroids in a moderate Reynolds-number regime. <i>Yasufumi Horimoto</i>	122 - Sloshing dynamics using free energy based Lattice Boltzmann Method. <i>Abdulvahab Sameen</i>	305 - Fractal reconstruction of sub-grid scales for particle dispersion in Large-Eddy Simulation. <i>Emmanuel O. Akinlabi</i>	<u>16:40</u> Voyager data from the heliosheath and interstellar medium. <i>J. Richardson</i>
17:00	576 - Turbulence modulation by inertial particles in a swirling flow. <i>Jérémy Vessaire</i>	592 - Streamwise-constant large-scale structures in Couette and Poiseuille flows. <i>Simon J. Illingworth</i>	294 - Lagrangian study of isothermal turbulence in normal and superfluid helium. <i>Bernard Rousset</i>	11 - Dynamics of subsiding shells in actively growing clouds with vertical updrafts. <i>Vishnu Nair</i>	350 - Intermittency of inertial particle distribution in high Reynolds number turbulence. <i>Keigo Matsuda</i>	150 - Does perforation relaminarize turbulent wakes? <i>Vagesh D. Narasimhamurthy</i>	388 - A new alternating direction forcing immersed boundary method for high-fidelity simulations of a moving object in a fluid. <i>Athanasios E. Giannenas</i>	116 - Reactive species in turbulence. <i>Wenwei Wu</i>	
17:15	292 - Collapse of turbulence in particle laden channel flow at critical volume loading. <i>Pradeep Muramulla</i>	446 - Sensitivity analysis of analytical models for the prediction of trailing-edge noise. <i>Gerardo Zampino</i>	540 - How well do particles track superfluid vortices? Insights from the Gross-Pitaevskii model. <i>Umberto Giuriato</i>	276 - DNS of a temporally evolving vertical natural convection boundary layer. <i>Junhao Ke</i>	6 - Topology of quasi-singularities in an experimental turbulent swirling flow. <i>Paul Debue</i>	308 - Mean flow generation in rotating annulus with stochastic methods. <i>Wenchao Xu</i>	531 - Numerical scheme for a Lagrangian stochastic model describing rods orientation. <i>Lorenzo Campana</i>	43 - Pair dispersion in canopy flow turbulence. <i>Ron Schnapp</i>	<u>17:05</u> Statistical properties of a local energy transfer proxy in space plasmas. <i>L. Sorriso Valvo</i>
17:30	229 - Influence of the quiescent core region on inertial particle dynamics. <i>Yucheng Jie</i>	487 - Experimental investigation of laminar-turbulent transition in supersonic boundary layer on swept wings. <i>Nikolai Semionov</i>	533 - Quantum Vortex Reconnections: crossover from interaction to driven regimes. <i>Luca Galantucci</i>	323 - Suppression of Rayleigh-Taylor turbulence by time-periodic acceleration. <i>Marta Magnani</i>	143 - Instanton calculus for the onset of turbulent intermittency. <i>Luca Moriconi</i>	498 - Dynamics of transition to turbulence in axial vortex breakdown. <i>Abdulvahab Sameen</i>	515 - Direct simulation of turbulent plumes in a crossflow. <i>Owen H. Jordan</i>	240 - Analysis of the turbulent energy spectra obtained during the WADIS-2 sounding rocket campaign. <i>Victor Avsarkisov</i>	
17:45	383 - Dense suspensions flowing in channels at moderate Reynolds numbers. <i>Francesco Picano</i>	124 - On drag reduction and wake asymmetry of 3d bluff bodies with local base blowing. <i>Luc Pastur</i>	536 - Interaction between active particles and quantum vortices at low temperatures. <i>Giorgio Kristulovic</i>	72 - Direct Numerical Simulation of shock-driven turbulent mixing. <i>Tao Wang</i>	403 - Turbulent dissipative anomaly and Lagrangian irreversibility. <i>Jeremie Bec</i>	500 - Ekman layer resonance in an ocean-analog rotating tank experiment. <i>Joel Sommeria</i>	572 - Flow reconstruction using thermal wall imprints. <i>Md. Rakib Hossain</i>	550 - Unravelling wave-vortex interactions and geophysical turbulence phenomenology at oceanic mesoscales. <i>Jim Thomas</i>	
18:00		465 - Bifurcations in a shear-driven cavity. <i>Laurette S. Tuckerman</i>	548 - Flying in a superfluid. <i>Davide Proment</i>	172 - Local heat transport in turbulent Rayleigh-Bénard convection at high aspect ratio. <i>Ronald du Puits</i>		499 - Modeling planetary atmospheres and oceans in the laboratory. <i>Stefania Espa</i>	255 - Dynamic bridging modeling for coarse grained simulations of shock driven turbulent mixing. <i>Fernando F. Grinstein</i>	464 - Toward understanding the multi-scale coupling in global oceanic flows. <i>Hussein Aluie</i>	
19:00	CONFERENCE DINNER AT THE NATIONAL CAR MUSEUM								

8:30 10:00		8:30 - Invited speaker • Turbulent channel flow laden with finite-size particles. <i>Luca Brandt</i> 9:15 - Invited speaker • Turbulent boundary layers developing over rough surfaces: from the laboratory to full-scale systems. <i>Nicholas Hutchins</i>								
10:00		COFFEE BREAK								
		ROOM 1	ROOM 3	ROOM 5	ROOM 7	ROOM 9	ROOM 2	ROOM 8	ROOM 10	ROOM 4
		MULTIPHASE FLOWS Session 7 - Chair: Paolo Gualtieri	INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS Session 6 - Chair: Federico Fraternali	FLUID-STRUCTURE INTERACTION Session 1 - Chair: Olivier Cadot	COMPRESSIBLE FLOWS Session 2 - Chair: Aleksey Yatskikh	INTERMITTENCY AND SCALING Session 4 Chair: Takeshi Matsumoto	STRATIFIED FLOWS Session 3 - Chair: Luca Mortarini	VORTEX DYNAMICS AND STRUCTURE FORMATION Session 2 - Chair: Djordje S. Cantrak	GEOPHYSICAL AND ASTROPHYSICAL TURBULENCE Session 2 - Chair: Nobumitsu Yokoi	
10:45	19 - Particle distribution in a turbulent rough wall pipe. <i>Leon Chan</i>	74 - Transfer functions for flow predictions in wall-bounded turbulence. <i>Kenzo Sasaki</i>	477 - Large-Eddy Simulation of sparse and dense rigid canopy regimes. <i>Alfredo Pinelli</i>	201 - Multi-point velocity measurements in grid turbulence interacted with a spherical shock wave. <i>Kento Inokuma</i>	260 - On the stochastic modeling of the spatio-temporal structure of homogeneous and isotropic turbulence. <i>Jason Reneuve</i>	159 - Layering and vertical transport in sheared double diffusive convection in the diffusive regime. <i>Yantao Yang</i>	10 - Two-dimensional vortex statistics of the wake flow of cylinder in channel flow. <i>Xiang Qiu</i>	192 - Waving perturbation of outlying sheets and core of molecular clouds in head-on collision. <i>Valery Goryachev</i>		
11:00	273 - Creation of turbulent puff in pipe flow with microbubble suspension. <i>Kotaro Nakamura</i>	146 - Identification of the pattern of breakdown based on binary sequence statistics and cellular-automaton simulations. <i>Wen Zhang</i>	623 - Comparison of Large-Eddy Simulations and wind tunnel experiments of flow above rough surfaces. <i>Vladimir Fuka</i>	269 - Direct Numerical Simulations on effects of turbulent Mach number in interaction between planar shock wave and turbulence. <i>Kento Tanaka</i>	381 - Experimental study of inertial intermittency using Fokker-Planck equation in von Karman cryogenic turbulent flows. <i>Swapnil Kharche</i>	328 - Internal gravity waves, shear, and mixing in forced stratified turbulence. <i>Christopher Howland</i>	340 - New diagnostics for turbulent vortices. <i>Robert M. Kerr</i>	51 - Bridging the turbulent vortex dynamo theory and tropical cyclone investigations. <i>Galina Levina</i>		
11:15	492 - Wall-bounded turbulent flows: particles near surfaces. <i>Christophe Henryk</i>	193 - An input-output approach to evaluating flow response to spatially varying actuator geometries. <i>Igal Gluzman</i>	154 - A numerical study of the spanwise turbulence past a cylinder flow. <i>Andrea Ferrero</i>	77 - Reynolds and Mach number effects on the skin-friction decomposition in turbulent boundary layers. <i>Yitang Fan</i>	424 - Energy budget in wall-bounded turbulent flows. <i>Rakesh Yuvaraj</i>	228 - Turbulent mixing driven by the Faraday instability. <i>Antoine Briard</i>	52 - Vortex impact with a rough wall formed by a hexagonal lattice of posts. <i>Qianhui Li</i>	511 - Statistics of extreme convective penetration in stellar interiors. <i>Dimitar Vlaykov</i>		
11:30	461 - Transition to turbulence in core-annular pipe flow. <i>Carlos Plata</i>	378 - Adjoint sensitivity of turbulence using unstable invariant solutions. <i>Davide Lasagna</i>	474 - Analysis of transient flows over an NACA0015 airfoil toward better flow control authority of plasma actuators. <i>Takuto Ogawa</i>	187 - Direct Numerical Simulation of a BZT dense gas compressible shear layer. <i>Aurélien Vadrôt</i>	426 - Energy transfer in Rayleigh-Bénard cell. <i>David Dumont</i>	344 - Vertical drafts and mixing in stratified turbulent flows. <i>Fabio Feraco</i>	109 - Flow transitions in collisions between vortex-rings and free surfaces. <i>K. W. B. Yeo</i>	289 - Rocket-borne turbulence measurements in mesosphere/lower thermosphere region. <i>Boris Strelnikov</i>		
11:45	517 - Investigation of interfacial forces in CFD simulation of turbulent bubbly pipe flows. <i>Mohsen Shiea</i>	291 - Active flow control of the logarithmic layer. <i>Anna Guseva</i>	324 - Bistability of a pendulum in a flow. <i>Ariane Gayout</i>	262 - An LES investigation of high-speed turbulent gas jets. <i>Francesco Bonelli</i>	458 - Extracting the spectrum by spatial filtering. <i>Mahmoud Sadek</i>	165 - Differentially heated rotating annulus experiments to study gravity wave emission from jets and fronts. <i>Costanza Rodda</i>	128 - Tracking vortex surfaces frozen in the virtual velocity in non-ideal flows an extension of the Helmholtz vorticity theorem. <i>Yue Yang</i>	452 - Development of turbulence and clouds under strong wind jet in atmospheric boundary layers; Large-Eddy Simulations. <i>Metodija Meto Shapkalijevski</i>		
12:00	427 - Fluid/particle momentum coupling in turbulent jets. <i>Francesca Battista</i>	556 - Mean DNS adjoint solutions of turbulent Navier-Stokes flows. <i>Sophie Knechtel</i>	259 - Simulation of thin & long flexible objects in a turbulent flow. <i>Daniel Meyer</i>	429 - Turbulent inlet effects on the cooling efficiency of an impinging jet. A compressible DNS study. <i>Gabriele Camerlengo</i>	585 - Projection method for the analysis of small-scale intermittency in hydrodynamic turbulence. <i>Jan Friedrich</i>	258 - Invariant manifolds in stratified turbulence. <i>Nicolas Sujovolsky</i>	210 - The analysis of recirculation zone dynamics in cavity flow. <i>Paulius Vilkinis</i>	590 - Potential vorticity, helicity, and vortex structures in the atmospheric boundary layer. <i>Orto Chikhetiani</i>		
12:15	435 - The exact regularised point particle method for wall turbulence modulation. <i>Paolo Gualtieri</i>	601 - Reinforcement learning versus linear control of Rayleigh-Bénard convection. <i>Gerben Beintema</i>	88 - Turbulent wake of a freely rotating disk in a uniform flow: experiments and stochastic modelling. <i>Olivier Cadot</i>	209 - A comparative study of Richtmyer-Meshkov instability and turbulent mixing. <i>Ping Li</i>	469 - Bolgiano-Obukhov scaling in Rayleigh-Taylor turbulence at moderate Atwood number. <i>Takeshi Matsumoto</i>	56 - The linear instability of the stratified plane Poiseuille flow. <i>Uwe Harlander</i>	95 - Spatiotemporal measurement of superstructures in a turbulent boundary layer flow. <i>Daniel Schanz</i>	284 - Turbulence in marine boundary layer clouds: a meta-analysis of airborne measurements. <i>Moien Mohammadi</i>		
12:30				520 - Hot-wire measurements of the evolution of total temperature and mass flow pulsations in 2D and 3D supersonic boundary layers. <i>Aleksey Yatskikh</i>		309 - A self-organized criticality analogy of submeso motions and intermittent turbulence across a nocturnal low-level jet. <i>Luca Mortarini</i>	430 - Calculation of the pressure field from the high speed 3C PIV data of the turbulent flow and its evaluation by use of the cobra probe. <i>Djordje S. Cantrak</i>	484 - Turbulence transport modelling in core-collapsed supernovae explosion. <i>Nobumitsu Yokoi</i>		
12:45	LUNCH / YOUNG INVESTIGATORS AWARDS CEREMONY									

	ROOM 1	ROOM 3	ROOM 5	ROOM 7	ROOM 9	ROOM 2	ROOM 8	ROOM 10	ROOM 4
	MULTIPHASE FLOWS Session 8 Chair: Jacek Pozorski	INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS Session 7 Chair: Daniela Tordella	FLUID-STRUCTURE INTERACTION Session 2 Chair: Frederic Dias	TURBULENT CONVECTION Session 6 Chair: Yuji Tasaka	INTERMITTENCY AND SCALING Session 5 Chair: Andrea Mazzino	STRATIFIED FLOWS Session 4 Chair: Robert Ecke	NUMERICAL METHODS AND DATA ANALYSIS Session 5 Chair: Alessandro Corbetta	TRANSPORT AND MIXING Session 4 Chair: Dario Vincenzi	
14:00	45 - DNS and modelling dynamics of inertial particles in the under-resolved shear turbulence. <i>Alexis Barge</i>	317 - Blowup and turbulence in the 3D incompressible Euler equations on a logarithmic lattice. <i>Ciro S. Campolina</i>	12 - On the dynamics of multiple elastically-bounded flapping plates for flow energy harvesting. <i>Stefano Olivieri</i>	362 - Large-scale coherence of turbulent superstructures in Rayleigh-Bénard convection. <i>Dominik Krug</i>	90 - Weak formulation and scalings in turbulent Rayleigh-Bénard convection. <i>Sergio Chibbaro</i>	476 - Wall-bounded stably stratified turbulence at large Reynolds number. <i>Francesco Zonta</i>	574 - Numerical analysis of the heat transfer of a nano-fluid immersed in a porous medium inside a central tower-type solar receiver. <i>Agustin Mora</i>	497 - Nearfield flow establishment in a pure coherent shear source turbulent flow tunnel. <i>Anoop Mohan Vijaya</i>	
14:15	50 - Numerical analysis of fully resolved ellipsoidal particle dynamics in isotropic decaying turbulence. <i>Konstantin Fröhlich</i>	482 - Extension of the one-dimensional turbulence model towards electrohydrodynamic variable density flows. <i>Juan Ali Medina Méndez</i>	239 - Modelling dynamic stall of a pitching airfoil in large-scale freestream turbulence. <i>ThankGod Boye</i>	389 - Resolved energy budget of superstructures in Rayleigh-Bénard convection. <i>Gerrit Green</i>	205 - Energy flux vectors in anisotropic turbulence. <i>Naoto Yokoyama</i>	629 - Fractal neutral curves in stably-stratified shear flows. <i>Jonathan Healey</i>	359 - Direct measurement of vorticity in transitional to turbulent flow. <i>Markus J. Schmidt</i>	363 - Passive scalar dispersion and mixing in turbulence: Direct Numerical Simulations and modelling. <i>Michel Orsi</i>	
14:30	598 - Direct Numerical Simulations of heat transfer in fluidized beds of spherical particles. <i>Mehdi Niazi Ardekani</i>	559 - Experimental investigation of perturbation growth in the submerged jet. <i>Julia Zayko</i>	263 - The effect of turbulence on the near-field of porous disks. <i>Magnus Kyrkjebø Vinnes</i>	123 - POD analysis and modelling of large-scale reorientations in a cubic Rayleigh-Bénard cell. <i>Berengere Podvin</i>	373 Large-scale transitions in fully developed turbulence. <i>Cristian C. Lalescu</i>	219 - Transition and layering in plane Couette flow with spanwise stratification. <i>Dan Lucas</i>	227 - 3D Lagrangian particle tracking with multi-pulse shake-the-box in turbulent boundary layer flows at high Reynolds numbers. <i>Matteo Novara</i>	444 - Lagrangian mixing in wall-bounded turbulence: a network perspective. <i>Giovanni Iacobello</i>	
14:45	501 - Momentum and heat transport in multiphase natural convection. <i>Chong Shen Ng</i>	232 - Simultaneous PIV and ultrasound measurements revealing slow mode switching in a von Karman flow cell. <i>Hanna Berning</i>	593 - Modifying spatial large-scales using blowing perturbations. <i>Venkatesh Pulletikurthi</i>	147 - Vortex formation during spin-up of thermal convection. <i>Daisuke Noto</i>	566 - Internal and external fluctuations in a turbulent non-premixed planar flame. <i>Michael Gauding</i>	140 - Controlling the secondary flow in turbulent Taylor-Couette turbulence through spanwise-varying roughness. <i>Daniel Chung</i>	130 - Impact of Lagrangian trajectory filtering on turbulent statistics in 4D-PTV measurements of von Karman flow. <i>Adam Cheminet</i>	591 - Towards a simple mixing model for passive scalar transport using Hierarchical Parcel Swapping (HIPS). <i>Tommy Starick</i>	
15:00	387 - Scaling parameters of subaqueous sediment bedforms in turbulent open channel flow. <i>Markus Scherer</i>		42 - On turbulence and wave energy converters. <i>Frederic Dias</i>	208 - Slip length effect on heat transfer and temperature profiles in turbulent Rayleigh-Bénard convection. <i>Maojing Huang</i>	21 - Flowing fibers as a proxy of two-point statistics of turbulence. <i>Andrea Mazzino</i>	264 - Simulating neutrally and stably stratified turbulent Ekman flows with a stochastic turbulence model. <i>Heiko Schmidt</i>	171 - Directional sensitivity & performance comparison of Dantec Dynamics triple sensor hotwire probes. <i>F. Gokhan Egin</i>	415 - Entrainment in non-Boussinesq jets. <i>Mathieu Creysse</i>	
15:15	605 - Assessment of structural-type subfilter models for particle-laden Large-Eddy Simulations. <i>Jacek Pozorski</i>			286 - Solitary turbulent plumes in steadily-heated flow of 2D Boussinesq model. <i>Yoshiki Hirata</i>		541 - Identification and parametrisation of spontaneous Kelvin-Helmholtz instabilities in stratified turbulence via convolutional neural networks. <i>Gavin Portwood</i>	632 - Turbulence measurements in an open channel with a new ADV profiler. <i>Marie Burckbuchler</i>	610 - Closure theory for particle clustering in turbulence. <i>Taketo Aiki</i>	
15:30				271 - Development of turbulent cellular structures in Rayleigh-Bénard convection in a finite liquid metal layer. <i>Yuji Tasaka</i>		197 - Filter approach for variable density flows. <i>Robert Ecke</i>	398 - Deep learning of turbulent velocity signals. <i>Alessandro Corbetta</i>	177 - Effects of grid resolution, source size and source elevation on large eddy simulation of plume dispersion in an infinite-Re neutral boundary layer. <i>Hamidreza Ardeshiri</i>	
15:45								174 - Preferential sampling of elastic chains in turbulent flows. <i>Dario Vincenzi</i>	

Tuesday • September 3rd, 2019AULA MAGNA15:30 **Opening ceremony**16:00 Invited speaker • **Instabilities and high-resolution simulations of particle-laden flows.** *Eckart Meiburg*16:45 Invited speaker • **Enhanced mixing and entrainment in turbulent plumes and gravity currents.** *Claudia Cenedese*18:00 *Welcome cocktail reception (Campus Cittadella, Corte Interrata)*Wednesday • September 4th, 2019AULA MAGNA8:30 Invited speaker • **The subcritical route to turbulence.** *Dwight Barkley*9:15 Invited speaker • **Toward internal gravity wave turbulence: an experimental approach.** *Sylvain Joubaud*10:00 *Coffee break*ROOM: 1MULTIPHASE FLOWS • Session 1 • Chair: Luca Brandt • 10:45 - 12:4510:45 Numerical and experimental investigation of regional deposition of glass fibres in the human respiratory airway.
*Yan Cui, Miloslav Belka, Frantisek Lizal, Jure Ravnik, Matjaž Hriberšek, Paul Steinmann*11:00 Drag reduction in turbulent channel flow of flexible fibers. *Arash Alizad Banaei, Marco Edoardo Rosti, Luca Brandt*11:15 Orientation dynamics of rigid fibres in a turbulent channel flow. *Subhani Shaik, Sofia Kuperman, Vladislav Rinsky, Rene van Hout*11:30 The Lumley triangle: a tool to analyse particle rotation anisotropies. *Helge I. Andersson, Kun Yang, Lihao Zhao*11:45 Single-drop breakup in homogeneous isotropic turbulence. *Marc Avila, Alberto Vela-Martín*12:00 Modeling of coalescence and breakup of fluid particles in turbulent flows. *Antonio Buffo, Marco Vanni, Daniele Marchisio*12:15 Cloud-clear air interfaces: Population Balance Equation solutions by considering nucleation information from in-situ measurements, and by modeling the droplet growth on super-saturation fluctuation data from numerical simulation.
*Mina Golshan, Federico Fratemale, Marco Vanni, Daniela Tordella*12:30 Dynamics of small flexible fibers in turbulent channel flow. *Cristian Marchioli, Diego Dotto*12:45 *Lunch*MULTIPHASE FLOWS • Session 2 • Room 1 • Chair: Alfredo Soldati • 14:00 - 15:4514:00 Droplet nucleation in turbulent steam jets. *Andrea Gallegati, Francesco Battista, Paolo Gualtieri, Carlo Massimo Casciola*14:15 Bubble break-up in turbulence. *Luc Deike, Daniel J. Ruth, Stephane Perrard, Wouter Mostert*14:30 Experimental investigation of bubble breakup in strong turbulence.
*Rui Ni, Ashik Ullah Mohammad Masuk, Ashwanth Salibindla, Shiyong Tan, Yinghe Qi*14:45 Effect of soluble surfactant on turbulent bubbly channel flow undergoing topology changes.
*Metin Mucradoglu, Zaheer Ahmed, Daulet Izbassarov, Outi Tammissola, Jiakai Lu, Gretar Tryggvason*15:00 Dynamics and fragmentation of small flexible fibers in turbulence.
*Sofia Allende, Christophe Henry, Jérémie Bec*15:15 Fragmentation of fibres in turbulent flows.
*Christophe Brouzet, Benjamin Favier, Marie-Julie Dalbe, Nicolas Vandenbergh, Gautier Verhille*15:30 Droplet size distribution in surfactant-laden turbulent channel flow.
*Alfredo Soldati, Giovanni Soligo, Alessio Roccon*15:45 *Coffee break*MULTIPHASE FLOWS • Session 3 • Room 1 • Chair: Mikhael Gorokhovski • 16:15 - 18:1516:15 Evaporating droplets in homogeneous shear turbulence. *Philipp Weiss, Daniel W. Meyer, Patrick Jenny*16:30 3D-reconstruction of O₂ bubble wake concentration fields of two consecutive bubbles.
*Alexandra von Kameke, R. Colombi, S. Ruttinger, S. Kastens, M. Schluter*16:45 Multiscale Lattice Boltzmann simulations of droplet dynamics in turbulent flows.
*Felix Milan, Luca Biferale, Mauro Sbragaglia, Federico Toschi*17:00 On the conservation of energy for interface-capturing techniques for multiphase flows. Application to falling films.
*Nicolas Valle, Francesc Xavier Trias, Jesús Castro*17:15 Analysis and modeling of evaporating dilute polydispersed sprays in isotropic turbulence.
*Valentin Giddey, Daniel Werner Meyer, Philipp Weiss, Patrick Jenny*17:30 On the momentum and heat exchange in wind-wave turbulent flows. *Federica Romoli, Lorenzo Silvestri, Andrea Cimarelli*17:45 Two-phase homogeneous shear turbulence. *Marco E. Rosti, Zhouyang Ge, Suhaz S. Jain, Michael S. Dodd, Luca Brandt*18:00 The stochastic subgrid model for droplet vaporization in a highly turbulent flow. *Mikhael Gorokhovski, Surya Kaundinya Oruganti*

ROOM: 3**INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS • Session 1 • Chair: Yohann Duguet • 10:45 - 12:30**

- 10:45 Optimal initial perturbations and the minimal seed of blasius boundary-layer flow.
Christos Vavaliaris, Miguel Beneitez, Dan S. Henningson
- 11:00 Transition in boundary layers with freestream turbulence. *Kristina Đurović, Philipp Schlatter, Ardeshir Hanifi, Dan S. Henningson*
- 11:15 Boundary layer transition induced by freestream turbulence subject to strong pressure gradient and high-curvature effects.
Yaomin Zhao, Richard D. Sandberg, Ivan Marusic
- 11:30 Invariant solutions of the filtered Navier-Stokes equations representative of Large-scale motions in the asymptotic suction boundary layer flow. *Sajjad Azimi, Carlo Cossu, Tobias M. Schneider*
- 11:45 Transition to turbulence in görtler flows. *Jeremie Dagaut, Guillaume Balarac, Maria-Eletta Negretti, Christophe Brun*
- 12:00 Noise emission of sub- and super-sonic boundary layer flows. *Yi Zhang, Martin Oberlack*
- 12:15 Spatial evolution of transition inside porous media. *Xu Chu, Yongxiang Wu, Ulrich Rist, Bernhard Weigand*
- 12:30 On the verge of laminarization in boundary layer flows. *Yohann Duguet, Taras Khapko, Philipp Schlatter, Dan S. Henningson*
- 12:45 *Lunch*

INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS • Session 2 • Room 3 • Chair: Daniela Tordella**14:00 - 15:45**

- 14:00 Bursting and amplitude explosions at the onset of turbulent stripes in channel flow.
Bjorn Hof, Chaitanya S. Paranjape, Vasudevan Mukund, Nazmi Budanur, Baofang Song, Yohann Duguet
- 14:15 Unsteady localized wave packets in laminar shock-wave/boundary-layer interactions.
Sébastien Niessen, Koen J. Groot, Stefan Hickel, Vincent E. Terrapon
- 14:30 Experiments on large-scale flows around turbulent spots.
José Eduardo Westfreid, Lukasz Klotz, Tao Liu, Alexandr Pavlenko, Benoit Semin
- 14:45 There and back again, build up and collapse of transitional plane Couette flow captured by rare events approaches. *Joran Rolland*
- 15:00 Turbulence threshold for plane Poiseuille flow. *Sebastien Gomé, Laurette S. Tuckerman, Akshunna Dogra*
- 15:15 Wave focusing and multiple dispersion transitions of perturbation waves in the plane Poiseuille flow.
Gabriele Nastro, Federico Fraternali, Daniela Tordella
- 15:30 Nonlinear dynamics of bursting spots in subcritical inclined convection. *Florian Reetz, Tobias M. Schneider*
- 15:45 *Coffee break*

INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS • Session 3 • Room 3 • Chair: Dan S. Henningson**16:15 - 18:15**

- 16:15 Feedback stabilization of a plane Couette flow exact coherent structure. *Geoffroy C. P. Claisse, Aji S. Sharma*
- 16:30 Optimal forcing to destabilise turbulence in a pipe flow. *Elena Marensi, Ashley P. Willis, Rich R. Kerswell*
- 16:15 Towards an extension of Barkley's pipe-flow model to transitional plane Couette flow. *Cristobal Arratia*
- 17:00 Wavy instability in pulsating pipe flow. *Atul Varshney, Duo Xu, Xingyu Ma, Bjorn Höf*
- 17:15 Interscale energy transport for turbulent stripe in rotating plane Couette flow. *Tomohiro Nimura, Takuya Kawata, Takahiro Tsukahara*
- 17:30 System identification using neural networks applied to experimental noise-amplifier flows characterized by real-time optical flow velocimetry. *Antonios Giannopoulos, Jean-Luc Aider*
- 17:45 Mean flow analysis of a turbulent wind turbine wake.
Giovanni De Cillis, Stefania Cherubini, Onofrio Semeraro, Stefano Leonardi, Pietro De Palma
- 18:00 What can we learn from the Edge about bypass transition? *Dan S. Henningson, Miguel Beneitez, Yohann Duguet, Philipp Schlatter*

ROOM: 5**WALL BOUNDED TURBULENCE • Session 1 • Chair: Ugo Piomelli • 10:45 - 12:45**

- 10:45 Particle image velocimetry measurement on the turbulent boundary layer over convergent-divergent riblets.
Fang Xu, Shan Zhong, Shanying Zhang
- 11:00 Diagnostic plot scaling accounting for adverse pressure gradient history effect.
Artur Dróżdż, Paweł Niegodajew, Witold Elsner, Ricardo Vinuesa, Ramis Örlü, Philipp Schlatter
- 11:15 Turbulence dynamics in separated flows: the generalised Kolmogorov equation for inhomogeneous anisotropic conditions.
Jean-Paul Mollicone, Francesco Battista, Paolo Gualtieri, Carlo Massimo Casciola
- 11:30 Experiments in non-equilibrium turbulent boundary layers with favorable pressure gradients. *Ralph Volino*
- 11:45 The effect of momentum exchange by coherent structures on the friction factor and mean velocity profile at extreme Reynolds numbers. *Hamidreza Anbarloaei, Fabio Ramos, Daniel O. A. Cruz, Cecilia Mageski*
- 12:00 Experimental investigation of spatially developing turbulent boundary layers over longitudinal grooves.
Michael Klaas, Wenfeng Li, Wolfgang Schröder
- 12:15 The quest for high Reynolds number turbulence: results from and future perspectives of clope.
Gabriele Bellani, Henrik Alfredsson, Jens Fransson, Hassan Nagib, Ramis Örlü, Alessandro Talamelli
- 12:30 Numerical investigation of flow control by embedded vortices in a diffuser. *Ugo Piomelli, Yang Zhang, Gang Chen, Jiakuan Xu*
- 12:45 *Lunch*

WALL BOUNDED TURBULENCE • Session 2 • Room 5 • Chair: Paolo Luchini • 14:00 - 15:45

- 14:00 Dynamics and evolution of turbulent Taylor rolls. *Francesco Sacco, Rodolfo Ostilla-Mónico, Roberto Verzicco*
- 14:15 Turbulence: the view from the wall. *Miguel P. Encinar, Javier Jimenez*
- 14:30 A realizable turbulence model for the Reynolds stress based on the square root tensor. *Kazuhiro Inagaki, Taketo Aiki, Fujihiko Hamba*
- 14:45 Statistics of streamline geometry in wall-bounded turbulence. *Rina Perven, Joseph Klewicki, Jimmy Philip*
- 15:00 Hierarchy of vortices in a developed turbulent boundary layer. *Susumu Goto, Yutaro Motoori*
- 15:15 How invariant solutions support the formation of oblique turbulent-laminar stripes. *Tobias M. Schneider, Florian Reetz*
- 15:30 A one dimensional example of the contrasting behaviour of laminar and turbulent flow. *Paolo Luchini*
- 15:45 *Coffee break*

WALL BOUNDED TURBULENCE • Session 3 • Room 5 • Chair: Lipo Wang • 16:15 - 18:15

- 16:15 Bifurcations of turbulent patterns in channel flow. *Masaki Shimizu, Paul Manneville*
- 16:30 Secondary flow generation mechanisms in turbulent sinusoidal channels. *Hassan Nagib, Alvaro Vidal, Philipp Schlatter, Ricardo Vinuesa*
- 16:45 Structure of the skin-friction drag fluctuations in turbulent channel flows. *Cheng Cheng, Weipeng Li, Adrian Lozano Duran, Hong Liu*
- 17:00 Mechanism of quasi-linear Orr burst in turbulent channel flows. *Yongseok Kwon, Javier Jimenez*
- 17:15 Data-driven quantification of nonlinear interactions in the resolvent analysis of turbulent channel flow. *Ryan M. McMullen, Kevin Rosenberg, Beverley J. McKeon*
- 17:30 Analysis of the skin-friction line structure in channel turbulence. *Lipo Wang, Weipeng Li*

ROOM: 7**TURBULENT CONVECTION • Session 1 • Chair: Detlef Lohse • 10:45 - 12:30**

- 10:45 Plume statistics in a rough Rayleigh-Bénard convection cell. *Julien Salort, Laura Guislain, Francesca Chillà*
- 11:00 Elusive transition to the ultimate regime of turbulent Rayleigh-Bénard convection. *Pavel Urban, Pavel Hanzelka, Tomáš Králík, Michal Macek, Věra Musilová, Ladislav Skrbek*
- 11:15 The ultimate state of convection without the hot air. *Philippe-E. Roche*

- 11:30 Direct Numerical Simulations towards ultimate turbulence. *Richard J. A. M. Stevens, Roberto Verzicco, Detlef Lohse*
- 11:45 Velocity structure functions of thermal convection and hydrodynamic turbulence follow similar scaling. *Shashwat Bhattacharya, Shubhadeep Sadhukhan, Anirban Guha, Mahendra K. Verma*
- 12:00 Unifying view on heat transport enhancement behaviour in confined Rayleigh-Bénard, rotating Rayleigh-Bénard, double diffusive convection and quasi-static magnetoconvection. *Kai Leong Chong, Yantao Yang, Zi Li Lim, Shi-Di Huang, Jin-Qiang Zhong, Richard J. A. M. Stevens, Roberto Verzicco, Detlef Lohse, Ke-Qing Xia*
- 12:15 Transition to the ultimate regime in 2D Rayleigh-Bénard convection. *Detlef Lohse, Xiaojue Zhu, Varghese Mathai, Richard J. A. M. Stevens, Roberto Verzicco*
- 12:30 *Lunch*

TURBULENT CONVECTION • Session 2 • Room 7 • Chair: Anne Sergent • 14:00 - 15:30

- 14:00 How surface roughness reduces heat transport in turbulent Rayleigh-Bénard convection. *Quan Zhou, Yi-Zhao Zhang, Chao Sun*
- 14:15 About the influence of rough boundaries on the heat transport in highly turbulent thermal convection. *Stephan Weiss, Chien-Chia Liu, Xiaozhou He, Guenter Ahlers, Eberhard Bodenschatz*
- 14:30 Investigating Reynolds analogy over riblet roughened surfaces. *Amirreza Rouhi, Davide Modesti, Sebastian Endrikat, Nicholas Hutchins, Daniel Chung*
- 14:45 Boundary layer structure for different plate boundary conditions. *Najmeh Foroozani, Dmitry Krasnov, Jörg Schumacher*
- 15:00 Pore-scale-resolving Direct Numerical Simulations of turbulent natural convection in porous media. *Stefan Gasow, Andrey V. Kuznetsov, Marc Avila, Yan Jin*
- 15:15 Heat transfert at the roughness scale in turbulent Rayleigh-Bénard convection. *Anne Sergent, Mebarek Belkadi, Bérengère Podvin, Yann Fraigneau*
- 15:45 *Coffee break*

TURBULENT CONVECTION • Session 3 • Room 7 • Chair: Rodion Stepanov • 16:15 - 18:15

- 16:15 The influence of spatial boundary heat distribution on turbulent convection. *Johanna Mader, John Craske, Maarten van Reeuwijk*
- 16:30 Transition to the ultimate regime in a radiatively driven convection experiment. *Basile Gallet, Vincent Bouillaut, Simon Lepot, Sébastien Aumaitre*
- 16:45 Dynamic heterogeneity and conditional statistics of non-gaussian temperature fluctuations in turbulent thermal convection. *Xiaozhou He, Yin Wang, Penger Tong*
- 17:00 Dense Lagrangian particle tracking of turbulent Rayleigh-Bénard convection in a cylindrical sample using shake-the-box. *Johannes Bosbach, Daniel Schanz, Philipp Godbersen, Andreas Schröder*
- 17:15 The influence of thermal boundary conditions on turbulent forced convection pipe flow. *Steffen Straub, Pourya Forooghi, Luca Marocco, Ricardo Vinuesa, Philipp Schlatter, Thomas Wetzel, Bettina Frohnäpfel*
- 17:30 Numerical study of radiatively driven convection: influence of the Prandtl number on the heat flux in the mixing-length regime. *Miquel Benjamin, Vincent Bouillaut, Sébastien Aumaitre, Basile Gallet*
- 17:45 Design process of a vertical backward facing step experiment for forced- and mixed-convection low Prandtl number flows. *Christine Steiner, Thomas Schaub, Kevin Krauth, Joachim Konrad*
- 18:00 Mechanisms of helicity excitation in large-scale convection in closed volumes. *Rodion Stepanov, Andrei Vasiliev, Peter Frick, Andrei Sukhanovskii, Valerij Titov, Frank Stefani*

ROOM: 9**INTERMITTENCY AND SCALING** • Session 1 • Chair: Béréngère Dubrulle • 10:45 - 12:45

- 10:45 Experimental study of the bottleneck in fully developed turbulence. *Eberhard Bodenschatz, Christian Küchler, Gregory Bewley*
- 11:00 4D particle tracking velocimetry measurements in a von Karman turbulence experiment. *Yaşar Ostovan, Christophe Cuvier, Paul Debye, Valentina Valori, Adam Cheminet, Tarek Chaabo, Jean-Marc Foucaut, Jean-Philippe Laval, Cécile Wiertel-Gasquet, Vincent Padilla, Béréngère Dubrulle, François Daviaud*
- 11:15 Inertial range skewness of the longitudinal velocity derivative in locally isotropic turbulence. *Semion Sukoriansky, Eliezer Kit, Fernando Harindra*
- 11:30 On a new symmetry-induced modeling framework applied to the closure problem of turbulence. *Dario Klingenberg, Martin Oberlack, Dominik Pluemacher*
- 11:45 Arrow of time in turbulent flows and its ramifications. *Mahendra Verma*
- 12:00 Universality of power fluctuations in turbulence. *Rémi Zamansky, Wouter Bos*
- 12:15 Non-locality of strain rate and vortex stretching in turbulent flows. *Dhawal Buaria, Alain Pumir, Eberhard Bodenschatz*

- 12:30 Eulerian vs Lagrangian irreversibility in an experimental turbulent von Karman flow. *Béréngère Dubrulle, Paul Debye, Valentina Valori, Tarek Chaabo, Adam Cheminet, Yaşar Ostovan, Christophe Cuvier, Jean-Philippe Laval, Jean-Marc Foucaut, Cécile Wiertel, Vincent Padilla, François Daviaud*

12:45 *Lunch***BOUNDARY FREE TURBULENCE** • Session • Room 9 • Chair: Alain Pumir • 14:00 - 15:45

- 14:00 Dynamics of the tetrad-based velocity gradient in turbulent flows. *Ping-Fan Yang, Alain Pumir, Haitao Xu*
- 14:15 Kinematics and dynamics of scale-local stress/strain alignment in turbulence. *Nicholas Ouellette, Joseph Ballouz*
- 14:30 Vortex stretching is not the main cause of the turbulent energy cascade. *Andrew Bragg, Maurizio Carbone*
- 14:45 Inverse cascade in 3D homogeneous isotropic turbulence. *Franck Plunian, Andrei Teimurazov, Rodion Stepanov, Mahendra Kumar Verma*
- 15:00 A Lagrangian model for the velocity gradient tensor in turbulent flows based on strain-rate eigenframe variables. *Maurizio Carbone, Andrew Bragg, Michele Iovieno*
- 15:15 Effects of synthetic low-level jet on scaled-down wind farm performance. *Luciano Castillo, Ali Doosttalab, Diego Siguenza, Josuenuy O'Donnell, Venkatesh Pulletikurthi, Humberto Bocanegra Evans, Yaqing Jin, Leonardo P. Chamorro*
- 15:30 How large can velocity gradients be in turbulent flows? *Alain Pumir, Dhawal Buaria, Eberhard Bodenschatz, P. K. Yeung*
- 15:45 *Coffee break*

BOUNDARY FREE TURBULENCE • Session 2 • Room 9 • Chair: Elisabetta De Angelis • 16:15 - 18:00

- 16:15 Universality of enstrophy dynamics within the turbulent/non-turbulent interface layer. *Marco Zecchetto, Carlos B. da Silva*
- 16:30 Entrainment and self-similarity in negatively buoyant turbulent jets. *Liam Milton-McGurk, Nicholas Williamson, Krishna M. Talluru, Steven Armfield, Michael Kirkpatrick*
- 16:45 Statistics of the irrotational flow region near the turbulent/non-turbulent interface layer. *Ricardo P. Xavier, Carlos B. da Silva, Miguel A. C. Teixeira*
- 17:00 Velocity and scalar structure near the turbulent/non-turbulent interface compared to internal turbulence. *Gerrit Elsinga, Carlos B. da Silva*
- 17:15 Particle entrainment through a turbulent/non-turbulent interface. *Tai Wada, Christos Vassilicos*
- 17:30 The statistical topology of a turbulent-non-turbulent interface. *John Craske, Jean-Paul Mollicone, Vishnu Satheesh Kumar Nair, Maarten van Reeuwijk*
- 17:45 Scale-by-scale analysis of a turbulent temporal jet. *Elisabetta De Angelis, Andrea Cimarelli, Jean-Paul Mollicone, Maarten van Reeuwijk, Thorsten Stoesser*

ROOM: 2**ROTATING FLOWS • Session 1 • Chair: Rudie P. J. Kunnen • 10:45 - 12:30**

- 10:45 Subcritical turbulent condensate in rotating Rayleigh-Bénard convection. *Benjamin Favier, Céline Guervilly, Edgar Knobloch*
- 11:00 Geostrophic turbulent regime of rotating Rayleigh-Bénard convection at different Prandtl numbers.
Andrés J. Aguirre-Guzmán, Matteo Madonia, Jonathan S. Cheng, Rodolfo Ostilla-Mónico, Herman J. H. Clercx, Rudie P.J. Kunnen
- 11:15 Global flow structures in rotating Rayleigh-Bénard convection in pressured SF_6 . *Xuan Zhang, Olga Shishkina*
- 11:30 Rotating homogeneous Rayleigh-Bénard convection. *Francesco Toselli, Stefano Musacchio, Guido Boffetta*
- 11:45 Rotating turbulent Rayleigh-Bénard convection at very large Rayleigh numbers.
Marcel Wedi, Dennis van Gils, Guenter Ahlers, Eberhard Bodenschatz, Stephan Weiss
- 12:00 Tilted rotating Rayleigh-Bénard convection. *Lyuba Novi, Jost von Hardenberg, Antonello Provenzale*
- 12:15 Explaining sharp transitions in turbulent rotating Rayleigh-Bénard convection with Lagrangian statistics.
Rudie P. J. Kunnen, Kim M. J. Alards, Richard J. A. M. Stevens, Detlef Lohse, Federico Toschi, Herman J. H. Clercx

12:30 *Lunch***STRATIFIED FLOWS • Session 1 • Room 2 • Chair: Alex Liberzon • 14:00 - 15:45**

- 14:00 DNS study on large-scale and small-scale flow structures of stably-stratified shear layers.
Tomoaki Watanabe, James J. Riley, Koji Nagata, Keigo Matsuda, Ryo Onishi
- 14:15 Entrainment zone properties in the atmospheric boundary layer conditioned on turbulent and non-turbulent regions.
Katherine Fodor, Juan Pedro Mellado
- 14:30 Signature and energetics of internal gravity waves in stratified turbulence. *Andrea Maffioli, Alexandre Delache, Fabien Godefert*
- 14:45 Can implicit LES of gravity currents match the mixing efficiency of a DNS?
Ricardo André Schuh Frantz, Bruno Avila Farenzena, Jorge Ugo Silvestrini
- 15:00 Turbulent entrainment in sheared convective boundary layers. *Armin Haghshenas, Juan Pedro Mellado*
- 15:15 A simple measure for predicting vortex pairing in shear layers. *Mahendra K. Verma, Anirban Guha, Mona Rahmani*
- 15:30 Particles crossing density interfaces. *Alex Liberzon, Lilly Verso, Maarten van Reeuwijk*
- 15:45 *Coffee break*

STRATIFIED FLOWS • Session 2 • Room 2 • Chair: Colm-cille Caulfield • 16:15 - 18:00

- 16:15 Revisiting Bolgiano-Obukhov scaling for stably stratified turbulence. *Shadab Alam, Anirban Guha, Mahendra K. Verma*
- 16:30 Decaying turbulence in a stratified fluid generated by a high-Prandtl-number scalar. *Hideshi Hanazaki, Shinya Okino*
- 16:45 Kelvin-Helmholtz instability above Richardson number $1/4$. *Jeremy Parker, Colm-cille Caulfield, Rich Kerswell*
- 17:00 Regime transitions and energetics of sustained stratified shear flows. *Adrien Lefauve, Jamie Partridge, Paul Linden*
- 17:15 Sensitization of eddy-viscosity models to buoyancy effects for predicting natural convection flows.
Syed Mohd Saad Jameel, Remi Manceau, Vincent Herbert
- 17:30 Subcritical and supercritical transitions for stratified fluid in a nearly semicircular pool. *Abhishek Kumar, Alban Pothèrat*
- 17:45 Experimental investigation of lock exchange flow using MTV/MTT. *Tanmay Agrawal, Spencer Zimmerman, Jimmy Philip, Joseph Klewicki*
- 18:00 Asymptotic dynamics of high dynamic range stratified turbulence. *Colm-cille Caulfield, Gavin D. Portwood, Steve de Bruyn Kops*

ROOM: 8**NUMERICAL METHODS AND DATA ANALYSIS • Session 1 • Room 8 • Chair: Antonella Abbà • 10:45 - 12:45**

- 10:45 Temporal Large-Eddy Simulation with exact deconvolution. *Daniel Oberle, David Pruett, Patrick Jenny*
- 11:00 On a proper tensor-diffusivity model for Large-Eddy Simulations of Rayleigh-Bénard convection.
F. Xavier Trias, Firas Dabbagh, Daniel Santos, Andrey Gorobets, Assensi Oliva
- 11:15 Controlled eddy simulation of complex wall bounded flows at large Reynolds numbers. *Yan Jin*
- 11:30 Effects of spatial filtering on scale-to-scale energy flux. *Daniel Feldmann, Jan Chen, Marc Avila*
- 11:45 Development and investigation of thermal subgrid-scale models for Large-Eddy Lattice Boltzmann methods.
Maximilian Gaedke, Daniel Rau, Hermann Nirschl, Mathias J. Krause
- 12:00 Spectral simulations of quantum turbulence using the Gross-Pitaevskii equation.
Danaila Ionut, Michikazu Kobayashi, Corentin Lathode, Francky Luddens, Ph. Parnaudeau, Luminita Danaila
- 12:15 A general formalism for scales interaction and their modelling in les.
Antonella Abbà, Andrea Cimarelli, Andrea Crivellini, Massimo Germano
- 12:30 *Lunch*

TURBULENCE, WAVES AND INSTABILITIES IN PLASMAS • Room 8 • Chair: William H. Matthaeus • 14:00 - 15:45

- 14:00 Solar wind turbulence.
Renaud Ferrand, Nahuel Andrés, Fouad Sahaoui, Sébastien Galtier, Romain Meyrand, Pablo Mininni, Pablo Dmitruk
- 14:15 Shear flow instabilities in asymmetric magnetic reconnection. *Dario Borgogno, Anna Perona, Daniela Grasso, Emanuele Tassi*
- 14:30 Macrophysics and microphysics of energy transfer in kinetic plasma. *Yan Yang, Minping Wan, William H. Matthaeus, Luca Sorriso-Valvo, Tulasi N. Parashar, Quanming Lu, Yipeng Shi, Shiyi Chen*
- 14:15 Curvature of Lagrangian trajectories in turbulence with zonal flows. *Benjamin Kadoch, Wouter J. T. Bos, Kai Schneider*
- 15:00 Simulation study of high magnetic Prandtl number magnetohydrodynamic turbulence under hall effects.
Hideaki Miura, Jingyuan Yang, Toshiyuki Gotoh
- 15:15 Magnetic turbulence anisotropy and cascade rates in the heliosheath and local interstellar medium as seen by the voyagers.
Federico Fraternali, Nikolai V Pogorelov, John D Richardson, Daniela Tordella
- 15:30 Solar wind and magnetosheath observations of energy transfer, intermittency and dissipation. *William H. Matthaeus, Alex Chasapis, Riddhi Bandyopadhyay, Rohit Chhiber, Tulasi Parashar, Manuel Cuesta, Yan Yang, Minping Wan, Luca Sorriso-Valvo*
- 15:45 *Coffee break*

NUMERICAL METHODS AND DATA ANALYSIS • Session 2 • Room 8 • Chair: Luca Biferale • 16:15 - 18:15

- 16:15 Turbulence modeling using artificial neural network. *Yuji Hattori, Satoshi Miyazaki*
- 16:30 Predictions of turbulent shear flows by neural networks and application to off-wall boundary conditions.
Luca Guastoni, Prem Anand Srinivasan, Hossein Azizpour, Philipp Schlatter, Ricardo Vinuesa
- 16:45 From deep to physics-informed learning of turbulence: diagnostics. *Michael Chertkov, Arvind Mohan*
- 17:00 Can artificial neural networks trained through deep reinforcement learning become a tool in active flow control and turbulence?
Jean Rabault, Miroslav Kuchta, Alexander Kuhnle, Atle Jensen, Bernd R. Noack
- 17:15 Optimal sub-grid-scale models for inertial range turbulence. *Michele Buzzicotti, Luca Biferale, Fabio Bonaccorso, Kartik Iyer*
- 17:30 Wavelet-convolutional LSTM: an efficient deep learning paradigm for high fidelity turbulence.
Arvind Mohan, Don Daniel, Daniel Livescu, Michael Chertkov
- 17:45 Data-driven investigations of scale interactions in turbulent flows. *Nikki Vercauteren, Thomas von Larcher, Abhishek Paraswarar Harikrishnan, Johannes von Lindheim, Gitta Kutyniok, Rupert Klein*
- 18:00 Inferring physical parameters in turbulence: from nudging to machine learning.
Luca Biferale, Michele Buzzicotti, Fabio Bonaccorso, Patricio Clark di Leoni

ROOM: 10**TWO-DIMENSIONAL TURBULENCE** • Session 1 • Chair: Gregory Falkovich • 10:45 - 12:30

- 10:45 Effect of rotation on turbulent thermal convection on a hemisphere. *Patrick Fischer, Charles-Henri Bruneau, Hamid Kellay*
- 11:00 Condensate in quasi two-dimensional turbulence. *Stefano Musacchio, Guido Boffetta*
- 11:15 Condensates in thin-layer turbulence. *Adrian van Kan, Alexandros Alexakis, Takahiro Nemoto*
- 11:30 Generalised flows and turbulent transport. *Simon Thalabard, Bec Jeremie*
- 11:45 Turbulence-driven rotors in 2D turbulent flows. *Nicolas Francois, Hua Xia, Horst Punzmann, Michael Shats*
- 12:00 Sub-surface PIV measurements of velocity fields in Faraday flows. *Raffaele Colombi, Michael Schlüter, Alexandra von Kameke*
- 12:15 Turbulence appearance and non-appearance in thin fluid layers. *Gregory Falkovich, Natalia Vladimirova*
- 12:30 *Lunch*

TRANSPORT AND MIXING • Session 1 • Room 10 • Chair: Joerg Schumacher • 14:00 - 15:45

- 14:00 Turbulent mixing in a channel flow. *Dimitrios Papavassiliou, Quoc T. Nguyen*
- 14:15 Two-point small-scale flow properties measured by means of Lagrangian rigid fiber tracking.
Mattia Cavaola, Stefano Olivieri, Andrea Mazzino
- 14:30 Non-Gaussianity in turbulent relative dispersion. *Benjamin Devenish, David Thomson*
- 14:45 A structural subgrid-scale model for Large-Eddy Simulation of relative dispersion of particles in isotropic turbulent flows. *Guodong Jin*
- 15:00 Anisotropic passive scalar fluctuations with uniform mean gradient in statistically homogeneous isotropic turbulence.
Tatsuya Yasuda, Toshiyuki Gotoh, Takeshi Watanabe, Izumi Saito
- 15:15 Turbulent mixing in variable-density helium-air jet.
Yacine Brahami, Michael Gauding, Dominik Denker, Emilien Varea, Luminita Danaila
- 15:30 Lagrangian perspective on turbulent passive scalar mixing.
Joerg Schumacher, Paul Goetzfried, Mohammad S. Emran, Emmanuel Villermaux
- 15:45 *Coffee break*

TRANSPORT AND MIXING • Session 2 • Room 10 • Chair: Rahul Pandit • 16:15 - 18:15

- 16:15 Buoyancy regulation of non-motile phytoplankton in a turbulent flow. *Matteo Borgnino, Guido Boffetta, Filippo De Lillo, Idan Tuval*
- 16:30 Settling dynamics of inertial particle. *David De Souza, Romain Monchaux, Anne Dejoan*
- 16:45 Turbophoresis of small heavy particles in homogeneous turbulence. *Robin Vallee, Jérémie Bec*
- 17:00 Broadening of cloud droplet size distribution and liquid water content spectrum in turbulence. *Izumi Saito, Tatsuya Yasuda, Toshiyuki Gotoh, Takeshi Watanabe*
- 17:15 Transport properties of quasi-neutrally-buoyant inertial particles. *Marco Martins Afonso, Sílvia M. A. Gama, Andrea Mazzino, Paolo Muratore-Ginanneschi*
- 17:30 Design, construction and characterization of instrumented particles for the Lagrangian characterization of turbulent flows. *Facundo Cabrera, Pablo Cobelli*
- 17:45 Spheroids in decaying turbulence from Taylor-Green vortex flow. *Rohith Jayaram, Juriaan J. J. Gillissen, Lihao Zhao, Helge I. Andersson*
- 18:00 Path-planning smart swimmers in turbulent flows. *Rahul Pandit, A. Jaya Kumar, Akhilesh Kumar Verma, Jeremie Bec*

ROOM: 4**COMPLEX AND ACTIVE FLOWS** • Chair: Massimo Cencini • 10:45 - 12:30

- 10:45 Effects of large-scale turbulence on the preferential concentration of elongated gyrotactic swimmers. *Filippo De Lillo, Guido Boffetta, Matteo Borgnino, Massimo Cencini*
- 11:00 Surfacing and clustering of gyrotactic micro-swimmers in free-surface turbulence. *Harshit Bhatia, Cristian Marchioli, Alfredo Soldati*
- 11:15 Controlling active spinners using vortex lattices. *Horst Punzmann, Hua Xia, Jean-Baptiste Gorce, Nicolas Francois, Michael Shats*
- 11:30 Rotation rate and preferential alignment of rods in convective turbulence from experiments and simulations. *Enrico Calzavarini, Linfeng Jiang, Chao Sun*
- 11:45 Kinematics of large buoyant ellipsoids rising in a quiescent fluid. *Jelle Will, Varghese Mathai, Dominik Krug, Sander Huisman, Detlef Lohse, Chao Sun*
- 12:00 Phase transitions to condensate formation in two-dimensional turbulence. *Moritz Linkmann, Bruno Eckhardt, Manuel Hohmann, Guido Boffetta, Cristina M. Marchetti*
- 12:15 Orientation of non-spherical swimming particles in turbulence. *Massimo Cencini, Guido Boffetta, Matteo Borgnino, Filippo De Lillo, Kristian Gustavsson, Bernhard Mehlig*
- 12:30 *Lunch*

NON-NEWTONIAN FLOWS • Session 1 • Room 4 • Chair: Rich Kerswell • 14:00 - 15:30

- 14:00 DNS-DEM simulation of turbulent non-newtonian suspension flow. *Enzu Zheng, Murray Rudman, Shibo Kuang, Andrew Chryst*
- 14:15 Some mechanism processes concerning shear-thinning t-junction mixing with Direct Numerical Simulation. *Haining Luo, Delache Alexandre, Simoens Serge*
- 14:30 Temporal statistics in two-dimensional elastic turbulence. *Himani Garg, Stefano Berti, Enrico Calzavarini*
- 14:45 Effects of numerical resolution on elasto-inertial turbulence. *Vincent Terrapon, Yves Dubief, Fuqian Yin, Jacob Page, Rich Kerswell*
- 15:00 Effects of viscoelasticity on turbulent bubbly flow. *Otu Tammisola, Daulet Izbassarov, Zaheer Ahmed, Metin Muradoglu*
- 15:15 Two-dimensional elasto-inertial coherent structures in viscoelastic channel flow. *Rich Kerswell, Jacob Page, Yves Dubief*
- 15:45 *Coffee break*

Thursday • September 5th, 2019

AULA MAGNA

8:30 Invited speaker • **Structures and scalings in natural thermal convection.** *Olga Shishkina*

9:15 Invited speaker • **Experimental investigation of turbulence and complex flows.** *Jerry Westerweel*

10:00 *Coffee break*

ROOM: 1

MULTIPHASE FLOWS • Session 4 • Chair: Caroline Nore • 10:45 - 12:45

10:45 Numerical study of gravity effects on the symmetry and development of particle-laden flows.
Matthew Xinchen Zhang, Graham Nathan, Zhao Feng Tian, Ray Cheng Chin

11:00 Modulation of very large scale motions by inertial particles. *David Richter, Guiquan Wang*

11:15 Direct Numerical Simulation of particle clustering in the wake of flow past a circular cylinder.
Zhaoyu Shi, Håkon Strandenæs, Fengjian Jiang, Lihao Zhao, Helge Ingolf Andersson

11:30 Cluster of inertial particles and fluid acceleration in turbulence. *Sunao Oka, Susumu Goto*

11:45 Turbulence modification of a particle-laden flow in a rocket engine model. *Sabrina Kalenko, Alex Liberzon*

12:00 Effects of Stokes number on particle mechanics in a free-shear jet.
Raúl Bayoán Cal, Bianca Viggiano, Jeremy Vessaire, Romain Volk, Mickaël Bourgoïn, Laurent Chevillard

12:15 Exact calculation of energy flux rate in turbulent ferrofluids. *Sukhdev Mouraya, Supratik Banerjee*

12:30 Electro-vortex flow in liquid metal batteries.
Caroline Nore, Pedro Ziebell Ramos, Wietze Herreman, Loïc Cappanera, Jean-Luc Guermont, Norbert Weber

12:45 *Lunch*

MULTIPHASE FLOWS • Session 5 • Room 1 • Chair: Alessandro Sozza • 14:00 - 15:45

14:00 Inertial effects on the settling and collisions between spheroids in a turbulent flow.
Aurore Naso, Sheikh Muhammad Zubair, Alain Pumir, Emmanuel Lévêque

14:15 Settling of large particles in a turbulence column. *Yulia Akutina, Thibaud Revil-Baudard, Julien Chauchat, Olivier Eiff*

14:30 Multiscale preferential sweeping of particles settling in turbulence. *Josin Tom, Andrew Bragg*

14:45 Effect of turbulence-induced inertial clustering on droplet arrival statistics in a polydisperse droplet field.
M. Shyam Kumar, Chakravarthy S. R., Mathur Manikandan

15:00 Effect of mass loading on the collision rate of cloud droplets. *Bogdan Rosa*

15:15 Results from the Zugspitze experiment: an in-situ cloud-droplet particle-tracking experiment.
Guus Bertens, Gholamhossein Bagheri, Haitao Xu, Eberhard Bodenschatz, Jan Moláček

15:30 Accumulation of sedimenting particles in turbulent flows. *Alessandro Sozza, Gabor Drots, Cristobal Lopez, Emilio Hernandez-Garcia*

15:45 *Coffee break*

MULTIPHASE FLOWS • Session 6 • Room 1 • Chair: Francesco Picano • 16:15 - 18:10

16:15 Sediment transport in a turbulent open-channel with macro-roughness elements. *Michele Trevisson, Olivier Eiff, Yulia Akutina*

16:30 Homogeneous shear turbulence laden with finite-size spheroidal particles. *Ali Yousefi, Mehdi Niazi Ardekani, Luca Brandt*

16:45 Interface-resolved investigation of particle-laden turbulent channel flow in the point-particle limit.
Pedro Costa, Luca Brandt, Francesco Picano

17:00 Turbulence modulation by inertial particles in a swirling flow. *Jérémy Vessaire, Romain Volk, Mickaël Bourgoïn*

17:15 Collapse of turbulence in particle laden channel flow at critical volume loading.
Pradeep Muramulla, Viswanathan Kumaran, Partha Sarathi Goswami

17:30 Influence of the quiescent core region on inertial particle dynamics. *Yucheng Jie, Helge I. Andersson, Guixiang Cui, Lihao Zhao*

17:45 Dense suspensions flowing in channels at moderate Reynolds numbers. *Francesco Picano, Pedro Costa, Luca Brandt*

ROOM: 3

NON-NEWTONIAN FLOWS • Session 2 • Chair: Carlo Massimo Casciola • 10:45 - 12:15

10:45 Direct Numerical Simulations of turbulent viscoelastic jets described by the FENE-P model.
Mateus C. Guimaráes, Nuno Pimentel, Fernando T. Pinho, Carlos B. da Silva

11:00 Elastic range scaling in turbulent flow of dilute polymer solution. *Yi-Bao Zhang, Haitao Xu, Eberhard Bodenschatz, Heng-Dong Xi*

11:15 The turbulent/non-turbulent interface layer in a viscoelastic fluid. *Hugo Abreu, Fernando T. Pinho, Carlos B. da Silva*

11:30 Mathematical modeling of non-newtonian geophysical flows. *Margarita Eglit, Alexander Yakubenko, Julia Zaiko*

11:45 Experimental analysis of coherent structures in non-newtonian power law fluids.
Cristian M. Potosi Rosero, Leonardo J. Castellanos Gonzalez, Juliana B. Rodrigues Loureiro, David J. C. Dennis

12:00 Dynamics of elastic chains in turbulent pipe flow. *Carlo Massimo Casciola, Francesco Battista, Paolo Gualtieri, Jean-Paul Mollicone*

12:30 *Lunch*

INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS • Session 4 • Room 3 • Chair: Shigeo Kida • 14:00 - 15:45

14:00 Instability of flow subregions in three-dimensional wake transition. *Andrey Aleksyuk, Victor Shkadov*

14:15 Buoyancy-suppressed transition in pipe flow. *Ashley P. Willis, Elena Marensi*

14:30 Linear stability of the far-jet: non-parallel effects. *Rustam Mullyadzhanov, Nikolai Yavorsky, Kilian Oberleithner*

14:45 Transient dynamics of the turbulent wake of a three-dimensional blunt body. *Yann Haffner, Andreas Spohn, Jacques Borée, Thomas Castelain*

15:00 Stabilisation of vortex shedding flow past a square prism using slip surfaces. *K. Aswathy Nair, Abdulvahab Sameen, S. Anillal*

15:15 Numerical simulations of counter-current round jets. *Karol Wawrzak, Andrzej Boguslawski, Artur Tyliczszak*

15:30 Instability of steady flows in a precessing sphere and spheroid. *Shigeo Kida*

15:45 *Coffee break*

INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS • Session 5 • Room 3 • Chair: Laurette S. Tuckerman

16:15 - 18:15

16:15 Turbulent drag reduction for a wall with a bump. *Jacopo Banchetti, Maurizio Quadrio*

16:30 Statistical characterization of viscoelastic flows in extended domains. *Alessia Ferraro, Tobias M. Schneider*

16:45 Numerical investigation of turbulence development in the channel with a small cone angles.
Vladimir V. Trifonov, Alexander I. Reshmin, Sergey Kh. Teplovodskii

17:00 Streamwise-constant large-scale structures in Couette and Poiseuille flows. *Simon J. Illingworth*

17:15 Sensitivity analysis of analytical models for the prediction of trailing-edge noise. *Gerardo Zampino, Andrea Ferrero, Renzo Arina*

17:30 Experimental investigation of laminar-turbulent transition in supersonic boundary layer on swept wings. *Nikolai Semionov, Alexander Kosinov, Vasilij Kocharin, Yury Yermolaev, Alexander Semenov, Boris Smorodsky, Aleksey Yatskikh, Alexandra Panina, Gleb Kolosov*

17:45 On drag reduction and wake asymmetry of 3d bluff bodies with local base blowing. *Luc Pastur, Manuel Lorite-Díez, José Ignacio Jiménez-González, Olivier Cadot, Carlos Martínez-Bazán*

18:00 Bifurcations in a shear-driven cavity. *Laurette S. Tuckerman, Yacine Bengana*

ROOM: 5**WALL BOUNDED TURBULENCE • Session 4 • Chair: Jean-Philippe Laval • 10:45 - 12:45**

10:45 Turbulent boundary layer of the flow past an infinite swept-back wing. *Carlo Alessio Suardi, Alfredo Pinelli, Mohammad Omidyeganeh*

11:00 Experimental investigation of coherent structures in a flat plate turbulent boundary layer at $Re_{\theta}=10,000$.
Christina Voß, Reinhard Geisler, Andreas Schröder, Markus Rütten, Matteo Novara

11:15 DNS study on Reynolds stress anisotropy in a turbulent boundary layer with separation and reattachment. *Hiroyuki Abe*

11:30 Embedded Large-Eddy Simulation of streamwise vortices within a spatially developing turbulent boundary layer.
Andrew Mole, Alistair Revell

11:45 A comparison of surface roughness effect in channel and Taylor-Couette flows. *Pourya Forooghi, Pieter Berghout, Richard J. A. M. Stevens, Philipp Schlatter, Detlef Lohse, Daniel Chung, Roberto Verzicco, Bettina Frahnapfel*

12:00 Network-based characterization of passive-scalar plume dynamics in a turbulent boundary layer.
Stefania Scarsoglio, Giovanni Iacobello, Luca Ridolfi, Massimo Marro, Pietro Salizzoni

12:15 Experimental and numerical investigation of attached flow structures in tubulent boundary layers.
Jean-Philippe Laval, Ilkay Solak, Sricharan Srinath, John Christos Vassilicos, Christophe Cuvier, Jean-Marc Foucaut, Michel Stanislas

12:30 *Lunch*

WALL BOUNDED TURBULENCE • Session 5 • Room 5 • Chair: Woutijn Baars • 14:00 - 15:45

14:00 Investigation of dynamics of secondary currents in marginally turbulent semi-filled pipe flow. *Julian Brosda, Michael Manhart*

14:15 Slip and transpiration velocity to model textured surfaces in turbulent channel flow. *Simon Pasche, Ugis Lacis, Shervin Bagheri*

14:30 Predicting particle phase velocity statistics in a sheared turbulent suspension using fluctuating force-fluctuating torque (F3TS) model. *Swagnik Ghosh, Partha Sarathi Goswami*

14:45 Structural effect on turbulent drag over porous media. *Yuki Okazaki, Ayumi Shimizu, Yusuke Kuwata, Kazuhiko Suga*

15:00 Investigation of the interaction between inner and outer region through the scaling of the streamwise turbulence intensity in a fully developed turbulent pipe flow.
Lucia Mascotelli, Bharathram Ganapathisubramani, Gabriele Bellani, R. Jason Hearst, Eda Dogan, Spencer Zimmerman, Milad Samie, Xiao Bo Zheng, Alessandro Talamelli, Joseph C. Klewicki, Ivan Marusic, Nicholas Hutchins, Jason P. Monty

15:15 Quantifying amplitude modulation in flows without clear scale separation.
Davide Gatti, Ricardo Vinuesa, Ramis Örlü, Philipp Schlatter

15:30 Vertical coherence of turbulence in the atmospheric surface layer. *Woutijn Baars, Dominik Krug, Nicholas Hutchins, Ivan Marusic*

15:45 *Coffee break*

QUANTUM AND SUPERFLUID TURBULENCE • Room 5 • Chair: Davide Proment • 16:15 - 18:15

- 16:15 Investigation on the occurrence of flight-crash events in turbulent flows of superfluid helium-4.
Marco La Mantia, Petra Hrubcová, Patrik Švančara
- 16:30 Three-dimensional numerical simulations of two-fluid coupled dynamics in thermal counterflows of superfluid 4He.
Hiroichi Kobayashi, Satoshi Yui, Makoto Tsubota
- 16:45 Persistence-time problem in the three-dimensional HVBK model for superfluid turbulence.
Akhilesh Kumar Verma, Vishwanath Shukla, Akshay Bhatnagar, Rahul Pandit
- 17:00 Lagrangian study of isothermal turbulence in normal and superfluid helium.
Bernard Rousset, Mickael Bourgoin, Diribarne Pantxo, Mathieu Gibert, Fatimata Sy
- 17:15 How well do particles track superfluid vortices? Insights from the Gross-Pitaevskii model.
Umberto Giuriato, Giorgio Krstulovic, Vishwanath Shukla, Serge Nazarenko
- 17:30 Quantum Vortex Reconnections: crossover from interaction to driven regimes.
Luca Galantucci, Andrew W. Baggageley, Nick G. Parker, Carlo F. Barenghi
- 17:45 Interaction between active particles and quantum vortices at low temperatures.
Giorgio Krstulovic, Umberto Giuriato
- 18:00 Flying in a superfluid.
Davide Proment, Seth Musser, Miguel Onorato, William T. M. Irvine

ROOM: 7**COMPRESSIBLE FLOWS** • Session 1 • Chair: Supratik Banerjee • 10:45 - 12:45

- 10:45 Self-similar compressible turbulent boundary layers with pressure gradients. Part 1: DNS of sub- and supersonic flow.
Christoph Wenzel, Tobias Gibis, Markus Kloker, Ulrich Rist
- 11:00 Self-similar compressible turbulent boundary layers with pressure gradients. Part 2: Self-similarity analysis of the outer layer.
Tobias Gibis, Christoph Wenzel, Markus Kloker, Ulrich Rist
- 11:15 Detached-Eddy Simulation of transverse hydrogen injection into supersonic crossflow.
Alexey Troshin, Vladimir Vlasenko, Vladimir Sabelnikov
- 11:30 Identification of Lagrangian Coherent Structures (LCS) in a flat-plate turbulent boundary layer with adverse pressure gradient.
Matthias Weinschenk, Christoph Wenzel, Ulrich Rist
- 11:45 Investigation of an unsteady shock wave in a Mach 2 boundary layer.
Rio Baidya, Sven Scharnowski, Matthew Brass, Christian J. Kähler
- 12:00 Effect of rarefaction on temporally developing compressible mixing layer.
Vishnu Mohan, Abdulvahab Sameen, Balaji Srinivasan
- 12:15 Scale energetics in baroclinic-torque-driven turbulent mixing.
G. S. Sidharth, Graham Candler
- 12:30 Energy transfer in compressible magnetohydrodynamic turbulence for self gravitating fluids.
Supratik Banerjee, Alexei G. Kritsuk
- 12:45 *Lunch*

TURBULENT CONVECTION • Session 4 • Room 7 • Chair: Janet Scheel • 14:00 - 15:45

- 14:00 Convection in liquid sodium: a direct comparison of DNS and experiments.
Lukas Zwirner, Ruslan Khalilov, Ilya Kolesnichenko, Alexander Pavlinov, Andrey Mamykin, Alexander Shestakov, Peter Frick, Olga Shishkina
- 14:15 The evolution of the large-scale flow in magnetoconvection.
Till Zürner, Felix Schindler, Tobias Vogt, Sven Eckert, Jörg Schumacher
- 14:30 Transition of the flow reversal in Turbulent thermal convection.
Xin Chen, Shi-Di Huang, Ke-Qing Xia, Heng-Dong Xi
- 14:45 Direct measurements of the thermal dissipation rate in turbulent Rayleigh-Bénard convection.
Anna Hertlein, Ronald du Puits
- 15:00 Velocimetry in a radiatively driven convection experiment.
Vincent Bouillaut, Simon Lepot, Benjamin Miquel, Sébastien Aumaître, Basile Gallet
- 15:15 Experimental investigation of a sheared thermally unstable boundary layer.
Gabriele Nunnari, Stephan Weiss
- 15:30 Convective turbulence in liquid sodium.
Janet Scheel, Joerg Schumacher
- 15:45 *Coffee break*

TURBULENT CONVECTION • Session 5 • Room 7 • Chair: Ronald du Puits • 16:15 - 18:15

- 16:15 Transitions of Reynolds numbers and temperature fluctuations in horizontal convection.
Hailong Huang, Olga Shishkina, Xiaozhou He
- 16:30 Transitions of heat transfer and temperature profiles in horizontal convection.
Bo Yan, Olga Shishkina, Xiaozhou He
- 16:45 Heat transport in classical and symmetrical horizontal convection.
Philipp Reiter, Mohammad Emran, Olga Shishkina
- 17:00 Dynamics of subsiding shells in actively growing clouds with vertical updrafts.
Vishnu Nair, Thijs Heus, Maarten van Reeuwijk
- 17:15 DNS of a temporally evolving vertical natural convection boundary layer.
Junhao Ke, Nicholas Williamson, Steven W. Armfield
- 17:30 Suppression of Rayleigh-Taylor turbulence by time-periodic acceleration.
Marta Magnani, Stefano Musacchio, Guido Boffetta
- 17:45 Direct Numerical Simulation of shock-driven turbulent mixing.
Tao Wang, Bing Wang, Jianyu Lin, Jingsong Bai, Ping Li, Gang Tao
- 18:00 Local heat transport in turbulent Rayleigh-Bénard convection at high aspect ratio.
Ronald du Puits, Anna Hertlein

ROOM: 9**BOUNDARY FREE TURBULENCE** • Session 3 • Chair: Juan Saenz • 10:45 - 12:30

- 10:45 Permanence of large eddies in variable-density homogeneous turbulence. *Olivier Soulard, Jérôme Griffond, Benoît-Joséph Gréa, Giovanni Viciconte*
- 11:00 What is a "Length Scale" in variable density turbulence? *Dongxiao Zhao, Hussein Aluie*
- 11:15 Scale-space turbulence energy density in compressible mixing layer. *Abdulvahab Sameen, S. Arun, Balaji Srinivasan, Sharath Girimaji*
- 11:30 Measuring the full velocity gradient and dissipation rate tensor in homogeneous turbulence using shake-the-box and flowfit. *Andreas Schroeder, Daniel Schanz, Sebastian Gesemann, Florian Huhn, Daniel Garaboa Paz, Vicente Pérez-Muñuzuri, Eberhard Bodenschatz*
- 11:45 Unifying local and global descriptions of turbulent entrainment. *Maarten van Reeuwijk, J. Christos Vassilicos, John Craske*
- 12:00 Effect of high-order finite difference discretization of the nonlinear term on turbulence statistics. *Naoya Okamoto, Tsuguo Matsuzaki, Mitsuo Yokokawa, Yukio Kaneda*
- 12:15 Filter-width dependence of the dynamics of homogeneous variable density turbulence. *Juan A. Saenz, Denis Aslangil, Daniel Livescu*
- 12:45 *Lunch*

INTERMITTENCY AND SCALING • Session 2 • Room 9 • Chair: Alexandros Alexakis • 14:00 - 15:30

- 14:00 Scale analysis of a numerical von Karman flow. *Hugues Fallor, Bérengère Dubrulle, Caroline Nore, Loïc Cappanera, Jean Luc Guermond*
- 14:15 Local estimates of Hölder exponents in turbulent vector fields. *Florian Nguyen, Jean-Philippe Laval, Bérengère Dubrulle, Pierre Kestener, Alexey Cheskidov, Roman Shvydkoy*
- 14:30 On the fine structure of turbulence determined by entropy variation. *Joachim Peinke, Andre Fuchs, Matthias Wächter, Swapnil Khariche, Alain Girard, Jean-Paul Moro*
- 14:45 On the inertial range scaling in the high- R_λ limit. *Christian Küchler, Gregory Bewley, Eberhard Bodenschatz*
- 15:00 Analyzing and influencing the wake of an active turbulence grid. *Lisa Rademacher, Gerd Gülker, Michael Hölling, Joachim Peinke*
- 15:15 High Reynolds number turbulence generation by active grid and wind tunnel control. *Lars Neuhaus, Joachim Peinke, Michael Hölling*
- 15:30 Cascades and transitions in turbulent flows. *Alexandros Alexakis, Luca Biferale*
- 15:45 *Coffee break*

INTERMITTENCY AND SCALING • Session 3 • Room 9 • Chair: Jeremie Bec • 16:15 - 18:00

- 16:15 Using persistent accelerations to disentangle Lagrangian turbulence. *Michael Wilczek, Lukas Bentkamp, Cristian C. Lalescu*
- 16:30 Extension of Lagrangian multifractal formalism to inertial particle dynamics. *Bianca Viggiano, Romain Volk, Mickaël Bourgoin, Raúl Bayoán Cal, Laurent Chevillard*
- 16:45 Lagrangian velocity and power structure functions from 4D particle tracking velocimetry measurements of a turbulent swirling flow. *Valentina Valori, Paul Debue, Christophe Cuvier, Yaşar Ostovan, Adam Cheminet, Tarek Chaabo, Cécile Wiertel, Vincent Padilla, Jean-Philippe Laval, Jean-Marc Foucaut, Bérengère Dubrulle, François Daviaud*
- 17:00 Intermittency of inertial particle distribution in high Reynolds number turbulence. *Keigo Matsuda, Kai Schneider, Katsunori Yoshimatsu*
- 17:15 Topology of quasi-singularities in an experimental turbulent swirling flow. *Paul Debue, Valentina Valori, Ostovan Yaşar, Christophe Cuvier, Jean-Philippe Laval, Jean-Marc Foucaut, Bérengère Dubrulle, Cécile Wiertel-Gasquet, Vincent Padilla, François Daviaud*
- 17:30 Instanton calculus for the onset of turbulent intermittency. *Luca Mariconi, Gabriel Brito Apolinário, Rodrigo Miranda Perera*
- 17:45 Turbulent dissipative anomaly and Lagrangian irreversibility. *Jeremie Bec, Simon Thalabard*

ROOM: 2**WAVE TURBULENCE** • Chair: Nicolas Mordant • 10:45 - 12:45

- 10:45 Turbulence of capillary waves forced by steep gravity waves. *Michael Berhanu, Eric Falcon, Luc Deike*
- 11:00 Experience of internal wave turbulence in the Coriolis facility. *Clément Savaro, Antoine Campagne, Nicolas Mordant*
- 11:15 Early stage of integrable turbulence in 1D NLS equation: the semi-classical approach to statistics. *Giacomo Roberti, Gennady El, Stéphane Randoux, Pierre Suret*
- 11:30 Coexistence of solitons and extreme events in deep water surface waves. *Annette Cazaubiel, Guillaume Michel, Simon Lepot, Benoit Semin, Sébastien Aumaître, Michael Berhanu, Félicien Bonnefoy, Eric Falcon*
- 11:45 On the convergence of the normal form transformation in discrete wave turbulence theory for the Charney-Hasegawa-Mima (CHM) equation. *Shane Walsh, Miguel Bustamante*
- 12:00 Mean flow instability of surface gravity waves propagating in a rotating frame. *Kannabiran Seshasayanan, Basile Gallet*
- 12:15 Anomalous scaling in gravitational wave turbulence. *Sébastien Galtier, Sergey Nazarenko, Éric Buchlin, Simon Thalabard*
- 12:30 Integrable turbulence: experimental realization of a soliton gas. *Ivan Redor, Nicolas Mordant, Eric Barthélemy, Hervé Michallet, Miguel Onorato*
- 12:45 *Lunch*

ROTATING FLOWS • Session 2 • Room 2 • Chair: Geert Brethouwer • 14:00 - 15:45

- 14:00 Heat transfer and temperature measurements in extreme rapidly rotating convection. *Matteo Madonia, Jonathan Cheng, Andrés Aguirre Guzmán, Herman Clercx, Rudie Kunnen*
- 14:15 Influence of internal heating on convection in the rotating spherical gap. *Florian Zaussinger, Christoph Egbers, Vadim Travnikov, Peter Haun*
- 14:30 Effects of thermal stratification on the axisymmetric state in spherical Couette flow. *Tomoaki Itano, Taishi Inagaki, Fumitoshi Gotoh, Masako Sugihara-Seki*
- 14:45 Localized structures and solitary states in a vertical Taylor-Couette system with a radial temperature gradient. *Changwoo Kang, Arnaud Prigent, Innocent Mutabazi*
- 15:00 Transition in rotating plane Couette flow, revisited. *Masato Nagata, Baofang Song, Darren P. Wall*
- 15:15 Effect of eccentricity in a counter-rotating Taylor-Couette flow. *Kameswararao Anupindi, Dhaval Paghdar*
- 15:30 Heat transfer in rotating wall-bounded flows. *Geert Brethouwer*
- 15:45 *Coffee break*

ROTATING FLOWS • Session 3 • Room 2 • Chair: Stefania Espa • 16:15 - 18:15

- 16:15 Anisotropy without waves in rotating turbulence. *Jonathan A. Brons, Alban Potherat, Peter J. Thomas*
- 16:30 On the complex behavior of the lateral wall boundary layer in an experimental co-rotating split-cylinder flow. *Jesús Oscar Rodríguez-García, Javier Burguete*
- 16:45 Instability of steady flow in precessing spheroids in a moderate Reynolds-number regime. *Yasufumi Horimoto, Atsushi Katayama, Susumu Goto*
- 17:00 Does perforation relaminarize turbulent wakes? *Vagesh D. Narasimhamurthy, Abhinav Singh*
- 17:15 Mean flow generation in rotating annulus with stochastic methods. *Wenchao Xu, Uwe Harlander*
- 17:30 Dynamics of transition to turbulence in axial vortex breakdown. *Abdulvahab Sameen, Manjul Sharma, R. Vishnu*
- 17:45 Ekman layer resonance in an ocean-analog rotating tank experiment. *Joel Sommeria, Miklos Vincze, Nora Fenyvesi, Marten Klein, Samuel Viboud, Yosef Ashkenazy*
- 18:00 Modeling planetary atmospheres and oceans in the laboratory. *Stefania Espa, Simon Cabanes, Enrico Ferrero, Renato Forza, Boris Galperin, Federica Ivo, Massimiliano Manfrin, Peter L. Read, Hélène Socolan, Roland Young*

ROOM: 8**VORTEX DYNAMICS AND STRUCTURE FORMATION** • Session 1 • Chair: Maurice Rossi • 10:45 - 12:45

- 10:45 On the geometry of coherent structures in channel flow turbulence. *Abhishek Paraswarar Harikrishnan, Johannes von Lindheim, Nikki Vercauteren, Rupert Klein, Gitta Kutyniok*
- 11:00 On the energetics of separating and reattaching flows and their modeling. *Andrea Cimarelli, Adriano Leonforte, Andrea Crivellini, Elisabetta De Angelis, Diego Angeli*
- 11:15 Large-Eddy Simulation of the fluidic oscillator jet. *Elizaveta Dauengauer, Rustam Mullyadzhonov*
- 11:30 Direct Numerical Simulation of variable density starting turbulent jets. *Vladislav Ivashchenko, Rustam Mullyadzhonov*
- 11:45 Energy balance quantification and wake morphology description in collocated wind plants. *Sarah Smith, Hawwa Kadum, Mike Quigley, Gerard Cortina, Raul Bayoan Cal, Marc Calaf*
- 12:00 Magnetic dissipation of coherent structures and particle deposition in magnetohydrodynamic turbulence at low magnetic Reynolds numbers. *Bruno Magacho da Silva, Luca Moriconi*
- 12:15 Turbulence dynamics transition of flow past a circular cylinder and the prediction of vortex-induced forces. *Bernat Font Garcia, Gabriel D. Weymouth, Vinh-Tan Nguyen, Owen R. Tutty*
- 12:30 Motion of helical vortices: a dynamical system approach. *Maurice Rossi, Ivan Delbende, Can Selcuk*
- 12:45 *Lunch*

NUMERICAL METHODS AND DATA ANALYSIS • Session 3 • Room 8 • Chair: Patricio Clark Di Leoni • 14:00 - 15:45

- 14:00 Hybrid LES / RANS paradigm for 3D turbulent mixing. *Filipe Pereira Soares, Fernando F. Grinstein, Dan Israel, Sharath S. Girimaji*
- 14:15 Spatial hierarchy detection in large scale coherent structures. *Ido Ruhman, Ian Jacobi*
- 14:30 Characterization of a hydrodynamic instability from experimental data using stochastic reduced order modeling. *Moritz Sieber, C. Oliver Paschereit, Kilian Oberleithner*
- 14:45 Statistical properties of the filtered turbulence. *Markus Klein, Christian Kasten, Massimo Germano*
- 15:00 Discrete adjoint based data assimilation for rans turbulence models. *Oliver Brenner, Patrick Jenny*
- 15:15 Can we derive turbulent closure using lattice gas? *Vincent Labarre, Bérengère Dubrulle, Didier Paillard*
- 15:30 Synchronizing turbulence via nudging. *Patricio Clark Di Leoni, Andrea Mazzino, Luca Biferale*
- 15:45 *Coffee break*

NUMERICAL METHODS AND DATA ANALYSIS • Session 4 • Room 8 • Chair: Fernando Grinstein • 16:15 - 18:15

- 16:15 Aero-optical investigation on turbulent mixing flow by high-order algorithm. *Sun Xi Wan, Liu Wei, Li Da Li, Wang Dong Fang*
- 16:30 Parallel 2D and 3D numerical simulations of melting with convection. *Georges Sadaka, Ionut Danaila, Corentin Lathode, Francky Luddens, Aina Rakotondrandisa, Pierre-Henri Tournier*
- 16:45 Slushing dynamics using free energy based Lattice Boltzmann Method. *Abdulvahab Sameen, Sita Sundar, Sumesh P. Thampi, T. Jaychandan*
- 17:00 A new alternating direction forcing immersed boundary method for high-fidelity simulations of a moving object in a fluid. *Athanasios E. Giannenas, Sylvain Laizet*
- 17:15 Numerical scheme for a Lagrangian stochastic model describing rods orientation. *Lorenzo Campana, Mireille Bossy, Jean Pierre Minier*
- 17:30 Direct simulation of turbulent plumes in a crossflow. *Owen H. Jordan, Maarten van Reeuwijk, Ben Devenish, Gabriel Rooney*
- 17:45 Flow reconstruction using thermal wall imprints. *Md. Rakib Hassain, John Craske, Maarten Van Reeuwijk*
- 18:00 Dynamic bridging modeling for coarse grained simulations of shock driven turbulent mixing. *Fernando F. Grinstein, Juan A. Saenz, Rick M. Rauen Zahn, Massimo Germano*

ROOM: 10**TWO-DIMENSIONAL TURBULENCE • Session 2 • Chair: Michael Shats • 10:45 - 12:30**

- 10:45 Lagrangian pair dispersion in generalized two-dimensional turbulence. *Stefano Berti, Alexis Foussard, Xavier Perrot, Guillaume Lapeyre*
- 11:00 The decay of two-dimensional turbulence in soap-film flows. *Zeyou Zhou, Haitao Xu*
- 11:15 Energy flux vector in a shell model of 2D rotating turbulence. *Masanori Takaoka, Naoto Yokoyama, Eiichi Sasaki*
- 11:30 Sudden transition from non-swirling to swirling axisymmetric turbulence. *Wouter J. E. Bos, Zecong Qin, Aurore Naso*
- 11:45 Mixing efficiency of laminar and turbulent wall-bounded flows. *Kai Schneider, Benjamin Kadoch, Wouter J. E. Bos*
- 12:00 Do shear layers spontaneously trigger turbulence? *Alexei A. Mailybaev, Simon Thalabard, Jeremie Bec*
- 12:15 Nonlinear evolution of a baroclinic wave and imbalanced dissipation. *William Riley Casper, Balu Nadiga*
- 12:30 Inertial and anisotropic particles in 2D turbulence. *Michael Shats, Nicolas Francois, Hua Xia, Jia Yang, Horst Punzmann*
- 12:45 *Lunch*

TRANSPORT AND MIXING • Session 3 • Room 10 • Chair: Patrice Le Gal • 14:00 - 15:45

- 14:00 Self-similarity of scalar spectra in a point-source plume released in a turbulent boundary layer. *Kapil A. Chauhan, Krishna M. Talluru*
- 14:15 Multi-scalar mixing in a coaxial jet at different velocity ratios. *Alais Hewes, Laurent Mydlarski*
- 14:30 Non-Richardson turbulent particle pair diffusion. *Nadeem A. Malik, Syed M. Usama*
- 14:45 Direct Numerical Simulations of combined Rayleigh-Taylor/shear flow to late times. *Jon Baltzer, Daniel Livescu*
- 15:00 Small Peclet-small Mach number approximation and its implications on statistical turbulence models. *Jean-Cedric Chkair, Olivier Soulard, Jerome Griffond, Xavier Blanc*
- 15:15 The role of turbulence on the development and entrainment of a turbulent jet in cross-flow. *Graham Freedland, Grace Eliason, Stephen Solovitz, Raúl Bayoán Cal*
- 15:30 Fragmentation of large aggregates in turbulence. *Patrice Le Gal, Hector M. De La Rosa Zambrano, Christophe Brouzet, Gautier Verhille*
- 15:45 *Coffee break*

GEOPHYSICAL AND ASTROPHYSICAL TURBULENCE • Session 1 • Room 10 • Chair: Hussein Aluie • 16:15 - 18:15

- 16:15 Effects of droplet sedimentation and wind shear on cloud-top entrainment. *Bernhard Schulz, Juan Pedro Mellado*
- 16:30 Scale invariant diffusion parameterization in a mechanistic general circulation model. *Serhat Can, Urs Schafer-Rolffs, Erich Becker*
- 16:45 Fractal reconstruction of sub-grid scales for particle dispersion in Large-Eddy Simulation. *Emmanuel O. Akinlabi, Marta Wacławczyk, Szymon P. Malinowski, Juan-Pedro Mellado*
- 17:00 Reactive species in turbulence. *Wenwei Wu, Lipo Wang, Enrico Calzavarini, Francois G. Schmitt, Michael Gauding*
- 17:15 Pair dispersion in canopy flow turbulence. *Ron Schnapp, Yardena Bohbot-Raviv, Eyal Fattal, Alex Liberzon*
- 17:30 Analysis of the turbulent energy spectra obtained during the WADIS-2 sounding rocket campaign. *Victor Avsarkisov, Boris Strelnikov*
- 17:45 Unravelling wave-vortex interactions and geophysical turbulence phenomenology at oceanic mesoscales. *Jim Thomas*
- 18:00 Toward understanding the multi-scale coupling in global oceanic flows. *Hussein Aluie, Mahmoud Sadek, Chayut Teeraratkul, Matthew Hecht, Geoffrey Vallis*

ROOM: 4

Minisymposium

TURBULENCE IN THE HELIOSPHERE AND IN THE LOCAL INTERSTELLAR MEDIUM

Convenor: Daniela Tordella • Co-convenor: Federico Fraternali • Session 1 • Chair: D. Tordella • 14:00 - 15:45

14:00 Observing solar wind turbulence from fluid to kinetic scales.
R. Bruno

14:25 Turbulence and dissipation in the solar wind.
S. Galtier

14:50 Simulating solar wind dynamics across scales: the expanding box model.
M. E. Innocenti, A. Tenerani, M. Velli

15:15 Generation of coherent structures in mhd and space plasmas: Reynolds number and system size effects.
W. H. Matthaeus, T. Parashar, M. Wan, M. Cuesta, A. Chasapis, R. Bandyopadhyay, R. Chhiber, Y. Yang

Minisymposium

TURBULENCE IN THE HELIOSPHERE AND IN THE LOCAL INTERSTELLAR MEDIUM

Convenor: Daniela Tordella • Co-convenor: Federico Fraternali • Session 2 • Chair: N. V. Pogorelov • 16:15 - 18:00

16:15 Turbulence and instabilities at the heliospheric interface.
N. V. Pogorelov, F. Fraternali, M. Gedalin, J. Heerikhuisen, T. K. Kim, V. Roytershteyn, M. Zhang

16:40 Voyager data from the heliosheath and interstellar medium.
J. Richardson, J. Belcher

17:05 Statistical properties of a local energy transfer proxy in space plasmas.
L. Sorriso Valvo

Friday • September 6th, 2019

AULA MAGNA

8:30 Invited speaker • **Turbulent channel flow laden with finite-size particles.** *Luca Brandt*

9:15 Invited speaker • **Turbulent boundary layers developing over rough surfaces: from the laboratory to full-scale systems.** *Nicholas Hutchins*

10:00 *Coffee break*

ROOM: 1

MULTIPHASE FLOWS • Session 7 • Chair: Paolo Gualtieri • 10:45 - 12:30

10:45 Particle distribution in a turbulent rough wall pipe. *Leon Chan, Tony Zahtila, Jimmy Philip, Andrew Ooi*

11:00 Creation of turbulent puff in pipe flow with microbubble suspension. *Kotaro Nakamura, Hyun Jin Park, Yuji Tasaka, Yuichi Murai*

11:15 Wall-bounded turbulent flows: particles near surfaces. *Christophe Henry*

11:30 Transition to turbulence in core-annular pipe flow. *Carlos Plana, Baofang Song, Marc Avila*

11:45 Investigation of interfacial forces in CFD simulation of turbulent bubbly pipe flows.
Mohsen Shiea, Marco Vanni, Daniele Marchisio, Antonio Buffo

12:00 Fluid/particle momentum coupling in turbulent jets. *Francesco Battista, Paolo Gualtieri, Jean-Paul Mollicone, Carlo Massimo Casciola*

12:15 The exact regularised point particle method for wall turbulence modulation.
Paolo Gualtieri, Francesco Battista, Jean-Paul Mollicone, Carlo Massimo Casciola

12:30 *Lunch / Young Investigators Awards Ceremony*

MULTIPHASE FLOWS • Session 8 • Room 1 • Chair: Jacek Pozorski • 14:00 - 15:45

14:00 DNS and modelling dynamics of inertial particles in the under-resolved shear turbulence. *Alexis Barge, Mikhael Gorokhovski*

14:15 Numerical analysis of fully resolved ellipsoidal particle dynamics in isotropic decaying turbulence.
Konstantin Fröhlich, Lennart Schneiders, Matthias Meinke, Wolfgang Schröder

14:30 Direct Numerical Simulations of heat transfer in fluidized beds of spherical particles.
Mehdi Niazi Ardekani, Christophe Duwig, Luca Brandt

14:45 Momentum and heat transport in multiphase natural convection. *Chong Shen Ng, Roberto Verzicco, Detlef Lohse*

15:00 Scaling parameters of subaqueous sediment bedforms in turbulent open channel flow.
Markus Scherer, Aman Ghebremichael Kidanemariam, Markus Uhlmann

15:15 Assessment of structural-type subfilter models for particle-laden Large-Eddy Simulations. *Jacek Pozorski, Maria Knorps, Bogdan Rosa*

ROOM: 3**INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS • Session 6 • Chair: Federico Fraternali • 10:45 - 12:30**

10:45 Transfer functions for flow predictions in wall-bounded turbulence.
Kenzo Sasaki, Ricardo Vinuesa, André V. G. Cavalieri, Philipp Schlatter, Dan S. Henningson

11:00 Identification of the pattern of breakdown based on binary sequence statistics and cellular-automaton simulations.
Wen Zhang, Hao Guo, Peiqing Liu, Mingping Wan, Jianchun Wang, Shiyi Chen

11:15 An input-output approach to evaluating flow response to spatially varying actuator geometries. *Igal Gluzman, Dennice F. Gayme*

11:30 Adjoint sensitivity of turbulence using unstable invariant solutions. *Davide Lasagna*

11:45 Active flow control of the logarithmic layer. *Anna Guseva, Miguel P. Encinar, Javier Jiménez*

12:00 Mean DNS adjoint solutions of turbulent Navier-Stokes flows. *Sophie Knechtel, Joern Sesterhenn*

12:15 Reinforcement learning versus linear control of Rayleigh-Bénard convection.
Gerben Beintema, Luca Biferale, Alessandro Corbetta, Pinaki Kumar, Federico Toschi

12:30 *Lunch / Young Investigators Awards Ceremony*

INSTABILITY, TRANSITION AND CONTROL OF TURBULENT FLOWS • Session 7 • Room 3 • Chair: Daniela Tordella**14:00 - 15:00**

14:00 Blowup and turbulence in the 3D incompressible Euler equations on a logarithmic lattice. *Ciro S. Campolina, Alexei Mailybaev*

14:15 Extension of the one-dimensional turbulence model towards electrohydrodynamic variable density flows.
Juan Alí Medina Méndez, Heiko Schmidt, Ulrich Riebel

14:30 Experimental investigation of perturbation growth in the submerged jet.
Julia Zayko, Alexander Reshmin, Vladimir Trifonov, Linar Gareev, Vasily Vedenev

14:45 Simultaneous PIV and ultrasound measurements revealing slow mode switching in a von Karman flow cell.
Hanna Berning, He Wang, Thomas Rösgen

ROOM: 5**FLUID-STRUCTURE INTERACTION • Session 1 • Chair: Olivier Cadot • 10:45 - 12:30**

10:45 Large-Eddy Simulation of sparse and dense rigid canopy regimes. *Alfredo Pinelli, Mohammad Omidyeganeh, Alessandro Monti*

11:00 Comparison of Large-Eddy Simulations and wind tunnel experiments of flow above rough surfaces.
Vladimír Fuka, Klára Jurčáková, Radka Kellnerová

11:15 A numerical study of the spanwise turbulence past a cylinder flow.
Andrea Ferrero, Francesco Larocca, Guglielmo Scovazzi, Massimo Germano

11:30 Analysis of transient flows over an NACA0015 airfoil toward better flow control authority of plasma actuators.
Takuto Ogawa, Kengo Asada, Tomoaki Tatsukawa, Kozo Fujii

11:45 Bistability of a pendulum in a flow. *Ariane Gayout, Nicolas Plihon, Martin Obligado, Mickaël Bourgain*

12:00 Simulation of thin & long flexible objects in a turbulent flow. *Daniel Meyer, Marco Hostettler*

12:15 Turbulent wake of a freely rotating disk in a uniform flow: experiments and stochastic modelling. *Olivier Cadot, Edouard Boujo*

12:30 *Lunch / Young Investigators Awards Ceremony*

FLUID-STRUCTURE INTERACTION • Session 2 • Room 5 • Chair: Frederic Dias • 14:00 - 15:15

14:00 On the dynamics of multiple elastically-bounded flapping plates for flow energy harvesting.
Stefano Olivieri, Corrado Boragno, Roberto Verzicco, Andrea Mazzino

14:15 Modelling dynamic stall of a pitching airfoil in large-scale freestream turbulence. *ThankGod Boye, Zheng-Tong Xie*

14:30 The effect of turbulence on the near-field of porous disks. *Magnus Kyrkjebø Vinnes, Hauk-Morten Heimlund Lykke, R. Jason Hearst*

14:45 Modifying spatial large-scales using blowing perturbations.
Venkatesh Pulletikurthi, Suranga Dharmarathne, Murat Tutkun, Luciano Castillo

15:00 On turbulence and wave energy converters. *Frederic Dias, Joao Bettencourt*

ROOM: 7**COMPRESSIBLE FLOWS • Session 2 • Chair: Aleksey Yatskikh • 10:45 - 12:45**

10:45 Multi-point velocity measurements in grid turbulence interacted with a spherical shock wave.
Kento Inokuma, Tomoaki Watanabe, Koji Nagata, Yasuhiko Sakai

- 11:00 Direct Numerical Simulations on effects of turbulent Mach number in interaction between planar shock wave and turbulence.
Kento Tanaka, Tomoaki Watanabe, Koji Nagata
- 11:15 Reynolds and Mach number effects on the skin-friction decomposition in turbulent boundary layers.
Yitong Fan, Weipeng Li, Sergio Pirozzoli
- 11:30 Direct Numerical Simulation of a BZT dense gas compressible shear layer. *Aurélien Vadrôt*
- 11:45 An LES investigation of high-speed turbulent gas jets. *Francesco Bonelli, Annarita Viggiano, Vinicio Magi*
- 12:00 Turbulent inlet effects on the cooling efficiency of an impinging jet. A compressible DNS study. *Gabriele Camerlengo, Jörn Sesterhenn*
- 12:15 A comparative study of Richtmyer-Meshkov instability and turbulent mixing. *Ping Li, Tao Wang, Bing Wang, Jianyu Lin, Jingsong Bai*
- 12:30 Hot-wire measurements of the evolution of total temperature and mass flow pulsations in 2D and 3D supersonic boundary layers.
Aleksey Yatskikh, Alexander Kosinov, Nikolai Semionov, Yury Yermolaev, Gleb Kolosov, Vasiliy Kocharin
- 12:45 *Lunch / Young Investigators Awards Ceremony*

TURBULENT CONVECTION • Session 6 • Room 7 • Chair: Yuji Tasaka • 14:00 - 15:45

- 14:00 Large-scale coherence of turbulent superstructures in Rayleigh-Bénard convection.
Dominik Krug, Roberto Verzicco, Detlef Lohse, Richard J. A. M. Stevens
- 14:15 Resolved energy budget of superstructures in Rayleigh-Bénard convection.
Gerrit Green, Dimitar Vlaykov, Juan-Pedro Mellado, Michael Wilczek
- 14:30 POD analysis and modelling of large-scale reorientations in a cubic Rayleigh-Bénard cell.
Berengere Podvin, Laurent Soucasse, Philippe Riviere, Anouar Soufiani
- 14:45 Vortex formation during spin-up of thermal convection. *Daisuke Noto, Yuji Tasaka, Takatoshi Yanagisawa, Yuichi Murai*
- 15:00 Slip length effect on heat transfer and temperature profiles in turbulent Rayleigh-Bénard convection.
Maojing Huang, Yin Wang, Yun Bao, Xiaozhou He
- 15:15 Solitary turbulent plumes in steadily-heated flow of 2D Boussinesq model. *Yoshiki Hiruta, Sadayoshi Toh*
- 15:30 Development of turbulent cellular structures in Rayleigh-Bénard convection in a finite liquid metal layer.
Yuji Tasaka, Megumi Akashi, Takatoshi Yanagisawa, Tobias Vogt, Sven Eckert

ROOM: 9**INTERMITTENCY AND SCALING • Session 4 • Chair: Takeshi Matsumoto • 10:45 - 12:30**

- 10:45 On the stochastic modeling of the spatio-temporal structure of homogeneous and isotropic turbulence.
Jason Reneuve, Laurent Chevillard

- 11:00 Experimental study of inertial intermittency using Fokker-Planck equation in von Karman cryogenic turbulent flows.
Swapnil Kharche, Alain Girard, Joachim Peinke, André Fuchs, Bernard Rousset, Michel Bon-Mardion, Jean-Paul Moro, Christophe Baudet
- 11:15 Energy budget in wall-bounded turbulent flows. *Rakesh Yuvaraj, Jean-Marc Foucaut, Jean-Philippe Laval, Christos Vassilicos*
- 11:30 Energy transfer in Rayleigh-Bénard cell. *David Dumont, Bérengère Dubrulle, Olivier Liot, Julien Salort, Francesca Chilli*
- 11:45 Extracting the spectrum by spatial filtering. *Mahmoud Sadek, Hussein Aluie*
- 12:00 Projection method for the analysis of small-scale intermittency in hydrodynamic turbulence.
Jan Friedrich, Holger Homann, Rainer Grauer
- 12:15 Bolgiano-Obukhov scaling in Rayleigh-Taylor turbulence at moderate Atwood number. *Takeshi Matsumoto*
- 12:30 *Lunch / Young Investigators Awards Ceremony*

INTERMITTENCY AND SCALING • Session 5 • Room 9 • Chair: Andrea Mazzino • 14:00 - 15:30

- 14:00 Weak formulation and scalings in turbulent Rayleigh-Bénard convection.
Sergio Chibbaro, Bérengère Dubrulle, Alessio Innocenti, Valentina Valori
- 14:15 Energy flux vectors in anisotropic turbulence. *Naoto Yokoyama, Masanori Takaoka*
- 14:30 Large-scale transitions in fully developed turbulence. *Cristian C. Lalescu, Michael Wilczek*
- 14:45 Internal and external fluctuations in a turbulent non-premixed planar flame.
Michael Gauding, Dominik Denker, Yacine Brahami, Emilien Varea, Luminita Danaila
- 15:00 Flowing fibers as a proxy of two-point statistics of turbulence.
Andrea Mazzino, Marco Edoardo Rosti, Stefano Olivieri, Luca Brandt

ROOM: 2**STRATIFIED FLOWS • Session 3 • Chair: Luca Mortarini • 10:45 - 12:45**

- 10:45 Layering and vertical transport in sheared double diffusive convection in the diffusive regime.
Yantao Yang, Roberto Verzicco, Detlef Lohse, Colm-cille P. Caulfield
- 11:00 Internal gravity waves, shear, and mixing in forced stratified turbulence. *Christopher Howland, John Taylor, Colm-cille P. Caulfield*
- 11:15 Turbulent mixing driven by the Faraday instability. *Antoine Briard, Benoît-Joseph Gréa, Louis Gostiaux*
- 11:30 Vertical drafts and mixing in stratified turbulent flows.
Fabio Feraco, Raffaele Marino, Alain Pumir, Leonardo Primavera, Pablo D. Mininni, Annick Pouquet, Duane Rosenberg

11:45 Differentially heated rotating annulus experiments to study gravity wave emission from jets and fronts.
Costanza Rodda, Steffen Hien, Ulrich Achatz, Ion Dan Borcia, Patrice Le Gal, Miklós Vincze, Uwe Harlander

12:00 Invariant manifolds in stratified turbulence. *Nicolás Sujovolsky, Pablo Mininni, Gabriel Mindlin*

12:15 The linear instability of the stratified plane Poiseuille flow.
Uwe Harlander, Patrice Le Gal, Ion Dan Borcia, Stephane Le Dizes, Jun Chen, Benjamin Favier

12:30 A self-organized criticality analogy of submeso motions and intermittent turbulence across a nocturnal low-level jet.
Luca Mortarini, Daniela Cava, Umberto Giostra, Otavio Acevedo, Gabriel Katul

12:45 *Lunch / Young Investigators Awards Ceremony*

STRATIFIED FLOWS • Session 4 • Room 2 • Chair: Robert Ecke • 14:00 - 15:30

14:00 Wall-bounded stably stratified turbulence at large Reynolds number. *Francesco Zonta, Pejman Hadi Sichani, Alfredo Soldati*

14:15 Fractal neutral curves in stably-stratified shear flows. *Jonathan Healey*

14:30 Transition and layering in plane Couette flow with spanwise stratification. *Dan Lucas, Colm-cille P. Caulfield, Rich R. Kerswell*

14:45 Controlling the secondary flow in turbulent Taylor-Couette turbulence through spanwise-varying roughness. *Daniel Chung, Pieter Berghout, Dennis Bakhuis, Rodrigo Ezeta, Pim Bullee, Roberto Verzicco, Detlef Lohse, Sander Huisman, Chao Sun, Dominic Tai*

15:00 Simulating neutrally and stably stratified turbulent Ekman flows with a stochastic turbulence model. *Heiko Schmidt, Marten Klein*

15:15 Identification and parametrisation of spontaneous Kelvin-Helmholtz instabilities in stratified turbulence via convolutional neural networks. *Gavin Portwood, Juan Saenz, Stephen de Bruyn Kops*

15:30 Filter approach for variable density flows. *Robert Ecke*

ROOM: 8

VORTEX DYNAMICS AND STRUCTURE FORMATION • Session 2 • Chair: Djordje S. Cantrak • 10:45 - 12:45

10:45 Two-dimensional vortex statistics of the wake flow of cylinder in channel flow. *Xiang Qiu, YuXian Xia, JiangHua Li, Quan Gao*

11:00 New diagnostics for turbulent vortices. *Robert M. Kerr, H. Jane Bae, John D. Gibbon, Adrian Lozano-Durán*

11:15 Vortex impact with a rough wall formed by a hexagonal lattice of posts. *Qianhui Li, Christoph H. Bruecker*

11:30 Flow transitions in collisions between vortex-rings and free surfaces. *K. W. B. Yeo, J. Y. Koh, J. Long, T. H. New*

11:45 Tracking vortex surfaces frozen in the virtual velocity in non-ideal flows an extension of the Helmholtz vorticity theorem.
Yue Yang, Jinhua Hao, Shiyang Xion

12:00 The analysis of recirculation zone dynamics in cavity flow. *Paulius Vilkinis, Nerijus Pedišius*

12:15 Spatiotemporal measurement of superstructures in a turbulent boundary layer flow. *Daniel Schanz, Matteo Novara, Reinhard Geisler, Janos Agocs, Felix Eich, Matthew Bross, Christian J. Kähler, Andreas Schröder*

12:30 Calculation of the pressure field from the high speed 3C PIV data of the turbulent flow and its evaluation by use of the cobra probe.
Djordje S. Cantrak, James T. Heineck, Laura K. Kushner, Nettie Roozeboom, Novica Z. Jankovic

12:45 *Lunch / Young Investigators Awards Ceremony*

NUMERICAL METHODS AND DATA ANALYSIS • Session 5 • Room 8 • Chair: Alessandro Corbetta • 14:00 - 15:15

14:00 Numerical analysis of the heat transfer of a nano-fluid immersed in a porous medium inside a central tower-type solar receiver.
Agustin Mora, Maria Belem Arce, Martin Salazar, Oscar Lopez, Adolfo Rene Correa

14:15 Direct measurement of vorticity in transitional to turbulent flow. *Markus J. Schmidt, Thomas Roesgen*

14:30 3D Lagrangian particle tracking with multi-pulse shake-the-box in turbulent boundary layer flows at high Reynolds numbers.
Matteo Novara, Daniel Schanz, Reinhard Geisler, Sebastian Gesemann, Christina Voss, Andreas Schroeder

14:45 Impact of Lagrangian trajectory filtering on turbulent statistics in 4D-PTV measurements of von Karman flow.
Adam Cheminet, Valentina Valori, Tarek Chaabo, Yasar Ostovan, Paul Debye, Christophe Cuvier, Berengere Dubrulle, Jean-Philippe Laval, Jean-Marc Foucaut, Cecile Wiertel, Vincent Padilla, Francois Daviaud

15:00 Directional sensitivity & performance comparison of Dantec Dynamics triple sensor hotwire probes. *F. Gokhan Ergin, Carsten Pedersen*

15:15 Turbulence measurements in an open channel with a new ADV profiler. *Marie Burckbuchler, Stéphane Fischer*

15:30 Deep learning of turbulent velocity signals. *Alessandro Corbetta, Roberto Benzi, Vlado Menkovski, Federico Toschi*

ROOM: 10

GEOPHYSICAL AND ASTROPHYSICAL TURBULENCE • Session 2 • Chair: Nobumitsu Yokoi • 10:45 - 12:30

10:45 Waving perturbation of outlying sheets and core of molecular clouds in head-on collision. *Valery Goryachev, Boris Rybakin*

11:00 Bridging the turbulent vortex dynamo theory and tropical cyclone investigations. *Galina Levina*

11:15 Statistics of extreme convective penetration in stellar interiors. *Dimitar Vlaykov, Isabelle Baraffe, Jane Pratt*

11:30 Rocket-borne turbulence measurements in mesosphere/lower thermosphere region.
Boris Strelnikov, Franz-Josef Lübken, Victor Avsarkisov

11:45 Development of turbulence and clouds under strong wind jet in atmospheric boundary layers; Large-Eddy Simulations.
Metodija Meto Shapkalijevski, Vera Schemann, Daisuke Sakurai, Nikki Vercauteren

- 12:00 Potential vorticity, helicity, and vortex structures in the atmospheric boundary layer.
Otto Chkhetiani, Boris Koprov, Victor Koprov, Michael Kurgansky, Egor Shishov, Valery Kramar
- 12:15 Turbulence in marine boundary layer clouds: a meta-analysis of airborne measurements.
Moein Mohammadi, Szymon Malinowski, Marta Waclawczyk, Yong-Feng Ma, Jesper Pedersen
- 12:30 Turbulence transport modelling in core-collapsed supernovae explosion. *Nobumitsu Yokoi, Tomoya Takiwaki, Youhei Masada*
- 12:45 *Lunch / Young Investigators Awards Ceremony*

TRANSPORT AND MIXING • Session 4 • Room 10 • Chair: Dario Vincenzi • 14:00 - 15:30

- 14:00 Nearfield flow establishment in a pure coherent shear source turbulent flow tunnel. *Anoop Mohan Vijaya, N. R. Panchapakesan*
- 14:15 Passive scalar dispersion and mixing in turbulence: Direct Numerical Simulations and modelling.
Michel Orsi, Fabio Feraco, Massimo Marro, Maurizio Boffadossi, Duane Rosenberg, Raffaele Marino, Pietro Salizzoni
- 14:30 Lagrangian mixing in wall-bounded turbulence: a network perspective.
Giovanni Iacobello, Stefania Scarsoglio, Hans Kuerten, Luca Ridolfi
- 14:45 Towards a simple mixing model for passive scalar transport using Hierarchical Parcel Swapping (HiPS).
Tommy Starick, David O. Lignell, Heiko Schmidt
- 15:00 Entrainment in non-Boussinesq jets. *Mathieu Creysseles, Samuel Vaux, John Craske, Maarten van Reeuwijk, Pietro Salizzoni*
- 15:15 Closure theory for particle clustering in turbulence. *Taketo Arikawa, Kyo Yoshida, Keigo Matsuda, Katsunori Yoshimatsu*
- 15:30 Effects of grid resolution, source size and source elevation on large eddy simulation of plume dispersion in an infinite-Re neutral boundary layer. *Hamidreza Ardeshiri, Massimo Cassiani, Soon-Young Park, Andreas Stahl, Kerstin Stebel, Ignacio Pizzo, Anna Solveig Dinger, Arve Kylling, Norbert Schmidbauer*
- 15:45 Preferential sampling of elastic chains in turbulent flows. *Dario Vincenzi, Jason R. Picardo, Nairita Pal, Samiddhi Sankar Ray*



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