iTi Conference on Turbulence X

July 23 - 26, 2023 | Bertinoro, Italy

time	Sunday (23rd of July)
19:00	Welcome buffet - Registration

time	Monday (24th of July)
08.30	Registration and Introductory remarks
	Session 1 – Turbulence Theory I – Chair: Martin Oberlack
9:00	**Invited talk** *CICLoPE – a Discriminating Facility for Wall-Bounded Turbulence and Recent Lessons from Experiments-Asymptotics-Computation*. **Hassan Nagib** (Illinois Institute of Technology, USA)
9:30	*A newly established laboratory and theoretical framework for non-equilibrium turbulence studies.* **C. M. Velte**, A. Hodzic, H. Abitan, P. J. Olesen, M. Schiødt, S. L. Ribergaard, Y. Zhang
9:50	*Multiscale dynamics in turbulent wakes.* **N. Biswas**, O. R. H. Buxton
10:10	*Linear Amplification of Large Scale Structures in Adverse Pressure Gradient Turbulent Boundary Layers through Resolvent Analysis*. **S. Gomez**, B. McKeon
10:30	*The role of laminar/turbulent interface on energy transfer between scales in by-pass transition*. **G. Papadakis**, H. Yao
	Coffee break (10:50 -11:20)

time	Monday (24th of July)
	Session 2 – Coherent Structures – Chair: Jonathan Morrison
11:20	*Contribution of large-scale coherent structures to budgets of turbulent kinetic energy in turbulent pipe flow*. A. Shahirpour, **J. Sesterhenn**
11:40	*Decay and formation of secondary motions in a turbulent channel flow*. **A. Andreolli**, N. Hutchins, B. Frohnapfel, D. Gatti
12:00	*On the origins of dual hairpin vortex arrangement in the wake of oscillating foils*. **S. Verma**, A. Hemmati
12:20	*Conditional analysis of local energy cascade in isotropic turbulence*. H. Yao, M. Schnaubelt, A. Szalay, P.K. Yeung, T. A. Zaki, **C. Meneveau**
	Lunch (12:40 – 13:40)
	Session 3 – Wall Turbulence I – Chair: Hassan Nagib
13:40	**Invited talk** *Modeling wall-bounded turbulent flows: a search for structure in chaos.* **Dennice Gayme** (Johns Hopkins University, USA)
14:10	*A tool for efficient application of the QSQH theory of modulation of near-wall turbulence.* **Y. Yang**,S. I. Chernyshenko
14:30	*Spectral analysis of the inter-scale transport mechanisms of energy-containing eddies in turbulent boundary layers*. **A. Matas**, E. Kannadasan, C. Atkinson, J. Soria
14:50	*Convection velocities of a turbulent boundary layer subjected to pressure gradients and curvature*. **P. Manovski**, M. Giacobello, C. M. de Silva, N. Hutchins, I. Marusic
15.10	*Law of the wake and scaling of the mean velocity profile in turbulent pipe flow.* **G. Bellani**, A. Talamelli
15:30	*Coupling anisotropic fiber tracking with instantaneous volumetric flow field in turbulent channel flows*. G. C. A. Caridi, V. Giurgiu, M. Alipour, M. De Paoli, **A. Soldati**
15:50 – 17:00	**Poster short presentation I and Coffee break**

time	Monday (24th of July)

time	Monday (24th of July)
	Session 4 – Flow Control – Chair: Ivan Marusic
17:00	*Vorticity transport mechanism in a turbulent channel flow controlled using streamwise travelling waves.* M. Umair, **S. Tardu**
17:20	*Crossflow-oscillating plasma jets in a turbulent channel flow*. L. d'Amato , E. Amico, G. Cafiero, G. Iuso, **J. Serpieri**
17:40	*Boundary layer modification with travelling surface waves generated by kagome lattices*. **I. Fumarola**, Z. Soltani, M. Santer, J. Morrison
18:00	*On the wave-induced Stokes sublayer and drag reduction in the turbulent wind*. **A. Cimarelli**, F. Romoli, E. Stalio
18:20	*Investigations into spatio-temporal interactions in rough wall-bounded turbulence using reduced order modelling*. **B. Viggiano**, D. F. Gayme

time	Tuesday (25th of July)
	Session 5 – Experiments – Chair: Joachim Peinke
8:30	**Invited talk** *Energy cascades in axisymmetric turbulent wakes*. **Martin Obligado** (Université Grenoble Alpes, France)
9:00	*Event-based imaging for visualization and measurement of turbulent flows*. **C. Willert**, J. Klinner
9:20	*Effects of anisotropy on the geometry of tracer particle trajectories in turbulent flows*. **Y. Hengster**, M. Lellep, J. Weigel, M. Bross, J. Bosbach, D. Schanz, A. Schröder, F. Huhn, M. Novara, D. Garaboa Paz, C. Kähler, and M. Linkmann
9:40	*Augmenting PIV temporal resolution via semi-Lagrangian estimation of velocity fluctuations*. M. Vocke, R. Kapulla, C. Morton, **R. Martinuzzi**
10:00	*Inertial Particles in Turbulence under Minimum Gravity*. F. Cabrera, K. Cardin, L. Chevillard, R. Volk, N. Plihon, M. Bourgoin, **R. B. Cal**
	Coffee break (10:20 -10:50)
	Session 6 – Turbulence Theory II – Chair: Joe Klewicki
10:50	*Not all Clear Air Turbulence is Kolmogorov - The fine-scale nature of atmospheric turbulence*. **A. Dörnbrack**, P. Rodriguez Imazio, P. D. Mininni
11:10	*Symmetries in Second Moment Turbulence Modeling.* **F. C. Putz**, M. Oberlack
11:30	*Isotropy, super-isotropy and a finite dimensional eigenvalue problem from the Lundgren hierarchy of turbulence*. **S. Görtz**, J. Conrad, M. Oberlack
11:50	*Self-similarity and the physical mechanism of the direct cascade in two-dimensional turbulence*. **R. O. Grigoriev**, D. Zhigunov, M. Reynoso
12:10	*New insights in wall-bounded turbulence*. **S. Hoyas**, M. Oberlack
	Lunch (12:30-13:30)

time	Tuesday (25th of July)
	Session 7 – Roughness – Chair: Bharath Ganapathisubramani
13:30	**Invited talk**: *Turbulent flows over heterogeneous rough walls*. **Bettina Frohnapfel** (KIT, Germany)
14:00	*Assessment of different methods for drag penalty predictions in rough-wall boundary layers*. **T. Medjnoun**, M. A. Ferreira, R. Reinartz, B. Nugroho, J. P. Monty, N. Hutchins, B. Ganapathisubramani
14.20	*On the instantaneous characteristics of ridge-type induced secondary motions*. **K. Schäfer**, B. Frohnapfel, D. Gatti
14:40	*Wall pressure fluctuations in the CICLoPE facility*. **G. Dacome**, W. J. Baars, A. Talamelli, L. Lazzarini, G. Bellani
15:00	*Flexible fibers in turbulent channel flow*. **C. Marchioli**, D. Di Giusto
15:20 – 16:20	**Poster short presentation II and Coffee break**
	Session 8 – Numerical Methods – Chair: Davide Gatti
16:20	*Evaluation of Turbulence Models in Unsteady Separated Flows*. C. Y. MacDougall, **U. Piomelli**, F. Ambrogi
16:40	*Computationally efficient prediction of turbulence statistics using a Bayesian hierarchical multifidelity model*. S. Rezaeiravesh, T. Mukha, **P. Schlatter**
16:00	*A multi-timescale wall model for LES and applications to non-equilibrium channel flows.* **M. Fowler**, T. A. Zaki, C. Meneveau
17:20	*Physics-Informed Minimal Error Simulation Methods for Turbulent Flow Predictions*. **S. Heinz**
18:00	**Conference dinner (BUS)**

time	Wednesday (26th of July)
	Session 9 – Free Shear Flows – Chair: Martin Obligado
8:30	**Invited talk**: *Towards a clearer understanding of jet and propeller noise: time-frequency analysis and stochastic models*. **Roberto Camussi** (University Roma Tre, Italy)
9:00	*The near– and intermediate–wakes of cylinders under the influence of freestream turbulence*. **L. Li**, R. J. Hearst
9:20	*Spatial evolution of the turbulent/turbulent interface geometry and turbulent momentum entrainment*. **J. G. Chen**, O. R. H. Buxton
9:40	*The beauty of active grids and their infinite possibilities of turbulence generation*. **L. Neuhaus**, M. Hölling, M. Wächter, J. Peinke
10:00	*Comparing hot-wire measurements and particle image velocimetry of turbulence fields generated by a flapping active grid*. **I. Neunaber**, M. Asadi, L. Li, R. J. Hearst
	Coffee break (10:20-10:50)
	Session 10 – Thermal Convection – Chair: Roberto Camussi
10:50	*Study of dust devils in a large-scale laboratory experiment*. **R. du Puits**, C. Kaestner
11:10	*Effect of coherent fluctuation in stellar convection viewed from the non-equilibrium turbulence effect*. **N. Yokoi**, Y. Masada, T. Takiwaki
11:30	*Estimation of boundary layer turbulence through non-intrusive sensing of wall-temperature fluctuations*. **F. Foroozan**, A. Ianiro, S. Discetti, W. J. Baars
11:50	*Enstrophy budgets in a turbulent temporal plume*. **L. Campana**, M. van Reeuwijk, E. De Angelis
12:10	*New Insights on Buoyancy Driven Turbulence*. **K. Bhaganagar**
	Lunch (12:30-13:30)

time	Wednesday (26th of July)
	Session 11 –Wall Turbulence II – Chair: Alessandro Talamelli
13:30	*Detailing history and non-equilibrium effects in adverse pressure gradient turbulent boundary layers*. **S. Romero**, S. Zimmerman, J. Philip, J. Klewicki
13:50	*Statistical characteristics of three velocity components in pipe flow at high Reynolds number*. **M. Ono**, N. Furuichi, Y. Tsuji
14.10	*Effects of spanwise mean pressure gradient on rotating plane Couette flow*. **O. Iida**, T. Kanda
14:30	*Turbulence in spatially accelerating turbulent boundary layers*. **M. Falcone**, S. He
14:50	Closing remarks

Posters

1. *Convective heat transfer enhancement in turbulent boundary layers with linear genetic algorithms*. **R. Castellanos**, I. Robledo, J. Alfaro, A. Ianiro, S. Discetti
2. *On intermittency in the turbulent asymptotic suction boundary layer*, **E. Foschi**, R. Örlü, A. Talamelli, P. Schlatter
3. *Analysing the large-scale circulation dynamics of a turbulent Rayleigh-Benard convection in a cubic cell*. **R. Barta**, C. Wagner
4. *Direct numerical simulation of turbulent open channel flow: Streamwise turbulence intensity scaling and its relation to large-scale coherent motions*. **C. Bauer**, Y. Sakai, M. Uhlmann
5. *Effect of freestream turbulence on the reattachment length downstream of a backward-facing step*. **S. Yadala**, G. K. Jankee, L. Li, N. A. Worth, R. J. Hearst
6. *Reversible Navier-Stokes equation on logarithmic lattices*. **C. Guillaume**, B. Amaury, B. Dubrulle
7. *Dual scaling and the n-thirds law in grid turbulence*. **S. L. Tang**, R. A. Antonia, L. Djenidi
8. *On the interface between freestream turbulence and a turbulent boundary layer*. **M. Asadi**, P. Bullee, R. J. Hearst
9. *Transfer mechanism of a passive scalar in grid turbulence with mean scalar gradient*. **M. Wang**, T. Yurikusa, K. Iwano, Y. Sakai, Y. Ito
10. *Phase proper orthogonal decomposition for analysis of spatio-temporal modal dynamics in a co-axial jet*. **Y. Zhang**, A. Hodzic, C. M. Velte
11. Temperature assimilation for convective flows by convolutional neural networks. **M. Mommert**, C. Bauer, C. Wagner
12. *Correlating free-stream turbulence structures to fluctuating loads on a cylinder in a turbulent cross-flow*. **F. J. G. de Oliveira**, Z. S. Khodaei, O. R. H. Buxton
13. *The role of background turbulence on the properties of a turbulent wake generated by different cylinders in a wind tunnel*. **F. Schmitt**, M. Hölling, J. Peinke, M. Obligado
14. *Scaling of Turbulent Moments in Compressible Axisymmetric Jets*. **K. Y.-N. Hinh**, R. J. Martinuzzi, C. T. Johansen
15. *Spectral analysis of the spatially evolving turbulent channel flow*. **E. Kannadasan**, C. Atkinson, J. Soria
16. *Characterisation of multi-scale rough surfaces for turbulent drag prediction*. **A. Ramani**, L. Schilt, B. Nugroho, A. Busse, T. O. Jelly, J. P. Monty, N. Hutchins
17. *Jet flow feature estimation with snapshot PIV and fast probes*, **L. Franceschelli**, M. Raiola, S. Discetti

18. *Effects of sinusoidal riblets on turbulent boundary layer flow structures*. **G. Cafiero**, E. Amico, J. Serpieri, G. Iuso
19. *Isolated roughness effect on boundary layer topology*. V**. Yanovych**, D. Duda, V. Uruba, V. Sokolenko
20. *New Experiments on High Reynolds Number Turbulent Pipe Flow Using Spatially Resolved Laser Doppler Velocimeter*. **F. Heitmann**, M. Juling, M. Ono, N. Furuichi
21. *Mixed convection in a particle-laden channel flow: effect of particles in one and two-way coupling regimes*. **D. Zaza**, M. Iovieno
22. *Reynolds number effects on secondary flows over ridge-type surfaces*, **M. Nilsson-Takeuchi**, B. Ganapathisubramani
23. *From wall measurements to three-dimensional turbulent-flow fields*. **A. Cuéllar Martín**, A. Güemes, A. Ianiro, R. Vinuesa, O. Flores, S. Discetti
24. *On the development of turbulent flow over a porous medium*. **T. Hunter**, F. Avallone, A. K. Doan, D. Ragni
25. *Effect of uniform blowing on the large-scale structures and 'bursting' events of a turbulent boundary layer*. **G. Hasanuzzaman**, S. Merbold, C. Egbers
26. *Experiments and simulations on the accelerating/decelerating flow on a square cylinder*. **G. Lunghi**, S. Brusco, A. Mariotti, G. Piccardo, M. V. Salvetti
27. *Simulation of massively separated flows using an intermittency-based hybrid model*. **F. Miralles**, S. Wornom, B. Koobus, A. Dervieux
28. *Tomo-PIV of turbulence structure in a rapid contraction*. **A. Alhareth**, V. Mugundhan, K. R. Langley, N. B. Speirs, S. T. Thoroddsen
29. *Observation of the alternation of large-scale structures in low Reynolds number two-dimensional turbulent channel flow by two-point correlation of velocity fluctuations*. T. Anada, **R. Takai**, Y. Tanada, K. Kato, N. Henmi, M. Matsubara
30. *A New Temperature- and Entropy-Concept for Turbulence*. **J. Peinke**, A. Fuchs, T. Wester, M. Wächter
31. *Flow Sensitivity Analysis for the Feedback Loop Phenomenon of Subsonic Jet Noise Generation*. **S. Morita**, A. Yakeno, C. Bogey, S. Obayashi
32. *Reynolds number induced growth of large-scale rolls in plane Couette flow and invariant scaling laws for added wall-transpiration using resolvent analysis*. **T. Dokoza**, M. Oberlack
33. *Symmetry-based turbulent scaling laws of a spatially evolving turbulent round jet*. **C. T. Nguyen**, M. Oberlack
34. *Study of the upstream influence of the diffuser of CICLoPE "long pipe" using oil film interferometry*. **L. Lazzarini**, G. Bellani, A. Talamelli