



ERCOFTAC
European Research Community On
Flow, Turbulence And Combustion



Workshop “Turbulence and Interface”

<https://www.ercoftac.org/events/turbulence-and-interface/>

Wednesday, June 15, 2022 - 9:00 - 17:00 - SkyLab, Ecole Centrale de Lyon, Ecully

8:30 - 9:00 Registration

9:00 - 9:30 Welcome and opening remarks by Christophe Corre (ECL), Christophe Bailly (LMFA), Mikhael Gorokhovski (ERCOFTAC PC Henri Bénard)

9:30 - 11:15 Targets. Chair: *Claude Cambon*

9:30 - 10:00 Gholamhossein Bagheri and O. Schlenczek, B. Thiede, L. Turco, K. Stieger, J-M. Kosub, B. Hejazi, S. Clauberg, M.L. Pöhlker, Ch. Pöhlker, J. Moláček, S. Scheithauer, E. Bodenschatz, Max Planck Institute, Göttingen (Germany)

Physics of airborne disease transmission: why do we need to advance our understanding?

10:00 - 10:30 Stephane Popinet and L. Deike, W. Mostert, P. K. Farsoiya, J. Wu, B. Deremble, T. Uchida, A. Berny, T. Séon - Inst. D’Alembert, Univ. Grenoble Alpes (France), Princeton Univ. and Oxford Univ. (USA)

Toward a multiscale framework for ocean atmosphere turbulence

10:30 - 10:45 Refreshment Break

10:45 - 11:15 Alain Pumir and D. Buaria - LP, Ecole Normale Supérieure Lyon (France), Max Planck Institute, Göttingen (Germany) and New York Univ., New York (USA)

Extreme events in Navier-Stokes turbulence

11:15 - 11:45 Turbulence and spray onset.

Chair: *Alfredo Soldati*

11:15 - 11:45 Rodney Fox and P. K. Farsoiya, L. Deike - Iowa State Univ., Center for Multiphase Flow Research/Education and Princeton Univ. (USA)

Direct-numerical simulation of droplet breakup in homogeneous isotropic turbulence

11:45 - 12:15 Stephane Zaleski - Inst. D’Alambert, Sorbonne-Univ. (France)

Kolmogorov's and Frisch's cascade theories applied to atomization

12:30 - 13:45 Lunch

13:45 - 14:15 Olivier Desjardins and L. Vu, A. Han - Cornell University (USA)

High-fidelity multi-scale modeling framework for predicting turbulent spray atomization

14:15 - 14:45 Marcus Herrmann and D. Kedelty, A. Goodrich - Arizona State Univ. (USA)

A dual scale LES model for dynamics of immiscible interfaces

14:45 - 15:15 Mikhael Gorokhovski and A. Barge, S.Oruganti - LMFA, Ecole Centrale, Lyon, LEGI, Univ. Grenoble-Alpes (France) and Argonne National Laboratory Lemont, IL 60439-4801, USA

Statistical scenarios of droplets breakup and motion in the turbulence with intermittency

15:15 - 15:30 **Refreshment Break**

Chair: *Carlomassimo Casciola*

15:30 - 16:00 Nathanael Machicoane and O.Tolfts - LEGI, Univ. Grenoble-Alpes (France)

Statistics and dynamics of a liquid jet surrounded by a gas jet

16:00 - 16:30 Zhujun Huang and M. Alonzo, A. Cartellier - LEGI, Univ. Grenoble-Alpes (France)

Breakup of surfactant liquid jet by a coaxial airblast atomizer

16:30 - 17:00 Nicolas Rimbart and B. Ji, G. Kewalramani, Y. Dossman¹, M. Gradeck, R. Meignen - Univ. Lorraine, and IRSN, Saint Paul Lez Durance (France)

Experimental Study of Liquid-liquid jet fragmentation: Eulerian and Lagrangian approach

17:00 - 17:30 Mickael Bourgoïn and T. Basset, B. Viggiano, T. Barois, M. Gibert, N. Mordant, R. B. Cal, R. Volk - LP, Ecole Normale Supérieure de Lyon (France) and LEGI, Univ. Grenoble-Alpes (France)

Entrainment, diffusion and effective compressibility in a self-similar free shear turbulent jet

17:30 **Welcome aperitif**

----- *end of the first day* -----

Thursday, June 16, 2022 - 9:00 - 11:45 - SkyLab, Ecole Centrale de Lyon, Ecully

Interface dynamics at a high and a low Reynolds numbers. External intermittency.

Chair: *Mickael Bourgoïn*

9:00 - 9:30 Filippo Coletti - ETH, Zurich (Switzerland)

Spatial and Temporal Scales of Free-Surface Turbulence

9:30 - 10:00 Luminita Danaila and Zh. Zhang, I. Danaila, E. Levéque - Univ. Rouen and LMFA, Ecole Centrale de Lyon (France)

High-order statistics and intermittency of a two-fluid HVBK quantum turbulent flow

10:00 - 10:30 John-Christos Vassilicos - LMFL, Centrale Lille, Univ. Lille (France)

The energy cascade at the turbulent/non-turbulent interface

10:30 - 10:45 **Refreshment Break**

10:45 - 11:15 Sergio Chibbaro and M. C. Esposito, L. Brandt - Univ. Paris-Saclay (France) and KTH Royal Institute of Technology (Sweden)

Modulation of homogeneous and isotropic turbulence in emulsions

11:15 - 11:45 Maria Vittoria Salvetti and A. Mariotti, M. Antognoli, S. Tomasi Masoni, E. Brunazzi, C. Galletti, R. Mauri - Univ. Pisa (Italy)

Fascinating interface topology and dynamics in micro mixers

12:00 - 12:45 **Lunch**

13:00 - Workshop will move for an afternoon session to Maison d'Ampère in Poleymieux-au-Mont-d'Or, including visit of the Museum – Historic Site of European Physics

Thursday, June 16, 2022 - 14:00-18:30, Maison d'Ampère, Poleymieux-au-Mont-d'Or

13:45 - 14:00 Words of Welcome by Genevieve Comte-Bellot

Turbulence ↔ Particles.

Chair: *Rodney Fox*

14:00 - 14:30 Carlomassimo Casciola and F. Seraffini, F. Battista, P. Gualtieri - Sapienza Univ. Rome (Italy)

Drag reduction in turbulent pipe flows of realistic polymer solutions

14:30 - 15:00 Olivier Simonin and A. Boutsikakis, P. Fede - IMFT, Univ. Toulouse (France)

On the modelling and simulation of the dynamic of charged particles in turbulent flow

15:00 - 15:30 Gautier Verhille and B. Favier, P. Le Gal - IRPHE, Aix-Marseille Univ. Centrale Marseille (France)

Inertial deformable particles in turbulence

15:30 - 15:45 **Refreshment Break**

Chair: *Olivier Desjardins*

15:45 - 16:15 Alfredo Soldati and F. Mangani, A. Roccon - TU Wien, Vienna (Austria) and Univ. Udine (Italy)

Influence of density and viscosity on deformation, breakage and coalescence of bubbles in turbulence

16:15 - 16:45 Frederic Risso and F. Le Roy de Bonneville, R. Zamansky, A. Boulin, J.-F. Haquet - IMFT, Univ. Toulouse and CEA, Saint-Paul-Lez-Durance (France)

Dynamics of bubble-induced turbulence from coarse-grained simulations

16:45 - 17:15 Kai Schneider - Centre de Mathematiques et d'Informatique, Aix-Marseille Univ. (France)

Multiscale techniques for analyzing voids and clusters in particle-laden turbulence

17:15 - 18:00 **Guided Tour of Museum**

18:00 - **Bus to Lyon Center (place Bellecour, Lyon 69002)**

19:30 - **Social Diner in Brasserie Georges–1836, Lyon (30 cours de Verdun, 69002, Lyon)**

----- *end of the second day* -----

Friday, June 17, 2022 - 9:00-17:00 - SkyLab, Ecole Centrale de Lyon, Ecully

Turbulence, Particles, Scalars

Chair: *Emmanuel Lévêque*

9:00 - 9:30 Sander Huisman and S. Angriman, P. Cobelli, M. Bourgoïn, R. Volk, P. Mininni, Max Planck UT Center (Germany) Univ. Twente (Netherlands), LP, ENS (France) and Univ. Buenos Aires (Argentina)

Broken mirror symmetry of tracer's trajectories in turbulence

9:30 - 10:00 Herman Clercx and M. Madonna, A. A. Guzmán, X. de Wit, R. Kunnen - Eindhoven Univ. of Technology, Eindhoven (Netherlands)

Turbulent rotating Rayleigh-Bénard convection: Flow organization and heat transfer in slender confined cylinders

10:00 - 10:30 Martin Obligado and A. Ferran, N. Machicoane, N. Mordant, A. Aliseda - LEGI, Univ. Grenoble Alpes, Grenoble (France) and Univ. Washington, Seattle (USA)

Gravitational settling of inertial particles in homogeneous isotropic turbulence

10:30 - 10:45 ***Refreshment Break***

Chair: *Olivier Simonin*

10:45 - 11:15 Cristian Marchioli and A. Hajisharifi¹, A. Soldati - Univ. Udine (Italy) and TU Wien (Austria)

Particle capture by large deformable drops in turbulent flow

11:15 - 11:45 Francesco Picano and J. Wang, F. Dalla Barba - Univ; Padova (Italy)

On the evaporation of dilute droplets in turbulent jets: from physics to applications

11:45 - 12:15 Aurore Naso and M. Z. Sheikh, K. Gustavsson, E. Lévêque, B. Mehlig, A. Pumir - LMFA, Ecole Centrale Lyon and LP, Ecole Normale Supérieure de Lyon (France)

Collisions between ice crystals in clouds

12:15 - 12:45 Loïc Méès and N. Grosjean, and J. L. Marie - LMFA, ECL (France)

Lagrangian tracking of evaporating droplets in a homogeneous quasiisotropic turbulence

12:45 - 13:15 Daniela Tordella and L. Fossa, Sh. Abdunabiev, M. Golshan - Politecnico Turin (Italy)

Microphysical time scales and local supersaturation balance at a warm Cloud Top Boundary

13:15 - 14:00 ***Lunch and Concluding remarks*** by Alfredo Soldati, Mickael Bourgoïn and Mikhael Gorokhovski

----- *end of the third day* -----