Scientific program – HELIX 2015

Fluid–Structure Interactions and Vortex Dynamics in Aerodynamics

MONDAY JUNE 29

14:00 – 14:15 Welcome

14:15 – 16:15 Dynamics and instabilities of vortices

- Introduction (examples of vortices in nature, industry and lab experiments)
  Thomas Leweke
- Dynamics of vorticity
  Maurice Rossi
- Filament theory
  Thomas Leweke

16:15 – 16:45 Coffee Break

16:45 – 18:45 Aerodynamics

- Steady aerodynamics in 2D and 3D
  Ivan Delbende

TUESDAY JUNE 30

08:15 – 09:45 Fluid-structure interactions

- Introduction to FSI
  Christophe Eloy

09:45 – 10:05 Oral presentations

- Fluid-Structure Interaction and Orbital Stability of a Light Tethered Sphere in Uniform Flow
  La Mi, Oded Gottlieb

10:05 – 10:45 Coffee Break

10:45 – 11:25 Oral presentations

- Fluid-Structure Interactions associated with a cylinder rolling down an incline under gravity
  Farah Yasmina Houdroge, Mark Thompson, Thomas Leweke, Kerry Hourigan
- Control of bluff bodies wake using flexible filaments
  Edoardo Alinovi, Mohammad Omidyeganeh, Alfredo Pinelli

11:25 – 12:25 Dynamics and instabilities of vortices

- Motion of a vortex pair and its application to industry
  Yasuhide Fukumoto

16:30 – 17:00 Coffee Break

17:00 – 19:00 Posters (3mn talks)

- Curvature effect on the elliptic instability
  Francisco José Blanco Rodriguez, Stéphane Le Dizès
- Mathematical modeling of an ideal atomizing liquid jet
  Fermin Franco-Medrano, Yasuhide Fukumoto
- Design of a transonic aeronautic fan for aeroelastic studies
  Quentin Rendu, Yannick Rozenberg
- Flow behind the rotating bluff body for moderate Reynolds number
  Kornel Gibinski, Maciej Skarysz, Sophie Goujon-Durand, Jose Eduardo Wesfreid
- Control of cylinder oscillations by plasma actuators
  Federico Nicolás Castro Hebrero, Roberto Sosa, Guillermo Artana
- Dynamics and Stability of Liquid Films on Strings
  Vineet Nair, Ishan Sharma, Viswanathan Shankar
- Effect of the axial jet on the optimal response in Batchelor vortex
  Francisco José Blanco Rodriguez, José Hermenegildo García-Ortiz, Luis Parras, Carlos del Pino
- Shape Optimisation for Dynamic Fluid-Structure Interaction Problems
  Jaco Brandsen, Axelle Viré, Sergio Turteltaub, Gerard van Bussel
- Gravity driven granular flow over a flexible base
  Prasad Sonar, Ashish Bhateja, Ishan Sharma, Jayant Singh
- Instability of vortical flows in stratified and rotating fluids
  Junho Park, Paul Billant, Jong-jin Baik
- OpenLB: An Open Source Library for Parallel Lattice Boltzmann Fluid Flow Simulations
  Robin Trunk, Mathias Krause
- Ground-induced lift enhancement in flapping wings: a lattice Boltzmann-immersed boundary study
  Alessandro De Rosis
- Towards FSI on Wind Turbine Blades Using OpenFOAM
  Bastian Dose, Bernhard Stoevesandt, Joachim Peinke
- An immersed boundary method for the simulation of fluid-structure interactions in OpenFOAM
  Eddy Constant, Li Cuicui, Julien Favier, Philippe Meliga, Eric Serre, Marcello Meldi

WEDNESDAY JULY 1

08:15 – 10:15 Aerodynamics

- Wind energy and aerodynamics of wind turbines
  Jens Sørensen

10:15 – 10:45 Coffee Break

10:45 – 11:05 Oral presentations

- Wind turbine with flexible blades
  Vincent Cognet, Benjamin Thiria, Sylvain Courrech Du Pont

11:05 – 12:35 Fluid-structure interactions

- Instabilities in FSI
  Sébastien Michelin
- Numerical methods in FSI
  Jeff Eldredge

16:30 – 17:00 Coffee Break

17:00 – 17:40 Oral presentations

- An extension of slender-body theory for moderate aspect ratio bodies
  Zhanle Yu
- Aeroelasticity of cables with ice accretion
  Arsenii Trush, Sergey Kuznetsov, Stanislav Pospíšil

17:40 – 18:40 Dynamics and instabilities of vortices

- Long-wave instabilities
  Thomas Leweke

08:15 – 09:15 Fluid-structure interactions

- Leading edge separation
  Jeff Eldredge

09:15 – 10:15 Oral presentations

- Vortex Pair Impinging on a Horizontal Ground Plane
  Daniel Asselin, Charles Williamson
- The effect of a small upstream wire on the cylinder wakes
  Mark Thompson, Anirudh Rao, Kerry Hourigan
- Effect of wingtip continuous injection on the structure of trailing vortices
  José Hermenegildo García-Ortiz, Luis Parras, Carlos del Pino, Francisco José Blanco Rodriguez

10:15 – 10:45 Coffee Break

10:45 – 11:25 Oral presentations

- Two-dimensional instabilities of a viscous vortex dipole
  Rémi Jugier
- Dynamics of a large ring-shaped structure towed via a heavy rope
  Abhinav Dehadrai, Ishan Sharma, Shakti Gupta

11:25 – 12:25 Fluid-structure interactions

- Energy harvesting with flexible structures
  Sébastien Michelin

Free afternoon

18:45 Banquet

FRIDAY JULY 3

08:15 – 09:15 Aerodynamics

- Wind Farm Optimization - tomorrows possibilities and challenges
  Stefan Ivanell

09:15 – 10:15 Oral presentations

- Mode selection in trailing vortices: harmonic response of the non-parallel Batchelor vortex
  Francesco Viola, Cristobal Arratia, François Gallaire
- Flapping prediction for an elastically anchored plate in a uniform flow for energy harvesting purposes
  Stefano Olivieri, Andrea Mazzino
- Paper waves in the wind
  Pan Jia, Bruno Andreotti, Philippe Claudin

10:15 – 10:45 Coffee Break

10:45 – 11:25 Oral presentations

- RANSE simulation of active pitch controlled vertical axis wind turbines
  Benoit Paillard
- Vortex flow structures and interactions for the optimum thrust efficiency of a heaving airfoil at different mean angles of attack
  Antonio Martín-Alcántara, Ramon Fernandez-Feria, Enrique Sanmiguel-Rojas

11:25 – 12:25 Dynamics and instabilities of vortices

- Short-wave instabilities
  Maurice Rossi

16:30 – 17:00 Coffee Break

17:00 – 17:40 Oral presentations

- Pairing instability of a helical vortex filament
  Umberto Quaranta, Thomas Leweke
- Implementation of the actuator line method in the spectral element fluid dynamics solver Nek5000
  Elektra Kleusberg, Mattias Brynjell-Rahkola, Philipp Schlatter, Stefan Ivanell, Dan Henningson

17:40 – 19:10 Aerodynamics

- Helicopter aeromechanics
  Michel Costes

08:15 – 09:15 Dynamics and instabilities of vortices

- Lagrangian approach to spectra and instability of rotating flows of conducting and non-conducting fluids
  Yasuhide Fukumoto

09:15 – 10:15 Oral presentations

- Efficient RANS calculations of high Reynolds number flow around a square wing tip
  Antoine Joulain, Damien Desvigne, David Alfano, Thomas Leweke
- Curvature instability of a curved Batchelor vortex
  Francisco Blanco-Rodriguez, Stéphane Le Dizès
- Instabilities in helical vortex systems: linear analysis and nonlinear dynamics
  Can Selcuk, Ivan Delbende, Maurice Rossi

10:15 – 10:45 Coffee Break

10:45 – 11:45 Fluid-structure interactions

- Open problems in undulatory swimming
  Christophe Eloy