

**IUTAM Symposium on
“Critical flow dynamics involving
moving/deformable structures
with design applications”**

Santorini, Greece, 18-22 June 2018



ANNOUNCEMENT

<http://iutam.org/iutam-symposium-on-critical-flow-dynamics-involving-movingdeformable-structures-with-design-applications/> and www.smartwing.org/iutam

Location: **Santorini island – Greece**

Co-chaired by

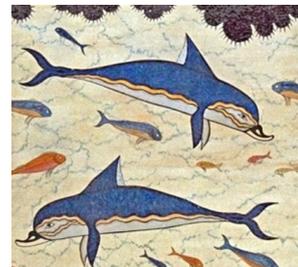
Dr. Marianna Braza - IMFT- France

Prof. Kerry Hourigan - Monash University, Australia

Prof. Michael Triantafyllou - MIT, USA

Host Institution:

**Institut de Mécanique des Fluides de Toulouse, IMFT
Unité Mixte de Recherche UMR CNRS-INPT-UPS 5502, France**



Sessions:

- **Theoretical aspects of Fluid-Structure Interaction (FSI) involving separation**
- **Instability and Transition studies related to critical phenomena in FSI**
- **Intelligent Materials, Morphing, Actuation, Energy Conversion**
- **Bio-inspired methods for smart-wing design**
- **Experimental techniques for the dynamics of separation in VIV, MIV, TIV**
- **Compressibility effects related to unsteady separation in FSI**
- **Direct Numerical Simulation of unsteady separated flows**
- **Turbulence Modeling approaches involving FSI: advanced statistical (URANS) and hybrid (URANS-LES)**
- **Coupling strategies CFD-SM**
- **Dynamically controlled aerodynamic and hydrodynamic shapes and vibrations for improved design**

Deadline of extended abstracts submission : **10th December 2017**

Notification of acceptance : **15th February 2018**

Full paper due: **30th April 2018**

Publication of the Proceedings by Springer **after full papers review**. Selected papers will be examined for publication in a dedicated volume of the Journal Fluids & Structures

The present IUTAM Symposium is also associated with the activities of the **ERCOFTAC - SIG 41** : “Fluid-Structure Interaction”

Scientific committee:

Dr. M. Braza, Co-Chairperson

Prof. M. Triantafyllou, Co-Chairperson

Prof. K. Hourigan, Co-Chairperson

Prof. A. Bottaro

Prof. B. J. Geurts

Prof. G. Karniadakis

Prof. J.F. Rouchon

Prof. B. Schrefler

IMF Toulouse - France

MIT - USA

Monash Univ. - Australia

Univ. Genova, Italy

University of Twente - Netherlands

Brown Univ., USA

LAPLACE - Toulouse, France

Univ. of Padova, Italy

IUTAM representative

Scope:

Progress in understanding turbulence and flow control is enabling scientists to improve aerodynamic / hydrodynamic performance by reducing drag, increasing lift or thrust and reducing noise under critical conditions that may result in massive separation, strong vortical dynamics, amplification of harmful instabilities (flutter, buffet), and flow -induced vibrations. Theory together with large-scale simulations and experiments have shown new features of turbulent flow in the boundary layer over wings, and in thin shear layers immediately downstream separation. Spontaneous and artificially generated fluctuations can be used to affect the turbulent flow, leading to reduction of noise and drag. Electromechanical actuation and energy conversion can be achieved efficiently using a variety of mechanisms available from a range of novel smart actuators to effect morphing.

The symposium will investigate a combination of new insights into turbulent flow interacting with actively deformable structures, leading to new ways of adapting and controlling the body shape and vibrations, to respond to these critical conditions. Furthermore, the symposium topics will include “smart”, bio-inspired methods together with new dynamically controlled aerodynamic and hydrodynamic shapes in order to attenuate the harmful effects and to increase performance and safety. Progress in these areas is receiving a great deal of impetus from international research groups, especially stimulated by major contracts related to this topic, involving key multinational industrial companies particularly in aeronautics and naval architecture, stimulated by targeted government programs. This symposium aims at bringing together the leading international groups of researchers working in the scientific communities.

The symposium will include advanced theoretical approaches experimental and simulation methods showing in synergy how smart designs lead to considerable benefits compared to conventional ways. The symposium is expected to draw the scientific advances in the state of the art and will establish important outlooks of research concerning these topics.