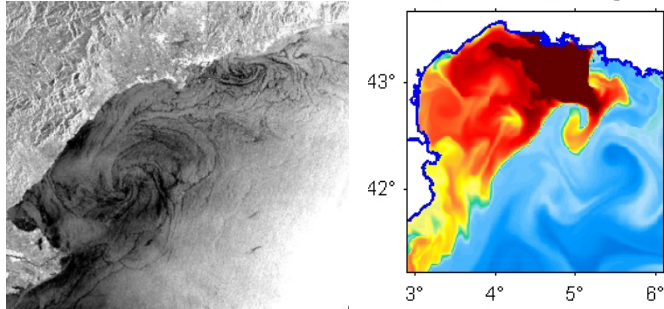


## **WORKSHOP-COURSE ON TURBULENCE IN LIFE**



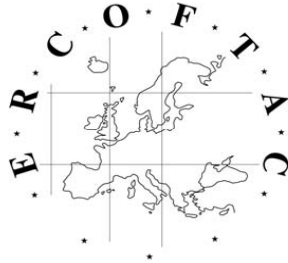
8th-14th June 2016

ERCOFTAC, CIMNE -UPC, MIO, CUM, PELN<sub>o</sub>HT  
Neapolis, Vilanova i la Geltru, Spain.

**Second Announcement**



Campus Universitari  
de la Mediterrània



UNIVERSITAT POLITÈCNICA  
DE CATALUNYA  
BARCELONATECH



ISP RAS

**Organizing and Supporting Institutions:**

ERCOFTAC, UPC, CIMNE, FLUMEN, M.I.O. CNRS, TOULON, UPC  
UNIVERSITAT POLITÈCNICA DE CATALUNYA, DEPT. FÍSICA.

PAN EUROPEAN LABORATORY on NON - HOMOGENEOUS  
TURBULENCE. E.S.A. BSC. E.N.S. PARIS. ISP RAS, Moscow.

**Further Information and Registration:**

P. Fraunie, J. M. Redondo, V. Zeitlin

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Fax(+34) 93401 6090

[redondo@fa.upc.edu](mailto:redondo@fa.upc.edu) / [fraunie@lseeet.univ-tln.fr](mailto:fraunie@lseeet.univ-tln.fr)

<http://www.campusmed.net>

**Location:**

**UPC- NEAPOLIS  
Vilanova i la Geltru, Barcelona**



## PRESENTATION AND OBJECTIVES

The UPC at the Vilanova i la Geltru Campus and UPC-CIMNE will host the ERCOFTAC international Workshop-summer school on TURBULENCE IN LIFE (and OpenFoam Models of Environmental Turbulent Flows). This follows similar events organized in Vilanova, Madrid, Warsaw, Prague, Volos and Barcelona since 1992. The main motivation for this 2016 Workshop and Summer School is to study in depth Turbulence in Non-Homogeneous, Non-Isotropic and Non-Stationary turbulence mostly affected by body forces, which is typical of Environmental Flows. Magnetic fields, Stratification and Rotation are fundamental processes affecting turbulence in industrial and environmental flows, for example to predict convective heat transport, pollutant diffusion and mixing. Reactions, Transport in Environmental Fluid Dynamics, direct and inverse cascades in turbulence at different scales will be discussed. The experimental part of the school and a series of student presentations will be done at the ERCOFTAC PAN-EUROPEAN LABORATORY ON NON-HOMOGENEOUS TURBULENCE with a one day dedicated Laboratory and Harbour visit during the workshop/school.

## MAIN TOPICS OF THE CONFERENCE

3D and 2D Turbulence, Biophysical and Geophysical flows. Industrial, Oceanographic and Meteorological Applications.

Thermoelectric and Thermomagnetic Transport, Mixing and Dispersion, Propulsion. Pollution detection, control and prediction

Laboratory experiments in Industrial and Environmental flows, Bio Physical Turbulence and complex flows, Open Foam simulations,...

### Invited Lecturers (Organizers \*) of the conference are:

P. Fraunié\*, (MII, U. Toulon, France), H. Calmet (BSC, Barcelona, Spain) L. Sorriso-Valvo (Univ. Calabria, Italy), P. Arnau\* (CIMNE, Nature Castelldefells, Spain) D. Campo (UPC. Terrasa Spain), P. Furmanek (CTU Prague, Czech Rep.) J.M. Redondo\*, C. Mosso (UPC,

Barcelona, Spain), J.J Martinez-Benjamin, J. Jorge, M. Vandershoor (UPC, Manresa. EPSEVG, Vilanova, Spain), O.B. Mahjoub (UAE, Morocco), I. Sibgatullin\*, M. Kurganski\* (MSU, Obukhov Atm. I. Moscow, Russia), S. Strijhak (ISPRAS, Moscow, Russia). J.M. Sanchez (BEROTZA, Pamplona, Spain). G. King (CSIC ICM). A. Carrillo ( U. Delaware, USA), V. Zeitlin\* (ENS Paris), J. Tellez\* (FLUMEN, UPC).

Participants, as well as scientists affiliated to the PELNoHT, ERCOFTAC related Special Interest Groups and to the XTDFTG international turbulence Network are invited to present their recent research in related topics. An Open Foam Turbulence Modelling 3 day course will also run on days 11-14 June

## REGISTRATION

The cost for the conference is 50 Euros. A reduced fee of 30 Euro is available for students and ERCOFTAC members. This will cover Lecture Materials, coffee breaks and the course reception. A selection of papers presented at the conference will be published at one of ERCOFTAC Journals: such as the Journal of Flow, Turbulence and Combustion (Kluwer). ERCOFTAC grants for young post doctoral or research students will be also available.

Please send an e-mail with arrival dates and to [jackson.david.tellez@upc.edu](mailto:jackson.david.tellez@upc.edu), [redondo@fa.upc.edu](mailto:redondo@fa.upc.edu) by **May 30, 2016**.



## How to arrive to Castelldefells UPC Campus

\*From the Airport: Take the RENFE railway towards Barcelona SANTS, at EL PRAT change trains and take the southward train Line C2 towards Castelldefells

\*From Highway C-32: Exit at Campus UPC towards near Castelldefells

\*From Barcelona take RENFE Line C-2 and stop at Castelldefells, cross the bridge over C-32 in 500m you are at the UPC Campus and RESA residence and near C-3 building.

## How to arrive to Vilanova UPC Campus

\*From the Airport: Take the RENFE railway towards Barcelona SANTS, at EL PRAT change trains and take the southward train Line C2 towards Vilanova

\*From Highway A7: Exit at Vilafranca del Penedes towards Vilanova i la Geltru- Sitges

\*From Highway C-32 ( or C-31) Exit at the first Vilanova I la Geltru Exit, follow the 1<sup>st</sup> roundabout towards the Beach ( to go to Moli de Mar ) o to the RENFE station (to go to the UPC Residence and to Can Gatell Hotel).



## Accommodation and Information

Student accommodation is available at the RESA residence in the UPC Campus of el Baix Llobregat in Castelldefells. <http://upc.edu>

*There are rooms available for participants in Vilanova I la Geltru:*

**Hotel CAN GATELL** CAN GATELL INN \*\*. 6-16, Puigcerdá street. Phone (+34) 938 930 117

Residencia UPC: Rambla de l'Exposició 41 Tel: 93 811 59 00 <http://www.qualitat.es/residencia/>

The conference will start Wednesday 8 June at 10.00 and end on Tuesday 14 at noon.

There will be an "Ice Breaker" reception at the MOLI DE MAR at 20.00 on Thursday

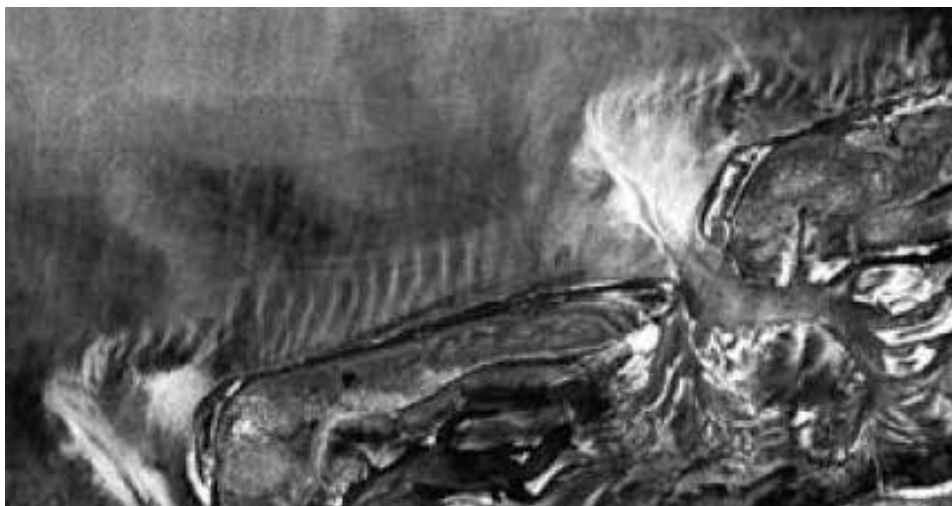
Coffee/tea breaks will be served between 10.30-11.00 and 17.00 – 17.30

The Workshop BBQ party will take place at the MOLI DE MAR

Large House near the Lighthouse, in Vilanova the last day.

## Main Lecturers of the Workshop-Course on Turbulence in Life

J.J.Martinez-Benjamin	UPC, Barcelona, Spain.	<a href="mailto:jj.Benjamin@upc.edu">jj.Benjamin@upc.edu</a>
Juan Jorge	UPC, Manresa, Spain.	<a href="mailto:Joan.jorge@upc.edu">Joan.jorge@upc.edu</a>
Ilias Sibgatullin	Moscow State University, Russia	<a href="mailto:ilias_s@mail.ru">ilias_s@mail.ru</a>
Sergei Strijhak	Institute for System Programming of the Russian Academy of Science, Russia	<a href="mailto:strijhak@yandex.ru">strijhak@yandex.ru</a>
Philippe Fraunié	Univ Sud.Toulon-Var, France	<a href="mailto:Philippe.Fraunie@lseet.univ-tln.fr">Philippe.Fraunie@lseet.univ-tln.fr</a>
Greg King	ICM CSIC. USA	<a href="mailto:greg.king@csic.es">greg.king@csic.es</a>
Luca Sorriso-Valvo	Univ. Calabria, CNR Italy	<a href="mailto:luca.sorriso@gits.upc">luca.sorriso@gits.upc</a>
Mijail Kurganski	Obukhov Atm. Inst. Moscow	<a href="mailto:Kurgansk@ifaran.ru">Kurgansk@ifaran.ru</a>
Petr Furmanek	CTU, Prague, Czech Rep.	<a href="mailto:furmanek@marian.fsik.cvut.cz">furmanek@marian.fsik.cvut.cz</a>
Otman B. Mahjoub	Univ. Abdelmalek Essaidi, Morocco	<a href="mailto:mahjoub@uae.mo">mahjoub@uae.mo</a>
Margarita Diez	Ports. Generalitat, Vilanova i la Geltru	<a href="mailto:margarita.diez@gencat.net">margarita.diez@gencat.net</a>
Jose M. Redondo	Dept. Fisica UPC, Barcelona	<a href="mailto:redondo@fa.upc.edu">redondo@fa.upc.edu</a>



# **“Hands on” Practical Computer Course**

## **“Introduction to OpenFoam: Modelling of Environmental Turbulent Flow”**

Instructors: Ilias Sibgatullin, Sergei Strijhak (ISP RAS, Moscow)  
Jackson Tellez, Esteban Sanchez (Flumen, UPC)

1 day (11.06.2016)

1. Remote work with UniHUB laboratory. Logins and Linux environment.
2. Introduction to OpenFoam source CFD code. Structure of the code.
3. FVM method, numerical schemes, boundary conditions, linear solvers.
4. Visualization in Paraview software
5. icoFoam incompressible solver and “cavity” case

2 day (13.06.2016)

6. Introduction to incompressible and multiphase flows
7. Turbulence modellings: RANS, LES, DES approaches. Different models of turbulence.
8. Mesh utilities: blockMesh, snappyHexMesh, extrudeMesh
9. Description of solvers: incompressible (simpleFoam, pisoFoam, pimpleFoam) and multiphase (interFoam, interDyMFoam, shallowWaterFoam) solvers
10. Running test cases: dambreak, waterchannel, bumpObstacle, Weir
11. Programming in OpenFoam and main classes in OpenFoam
12. Code styling in OpenFoam

3 day (14.06.2016)

13. How to add a scalar transport equation to OpenFoam solver icoFoam
14. Running solver myicoFoam and cavity case
15. Review of byoantpimpleFoam and hotroom case
16. Review of solver waveFoam, waveDyMFoam, iHFoam for waves simulations
17. Test case for waveFoam
18. Discussion

