

# EXPRESSION OF INTEREST\_ MSCA

## Individual Fellowships

- **Key word:** Computational Fluid Dynamics (CFD), Heat and Mass Transfer

### α Contact Person / Scientist in charge

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### α Department / Institute / Centre

-Technical University of Catalonia (UPC) <http://www.upc.edu/>  
-Heat and Mass Transfer Technological Center (CTTC) <http://www.cttc.upc.edu/>  
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### α Brief description of the institution

The Technical University of Catalonia (In Catalan: Universitat Politècnica de Catalunya, UPC) is the largest engineering university in Catalonia. It also offers programs in other disciplines such as mathematics and architecture. The university was founded in 1971 as the Universitat Politècnica de Barcelona through the merger of engineering and architecture schools founded in the 19th century. It has 25 schools in Catalonia located in the cities of Barcelona, Castelldefels, Manresa, Sant Cugat del Vallès, Terrassa, Igualada, Vilanova i la Geltrú and Mataró. The UPC has over 30,000 students and over 3,000 teaching and research staff, 65 undergraduate programs, 73 graduate programs and 49 doctorate programs. The UPC's objectives are based on internationalization, as it is one of Europe's technical universities with the most international PhD students and the university with the largest share of international master's degree students. The UPC is a university aiming at achieving the highest degree of engineering/technical excellence and has bilateral agreements with several top-ranked European universities. Further details can be found in the website: <http://www.upc.edu/>

### α Brief description of the Centre/ Research Group (incloueu URL si aplica)

The *Heat and Mass Transfer Technological Center* (CTTC) from the Technical University of Catalonia (UPC, <http://www.upc.edu/>) was founded, and is being directed, by Prof. Assensi Oliva more than three decades ago. Nowadays, the center is composed by 6 professors/assistant professors and around 40 full-time researchers, including post-docs, PhD students and support staff.

The research activities of the CTTC are focused on two main lines. The first one is dedicated to the mathematical formulation, numerical resolution and validation of heat and mass transfer and fluid mechanics phenomena. Topics of research in this line are: natural and forced convection, turbulence modeling, aerodynamics, fluid-structure interaction, combustion, two-phase flow, solid-liquid phase change, radiation, porous media, numerical algorithms and solvers, high performance computing, etc. The second line involves the application of the acquired know-how from the basic studies mentioned above to the thermal and fluid dynamic optimisation of thermal system and

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equipment. Within this second line the Research Group is working on: refrigeration, HVAC, active and passive solar systems, heat exchangers, heat storage...

These lines of research have allowed the Group to occupy a privileged position within the UPC with a high level of technology transfer by means of projects with several national and international companies. A more detailed list of the different lines of research, publications and research projects developed in the CTTC can be found in: [www.cttc.upc.edu](http://www.cttc.upc.edu)

### α Project description

The Heat and Mass Transfer Technological Center (CTTC) at the Technical University of Catalonia (UPC), is seeking candidates for a postdoctoral position in computational fluid dynamics. Specific areas of interest are compressible flows, aerodynamics, fluid-structure interaction, computational aeroacoustics, combustion and coupled multiphysics simulations. Other related topics (e.g. numerical methods, turbulence modeling, high-performance computing, solvers, ...) will be also considered (see the Brief Description of the Institution and the web-page of the Research Group for a complete list of our lines of research).

### α Candidate profile

Apart from a PhD in mechanical engineering, applied mathematics, physics, or computational science, a proven proficiency in computer programming (e.g. Fortran, C++, ...), numerical methods and mathematics are required for this position. Candidates with previous experience with:

- Finite Volume/Difference/Element Method
- Direct Numerical Simulation
- Modeling of fluid structure interaction
- Modeling of two-phase flows
- Turbulence modeling
- High Performance Computing

are particularly encouraged to apply.

### α Research Area

- Information Science and Engineering (ENG)
- Mathematics (MAT)
- Physics (PHY)

### α Applications: Documents to be submitted and deadlines

- Curriculum Vitae
- Motivation letter
- Reference letter