

The research group M2S2M (Mathematical Modeling and Simulation of Environmental Systems) offers two 4-year term pre-doctoral contract to prepare a Ph D Thesis. The group M2S2M performs a research activity since 1982 in Computational Fluid Dynamics, dealing with numerical modeling of environmental flows (shallow water and oceanic flows), turbulence modeling, numerical analysis, scientific computing and domain decomposition techniques. It has developed over 30 research projects with private and national and international public funding, published over 200 research papers and advised 10 Ph D Thesis.

The group M2S2M is seeking young, highly motivated researchers with good formation in applied mathematics (mathematicians, physicists, engineers, architects), who meet the following requirements:

- Very good ability for team work and learning.
- A master degree in mathematics (engineering, architecture or physics might also be considered).
- High level of proficiency in English or Spanish.
- Special interest in the fields of numerical analysis and scientific computing.

The two pre-doctoral contracts are funded by the Spanish Government, within two research projects:

1) "Development of reduced models of aero-thermal flows in buildings". The objective of the project is to build numerical models for the computation of the energetic efficiency of buildings, based upon the accurate parameterization of the thermal exchange between the air and the building. It is developed by a research team composed by applied mathematicians and thermal engineers. It is a highly challenging subject, as usual procedures for the computation of the heat exchange are un-useful due to the huge amount of degrees of freedom required. The long-term application of this research is the elaboration of computed-aided programs for the eco-efficient design of buildings, much as today structural computer-aided program allow to compute the structural charges in the process of design of building by architects.

2) "Development, analysis, and efficient implementation of high order numerical methods for simplified fluid models with data uncertainty".

The ultimate aim of this project is the development of efficient geophysical flow simulators that are expected to become useful tools to model river and channel flows, marine currents, sedimentation/erosion processes, turbidity currents, etc. These tools

play a fundamental role in operational forecasting and risk management in natural hazards, as floods, avalanches, tsunami waves, etc. To achieve this goal, simplified depth-integrated flow models will be considered whose mathematical form are nonlinear hyperbolic PDE systems that may include source terms and/or nonconservative products.

Interested candidates are requested to send their CV to Prof. Tomás Chacón, chacon@us.es and to Prof. Enrique Fernández-Nieto, edofer@us.es, specifying their interest for contract 1 or 2.

The deadline for the call is next September 10, 2013.

Detailed information (in Spanish) including the formal submission procedure is available at:
<http://www.idi.mineco.gob.es/portal/site/MICINN/menuitem.dbc68b34d11ccbd5d52ffeb801432ea0/?vgnnextoid=68eb71d255dcf310VgnVCM1000001d04140aRCRD>

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