4D-BIOMAP

Biomechanical Stimulation based on 4D Printed Magneto-Active Polymers

Universidad Carlos III de Madrid (UC3M, www.uc3m.es) invites to apply for the following **post-doctoral position**:

Ref. 4D-BIOMAP-PostDoc2: Computational Modelling of Magneto-Active Polymers for Biological Stimulation.

Overall description of the project: 4D-BIOMAP is a multidisciplinary project, recently funded by the European Research Council, that aims at providing cutting-edge solutions to modulate the mechanical properties of cell's/tissue's substrate remotely. This mechanical stimulation has an important role on biological structures leading to alterations in functional responses, morphological changes and activation of growth or healing processes. To overcome the current limitations preventing advance in this field, we will develop novel 4D printed structures based on magneto-active polymers. These structures will enable for remote magneto-mechanical stimulation of biological structures and (reversible) evolution of their mechanical surrounding simulating relevant pathological processes. To this end, we will combine experimental, theoretical and computational methodologies to be implemented by a highly multidisciplinary work team.

Role of PostDoc2 in the project: The postdoc will be responsible for conducting the following research activities:

- Develop finite element (FE) frameworks to simulate nonlinear magneto-mechanical problems.
- Support the implementation of new constitutive models into the FE codes.
- Develop FE frameworks to simulate mechano-physiological processes on biological systems.
- Help at designing the experimental activities providing computational support.
- Help at supervising PhD and MSc students.

The successful candidate will join the newly created Lab for Smart Materials and Mechanobiological Systems, within the Department of Continuum Mechanics and Structural Analysis of UC3M. He/she will work in the group of Dr. Daniel Garcia-Gonzalez (http://danielgarciagonzalez.com/) within the recently granted ERC Starting Grant project 4D-BIOMAP (Biomechanical Stimulation based on 4D Printed Magneto-Active Polymers) and will participate to the supervision of scientific activities of the team.

Desired background and skills:

- Outstanding academic record.
- PhD holder (or close to finish PhD studies) in Computational Mechanics, Biomechanics, Applied Mathematics or Solid Mechanics. Also, candidates with tracks in other disciplines but outstanding academic record are invited to apply.
- Experience in computational methods and numerical modelling.
- Fluent in written and spoken English (particularly scientific language).
- Track record of publications in the relevant technical areas and projects.
- International experience, team-working, communications and leadership skills.
- Critical thinking, and ability to cope with innovation and interdisciplinarity.

What we offer:

- Annual gross salary 31000-35000€ range, depending on experience.
- Total duration: up to 4 years, through renewable 1-year contracts.

- Become part of a young, dynamic, highly qualified, collaborative team.
- Flexible working environment and schedule.
- Opportunity to travel to international conferences to present research activities.
- Opportunity to carry out international research stays with top researchers in the field.
- Opportunity to supervise the activities of MSc and PhD students.
- Health coverage under the National Health System.

How to apply:

Interested candidates must send their applications to danigarc@ing.uc3m.es indicating in the e-mail subject **4D-BIOMAP-PostDoc2**, including in a single pdf file:

- CV (max. 3 pages), including relevant professional experience and knowledge.
- Highlights of the 3 main research papers.
- A motivation letter of experience, interests, and research goals (max. 1 page).
- 2 professional or academics recommendation letters. Alternatively, the contact information can be provided instead.

Submission of applications is due by **November 15th, 2020** (though early applications are strongly encouraged, and later applications will be considered until the vacancy is filled). The contract will begin in January 2021, though later start date can be agreed.