PostDoc Position in Multiscale Modeling of the Heart

Opportunity: Postdoctoral position at MOX, Dep. of Mathematics, Politecnico di Milano (Italy).

The position is offered within the **ERC Advanced Grant** "*HeartCORE: Boosting predictive concepts on arrhythmogenesis resolving and unifying cardiac electrophysiology and structural remodelling at organ-level*", funded by the European Union (2.6 M€). The consortium includes: CNR - Consiglio Nazionale delle Ricerche (Project P.I. Leonardo Sacconi), Politecnico di Milano, University of Glasgow, and Università degli studi di Firenze.

Research topic: The computational modeling activities in *HeartCORE* will represent an unprecedented effort to integrate cardiac morphology and function through high-fidelity, multiscale simulations of electrophysiology. Virtual heart models will be built from whole-organ, micrometric-resolution reconstructions capturing detailed myocardial architecture — including cardiomyocyte orientation, microstructural disarray, and the spatial distribution of diffuse and compact fibrosis. These data will be coupled with novel mathematical formulations and advanced numerical methods that bridge cellular electrophysiology with organ-level electrical propagation across healthy and remodelled tissues.

This unique framework will enable a mechanistic investigation of how structural remodelling — such as interstitial fibrosis in hypertrophic cardiomyopathy or compact scarring after myocardial infarction — alters cardiac conduction and arrhythmogenesis. By bridging high-resolution experimental data and predictive simulations, *HeartCORE* aims to establish a new standard for computational models of cardiac electrophysiology and open new perspectives for data-driven digital twins of the heart.

Candidate profile:

- Ph.D. in Applied Mathematics, Computational Modeling, or a related field.
- Solid background in Computational Sciences; experience in Cardiac Modeling is a plus.
- Passion for innovative research and collaboration in an interdisciplinary setting.

Duration: 24-48 months

Contact: Interested candidates are invited to send their expression of interest and CV to francesco.regazzoni@polimi.it