Project title: Investigation of the biomechanics of human ventricles in hypertensive patients using computer models of the heart

Anticipated start date for project: September 2017.

Closing date for applications: The application process remains open until a suitably qualified candidate is successfully recruited.

Information about the project:
A funded PhD studentship is available starting from September 2017 in Biological Physics, the School of Physics and Astronomy, University of Manchester.

Abnormalities of contractile function are common in hypertensive heart diseases. Traditionally the development of concentric left ventricular hypertrophy (increased wall thickness) is regarded as a compensatory response of the myocardium that normalizes wall stresses. However, it is increasing apparent that hypertensive heart diseases may be present with contractile abnormalities, such as reduced contractile stress and strain, despite a normal ejection fraction. The main objectives of this project are to perform patient specific and detailed analysis of the contractile parameters of clinical imaging data and advanced computer simulations of the human heart, from which the biophysical relationship between myocardial stress, strain and energetics in hypertensive cardiac disease conditions will be determined. The student will learn not only how to interpret and analyse clinical imaging data, but also how to develop and implement large scale computer models of the heart in high performance scientific computing and visualization environment. This work contributes to a global effort in developing biophysically detailed computer model of the heart.

The student will base his/her research at Manchester but will undertake some research and training at Somerset Cardiac Research Centre. The project thus provides a unique training opportunity for the student to learn how to link leading scientific research to clinical applications.

Qualifications applicants should have/expect to receive: The successful candidate will have or expect to obtain a first or upper second class degree or equivalent in a relevant degree (e.g. MPhys, MSci, MEng) in science, engineering and applied mathematics. Those with computational skills and enthusiasm for research and innovation are encouraged to apply.

Amount of funding available and eligibility: The project is funded for the maximum period of 3 years. No prior experience of clinical imaging analysis or modelling is required as training and support will be provided.

Contact for further information: henggui.zhang@manchester.ac.uk or drop in to Room 3.07, Schuster Building on Manchester campus.

Project Supervisors: Profs Henggui Zhang (Manchester Biological Physics) and David Maclver (Taunton & Somerset Hospital).

How to apply:
standard procedure by following the online application from http://www.physics.manchester.ac.uk/study/postgraduate/how-to-apply/
but informal enquiries should be directed to Prof Henggui Zhang.