QUB - Mechanical and Aerospace Engineering PhD Project 2019-2020

Title:

Multifunctional elastomer nanocomposites for self-healing stretchable conductors

Project description:

Stretchable and electrically conductive materials have recently attracted significant interests from researchers in various disciplines including materials science and engineering, chemistry, physics, manufacturing engineering, electronic and electrical engineering, and bio-engineering. However, most of existing materials are either non-conductive or non-stretchable, largely limiting the development of next-generation technologies. This project aims to design and manufacture innovative stretchable conductors, based on novel multifunctional elastomer nanocomposites and rational design of the devices, with high stretchability and high conductivity as well as intrinsic self-healing ability for various applications such as "smart" stretchable electric devices, energy devices, sensors, wearable medical devices and soft robotics. Various novel self-healing, conductive elastomer nanocomposites will be prepared, and characterised using a range of techniques. Stretchable conductors will then be designed and manufactured, with their potential performance in a number of selected applications assessed. The fundamental science underpinning the development of these materials will be also investigated.

For further information about the project, please contact Prof Biqiong Chen (b.chen@qub.ac.uk).

Key skills required for the post:

- A minimum degree of 2:1 (or equivalent) in Mechanical Engineering, Materials Science, Chemistry or another relevant discipline.
- Strong interests in Materials Science and Engineering in particular Polymeric Materials and Processing.

Key transferable skills that will be developed during the PhD:

- Experimental skills in materials synthesis, processing and characterisation
- Skills in applying new materials in various industrial sectors
- Project management skills
- Presentation skills

Lead supervisor:	Prof Biqiong Chen
Other supervisor(s):	Dr Oana Istrate
Guaranteed stipend:	The scholarship will cover the student's full tuition fees at the home rate and a stipend of approx. £14,925 per annum.

PhD students in the School have the opportunity to apply to be demonstrators on undergraduate modules. Compensation for this can amount to in excess of £2,400 per year.

Queens University Belfast is a diverse and international institution which is strongly committed to equality and diversity, and to selection on merit. Currently women are under-represented in research positions in the School and accordingly applications from women are particularly welcome.