

The newly established Biophotonics Research group is looking for two research students to work in the following areas.

1. Microscopic surface plasmon sensing.

Prior to coming to PolyU members of our team have been very active in developing a new form of surface plasmon sensor based on confocal microscopy. This is capable of measuring biological reactions over very small areas. We expect to develop this work for a range of applications in detection of small numbers of molecules in realistic biological environments. The project will involve development of the modified confocal microscope and also construction of environmental chambers to conduct biological experiments. The project aims to demonstrate the ability to visualise the dynamics of many different protein reactions in real time with applications in disease diagnosis, cell characterisation and even drug discovery. The successful candidate should have a degree in Engineering, Physics or Chemistry, with a strong interest in and a desire to contribute to Biological Sciences.

2. Modelling and prediction of biosensing nanosensors.

We are looking for PhD candidates to examine some of the key issues in the development of sensor technology with a view to understanding and developing novel practical solutions to a range of measurement problems. Specifically, we are examining (i) different detection strategies to optimise light utilization (and minimize sample damage) (ii) optimization of sensitivity in guided wave sensors and different approaches to the measurement of local molecular structure and (iii) simulation of phonon modes for biosensing at infrared wavelengths to access localized mechanical properties.

Although the successful applicant will have a strong theoretical background, he/she will be expected to contribute to the design of experiments and will be encouraged to carry out some experimental work as part of their training. Applicants should have a degree in a relevant discipline such as Applied Mathematics, Engineering or Physics.

We expect that there will be opportunities for successful candidates to spend some time overseas working with collaborators.

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