2013 YCCSA SUMMER SCHOLARSHIP PROJECT SUBMISSION

This form is for prospective project supervisors to submit their projects to be included in the YCCSA Summer Scholarships Programme for 2013. It is the purpose of the Summer School that any projects submitted are interdisciplinary in nature.

Date	*2013*
Main Supervisor + Department	*Dr Fiona Polack (Computer Science)*
Co-supervisors + Departments	*Dr Yvette Hancock (Physics)* *Dr James Walker (Electronics)*
Project Title	*A hybrid modelling language for designing graphene-based electronics*
Project Description	*Graphene is a "wonder material" with potential as a basis for novel electronic applications. To support development of graphene-based electronics, we need to understand ways that the materials and electronic disciplines present conceptual descriptions and designs, thus understanding how these can be modelled. This understanding would then give us a conceptual language for describing and designing graphene-based electronics* *A standard technique in modelling software is to have a graphical language (usually drawn using various forms of boxes and arrows) made up of concepts that are understood either in the context of the domain (the thing being modelled) or the target computational language (the programming language). Good design procedures (software engineering) can then be represented as formulating the mappings between domain concepts and program concepts.* *During the project, the student will work on identifying and characterising the modelling languages that are currently used: Yvette Hancock, an academic in graphene in the Physics Department, and with James Walker, a researcher working on novel computer electronics in the electronics department, will provide the expert guidance. The language characterisation will be guided by Fiona Polack, an academic software engineer with experience of the design of hybrid modelling languages.*
Required skills	*This project needs some (but not necessarily a lot of) knowledge of the ways that graphene and its properties are described in physics (and chemistry), and at least some level of knowledge of how circuits or electronic hardware are described.*
Project dates	*Up to 10 weeks, ideally to include the 9 weeks of the YCCSA Summerschool (15 July 2013 to 13 September).*
Other information	
References	*Y. Hancock (2011). The 2010 Nobel Prize in physics—ground-breaking experiments on graphene. J. Phys. D: Appl. Phys. 44 473001. http://iopscience.iop.org/0022-3727/44/47/473001* *F. Polack (2012). Choosing and adapting design notations in the principled development of complex systems simulations for research. Workshop, Modelling the Physical World at Models 2012. ACM Digitial Library. https://sites.google.com/site/motpw2012/motpw2012-pre-polack.pdf?attredirects=0*

When complete, please email the form to sarah.christmas@york.ac.uk