Queen Mary
University of London

Detector Development Meeting
Welcome

Prof. Adrian Bevan

26th November 2020

detectors@qmul.ac.uk

zoom/meeting etiquette

- Recording:
  - We will record QMUL speaker presentations
  - Recording will be stopped for questions
  - We will not record anything else in the event

- Please raise your hand when you want to ask question, or alternatively share your question in the chat with everyone

- Please mute your audio unless asking a question

Queen Mary University of London

- Russell Group University in the heart of London:
  - 5th in the UK for research[2]
  - 12th in the UK[1]
  - 9 Nobel Prize winners
  - Diverse population of staff and students
  - 27,000 students and 4,600 staff
- Detector Development Group:
  - Dedicated laboratories in the School of Physics and Astronomy
  - Access to laboratories across Science and Engineering Faculty
  - State of the art computing facilities including one of the largest STFC funded GridPP High Throughput Computers in the country

[1] Times Higher Education World University Rankings
[2] 3* and 4* level in the REF2014

Aim of this meeting

- Demonstrate our capabilities through presenting examples of our research and outputs of commercial work

- Start conversations about how we can work with your organisation to help you solve your problems

- Discuss funding opportunities and mechanisms to provide mechanisms for us to work with your organisation

Agenda

Session 1

Presentation of QMUL Capabilities

14:00 **Welcome** *5′*

Welcome to the meeting and information about the afternoon events, and follow up discussions with academics.

14:05 **Overview of the group's R&D and its capabilities** *15′*

An introduction to QMUL, the facilities at the disposal of the group and a brief overview of some highlights including silicon detector instrument development, pushing the envelope with novel application of thin silicon detectors, using novel materials such as perovskites and automation of data processing and analysis.

Speaker: Prof. A Bevan (Queen Mary)

14:20 **Radiation environment simulation and hardness testing** *10′*

Computational simulation and modelling plays an important role in understanding how detector systems cope in challenging radiation environments such as those found in the space, nuclear and accelerator industries. I will give examples of how we use high-fidelity simulation tools (e.g. FLUKA, GEANT4) for this purpose and for optimising product design. I will also discuss some of the irradiation facilities we use for testing the radiation resilience of devices and for validating the simulated predictions.

Speaker: Dr. I Dawson (Queen Mary)

14:30 **Organic semiconductor development** *10′*

Organic semiconductors (OSCs) are cheap, easy to process and scalable to large area devices. As a result of decades of experience with OSCs at QMUL, we have overcome many problems traditionally associated with their stability to develop long lived diode and transistor based radiation detectors. We have total control the whole chain from precursor organic molecule synthesis for many materials through device fabrication and testing to analysis of data, as well as simulation and data acquisition as mentioned elsewhere in this meeting.

Speaker: Dr. T Kreouzis (Queen Mary)

14:40 **Radiation damage in optical materials** *10′*

Radiation damage to optical materials is a critical limiting factor in many sensors systems. I will discuss radiation-induced absorption in scintillators and fluorescent wavelength shifters and also in materials, primarily glasses, used as faceplates in photomultiplier tubes and in camera lenses. I will use examples from Particle Physics and Space Science and discuss the use of optical ray tracing simulations in the design of instrumentation to measure these effects.

Speaker: Prof. P Hobson (Queen Mary)

Industry Session

Presentation of industry sectors and needs

15:15 **AWE** *10′*

Speaker: Dr. Jon Burns (AWE)

15:25 **Micron Semiconductor Ltd.** *10′*

Speaker: Dr. Gwenaëlle Lefeuvre

15:35 **Ultra Electronics (tbc)** *10′*

15:45 **Centronic Ltd.** *10′*

Speaker: Michael Hodgson

Wrap Up Session

We review possible ways to engage with our group, from dialogue to explore how we might be able to help your organisation using our expertise, through to collaborative funding opportunities and contract work. There will also be some time for more general discussions at the end of the day. We are also available for more detailed follow up discussions with you and your colleagues following this event.

16:15 **Opportunities - funding and collaborating with us** *15′*

Speaker: Dr. Michal Filus

16:30 **Opportunity for discussion** *15′*

Opportunity for general discussion and to arrange a follow up to discus your needs in more detail.

After the meeting

- Think about how we can work with your organisation to invent new methods and technologies, test devices, develop new products, solve issues that are relevant for you
- Fill out the google form to express your interests in discussing with us
- Alternatively contact us on detectors@qmul.ac.uk with as much detail as you are able to so that we can identify the right researchers to reach out to you
- We are also able to quickly set up confidentiality agreements with the help of our business development and innovation colleagues:
    - Let us know if you need this in place before discussing with us