



University
of Glasgow

TEM-Pix – Development of a fully retractable novel electron microscope detector

Dr Damien McGrouther, Senior Lecturer in Materials and Condensed Matter Physics, School of Physics and Astronomy, in collaboration with Quantum Detectors Ltd.

The Opportunity

Transmission electron microscopes (TEMs) are highly complex instruments used for high resolution investigation of materials at the atomic length scale. On the majority of TEMs, digital images are recorded using charge coupled device (CCD) technology and, although this “indirect” TEM technique has been highly refined, it suffers from disadvantages which limit of performance.

Addressing the Challenge

The EPSRC Impact Acceleration Account (IAA) supported the development of “TEM-Pix” – a “direct” electron counting detector with unique pixel electronics. This imaging detector enables novel imaging by achieving noise free detection of single electrons; surpassing quality achieved through traditional CCD routes, as well as through more expensive “direct” complementary metal-oxide semiconductor (CMOS) technologies. Following the success of this first phase knowledge exchange and technology exploitation, further IAA funding was strategically allocated to advance this development towards commercial return. Specifically, design and development which enabled the detector to be fully retractable was implemented. This enabled an entirely new market opportunity for the collaborators involved.

Outcomes

By licensing University of Glasgow intellectual property, Quantum Detectors Ltd. were ideally placed to enter the materials science electron microscopy market

and retail their highest value product to date (~£100k). This has generated a number of instrument sales as well as resulting in the creation of several jobs within the company to serve demand for the new product. This has resulted in significant licence income for The University of Glasgow, with substantial future sales of the product expected.

During 2017, McGrouther was invited to give talks at 6 international conferences to present the unique developments. His research colleagues are benefitting through having first access to cutting edge detector hardware and developments.

McGrouther and Quantum Detectors have also been awarded an STFC CASE PhD studentship to investigate over 3.5 years the next “next generation” of detector technologies.

The team were further nominated for Best Collaboration (Business) award at UoG 2017 Knowledge Exchange & Public Engagement Awards.

To find out more please contact

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