


Name of the Partnering Organization:	Department of Physics, University of Warwick	
Location (town, country):	Coventry, UK	
Web site address:	http://www.warwick.ac.uk/go/microscopy	
Brief description of the organization		
<p>The Physics Department at the University of Warwick is one of the leading and most innovative in the UK. It currently consists of 60 academic staff and a similar number of contract researchers, supported by 20 technical and 10 administrative staff, and almost 200 postgraduate research students. Research in experimental condensed matter physics has been a particular strength and constitutes over half of the department, covering areas as diverse as superconductivity and magnetism, ultrasound, magnetic resonance, microscopy, ferroelectrics, diamond and silicon epitaxy. Several recent major strategic investments in infrastructure have been made, including £3.5M for high end electron microscopes, now housed in a new £25M Materials and Analytical Sciences building specifically designed to house them in the optimal environment. Warwick holds the third largest portfolio of research funding held by a Physics department in the UK and collaborations extend across the UK and EU with strong links to many institutions worldwide. These are maintained by an open and active atmosphere driving towards research excellence. A new Warwick Centre for Analytical Science (WCAS) was founded in 2008 (EPSRC Science and Innovation Grant EP/G02586X/1), with the aim of providing a platform for identification, definition, and implementation of new Analytical Science research including the development of new instrumentation, new methods for data acquisition and statistical inference.</p>		
Description of the research group		
<p>The microscopy group at Warwick has recently expanded significantly with the addition of Dr. J. Sloan and Dr. R. Beanland in 2008 and Dr. A.M. Sanchez in 2009. They bring their experience in electron microscopy to that of Dr. N. Wilson in scanning probe microscopy, and have established a new facility with state of the art equipment, including a doubly-corrected field emission transmission electron microscope with next-generation electron and X-ray spectroscopy capabilities, giving a spatial resolution of a few tens of pm both in imaging and probe-forming modes. Two other transmission electron microscopes, two scanning electron microscopes, a focused ion beam/scanning electron microscope and several scanning probe microscopes, all housed in new facilities, provide a capability equal to most other electron microscopy groups world-wide. The microscopy group interacts across experimental condensed matter physics in characterising a wide range of nanoscale features, and benefits from collaboration with theory, biology, chemistry and engineering. Beanland researches on electron microscopy of materials such as III-V semiconductors, oxides and Ni superalloys, focusing on interfacial crystallography and electron diffraction. Sanchez works with world-leading groups on III-N materials, she is developing III-V-Sb materials for quantum computing, and has strong experience in aberration-corrected microscopes from SuperSTEM. Sloan continues his pioneering investigations into atomically-regulated crystal growth now incorporating encapsulated, and graphene oxide supported, polyoxometalate ions. This research makes use of hardware aberration-corrected HRTEM/STEM and advanced imaging techniques. Wilson's research focuses on nanocarbon and molecular electronics, studying the synthesis, properties and applications of graphene and related materials. These facilities and activities provide an excellent match to goals of the EAgLE project.</p>		
Selected list of relevant publications		
<p>"Blocking of indium incorporation by antimony in III-V-Sb nanostructures". A.M. Sánchez et al. <i>Nanotech.</i> 21 (2010) 145606;"Imaging the Structure, Symmetry, and Surface, and Surface-Inhibited Rotation of Polyoxometalate Ions on Graphene Oxide" J. Sloan et al. <i>Nano Lett.</i>, 2010, Vol. 10, pp 4600–4606.</p>		
Key researcher's CV		
<p>Dr Neil Wilson is an Assistant Professor in Physics (Microscopy Group) at Warwick University, he specialises in 'nano-carbon' (including publications on nanotube AFM tips, nanotube networks, doped diamond and graphene), AFM-based local probe measurements and molecular electronics. Recently his research has focussed on the structure, properties and applications of chemically modified graphene. With the support of a Royal Society research grant he has begun investigations on the growth of graphene by chemical vapour deposition and its application in sensors and photovoltaics. 6 years on from his PhD, he has published more than 30 papers in peer-reviewed journals including <i>Nature Nanotechnology</i>, <i>Nano Letters</i> and <i>ACS Nano</i>.</p>		