



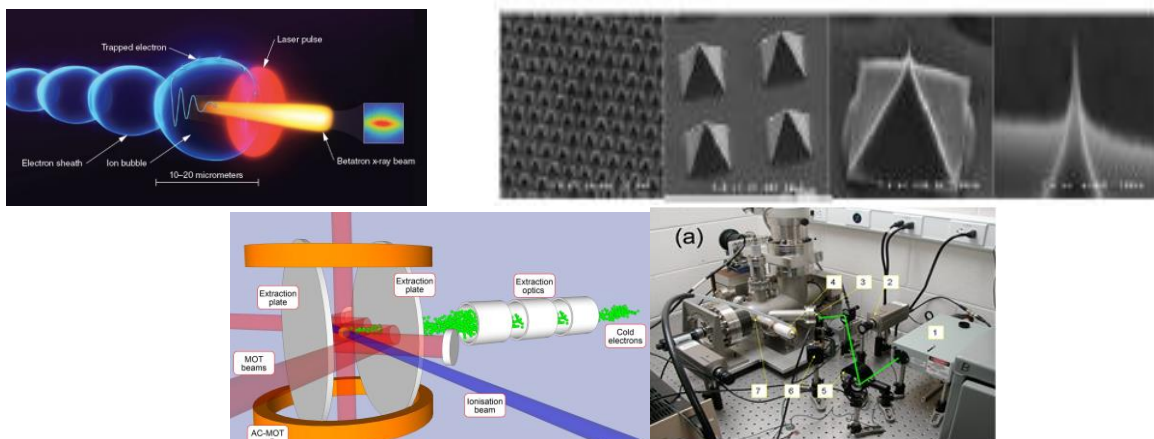
John Adams Institute for Accelerator Science Lecture Series

Wednesday 24th May 2017 at 4:15 pm
Dennis Sciama Lecture Theatre, Denys Wilkinson Building

Progress Towards Ultra-cold Quantum Degenerate Electron and Photon Sources

Professor Swapan Chattopadhyay
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and
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Ultra-cold electron beams with intrinsic phase-space volume comparable to the electron Compton wavelength volume is a dream far from reality. But even “mildly” quantum degenerate yet low energy electron beams can produce table-top compact x-ray free electron lasers or coherent electron diffraction sources that will be revolutionary. Approaching this scale via various techniques -- cold “atomic trap” sources, “Terahertz cavity” photo-electrodynamic sources, “field-emission” sources based on structured materials such as carbon or graphene nano-tips and diffraction gratings, and laser- and/or plasma-based sources -- might show a path forward. Physical mechanisms and progress to date in some of these approaches will be discussed to motivate the need for further research.



For further details contact Glenn Christian: glenn.christian@physics.ox.ac.uk