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Reader

Area of research

Wide Band Gap Nanomaterials

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Summary

I am a member of the CVD Diamond Lab based in the School of Chemistry at the University of Bristol, UK. In this lab we study the growth of films of diamond, diamondlike carbon (DLC) amorphous carbon (a-C), and other related materials such as zinc oxide, using various physical and chemical vapour deposition techniques.

I undertake research into the use of synthetic diamond and zinc sulphide for applications in energy conversion, energy storage, and radiation detection. Within the diamond lab we have equipment for testing the electron emission properties of these materials, including Field emission, Thermionic emission and Secondary Electron Emission.

I also have laboratory space in the School of Physics for material processing, and in the Bristol Centre for Nano Science and Quantum Information where I undertake UHV surface analysis located in the ultra quiet laboratories. The equipment includes an Omicron VT XA Scanning Probe Microscope (SPM) for tunnelling, atomic force microscopy, and Scanning Kelvin Probe Force Microscopy. Also the Bristol NanoESCA facility a state-of-the-art platform to perform surface science studies on various materials for energy.

The three main characterization techniques are: XPS, SPA-LEED, PEEM and micro-ARPES. a NanoESCA II instrument from ScientaOmicron Nanotechnology. This is the only NanoESCA in the UK and is currently funded by EPSRC.

Links

<http://www.bristol.ac.uk/physics/facilities/nanoesca/>

<http://www.eon.com/en/corporate/21278.jsp>

<http://www.bristol.ac.uk/nsqi-centre/research/researchers.html#D>

http://www.phy.bris.ac.uk/people/fox_na/index.html

Keywords

- Diamond Thermionics
- UHV Scanning Probe Microscopy
- UHV Photo Electron Emission Spectroscopy
- Diamond synthesis
- Chemical self-assembly
- Physical Vapour Deposition Techniques
- Secondary Electron Emission
- Hydrogen Storage
- Nuclear Batteries

Memberships

Organisations

[School of Chemistry](#)

Other sites

- [Physics](#)

Chemistry staff

- [Chemistry academic staff](#)

Research sections

- [Physical and Theoretical Chemistry](#)

Selected publications

- Sun, Y, Fox, N, Fuge, G & Ashfold, M, 2010, '[Toward a Single ZnO Nanowire Homojunction](#)'. *Journal of Physical Chemistry C*, vol 114., pp. 21338 - 21341
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- Sun, Y, Fuge, G, Fox, N, Riley, D & Ashfold, M, 2005, '[Synthesis of aligned arrays of ultrathin ZnO nanotubes on a Si wafer coated with a thin ZnO film](#)'. *Advanced Materials*, vol 17 (20), pp. 2477 - 2481

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Recent publications

- Nguyen, TH, Perilli, D, Cattelan, M, Liu, H, Sedona, F, Fox, N, Di Valentin, C & Agnoli, S, 2019, '[Microscopic insight into the single step growth of in-plane heterostructures between graphene and hexagonal boron nitride](#)'. *Nano Research*, vol 12., pp. 675-682
- Szczepanska, A, Wan, G, Cattelan, M, Fox, N & Vasiljevic, N, 2019, '[Surface Investigation on Electrochemically Deposited Lead on Gold](#)'. *Surfaces*, vol 2., pp. 56-68
- Wan, G, Cattelan, M & Fox, N, 2019, '[Electronic Structure Tunability of Diamonds by Surface Functionalization](#)'. *Journal of Physical Chemistry C*, vol 123., pp. 4168-4177
- Dominguez-Andrade, H, Croot, A, Wan, G, Smith, JA & Fox, NA, 2019, '[Characterisation of thermionic emission current with a laser-heated system](#)'. *Review of Scientific Instruments*, vol 90., pp. 045110
- Cattelan, M, Vagin, MY, Fox, N, Ivanov, IG, Shteplyuk, I & Yakimova, R, 2019, '[Anodization study of epitaxial graphene: insights on the oxygen evolution reaction of graphitic materials](#)'. *Nanotechnology*, vol 30.
- Yang, C, Cattelan, M, Fox, N, Huang, Y, Golden, M & Schwarzacher, W, 2019, '[Electrochemical modification and characterization of topological insulator single crystals](#)'. *Langmuir*.

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