University of Birmingham

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Senior Lecturer

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Qualifications

- Fellow of Institute of Physics
- Chartered Physicist
- PhD Physics (Lancaster)
- BSc Engineering (Tsinghua)

Biography

- Senior Lecturer, University of Birmingham, 2003
- Lecturer, University of Birmingham, 1998-2003
- Research Associate, University of Salford, 1997-1998
- Research Associate, University of Liverpool, 1990-1997

Teaching

- Year 1 Lecture: Optics and Waves
- Year 2 Lecture: Statistical Physics
- Year 1 Tutorials
- Year 3 Tutorials
- Year 4 Project supervision

Research

Physical processes at the nanometer scale
Fundamental physical processes such as atomic diffusion, molecular recognition and self-organisation on solid surfaces are investigated using scanning tunnelling microscopy (STM), atomic force microscopy (AFM) and electron spectroscopic techniques.

The aim of the research is to explore the behaviour of atoms and molecules on surfaces where nanoscale features are created artificially via either atom manipulation or self-assembly, and hence to understand the property and stability of nanoscale structures. Research in this field has a particular importance in guiding the industry towards the realisation of a new generation of quantum devices with nanometre scale dimensions.

Recent and ongoing research projects include:

- Physics of zero-gradient stepped surfaces
- Assembly of molecular monolayers
- Nanoscale fabrication based on nanosphere lithography

Publications

Selected publications:

1. Xie, Y-C., Tang, L., and Guo, Q., Phys. Rev. Lett. 111 (2013) 186101.
2. Palmer, R. E., Robinson, A. P. G., and Guo, Q., ACS Nano, 7 (2013) 6416.
3. Tang, L., Xie, Y-C., and Guo, Q., J. Chem. Phys. 135 (2011) 114702.
4. Li, F. S., Tang, L., Zhou, W-C., and Guo, Q., J. Am. Chem. Soc. 132 (2010) 13059.
5. Li, F. S. Zhou, W-C., and Guo, Q., Phys. Rev. B 79 (2009) 113412.
6. Guo, Q., Yin, F., and Palmer, R. E., Small, 1 (2005) 76.
7. Yin, F., Xirouchaki, C., Guo, Q., and Palmer, R. E., Adv. Mater. 17 (2005) 731.

8. Guo, Q., Fallon, P., Yin, J., Palmer, R. E., Bampos, N., and Sanders, J. K. M., Adv. Mater. 15 (2003) 1084.
9. Guo, Q., Arnoux, C., and Palmer, R. E., Langmuir, 17 (2001) 7150.
10. Guo, Q., Cocks, I., and Williams, E. M. Phys. Rev. Lett. 77 (1996) 3851.
11. Bowker, M., Guo, Q., and Joyner, R. W., Surf. Sci. 253 (1991) 409.