

# Professor Andrew Boothroyd

Professor of Physics, University of Oxford, and Tutorial Fellow of Oriel College, Oxford

## Education

1984 MA in Natural Sciences, Cambridge University (*1st class honours, Physics & Theoretical Physics*)

1988 PhD in Physics, Cambridge University (*Advisor: Dr Gordon Squires*)

## Academic Career

1988–1989      Research Associate, University of Warwick  
1989–1991      Lecturer in Physics, University of Warwick  
1991–Present    Lecturer in Physics, University of Oxford, and Tutorial Fellow of Oriel College, Oxford  
2000            Awarded title of Reader in Physics  
2006            Awarded title of Professor of Physics  
2004–2008      Head of Condensed Matter Physics at Oxford University  
2011–2015      Vice Provost of Oriel College, Oxford

## Research interests

Novel phenomena in materials that exhibit complex forms of electronic order, such as unconventional superconductivity and magnetic materials whose properties depend on a delicate interplay between the spin, charge and orbital degrees of freedom of the electron; structure and dynamics of quantum materials (materials with exotic physical properties arising from quantum fluctuations), especially spin dynamics; neutron and X-ray scattering techniques, and magnetic, thermodynamic and transport measurements; crystal growth of magnetic oxides by the floating zone technique.

## Awards

2011      Institute of Physics Superconductivity Group Prize

## Professional Activities

1992–2015      Member of ISIS Facility Access Panels (1992–1997, 1999–2002, and 2008–2014)  
1999–Present    Member of EPSRC Peer Review College; member of Programme Evaluation and Prioritisation panels  
1999–2002      Member of ILL College 4 Proposal Evaluation Panel,  
2001–2007      Member of Institute of Physics Magnetism Group Committee  
2002–2011      Member of ISIS User Committee  
2004–2014      Chair of SINQ Scientific Advisory Committee, Paul Scherrer Institut, Switzerland  
2007–2011      Member of Editorial Advisory Board of *J. Phys.: Condens. Matter*  
2007–Present    Member of PMC for XMaS, the UK's magnetic scattering beamline at the ESRF  
2009–2011      Deputy Chair of STFC's Neutron Advisory Panel (NAP)  
2009–2011      Deputy Chair of STFC's Facilities Research and Development Panel (FRDP)  
2011–2014      Chair of ISIS proposal review committee FAP4  
2010–Present    Member of Diamond beamlines I05 (ARPES) and I21 (RIXS) Working Groups  
2011–Present    UK Representative of IUPAP Commission C9 (Magnetism)  
2012–2015      External Examiner in Physics, University of Warwick  
2015–Present    External Examiner for Condensed Matter Physics CDT, University of Bristol

## Invited talks at national and international conferences (last 5 years)

23. *Spin fluctuations in FeSe & derivative superconductors*, workshop on chalcogenide superconductors, Dresden, Sep 2015
22. *Unconventional metallic osmates*, Concepts and Discovery in Quantum Matter, Cambridge, July 2015
21. *Spin fluctuations in iron selenide superconductors*, Frontiers in Unconventional Superconductivity and Magnetism, Bristol, Jan 2015
20. *Magnetic order coupled to Dirac fermions in AMnBi<sub>2</sub> (A = Sr,Ca)*, Theoretical & Experimental Magnetism, STFC, July 2014
19. *Magnetic phenomena in strongly-correlated 5d oxides*, IoP Magnetism Conference, Manchester, Apr 2014
18. *Structural and magnetic phase transitions in osmates prepared at high pressure*, Mott Physics beyond the Heisenberg Model, Ascona, Switzerland, Oct 2013
17. *Single crystal magnetic spectroscopy with chopper spectrometers*, TAS-TOF workshop, Murnau, Germany, Oct 2013
16. *Opportunities in magnetism and superconductivity at the ESS*, ESS Science & Scientists meeting, Edinburgh, July 2013
15. *A ferroelectric-like transition in the 5d metal LiOsO<sub>3</sub>*, Theoretical and Experimental Magnetism, Abingdon, July 2013
14. *Unravelling emergent order in charge-ordered oxides*, MAMA-trend, Sorrento, Italy, May 2013

13. *Electric-field control of chiral magnetic domains in the high temperature multiferroic CuO*, Flipper workshop on polarized neutron diffraction, Institut Laue-Langevin, Grenoble, France, Jan 2013.
12. *Spin fluctuations in unconventional superconductors*, IoP Current Research in Magnetism and Superconductivity (CRIMS) conference, National Physical Laboratory, Nov 2012.
11. *Electric-field control of chiral magnetic domains in the high temperature multiferroic CuO*, Royal Society meeting on Magnetoelectrics at the Mesoscale, Cricheley Hall, Sept 2012
10. *Spin Anisotropy of the Resonance Peak in Unconventional Superconductors*, Polarized Neutrons in Condensed Matter Investigations (PNCMI) conference, Paris, July 2012
9. *Magnetic Fluctuations in Fe-based Superconductors*, SEPnet Summer Program: Condensed Matter in the City, Rutherford Appleton Laboratory, June 2012
8. *ESS Symposium on Spin Dynamics*, ESS Science & Scientists meeting, Berlin, April 2012
7. *Emergent Stripe Order in Antiferromagnetic Oxides*, UK–Korea meeting on Strongly Correlated Electron Systems, Rutherford Appleton Laboratory, April 2012
6. *Coupled electric and magnetic order parameters in CuO*, UK–India Scientific Seminar, Cambridge, March 2012
5. *Electric control of magnetic order in CuO*, Multiferroics meeting, National Physical Laboratory, Sept 2011
4. *Hour-glass magnetic spectrum in stripe-ordered  $La_{2-x}Sr_xCoO_4$* , Stripes II, Sapienza University of Rome, July 2011
3. *Structural and Magnetic Properties of Fe-based Superconductors*, IoP Conference: 100 Years of Superconductivity, 25 Years of High Temperature Superconductivity, Cavendish Laboratory, Cambridge University, July 2011
2. *Magnetic Fluctuations in Fe-based Superconductors*, SEPnet Summer Program: Condensed Matter in the City, Rutherford Appleton Laboratory, June 2011
1. *Magnetic Fluctuations in Fe-based Superconductors*, UK–Korea workshop on Strongly Correlated Electron Systems, Seoul, Korea, Feb. 2011

### Seminars and Colloquia (last 5 years)

10. *Superconductors: Ultimate quantum metals*, Balliol College Physics Society, May 2015
9. *Magnetic phenomena in correlated 5d and Dirac systems*, ISIS-Diamond joint seminar, Aug 2014
8. *Emergent Electronic Order in Strongly-Correlated Oxides*. Technical University of Munich, May 2013
7. *Spin fluctuations in iron-based superconductors*, National Institute for Materials Science, Tsukuba, Apr 2013
6. *Emergent electronic order in strongly correlated oxides*, Institute for Solid State Physics, University of Tokyo, Apr. 2013
5. *Emergent Electronic Order in Strongly-Correlated Oxides*. Inorganic Chemistry Laboratory, Oxford University, Oct 2012
4. *Coupled magnetic and electric orders in CuO*, Quantum Matter Seminar, University of Cambridge, Oct 2011
3. *Emergent Electronic Order in Strongly-Correlated Oxides*. MPI Chemical Physics of Solids, Dresden, Germany, Nov 2010
2. *Emergent Electronic Order in Strongly Correlated Oxides*, CMP seminar, Lancaster University, Nov 2010
1. *Magnetic spectra of hole-doped antiferromagnets: cuprates to cobaltates*, Theory group, Warwick University, Feb 2010

### Public outreach

In 1990 and 1991 I helped to organize, and participated in, a workshop designed to encourage women to study physics at university. In June 2004 I delivered a lecture entitled *Cool Physics in Condensed Matter* to around 200 high school students and teachers at a Physics Department Open Day. During 1990–1993 I wrote the annual entry entitled “Physics” in the Encyclopaedia Britannica Book of the Year. In 2014 & 2015 I lectured at a UNIQ summer school at Oxford University for Year 12 students from state schools. I jointly led a STFC-funded project to develop and deliver two workshops entitled *Levitate!* and *Fantastic Fields*, on Superconductivity and Magnetism for Years 8–10 in secondary schools. In 2014, I demonstrated superconducting levitation on the BBC2 celebrity quiz show QI.

### Conference organisation (last 5 years)

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| 2009      | Member of International Advisory Committee for the PNSXM 2009 conference                                    |
| 2013      | Member of Programme Committee, 8 <sup>th</sup> International Conference on Inelastic X-ray Scattering, SLAC |
| 1991–2015 | Co-organiser, Oxford Neutron Scattering Summer School (odd years)   |
| 2012      | Organiser of <i>ESS Symposium on spin dynamics in correlated electron systems</i> , Abingdon, UK            |
| 2014      | Organiser of conference <i>Mott Physics beyond the Heisenberg model</i> , Oxford, UK                        |

### Workshops and Summer Schools

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| 1991–2015 | Invited Lecturer, Oxford Neutron Scattering Summer School (odd years)   |
| 2000–2008 | Invited Lecturer, IoP workshop <i>Measurement Techniques in Magnetism: Neutrons &amp; Muons</i> (2000, '03, '06, '08) |
| 2005–2013 | Invited Lecturer, PSI Summer School on Condensed Matter Science, Zuoz, Switzerland (2005, '07, '13)                   |