

# 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 Brian Pippard Prize (formerly Superconductivity Group Prize)

2017 Outstanding Referee for the journals of the American Physical Society

## Professional Activities

1999–Present Member of EPSRC Peer Review College; member of Programme Evaluation and Prioritisation panels  
2001–2007 Member of Institute of Physics Magnetism Group Committee  
2002–2011 Member of ISIS User Committee  
2004–2013 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) User Working Groups  
2011–2017 UK Representative of IUPAP Commission C9 (Magnetism)  
2015–Present Member of ORNL Neutron Sciences Science Review Committee  
2016–Present Member of ESS Science & Technology Advisory Panels (Sample Environment & Spectroscopy)  
2012–2015 External Examiner in Physics, University of Warwick  
2015–Present External Examiner for Condensed Matter Physics CDT, University of Bristol  
2017–Present Chair of ILL College 4 proposal review panel, and member of ILL Scientific Council

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

22. *Unravelling complex order in strongly correlated oxides* International Conference on Advanced Materials, Kyoto, Japan, Aug 2017 (keynote)
21. *Understanding magnetic phenomena in quantum materials with advanced neutron and x-ray scattering techniques*, Electronic Phenomena studied in the Nordic Countries, Lund, Sweden, July 2017
20. *Spin fluctuations in iron selenide superconductors*, Neutron and Muon Science and User Meeting, Warwick University, June 2017
19. *Evidence for charge stripes in the layered cobaltate  $La_{5/3}Sr_{1/3}CoO_4$* , Joint JCNS Workshop and Flipper, Tutzing, Germany, Sept 2016
18. *Commensurate lattice distortion and CDW proximate to superconductivity in titanium oxypnictides*, TEMM, Harwell Campus, June 2016
17. *Spin fluctuations in iron selenide superconductors*, International Conference on Superconductivity and Magnetism, Fethiye, Turkey, April 2016

16. *Spin fluctuations in FeSe & derivative superconductors*, workshop on chalcogenide superconductors, Dresden, Sep 2015
15. *Unconventional metallic osmates*, Concepts and Discovery in Quantum Matter, Cambridge, July 2015
14. *Spin fluctuations in iron selenide superconductors*, Frontiers in Unconventional Superconductivity and Magnetism, Bristol, Jan 2015
13. *Magnetic order coupled to Dirac fermions in AMnBi<sub>2</sub> (A = Sr,Ca)*, Theoretical & Experimental Magnetism, STFC, July 2014
12. *Magnetic phenomena in strongly-correlated 5d oxides*, IoP Magnetism Conference, Manchester, Apr 2014
11. *Structural and magnetic phase transitions in osmates prepared at high pressure*, Mott Physics beyond the Heisenberg Model, Ascona, Switzerland, Oct 2013
10. *Single crystal magnetic spectroscopy with chopper spectrometers*, TAS-TOF workshop, Murnau, Germany, Oct 2013
9. *Opportunities in magnetism and superconductivity at the ESS*, ESS Science & Scientists meeting, Edinburgh, July 2013
8. *A ferroelectric-like transition in the 5d metal LiOsO<sub>3</sub>*, Theoretical and Experimental Magnetism, Abingdon, July 2013
7. *Unravelling emergent order in charge-ordered oxides*, MAMA-trend, Sorrento, Italy, May 2013
6. *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.
5. *Spin fluctuations in unconventional superconductors*, IoP Current Research in Magnetism and Superconductivity (CRIMS) conference, National Physical Laboratory, Nov 2012.
4. *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
3. *Spin Anisotropy of the Resonance Peak in Unconventional Superconductors*, Polarized Neutrons in Condensed Matter Investigations (PNCMI) conference, Paris, July 2012
2. *Magnetic Fluctuations in Fe-based Superconductors*, SEPnet Summer Program: Condensed Matter in the City, Rutherford Appleton Laboratory, June 2012
1. *ESS Symposium on Spin Dynamics*, ESS Science & Scientists meeting, Berlin, April 2012

### Seminars and Colloquia (last 5 years)

9. *Unravelling emergent order in quantum materials*, Peter Grünberg Institut Colloquium, FZ Jülich, Germany, Oct 2016
8. *Unravelling emergent order in quantum materials*, Brahmagupta Colloquium, IIT Madras, India Sept 2016
7. *Unconventional electronic phases in 5d oxides*, Condensed Matter Physics, QMUL Mar 2016
6. *Superconductors: Ultimate quantum metals*, Balliol College Physics Society, May 2015
5. *Magnetic phenomena in correlated 5d and Dirac systems*, ISIS-Diamond joint seminar, Aug 2014
4. *Emergent Electronic Order in Strongly-Correlated Oxides*. Technical University of Munich, May 2013
3. *Spin fluctuations in iron-based superconductors*, National Institute for Materials Science, Tsukuba, Apr 2013
2. *Emergent electronic order in strongly correlated oxides*, Institute for Solid State Physics, University of Tokyo, Apr. 2013
1. *Emergent Electronic Order in Strongly-Correlated Oxides*. Inorganic Chemistry Laboratory, Oxford University, Oct 2012

### 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 |
| 1991–2017 | 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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| 1991–2017 | 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, Zuzo, Switzerland (2005, '07, '13)                   |