

Adam West

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Date of birth 14/11/1985

Academic History

- October 2008 - May 2012: **Durham University** PhD in AtMol group, 'Interfacing ultracold atoms with nanomagnetic domain walls', supervised by Prof. Ifan Hughes. This project has examined the interaction of ultracold Rubidium atoms with an atom chip based on lithographically patterned planar nanowires. This has led to the realisation of a reconfigurable atom mirror based on permanent magnetic material. I have also studied the nature of trapping potentials based on domain walls, leading to the development of a novel scheme for creating time-averaged potentials. Thesis available online at <http://theses.dur.ac.uk/3588/>.
- October 2004 - July 2008: **Durham University** MSci in Physics (1st class, Hons), average mark of 86%, including a 4th year project entitled 'Collective Dynamics of Mesoscopic Ensembles of Rydberg Atoms', supervised by Prof. Charles Adams.
- September 2002 - July 2004: **King Edward VI Camp Hill School for Boys** 5 A levels at grade A (Physics, Maths, Chemistry, English, General Studies).

Journal Papers

- 2012 *Realization of the manipulation of ultracold atoms with a reconfigurable nanomagnetic system of domain walls*,
West, A. D., Weatherill, K. J., Hayward, T. J., Fry, P. J., Schreffl, T., Gibbs, M. R. J., Adams, C. S., Allwood, D. A. and Hughes, I. G.
Nano Letters **TBA**, TBA [arXiv:1112.0485](https://arxiv.org/abs/1112.0485).
- Piezoelectrically-actuated time-averaged atomic microtraps*,
West, A. D., Wade, C. G., Weatherill, K. J. and Hughes, I. G.
[Appl. Phys. Lett.](https://arxiv.org/abs/1205.0194) **101**, TBA. [arXiv:1205.0194](https://arxiv.org/abs/1205.0194).
- A simple model for calculating magnetic nanowire domain wall fringe fields*,
West, A. D., Hayward, T. J., Weatherill, K. J., Schreffl, T., Allwood, D. A. and Hughes, I. G.
[J. Phys. D.](https://arxiv.org/abs/095002) **45**, 095002.

- 2011 *Nanomagnetic engineering of the properties of domain wall atom traps*, Hayward, T. J., West, A. D., Weatherill, K. J., Schrefl, T., Hughes, I. G. and Allwood, D. A.
[J. Appl. Phys.](#) **110**, 123918.
- 2010 *Design and characterization of a field-switchable nanomagnetic atom mirror*, Hayward, T. J., West, A. D., Weatherill, K. J., Curran, P. J., Fry, P. W., Fundi, P. M., Gibbs, M. R. J., Schrefl, T., Adams, C. S., Hughes, I. G., Bending, S. J. and Allwood, D. A.
[J. Appl. Phys.](#) **108**, 043906.

Invited Talks

- May 2012 IOP meeting: ‘Quantum interfaces: Integrating light, atoms and solid-state devices’ – selected for oral presentation: *Interacting ultracold atoms with nanomagnetic domain walls*.
- February 2012 University of Strathclyde – Talk given during visit: *Interacting ultracold atoms with nanomagnetic domain walls*.
- December 2011 University of Amsterdam – Talk given during visit: *Interacting ultracold atoms with nanomagnetic domain walls*.
- September 2011 MUARC & MPAGS summer school, Quantum Matter: Foundations and New Trends: *Interacting ultracold atoms with nanomagnetic domain walls*.
- November 2010 University of Texas at Austin – Talk given to the Raizen group during a visit: *Interacting ultracold atoms with domain walls in magnetic nanowires*.

Presented Posters

- September 2011 MUARC & MPAGS summer school, Quantum Matter: Foundations and New Trends, Granada: *Experimental demonstration of interactions of cold atoms with magnetic nanowire domain walls*.
- June 2011 ICOLS, Aerzen: *Experimental demonstration of interactions of cold atoms with magnetic nanowire domain walls*.
- September 2010 QUAMP summer school, Imperial College Controlled Quantum Dynamics centre for doctoral training: *Interactions of cold atoms with domain walls in magnetic nanowires*, winner of IOP poster prize.
- September 2009 Les Houches PreDoc School, Ultracold Quantum Gases of Atoms and Molecules: *Interactions of cold atoms with domain walls in magnetic nanowires*.

Academic Responsibilities

- 2012 Training session on the use of Blender 3D modelling software given to students and staff.
- 2011 Supervision of a summer student investigating the dynamics of piezoelectric actuators.
- 2009 - 2011 Marker for the 4th year undergraduate module ‘Atomic and Optical Physics’ weekly problems on ‘Lasers and Spectroscopy’ and ‘Atoms, Photons and Qubits’.
- 2009 Supervision of a IAESTE summer student investigating saturation spectroscopy and polarisation spectroscopy of Rubidium.

Key Skills

Throughout the course of my PhD work I have developed a wide range of experimental skills such as working with lasers and associated optics, building UHV systems and developing Labview programs to control experiments and interface with associated hardware. This has come through being intimately involved with the design and building of a new cold atom setup which has been used to realise our atom mirror. I have been primarily responsible for the day to day running of the experiment and collection of data for the duration of my PhD.

Throughout my work I have also been responsible for the associated theoretical simulations. I am proficient in Matlab and have used it to write Monte Carlo simulations and numerical models of atom dynamics, nanomagnetic fringing fields, atom-light interactions and other related concepts that have provided the basis for, and tests of, our experimental work. I also have experience using Mathematica, Fortran, Python, HTML and PHP.

My work has allowed me the opportunity to be directly involved with the writing of academic papers. I am the first author of 3 such papers and have been directly involved with all 5 listed above. I have also been able to use my skills with 3D graphics software, such as Blender and Inventor, to produce figures for papers, posters, talks and grant proposals.

I have also been privileged to collaborate with the materials science and nanoscience departments at the University of Sheffield. This has helped develop an understanding of lithographic and nanomagnetic processes and also the ability to work with researchers from different backgrounds to realise interdisciplinary goals.

During my work I have enjoyed holding supervisory roles for undergraduate students who have undertaken summer projects. One of these projects has formed the basis of work which has led to the writing of a paper.

Referees

Prof. Ifan Hughes
Reader, Durham University
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Prof. Charles Adams
Group leader, AtMol, Durham University
c.s.adams@durham.ac.uk

Degree marks

Module Name	Year	Mark (%)
Core Mathematics A	1	89
Foundations of Physics 1	1	88
Discovery Skills in Physics	1	79
Introduction to Astronomy	1	80
Laboratory Skills and Practice	2	71
Mathematical Methods in Physics	2	88
Stars and Galaxies	2	93
Foundations of Physics 2	2	92
Thermal and Condensed Matter Physics	2	87
Electronics and Physics Laboratory	2	82
Key Skills A	3	83
Foundations of Physics 3	3	87
Theoretical Physics	3	93
Condensed Matter Physics	3	77
Laboratory Project	3	78
Advanced Theoretical Physics	4	83
Atomic and Optical Physics	4	85
Particle Theory	4	69
Project	4	78