Hywel Owen

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"It is the absence of direct responsibility for practical affairs and the consequent absence of first hand knowledge of them which distinguishes the typical intellectual from other people who also wield the power of the spoken and written word" – Friedrich Hayek

Research Interests

My research interests are in beam dynamics in particle accelerators, particularly electron accelerators used as particle sources for synchrotron radiation, and accelerators as drivers for hybrid nuclear reactors and to manufacture radiopharmaceuticals; my background is in the use of numerical particle simulation in the design of several UK-based accelerator facilities. I am also interested in the overall energy question, and how to provide low-carbon electricity.

Current work includes: optimisation of the Next Light Source accelerator and the effect of bunch compressors; the use of Fixed-Field Alternating Gradient accelerators as drivers for hybrid nuclear reactors; modelling of particle collimation in the Large Hadron Collider; target design for the production of radiopharmaceuticals via photofission.

Experience

Research and Main Projects

2008-Present **Lecturer**, *University of Manchester*.
Research in novel accelerator systems, for accelerator-driven nuclear reactors and for future photon sources.

2007-2008 **New Light Source**, *STFC Daresbury Laboratory*.
Original physicist working on this novel next-generation synchrotron source for the UK (£150M capital). Published first paper on chosen technology option.http:// www.newlightsource.org/

2004-2007 **4th Generation Light Source**, *STFC Daresbury Laboratory*.
Lead designer for beam transport on this challenging 3-accelerator proposal (£200M capital). Produced design study to time.http:// www.4gls.ac.uk/

2002-2004 **ALICE**, *CCLRC Daresbury Laboratory*.
Design of beam transport system for Europe's first energy-recovery linac (£12M capital). Due for commissioning 2009.

1994-2002 **DIAMOND**, *CCLRC Daresbury Laboratory*.
Joint design of storage ring for this national X-ray facility (£250M capital). Accelerator successfully commissioned to time, budget, and with design parameters in 2006.http:// www.diamond.ac.uk/

Professional

2009 **Scientific Programme Committee**, *Free-Electron Laser Conference, FEL09*.

2008-Present **Founding Member**, *ThorEA, The Thorium Energy Amplifier Organisation*.

2008 **Editor**, *ICFA X-Band Workshop 2008*.

2008 **Chair**, *European Synchrotron Light Source Workshop, ESLS XIV*.

2008-Present **Committee Member**, *Particle Accelerators and Beams Group, Institute of Physics*.

2006 **Chief Editor**, *European Particle Accelerator Conference, EPAC06*.

2005-2008 **Work Package Manager**, *EuroFEL FP6 Project*.

2005-Present **Review Panel, American Physics Society**.
Review of papers for Phys.Rev.S.T.A.B.

2005 **Editor**, *Particle Accelerator Conference, PAC05*.

2004 **Editor**, *European Particle Accelerator Conference, EPAC04*.

2004-Present **Chartered Physicist Review Panel**, *Institute of Physics*.

Teaching Experience

- Postgraduate Lecture Course in Accelerator Simulation, 2008
- Undergraduate Nuclear Physics Laboratory, 2008-2009
- Undergraduate Project Course in Physics Simulation, 2009
- Undergraduate Tutorials, inc. Maths, Electromagnetism, Quantum Mechanics, Statistical Physics, and Optics, 2009
- Undergraduate Maths Tutorials, 1991-1994
- O and A Level Maths/Physics Tutorials (Private), 1993-2002

Education

1991-1994 **PhD Student in Chemical Physics (CASE Award)**, *University of Manchester*.
Development and analysis of new type of ferroelectric liquid crystal for electro-optic switching.

1988-1991 **BSc (Hons) 1st Class (Scholarship)**, *University of Manchester*.
Mathematics options in first 2 years, experimental projects 3rd year.

1983-1988 **O and A Levels**, *University College School, London*.
A Grades in Maths, Further Maths, Physics and Chemistry, S Level in Physics, A/B in 9 O-Levels, 2 Music Qualifications.

Computing

Languages	C, Python, Fortran, Pascal, VB	Packages	MATLAB™, Mathematica™, LabVIEW™
Development	Eclipse, Subversion, Visual Studio	Platforms	Windows 3.1 to XP/Vista, Macintosh OSX, Linux, Unix (SGI/Sun/HP-UX)
Tools	MS Office/Open Office, LaTeX	Formats	HTML, CSS, GPIB, RS-232, NMEA-0183
Information	Sharepoint, Wordpress, Plone, Mambo, Joomla		

Languages

English **Fluent** — *My native language.*

French **Basic** — *Can survive and read the paper.*

Personal

Daresbury PCC Member of PCC in rural parish, helping to grow community through good management.

Archery	My lifelong sport; British student champion 1992, British team 1993, county team 1995-2006. Extensive experience of coaching from beginner to expert level.
Ski/Snowboard	Lots of snow experience, having covered most of France by now.
Hiking and Climbing	British 5 peaks, cardinal points (N,S,E,W), most of the UK, Mount Elbert (USA), Mount Pilatus (Switzerland), plus others.

Publications

H.L. Owen, S. AlShammari, R. Appleby, R.J. Barlow, and A. Toader. Simulation of the LHC Collimation System Using MERLIN. In *Proc. 23rd Particle Accelerator Conference*, 2009.

K. Peach et al. PAMELA Overview: Design Goals and Principles. In *Proc. 23rd Particle Accelerator Conference*, 2009.

S. Tygier, R.J. Barlow, and H.L. Owen. 6D Acceleration Studies in Proton Fixed Field Alternating Gradient Accelerator Lattices. In *Proc. 23rd Particle Accelerator Conference*, 2009.

R. Walker et al. A Proposed New Light Source Facility for the UK. In *Proc. 23rd Particle Accelerator Conference*, 2009.

P.H. Williams et al. A Recirculating Linac as a Candidate for the UK New Light Source Project. In *Proc. 23rd Particle Accelerator Conference*, 2009.

T.R. Edgecock et al. EMMA - the World's First Non-scaling FFAG. In *Proc. 11th European Particle Accelerator Conference*, 2008.

P.H. Williams, G. Bassi, S. Thorin, and H.L Owen. Collective Effects in a Short-Pulse FEL Driver. In *Proc. 11th European Particle Accelerator Conference*, 2008.

P.H.Williams, B.L. Militsyn, M.W. Poole, N.R. Thompson, B.W.J. McNeil, and H.L. Owen. PULSE - A High-Repetition-Rate Linac Driver for X-ray FELs. In *Proc. 11th European Particle Accelerator Conference*, 2008.

J. Feldhaus, M. Ferianis, M. Ferrario, J. Knobloch, U. Krell, T. Limberg, H. Owen, B. Petersen, and S. Werin. EUROFEL: Europe tackles key issues of free electron lasers. *Synchrotron Radiation News*, 21(2):28, 2008.

R.J. Barlow, J.K. Pozimski, K. Peach, N. Bliss, N. Marks, H. Owen, M. W. Poole, and T. R. Edgecock. The CONFORM Project: Construction of a Non-Scaling FFAG and its Applications. In *Proc. 22nd Particle Accelerator Conference*, 2007.

P.H. Williams, G. Hirst, B.D. Muratori, H.L. Owen, and S.L. Smith. Electron Beam Dynamics in 4GLS. In *Proc. 22nd Particle Accelerator Conference*, 2007.

H.L. Owen, B.D. Muratori, and P.H. Williams. Optics Issues for the 4GLS High-Current ERL. In *Proc. 2nd ERL Workshop*, 2007.

H.L. Owen. The 4GLS at Daresbury. In *Proc. International Linear Accelerator Conference*, 2006.

M.A. Bowler, B.D. Muratori, H.L. Owen, S.L. Smith, and S.V. Miginsky. Lattice Design for the Fourth Generation Light Source at Daresbury Laboratory. In *Proc. 10th European Particle Accelerator Conference*, 2006.

B McNeil, J Clarke, D Dunning, G Hirst, H Owen, N Thompson, B Sheehy, and P Williams. An XUV-FEL amplifier seeded using high harmonic generation. *New Journal of Physics*, 9:82, Apr 2007.

C Thomas, G Rehm, H Owen, N Wyles, S Botchway, V Schlott, and M Wahl. Bunch purity measurement for Diamond. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 566(2):762–766, Oct 2006.

S Smith, B Muratori, H Owen, G Hoffstaetter, V Litvinenko, I Benzvi, M Bai, J Beebewang, M Blaskiewicz, and R Calaga. Optic issues in ongoing ERL projects. *Nuclear Instruments and*

Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 557(1):145–164, Feb 2006.

G Hoffstaetter, V Litvinenko, and H Owen. Optics and beam transport in energy recovery linacs. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 557(1):345–353, Feb 2006.

C. Gerth, M. Bowler, B. Muratori, H.L. Owen, N.R. Thompson, B. Faatz, and B.W.J. McNeil. Start to End Simulations of the ERL Prototype at Daresbury Laboratory. In *Proc. 21st Particle Accelerator Conference*, 2005.

B. Muratori, H.L. Owen, C.K.M. Gerth, S.B. van der Geer, and M.J. de Loos. Start to End Simulations of the ERL Prototype at Daresbury Laboratory. In *Proc. 21st Particle Accelerator Conference*, 2005.

C. Gerth, M. Bowler, H.L. Owen, N.R. Thompson, B. Faatz, and B.W.J. McNeil. Start-to-End Simulations of the Energy Recovery Linac Prototype FEL. In *Proc. 26th International FEL Conference*, 2004.

B. Muratori and H.L. Owen. Choice of Arc Design for the ERL Prototype at Daresbury Laboratory. In *Proc. 9th European Particle Accelerator Conference*, 2004.

B. Muratori, H.L. Owen, and J.A. Varley. Optics Layout for the ERL Prototype at Daresbury Laboratory. In *Proc. 9th European Particle Accelerator Conference*, 2004.

M.A. Bowler and H.L. Owen. A Study of CSR Induced Microbunching Using Numerical Simulations. In *Proc. 9th European Particle Accelerator Conference*, 2004.

M.W. Poole et al. 4GLS: A New Type of Fourth Generation Light Source Facility. In *Proc. 20th Particle Accelerator Conference*, 2003.

H.L. Owen, J.K. Jones, and S. Smith. Optimisation of the DIAMOND Storage Ring Lattice. In *Proc. 8th European Particle Accelerator Conference*, 2002.

N.G. Wyles, J.K. Jones, H.L. Owen, and J.A. Varley. DIAMOND Storage Ring Apertures. In *Proc. 8th European Particle Accelerator Conference*, 2002.

D.J. Scott, J.A. Clarke, D.M. Dykes, D.J. Holder, J.K. Jones, J. Kay, N. Marks, H.L. Owen, M.W. Poole, S.L. Smith, V.P. Suller, J.A. Varley, and N.G. Wyles. A Revised DIAMOND Booster Design. In *Proc. 8th European Particle Accelerator Conference*, 2002.

J.A. Clarke, D.J. Holder, J.K. Jones, H.L. Owen, M.W. Poole, D.J. Scott, S.L. Smith, J.A. Varley, and N.G. Wyles. Recent Developments in the DIAMOND Storage Ring Design. In *Proc. 19th Particle Accelerator Conference*, 2001.

J.A. Clarke, H.L. Owen, M.W. Poole, S.L. Smith, V.P. Suller, and N.G. Wyles. Prospects for a 4th-Generation Light Source for the UK. In *Proc. 19th Particle Accelerator Conference*, 2001.

J. Jowett, T. Risselada, F. Zimmermann, and H.L. Owen. Damping Rings for CLIC. In *Proc. 7th European Particle Accelerator Conference*, 2000.

J.A. Balmer, D.J. Holder, and H.L. Owen. Measurement of Ground Vibrations and Calculation of Their Effect on the DIAMOND Light Source. In *Proc. 7th European Particle Accelerator Conference*, 2000.

H.L. Owen and M.W. Poole. Low Energy Operation of the DIAMOND Light Source. In *Proc. 7th European Particle Accelerator Conference*, 2000.

R. Assmann et al. Design Status of the CLIC 3-TeV Beam Delivery System and Damping Rings. In *Proc. 7th European Particle Accelerator Conference*, 2000.

M.W. Poole et al. Evolution of the DIAMOND Light Source. In *Proc. 7th European Particle Accelerator Conference*, 2000.

H.L. Owen. Photon Counting Detectors for Fill Structure Measurements and Visible Wavelengths. In *Proc. 4th European Workshop on Beam Diagnostics and Instrumentation for Particle Accelerators*, 1999.

A.A. Chesworth, J.A. Clarke, G.S. Dobbing, D.J. Holder, H.L. Owen, M.W. Poole, S.L. Smith, and V.P. Suller. DIAMOND: A UK National Light Source Project. In *Proc. 18th Particle Accelerator Conference*, 1999.

J.A. Clarke, D.M. Dykes, C.W. Horrabin, P.A. McIntosh, H.L. Owen, M.W. Poole, S.L. Smith, and V.P. Suller. An Updated Assessment of a Medical Cyclotron as an Injector for an Energy Upgrade. In *Proc. 19th International Linear Accelerator Conference*, 1998.

J.A. Clarke, D.M. Dykes, C.W. Horrabin, A. Kacperek, B. Marsland, H.L. Owen, M.W. Poole, S.L. Smith, and V.P. Suller. Assessing the Suitability of a Medical Cyclotron as an Injector for an Energy Upgrade. In *Proc. 6th European Particle Accelerator Conference*, 1998.

J.A. Clarke, H.L. Owen, M.W. Poole, S.L. Smith, and V.P. Suller. An Update on the DIAMOND Light Source Project. In *Proc. 6th European Particle Accelerator Conference*, 1998.

J.A. Clarke, D.M. Dykes, C.W. Horrabin, A. Kacperek, B. Marsland, H.L. Owen, M.W. Poole, S.L. Smith, and V.P. Suller. Assessing the Suitability of a Medical Cyclotron as an Injector for an Energy Upgrade. In *Proc. 6th European Particle Accelerator Conference*, 1998.

J.A. Clarke, H.L. Owen, M.W. Poole, and S.L. Smith. Progress with the SRS Upgrade Project. In *Proc. 6th European Particle Accelerator Conference*, 1998.

H.L. Owen. Characteristics, Uses and Developments of the Photon Counting System at the SRS. In *Proc. 3rd European Workshop on Beam Diagnostics and Instrumentation for Particle Accelerators*, 1997.

H.L. Owen. Beam Lifetime at the SRS. In *Proc. 17th Particle Accelerator Conference*, 1997.

B.G. Martlew, H.L. Owen, M.J. Pugh, W.R. Rawlinson, and S.L. Smith. PC-Based Applications Programming on the SRS Control System. In *Proc. 17th Particle Accelerator Conference*, 1997.

J.A. Clarke and H.L. Owen. Operation of the Daresbury Synchrotron Radiation Source with a Reduced Vertical Aperture. In *Proc. 5th European Particle Accelerator Conference*, 1996.

J.A. Clarke and H.L. Owen. Measurement of Vertical Dispersion and Coupling in the Daresbury SRS. In *Proc. 5th European Particle Accelerator Conference*, 1996.

H.L. Owen and S.L. Smith. Optimising the Injection Scheme for DIAMOND from a 3GeV Booster Synchrotron. In *Proc. 5th European Particle Accelerator Conference*, 1996.

M. Muñoz, H.L. Owen, and S.L. Smith. Optimisation of the Dynamic Aperture of DIAMOND. In *Proc. 5th European Particle Accelerator Conference*, 1996.

J.A. Clarke, H.L. Owen, and S.L. Smith. A Racetrack Lattice for DIAMOND. In *Proc. 5th European Particle Accelerator Conference*, 1996.

V.P. Suller, J.A. Clarke, J.B. Fitzgerald, H.L. Owen, M.W. Poole, X. Queralt, and S.L. Smith. Fluorescent Ferroelectric Liquid Crystalline Copolyacrylates. In *Proc. 5th European Particle Accelerator Conference*, 1996.

A. Beer, G. Scherowsky, and H. J. Coles. Fluorescent Ferroelectric Liquid Crystalline Copolyacrylates. *Liquid Crystals*, 19:565, 1995.

H.J. Coles, H. Owen, J. Newton, and P. Hodge. Electro-Optic Effects in Novel Siloxane Containing Oligomeric Liquid Crystals II: Smectic C* Materials. *Proceedings of the SPIE*, 2408:22, 1995.

H. Owen. *Physical Properties of Organosiloxane Ferroelectric Liquid Crystals and Fluorescent Dyes for Electro-Optic Device Applications*. PhD thesis, University of Manchester, 1995.

H. Owen, J. Newton, P. Hodge, and H.J. Coles. Comparison of Mesomorphic Behaviour and Electro-Optic Properties of Ferroelectric Mesogens With and Without Disiloxane End-Groups. *Molecular Crystals and Liquid Crystals*, 265:563, 1995.

H. Owen, H.J. Coles, J. Newton, and P. Hodge. Electro-Optic Properties of an Unusual Guest-Host Liquid Crystal Mixture: A Mauve Anthraquinone Dye in a Ferroelectric Organosiloxane. *Molecular Crystals and Liquid Crystals*, 257:151, 1994.

J. Newton, H.J. Coles, and P. Owen, H.and Hodge. A New Series of Low Molar Mass Ferroelectric Organosiloxanes with Unusual Electro-Optic Properties. *Ferroelectrics*, 148:379, 1993.

H.J. Coles, H. Owen, J. Newton, and P. Hodge. New Low Molar Mass Organosiloxanes with Unusual Ferroelectric Properties. *Liquid Crystals*, 15(5):739, 1993.

H. Owen, G. A. Lester, and H. J. Coles. Fluorescent Dye Guest-Hose Effects in Advanced Ferroelectric Liquid Crystals. *Liquid Crystals*, 14(4):1039, 1993.