

Curriculum Vitae

Andrew Docherty

Personal Details

Address: TRC Building Room 220
1000 Hilltop Circle
Baltimore, MD 21250, USA

E-Mail Address: docherty@gmail.com

Telephone: +1 410 929 0845

Citizenships: New Zealand and United Kingdom

Skills and Experience

- Developed an object oriented library in Python and C++ to solve the vector wave equation in 2d using a finite difference approach.
Released as open source software at <http://code.google.com/p/polymode>
- Developed a python library for the simulation of phase noise in optoelectronic oscillators.
Released as open source software at <https://github.com/adocherty/Oscillate>
- Research experience in photonics:
 - Modal analysis of microstructured polymer optical fibres
 - Analysis of bragg fibres made from chiral materials
 - Modelling supercontinuum generation in chalcogenide fibres
 - Analysis of motheye anti-reflective structures on optical fibre endfaces
- Research experience in mathematical modelling including:
 - Dirichlet-to-Neumann boundary conditions for unbounded wave problems
 - Arnoldi methods for the solution of nonlinear eigenvalue problems
 - Soliton solution of non-linear wave equations for nonlinear optics and water waves
 - Modelling of crosstalk and noise induced by nonlinear effects in optical fibres
 - Simulation of nonlinear evolution equations, specifically the nonlinear Schrodinger and Haus master equations, using split-step and exponential time differencing methods.

Education

1998-2004: University of New South Wales, Australia

Ph.D. in Electronic Engineering

Thesis entitled: *"Collision Induced Timing Shifts in Wavelength-Division-Multiplexed Optical Fiber Communications Systems."*

Advisor: Mark J. Ablowitz and Iain Skinner

1993-1996: University of Canterbury, New Zealand

Bachelor of Engineering (Electronic) with first class honours.

Employment

2010-present: University of Maryland Baltimore County (UMBC), USA

Post-doctoral research associate at the Center for Advanced Photonics Research (CASPR)

Research Supervisor: Curtis Menyuk

2007-2009: University of Sydney, Australia

Post-doctoral research associate at the Department of Mathematics and Statistics.

Research Supervisor: Leon Poladian

2005-2006: University of Colorado at Boulder, USA

Research associate at the Department of Applied Mathematics.

Research Supervisor: Mark Ablowitz

2001-2004: University of Colorado at Boulder, USA

Graduate Assistant and then Research assistant at the Department of Applied Mathematics.

Selected Publications

M. J. Ablowitz, G. Biondini, A. Biswas, and A. Docherty, T. Hirooka and S. Chakravarty. "Collision-induced timing shifts in dispersion-managed soliton systems," *Optics Letters*, vol. 27, no. 5, 2002.

M. J. Ablowitz, A. Docherty, and T. Hirooka. "Incomplete collisions in strongly dispersion managed return-to-zero communication systems," *Optics Letters*, vol. 28, No 14, pp 1191 2003.

M. J. Ablowitz and A. Docherty. "Solitary waves from optics to fluid dynamics," *Frontiers of Applied Mathematics*, Proceedings of the 2nd International Symposium, Beijing, China, 2006.

A. Argyros, S. G. Leon-Saval, J. Pla, and A. Docherty, "Antiresonant reflection and inhibited coupling in hollow-core square lattice optical fibres," *Optics Express*, vol. 16, no. 8, 2008.

A. Docherty, L. Poladian, A. Argyros, M. C. J. Large, J. Poulin, and R. Kashyap "Increasing the numerical aperture of large-core microstructured polymer optical fibers using a 'Y'-bridge cladding ." *Journal of Lightwave Technology*, vol. 27, no. 11, 2009.

A. Docherty and L. Poladian, "Modal analysis of a highly multimoded microstructured optical fibre using a deflated nonlinear eigenvalue solver," *CLEO Europe*, Munich, 2009.

A. Wang, A. Docherty, B. T. Kuhlmeier, F. M. Cox, and M. C. J. Large, "Side-hole fiber sensor based on surface plasmon resonance ," *Optics Letters*, vol. 34, no .24, 2009.

References

Available on request.