

# Lorna Dougan

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## Education

PhD in Physics 2002-2005  
University of Edinburgh, Department of Physics, United Kingdom  
Mentor: Dr Jason Crain and Prof Alan Soper

MPhys in Physics 1997-2002  
University of Edinburgh, United Kingdom  
1<sup>st</sup> class

## Research Experience

Postdoctoral Research Scientist 2005-present  
Columbia University, Department of Biological Sciences, New York  
Single molecule protein folding Mentor: Prof J.M. Fernandez

Research Student 2002-2005  
Rutherford Appleton Laboratories, Oxford, United Kingdom  
Neutron diffraction to explore aqueous solutions Mentor: Prof A.K. Soper

Summer Research Student Scholarship 2000  
CERN, Geneva, Switzerland  
Successfully completed a research project on radioactivity detection methods

Summer Research Student 1999  
Bruker AG, Zurich, Switzerland  
Tested and implemented new Nuclear Magnetic Resonance research equipment

## Teaching Experience

Physics and computational physics tutor 2002-2005  
Workshop coordinator for summer school for physics teachers 2002-2005  
Science communication presenter for SCIFUN traveling road-show 1997-2005

## Honors and Awards

Poster prize winner Gordon Research conference Water and Aqueous Solutions, 2006  
Young Scientist Bursary for Gordon Research Conference Protein Folding, 2006  
UK Student Representative World Year of Physics, 2005  
Winston Churchill Memorial Trust Travel Fellowship, 2005  
Student Bursary Institute of Physics, 2005  
Young Scientist Bursary Institute of Physics Neutron Scattering Group, 2004  
Poster prize winner European Molecular Liquids conference, 2003  
University of Edinburgh School of Physics award for outstanding achievement, 2002

## Published Papers

**L. Dougan**, and J. M. Fernandez, *Tandem repeating modular proteins avoid aggregation in single molecule force spectroscopy experiments*, J. Phys. Chem. (2007)

**L. Dougan**, G. Fang, G. H. Lu, J. M. and Fernandez, *Solvent molecules bridge the unfolding transition state of a protein*, PNAS (submitted)

K.W. Walther\*, F. Gräter\*, **L. Dougan**\*, C.L. Badilla, B.J. Berne and J.M. Fernandez, *Signatures of hydrophobic collapse in extended proteins captured with force spectroscopy*, PNAS, 104, 7916 (2007) \*joint first authors

A.K. Soper, **L. Dougan**, J. Crain, and J.L. Finney, *Excess entropy in alcohol-water solutions: a simple clustering explanation*, J. Phys. Chem. B, 110 (8), 3472 (2006)

**L. Dougan**, S.P. Bates, R. Hargreaves, J. Crain, J.L. Finney and A.K. Soper, *Segregation in Aqueous Methanol Enhanced by Cooling and Compression*, J. Chem. Phys, 122, 174514, (2005)

**L. Dougan**, S.P. Bates, R. Hargreaves, J.P. Fox, J. Crain, J.L. Finney, V.Reat and A.K. Soper, *Methanol-Water Solutions: A Bi-Percolating Liquid Mixture*, J. Chem. Phys., 121, 6456(2004)

**L. Dougan**, J. Crain, H. Vass and S.W. Magennis, *Probing the Liquid State Structure and Dynamics of Aqueous Solutions Using Fluorescence Spectroscopy*, J. of Fluorescence, 14, 91(2004)

J. Crain, S.P. Bates, S.W. Magennis and **L. Dougan**, *Recent Research Developments in Molecular Physics, Transworld Research Network, India*, 1-20, (2003),

## Presentations (only oral presentations listed)

‘Using the solvent environment to probe protein folding in force-clamp single molecule force spectroscopy’, invited talk Rensselaer Polytechnic Institute, USA, 2007,

‘Single molecule force spectroscopy as a new tool to probe the role of the solvent environment in protein folding’, Liquid and Glass Science conference, Oxford, UK, 2007

‘Probing the unfolding transition state of a protein in aqueous glycerol solutions’, Gordon Research Conference Water and Aqueous Solutions, New Hampshire, USA, 2006,

‘The Aqueous Environment- Lessons from small molecules’, University of Edinburgh, School of Physics, 2004

‘Exploring the structure and dynamics of aqueous amphiphiles’, Collaborative Optical Spectroscopy Micromanipulation and Imaging Centre, University of Edinburgh, 2003