Conference Chair: Sonja Franke-Arnold

Oral programme

All talks are invited

Monday 3 June 2013

08:00 Registration and refreshments
09:10 Welcome and Introduction

Session 1: OAM phenomenology
Chair: S Barnett, University of Strathclyde, UK

09:20 (session introduction) Analogies between wave optics and quantum mechanics
G Nienhuis, Universiteit Leiden, Netherlands
09:50 What is spin to orbit angular momentum transfer?
I Fernandez-Corbaton, Macquarie University, Australia
10:10 Singular phase structure of nano-antenna system
M Coles, University of East Anglia, UK
10:30 Refreshments
11:00 Optical angular momentum and symmetries
R Cameron, University of Strathclyde, UK
11:20 Chiral electromagnetic fields
E Hendry, University of Exeter, UK
11:40 Five momenta
M Berry, University of Bristol, UK
12:00 Poster mini talks
13:00 Lunch

Session 2: Vortices in optical, electron and matter waves
Chair: D Andrews, University of East Anglia, UK

14:20 (session introduction) Peculiar rotation of electron vortices in magnetic fields
P Schattschneider, University Service Centre for Electron Microscopy, Austria
14:50 Generation and detection of OAM in electron beams
J Verbeeck, University of Antwerp, Belgium

15:10 Manipulation and detection of OAM in electron vortex beams
B McMorran, University of Oregon, USA

15:30 Refreshments

16:00 Controlling the handedness of laser resonators
A Forbes, National Laser Centre, South Africa

16:20 The physics of conserved quantities in classical electrodynamics
B Thide, Swedish Institute of Space Physics, Sweden

16:40 Radio applications of OAM states
F Tamburini, University of Padova, Italy

17:00 Poster mini talks
18:00 Drinks reception
18:30 Poster session part 1
19:45 Finger buffet
20:30 Poster session part 2

Tuesday 4 June 2013

08.30 Registration

Session 3: OAM toolbox (Phorbitech)
Chair: M Padgett, University of Glasgow, UK

09:00 (session introduction) Spiral photolithography of azopolymers
L Marrucci, Università di Napoli Federico II, Italy

09:30 Complete experimental toolbox for alignment-free quantum communication
F Sciarrino, Sapienza Università di Roma, Italy

09:50 Integrated vortex beam emitters
S Yu, University of Bristol, UK

10:10 "Twisted" photon entanglement
W Löffler, Leiden University, Netherlands

10:30 Refreshments

11:10 Dimensionality in orbital angular momentum entanglement
M J Romero, University of Glasgow, UK

11:30 Biphoton optical vortices
S Walborn, Universidade Federal do Rio de Janeiro, Brazil

11:50 Quantum nature of radial degree of freedom of paraxial waves
E Karimi, University of Ottawa, Canada
12:10 High density atom traps using holographically shaped beams
N Radwell, University of Glasgow, UK

12:30 Experimental instability of higher-order optical vortices
M van Exter, Leiden University, Netherlands

13:00 Lunch

Session 4: Vector vortex beams and spin–orbit interactions of light
Chair: F Sciarrino, University of Rome, Italy

14:20 (session introduction) Transverse spin and momentum in evanescent waves
K Bliokh, RIKEN, Japan

14:50 Vector beams
G Milione, City College of New York, USA

15:10 Polarization patterns and singularities of Poincare beams
E J Galvez, Colgate University, USA

15:30 Optical and matter vortices and interactions
M Babiker, University of York, UK

15:50 Refreshments

16:20 Singularimetry and topological aberrations
J Götte, Max-Planck-Institute for the Physics of Complex Systems, Germany

16:40 Imprinting skyrmion spin textures in spinor Bose-Einstein condensates
Y Shin, Seoul National University, South Korea

17:00 Exploiting the angular momentum of light in nanophotonics
G Molina-Terriza, Macquarie University, Australia

18:00 Coaches depart from the Burrell Collection

18:30 Drinks reception and conference dinner (National Piping Centre)

Wednesday 5 June 2013

08:30 Registration

Session 5: OAM applications in imaging
Chair: B Boyd, University of Ottawa, Canada and University of Rochester, USA

09:00 (session introduction) Using OAM light for optical imaging
M Ritsch-Marte, Innsbruck Medical University, Austria

09:30 Quantitative spiral phase contrast imaging in a stimulated emission depletion microscope
M Guillon, Centre National de la Recherche Scientifique, France

09:50 On the generation and analysis of wave vortices
K Volke-Sepúlveda, Universidad Nacional Autonoma de Mexico, Mexico
Storage and non-collinear retrieval of optical angular momentum of light in cold atoms
L Pruvost, Centre National de la Recherche Scientifique, France

Refreshments and guided tour of the Burrell Collection

Session 6: OAM matter interaction
Chair: S Franke-Arnold, University of Glasgow, UK

11:30 (session introduction) Vortex beams and angular momentum of light
H Rubinsztein-Dunlop, University of Queensland, Australia

12:00 Structured light fields based on spiral beams – promoting photonic lattices and optical micromanipulation
C Denz, University of Münster, Germany

12:20 Twisted light in nanostructures
N M Litchinitser, The State University of New York, USA

12:40 Topological shaping of light by structured thin metal films
E Brasselet, Centre National de la Recherche Scientifique and University of Bordeaux, France

13:00 Lunch

Session 7: OAM applications in quantum information
Chair: L Marrucci, University of Naples, Italy

14:20 (session introduction) The Poincare sphere for OAM: variations on a theme
M Dennis, University of Bristol, UK

14:50 The duality relationship in the presence of post-selection
J Leach, Heriot-Watt University, UK

15:10 Playing with quantum states, playing with dimensions
J P Torres, Institut de Ciencies Fotoniques, Spain

15:30 Visualizing quantum state rotations through weak measurements of orbital angular momentum
M Malik, University of Rochester, USA

15:50 Refreshments

16:20 Real-time imaging of quantum entanglement
R Fickler, University of Vienna, Austria

16:40 More twists on optical twisters: of helicon-conical beams, superpositions and combinations
D Z Palima, Technical University of Denmark, Denmark

17:00 Close
Poster programme

Topic: OAM phenomenology

P.01 Experimental study of the cross-correlation function for partially coherent Laguerre-Gaussian beams
A Mourka, University of St. Andrews, UK

P.02 Optical angular momentum in conical diffraction
R Darcy, Trinity College Dublin, Ireland

P.03 Clebsch-Gordan coefficients for the addition of orbital angular momentum of Gaussian modes
M Dennis, Bristol University, UK

P.04 The role of vortices in the generation of optical lift (withdrawn)

P.05 Modal characterisation using principal component analysis: application to Laguerre-Gaussian beams and their superposition
A Mourka, University of St Andrews, UK

P.06 The forgotten quantum number: radial modes of Laguerre-Gauss beams
W Plick, Institute for Quantum Optics and Quantum Information, Austria

P.07 Do waves carrying orbital angular momentum possess azimuthal linear momentum?
F Speirits, University of Strathclyde, UK

Topic: Vortices in optical, electron and matter waves

P.08 Electron vortex propagation in magnetic fields
C Greenshields, University of Glasgow, UK

P.09 Chiral specific electron vortex beam spectroscopy
S Lloyd, University of York, UK

P.10 Subwavelength control of orbital angular momentum of light
G Parisi, Padova University and Laboratory of Nanofabrication of Nanodevices, Italy

P.11 Electron diffraction catastrophies
T C Petersen, Monash University, Australia

P.12 Instability of higher-order optical vortices
F Ricci, University of Padova, Italy

P.13 Experimental study of nanomanipulation of nanoparticles using electron vortex beams
J Yuan, University of York, UK

P.14 Angular momentum-dependent helicity transfer in nano-apertures
X Zambrana-Puyalto, Macquarie University, Australia

Topic: OAM toolbox (Phorbitech)

P.15 Photonic qudits and their applications in fundamental quantum mechanics and quantum information
V D’Ambrosio, Sapienza Università di Roma, Italy

P.16 Simulation of a spin polarization device in an electron microscope
V Grillo, S3-NANO CNR, Italy
Detection of a spinning object using light’s orbital angular momentum
M Lavery, University of Glasgow, UK

Nonlinear interpolation of OAM enhanced beam shifts
A Nugrowati, Leiden University, Netherlands

Method for direct measurements of the mean and variance of light OAM
B Piccirillo, Università degli Studi di Napoli, Italy

3D fluorescence imaging of laser beams
N Radwell, University of Glasgow, UK

Transverse Doppler Effect using optical beams with a twist
C Rosales-Guzmán, ICFO-Institut de Ciencies Fotoniques, Spain

Photoalignment-based liquid crystal q-plate technology
S Slussarenko, Università degli Studi di Napoli “Federico II”, Italy

Joining the quantum state of two photons into one
N Spagnolo, Sapienza Università di Roma, Italy

Controlled acceleration of superimposed higher-order Bessel beams
A Dudley, Council for Scientific and Industrial Research National Laser Centre, South Africa

Measuring Poynting vector of optical vortices using polarization interference
G Milione, City College of New York, USA

Optical angular momentum and phase conjugation (withdrawn)

Topology of dark tangles in light
A Taylor, University of Bristol, UK

Spatial correlation singularities of partially coherent fields
Y Yang, University of Electronic Science and Technology of China, China

Ince-Gaussian beams: manifold perspective in optical tweezers
C Alpmann, University of Münster and Institute of Applied Physics, Germany

Heralded single-photon ghost imaging utilising EPR correlations
R Aspden, University of Glasgow, UK

3D computational imaging via correlation measurement
B Sun, University of Glasgow, UK

Sub-Rayleigh optical vortex coronagraphy
E Mari, University of Padova, Italy

Optimising the use of detector arrays for measuring intensity correlations of photon pairs
D Tasca, University of Glasgow, UK
**Topic: OAM matter interaction**

P.34  
**Propagation of high-intensive femtosecond vortex beams in media with focusing and inertial defocusing nonlinearities**  
O Fedotova, Belarus National Academy of Sciences, Belarus

P.35  
**Duality and beams of well-defined helicity: how to use them for experimental purposes**  
I Fernandez-Corbaton, Macquarie University and 2 ARC Center of Excellence for Engineered Quantum Systems, Australia

P.36  
**Light-matter angular momentum exchange in nanophotonic structures: beyond "spin" and "orbital" angular momentum**  
R Oulton, Bristol University, UK

P.37  
**Highly collimated source of cold Rb atoms from a 2-dimensional magneto-optical trap**  
L Pruvost, Centre National de la Recherche Scientifique, France

P.38  
**Classical and quantum regimes of collective orbital angular momentum exchange between light and ultracold atoms**  
G Robb, University of Strathclyde, SUPA, UK

**Topic: OAM applications in quantum information**

P.39  
**Fractional quantisation of optical angular momentum**  
K Ballantine, Trinity College Dublin, Ireland

P.40  
**Efficient quantum state reconstruction with mutually unbiased bases in high-dimensional orbital angular momentum subspaces**  
D Giovannini, University of Glasgow, UK

P.41  
**Imaging high-dimensional spatial entanglement with a camera**  
M Edgar, University of Glasgow, UK

P.42  
**Entanglement in 100 dimensions**  
M Krenn, University of Vienna, Austria

P.43  
**Gaussian entropy minimising states for orbital angular momentum and angular position**  
A Yao, University of Strathclyde, UK