

## PH450 Talks Wednesday 14th February 2018

| JA5.04 |                    |        | Chair: Neil Hunt                                                                  | 1st Sup        | 2nd Sup       |
|--------|--------------------|--------|-----------------------------------------------------------------------------------|----------------|---------------|
| 1300   | <b>Cuthbertson</b> | Stuart | Moving a standing wave with an electronically controlled piezo-mirror device      | Gail McConnell | David McKee   |
| 1315   | <b>Irwin</b>       | Edward | Making light-sheets for microscopy and mesoscopy                                  | Gail McConnell | Brian Patton  |
| 1330   | <b>Percival</b>    | John   | Quantification and measurement of marine microbial populations using the Mesolens | Gail McConnell | David McKee   |
| 1345   | <b>Doak</b>        | Elliot | A Physical Investigation of Protein-drug Binding                                  | Neil Hunt      | Daniel Shaw   |
| 1400   | <b>O'Hare</b>      | Dawn   | Uncovering the Early Stages of Protein Folding                                    | Neil Hunt      | Maxim Fedorov |
| 1415   |                    |        | Break                                                                             |                |               |

## Chair: Gail McConnell

|      |                  |        |                                                                                 |                        |              |
|------|------------------|--------|---------------------------------------------------------------------------------|------------------------|--------------|
| 1430 | <b>Hamilton</b>  | Julie  | Pathological modifications in proteins detected by their intrinsic fluorescence | Olaf Rolinski          | Yu Chen      |
| 1445 | <b>Jackson</b>   | James  | Quantum Dots TBC                                                                | Olaf Rolinski          |              |
| 1500 | <b>Maclure</b>   | Daniel | Pathological modifications in proteins detected by their intrinsic fluorescence | Olaf Rolinski          | Yu Chen      |
| 1515 | <b>Jordan</b>    | Brian  | Three-Dimensional Single-Molecule Based Super-Resolution Imaging                | Sebastian van de Linde | Brian Patton |
| 1530 | <b>McFarlane</b> | Mollie | mRNA nanoparticles for cancer detection                                         | Yu Chen                |              |
| 1545 |                  |        | Break                                                                           |                        |              |

## Chair: Zhengming Sheng

|      |                  |          |                                                                             |                 |              |
|------|------------------|----------|-----------------------------------------------------------------------------|-----------------|--------------|
| 1600 | <b>Benson</b>    | Philippa | Simulations of magnetic turbulence in plasma                                | Bengt Eliasson  | Kevin Ronald |
| 1615 | <b>Moir</b>      | Connor   | Stochastic Particle Heating of Charged Particles by Plasma Waves            | Bengt Eliasson  | Kevin Ronald |
| 1630 | <b>MacLean</b>   | Cameron  | Plasma optical modulators for intense lasers                                | Zhengming Sheng |              |
| 1645 | <b>Pettigrew</b> | Graham   | Compact X-ray sources from nonlinear Thomson scattering with intense lasers | Zhengming Sheng |              |

| JA5.06 |                |        | Chair: Kevin O'Donnell                                                               | 1st Sup            | 2nd Sup                         |
|--------|----------------|--------|--------------------------------------------------------------------------------------|--------------------|---------------------------------|
| 1300   | <b>Graham</b>  | Stuart | Phosphorescence of glowstones™                                                       | Kevin O'Donnell    | Paul Edwards                    |
| 1315   | <b>Taylor</b>  | Ahna   | Hysteretic Photochromic Switching (HPS) of europium-magnesium (Eu-Mg) defects in GaN | Kevin O'Donnell    |                                 |
| 1330   | <b>Webster</b> | David  | RE-doped III-nitrides for solid state lighting applications                          | Kevin O'Donnell    | Paul Edwards                    |
| 1345   | <b>Burns</b>   | Elise  | Investigation of Polytypism in nitride semiconductors                                | Carol Trager-Cowan | Naresh Kumar, Jochen Bruckbauer |
| 1400   | <b>Waters</b>  | Dale   | Investigation of Polytypism in nitride semiconductors                                | Carol Trager-Cowan | Naresh Kumar, Jochen Bruckbauer |
| 1415   |                |        | Break                                                                                |                    |                                 |

## Chair: Jonathan Pritchard

|      |                   |           |                                                                                        |                    |                                         |
|------|-------------------|-----------|----------------------------------------------------------------------------------------|--------------------|-----------------------------------------|
| 1430 | <b>Lesniewska</b> | Magdalena | Large scale lattice-Boltzmann simulation of colloid-liquid crystal composite materials | Oliver Henrich     | Neil Hunt                               |
| 1445 | <b>Quinn</b>      | Gary      | Understanding how to exploit diamond in solid-state lasers                             | Alan Kemp          | Rolf Birch, Vasil Savitski, Sean Reilly |
| 1500 | <b>Bommer</b>     | Sean      | Development of a highly accurate alignment process for multi-stage laser lithography   | Michael Strain     | Benoit Guilhabert                       |
| 1515 | <b>McCallum</b>   | Jake      | Signal processing for Atomic Magnetometry                                              | Paul Griffin       | Stuart Ingleby                          |
| 1530 | <b>Preston</b>    | Jack      | Long range entanglement in a hybrid atom-superconductor quantum processor              | Jonathan Pritchard |                                         |
| 1545 |                   |           | Break                                                                                  |                    |                                         |

## Chair: Robert Martin

|      |                |          |                                                                                 |                   |                  |
|------|----------------|----------|---------------------------------------------------------------------------------|-------------------|------------------|
| 1600 | <b>Salmond</b> | Ben      | Colour stability of LEDs from the red to the UV                                 | Jochen Bruckbauer | Robert W. Martin |
| 1615 | <b>Earle</b>   | Alasdair | Investigating non-ideal behaviour in current-voltage curves from GaN-based LEDs | Robert Martin     | Paul Edwards     |
| 1630 | <b>Cannon</b>  | Rachel   | Computing the inverse square law                                                | Ben Hourahine     | Oliver Henrich   |
| 1645 | <b>Daffurn</b> | Andrew   | Twisted Nanostructures                                                          | Ben Hourahine     |                  |

**JA5.07****Chair: Kevin Ronald****1st Sup****2nd Sup**

|      |                  |        |                                                                                                 |                     |                 |
|------|------------------|--------|-------------------------------------------------------------------------------------------------|---------------------|-----------------|
| 1300 | <b>Clarkson</b>  | Scott  | Design and Measurement of a Mode Converter for a Microwave Amplifier                            | <b>Wenlong He</b>   | Craig Donaldson |
| 1315 | <b>MacDonald</b> | Louise | Design of a Brewster Window for a W-band Gyro-TWA                                               | <b>Wenlong He</b>   | Liang Zhang     |
| 1330 | <b>Sloan</b>     | Sean   | Design and simulation of a millimetre wave source based on a pseudospark produced electron beam | <b>Adrian Cross</b> |                 |
| 1345 | <b>Galbraith</b> | Connor | Numerical simulation of cyclotron maser amplifiers                                              | <b>Kevin Ronald</b> | Alan Young      |
| 1400 | <b>Wilson</b>    | Kieran | Simulation of Langmuir probes and sheaths in plasma                                             | <b>Kevin Ronald</b> | David Speirs    |
| 1415 |                  |        | Break                                                                                           |                     |                 |

**Chair: Bernhard Hidding**

|      |                   |         |                                                                   |                         |              |
|------|-------------------|---------|-------------------------------------------------------------------|-------------------------|--------------|
| 1430 | <b>Campbell</b>   | David   | Monte Carlo Modelling of Particle Beam-Matter Interaction         | <b>Bernhard Hidding</b> | Mark Wiggins |
| 1445 | <b>Kelly</b>      | Ellis   | Electron beam physics and transport modelling                     | <b>Bernhard Hidding</b> | Brian McNeil |
| 1500 | <b>McWilliam</b>  | Allan   | Space Radiation Reproduction and Testing                          | <b>Bernhard Hidding</b> | Mark Wiggins |
| 1515 | <b>Rutherford</b> | Lorne   | Space Radiation Reproduction and Testing                          | <b>Bernhard Hidding</b> | Mark Wiggins |
| 1530 | <b>Boyle</b>      | Michael | Simulations of the Demonstration of Ionisation Cooling Experiment | <b>Alan Young</b>       | Kevin Ronald |
| 1545 |                   |         | Break                                                             |                         |              |

**Chair: Francesco Papoff**

|      |                  |        |                                                               |                         |             |
|------|------------------|--------|---------------------------------------------------------------|-------------------------|-------------|
| 1600 | <b>Brodie</b>    | Seoras | Atomic Processes for Astrophysical Plasmas                    | <b>Nigel Badnell</b>    | TBC         |
| 1615 | <b>Archibald</b> | Stuart | Parametric difference resonance in lasers                     | <b>Francesco Papoff</b> | Gordon Robb |
| 1630 | <b>McCormack</b> | Robbie | Using angular momentum of light to detect particles in fluids | <b>Francesco Papoff</b> | Alison Yao  |
| 1645 | <b>Stevenson</b> | Jack   | Investigation of multi-modal flex-tentional transducers       | <b>Francesco Papoff</b> |             |

**PH450 Talks Wednesday 28th February 2018. Other students welcome to attend.****JA5.04****Chair: Mark Wiggins**

|      |                   |             |                                                                            |                         |                                |
|------|-------------------|-------------|----------------------------------------------------------------------------|-------------------------|--------------------------------|
| 1000 | <b>Bruce</b>      | Emily       | Medical Radioisotope Production using a Laser-Plasma Wakefield Accelerator | <b>Mark Wiggins</b>     | Dino Jaroszynski               |
| 1015 | <b>McClue</b>     | Dylan       | Nonlinear waves in plasmas                                                 | <b>Adam Noble</b>       | Dino Jaroszynski, Samuel Yoffe |
| 1030 | <b>McQueen</b>    | Christopher | Radiation Reaction                                                         | <b>Dino Jaroszynski</b> | Adam Noble, Samuel Yoffe       |
| 1045 | <b>Thiagaraja</b> | Anujan      | Nonlinear Vacuum Electrodynamics                                           | <b>Dino Jaroszynski</b> | Adam Noble                     |

**Chair: Daniel Oi**

|      |                |            |                                                     |                         |                  |
|------|----------------|------------|-----------------------------------------------------|-------------------------|------------------|
| 1115 | <b>McCorry</b> | Kieran     | Ion Channel Laser with Large Oscillation Amplitude  | <b>Bernhard Ersfeld</b> | Dino Jaroszynski |
| 1130 | <b>Kinanis</b> | Alexandros | Quantum interference and boson sampler verification | <b>Andrew Daley</b>     | Marco Piani      |
| 1145 | <b>O'Brien</b> | Ciaran     | Magnetic states with long-range interactions        | <b>Andrew Daley</b>     | Luca Tagliacozzo |

## PH450 Talks Wednesday 21st February 2018

### JA5.04

Chair: Daniel Oi

1st Sup

2nd Sup

|      |                |         |                                                                      |                         |                 |
|------|----------------|---------|----------------------------------------------------------------------|-------------------------|-----------------|
| 1300 | <b>Brown</b>   | James   | The scientific applications of X-ray Free Electron Lasers            | <b>Brian McNeil</b>     | Gordon Robb     |
| 1315 | <b>McCourt</b> | Declan  | Computational Modelling of X-ray Free Electron Lasers                | <b>Brian McNeil</b>     | Gordon Robb     |
| 1330 | <b>Reid</b>    | Michael | Creation and control of continuous-mode optical superposition qubits | <b>John Jeffers</b>     | Luca Mazzarella |
| 1345 | <b>Brown</b>   | Josh    | Floquet theory for trapped atoms in optical lattices.                | <b>Luca Tagliacozzo</b> | Daniel Oi       |

Chair: Marco Piani

|      |                 |        |                                                                         |                    |                    |
|------|-----------------|--------|-------------------------------------------------------------------------|--------------------|--------------------|
| 1430 | <b>Bintener</b> | Tom    | Quantifying the resources of global quantum evolutions and measurements | <b>Marco Piani</b> | Daniel Oi          |
| 1445 | <b>Lavan</b>    | Declan | Distinguishability of quantum states                                    | <b>Marco Piani</b> | John Jeffers       |
| 1500 | <b>Geddes</b>   | Daniel | Acquisition, Pointing, and Tracking for CubeSat QKD                     | <b>Daniel Oi</b>   | Luca Mazzarella    |
| 1515 | <b>Reddie</b>   | Grant  | Gravity Gradiometry with Satellite Constellations                       | <b>Daniel Oi</b>   | Nicholas Lockerbie |

### JA5.06

Chair: Alison Yao

1st Sup

2nd Sup

|      |                   |         |                                                                                |                       |              |
|------|-------------------|---------|--------------------------------------------------------------------------------|-----------------------|--------------|
| 1300 | <b>Glass</b>      | Helena  | Grating magneto-optical trap modelling                                         | <b>Aidan Arnold</b>   | Paul Griffin |
| 1315 | <b>Anderson</b>   | Stewart | Astigmatic mirror multipass absorption cells for long path length spectroscopy | <b>Nigel Langford</b> |              |
| 1330 | <b>McLafferty</b> | Sam     | Nonlinear Optical Loop Mirrors Based on 3 X 3 fibre optic couplers             | <b>Nigel Langford</b> | A Yao        |
| 1345 | <b>Love</b>       | Callum  | Nonlinear Propagation of Structured Light                                      | <b>Alison Yao</b>     | TBC          |

Chair: Elmar Haller

|      |                   |         |                                                                                       |                     |               |
|------|-------------------|---------|---------------------------------------------------------------------------------------|---------------------|---------------|
| 1430 | <b>McLaughlin</b> | Sean    | Grating Magneto-Optical Trap experiments                                              | <b>Paul Griffin</b> | Oliver Burrow |
| 1445 | <b>Steven</b>     | Rachael | A Polarisation Analyser for Quantum Optics Experiments                                | <b>Paul Griffin</b> | Aidan Arnold  |
| 1500 | <b>Ballantyne</b> | Calum   | Implementation and characterization of optical lattice potentials for ultracold atoms | <b>Elmar Haller</b> | Stefan Kuhr   |
| 1515 | <b>Twaddle</b>    | William | Design and Construction of a Fabry-Perot Scanning Interferometer                      | <b>Elmar Haller</b> | Stefan Kuhr   |

Chair: Paul McKenna

|      |                   |          |                                                                                                |                     |                |
|------|-------------------|----------|------------------------------------------------------------------------------------------------|---------------------|----------------|
| 1600 | <b>Highton</b>    | Jennifer | An ultrafast, time-resolving ion spectrometer as a diagnostic of intense laser-plasma dynamics | <b>Paul McKenna</b> | Robbie Wilson  |
| 1615 | <b>Hunter</b>     | Daniel   | Intense Laser Pulse Filamentation in Near Critical Density Plasmas                             | <b>Paul McKenna</b> | Martin King    |
| 1630 | <b>Valk</b>       | Jilles   | Modelling relativistic electron motion in spatially varying intense laser fields               | <b>Paul McKenna</b> | Martin King    |
| 1645 | <b>Williamson</b> | Murray   | High power laser-driven X-ray sources in dense plasma                                          | <b>Paul McKenna</b> | Remi Capdessus |

### JA5.07

Chair: Jennifer Hastie

1st Sup

2nd Sup

|      |                 |          |                                                                 |                        |                   |
|------|-----------------|----------|-----------------------------------------------------------------|------------------------|-------------------|
| 1430 | <b>Anderson</b> | Steven   | Quantum applications of Semiconductor Disk Lasers               | <b>Jennifer Hastie</b> | Lucia Caspani     |
| 1445 | <b>Wade</b>     | Ewan     | Photonic Neurons: Spiking information processing with lasers    | <b>Antonio Hurtado</b> | Thorsten Ackemann |
| 1500 | <b>Scott</b>    | Philip   | Neurophotonic Systems for Interfacing with the Retina           | <b>Keith Mathieson</b> | Niall McAlinden   |
| 1515 | <b>Carroll</b>  | Mark     | Opto-mechanics of Bose-Einstein Condensates in Optical Cavities | <b>Gian-Luca Oppo</b>  | Gordon Robb       |
| 1530 | <b>Ferguson</b> | Alistair | Cold Atom-Light Interactions                                    | <b>Gordon Robb</b>     | Brian McNeil      |
| 1545 |                 |          | Break                                                           |                        |                   |

Chair: Gordon Robb

|      |                   |         |                                            |                    |                |
|------|-------------------|---------|--------------------------------------------|--------------------|----------------|
| 1600 | <b>Catto</b>      | Jamie   | Bose Einstein Condensate (BEC) Simulations | <b>Gordon Robb</b> | Aidan Arnold   |
| 1615 | <b>Smith</b>      | Cameron | Interactive Physics Simulations            | <b>Gordon Robb</b> | Nigel Langford |
| 1630 | <b>Vandeville</b> | Victor  | Four-wave Mixing in Atomic Gases           | <b>Gordon Robb</b> | Aidan Arnold   |