3rd Postgraduate Research Conference
29th – 30th January 2013

Inspiring research

Abstract Book
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As well as various roles in UKSPA and IASP, in 2006 Dr Parry was asked to join a UNESCO panel as an expert on science parks and thus is now actively involved in promoting the development of science parks in a number of countries.

Drawing on his first-hand knowledge from the founding, development and running of Surrey Research Park, Dr Parry has written many papers on the design, development and operation of science parks and business incubators. He has co-edited and contributed five chapters to the first edition of the UKSPA book on planning, development and operation of science parks. In 2008 he was asked by the Economic and Social Council of the United Nations to write a report on ‘creating a supportive environment for innovative developments’. The published version of this influential work has been translated into Russian and French.

Dr Parry is also active in a number of local roles, including Chair of the Guildford Business Forum and sitting on the Regional Council of the Chamber of Commerce for the County of Surrey in the UK. In addition to being a full time member of staff at the University of Surrey, Dr Parry has simultaneously nurtured three successfully companies, two of them born out of his own research interests.
Recent commissions have come from: guitarists John Williams, David Russell and Xuefei Yang, cellist Natalie Clein, flautist William Bennett, and The Barcelona Symphony Orchestra. Steve’s Albéniz Concerto (2009) for guitar and orchestra was released to great critical acclaim on EMI Classics in November 2010. He has received funding from Sir Mick Jagger and the Rolling Stones, the Wellcome Trust, SW Mitchell Capital and Arts Council England.

Projects for 2012 included; a new guitar concerto for the Royal Philharmonic Orchestra, works for guitarist John Williams (City of London Festival), violinist Nicola Benedetti, the National Youth Choir of Great Britain, and a piano concerto for Emmanuel Despax to be recorded on the Signum label. This season he is composer-in-residence for the Orpheus Sinfonia. In 2013, John Williams will be recording Steve’s Guitar Concerto (2012) with the English Chamber Orchestra, The Flower of Cities (2012) and Marylebone Elegy (2012). In 2014 John will be performing Steve’s Guitar Concerto in Australia, America and throughout the UK.

Steve’s music has been played in many prestigious halls, including Carnegie Hall and the Lincoln Centre in New York, the Wigmore Hall, The Royal Albert Hall, the Barbican Centre, the South Bank Centre in London, and the National Centres for Performing Arts in Beijing, China, and Mumbai, India.

As a talented guitarist, Professor Goss has had the pleasure of working with many of today’s leading composers, including Toru Takemitsu, Hans Werner Henze and Elliot Carter.

He has had the opportunity to tour and record extensively with the Tetra Guitar Quartet, as well as perform alongside John Williams and Paco Peña.
## Oral Programme
### Tuesday 29th January

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>09:00</td>
<td>Registration &amp; Coffee</td>
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<tr>
<td>10:00</td>
<td>Opening by Prof Steve Williamson (AP1)</td>
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<tr>
<td>10:10</td>
<td>Nigel Biggs – Entrepreneur-in-Residence (AP1)</td>
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### Oral Session 1

#### AP1
- **10:30** Corporeality as a ‘Something to hold on to Factor’ in Abstract Electronic Music
  - Annelie Nederberg

#### AP2
- **10:30** The Influence of Hostel Design on Backpackers’ Social Interaction and Service Experience
  - Jasmine Rashid Radha

#### AP1
- **10:50** Religious Politics: Interpretation and Women’s Rights in the Muslim World
  - Samantha Cooke

#### AP2
- **10:50** Mind-altering Milk? Linking Mood, Microorganisms and Metabolism
  - Pamela Farshim

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>11:30</td>
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### Oral Session 2

#### AP1
- **11:50** Culture and Online Trust
  - Antonina Bauman

#### AP2
- **11:50** The Translation of Multimodal Texts
  - Sara Dicerto

#### AP1
- **12:10** Olive Tree – A Potential Biomonitor for Assessing Environmental Contamination
  - Andrea Petronda

#### AP2
- **12:10** Running Away from Addiction: Exercising to Reduce Nicotine Withdrawal
  - Helen Keyworth

#### AP1
- **12:30** The Development of Cryptographic Research in the United Kingdom
  - Richard Fletcher

#### AP2
- **12:30** Improving Outcomes for Patients with Hearing Loss: Learning Lessons from Other Long Term Conditions
  - Fiona Barker

### Poster Session 1
- **12:50** Lunch - Featuring Dawn Chorus from Eleanor Ratcliffe

### Oral Session 3

#### AP1
- **14:20** E-Learning Evolution: Semantic Web and Social Networking
  - Abdulaziz Aldaej

#### AP2
- **14:20** How She Rocked: An Exploration of the Guitar Style of Sister Rosetta Tharpe
  - Kate Lewis

#### AP1
- **14:40** Status, Social Capital and Inter-Organisational Knowledge Transfer
  - Ebrahim Shariatzadeh

#### AP2
- **14:40** Application of Forward Osmosis in Desalination
  - Maryam Aryafar

#### AP1
- **15:00** Smooth Shifts Between Modes of Thought: A key Cognitive Ability Possessed by the Creative Designer?
  - Andrew Pringle

#### AP2
- **15:00** Preliminary Research into Performance Measurement in the Irish Hotel Sector
  - Philip Murray

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>15:20</td>
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### Keynote Address
- **15:30** Dr Malcolm Parry – Director of the Surrey Research Park

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>16:30</td>
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</table>

### Oral Session 4

#### AP1
- **16:50** Making Sense of Emotion Through Psychological Contract Type
  - Michelle McGrath

#### AP2
- **16:50** Graphene in Organic Electronics
  - Chris Smith

#### AP1
- **17:10** The Performance Management in Public Sector Organisations in Brunei Darussalam
  - Thuraya Haji Said

#### AP2
- **17:10** ‘Feeling the Familiar’: Factors Influencing Music-Evoked Emotions
  - Sarah Campbell

### Evening Events

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>17:30</td>
<td>TELL ME – Networking in Practice</td>
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<td>19:00</td>
<td>Jim Al-Khalili Meets...</td>
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## Oral Programme
### Wednesday 30th January

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>09:00</td>
<td>Registration &amp; Coffee</td>
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<tr>
<td>10:00</td>
<td>Oral Session 1</td>
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<tr>
<td>10:00</td>
<td>AP1</td>
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<tr>
<td>10:00</td>
<td>Judith Bingham and Jehan Alain; Commissions and Performance Issues</td>
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<tr>
<td>10:00</td>
<td>Stephen Farr</td>
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<tr>
<td>10:20</td>
<td>AP2</td>
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<tr>
<td>10:20</td>
<td>&quot;A Think Aloud Study of Parents’ Decision-Making for Screening of their Adolescent Children for Inherited Cardiac Conditions: An In-depth Evaluation of the First Reactions to the Invitation&quot;</td>
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<tr>
<td>10:40</td>
<td>Female Captivity in the Art of Evelyn De Morgan</td>
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<td>10:40</td>
<td>Lucy Ella Hawkins</td>
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<td>11:00</td>
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<tr>
<td>11:20</td>
<td>Oral Session 2</td>
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<tr>
<td>11:20</td>
<td>AP1</td>
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<tr>
<td>11:20</td>
<td>Turning the Volume Down on Heavy Metals Using Tuned Diatomite for their Extraction from Water</td>
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<tr>
<td>11:20</td>
<td>Oliver Webb</td>
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<tr>
<td>11:40</td>
<td>Metaphor in Popular Science Texts: A Translation Challenge?</td>
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<tr>
<td>11:40</td>
<td>Khadija Merakchi</td>
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<td>12:00</td>
<td>AP2</td>
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<td>12:00</td>
<td>Blue Energy for a Greener Future</td>
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<td>12:00</td>
<td>Donna Hillman</td>
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<td>12:20</td>
<td>ReEnact: Sketch based Choreographic Design from Archival Dance Footage</td>
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<td>12:20</td>
<td>Stuart James</td>
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<tr>
<td>12:40</td>
<td>Poster Session 2</td>
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<tr>
<td>12:40</td>
<td>Lunch – Featuring Dawn Chorus from Eleanor Ratcliffe</td>
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<tr>
<td>14:00</td>
<td>Keynote Address</td>
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<tr>
<td>14:00</td>
<td>Prof Stephen Goss – Head of Composition, University of Surrey</td>
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<td>15:00</td>
<td>Coffee</td>
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<td>Feasibility Study on Salinity Gradient Power Production from Lake Urmia</td>
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<td>Alireza Abbassi Monjezi</td>
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<td>15:40</td>
<td>AP2</td>
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<td>15:40</td>
<td>Mapping the Political Behaviour of Turkish Citizens Under the Lens of the Affective, Cognitive and Motivational Determinants</td>
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<td>Stavroula Chrona</td>
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<td>16:00</td>
<td>Extractive Industries Transparency Initiative as a Possible Antidote to Reducing Corruption in Extractive Industries Sector: A Case Study of Azerbaijan’s Oil Industry.</td>
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<td>Elina Konstantinidou</td>
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<td>Closing – Featuring Anthony Bonello</td>
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<td>17:30</td>
<td>Ivy Arts Centre</td>
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<td>17:30</td>
<td>Conversations with my Voice</td>
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<td>17:30</td>
<td>Heather Keens</td>
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<tr>
<td>18.30</td>
<td>Drinks and Canapé</td>
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<td>19:30</td>
<td>Bright Club PGR Special</td>
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<td>Anna L. J. Markowska</td>
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<td>Saad Alshehri</td>
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<td>Ashraf Almahwasi</td>
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<td>Jessica Walsh</td>
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<td>Manrutt Wongkaew</td>
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**Poster Session 2** (Wednesday 30th January at 12:40-14:00 in AP 3 & 4)

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<tbody>
<tr>
<td>54</td>
<td>Sushma Acharya</td>
<td>Heterogeneous Enantioselective Hydrogenation</td>
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<tr>
<td>55</td>
<td>Lucy Howes</td>
<td>The Application of Radiation-Grafted Cation and Anion Exchange Membranes in Microbial Electrochemical Systems</td>
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<tr>
<td>56</td>
<td>Gillian Lord</td>
<td>Development of a Field Based Selenium Speciation Method</td>
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<td>57</td>
<td>Najlaa Al-Mana</td>
<td>The Acute Effects of Calcium Supplementation on Appetite and Satiety in Overweight Women</td>
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<td>58</td>
<td>Brendan Richards</td>
<td>People with Obsessive Compulsive Tendencies are Slower at Visual Search Tasks and have Difficulties Inhibiting Irrelevant Information: Evidence from a Priming of Pop-out Study</td>
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<td>Agata Gajewicz</td>
<td>A Pore-Type Resolved Isotherm of Cement Paste Measured by 1H NMR Relaxometry</td>
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<td>60</td>
<td>Karendale Pereira</td>
<td>VOC Capture Using Activated Carbon</td>
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<td>61</td>
<td>Fahad A. Alhumaydhi</td>
<td>Elucidating the Mechanism of Aag-dependent Cell Death</td>
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<td>62</td>
<td>H. Cairns-Lee</td>
<td>A Journey to Inner Space – Exploring Leadership from Within</td>
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<td>63</td>
<td>Sandra Kabisch</td>
<td>Phase Field Models in Shape Optimization</td>
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<td>64</td>
<td>Mazin Alshamrani</td>
<td>SIP Based VoIP over IPv6 Heterogeneous Wireless Networks</td>
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<td>David Taylor</td>
<td>Modelling Protein Synthesis with Snoopy</td>
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<tr>
<td>66</td>
<td>Michaela Dewe</td>
<td>The Cigarette Box as an Advertising Vehicle: A Case for Plain Packaging</td>
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<td>67</td>
<td>Wan Aminah Wan Hassan</td>
<td>Improvement of Selected Properties of a Commercial Polymer</td>
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<td>68</td>
<td>Winnie Tang</td>
<td>Moisture Barrier Properties</td>
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<td>69</td>
<td>Mariwan Homar</td>
<td>Quorum Sensing and Theory of Social Cheating in the Bacterial Species Pseudomonas Aeruginosa</td>
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<td>70</td>
<td>Olubunmi Aregbesola</td>
<td>Has Nigerian Healthcare Insurance Improved Access to Healthcare?</td>
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<td>71</td>
<td>Gary Chaffey</td>
<td>Modelling the Cell Cycle</td>
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<td>72</td>
<td>Imran Mohammad Sofi</td>
<td>Investigation of Cerium, Europium and Ytterbium Doped Silicon for Active Silicon Photonic Devices</td>
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<tr>
<td>73</td>
<td>Zoe Kelly</td>
<td>HOX Gene Expression in Ovarian Cancer</td>
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<td>74</td>
<td>Katherine Hubbard</td>
<td>A Historical Review and Explanation of the Use of the Rorschach Inkblot Test in the U.K.</td>
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<td>Fiona Binks</td>
<td>Examination of the Reaction Mechanism and Structure Property Relationships of New Initiators for Curing Epoxy Resins – Three Peak Challenge</td>
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<tr>
<td>76</td>
<td>Alasdair Crawford</td>
<td>Novel Cyanate Ester Blends: Simulation and Experimental Thermo-Mechanical Performance</td>
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<td>77</td>
<td>Lulu Akhigbe</td>
<td>Silver Modified Zeolite-clinoptilolite for the Removal of Heavy Metals and Pathogens from Waste Water</td>
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<td>Polymnia Georgiou</td>
<td>Long-term Cocaine Use and Relapse to Cocaine After Abstinence Alters mGluR5 and MOPr Levels in the Mouse Brain</td>
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<td>79</td>
<td>Harshana Liyanage</td>
<td>Accessing and Linking the Data to Manage the Quality and Safety of Chronic Disease Using Diabetes as an Exemplar: Ontology Driven Approach</td>
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<td>80</td>
<td>Oluremi Olamigoke</td>
<td>Vulnerability of Cable-Stayed Bridges</td>
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<td>81</td>
<td>Xuefei Bai</td>
<td>Normal Gait Database Construction in Multiple Common Daily Activities</td>
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<td>82</td>
<td>Sofia Siddique</td>
<td>Investigating Charge and Energy Transfer in Polymer-Nanotube Hybrids</td>
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<td>83</td>
<td>Evangelos Latzourakis</td>
<td>Patient Education by Nurses Working in the Nephrology Area in Cyprus and in Other Countries</td>
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<td>84</td>
<td>Toni Schwarz</td>
<td>The Everyday Life of a Teenager: Exploring the Meaning of Happiness and Unhappiness for Young People within Contemporary U.K.</td>
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<td>85</td>
<td>Saleh Alaswad</td>
<td>Sea Water Manipulated Forward Osmosis Desalination by Adsorption</td>
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<td>86</td>
<td>Ravi Shanker</td>
<td>Template Ordering of Novel 2-Dimensional Sheets for Photonic Application</td>
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<td>87</td>
<td>Monica Nikitara</td>
<td>A Comparison of Cypriot Nurses and Nurses in Other Countries Knowledge on Diabetes Self-care Management</td>
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<tr>
<td>88</td>
<td>Eshaby Mustafa</td>
<td>The Influence of Food Choice in Acculturative Stress Management of International Students</td>
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<td>89</td>
<td>Alexander Neocleous</td>
<td>Microbial Communities and their Application in Fuel Cells: Exploring the Metabolic Interactions</td>
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<tr>
<td>90</td>
<td>Dinesha Dabera</td>
<td>Polymer Wrapped Carbon Nanotubes as a Transparent Electrode for Large Area Optoelectronics</td>
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<td>91</td>
<td>Weam Abou Hamdan</td>
<td>Fishing for Pharma: Selective Extraction of Pharmaceuticals and Biologically Active Species from Water</td>
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<td>92</td>
<td>Nanyi Ciu</td>
<td>Novel Experimental System Linking Brain Activity to Behaviour</td>
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<td>93</td>
<td>Maria Kouloumbri</td>
<td>Exploring Counselling Psychologists’ Perceptions of the Body and its Aspects within a Psychotherapeutic Context</td>
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Oral Presentation Abstracts  
Tuesday 29th January

**Corporeality as a ‘Something to hold on to Factor’ in Abstract Electronic Music**  
Annelie Nederberg

In this performance presentation, I will make visible and audible the artistic research I am carrying out in the field of electronic music. This research is based on the notion from embodied music cognition that we understand the world (and consequently also music) through our actions and our perception, in a cyclical process rather than a linear, which implies meaning-making through a constant interaction with the world through our gestures and the movement of our bodies.

I want to employ this idea in the process of composing electronic music and so, for this purpose, I have created a feedback instrument that incarnates a simplified action-perception cycle.

I interact with this instrument through microphones on my hands, which creates a feedback or cycle of sound through two loudspeakers and a computer. This allows me to activate my body in the creation of sounds that constitute the material of my music and to explore its emotional and expressive links with body movement. Since abstract electronic music can be inaccessible to the average listener, this engagement of expressive qualities of the body, or corporeality, can serve as a way to understanding the music, a ‘Something to Hold on to Factor,’ as Leigh Landy terms it.

**Religious Politics: Interpretation and Women’s Rights in the Muslim World**  
Samantha Cooke

This thesis seeks to understand the extent to which the interpretation of religion has affected the compatibility between Islam and women’s rights. For the purpose of this thesis, the term ‘feminism’ refers to the broad and highly debated subject matter which is the advocacy of women’s rights. This has been a matter of debate for a greater period of time than many people choose to recognise and while it will be at the forefront of this thesis, there have been many attempts to push the topic under the metaphorical rug and ignore it. An explanation is also sought regarding this somewhat negative approach to women’s rights and why the interpretation of religion has been used as both a political and social tool to justify the suppression of women’s rights throughout the Middle East North Africa (MENA) region. The primary research question for this thesis remains as ‘To what extent has the interpretation of religion affected the compatibility between Islam and Feminism?’ The concept of multiculturalism will also be examined throughout in an attempt to comprehend how other ‘minority’ groups are represented, marginalised, and understood. It also addresses the manner in which multiculturalists seek to omit the concept of feminism from their field.
The Influence of Hostel Design on Backpackers' Social Interaction and Service Experience
Jasmine Rashid Radha

Backpacking is a unique travel experience that offers many opportunities to meet new people and learn different cultures. In the past, hostels have been designed to encourage their guests to mingle and get to know one another by providing shared spaces such as dormitories, communal kitchens and common living areas. However, there is an increasing demand among certain segments of the backpacker market for hostels to provide facilities and services that offer more privacy, security and personal space. Hostels therefore need to find out how the design of their facilities and the types of services being offered could accommodate the demands of the changing backpacker market. As this research is still at an early stage of the literature review, it is proposed that an online questionnaire survey be conducted to gather data from backpackers who have stayed in hostels before. It is expected that the findings of this research will shed light on which aspects of a hostel’s services and physical design would contribute towards enhancing the backpacker’s service experience. It is therefore anticipated that hostel operators would have a much clearer understanding of whether or not they are providing the right services, facilities and environment to meet the changing requirements of their target markets.

Quinine: From the Perfect G&T to the Reduction of Animal Testing
Grace Edmund

Quinine, the chemical which gives tonic water its distinctive taste, is not just a key component of the perfect gin and tonic. In fact, quinine may hold the key to the reduction of animal testing in pharmaceutical research.

Quinine and its almost identical twin, quinidine, show vastly different responses when ingested by rats and humans, which not only questions the reliability of animal testing but also begs the question why?

When ingested, quinine and quinidine are metabolised by the enzyme (biological catalyst), known as Cytochrome P450 2D6, with quinine showing greater reduction of the enzyme’s activity (inhibition) in rat than in human. By using computer based modelling techniques to look at the three-dimensional structures of these enzymes in both rat and human it is possible to predict the response of these compounds to a reasonable degree of accuracy.

With further research and refinement, we aim to create a series of rules to be used in conjunction with computer modelling for use by the pharmaceuticals industry as an alternative to animal testing in the early stages of drug development.
Mind-altering Milk? Linking Mood, Microorganisms and Metabolism
Pamela Farshim

Mood disorders, such as depression, affect people of all ages and it remains impossible to identify individuals at risk of developing these diseases. During the postnatal period after birth, the rapidly developing brain is more vulnerable to nutritional influences. During this crucial stage, the gut microbiota develops, and recently the impact of microorganisms on brain and behaviour, the “gut-to-brain axis”, has been revealed. These microorganisms include “good” and “bad” bacteria and some can be involved in different metabolism pathways. The chemicals produced by metabolism can be detected analytically and give us an idea of what is going on within. Previously we have demonstrated that delayed weaning and high casein levels in milk cause changes in levels of certain neurochemicals in different brain regions. We recently found that delayed weaning increases depressive-like behaviour in rats and “depressed” animals have higher levels of a group of “bad” bacteria. We have also shown significant differences in by-products of metabolism in urine of “depressed” animals. An understanding of the different systems involved and the relationship between these can help us pinpoint early-interventions and potential therapeutics to aid in the treatment of developmental mood disorders.

Culture and Online Trust
Antonina Bauman

When you shop online, how do you know if you can trust an online seller? Do you get signals from the web site or is it your intuition prompted by your cultural background?

The purpose of the study is to gain insight into customers’ perceptions of online trustworthiness and into what signals online trust to them.

To better understand customers’ perspective on online trust, a repertory grid technique is used for this research. This qualitative research tool asks respondents with different cultural background to compare six web sites that sell the same product. Based on the contrast and comparison of what they consider trustworthy, respondents list those characteristics of a web site that help them to build online trust towards online sellers.

The analysis of elicited web site characteristics should show that customers with different cultural backgrounds pay attention to different web site features when they shop online.

This research will contribute to the theory of the consumer’s behaviour and management strategy, as well as have practical applications to help businesses to design web sites in a way that signals trust to customers.
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**The Translation of Multimodal Texts**
Sara Dicerto

The purpose of my research is to investigate how multimodal texts are construed and suggest techniques for their translation. “Multimodal” texts are those which include linguistic content, and also images and sounds (e.g. comics, films, websites). With the rise of new technologies, integrating language with images and sounds to create multimodal texts has become much easier, and the number of multimodal texts which are sent for translation is increasing. However, translation theories have always accounted for messages only as linguistically produced. They consider translation as a phenomenon which involves only language, and mostly disregard how images and sounds can contribute to the creation of a message, often influencing the meaning of language. For this reason, when faced with a multimodal text, translators have no theoretical model on which to ground their translation choices. The objective of my study is to fill this theoretical gap in Translation Studies, by providing a model for the translation of multimodal texts. This model is based on a multidisciplinary approach which aims to offer practical support to translators in their work, by making them more conscious of the structure of a multimodal text and helping them recreate this structure in translation.

**Olive Tree – A Potential Biomonitor for Assessing Environmental Contamination**
Andrea Petronda

Plants have been widely used as biomonitors of trace metals in the environment, especially in relation to anthropogenic sources of chemicals associated with urban and industrial development. This study is focused on the island of Cyprus where during the last 10 years there has been a dramatic redevelopment of the Greek Cypriot part of the island, especially due to urbanisation, transport and tourism. Olive (olea europaea) trees are located in many regions of Cyprus and a novel investigation has been undertaken to assess the trace element pollution of main towns, transport, touristic and rural areas of the Greek Cypriot part of the island by analysing all the parts of the tree (bark, leaves, soil, olives/olive oil) for each location. At present no database of elemental levels exists for Cyprus. Results will allow us to evaluate the elemental distribution (Mn, Cu, Zn, Pb, Cr, Co, Ni, Mo, As, Cd) between different parts of the olive tree for different areas of Cyprus. For the first time we can evaluate whether there is a link between anthropogenic activities associated with urbanisation and local foodstuffs (olives and olive oil). This study shows that most of the elevated concentrations (Pb, Zn, Mn, As) in olives and olive oils were predominantly concentrated in urban and highway areas and commercial olive oils produced in Cyprus show elevated zinc concentrations which may originate from the machinery used for the oil extraction.
Running Away from Addiction: Exercising to Reduce Nicotine Withdrawal
Helen Keyworth

In the UK, fifty per cent of attempts to quit smoking fail, costing the NHS more than £150 million per year. There is a need for low cost, effective interventions to help people stop smoking. We know that just 10 mins of exercise can help someone reduce cigarette cravings and problems of withdrawal but we do not know why. To investigate this, we looked at the effect of different levels of exercise intensity on nicotine withdrawal in mice. Any level of exercise was able to reduce withdrawal symptoms in the mice compared to mice that did not exercise at all. Exercise also caused changes in areas of the brain associated with learning and memory in nicotine-treated mice. By understanding how exercise reduces symptoms of nicotine withdrawal, it may be possible to design effective interventions or to provide a target for new drugs.

The Development of Cryptographic Research in the United Kingdom
Richard Fletcher

In the 1970s, technologies that utilised cryptography began to be developed outside of the military and intelligence services. Cryptographic research was carried out at a number of additional sites, including universities, the civil service, and in industry. As in the United States, this growth led to debates in the 1990s over how these new technologies should be regulated, given, on the one hand, the perceived threat to national security, and on the other, the potential to catalyse electronic commerce and uphold individual privacy.

Through ethnographic research, details about how each of these sites designed and constructed cryptographic technologies have been uncovered. Examination of the practices employed at each of these locations has revealed a divergent set of methods, operations and goals.

Science and Technology Studies (STS) have been successful in describing how rhetoric is used in controversies, how scientific expertise is enlisted, and how controversies achieve closure. This research aims to use the study of practices to explore why some scientific research can shape a controversy and why some research is ignored. This may have wider implications for the way in which future scientific research practices are designed.
Improving Outcomes for Patients with Hearing Loss: Learning Lessons from Other Long-Term Conditions

Fiona Barker

Hearing loss is a common condition with increasing prevalence in an aging population. It has effects on communication, relationships, mental health and wider societal and economic consequences. The standard intervention for hearing loss is hearing aid fitting but despite recent improvements in hearing aid technology, up to 40% of people fitted with a hearing aid do not use it.

Hearing loss meets the World Health Organisation definition of a long term health condition (LTC) as it requires ongoing management over a period of years. However in the English NHS it only came under the same managerial umbrella as other LTCs such as diabetes in 2012.

Objective: To apply theoretical frameworks for assessing the quality of LTC service to hearing loss. This involves systematically reviewing interventions to improve hearing aid use, then analysing the results against these frameworks to identify areas of strength and weakness in current care processes. I plan to use any apparent gaps in care to develop and pilot a complex intervention in the context of hearing loss with the primary aim of improving hearing aid use.

This research will bring in insights from the wider field of LTCs to audiology and lead to potential improvements in outcomes for patients.

Dawn Chorus

Eleanor Ratcliffe and Sebastian Schmidt

Experience of natural environments has been shown to help people recover from stress and to improve their attention. However, most research in this field has focused on visual experience of nature, resulting in limited understanding of whether natural sounds might have similar restorative benefits. Eleanor Ratcliffe's PhD explores whether specific sounds, such as birdsong, can produce such benefits and why this might be. Individual studies within the PhD explore how birdsong can reduce physiological signs of stress and improve mood and attention, and examine the aesthetic, acoustic, and semantic properties of bird sounds that might predict their restorative potential.

Based on this work, we are producing a multi-sensory experiential piece that will run during 'downtime' periods of the conference; for example, before sessions and during lunch breaks. It aims to provoke thoughts about how the natural world, including birdsong, is experienced, and what benefits that experience might provide. This will be achieved through light and shadow projection, fans, and an audio soundtrack of birdsong. In her work to date Eleanor has found that the idea of birdsong captures the public imagination very easily, and our piece aims to demonstrate that birdsong may have everyday benefits for mood and cognitive function which need not be limited to the scientific laboratory. The conference takes place in the depths of winter, and it is our hope that this project will remind the audience that brighter days are not too far away.
E-Learning Evolution: Semantic Web and Social Networking
Abdulaziz Aldaej

After the arrival of the Internet in the 1990s, education institutions started to maintain their learning materials within Virtual Learning Environments (VLEs). These VLEs give significant power to educational organisations. However, there has been less development in these VLEs in the past few years even though the web has been developing (e.g., web 2, web 3 and social networking). As a consequence, this research starts to explore the new development and generation of the web including Semantic Web technologies to enhance VLEs. Because these learning systems depend basically on the web, any development on the web could, of course, impact on these systems. Essentially, the aim is to use the semantic web to both link VLEs with social networks and support dynamic content composition for e-Learning services to make VLEs collaborative and communicative. This research proposes to develop a new VLE based on the rich semantic web content. It will use the Semantic Content Management System (SCMS) Drupal to deploy the work. Finally, this paper will introduce the work that is currently being prototyped to demonstrate the advantages of semantic web on VLEs.
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Application of Forward Osmosis in Desalination
Maryam Aryafar

Access to clean water is one of the most important issues in the world today and will be challenge for the future as well. According to the United Nation World Water Development Report which was published in 2003, a minimum of 2 billion people will suffer from clean water scarcity in 62 countries by the middle of this century. The development in water treatment infrastructure is likely to become the most important issue due to limited fresh water resources in the next two decades. While 71% of the earth’s surface is covered by water, only 1% of that is suitable for human use and 99% of total water is salty water with the same concentration as seawater. Furthermore, fresh water decline is dramatically raised due to population increase, growing irrigated agriculture demand, rising life style, climate change and industrial development. In this context, desalination of sea and brackish water has the potential to provide a sustainable means of clean water production for domestic, industrial and agricultural usages, if the cost of the technology and the environmental impacts are reduced to acceptable levels. The main conventional desalination techniques are classified in two categories: thermal and membrane processes. Three thermal distillation methods which are most widely used today for seawater desalination in the Persian Gulf and North Africa include MED (Multiple Effect Distillation), MSF (Multi-Stage Flash) distillation and VC (Vapour Compression). Membrane technologies, which compared with thermal desalination, consume less energy, are commercialized in two important processes comprising Reverse Osmosis (RO) system and Electro Dialysis (ED).

Since the mid-nineties, the worldwide installed capacity of RO plants has been exceeding thermal desalination plants’ capacity. The RO process, which uses high pressure for desalination and pre-treatment of the feed, is a very important step in protecting membranes by reducing fouling and scaling problems. However, the specific energy consumption of the RO process has decreased from 7 kwh/m³ in the 1980s to about 2 kwh/m³ in 2004 due to membrane development and energy recovery applications. The cost of desalinated water is likely to increase as a result of rising oil prices given that the breakdown of the cost of the RO method shows that more than 80% of the cost is for energy and equipment. Recent research has concentrated on membrane development and there has been less research focus on improving energy efficiency in this process with most energy consumption coming from osmotic pressure of feed solution.

One of the recent developments and the most promising desalination technique which has the potential to increase process efficiency, reduce operating cost and energy consumption as well as having low environmental impact, is Forward Osmosis. The FO system is driven by the natural osmosis process without external mechanical pressure and hence lower energy consumption. Forward Osmosis desalination has the potential to provide a reliable and cost effective technology for producing fresh water with low energy consumption, high performance, a lower fouling trend and reduced chemical consumption if the draw solution DS regeneration process limitations are addressed and the membrane technology is further developed.

Modern Water is one of the few companies that has developed and deployed a forward osmosis desalination process on a commercial scale. The background development work undertaken at Modern Water over the last three years to take the process from the lab to a commercial reality is presented here. Data and discussion are offered covering laboratory work in the UK, a trial facility installed in Europe on the Mediterranean Sea and a commercial plant operating in Oman on the Arabian Sea. Operational results taken from a commercial scale manipulated osmosis plant operating alongside a seawater reverse osmosis plant, located in Oman, utilising a common pre-treatment system, are outlined. The forward osmosis plant demonstrated significant advantages in performance, both in energy consumption and, in particular, a very low fouling trend. The plant has operated over a nineteen month period without any chemical cleans, whereas the conventional plant had numerous chemical cleans, a change of membranes and showed a marked decline in productivity over the same period. The manipulated osmosis plant also demonstrated the inherent capability for higher boron rejection than conventional membrane plants.
Oral Presentation Abstracts  
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**Status, Social Capital and Inter-Organisational Knowledge Transfer**  
*Ebrahim Shariatzadeh*

The primary purpose of this study is to measure the impact of status and social capital on transfer of knowledge within a multinational corporation (MNC). I argue how social capital acts as a mediator to link subsidiaries’ status with their access to knowledge resources within an organisational network. I hypothesise how structural, relational and cognitive dimensions of subsidiaries’ social capital are influenced by their perceived status, and how these dimensions further affect transfer of knowledge between the subsidiaries. Due to the network nature of this research, I apply social network analysis as my primary data analysis method. Although an in-depth analysis of the interrelations between status and inter-organisational knowledge transfer can contribute to both status and knowledge transfer literature, such a study has not yet been conducted by business scholars. Including the concept of social capital also adds a practical aspect to this research; individuals and groups constantly attempt to improve their social capital by achieving a better position in their respective networks. The outcomes of this research demonstrate the real value of social capital within networks. I have conducted a pilot study and the acquired results confirm my initial hypotheses.

**How She Rocked: An Exploration of the Guitar Style of Sister Rosetta Tharpe**  
*Kate Lewis*

The guitar is the defining instrument of “rock and roll” and has long been situated within the hegemonic territory of male players. However, one of the significant, yet often overlooked figures credited with pioneering the “rock guitar” style is a woman, Sister Rosetta Tharpe.

Described as the “Godmother of Rock and Roll” and a highly charismatic and virtuosic performer, Tharpe began her career as a gospel musician and later controversially “crossed over” into various secular styles. Throughout her career she gained commercial success as a gospel, big band and rhythm-and-blues artist. In this study I intend to situate Tharpe within these genres, perform an analysis of her guitar style (including technique and underlying musical structures) and determine her influence upon early rock and roll guitarists. My aim is to illuminate the guitar playing abilities of this pioneering, yet disregarded female performer who has been quoted as having influenced many rock and roll luminaries including Elvis, Little Richard, Jerry-Lee Lewis, Johnny Cash and Isaac Hayes. Also, this research aims to emphasise the successes of female guitar players and provide role models for more women to excel as pop/rock guitarists.
Smooth Shifts between Modes of Thought: A Key Cognitive Ability Possessed by the Creative Designer?
Andrew Pringle

In the field of design, the ability to control and combine the use of different modes of thought has been suggested as one of the most important skills that designers possess (Lawson, 2006). Designers must employ not only imaginative thought but the products of such thought needs to be subjected to evaluation so it can be used to address real world problems (Lawson, 2006). A key component of recent models of creative-cognition is the proposal that when engaged in performing certain creative tasks, we draw on different modes of thought (Cropley, 2006; Dietrich, 2007; Gabora & Ranjan, in press; Howard-Jones, 2002). One mode of thought is conducive to accessing remote associations and generating novelty and a second mode of thought is conducive to performing logical analysis and critically evaluating existing ideas (Gabora, 2010; Gabora & Ranjan, in press; Howard-Jones, 2002). It has been suggested that the ability to dynamically shift between modes may be an important characteristic of creativity (Howard-Jones, 2002). I will first outline findings from a behavioural experiment designed to provide an initial test of this hypothesis and then discuss ongoing work examining the link between creativity and expertise in design and patterns of shifting between modes.

Preliminary Research into Performance Measurement in the Irish Hotel Sector
Philip Murray

After a spectacular rise and monumental collapse, the Irish hotel sector is beginning the long road to recovery. The creation, however, of so called zombie hotels, artificially maintained by banks as government investment vehicles, in an environment of chronic bedroom oversupply and weak demand; make the management of hotels in Ireland a unique and challenging proposition.

Hospitality has already been identified by Harris & Mongiello (2001) and Atkinson (2006) as a challenging environment in which to develop effective performance measures and performance measurement in services is further complicated by inherent difficulties associated with the nature of the sector and difficulty of managing the conflicting interests of stakeholders (Fitzgerald, 1988, Yasin & Gomes, 2010).

The Performance Management literature is replete with investigations into the determinants of performance but the role of measurement in organisational outcome is rarely addressed. This paper presents the preliminary results of research into the conduct of performance measurement and its impact on organisational achievement in the context of the unique trading conditions of the Irish hotel sector. It is the first stage in a multi-method examination of the “state of the art” of performance measurement in hospitality and its wider implications for the management of performance.
Making Sense of Emotion through Psychological Contract Type
Michelle McGrath

The current study explores whether the type of relationship employees perceived they had with their organization is linked to how they made sense of their emotions at work. The employment relationship is explored through the lens of the psychological contract. The two contract types of interest are known as transactional and relational. Semi-structured interviews with 30 participants were carried out. Critical incident technique was used to obtain an understanding of whether psychological contract type was linked to the way emotion was made sense of in relation to certain experiences at work. Template analysis was used to analyse this sensemaking process. Relationship type (transactional/relational) acted as a lens through which employees made sense of their workplace emotion. The emotions that were experienced in general, the emotions experienced in relation to a positive or negative event, and also the emotions that employees felt they needed to actively manage, were all related to the type of relationship they perceived they had with their organization. This study is the first to examine how the type of relationship employees perceive with their organization is linked to their understanding, experience, and management of emotion.

Graphene in Organic Electronics
Chris Smith

The arrival of organic electronics to the marketplace has already begun, with organic light emitting diode (OLED) TVs and mobile phones already available for purchase. Organic photovoltaics (OPVs), also known as organic solar cells, are also set to provide a cheaper means of producing green energy. Before this becomes a reality, both the lifetime and the efficiency of these devices must be improved. To do this, research into new materials for use in the construction of devices is imperative. Graphene is a new nanomaterial sparking considerable interest amongst the scientific community. Simply put, it is a 2D hexagonal sheet of carbon atoms which exhibit significant properties. Similar to carbon nanotubes, graphene is highly conductive, durable, and is air/chemically stable making it ideal for use in electronic devices to increase efficiencies and provide extended lifetimes. Additional chemical modifications can be used to modify graphene for a wide range of functions, including making it soluble in solution enabling large areas to be covered cheaply, with huge potential for improving the current rate of development for organic electronics. This work details the use of graphene based materials in various organic electronic devices including cutting edge research into graphene oxide based solar cells.
The Performance Management in Public Sector Organisations in Brunei Darussalam
Thuraya Haji Said

When new public management (NPM) reform was introduced in advanced countries in the 1990s, many developing countries opted for the same reform to modernise and improve public-sector performance. In the light of this, the emergence of NPM has highlighted the importance of performance management (PM) in the public sectors, including institution of strategic planning together with key performance indicators to measure performance objectives achieved. However, there is a great deal of literature surrounding the NPM debate suggesting that although NPM ideas are influential, they are more so at the level of rhetoric than practice. This study focuses on the NPM and PM literature relating to developing countries by addressing the major question: to what extent is PM institutionalised in the Brunei public sector. Recently, ministries and departments in that country set their priority target based on their strategic plan towards achieving ‘Wawasan’ (vision) Brunei 2035. In this research, concepts from institutional theory, theoretically relevant to explain the nature of change, are considered as to what implementation of change would mean in the Brunei public sector. Five qualitative case studies where data has been collected through semi-structured interviews, document reviews, informal conversation and observations have also been used to analyse the degree of institutionalisation. Despite the attempt to promote PM policy, the data reveal that PM becomes loosely coupled to other organisational activities.

'Feeling the Familiar': Factors Influencing Music-Evoked Emotions
Sarah Campbell

Music is a universal feature of all societies and is often used in communication, social bonding and social cooperation (Mithen, 2005; Peretz, 2001). This universality suggests music has evolutionary and adaptive purposes, perhaps as the language of emotion (Hunter, Schellenberg & Schimmack, 2010), rather than simply serving aesthetic functions. Of particular interest is whether the emotions evoked by music are similar to everyday emotions. An increasing body of research suggests this is the case (Koelsch, 2010), presenting the possibility of music being used as a therapeutic tool for affective disorders. However, there are numerous outstanding questions about the precise factors influencing emotional responses to music. The present work aims to unpick the contribution of some of these factors to felt musical emotion.

This study examined the influence of several factors on emotional responses to music, including genre preference, song familiarity, typicality and Gap Across Emotion Loci (GAEL) (Schubert, 2007). It also explored any differences in strength of felt emotion when the experimenter selects the music using the same criteria, compared to participant-selected songs. Results will be discussed in terms of potential therapeutic application.
Judith Bingham and Jehan Alain; Commissions and Performance Issues
Stephen Farr

My PhD portfolio comprises two elements: a performance collaboration with Judith Bingham and an examination of editorial problems in the printed texts of Jehan Alain's organ works.

Recorded performances are used to demonstrate both aspects of my work, with extracts from performances of a work newly written by Bingham specifically for the portfolio and commercially recorded in April 2012. There are also extracts from a work commissioned from her by the BBC Proms, and broadcast live from the Royal Albert Hall in 2011.

The process of editing music for publication influences the way it is played in the same way as punctuating the written word affects the way it is read. Interpreters of Alain's music still do not widely recognise the need to reconsider published texts of his organ works. An important range of variant textual readings, too often suppressed in the preparation of available editions, are explored in extracts from live recordings of Alain's organ works. These interpretations, based on research into documentation of Alain's original manuscripts as well as facsimiles of other recently available sources, indicate the necessity of revisiting the published texts of Alain's organ works.

Oxytocin: Is the “Love” Hormone a Novel Treatment for Drug Addiction?
Panos Zanos

Opiates (heroin, morphine) comprise one of the most addictive drugs with the highest rates of relapse after abstinence. Heroin abstinent individuals suffer from persistent emotional impairments including depression and social isolation, which usually are the key factors leading to relapse to drug taking. Oxytocin, also referred as the “love” hormone has been shown to have promising anti-depressant and anti-anxiety effects in humans. Therefore, we hypothesized that treatment with oxytocin might reduce the emotional impairment following abstinence from opiates. In the current study, mice withdrawn from morphine for a long period showed anxiety- and depression-like symptoms, mimicking the human pattern of opiate withdrawal. Oxytocin treatment completely abolished the negative emotional symptoms observed during morphine withdrawal. Our results demonstrate for the first time that oxytocin may prove to be a novel strategy for the prevention of opiate relapse and the maintenance of abstinence in opiate addicts.
A Think Aloud Study of Parents’ Decision-Making for Screening of their Adolescent Children for Inherited Cardiac Conditions: An In-depth Evaluation of the First Reactions to the Invitation
Mary Yasemin Hirst

Health screening continues to be a hotly debated topic. Psychological literature provides some evidence about the reasons for participation in screening in relation to chronic diseases and adult population. Screening for inherited cardiac conditions offered to adolescents however has not been subject of similar investigations. Despite an increase in awareness of sudden cardiac death in young people in the UK (partly informed by high profile deaths), little is known about the way people make a sense of these conditions and take precautionary actions. We report on a qualitative study that forms a part of the larger research programme to explore reasons for non-participation in cardiac screening of adolescents. The objective of the study is to explore factors influencing parent’s decision whether or not to take their child for cardiac screening.

In-depth interviews with parents of adolescents were conducted exploring screening perceptions and a think aloud method applied to elicit a concurrent decision-making process about uptake of screening. The parents’ accounts for the factors influencing their decisions were analysed using Weinstein’s (1988) Precaution Adoption Process Model (PAPM), with a particular emphasis upon the role of affect in decision-making. This research evaluates the stage models of behaviour change in relation to the uptake of screening decisions.

Female Captivity in the Art of Evelyn De Morgan
Lucy Ella Hawkins

Female captivity is a strikingly explicit, persistent and pervasive theme in the painting of the largely forgotten Victorian woman artist Evelyn De Morgan. Her plethora of paintings depicting the imprisonment of women have been perceived by critics as allegories of spiritual bondage, and yet Evelyn consistently represents prisoners as female protagonists in what can be read as a proto-feminist statement about the bondage of specifically female rather than ‘nongendered’ human embodiment. This paper will focus on the unique, unusual and understudied proto-feminist elements of her iconography in isolation to show how her works overtly engaged with the fight for female emancipation that intensified over the late nineteenth and early twentieth century. Her art can be seen to reflect a tension between female captivity and liberty as well as to trace a movement from the former to the latter; Evelyn employed the female body as a model for socio-political transformation from incarceration to liberation. Evelyn’s paintings of women can be seen from a feminist perspective to make a significant Victorian statement about the evolving roles and shifting positions of women from domestic to artistic, passive to active, and feminine to feminist.
Tissue-Engineered Bone Grafts
Ali Salifu

Bone defects are one of the main causes of long-term pain and physical disability. Conventional bone grafts used by surgeons for bone repair are fraught with limitations ranging from rejection by the immune system to insufficient supply. To circumvent these limitations, a novel fibre fabrication technique known as electrospinning is proposed in this study to produce gelatin-hydroxyapatite scaffolds to serve as templates for bone tissue formation outside the body.

In this work, gelatin-hydroxyapatite scaffolds with different properties such as fibre diameter, pore size, porosity and hydroxyapatite content were produced and the extent of human osteoblast (bone-forming) cell attachment and growth on the scaffolds was quantified in order to optimise bone formation and assess them for use as bone grafts. The results indicate that there was successful attachment and growth of osteoblast cells on the scaffolds. The cells continued to grow and produce bone tissue on the scaffolds with time and this was monitored via imaging and various confirmatory chemical and biological tests. The extent of bone formation varied with the various scaffold properties and there was more bone tissue formed on scaffolds with higher hydroxyapatite content.

Turning the Volume Down on Heavy Metals Using Tuned Diatomite for their Extraction from Water
Oliver Webb

Contamination of water by heavy metals is a global problem for which an inexpensive and simple solution is required. Within this context, the unique properties of diatomite and its abundance in many regions of the world have led to the current widespread interest in this material for water purification purposes. The capability of the material as an extracting agent for individual species and mixtures of heavy metals is considered in terms of the kinetics, the thermodynamics and the recyclability for both the pollutant and the extracting material. The concept of ‘selectivity’ for the enrichment of naturally occurring materials such as diatomite through the introduction of suitable functionalities in their structure to target a given pollutant is emphasised. Suggestions for further research in this area will be given.
The Act of Listening as the Act of Becoming: Rethinking Authenticity in Popular music Discourse
Remy Martin

‘That song speaks to my life’. ‘That track connects with my own experiential reality’. ‘That record represents who I am and what I stand for’. The experiences described are familiar to many of us. But how are we to make sense of our compelling and at times perplexing engagements with popular music?

Drawing from musicological, philosophical, and psychological perspectives, I argue for the need to rethink our understanding of ‘authenticity’ in relation to the meaning(s) of popular music. What is required is a shift of focus in the authenticity discussion- instead of asking what or who is authentic, (i.e. is an artist speaking the truth of their own life?) we must instead take seriously the idea that as listeners we contribute to the meaning(s) of music. We do this by committing, within and after the listening experience, personal expressions and reflections upon who we are, and elevated by the modes of being afforded in a particular song, who we could be (or who we are not). This expression of and reflection upon our existential potentialities is an act of becoming.

So what? Well, considering ‘authenticity’ not only facilitates a stimulating discussion of popular music’s ability to resonate with a listener’s experiential reality, it also demands that we think seriously about ‘who we are’, the unique constellation of traits and convictions that make us ‘who we are’, what constitutes the ‘self’, and the activities (including listening to music) we perceive to be meaningful in our lives.

Metaphor in Popular Science Texts: A Translation Challenge?
Khadidja Merakchi

Metaphors are no longer considered just as aesthetic devices but are rather approached as both a conceptual and linguistic device that helps us understand abstract concepts by mapping them on to physical experiences (Lakoff and Johnson, 1980). Because of the level of abstraction of scientific concepts, metaphors are widely used when explaining science to non-specialist audiences. The translation of these metaphors may be particularly challenging given the cultural and experiential differences that exist between the reader of the original and the translated texts.

Drawing on examples from a bilingual English/Arabic corpus of popular science texts dealing with Astronomy and Astrophysics, this presentation will aim to demonstrate how metaphors can contribute to explaining abstract scientific phenomena - such as the formation of the universe - based on everyday experiences. It will go on to deal with the challenges that arise during the translation of selected metaphors into Arabic with a focus on the cultural elements embedded in metaphors. The examples provided will focus on a number of difficulties that arise when cultural elements are not shared by both the readers of the original text and those of the translated texts. The analysis of the corpus allowed the identification of various strategies to overcome cultural differences between English and Arabic.
Look, No Headphones! Multiple Listening Zones In A Single Room
Jon Francombe

In many situations, it is desirable for two or more audio programmes to be replayed simultaneously in the same space with no interference between the programmes. This could be achieved with headphones but there are a number of advantages to loudspeaker reproduction: multiple listeners can be present, awareness of environment is improved and the discomfort associated with extended headphone listening is removed. It is therefore beneficial to design a system capable of producing multiple ‘zones’ of audio over loudspeakers in a single environment with minimal interference between the zones. Such a system is said to produce ‘personal sound zones’.

It is challenging to produce perfect separation using existing sound field control methods; it is therefore desirable to optimise the performance of a sound zone system in a perceptually relevant manner, that is, using an evaluation method taking into account listener reaction. In order to achieve this, a model of the effect of interference on the experience of a listener must be produced. In addition to the optimisation of personal sound zone systems, such a model has wide-ranging application areas, for example in noise-cancellation systems, environmental/workplace noise assessment and mitigation and audio source separation algorithms.

Blue Energy for a Greener Future
Donna Hillman

With global energy consumption increasing every year and non-renewable fuels rapidly depleting there is a growing need for sustainable affordable power.

Salinity gradient power or “Blue Energy” is the process of generating energy from the reversible mixing of salt solutions of differing concentration. This project concentrates on Reverse Electrodialysis (RED), which derives energy from the difference between the chemical potentials of sea and fresh water. Sea water contains a higher concentration of charged ions than river water. These Na\(^+\) and Cl\(^-\) ions migrate through polymer membranes which in turn generates an electric current. It has been reported that up to 2.5MJ of energy can be generated per m\(^3\) of river water if it is mixed with an excess amount of seawater.

This research looks at adapting current membrane technology as well as developing new polymer membranes, for use in RED Cells. A cation exchange membrane has successfully been synthesised via a low toxicity route by grafting vinylbenzyl sulfonate onto electron-beam irradiated PVDF membranes (reducing problems associated with the traditional route using carcinogenic styrene and corrosive chlorosulfonic acid). The project is now focusing on adapting existing anion exchange membranes and optimising them for blue energy applications.
Installer Businesses and Renewable Energy Uptake in Homes  
Richard Hanna

This PhD thesis compares the effectiveness with which different installer businesses are able to fit small scale renewable energy in UK homes. It looks particularly at how installer businesses can affect the rate and standards of uptake of these technologies. 400 installer businesses were surveyed last year. Over summer 2012, 20 installers who completed this survey were then interviewed. Last year's respondents are currently being surveyed again to assess market change over the past 12 months. The results so far indicate an emerging and volatile market where solar PV, solar hot water and air source heat pumps are the dominant technologies. Most installers are very small: around half have five employees or less or are no more than four years old. Feed-in Tariffs subsidies to support solar PV were suddenly halved from April 2012, meaning there are now more installers than there is demand for installations. Confusion remains over the timing and structure of other government subsidies due next year, for example the Green Deal and Renewable Heat Incentive. Installers also attribute low installation numbers to negative press coverage about renewable energy. The interviews have shed light on a training and inspection regime which is barely adequate in ensuring installation standards.

ReEnact: Sketch-based Choreographic Design from Archival Dance Footage  
Stuart James

In recent years there has been a proliferation of online digital archives of the performing arts, particularly in Dance. Existing solutions for searching dance footage rely on text keywords, which focus upon authorship or time-location metadata rather than the choreography itself. We describe a novel system for searching through dance video using free-hand sketches of human pose. Our sketch based dance retrieval system also enables new video-real choreography to be synthesised from a sequence of sketched poses. The synthesis is performed by seamlessly stitching together fragments of archival footage.

This research will explain the sketch based search engine, outlining how a skeleton (stick man) is parsed from the free-hand sketch and matched to the video. This is a challenging problem due to the low-fidelity archival footage processed and the ambiguity inherent in sketch. We will also explain the optimization process used to seamlessly stitch together archival footage to create new sequences that pass through the user-sketched poses. Our results show successful creation of synthetic new sequences from archive dance repositories. This cross-disciplinary study into dance footage demonstrates how computer vision can impact the dance domain to enable choreographic research and design.
Oral Presentation Abstracts
Wednesday 30th January

Does Better Vitamin D Status Improve Bone Health in Older South Asian Women?
Andrea Darling

Bone fractures are a costly health problem to society and individuals. Research has shown that vitamin D deficiency leads to weaker bones therefore making it more likely to fracture. However, these findings have not been studied in all ethnic groups. This work is novel in assessing whether vitamin D sufficiency is associated with bone structure in older South Asian women compared with Caucasian women. We measured the vitamin D status of 18 South Asian and 50 Caucasian women and gave them a pQCT scan (‘x-ray’) of the radius bone (forearm).

In Caucasians, as vitamin D increased, there was increased bone mass and size at the ‘wrist end’ of the bone. In Asians, there were higher trabecular (inner layer) densities in those with higher vitamin D. In Caucasians, increased vitamin D was associated with increased cortical (outer layer) bone size further up the bone. However, there were no associations between vitamin D status and bone structure in South Asians at this bone site. The clinical importance of these findings is that vitamin D supplementation in South Asians may be successful in improving bone density and, thus, strength. However, unlike in Caucasians, vitamin D supplements may not increase bone size and mass.

Feasibility Study on Salinity Gradient Power Production from Lake Urmia
Alireza Abbassi Monjezi

Salinity gradient power is a non-polluting source of energy which is converted from the energy of mixing of two solutions with different salinities. Reverse electrodialysis (RED) is a promising technique to extract this invaluable energy. Various factors determine the maximum power output of a RED system. This study offers the optimum operating conditions for RED stacks based on the most recent experimental work. The feasibility of implementing this technology is studied on the mixing of the Caspian Sea water and the water of Lake Urmia. This transfer of water has been previously suggested in order to save the desiccation of Lake Urmia. The cost analysis suggests that the proposed RED plant is not financially viable while the transfer of seawater is essential in order to prevent an environmental catastrophe endangering the lives of millions in Iran, Iraq and Turkey as well as the unique species inhabiting the lake. The capital cost of the pipeline was determined to be $4.590 b while the annual operating cost is $3.770 b. However, there is a potential to generate $2.2 b of revenue from Artemia harvesting at the lake. Suggestions for areas of concentration in future experimental works to improve RED power output are also offered.
Michael Burnett

The context for this research is the practitioner view of using simulation-based assessment techniques in applied psychology for hiring and developing individuals and for team development. The presentation summarises four scientific studies combining psychometric measures (competency, personality trait and cognitive ability) with cognitive measures (situational comprehension, event memory and model construction) to help unravel performance in simulated situations. Traditional personality trait and competency measures consistently account for a proportion of the measured variance indicating their value. However, in each of the studies, greater measurement variance is attributable to how people deal with situations over and above their traits or competencies. It is hypothesised that understanding how people build cognitive models of the situation with which they have to interact and meet work goals, through processes of comprehension and encoding, provides additional measures of value for extending psychometric assessment methods. The presentation concludes with a summary of the implications of the research for theory and future practice.

Mapping the Political Behaviour of Turkish Citizens Under the Lens of the Affective, Cognitive and Motivational Determinants
Stavroula Chrona

Taking into account recent developments in the Middle East as well as the Euro-crisis, the importance of Turkey as a decisive actor in the international arena is increasing. Several studies question the applicability of the Turkish pattern of modernization in the Middle East, while others examine Turkey’s attempts to access the European Union. This paper takes a different standpoint by examining the internal dynamics of the country. Focusing on the ongoing conflict between Islamism and Kemalist secular nationalism, this study explores how these ideological orientations shape the political behaviour of Turkish citizens. The study draws on the findings from 10 in depth interviews conducted in Istanbul in 2011. The analysis shows that the ideological orientations of Islamism and Kemalism, in some instances, share a common understanding of the political conditions of the country. However, they often appear to shape conflictual attitudes based on the affective and motivational elements that lie behind citizens’ political considerations. These results show that the Turkish public has to be considered under the lens of the political evolution that is taking place in the country. This, in effect, can provide significant inferences as to Turkish public opinion regarding the role of the county in the international arena.
Oral Presentation Abstracts
Wednesday 30th January

How the European Union can Ensure Adequate Protection of Indigenous Peoples’ Rights in its Policies
Sanna Elfving

This presentation identifies a number of key issues that the EU must take into account when dealing with indigenous peoples who are affected by the Union’s decision making. In order to assess whether the European Union applies the key principles found in international law for the protection of indigenous peoples, this work investigates whether the EU has found a fair balance between the protection of seals from cruelty on the one hand, and the rights of Inuit of Canada to engage in their traditional economic activities, namely the sale of sealskins, on the other hand. Although it appears that the EU openly supports the rights of indigenous peoples under a number of international law instruments, in reality the non-existence of concrete policy guidelines has resulted in an inability for Inuit to put their rights into effect. Therefore, the EU must develop policies and processes which promote the protection of indigenous rights within Europe in line with international law. In order to help the legislative institutions of the EU in making better policies, this presentation introduces easy guidelines for their use.

Extractive Industries Transparency Initiative as a Possible Antidote to Reducing Corruption in Extractive Industries Sector: A Case Study of Azerbaijan’s Oil Industry
Elina Konstantinidou

It is often said that corruption is an important contributor to underdevelopment and poverty. The link between corruption and poverty occurs when money which could be used in areas such as infrastructural developments, education and social care is used for personal enrichment of a small group of people. It is believed that levels of corruption can be reduced through greater transparency, a principle which Extractive Industries Transparency Initiative (EITI) has as its main objective. Many nations have signed up to the initiative, thus increasing the hopes of their people that corruption in the extractive industries sector will be reduced. This particular research studied this hypothesis through a case study of Azerbaijan’s oil industry by applying socio–legal methodology by means of questionnaires.

It was investigated whether the country’s current compliant status presents an example of EITI’s progress in reducing corruption. A number of controversial findings have been identified during the research with regards to EITI’s application in the country. It has been revealed that the EITI as an initiative leaves many points related to its implementation and operation unclear to those wishing to implement the initiative. Thus, survey results revealed a number of pitfalls with regard to EITI's application in Azerbaijan which subsequently weaken the initiative's effectiveness in the country.

The importance of this research is that it revealed important pitfalls in an initiative that aims to increase transparency and which, for many people, presents the only means of tracking the flow of revenues received through sale of their country's natural resources.
Oral Presentation Abstracts
Wednesday 30th January

Full Body Motion Control for Humanoid Robots in Space Applications
Ahmed Elhasairi

A humanoid robot is one that has the overall appearance of the human body, allowing interactions with tools and equipments that are made for human use. The similarities to the human body also mean that the robot is highly redundant, giving this robotic platform an advantage comparing to other platforms that are currently studied for space applications. Despite this, present humanoid robots lack mobility even for basic tasks like walking on even ground. The humanoid shape has a high body Centre of Mass (CoM), resulting in a highly unstable stance.

The goal of this project is to enhance the flexibility of robots by developing a novel full body control algorithm. Different gait stability criterions are presented alongside a spherical inverted pendulum model to generate a stable walking gait.

Conversations with My Voice
Heather Keens

Conversations with My Voice is an exploration of the sounds and the unspoken memories of a singer performing. She stands in front of a microphone, contemplating a world in which the synthetic and the virtual are being heard above the natural. Her inner voice speaks to her - in ‘virtual-vocoded-techno’ speak. Techno-voice is represented by a ‘nasendoscopy’ projected video image of her vocal folds in action.

“Why can’t I hear myself?” – “Can you hear me?” – “Am I too loud?” she asks as she is answered by this seemingly disembodied techno-voice. Is this her inner voice or is it the voice of a future threatening to silence her?

Throughout this performance we see her working with technology – principally, a microphone - continually attempting to enunciate genuine emotion. During this process she revisits her past. We hear her sifting through a range of spoken and sung voice types. Some are accommodated by the technology - some are not – some sound sweet - some distorted – some exploit the sound of the virtual, some are constricted and constrained by it. The experience is an exploration of the voice from ‘plain speaking’ through to virtuosic singing. All the while the audience is seeing and hearing two presentations of the voice – one techno that speaks through the images of the vocal folds the other natural but mediated and processed through the microphone.

As an interactive multimedia performance for soprano and projected moving image Conversations with My Voice explores the topic ‘the voice as identity in a technological age’. Pre-recorded non-processed and processed singing, captured through ‘nasendoscopy’ imaging, are used to frame this live performance. Other technologies used include sound enhancement and an ‘Ableton Live’ looping program.

The images projected are the documentation of a series of nasendoscopy investigations - a small camera is inserted through the nose in order to film the vocal folds in motion while engaged in vocal utterances, speaking and singing (Heather Keens). The sonic aspect of the performance is disseminated through a sound system enabling the real time digital manipulation of vocalisations mixed with pre-prepared materials. On a single screen installation we see a visual dialogue between the real (vocal fold images) and the technically represented (3D spectrographic images) – while hearing a conversation between a virtual and a real voice. The musical soundscapes that underscore and features in the work include: techno, dubstep, hip hop, doo-wop, blues, ballad, music theatre and opera.
It’s Shocking! Fundamentals of the Use of Enzymes to Produce Electricity
Anna L. J. Markowska

With natural gas and oil reserves predicted to run out within the next 30 years and CO₂ emissions having already reached crisis point, “Alternative Energy” and “Green Power” are topics that have dominated our societal thinking throughout recent decades. Harvesting enzymes (biological catalysts) from fungi and using them to generate electricity via an enzymatic fuel cell (EFC) is just one of the strategies currently under investigation. Bilirubin oxidase (BOD) is an enzyme of particular interest as it uses abundantly available oxygen and converts it to water. Recent research at the University of Surrey has focused on immobilising the enzymes on to supports as it has been found that this can extend the lifespan of electricity generation and improve overall EFC performance. Our study investigates the immobilisation of BOD on two different carbon nanomaterials: multi-walled carbon nanotubes (MWCNTs) and a carbon black powder. A variety of electrode architectures has been investigated, with and without the presence of surfactants that are suspected to stabilise biological species.

Proton Beam Writing of Buried Channels and Overhanging Structures for Microfluidics Applications using High Energy Ion Beam
Saad Alshehri

The proton beam writing (PBW) technique has additional abilities when compared with other lithography techniques (such as X-ray, UV and electron beam lithography) in the fabrication of three-dimensional structures with a high aspect ratio, straight and smooth sidewalls and overhanging structures. These features potentially facilitate the fabrication or rapid prototyping of microfluidic systems (microfluidics devices manipulate fluids that are geometrically constrained to microchannels). This paper reports progress in the use of multiple energy exposures to fabricate buried channels in SU-8 resist (polymer photoresist) as part of a project to develop functional microfluidic networks. Using protons with energies between 2.5 MeV and 0.75 MeV both buried and overhanging structures have been fabricated with minimum feature size of around 1 µm and depths of up to 40 µm and their properties have been evaluated. We describe the exposure and development processes and present preliminary examples of functional networks.
Lower Limb Surgery After Injury: Does Whether Surgery is Elective or Emergency make a Difference to the Patient Experience in Saudi Arabia?

Nouf Alkhamees

Background: Injury is a condition that has been given substantial academic attention over recent decades. This has largely been as a result of significant mortality and morbidity rates. For example, in Saudi Arabia, the Traffic General Directorate (2008) records showed that 36,000 people are injured annually.

Several prospective epidemiological studies have indicated that 40% to 50% of injury patients experience moderate levels of disability, up to 80% produce lower quality of life scores than the healthy adult population, and up to 50% delay their return to work for up to two years.

Method: The research used a qualitative methodology to achieve its objectives. This will involve a semi-structured open-ended interview (either face-to-face or by telephone); using a thematic sampling approach.

Results: Our findings indicate that although some of the participants who have experienced traumatic event (both elective and emergency cases), appear to be doing reasonably well at present, it can be seen that patients who have had emergency surgical intervention are still struggling with some doubts and fears including biological, social and/or psychological concerns.

Conclusion: Given patients’ experiences and perceptions, treatment of injury seems to have wider implications than the physical trauma, suggesting the need for a healthcare pathway that incorporates both biomedical and psychosocial aspects.

Should Duress be a Defence to Murder?

Amy Elkington

Duress is a defence that allows a person, who commits a crime against their will, to receive a full acquittal. However, this defence is not available for murder (or attempted murder) meaning that the morally innocent face life imprisonment if found guilty.

This presentation focuses on whether duress should be extended to murder and the theoretical underpinning to support this amendment. This question is answered by analysing statute law, case law and legal theories to discover the historical development of duress, the current law, reform proposals and comparisons with other jurisdictions.

The results from this research show that, historically, duress was formed as a defence to treason, and, because duress is an anomalous defence, there is no theoretical reason as to why it has been developed as a full defence to all crimes but denied to murder and attempted murder.

In conclusion, this presentation establishes that a new theory needs to be developed. This new theory will explain duress as an ‘understandable compliance’ and will allow that duress, subject to certain conditions, is a defence to all crimes in order to ensure that justice is achieved for all individuals.
Electrospinning of Carbon Nanotubes
Simon King

With rising fuel costs, the demand for increased efficiency has led to the need for developing further advanced materials which deliver increased strength and reduced weight at the same time. Composite materials containing carbon nanotubes have low-weight and high-strength and can take on multi-roles, such as charge storage, becoming increasingly the material of choice in modern applications. Aligning single-walled nanotubes in these composites along a particular direction can significantly increase their electric and mechanical properties and here we show how electro-spinning can achieve this. These nanotube arrays were seen to increase the properties drastically in a poly(ethylene oxide) composite material, observing an increase of the tensile strength by 320%, of the ductility by 315% and of the conductivity by 108 Sm$^{-1}$.

Silver Nanowires-Based Transparent Electrodes
Abdullah Alshammari

Silver nanowires were grown via polyol reduction of AgNO$_3$ and used with poly(3,4-ethylenedioxythiophene) poly(styrenesulfonate) (PEDOT:PSS) to produce a conductive and transparent thin film. The conductivity of the grown nanowire was measured and found to be in the range of 103 S/cm. Conductive PEDOT:PSS/Ag nanowire composite were deposited on glass substrate by transferring the nanowires network on a spin coated PEDOT:PSS layers with different thicknesses. Scanning electron microscopy studies show a good distribution of the nanowires in the samples. Furthermore, the electrical measurements which have been performed at room temperature show that the resistance of the film strongly depends on the concentration of the nanowires in the sample and the thickness of the layer as well. The samples show low sheet resistance with very good optical transparency in the range of 80 – 90%.
An Investigation of a Rehabilitation Training Programme to Facilitate the Benefits of Hearing Aid Use for Hearing-Impaired Adults in Saudi Arabia

Aseel Alkhamees

In 2000, there were 250 million people with hearing impairment worldwide. The trend continued in 2005, when the estimate rose to 278 million people with such a disability worldwide.

Saudi Arabia takes third place after Algeria and Iraq with the population of deaf people amounting to 100,000. However, it has the highest percentage rate of deaf people in the general population, with a figure of 3.55%. In Saudi Arabia this number is high because of the frequent practice of consanguineous marriage (marriage between close relatives) which increases the chance of transmitting inherited conditions such as certain types of hearing impairment.

The effects of a hearing impairment can impact on people’s lives in many different ways – in terms of their communication skills, their social life, their academic progression and their overall quality of life. The current rehabilitation model available for managing hearing impairment is to use the hearing aid. Research in the USA and Western Europe suggests that a programme of auditory rehabilitation enhances the benefit of the aid. There are no auditory rehabilitation programmes in Saudi Arabia, no research to investigate this in Arabic-speaking countries and no investigation of rehabilitation outcomes in Islamic cultures.

In the study, a rehabilitation programme was developed for Saudi Arabian adults who suffer from hearing impairment that focused on listening training, education in information and hearing strategies. The results showed that there was statistically significant difference in the participants’ performance in those who received an auditory rehabilitation programme compared with those who did not receive any rehabilitation programme.

“It’s like you are dead alive”. How Professional Care Staff Construct Challenging Behaviours Amongst Nursing Home Residents Living with Dementia: A Discourse Analysis Approach

Emma Day

Living well with dementia has become a national objective (Department of Health, 2009). The Government plans to achieve this by improving workforce capability as it is through its interactions with service users that care is delivered.

This is fundamental in institutional settings where research suggests that staff interactions can play a significant role in the disempowerment of service users (McConkey, Morris, & Purcell, 1999). Constructions of terms such as ‘mental retardation’ can serve to disempower those so labelled and legitimise social control over their lives. (Danforth & Navarro, 1998). Emerging from current research are studies that use the social-constructionist framework which focuses on language and the function of constructions of discursive objects. However, the extension of this research to dementia care has been neglected.

The present study explores the discursive constructions of challenging behaviour amongst individuals living with dementia. Discourses will be analysed to understand and explain how professional care staff talk about challenging behaviour. A detailed understanding of such discourses may highlight the subject positions and power relations afforded to individuals with dementia. It is hoped that this will enable staff to reflect upon their practice and the implications their constructions have on the type and quality of care provided.
Photoluminescence Study on Dysprosium Doped Dislocation-Engineered Silicon Structure
Zulhilmi Mustafa

Silicon has been the mainstay in the semiconductor chip industry for more than 40 years and silicon ultra large scale integration (ULSI) technology is the foundation of microelectronics. This technology has empowered the exponential growth of electronic and telecommunication sectors in term of speed and power performance. Silicon-based light-emitting devices, lasers and light-emitting diodes (LEDs) have attracted great interest in recent years. This is due to optical data transfer which is currently being recognised as a solution to the primary drawback of electron interconnection delay as a result of scaling down the semiconductor chip. However, as silicon is an indirect band gap material, it is fundamentally a poor light emitter. It means that the ability of silicon to emit light is low and less efficient. Nevertheless, by introducing a dislocation loop in silicon, light emission at room temperature has been reported. Incorporation of rare earth elements into silicon has also been viewed as a useful way of extending emission wavelengths to regions of interest for optical communication.

Here, we report on photoluminescence in the 1.1 – 1.7 µm region of dysprosium doped dislocation-engineered silicon. This is obtained by the implantation of dysprosium into silicon which initially has been doped with boron that introduces the dislocation loops. The dislocation loops can be engineered to reduce or eliminate thermal quenching. At least 18 emission lines can be observed at 80 K where most lines are located in the 1.3 – 1.4 µm region. LEDs on this material will be further studied.

A Bufedienolide Glycoside from Rhodocodon Calcicola (Hyacinthaceae)
Alaa Alqahtani

The phytochemistry of the Rhodocodon genus (Hyacinthaceae) has not been investigated previously. Rhodocodon genus was collected from Madagascar. In this study we report on the isolation of one compound known as bufadienolide glycoside. Bufadienolides possess a wide range of bioactivities including cardiotonic function, renal sodium excretion, blood pressure stimulation and immunoregulatory and antineoplastic functions. Of all the activities described for bufadienolides, the antitumor activity is to date one of the most interesting research subjects. Bufadienolides obtained from plants and animals have been extensively evaluated for their cytotoxic activity towards a variety of cancer cells including human leukaemia, hepatoma, lung carcinoma, and gastrointestinal and breast cancers. All the bufadienolides showed potent cytotoxic activity.
The Effect of Pomegranate Active Component (Punicalagin) on Human Colon Cancer Cells
Ulfat Omar

Background: Research evidence indicates that some fruit species have antioxidant and anticancer properties and pomegranates contain a lot of these components. One of these components which has a toxic effect on colon cancer is punicalagin. The aim of this study is to investigate the anticancer activity of punicalagin in human colon cancer cells.

Methods: It has been determined that Lethal Dose (LD50) is the amount of punicalagin, which causes the death of 50% of colon cells. This concentration has also been tested on normal colon cell line as well to compare the effect between them. This comparison is illustrated by pictures.

Results: Punicalagin killed cancer cells but does not affect normal cells. Seventy five micro molars was the effective concentration on cancer cells.

Conclusion: Punicalagin has the potential to reduce the growth of colon cancer cells. Hopefully, this finding will help in cancer therapy using the development of natural products.

The Diabetes and Obesity Epidemic in Saudi Arabia: Implications for Computerised Disease Registers. A Systematic Review and Meta-Analysis
Nouf Alharbi

Objective: The prevalence of Type 2 diabetes mellitus (T2DM) is rising worldwide. This review was performed to evaluate the trends in the prevalence of T2DM and obesity among Arabian Gulf adults from 1981 to 2011.

Research design and methods: The literature review of Medline and Embase. Studies which reported the prevalence of T2DM and obesity in Arabian Gulf states, using World Health Organization criteria, and giving the date of the data extraction were considered eligible. Data were aggregated by the country, number of participants, number of cases, prevalence, and the diagnostic criteria used. The Quality assessment was achieved using a Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist.

Results: 34 studies met the inclusion criteria. Due to the limitation and the heterogeneity between the studies, only the prevalence of T2DM the Kingdom of Saudi Arabia was analysed. It recorded an increase between 10.6% and 32.1% between 1989 and 2009. T2DM is increasing faster in Saudi men than women, according to the growth rates which were 0.8% and 0.6% per year, respectively (p<0.0001).

Conclusion: There are high prevalences of T2DM and obesity in Arabian Gulf countries. There is an urgent need to implement strategies to slow or reverse this trend in prevalence.
**Enhancement of Oil Separations by Dissolved Air Flotation**  
Aliff Radzuan Mohamad Radzi

One of the major concerns for food-processing plants, agricultural industries, oil refineries and gas/oil offshore production platforms is the wastewater contaminated with oil. Separation of oil from oil-in-water mixture can be difficult, especially for fine oil droplets. Oil droplets can be removed from the mixture by using air bubbles which will cause the fine droplets to float to the surface by buoyant force. One of the best methods for such a separation is Dissolved Air Flotation. It produces micro bubbles with a range of 50-60 μm, depending on the pressure applied. The advantages of this method are: it has no moving parts, it provides high efficiency, it is easy to operate and is low in operating cost. The objective of this research is to investigate the separation efficiency of the unit by adjusting different variables: (1) saturation pressure, (2) inlet oil concentration, (3) inlet oil droplet size distributions, (4) type of oil and type of continuous phase and (5) temperature. The experiments conducted at the University of Surrey show that Dissolved Air Flotation is able to achieve up to 95% of separation efficiency by applying 4 bars of saturation pressure, vegetable oil and salty water at a temperature of 35 °C.

**Radiation Hard Semiconductor Neutron Detectors for Security Applications**  
Michael Hodgson

The development of effective and quick methods to detect the trafficking of illicit materials is of increasing importance to both national security and commerce. An important technique in this field is the use of ionizing radiation to actively interrogate cargo vessels at maritime ports or borders, specifically for the detection of radiological or special nuclear material (SNM).

The benefit of this inspection method is the ability to penetrate large amounts of attenuating material which would normally shield standard radiological emissions. However, this method often utilises methods which result in a large flux of high energy photon and/or neutron emissions which could potentially saturate or damage the instruments used to detect them. Consequently, the use of radiation hard detectors, such as Silicon Carbide (SiC) and Diamond (D) has been suggested as potential detection technologies suitable for these types of applications.

This presentation aims to give an overview of the importance and concepts of active interrogation methods, as well as some of the technical detection challenges it faces. It will also introduce the potential benefits of using radiation hard semiconductors in these applications, specifically for the detection of neutrons.

Results will also be presented from initial investigations into the operational characteristics of radiation hard detectors. Furthermore, discussion will also be given to the proposed future test plan and potential project outcomes.
Effect of Exercise Intensity on Post-Exercise Energy Intake, Appetite and Fat Metabolism
Ghalia Shamlan

Exercise is known to acutely influence effect appetite but there is a lack of evidence as to the independent effect of intensity. This study investigated the role of exercise intensity on appetite, energy intake (EI) and subjective measures of appetite. One hour after a standardised breakfast, 14 healthy normal-weight volunteer subjects undertook either 8 repeated 60 second bouts of cycling at 95% VO2 max (high intensity) or 30 minutes of continuous cycling at a fixed cadence, equivalent to 50% of the participant’s VO2 max (low intensity) in randomised crossover design. Subjective satiety was assessed throughout the study using visual analogue scales and subsequent ad libitum intake of a pasta meal was measured at the end (3-h post-breakfast). No significant effect of exercise was observed on 24 hour energy intake post-exercise. Hunger scores were significantly decreased for exercise for high intensity (HI). HI significantly increased fat oxidation compared to low intensity (LI) at 15 minutes post-exercise. Despite no significant difference in energy intake for 2 days post-exercise between two intensities, dietary fat intake was the same. In conclusion, there are currently mechanisms and consequences of exercise in short and long-term appetite control; however, these mechanisms warrant further explanation.

Experiences of Living with a Mild Traumatic Brain Injury: A Qualitative Analysis in Military Personnel
Helen Brunger

Background: Mild traumatic brain injury (mTBI) has been labelled a ‘signature injury’ of the recent conflicts in Iraq and Afghanistan and, as such, has become the focus of mounting treatment interest and importance within the military rehabilitation community. The aim of the present study was to explore the experiences of military personnel living with mTBI within the context of a larger scale evaluation of a recently implemented psycho-educational rehabilitation programme (Phase 2).

Methods: Semi-structured interviews were carried out with 15 servicemen and 1 servicewoman, each of whom had sustained suspected mTBI and had completed the Phase 2 intervention within 18 months prior to interview. Thematic analysis was used to identify recurrent patterns within the data set.

Findings: Three main themes were identified: 1) Injury event and recognition; 2) Pervasive nature of an invisible injury; 3) The idiosyncratic recovery. Together the findings support an overarching notion of an altered sense of self and are analysed within the context of individual variability and the role of the response shift.

Discussion: Understanding how individuals experience this ‘invisible’ injury and the subsequent adjustment process may enhance the effectiveness of the intervention by highlighting potential important treatment components and allowing for a more person-specific approach.
Ethoxyvinylarenes as Stable Intermediates for Bicyclic Arene Synthesis
Marianne Swindlehurst

In the field of drug discovery, medicinal chemists often build molecules containing moieties called thieno-, furo-, and pyrrolo-pyridines. This project aims to provide a robust method of synthesis that will provide access to all three of these. The work is based on our previously published method of synthesising pyrrolo-pyridines via stable ethoxyvinylarene intermediates. This is being advanced by applying it to alternative starting materials to make it a generalised method for the synthesis of bicyclic arenes. In comparison with previous methods, particularly of unsubstituted versions, this route will be inexpensive, robust and applicable to a very wide range of substrates. If fully successful, it will provide medicinal and organic chemists with a ‘go to’ method for the synthesis of these important bicyclic arene building blocks.

Novel Bufadienolides from Urginavia Altissima (Hyacinthaceae)
Linda C. Langat

Over three million people in South Africa use traditional plant medicine for health care purposes. Therefore, South Africa’s plant biodiversity indicates a high potential for the discovery of biologically active chemicals. The bulbs of Urginavia altissima are a herbal remedy used in that country for the treatment of gout, rheumatism and respiratory complaints. In this study several novel compounds belonging to the bufadienolide class have been isolated. The chemical structures of these compounds have structural similarities with the known drug proscillaridin which is used for the treatment of congestive heart failure and cardiac arrhythmia. Also, isolated from this plant, is adenosine which is a drug used for the treatment of surgical pain, nerve pain, pulmonary hypertension and certain types of irregular heartbeats. These results review the presence of medicinally important constituents from Urginavia altissima and suggest additional work is required to test the isolated compounds for their biological activities. The compounds isolated in this study will be submitted to the National Cancer Institute (NCI) for anticancer screening.
Investigating the Effect of Troglitazone on Glucose and Glutamine Metabolism
Maryam Thabit

Troglitazone is an anti-diabetic drug which enhances insulin sensitivity; however, it was withdrawn from the U.K. in 1997 and from the U.S.A. in 2000 due to idiosyncratic hepatotoxicity. The mechanism of troglitazone toxicity is not clear and a broad aim of this project is to investigate cellular metabolic pathways in the liver that are affected by troglitazone in order to reduce the toxic profile of future drugs. This study has focused on the effect of troglitazone on glucose and glutamine metabolism.

The objectives were (1) to investigate whether troglitazone affects glucose uptake and (2) to assess the effect of metabolite supplementations; glutamine, glutamate, pyruvate, malate and methyl-pyruvate on troglitazone toxicity, to examine if troglitazone affected cells can be “rescued”.

Liver-like HuH7 (human hepatoma 7 cell line) cells were treated with troglitazone and the glucose levels measured in the medium. In “rescue” experiments, the cells were treated with troglitazone as well as metabolite supplementations, with cell viability assessed by the methylthiazol tetrazolium (MTT) assay. Troglitazone reduced glucose utilization, which was consistent with our hypothesis of troglitazone-mediated changes to metabolism, however, metabolite supplementations did not prevent troglitazone toxicity. Further work is in progress to elucidate the cellular metabolic processes inhibited by troglitazone that affect cell viability.

The Impact of Elicited Emotions on Patients’ Food Consumption
Reena Vijayakumaran

This study examined the provision of food in Malaysian public hospitals and investigated emotion as a factor influencing patients’ food consumption. Semi-structured interviews were used with incorporation of the Critical Incident Technique (CIT) which allowed identification of 180 incidents. Five main themes were identified – food attributes, familiarity of food, feeling cared for by staff, rights to choose and eating environment - where the influence of emotions was most evident. Frequently mentioned emotions included ‘frustration’, ‘interest’, ‘enjoyment’, ‘hostility’, ‘shame’, ‘boredom’, ‘sadness’, ‘anger’, ‘surprise’ and ‘satisfaction’. A higher frequency of incidents eliciting negative emotions (n=108, 56.7%) rather than positive emotions (n=78, 43.3%) was observed. Chi-square analysis indicated an association between the incidents that elicited positive or negative emotions and the emergent themes. The findings established emotion as a powerful intermediating factor on patients’ reported food consumption. Eliciting of positive emotions led to positive outcomes (reported better acceptance of hospital food and increased consumption of hospital food) and negative emotions led to negative outcomes (decreased consumption of hospital food and increased consumption of food from outside). Acknowledging the role of food provisioning in eliciting ‘emotion’ will be useful to hospital food service departments and healthcare teams in ensuring patients eat well.
Towards a Predictive Model for Quality of Experience in 3D Video Communications
Emad Danish

In today’s multimedia communication systems, user’s Quality of Experience (QoE) has become the dominant dimension being a user-centric rather than a network-centric approach to measure service quality. Hence, this work studies the effect of changing network’s Quality of Service (QoS) parameters on user’s QoE. Measuring 3D video’s QoE has been dependent on human subjective testing; however, in this study we utilise a new objective 3D video quality metric to measure user perception, saving on time and people required. The simulation caters 3D video transmitted over a wireless network, under different information loss ratios and powers of transmitted signal, then assessed for quality perception at receiver’s side. The study concludes by highlighting three findings. First, the level of power for each modulation and coding scheme at which the perceptual quality can be maximised to save on scarce wireless resources. Secondly, the maximum and minimum achievable perceptual quality given certain video coding parameters. Thirdly, the vehicular scenario’s performance surpassing the pedestrian's which signifies the significance of researching low speed mobile terminals.

This simulation represents grounds of a predictive model for network providers to adopt in order to predict user's QoE since it is extremely difficult to measure QoE at the user end.

Tetranortriterpenoids from the Heartwood of Xylocarpus Rumphii
Watcharee Waratchareeyakul

Tetranortriterpenoid derivatives commonly occur in the Meliaceae family, including the genus Xylocarpus. In this study, eight novel compounds and a known compound were identified from the heartwood of X. rumphii. Acetylation of some of the novel compounds that were impossible to purify resulted in the isolation of ten compounds that have not been reported previously. The structures of the compounds were determined using spectroscopic and spectrometric analysis. Five compounds were tested against several leukaemia, non-small cell lung, colon, CNS, melanoma, ovarian, renal, prostate and breast cancer cell lines. The compounds did not meet the one-dose NCI59 cell test criteria and were not further tested.
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**Differences in Vitamin D Status in Caucasian and South Asian Women Following UVR Exposure**  
**Ohood Hakim**

It is known that skin pigmentation reduces the penetration of Ultra Violet Radiation (UVR) and thus photosynthesis of 25(OH)D. However the ethnic differences in 25(OH)D production remain to be fully elucidated. This study aimed to investigate the differences in vitamin D production between South Asian and Caucasian postmenopausal women, in response to a defined, controlled UVB exposure. Seventeen women; 9 white Caucasian(skin phototype II and III), 8 South Asian women (skin phototype IV and V) participated in the study, acting as their own controls. Three blood samples were taken for measurement of 25(OH)D during the run in period (9 days, no sunbed exposure) after which all subjects underwent an identical UVR exposure protocol irrespective of skin colour (9 days, 3 sun bed sessions, 6, 8 and 8 minutes respectively with approximately 80% body surface exposed). Skin tone was measured four times during the study along with an assessment of skin type.

Both groups showed a gradual increase in 25(OH)D with final levels significantly higher than baseline (p<0.01). 25(OH)D concentration mean rose from a baseline of 43.58(19.65) to 57.80(17.11) nmol/l among Caucasian and from 27.03(23.92) to 44.73(17.74) nmol/l among South Asian women. The baseline status of vitamin D was classified as deficient among the South Asian women and insufficient among the Caucasian women. The percentage increase in vitamin D3 among Caucasians was 39.86% (21.02) and 207.78% (286.02) in South Asian subjects respectively. This greater response to UVR exposure reflects the lower baseline levels of the South Asian subjects. Mixed linear model analysis identified a significant effect of duration of UVR exposure on the production of 25(OH)D. However, the model shows no significant effect of ethnicity and skin tone on the production of 25(OH)D.

These novel findings indicate initial vitamin D concentration influences the amount of UVB needed to reach equal serum concentrations rather than skin tone and ethnicity and people of South Asian ethnicity have the full capability to produce similar amount of vitamin D compared with the Caucasian group.

**Where are the Women in NATO’s Implementation of UN Security Council Resolution 1325 on Women, Peace and Security?**  
**Katharine Wright**

United Nations Security Council Resolution 1325 (UN SCR 1325) adopted in 2000 was groundbreaking because it acknowledged for the first time that women could play a role in international peace and security and had the potential to transform gender hierarchies and challenge dominant forms of masculinity through the mainstreaming of a gender perspective into peace and security operations. This made NATO’s decision, as a militarist defensive organisation, to implement the resolution surprising, because it has the potential to challenge NATO’s very purpose. However, a qualitative analysis of the discourse emanating from NATO in reference to women, peace and security including analysis of key policy documents, speeches and images, finds women confined to traditional gender roles such as maternal and caring roles. Rather than transform gender roles, NATO’s implantation of UN SCR 1325 has served to reinforce the power of the dominant masculinity associated with NATO elites. This has implications for the efficacy of UN SCR 1325 as a tool for pursuing a transformative agenda intended to challenge gender binaries, on an organisation embodying a dominant form of masculinity.
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**Comparison of Gravity Tractor Spacecraft Operations**

*Nicolas Ummen*

Currently more than 500,000 asteroids are known. While none are a threat to Earth today, a hazardous close approach may be discovered tomorrow. A proposed solution to deflect asteroids is the Gravity Tractor. Such a spacecraft is thought to be most efficient when hovering in front of the asteroid, balancing thrust and mutual gravity—by which the asteroid is towed. Little, however, seems to have been done to confirm this as the optimal configuration or learn about alternatives.

This work derived for the first time closed solutions for the classic approach and a constant altitude variant. The first validates earlier simulations. The variant was found to offer more deflection with a slight time penalty. Further alternatives were tested in open loop simulations. A periodically changing minimum clearance was included to exploit the asteroid rotation. The results inform the optimized design for multiple spacecraft deflection missions and allow better adjustment of the mission according to local circumstances. Moreover, the on-going effort to implement an optimal controller, based on the above findings, in a high fidelity simulation with a realistic polyhedron asteroid model and disturbances are presented.

**Gold Grid as a Transparent Conducting Electrode for OLEDs**

*Laurent Sam*

Organic Light Emitting Diodes (OLEDs) are energy efficient and flexible forms of lighting. They have the potential to improve current applications e.g. TVs, tablets or mobile phones as well as enabling new forms of devices e.g. flexible display screens, which were not previously possible.

For this to be successful, all the components in the device must be flexible. However, the transparent electrode which is currently used in industry (Indium Tin Oxide, or ITO) is brittle. An alternative transparent conductor must be developed.

This project proposes the use of a thin metal grid fabricated using photolithography as the transparent conducting electrode. This method can be accurately reproduced on the micrometre scale. It is shown that an OLED using such an electrode will emit light at 58% the intensity of one using an ITO electrode. Using a light microscope, it was observed that the light was emitted from the gaps between the metal lines, and it was uniform. This shows that a metal grid is a feasible replacement for ITO. A grid with larger gaps should make the OLED emit more light.
**Slow-Wave Activity as a Marker of Sleep Homeostasis: Unexpected Time Course During Partial Sleep Deprivation**

*Emma Arbon*

Various sleep parameters have been used to monitor processes underlying sleep-wake regulation. EEG slow-wave activity (SWA) is a classical marker of sleep homeostasis thought to play a crucial role in maintaining synaptic homeostasis. It is well established that following total sleep deprivation (TSD) a rebound in SWA can be observed, whereas under sleep restriction conditions imposed for 2-5 days, SWA is largely preserved. We investigated the homeostatic response to sleep extension (10h for 1 week), sleep restriction (6h for 1 week) and recovery sleep (12h) following total sleep deprivation (TSD, ~40h) in 36 individuals. Under sleep restriction conditions SWA showed the expected increase above baseline values for the first 4 days. However, over the remaining days, SWA reverted towards baseline. This time course suggests that SWA is not always a good marker of sleep homeostasis or that the homeostatic drive for sleep is no longer elevated. The latter interpretation is, however, not supported by an analysis of other markers of sleep homeostasis such as sleep latency or waking performance. Understanding the dynamics and differential response of various sleep parameters to sleep restriction may contribute to insights into the mechanisms by which sleep loss leads to detrimental health effects.

**The European Citizens’ Initiative: Your Voice in the European Union?**

*Anastasia Karatzia*

The European Citizens’ Initiative (ECI) as introduced by the Treaty of Lisbon is a new method which attempts to provide the citizens with a voice in the European Union. According to the ECI, a group of citizens could oblige the Commission to give serious consideration to their request by gathering 1000000 signatures. Arguably, the initiative has the potential to create a big impact on the EU’s participatory democracy model. The poster I plan to present aims to inform people about this new instrument, its value and the way it works. It will also provide the bigger picture by presenting other ways of citizens’ involvement and participation in the EU. People from the academia will have the chance to discuss how this new instrument fits into the discussion on ‘the European Union’s democratic deficit.’ Moreover, the poster will give food for thought to people who are non-specialists in the field; is this ‘transnational instrument’ going to succeed or is it destined to fail? Are citizens given enough opportunities to make their opinion known? If they do, does the European Union actually take them under consideration?
Chemical Etching for the Removal of Focused Ion-Beam Damage
Mark Langridge

Focused ion-beam milling is a technique in which a beam of ions is able to sculpt surfaces on the micron-scale. By doing this, interesting and useful shapes can be created, such as micro and nano-lenses. The semi-conductor industry uses this technique to clean up defective circuits.

A downside of this technique is that the ions fired implant into the surface, damaging the first 50nm of it and leaving ions stuck inside. This changes the electrical, thermal and optical properties of the surface. To restore the original properties of a milled geometry, we have looked at using a hydrofluoric acid etch to remove the damaged and implanted surface from ion-milled silicon.

This is useful in restoring the optical properties of the milled features, such as silicon wave-guides or lenses milled on the ends of optical-fibres.

A Novel Method to Produce Crack-Free Monolayer Latex Based Coatings Over Large Areas
Sultan Alomairy

Increasing demands for producing waterborne coatings have been extensively developed academically and industrially due to their promising potential applications and lower impact on our environment. For applications where the coating should be relatively hard (i.e. the glass transition of the polymer is high) a bottleneck to fabricating large area homogeneous films is associated with the formation of cracks as a result of the mismatch of mechanical properties between the coating and the substrate during film formation. In this study we show, by using the Langmuir – Blodgett (LB) technique, it is possible to form a monolayer of polymer latex spheres at the air /water interface without any modification to the composition and, secondly, it is possible to deposit these monolayers on to large area glass substrates. Atomic force microscopy studies indicate that the resulting coatings consist of hexagonally close packed particles that form crack-free monolayers over large areas. The resulting transparent homogeneous coatings are ideal systems to act as packaging for plastic electronic applications.
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Structural and Functional Analysis of HCV-like IRES Elements
Salmah Zaini

All cells require proteins as building blocks and for its functioning and propagation. Proteins are made in the cells itself. Viruses do not have their own protein factory so they hijack the host cell’s protein factory. Classical swine fever virus (CSFV) and Hepatitis C virus (HCV) come from the same family and they both have structures that helps the viruses attach to the host’s protein factory but they have a difference of an extra structure present in the CSFV. The function of this extra structure in CSFV is not known. In this research, the deletion of the extra structure in the CSFV affects the virus infectivity, suggesting the extra structure is important for the CSFV protein production. Hopefully, this will pave a way to prevent the spread of the virus.

A Qualitative Study of Unintended Harm Within Psychotherapy: Potentials for Therapeutic Healing
Philip Cox

Objectives: The aim of this study is to explore experiences of how psychotherapy can unintentionally cause harm, with the objective of understanding how or if, therapists and clients heal such unintended outcomes.

Literature and relevance: Across theoretical approaches psychotherapy is reported to have a success rate of 70%-90% (Duncan, Miller, Wampold and Hubble, 2009; Leichsenring and Rabung, 2011). Yet irrespective of approach, 10% of clients consistently report experiencing therapy as harmful (Fonagy and Bateman, 2004; Treasure, Crane, McKnight, Buchanan and Wolfe, 2011; White and Kleber, 2008). The factors leading to unintended harm within this sub-group are well-reported in the literature. However, there is a gap in the literature exploring how, or even whether attempts were made to heal such harmful experiences.

Method: The study will apply interpretative phenomenological analysis (IPA; Smith, 1996; Smith, Flowers & Larkin, 2009). Data from semi-structured interviews with six counselling-psychology practitioners and their clients, who perceived their therapy to be harmful, will be retrospectively explored to illuminate the experiences of these unwitting outcomes.

Analysis: Potential themes from therapists and their clients relating to the healing of unintended harm will be developed from the texts.

Conclusion: The conclusion will be reported with the aim of dissemination within academia, the therapeutic community and clients.
Risk Assessment in Removing the Flattening Filter from a High Energy Medical Linear Accelerator

Maan Najem

Medical linear accelerators (linacs) are considered the most frequently used radiotherapy sources emitting high energy photons (several MeV) in treating cancer. However, the main problem arising in using a conventional linac is the possible increase in inducing secondary cancers appearing after treatment of the primary cancer volume. This is due to the relatively high photon dose to normal tissues located outside the field of the beam (out-of-field dose) as well as the neutron dose to the patient when the linac is operated in high energy mode. To reduce the risk of causing these secondary cancers, the flattening filter located inside the linac is removed to reduce the scattered photons which reduce the photon and neutron dose to normal tissues. The main purpose of this work is to assess the risk of causing secondary cancers by the removal of the flattening filter. Several simulations based on Monte Carlo techniques were carried out in order to calculate the difference in the out-of-field dose to normal tissues and also the neutron dose to the patient who undergoes radiotherapy treatment using a high energy photon beam. The results obtained show a significant drop-off in the out-of-field dose and neutron dose to the patient when the flattening filter was removed which is translated to a decrease in the risk of causing secondary cancers. It can be concluded that removal of the flattening filter from the head of the linac could reduce the risk of causing secondary cancers and improve the outcome of radiotherapy treatment.

Implementing Industrial Symbiosis Policies Successfully in Industrial Regions

Anne Velenturf

There is an increasing pressure for industries to adopt more sustainable modes of production. Governments can impose change on firms through top-down processes or through facilitation of bottom-up processes among firms. One sustainable development strategy is the development of industrial symbiosis; i.e. firms acting collectively by exchanging or sharing resources leading to environmental and economic benefits. In countries with planned economies such as South-Korea industrial symbiosis was successfully implemented primarily in a top-down fashion, while in countries with market economies such as the US the top-down processes largely failed. In the UK industrial symbiosis was introduced successfully through primarily bottom-up processes. Therefore, we theorise that policy development and implementation needs to fit to the way firms work together with other firms and governmental organisations. We aim to explore how and why top-down and bottom-up policy processes led to successful industrial symbiosis in two industrial regions in South-Korea and the UK. Data collection is planned through interviews with policy makers and firm managers combined with desk research. We expect that this study will further understanding of the steps through which firms implement policies. The findings could help policy makers to optimise the potential effectiveness, efficiency, and legitimacy of policy processes for sustainable development.
Analysis of the Elements Required for the Kaposi’s Sarcoma-Associated Herpesvirus vFLIP IRES Function
Mariam Sulaiman

Kaposi’s sarcoma-associated herpesvirus (KSHV) is the causative agent of the most common tumour in HIV-infected patients (Kaposi’s sarcoma). It is also implicated in other malignancies such as Castleman’s disease and certain lymphomas. KSHV is classified as an oncogenic virus, infection eventually leading to tumour formation. It mainly produces a latent infection in the tumours, though virus reactivation may be found in some cells.

vFLIP I is one of the virus proteins associated with latency and has been thought to play a major role in KSHV pathogenesis. It is expressed by an internal ribosome entry site (IRES) located in the coding region before the vFLIP gene. Previous work here used a cell-free system to identify the minimal region required for IRES activity. In this study, by using cells that permit KSHV growth and cell lines derived from sarcomas, we are investigating the interaction of the IRES with cellular proteins. Analysing the IRES and cell proteins required by vFLIP will provide a better understanding of how its expression is regulated during KSHV latency and, it is hoped, to provide insights into the oncogenic properties of the virus.

Knowledge Transfer and Management of Tourism Crises: A Multi-Case Study of Hotels in Thailand
Jirapa Wongtao

The hotel industry is prone to crises which must be planned for and managed. In order to make decisions and respond to tourism crises, knowledge management and the transfer of lessons learned from previous crises, both internally and externally, (especially with policy makers) are keys to help hoteliers respond to these emergencies appropriately. This research study’s main aim is to explore knowledge transfer and management for managing tourism crises in Thailand and to understand how this is manifested in the hotel sector. The specific research objectives of this study are to analyse: 1. differences between the understanding and objectives of policy makers and those in hotels responsible for managing issues that affect hotel businesses, 2. to analyse differences between hotels of different sizes and types of operation in recognizing tourism crises and their approaches to knowledge transfer/management and 3. to examine the barriers and facilitators they encounter. Multi-case study research with a mixed qualitative approach, influenced by interpretivism, will be used to investigate case studies. Both interview and non-interview evidence will be used as data collection tools to ensure the validity of the research findings. This research aims to contribute to academic knowledge by adding new perspectives to theoretical or conceptual frameworks required for crisis management in hotel businesses. It will also provide practical guidelines to both hoteliers and tourism crisis management policy makers to improve and increase their awareness, understanding and mutual collaboration in relation to these issues. The paper will outline the conceptual framework and methodology of the research, as well as some preliminary findings.
Redox Flow Battery Strategies – Making Renewable Energy Viable
Sarah Mallinson

With the increasing cost and lack of supply of non-renewable energy supplies, research has focused on the alternative - renewable energy. The intermittency of current renewable energy sources is a major issue. Energy storage provides the solution by allowing excess energy (produced during optimum conditions) to be stored until it is required.

The study of large scale energy storage in RFBs is new at The University of Surrey. The following two themes have been identified: the synthesis of novel ion-exchange membranes to alleviate potential problems associated with vanadium ion crossover; additional development of the electrolyte via the use of additives and alternative acids. Each of these will potentially improve overall cell efficiency. Currently our all-vanadium redox flow battery (RFB) involves 0.5 – 3.0 mol dm$^{-3}$ vanadium dissolved in 1.0 – 5.0 mol dm$^{-3}$ aqueous sulfuric acid, using standard electrodes (graphite felt) and an industry standard membrane (perfluorosulfuric acid polymer ‘Nafion’).

My presentation will highlight the importance of establishing standard testing procedures for this new research. It will also illustrate the key results of my project to date which include the testing of vanadium(IV) permeability, membrane stability and thermal stability of the electrolyte with and without additives.

Attachment and Inactivation of MS2 and QX174 in Natural Soils
Florence C. H. Lee

Knowledge about attachment and inactivation of viruses in soils is important for public health management practices. However, this research field still has many knowledge gaps. The main challenge of this research field is that it is multidisciplinary, whereby various characteristics of soils each act as a factor controlling attachment and inactivation. This is further complicated by the fact that different viruses behave differently even with the same soil sample. To date, there has been no attempt to link the various factors together to assess the outcome of attachment and inactivation of viruses by soils. This study aims to achieve this by considering together the types of clay minerals and non-clay minerals of the soils, particle size distribution, extractable cations and acidities, organic matter, pH, autochthonous bacteria and water content of the soil. Two indicator viruses, MS2 and ØX174 (bacteriophages), were used in the test. Natural soil from different areas has been collected. Preliminary results from 6 samples showed that ØX174 was inactivated more than MS2 by soil samples with high clay content. Soils with higher organic matter attached about twice the amount of MS2 and ØX174.
**Understanding Translational Control by an Emergent Virus**

Melvin Leteane

Enterovirus 71(EV71) causes significant health problems worldwide, particularly in the Asia-Pacific region. Initiation of viral protein translation by an internal ribosome entry site (IRES) presents a potential antiviral target for EV71. Control of this mechanism requires interaction of an IRES transacting factors (ITAFs) with the IRES element. ITAFs regulate IRES function by modulating their structure upon binding, subsequently facilitating recruitment of the ribosome. We aim to decipher how Far Upstream binding protein (FBP2), a previously identified negative EV71 ITAF recognises and modulates RNA structure. Interactions between FBP2 and viral IRES EV71, FBP2 and cellular IRES (Bip) will be determined by biochemical techniques. These will include RNA structure determination and RNA binding assays using truncated recombinant FBP2. Very little is currently known about how FBP2 acts and what its actual role is in IRES function. This work will elucidate the structure of the Bip IRES and mechanism(s) of viral RNA interaction with cellular proteins during the virus takeover of host cellular translation machinery.

**Secondary School Children’s Reasoning about Evolution**

Cheryl To

There are developmental changes in children’s reasoning about the origins of species between the ages of 6 – 12 years old (Evans, 2000; 2001). For example, whereas 5- to 7-year-old children endorsed a mixture of creationist and spontaneous generationist reasoning patterns, 8- to 9-year-old children endorsed creationist explanations. By early adolescence, children’s reasoning about evolution mirrored that of their parents’ creationist or evolutionary beliefs (Evans, 2000). There is reason to believe that children’s reasoning about evolution continues to change through their secondary school years because their reasoning capacities drastically improve. To date, there has been no research investigating children’s reasoning about evolution from 12 years to adulthood. This study documents secondary school students’ reasoning about the origins of species. Seventy-three (40 males; 33 females) secondary school students aged 14 and 16 participated in a semi-structured interview.
**Simple and Cheap Synthesis of Single Walled Carbon Nanotubes**

Liam McCafferty

Single walled carbon nanotubes (SWCNTs) have been synthesised using a simple and cheap method. SWCNTs are hollow tubes of carbon, just one atom thick and have useful electrical and mechanical properties, making them a major focus for future electronics. The method proposed negates the need for costly metal layer deposition steps, normally required for such a process. SWCNTs have been produced for the first time using this precursor.

**Could Dielectrophoresis Provide the Basis of an Early Diagnosis Tool for Oral Cancer?**

Karen Graham

Oral cancer was the 10th most common cancer in men, worldwide, in 2008 and has a 5 year survival rate of approximately 50%. Early detection has been identified by the World Health Organisation (WHO) and clinicians, as the key to improving survival rates for oral cancer, but currently available methods of detection have failed to improve survival rates over the past several decades.

In this study, the AC electrokinetic technique dielectrophoresis (DEP) was used to determine the electrophysiological characteristics of normal and abnormal (dysplastic and cancerous) exfoliated oral cells, collected from patients via brush biopsies.

Preliminary results of dielectrophoretic testing suggests differences exist in electrical properties of cancer cells when compared with normal, healthy cells and, therefore, indicate that DEP can distinguish between oral cancer samples and samples from healthy oral tissue on the basis of cellular membrane capacitance.

The long-term goal is to incorporate DEP testing and analysis into a bench-top diagnostic tool which will provide fast, accurate and non-invasive evaluation of oral samples, facilitating the early diagnosis of oral cancer.
The Roles of P-Bodies and Stress Granules During Calicivirus Infection
Majid Humoud

Caliciviruses are single-stranded positive RNA viruses that are responsible for several important diseases in human and animal hosts. To date, the replication mechanisms of human caliciviruses are poorly understood because of a lack of a suitable cell culture system. Feline calicivirus (FCV) shares many properties with the human caliciviruses, and is used as a model to increase our understanding of calicivirus translation and replication.

In the host cell, translationally silenced mRNA is thought to be trafficked to P bodies and stress granules for decay or storage. These granules play important roles in RNA turnover with a dynamic exchange of mRNA between polysome and P-bodies and/or stress granules. Recent evidence from other RNA viruses such as poliovirus indicates that critical proteins within P-bodies or stress granules can enhance or limit viral infection and that viral proteins can accumulate in P-bodies and/or stress granules. These results suggest an important relationship between P-bodies, stress granules and the viral life cycle. This is an exciting emerging field in virology and in this research, we set out to investigate how calicivirus infection affects the formation of P-bodies and stress granules and to address whether these granules may be involved in the regulation of translation of viral RNA and the switch to replication.

How to Create Brand Image in an Online Context? The Hotel Customer’s Perspective
Duangthida Nunthapirat

The Internet has reshaped not only how products and services are distributed and purchased but also how brands are perceived and managed. Several studies have investigated how web sites influence a customer’s purchase intentions using online marketing tools such as social media to create brand engagement. However, they have failed to investigate how online presence helps to enhance brand image, especially in the hospitality context (Law & Hsu, 2006; Rowley, 2009; Chen et al., 2010). This study aims to address this research gap by exploring the factors that drive online brand image from the hotel customer’s perspective.

Preliminary research has been conducted using semi-structured interviews with 19 hotel customers in the UK. Template analysis was used to analyse this interview data. The results show that there are seven key attributes of a brand’s online presence that enhance online brand image. They are ease of use, download time, site appearance, structure and layout, content, price, and reliability. The findings also show that a customer’s perception of an online brand image then has an influence on the customer’s brand recommendation and subsequent purchase intention.

These results highlight a number of factors that have clear implications for how hotels can create a positive brand image in an online context.
The Effect of Low Doses of Radiation and Malignant Induction
Ashraf Almahwasi

Background: Proton therapy is a promising treatment modality for cancer that may have distinct advantages over conventional radiotherapy. This relates to its ability to deliver a very high dose of linear energy transfer (LET) radiation to deeply seated or critically located tumours, thus minimizing radiation dose to the surrounding normal tissues. Therefore, several proton therapy facilities are currently operating or being planned world-wide. Moreover, treatment of cancer with ion beam is considered a rapidly developing field of research. However, concerns still existing due to the rare but serious potential effects of the minimal low doses of radiation which might be received by normal tissues adjacent to a targeted tumour volume during proton therapy treatment.

Purpose: This research is designed to investigate the effect of low doses of different qualities of radiation on the normal human tissues adjacent to the treated cancerous region.

Methods: This project currently uses the Radiation Therapy facility in the Royal Surrey County Hospital and the Surrey Vertical Nanobeam (VNB) facility to irradiation non-cancerous human cells with a range of low doses, ion species & energies. Time-lapse microscope and clonogenic assay are used to assess the probability of cancer induction (malignancy) within or distal to irradiated populations.

Nanomaterials Based Field-Effect Transistors
Kiron Prabha Rajeev

Electronic technology based on printable electronics has been a major academic research theme and investment by many companies. Organic semiconductor materials can offer the potential for the applications of printable electronic technology but their charge carrier mobility is limited to only few cm²/Vs. Nanomaterials such as inorganic nanowires shows the potential of achieving high device performance.

Solution processed nanomaterials offer high charge carrier mobility and show compatibility with low temperature processes due to the possibility of separating the synthesis and device fabrication procedures. In order to realise high performance printed field-effect transistors (FETs) based on nanowires, a number of challenges needs to be addressed such as alignment of nanowires to form ordered arrays on host substrates and electrical hysteresis effects caused by surface states.

Alignment of nanowires, using techniques like dielectrophoresis alignment, has shown the potential of obtaining a highly ordered array of nanowires for transistor device. We have demonstrated the effect of atmosphere and dielectric interface on the silicon nanowire transistor performance.
Involvement of Farnesoid X Receptor in Matrix Metalloproteinase Regulation in Breast Cancer

Noura Alasmael

Breast cancer is a main cause of death for UK women. Therefore, the discovery of new treatments is very important. Metastasis is a process by which cancer cells migrate to organs distant from the site of origin. Matrix metalloproteinases are enzymes used by cancer cells to break down the adjacent tissues in this process. Once breast cancer metastasizes, it is incurable. Our research investigates whether the protein Farnesoid X receptor (FXR), which has been previously shown to induce cancer cell death, is a regulator for matrix metalloproteinases and could be a potential target for breast cancer treatment.

Breast cancer lines MCF-7 and MDA-MB-468 were treated with FXR chemical activators and this resulted in increased cell killing. In addition, matrix metalloproteinases’ activity and expression changed after treatment. We found that one of the chemicals, namely CDCA, decreases the activity of matrix metalloproteinases whereas the other chemical, called GW4064, increased it in both breast cancer lines. Moreover, the level of matrix metalloproteinases was measured and we found that FXR activation did not change enzyme levels inside the cells but only outside the cells. More investigation is required as these findings suggest that FXR might be a novel regulator for matrix metalloproteinases.

Dancing Nationhood in Contemporary Spain

Eva Aymami

In Bésame el Cactus (2004), Sol Picó, modern dancer and choreographer, simultaneously performs flamenco music and dance. Using her body, her shoes, castanets and hands, she is integrating flamenco - as cultural symbol of Spain - into a contemporary performance. In a Spain impacted by Franco’s dictatorship (1939-1975), the peculiar ambiguous choice of using flamenco in a modern performance raises questions about the construction of national and gender identity, both during the dictatorship and now. Franco’s regime promoted a centralized nationalism, imposing it on the other cultures that were part of the Spanish state. These were cultural regionalisms linked to the historic communities of Catalonia, Galicia and the Basque Country. During Francoism, popular and folk music and dances were employed in an effort to construct a unified Spanish culture. This paper will address the problems of gender and national construction in contemporary Spain through a close reading of this choreographic piece. A methodological analysis of Bésame el Cactus will be presented using applied performing arts theories. I will also draw upon interview material with the choreographer/performer, Sol Picó. In conclusion, this paper will illustrate the ways in which the heritage of Francoism still informs choreographers’ choices and thereby creates an artificial national music and dance in Spain.
Carbon Nanotubes Grown by Photo-Thermal Chemical Vapour Deposition (PT-CVD)
Jeng Shiung Chen

A variety of carbon nanotubes (CNTs) have been synthesized by photo-thermal CVD. CNTs show immense potential in nano-electronics, free electron emitters, solar cells and composite materials. For each different application, a different type of carbon nanotube is required. In our experiments, single-walled CNTs (SWCNTs) and multi-walled CNTs (MWCNTs) were fabricated using a thin iron layer as a catalyst. Optimisation of the growth conditions result in there being three advantages to our process: 1. High growth rate, 2. High quality, 3. Lower temperature growth. To summarise, with respect to applications, it is essential to fabricate suitable CNTs for particular function. Therefore, through our method wide ranges of CNTs were synthesized, usable in multiple applications.

Treatment of Water Pollution due to Motorway Traffic by Using a Milled Commercial Mineral
Farideh Hamilton

Motorway surfaces, in developed urban areas, are one of the major locations which accumulate pollutants, such as nutrients, heavy metals, polycyclic aromatic hydrocarbons. Whilst emission control regulation has been very successful in reducing exhaust emission pollution, non-exhaust emissions from road vehicles, such as brake, road and tyre wear are not reduced. During rain events and snowmelt these sources provide pollutants that are dispersed via surface run-off into adjacent storm water ponds. To remove these contaminants from storm water, a complex combination of processes is needed, such as sedimentation, adsorption and filtration.

This paper focuses on initial studies in the laboratory to remove heavy metal pollution from storm water using a milled commercial mineral. The material investigated was capable of removing nearly all Cu, Fe, Mn, Pb and Zn present in the solution within a 2 minute contact time. For Cu, Mn, Pb and Zn increasing the contact time beyond 2 minutes did not change the removal efficiency. The removal efficiency of 0.25 gram of absorbent in the 50 ml solutions is very high and using higher quantities of material did not make a considerable difference in the process.

The results show that this material is very good for removing heavy metals from water.
Ageing and the Protective Effects of Nox2 in the Cardiovascular System
Sarah Cahill-Smith

Ageing is recognised as a major risk factor for the development of cardiovascular disease and evidence suggests oxidative damage plays an important role in age-related cardiovascular dysfunction. Researchers from our group and others have discovered that an enzyme called NADPH Oxidase 2 (Nox2) is a major source of ROS within the vasculature. However, the role of Nox2 in age-related cardiovascular diseases is unclear. In this study we used wild-type and Nox2 knockout mice from young (3-4 months) to ageing (20-24 months). Blood pressure was measured and the aortic function was investigated. Ageing corresponds to a significant increase in blood pressure and a significant decrease in aortic function in wild-type mice. However, in Nox2 knockout mice this ageing effect was abolished. Furthermore, ageing wild-type aortas produced more ROS than young wild-type aortas. In contrast, Nox2 knockout aortas generated less ROS than the wild-type aortas in both young and ageing groups. In conclusion the ageing process results in an increased blood pressure and a decrease in aortic function, and removal of the ROS-producing Nox2 enzyme improves aortic function and blood pressure by reducing the level of oxidative damage in the ageing vasculature.

Judicial Corruption in Argentina and South Africa: What Can Civil Society Do to Fight it?
Jessica Walsh

In democratic societies, where the levels of corruption are high in both public and private sectors, the judiciary has an important role to play in fighting corruption. Thus, theories of separation of powers, judicial independence and judicial accountabilities have long been promoted to ensure that the judiciary fulfils this role. However, where corruption pervades the judiciary, and where there is collusion between the judicial and executive powers, such theories are not given effect. Citizens are left with few resources in the fight against corruption, and worse, a barrier is created to any hope for change.

What, then, can society do to overcome this barrier? My research aim is to gain an understanding of the relationship between the judiciary and civil society in developing countries, and to identify what is limiting civil society in its fight against corruption in the judiciary. I propose that judicial accountability should be directly to the public, circumventing corrupt governments, but without unduly decreasing judicial independence. I am focusing on developing countries where judicial corruption is endangering the rule of law and the transition to true democracy. I am using Argentina and South Africa as case studies.
Fashion in Motion: A Critical Mapping of the Genealogy and Interrelationships Between Fashion, Fabrics and Choreography of Modern Dance

Manrutt Wongkaew

Shapes, forms, gestures and motion have been critically embedded in high fashion practice since the birth of haute couture. Not only are these concepts involved in the process of designing and constructing garments, their kinetic properties are also explicitly choreographed in fashion performance particularly in editorials and advertising campaigns.

Focusing on choreographing fashion, this paper questioned how shapes, forms, gestures and motion in fashion performance reference modern dance choreographies. In its final outcome, how did movement vocabularies in modern dance feed into the socio-political economy of luxury fashion particularly the interrelationships between moving bodies and mobility in fashion products?

Methodologically, I composed three photographic essays demonstrating a visual history of fashion’s relationships to dance from the work of Loïe Fuller to Martha Graham and Merce Cunningham. This followed the trajectory evidenced in current fashion editorials from Feel The Power (Harper’s Bazaar 2010) to Dynamic Blooms (AnOther magazine 2011) and Beautiful Stranger (British Vogue 2012). The analysis focused on textile and costume construction, image composition and role of technology and media within the work in relation to choreographic shapes of the bodies.

I argued that Fuller, Graham and Cunningham have become trailblazers in their experimentations with fabrics and fashion garments. Their influence can be seen in current editorials and clothing campaigns as modern dance brings the concept of dynamic flow, tensile elasticity and abstraction of bodily silhouettes into fashion performance.
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**Heterogeneous Enantioselective Hydrogenation**
**Sushma Acharya**

This research will create a catalytic system capable of producing valuable single enantiomer products from inexpensive pro-chiral reagents. An enantiomer is one of a pair of molecular entities which are non-superimposable mirror images of each other. This is of great importance for the pharmaceutical and fine chemical industries. The two enantiomers of a chiral molecule can have vastly different physiological properties, therefore the use of even parts per million of the ‘wrong’ enantiomer can have serious consequences.

Depending on the starting material and the chemicals required the catalyst used may be in a heterogeneous or homogeneous form. Heterogeneous catalysis, a process where the catalyst is in a different phase (typically solid) to the reactants and products is preferred choice in industry due to the ease of separation from the catalyst and continuous throughput potential. Homogeneous catalysts are in the same phase (for example liquid) as the reactants and products.

This research uses a range of nanoparticles produced ‘in house’ that are capable of performing hydrogenation reactions (addition of hydrogen, usually as H2). We utilize a number of different characterization techniques which will link results obtained during high-pressure reactions with detailed information about the structure and interactions of the relevant molecules.

**The Application of Radiation-Grafted Cation and Anion Exchange Membranes in Microbial Electrochemical Systems**
**Lucy Howes**

Microbial fuel cells are emerging as an important area of investigation in the field of renewable energy and wastewater treatment. The research into microbial fuel cells at The University of Surrey is currently focused on several different areas. Anion-exchange membranes (AEMs) have been extensively researched for application in low temperature fuel cells at Surrey but have the potential for use in microbial fuel cells. These membranes potentially possess characteristics desirable in a microbial fuel cell setup such as low oxygen permeability and low resistance. Alternative cation-exchange membranes (CEMs) have also been investigated for future use in MFCs.

Stability testing has been carried out on Surrey AEMs and CEMs ex-situ to determine whether the various components of solutions used in the cells have any measurable effect on their performance. Tests include ion exchange capacity, conductivity and gravimetric water uptake measurements and analytical methods such as Raman spectroscopy.
Development of a Field Based Selenium Speciation Method
Gillian Lord

Selenium is an essential trace element in humans, required for the synthesis of important selenium-containing proteins. Through these proteins, and other mechanisms, selenium can protect against the toxic effects of several metallic elements including arsenic, lead and mercury. However, the interaction between selenium and these toxic elements depends on the chemical form and dose of selenium. Thus, in waters that are contaminated with arsenic and other toxic elements, it is important to determine the forms (species) of selenium present.

Selenium may be present in water as inorganic selenite (Se(IV)) and selenate (Se(VI)), and organic methylated species. A solid phase extraction (SPE) method utilising a C18 cartridge and strong anion exchange (SAX) cartridge was developed to separate these selenium species from water at the time of sample collection. This technique allows the in-field separation of both inorganic and organic species, and the determination of Se(IV) and Se(VI) by inductively-coupled plasma mass spectrometry (ICP-MS). To date, this speciation method has been applied to groundwater in Santa Fe, Argentina and geothermal waters in the Taupo Volcanic Zone, New Zealand.

The Acute Effects of Calcium Supplementation on Appetite and Satiety in Overweight Women
Najlaa Al-Mana

The prevalence of obesity has been widely reported in the past 20 years. In recent years, research has suggested that calcium (Ca) consumption could play an important role in the maintenance of a healthy body weight. Moreover, it has been reported that Ca deficiency may increase the risk of obesity to a greater extent than high fat diets or sedentary lifestyles. It has been suggested that appetite and food intake may be affected by Ca intakes in the diet. However, the mechanism is unclear.

The aim of the present study was to investigate the short-term effects of Ca on appetite and satiety in overweight/obese subjects and to investigate the effects of the Ca on glucagon-like peptide-1 (GLP-1) release. Ten healthy female overweight/obese subjects (aged 18 - 45 years, BMI 25 – 37 kg/m²) participated in this single blind, randomized, crossover study. Subjects were required to consume a standard test breakfast, containing either 500 mg Ca (Calcium-Sandoz® Syrup) supplement or placebo (PL) mixed into orange juice. Subjects recorded ratings of hunger, satiety, fullness and prospective food consumption using visual analogue scales (VAS) every 30 min for 3 hours. Postprandial plasma glucose, insulin and GLP-1 concentrations were also measured. Energy intakes from an ad libitum lunch and over 24 hours were assessed.

The Ca supplement significantly reduced hunger (p=0.07) and in prospective food consumption (p=0.012) as measured by the VAS. In-line with this finding, the Ca -enriched breakfast also significantly reduced energy intake at the ad libitum lunch compared with PL 1066 (SEM 43.80) kcal versus 1122 (SEM 66.98) kcal, respectively, (p=0.017). However, there were no significant effects of Ca over 24 hour compared to PL. Ca enrichment had no significant effect on plasma glucose concentrations compared with PL, whilst the postprandial insulin responses were significantly higher (p=0.007). There were significantly lower GLP-1 levels with Ca (p<0.001). These results suggest that calcium supplement may play an important role in reducing food intake in overweight/obese women’s. Further investigation in other groups would be required.
People with Obsessive Compulsive Tendencies are Slower at Visual Search Tasks and have Difficulties Inhibiting Irrelevant Information: Evidence from a Priming of Pop-out Study

Brendan Richards

The nature of the cognitive mechanisms underlying the clinical picture of obsessive-compulsive disorder (OCD) is unclear. Part of the problem is that OCD is a heterogeneous condition with several subtypes (e.g., checking, washing and hoarding). However, a number of studies have suggested that impaired inhibitory control and cognitive inflexibility may be key aspects of the disorder. The aim of the current study was to investigate possible attentional bias to irrelevant information with the condition – behaviour which is said to reflect weakened inhibitory processes – using participants with sub-clinical obsessive-compulsive (OC) tendencies and aged-matched controls (N=14 per group). We used a visual search task, called priming of pop-out, which is designed to manipulate selective attention to a target, independent of the response-relevant aspects of the task. Findings showed that OC participants were significantly slower in the task, independent of bottom-up or top-down control manipulations, and demonstrated evidence of increased distractibility by irrelevant non-targets. Furthermore, analysis of OC subtypes revealed that participants with checking or washing tendencies were particularly disadvantaged in performance. These findings are in line with previous research reporting selective attention and inhibitory impairments with OCD, and support suggestions that different obsessive-compulsive subtypes might have different cognitive profiles.

A Pore-Type Resolved Isotherm of Cement Paste Measured by 1H NMR Relaxometry

Agata Gajewicz

Cement is a morphologically complex material responsible for 5% of global CO2 emissions. All forms of degradation of cement can be traced back to water and water transport in the pores of cement which range from nanometre to tens of microns in size.

Proton (1H) Nuclear Magnetic Resonance (NMR) relaxometry is proving to be an excellent non-invasive and non-destructive tool for the characterization of pore size distribution and pore-water interactions in cement since the NMR signal relaxes by interaction with the pore surface.

In this work we show how 1H NMR can be used to determine the evolution of nanoscale porosity of cement, the density and composition of hydration products within cement and how it can be used to create a pore-type resolved sorption isotherm as shown in Figure 1. In particular, we find that the composition of calcium-silicate-hydrate (C-S-H), the main glue phase of cement, is Ca1.53 (Si0.96,Al0.04) O3.51 (H2O)1.92 and its density is 2.68g/cm³ in as–prepared material without drying. This opens the door to a routine characterization tool for C-S-H, needed by researchers to rapidly characterize new cements.
VOC Capture using Activated Carbon
Karendaie Pereira

Volatile organic compounds (VOC) are hydrocarbons that evaporate readily due to their low boiling points. Common examples include: petrol vapour, paint solvents and alcohols including propanol. Approximately 10% of the UK’s VOCs are believed to originate from the printing industry. According to current legislation, only 10-30% of solvents used in industrial activity can be released into the atmosphere as emissions. Thus, the aim of this project is to develop and test a complete demonstration-scale capture and regeneration system capable of reusing both the adsorbent, the activated carbon (AC), and the adsorbed VOC.

A prototype adsorber was built and tested at a lithographic printing company for the purpose of capturing the n-propanol (NPA) emissions under real life conditions. The prototype consisted of an AC bed placed inside a vacuum cleaner which was used to suck in the NPA vapours from the press. The experiment was successful since results showed that it took a reasonably long time for the NPA to emerge at the exit of the bed. This meant that all of the NPA entering the bed during that period of time had been captured by the AC. This was further proved by the resulting increase in AC weight.

The next stage of this project is to develop and test a lab-scale experiment for regenerating the AC and analysing the driven off material.

Elucidating the Mechanism of Aag-dependent Cell Death
Fahad A. Alhumaydhi

DNA damage results from many endogenous and environmental agents such as alkylating agents. Base excision repair (BER) is key for the repair of DNA bases modified by alkylating agents. Initiation of the BER pathway occurs via the removal of a damaged alkylated base by an enzyme called alkyladenine DNA glycosylase (Aag). Aag excises alkylated DNA bases in the BER pathway generating abasic sites within the DNA which are processed to form single strand breaks (SSBs). These abasic sites and SSBs are very toxic to the cell. Any imbalance of the BER pathway can lead to accumulation of these abasic sites and SSBs and consequently trigger cell death.

Aag proficient and deficient cells were treated with an alkylating agent. The temporal changes in abasic site number and cell death incidence were characterised and results used to generate a mathematical model for Aag activity on alkylated substrates.

The results show that abasic site formation increases in Aag proficient cells while remaining constant in Aag deficient cells. Increased abasic site formation correlates with increased cell death in Aag proficient cells while Aag deficiency protects cells from alklylation-induced cell death. Our results will be discussed in general and in the context of our mathematical model.
**A Journey to Inner Space – Exploring Leadership from Within**  
H. Cairns-Lee

Leadership has been described as “vast, amorphous, slippery, and above all, desperately important.” (Bennis, 2007:2). Unsurprisingly, the quest to understand leadership and its development both in research and business attracts enormous attention and resources.

Part of the complexity of leadership is its dynamism, multiple levels of analysis and its subjective and symbolic nature. Yet, a frequent external focus on leadership and its development can distract attention from how the mental maps of those in leadership roles shape their thoughts and actions. Responding to the claim that “leaders may be unaware of the degree to which their models are shaping their leadership behaviours.” (Hackman, Wagman, 2007: 46), this research seeks to explore how people in leadership roles can become more aware of their mental models and their implications.

Metaphor, said to be the very foundation of our conceptual system, is one way to understand mental models. This inductive research aims to facilitate the articulation and exploration of leaders’ metaphors to discover what leaders can learn about themselves, their leadership and development from awareness of their mental models. Research is based on depth-interviews using Clean Language, a process to facilitate people’s greater understanding more about their inner world and its organization and consequences.

**Phase Field Models in Shape Optimization**  
Sandra Kabisch

In the process of steel formation, a workpiece distorts from its initial design at high temperature during the cooling process. This is due to the different temperature evolution throughout the geometry which causes different microstructures to evolve that have different densities. The final distorted product often has to undergo a surface finishing procedure to correct its shape. Consequently, it is desirable to find an initial workpiece design and to control the cooling process in such a way that the resulting product minimizes a certain displacement.

The following study deals with a part of this problem which is to find a phase distribution that yields a certain displacement of the workpiece. This question does not answer how such a phase distribution can be reached (by temperature control), but it nevertheless hints whether and how a coupled approach can be pursued.

The task stated above is tackled by using a phase field approach, a method to model phase transformation processes with the use of a double obstacle potential. This potential prevents unphysical phase values leading to a time-dependent variational inequality subjected to mechanical constraints.

Some numerical examples of the above equations are presented.
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SIP Based VoIP over IPv6 Heterogeneous Wireless Networks
Mazin Alshamrani

Most Future Internet users will be wirelessly connected to IP clouds through different types of wireless network systems. Thus, the number of applications and end devices will be increased, and IPv6 needs to be applied. Voice over IP (VoIP) is one of the most common applications over the Internet which provides real-time voice communications between different parties and network systems. The Quality of Service (QoS) of VoIP is influenced by the performance metrics comprised of signalling, bandwidth, packet loss, delay and jitter. Signalling is the main parameter which manages and controls VoIP and affects the other QoS parameters. One of the most efficient signalling systems for VoIP is the Session Initiation Protocol (SIP). The heterogeneous wireless networks consist of different types of wireless technologies connected together through IP clouds where the variable bandwidth and delays of the wireless networks are relatively affected on the QoS.

In this paper, the performance metrics of SIP based VoIP applications over heterogeneous wireless networks will be studied with the OPNET modeller over IPv4 and IPv6 using different voice codecs. The results show comparable performance between IPv4 and IPv6 with SIP signalling is acting poorly with IPv6. Both IPv6 and SIP need to be adapted for VoIP over heterogeneous wireless networks.

Modelling Protein Synthesis with Snoopy
David Taylor

Animal cells synthesize a diverse array of proteins to perform their basic functions and to respond to an ever-changing environment. During an infection with a virus, the host cell machinery is often hijacked in order for the virus to replicate. The aim of this project is to computationally model protein synthesis in both host cells and a virus to understand how this changes during infection. We focus on Calicivirus which is not only an important veterinary pathogen but also a model of a significant cause of hospital- and community-acquired viral gastroenteritis. The computer simulation is constructed as the network of interacting molecules, using the PetriNet software Snoopy. At present the model is composed of data collected from the existing literature in the field of cellular protein synthesis and Calicivirus protein synthesis and qualitatively reproduces cellular responses observed in ‘wet’ experiments. The hope is that this model will guide future research and, potentially, identify new targets for clinical use. So far the model has highlighted several potential links in the control of viral protein synthesis.
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The Cigarette Box as an Advertising Vehicle: A Case for Plain Packaging
Michaela Dewe

There is currently much discussion around the possible implementation of plain packaging for tobacco products in the UK. The present study analysed tobacco advertising between 1950 and 2003 to evaluate the role of the cigarette box in advertising. Changes in advertising strategy were mapped onto national changes in smoking incidence.

Across the decades there was a significant shift from cigarettes being displayed in advertisements to an increase in the use of the cigarette box only. In terms of meaning, smoking was most commonly presented in terms of flavour, pleasure, quality and cost. The shift from cigarette to box only was reflected in a greater emphasis placed on quality. Changes in advertising practice from cigarette to box and the meanings being evoked were unrelated to changes in smoking behaviour.

It is argued that with the shift from cigarette to cigarette box in advertising, the cigarette box has absorbed the positive meanings the advertisers associated with smoking and in itself has become an effective vehicle for advertising. It is also argued that this effect can only be minimised by the introduction of plain packaging.

Improvement of Selected Properties of a Commercial Polymer
Wan Aminah Wan Hassan

A new chemical compound has been synthesised and characterised and this compound later will be incorporated into the commercial polymer benzoxazine. The incorporation of the compound aims to improve the production of the commercial polymer benzoxazine. The second study was based on molecular modelling to predict the data for the mechanical and thermal properties. The last part of the project focused on the Quantitative Structure Properties Relationships (QSPR) to create an equation with a low percentage error to be used for prediction of the unknown compound properties.
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**Moisture Barrier Properties**
*Winnie Tang*

Carbon fibre reinforced composites have been gaining wide use in a variety of applications such as transport and aerospace. The performance and life-time of such composites can be affected when they are exposed to adverse environments for long periods of time. Satellites, in particular, are often subjected to extreme conditions such as water absorption and desorption, build-up of electrostatic discharge and thermal cycling. All these factors may result in unpredictable changes to their structure and/or hardware damages.

In this study, the addition of inorganic monomers and carbon nanotubes into an existing epoxy system has been carried out in order to reduce the moisture uptake as well as improving the thermal and electrical conductivity.

**Quorum Sensing and Theory of Social Cheating in the Bacterial Species Pseudomonas Aeruginosa**
*Mariwan Homar*

Many bacteria have evolved a mechanism that is thought to engender communication between cells. This capability is assumed to be advantageous in, for example, low nutrient environments where the concerted activity of a critical mass of cells is needed to provide sufficient exoenzyme concentration to break down large molecules into useful quantities of assimilable compounds.

In a process called Quorum Sensing, many bacteria start releasing chemical signals (acyl homoserine lactone, AHL) once a critical cell concentration has been achieved. This directs neighbouring cells to produce a range of virulence factors such as protease enzymes. Mutant cells invariably emerge that are unable to respond to the signals but, instead, survive by exploiting the efforts of the neighbouring wild-type cells which expend the necessary energy required for protease biosynthesis. In the majority of chronic lung infections, especially in patients having Cystic Fibrosis, non-quorum-sensing mutants will out-compete the wild type bacteria because they do not have the metabolic burden associated with quorum sensing-induced biosynthesis (particularly protease production). As they benefit from energy-expensive activities of the wild-type, these mutants are known as "Social Cheaters".

This study is aimed at assessing, in vitro, the minimum required proportion of the wild type bacteria in a protein-based growth medium that sustains the growth of the mutants. Such media normally don’t allow the mutants to grow significantly. First, optimization of the best medium is required with our primary results suggesting gelatine as a promising nutrient component for this purpose. In addition, antibiotic resistance and susceptibility needs to be tested under experimental conditions.

The outcome of this study might establish a better treatment policy for lung infections, based on the hypothesis that the faster growing mutants can confer the infection with less pathology than wild type infections.
Has Nigerian Healthcare Insurance Improved Access to Healthcare?

Olubunmi Aregbesola

Introduction: A chief determinant of effective and equitable use of health services is the presence or absence of financial barriers; in the developing world, it is acknowledged that practical, sustained instruments for health financing are required to reduce the catastrophic effects of high levels of out-of-pocket healthcare payments. In Nigeria, mandatory national health insurance introduced in 2006 sought to protect families from financial hardship and improve access to health care services.

Rationale: Research on the influence of healthcare financing on access to healthcare services has been mainly in the context of developed countries of the world. With countries differing in the manner in which they arrange their healthcare funding and healthcare facilities, the assessment of the effectiveness of such financing is best carried out with reference to the specific context. In Nigeria, while it has been suggested that health insurance has the potential to improve access to healthcare, there hasn't been any study specifically aimed at determining the effectiveness of the new system.

Objectives: The research aims are as follows; an exploratory study into the specific goals of the insurance scheme, an examination of the effect of mandatory health insurance on access and equity of access to healthcare services and an exploration of the extent to which possession of health insurance has reduced the levels of out-of-pocket payments.

Methods: The study will adopt a multi-method approach including an inductive qualitative phase to generate rich in-depth information which will be followed by a quantitative phase conducted among two separate groups of patients who are either covered or not covered by health insurance.

Modelling the Cell Cycle

Gary Chaffey

Cancer tumours are comprised of a population of cells which vary in age, size and DNA content. Such populations may be modelled mathematically using a population density framework leading to a set of partial differential equations. Such a model may then be modified to account for external factors affecting the population such as nutrient deprivation, radiation treatment or cytotoxic drugs allowing for a greater understanding of how the tumour cells respond to treatments. This poster will outline such a model and compare its outcome against experimental data.
Investigation of Cerium, Europium and Ytterbium Doped Silicon for Active Silicon Photonic Devices
Imran Mohammad Sofi

Microprocessors’ processing speed and power is proportional with the number of transistors inside the chip. Each year the number of transistors inside a microprocessor doubles in exponential growth following the trend predicted by Moore’s Law (Law 1997). The size of a transistor is reduced by scaling down the gate length of the transistors but this does not scale down the time taken for electrons to move between transistors’ metal interconnection which will ultimately limit processing speed.

The solution to this interconnection problem is to have optical data transfer which replaces the speed of electrons with the speed of light as found in LEDs or lasers. As silicon is the basic element used in transistors and microelectronics, it is best to have optical emitter in silicon itself.

The Silicon integrated lasers and optical amplifiers (SILAMPS) team under the direction of Prof. KP Homewood has developed a method called dislocation engineering (R. Gwilliam et al. 2005) to reduce and sometimes eliminate the well-known thermal quenching effect suffered by silicon material which enables an indirect-gap semiconductor material to emit light at room temperature. Optical gain and near-infrared (NIR) luminescence can be achieved by incorporating rare-earth element such as Erbium into silicon (Lourenço et al. 2007).

The aim is to investigate the optical properties and behaviour of three different type of rare earth called Cerium, Europium and Ytterbium implanted using ion implantation inside dislocation-engineered silicon structure. The study will focus within the NIR region of 1.1 to 1.8 m extended optical communication band.

HOX Gene Expression in Ovarian Cancer
Zoe Kelly

Ovarian cancer is the leading cause of cancer death among all gynaecological cancers. The aggressive nature of ovarian cancer is partly due to its heterogeneity and lack of effective treatment strategies. Further work to understand the molecular changes and design more effective drugs is essential. We have studied the expression of HOX genes - a family of homeodomain - containing transcription factors that determine cell and tissue identity in the early embryo and have been found to be dysregulated in cancer. We looked at the HOX gene expression profile of all 39 HOX genes in primary ovarian and peritoneal tumours of different histotypes. QPCR was used to analyse the HOX expression profiles of 76 tumour samples from epithelial ovarian cancer patients. Many HOX genes were found to be upregulated in the ovarian cancer samples, with little to no expression found in normal ovarian tissue. HOXA9 and HOXB5 were the most highly expressed genes. HOXB5 was seen in 98% of cancerous tissue. This, however, did not correlate with clinical stage or CA-125 levels. The median follow up of the cohort was 26 months. And the medium survival has not yet been reached. This suggests that HOX genes may have a role in ovarian cancer oncogenesis.
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A Historical Review and Explanation of the Use of the Rorschach Inkblot Test in the U.K.
Katherine Hubbard

The Rorschach Inkblots are iconic images that most people are aware of to some degree. They feature in the ‘Watchmen’ comics, in the new film ‘The Master’ as well as TV shows and books. Yet, very little is known about their use in Psychology in the UK. In the US the Rorschach Inkblot Test was the most widely used test in the 1950s-60s and was applied to all manner of contexts. Rorschach tests were used heavily in Military selection, to detect homosexuals, as well as in the diagnosis of mental illnesses. In contrast however, Psychologists in the UK used the Rorschach very little. I investigated the Rorschach Newsletter (1952-1968), a publication from the British Rorschach Forum, which showed that the UK continued to use case-studies as opposed to the group testing methods used by the US, and were also more stringent on who could administer the tests. The UK also focused on personality and different kinds of social deviance, such as alcoholism and drug misuse rather than homosexuality. They both however, shared concerns about the non-European in the period of decolonisation. These similarities and differences are explained in reference to the distinct socio-historical contexts of each country.

Examination of the Reaction Mechanism and Structure Property Relationships of New Initiators for Curing Epoxy Resins – Three Peak Challenge
Fiona Binks

Epoxy resins, used in the manufacture of wind turbine blades, begin life as liquid monomers which require addition of another chemical compound to transform them into hard, infusible, solid networks. Upon addition of the second compound, the reaction occurs slowly at room temperature and at a much faster rate when the temperature is increased. In the case of large structures, such as wind turbine blades, it is imperative that the mixture does not become solid until filling of the mould has been completed. Through monitoring the reaction with the use of thermal analysis instrumentation, it has been observed that three peaks are present in the data. This suggests that the chemical reaction proceeds via three different pathways which occur in a concomitant manner. It is necessary to draw out these peaks individually and understand the mechanism responsible for each in order to design a compound which inhibits the reaction at room temperature but promotes the reaction at elevated temperatures.
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**Novel Cyanate Ester Blends: Simulation and Experimental Thermo-Mechanical Performance**  
**Alasdair Crawford**

Cyanate esters are a species of polymer that are known for possessing properties enabling their use in high performance applications. They display excellent thermo-mechanical performance, which lend themselves to industries such as aerospace where the use of composite materials is driven by the need to reduce weight and fuel consumption.

This project is investigating the structure-property relationships between blends of cyanate esters to assess whether blended materials are able to improve upon the already well-established characteristics displayed by non-blended materials. This experimental data is coupled with computational simulations with the aim of predicting properties of novel blends through molecular modelling.

Several generations of computer models of binary cyanate ester blends have been built up, with each generation yielding thermal data that improved upon its previous model with the final computer model optimised to display an accurate prediction of experimental data.

**Silver Modified Zeolite-clinoptilolite for the Removal of Heavy Metals and Pathogens from Waste Water**  
**Lulu Akhigbe**

The main objective of this work is to evaluate the potential of silver-modified clinoptilolite for the treatment of wastewater by combining the ion exchange properties of the zeolite with the antibacterial activity of the silver ions to produce a one-step treatment process that can deal with both bacterial and inorganic contamination in wastewaters.

Adsorption experiments have been undertaken to look at the effects of metals (Pb²⁺, Cd²⁺ and Zn²⁺) initial concentration, pH and contact time in order to evaluate the adsorption and kinetics mechanisms involved during the removal process. Single and mixed metals solutions have been investigated to simulate real systems. These studies have been combined with the removal of pathogens using Escherichia coli as an indicator under different conditions.

The silver modified zeolites exhibited high metal removal efficiencies ranging from 70-90% with complete elimination of Escherichia coli. Up to date results indicate a rapid adsorption and complete disinfection occurring within the first 30 minutes of contact and equilibrium reached within the first hour. In the mixed solutions, interactions between the Escherichia coli and metals had little effect on the removal performance of the system compared with the results of the single metal solutions. Overall, the results show that silver-modified clinoptilolite has significant potential for its application for the treatment of complex wastewater effluents.
**Long-term Cocaine Use and Relapse to Cocaine after Abstinence Alters mGluR5 and MOPr Levels in the Mouse Brain**  
*Polymnia Georgiou*

Cocaine addicts experience intense craving for the drug following cessation of drug-taking. Abstinent cocaine addicts often relapse when they are exposed to cocaine itself or to an environment which is associated with cocaine. Its use triggers changes to the brain chemistry. However, it is not yet known what exact changes in brain chemistry trigger this severe craving and make an abstinent cocaine addict relapse. Identifying those changes is important to understand how to prevent relapse. There is evidence suggesting that the metabotropic glutamate receptor 5 (mGluR5) and the mu-opioid receptors (MOPr) may be involved in cocaine addiction. In this study we investigated whether MOPr and mGluR5 levels are altered in the brains of addicted mice and of mice relapsing to cocaine use. Long-term cocaine exposure as well as relapse induced by cocaine or by drug-associated environment altered mGluR5 and MOPr levels in brain regions associated with reward, learning and memory. Preventing those changes from happening or reversing those changes may help to reduce cocaine craving and prevent cocaine addicts relapsing.

**Accessing and Linking the Data to Manage the Quality and Safety of Chronic Disease Using Diabetes as an Exemplar: Ontology Driven Approach**  
*Harshana Liyanage*

The World Health Organisation reports that by the year 2020, chronic disease will be responsible for three-quarters of the world’s deaths. Diabetes mellitus is one of the greatest health challenges facing the UK with an estimated prevalence of approximately 4%. Integrated chronic diseases management, as set out in the chronic care model (CCM) is considered essential to provide better care for patients; components of the CCM include health information systems (HIS) and decision support. However, the routine data that might inform decision making and be used to measure quality is often held in different locations and forms. The underlying data quality of HIS is an important factor when effectively using routine healthcare data to support integrated chronic disease management and population health. In this paper we explore how ontologies can be used to maximise the use of available data to support improved chronic disease management using diabetes mellitus as an exemplar. As an initial step we work towards improving data quality through better semantic interoperability. We also present latest trends in ontology development such as fuzzy ontologies and new ontology mapping and alignment techniques that might improve semantic interoperability in HIS.
Vulnerability of Cable-Stayed Bridges
Oluremi Olamigoke

Over the last years, there has been an increase in cable-stayed bridges because they provide an economical solution for carrying traffic loading for spans up to 1000m, high strength materials, development of computer technology and better construction methods.

These elements of this type of bridge can break due to accidental or intentional extreme events, lack of maintenance over a long period of time, excessive corrosion of the connection or the loosening of a cable. Likewise, the pylon can be subject to blast, impact or fire loading which can also lead to the vulnerability of this structure’s progressive collapse.

Previous work and codes has focused on the effect of the loss of an element without the consideration of the time of loss.

An analysis of the bridge that takes time into consideration will be carried out by varying the traffic load, rupture time, number of broken stays anchorage zone of the cable stayed bridge.

This research will ensure that the economic advantage of the bridge is fulfilled and also benefit the code of practice due to the present lack of knowledge in carrying out dynamic analysis for the loss of a cable.

Normal Gait Database Construction in Multiple Common Daily Activities
Xuefei Bai

The comparison of the patterns between those from the representative ‘normal’ population and those from the patients is a key aspect in orthotic and prosthetic gait analysis. As the gait data is influenced by various local factors such as ground conditions, equipment setup and the marker set used, it is essential for the laboratory to establish a normal data base associated with the local studies.

The purpose of this study was to collect the gait data from able-bodied subjects in different common daily walking conditions and constitute the normal data base for future gait studies in Movement Analysis Laboratory in University of Surrey.

A group of able-bodied subjects participated in the experiment and performed level ground walking, uphill and downhill slope walking, stair ascending and descending and obstacle crossing. The subjects were requested to perform 5 trials of walking for each activity and the gait data, including kinematic data collected by motion capture system and kinetic data measured by ground force plates, were recorded covering at least one completed gait cycle in each trial. The biomechanical and physiological parameters were calculated in Visual 3D and saved as normal data set.
Investigating Charge and Energy Transfer in Polymer-Nanotube Hybrids

Sofia Siddique

Solar cells made from organic materials offer large areas and low fabrication cost but at present their overall efficiency is low. Combining the organic materials with nanostructures may allow for an improvement in efficiency. For example, carbon nanotubes have excellent properties for transporting photogenerated charge. However in these hybrid structures there is a need for efficient transfer of energy from one material to the other. There are several mechanisms for such transfer which all depend on the electronic energy bands in the two materials and how they align with each other.

We are studying energy transfer between polymers and carbon nanotubes. Under illumination, charge pairs are created in the polymer which have to travel to the nanotube, transfer across the interface, separate into positive and negative charges and travel to the electrodes. Annihilation or trapping of the charge before it reaches the electrodes will lead to low efficiency. Because of the tight wrapping of polymers around the nanotube, energy transfer between them can be efficient if their electronic energies are in resonance. We use light pulses the duration of which is shorter than 1 trillionth of second (picosecond) to generate charge and then test whether charge is still present a short time later. This allows us to determine the rate of the processes that lead to a reduction in the charge reaching the electrode. An understanding of these rates and how they depend on the properties of the materials will allow the design of solar cells with improved performance.

Patient Education by Nurses Working in the Nephrology Area in Cyprus and in Other Countries

Evangelos Latzourakis

The specialty of nephrology nursing has evolved in response to increasingly complex knowledge, technology and clinical expertise required in the care of people with impaired renal function (Parker, 1998). Such patients should obtain the necessary knowledge through proper and sufficient patient education (Castner & Douglas, 2005) by nephrology nurses. However, in Cyprus there are no specialized nephrology nurses and there are no data regarding the care provided to renal patients.

A literature review was conducted in order to: 1) identify as well as critically evaluate the recent evidence relating to nurses’ knowledge about nephrology care and how Chronic Kidney Disease (CKD) is managed by nurses in the period from 1998 to 2012, 2) to classify the factors affecting the implementation and outcomes of patient education by nurses and 3) to identify and evaluate models of care and management of patients with CKD.

The finding of the literature review concluded in the following key themes and subthemes:

1. Nurses knowledge on nephrology care
   - Lack of knowledge
   - Sources of knowledge
2. Factors affecting nephrology patient education
   - Educational level
   - Lack of time
   - Lack of support/administration guidance
   - Patients’ compliance
The Everyday Life of a Teenager: Exploring the Meaning of Happiness and Unhappiness for Young People within Contemporary U.K.
Toni Schwarz

Contemporary UK has a seemingly endless fascination with ‘our children’s’ emotional states, recorded both in research data and policy driven agendas for education as well as the daily media attention focused on the ‘state of the teenager’. Much of the material concludes that young people today are ‘unhappy’ and that regardless of the investment in developing the ‘emotional intelligence’ of young people, there are increasing numbers diagnosed with mental illness.

What is less known about, however, is how the ‘everyday’ teenager navigates their way through emotional exchanges, to develop an emotional management system sufficient to enable transition to adulthood as well as preserving the presentation of an authentic self.

Inductive methodology has been adopted by using photo-elicitation and semi-structured interviews as data collection tools. There were 30 young people aged 13-15years, who self-selected to participate in the study. Their remit was to take a photograph which represented an emotion of happiness or unhappiness that they wanted to talk about, within their everyday lives.

Social interactions elicit feelings, many of which are mediated by social and cultural expectations; these feelings are committed to an ‘emotional bank’ which can be accessed and drawn upon using a range of private and public strategies increasing the complexity and volume of emotional management. Managing emotions and presenting an authentic self is seen as important for young people’s everyday social interactions.

Sea Water Manipulated Forward Osmosis Desalination by Adsorption
Saleh Alaswad

Nearly one third of the global population today lives in water-stressed regions and by 2025 this number is expected to double (Service, 2006). Research in unconventional water production techniques, such as desalination, is an essential avenue to counter the imminent water shortages and resolve many issues that the lack of fresh water involves. A number of methods in water desalination has been proposed such as reverse osmosis (RO), thermal distillation and electrodialysis. All these methods, however, involve high operating and investment costs and negative environmental impact. Forward Osmosis (FO) is a relatively new approach for water desalination that has the potential to overcome these issues. The major factors to consider in FO system are finding the optimal draw agents, developing practical regeneration process for low energy consumption and selecting suitable FO membrane to achieve high recovery.

This project, carried out at the Centre for Osmosis Research and Applications (CORA), University of Surrey, covers the manipulated osmosis desalination (MOD) process that combines FO with adsorption processes. The experiment will use a thin film semi-permeable membrane, NaCl solution as feed water (FS) and sucrose as an osmotic agent (OA). The clean water will be segregated from the diluted draw solution by GAC. The draw solution will be reclaimed to FO process by applying a desorption technique. The collected and grapping clean water from adsorption method will be analysed by undergo samples to High Performance liquid Chromatography (HPLC). The effects of membrane, orientation draw solution concentration, flow rate and temperature, different membranes, feed solution temperature and flow rate will be contacted for study to estimate the optimum condition parameters for water flux in FO process and these conditions applied to adsorption method.
Template Ordering of Novel 2-Dimensional Sheets for Photonic Application
Ravi Shanker

The ability of photonic crystals (PCs) to confine and manipulate photons at nanometre scales opens up unique opportunities in classical as well as quantum information processing technologies and sensing. PCs usually consist of dielectric materials, that is, materials that serve as electrical insulators or in which an electromagnetic field can be propagated with low loss. In PCs, atoms are arranged in a lattice-like structure in the dielectric and repeated identically and at regular intervals, a property known as periodicity. The resulting crystal will have a photonic band gap, a range of frequencies within which a specific wavelength of light is blocked. This phenomenon is similar to the establishment of an electronic band gap in silicon-crystal lattices used in the semiconductor industry.

My research work is focused on the fabrication of three-dimensional (3D) PCs by means of the template-assisted colloidal self-assembly method, aided by capillary and gravitational sedimentation. The incorporation of 2-dimensional (2D) materials such as Graphene, Boron Nitride (BN), Molybdenum disulfide (MoS2) into the PC structure significantly enhances their optical and mechanical properties. Such PC composites show ability to control flow of photons and allow for greater control of material properties which could address many of the problems that currently limit the speed and capacity of optoelectronics devices.

A Comparison of Cypriot Nurses and Nurses in Other Countries Knowledge on Diabetes Self-Care Management
Monica Nikitara

Nursing culture in Cyprus has recently undergone a transformation. Prior to 2007, the provision for nursing education on the island was through diploma-level training from the Cyprus Nursing School. However, since 2007, one state university and three private universities now deliver nursing courses at degree level. There are only a few trained specialised nurses in the country and nurses do not need to specialize in the area in which they work.

This study will focus on diabetes knowledge and education. A literature review was conducted to a) identify nurses’ knowledge about diabetes care and how diabetes is managed by nurses during the period 1999 and 2011 and b) compare how nurses in Cyprus care and manage diabetes in relation to other countries. The literature review suggested the following three key themes: 1) Lack of knowledge on specific areas of diabetes, 2) Reasons for knowledge deficit, 3) Reasons for not providing information to patients about diabetes. Two research questions arose from the literature: what are Cypriot nurses’ knowledge on diabetes care and on educating diabetic patients to self-care management and how are Cypriot nurses prepared during their undergraduate training to educate patients with diabetes for self-care management.
The Influence of Food Choice in Acculturative Stress Management of International Students
Eshaby Mustafa

The number of international students in the UK in 2011 has increased by 6% from 2010 (Smith et al., 2011). In a statistical report by the Organization for Economic Co-operation and Development (OECD) 2010, international students are said to have contributed £14 billion to UK economy from their tuition fees and expenditure on goods and services. These figures have prompted researchers to explore the process that international students went through including the experience of acculturative stress and difficulties with the adjustment to the new culture. Whilst the research literature discusses the importance of food in the adjustment journey of international students (Brown et al., 2010; Brown, 2009; Wahlqvist, 2002; Pan et al., 1999), there is limited research on how food choice may influence their acculturative stress. It is this issue which my research focuses on with a preliminary study of new international students at a university in the UK where these questions will be posed. This study will also address the measurement issue of acculturative stress and test how food choice influences the process. Research implications of this may apply not only to international students but to migrants in general.

Microbial Communities and their Application in Fuel Cells: Exploring the Metabolic Interactions
Alexander Neocleous

Microbial fuel cells are an emerging source of renewable power and wastewater treatment, designed to give for low amounts of power over extended periods of time. They differ from chemical fuel cells by using a microbial community to obtain power as opposed to a defined chemical reaction.

Since the microbial communities being used are generally obtained from wastewater, they are not comparable to the single species cells run by the large majority of groups who primarily focus on Shewanella and Geobacter. This has led to a linear way of thinking which does not take into account the potential interactions of the species in the community.

The research will be based around the steps being taken to look into the potential interactions between different species and the attempt to link the different metabolic profiles with the electrogenic potential of the community. This will be carried out by using a technique called Biolog which can determine if a microbial species can metabolize a number of given substrates. This information will then be used to assemble a synthetic community which could potentially be used in a microbial fuel cell.
Polymer Wrapped Carbon Nanotubes as a Transparent Electrode for Large Area Optoelectronics
Dinesha Dabera

One of the key ingredients of any flat panel display, touch screen or solar cell is the transparent conducting electrode layer applied to the glass or plastic substrate. This is nominally indium tin oxide (ITO) or another inorganic transparent oxide conductor. The price of indium, its scarcity and the fact that a replacement technology is far from present, has intensified research into this field. In this work we demonstrate a method to produce a large area solution processable inexpensive answer to this problem based on a carbon nanotube (CNT) network film as a transparent electrode.

Regio regular poly(3-hexylthiophene-2,5-diyl) (rr-P3HT) wrapped semiconducting single walled carbon nanotubes (s-SWNT) are prepared and then used to coat transparent substrates such as glass and plastic, using coating processes highly compatible with large area printing techniques. The conductivity of the film is improved further through thermal and acid treatments, leaving a flexible, semi-transparent CNT network for use as an electrode. Light transmission levels of ~75% have been recorded for the transparent electrode film. We have also used the films in a test organic solar cell comprising of the device architecture: CNT electrode (anode)/hole transport layer/active layer/electrode transport layer/metal cathode.

Based on the results we have obtained, we believe that the CNT films will pave the way for a less costly and more flexible alternative for expensive inorganic transparent electrodes such as ITO in large area electronics and points towards the realization of low-cost flexible future electronics.

Fishing for Pharma: Selective Extraction of Pharmaceuticals and Biologically Active Species from Water
Weam Abou Hamdan

The early results are outlined from a project which promises to deliver re-useable and selective extracting agents, able to remove potentially harmful organic pollutants (pharmaceuticals, metabolites, pesticides etc.) from water. A calixarene, diethylamino derivative and an aminopropyl functionalised silica have been assessed for their ability to extract such compounds from aqueous solutions. The calixarene derivative was found to interact selectively with acetylsalicylic acid (aspirin). The process of extraction was found to be kinetically fast, occurring within the first 15 minutes of exposure and involved the formation of a 1:1 complex between the host (calixarene) and guest (pharmaceutical). The optimum temperature for extraction was found to be 30°C. The functionalised silica was found, when tested, to extract aurintricarboxylic acid and pesticides. The extraction capacity of the materials was determined. Both materials show promise for application in wastewater treatment, given the selective properties demonstrated, the insoluble nature of the extracting species and the ability to recycle them for multiple uses. Two new materials have been developed and assessed and are considered ready for field testing; further work is in progress.
**Novel Experimental System Linking Brain Activity to Behaviour**

_Nanyi Ciu_

It remains unclear how the brain encodes various aspects of behaviour and what is the role of sleep in the behaviour-encoding process. We set out to investigate the correlation between activity of individual cortical neurons in rodents during various spontaneous behaviours, running-wheel activity and during subsequent sleep. Individual cortical neurons are often activated in relation to specific spontaneous behaviours. For example, providing rodents with running wheels results in stereotypic voluntary running for hours, allowing us to investigate neuronal activity continuously in “standardized” active behavioural state and sleep state in different cortical areas. We hypothesize that those neurons that are specifically activated during waking will show more pronounced changes in their firing properties during sleep. We have set up a system that records continuously local brain activities (Electroencephalogram and Multi-Unit Activity) concomitantly with video and running-wheel activity in synchronization with sub-millisecond precision. This novel system can accommodate large amounts of real time multichannel data recorded with high sampling frequency for consecutive days. Our setup provides a unique opportunity to gain novel insights into the link between local brain activity, behaviour and sleep. Understandings of how the brain regulates local sleep homeostasis after behavioural tasks will help us answer the question “What is the function of sleep?”

**Exploring Counselling Psychologists’ Perceptions of the Body and its Aspects within a Psychotherapeutic Context**

_Maria Kouloumbri_

Objective: The role and use of the body in psychotherapy is perceived differently by various psychotherapeutic approaches. For example, psychoanalysis expresses both concern and interest in its potential use within the therapeutic relationship whilst the humanistic paradigm acknowledges the body as a channel for communication for both clients and therapists. In Cognitive Behaviour Therapy (CBT), mindfulness and relaxation techniques are considered as significant components in therapy. However counselling psychology, as a discipline, lacks reference on the role of body and its meaning in therapy. This study aims to enrich the literature by exploring counselling psychologists’ understanding of the role of the body and its meaning in clinical practice.

Method: Semi structured interviews were conducted with 5 qualified counselling psychologists working in private practice. Data were analysed using Interpretative Phenomenological Analysis (IPA).

Results: The results of the analysis revealed a number of interesting themes. Participants acknowledged the significance of the use of the body, including bodily techniques and touch as important tools in therapy. Simultaneously, they expressed mixed thoughts and considerations which they take into account when using such tools. Therapist’s and client’s characteristics, their personal relationship with their bodies and the lack of reference in body-oriented theories in their training appeared to be influential factors on their perceptions of the body as well as how and when they use it in therapy.

Conclusion: The results of this study highlighted the need for counselling psychology to reconsider the place and meaning of the body and its aspects in therapy and in training to encourage professionals towards a greater involvement with bodily aspects.
Modelling Antibiotic Production in Bacteria
Spencer Angus Thomas

Many biological systems are of interest to scientists, particularly areas that could lead to progression in medical science and healthcare. Such a biological system is the soil dwelling bacteria Streptomyces coelicolor, which produces about 70% of known antibiotics. Bacteria, like all organisms, contain genes that interact with each other in a network to perform certain functions, and can be described using mathematical models. One issue with models of complex biological systems is the number and values of parameters needed to describe the network. Fortunately, there are mathematical tools available such as evolutionary algorithms which are able to determine many parameters in seconds with a computer. Using this technique and experimental biological data, we aim to reconstruct the gene network of a part of Streptomyces thought to be important in antibiotic production in an effort to understand the process required to produce the antibiotics. Once the process is understood, we can potentially increase efficiency and/or production rate, and this may even allow us to develop different kinds of antibiotic which will benefit medical science and the battle against disease. This is a general technique that can be used to build gene interaction networks for any organism from bacteria to humans.

Radiation Damage in Nuclear Graphite
Alice McKenna

In the UK the majority of nuclear reactors have graphite as the biggest component in the core. The graphite is used to slow down (or 'moderate') fission neutrons to improve the probability for further reactions with the fissile uranium (U235) nucleus.

Here, Molecular Dynamic (MD) simulations are used to study radiation damage of the graphite moderator. Two interatomic potentials are used in the simulations which describe interactions between the atoms. The Environment Dependent Interaction Potential (EDIP) describes the chemical bonding between carbon atoms and the Ziegler Biersack Littmark (ZBL) potential describes the short range interactions. Three types of simulations were performed, each to represent different ranges of energy for the first carbon atom that the neutron collides with in the graphite. These simulations either employ larger cells (over 100,000 atoms) to look at the higher energy neutrons or smaller cells (a few hundred atoms) for the lower energies. Equivalent simulations on other carbon materials, such as diamond and amorphous (disordered) carbon, highlight the unique behaviour of graphite. The defects formed were further analysed for their energies. These were compared to first principle quantum mechanical calculations and showed a good correspondence, justifying the use of interatomic potentials.
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Thermal Degradation of Polybenzoxazines
Scott Thompson

Polymers are exposed to a wide variety of challenging environments every day. One of these is being exposed to high temperatures, for example, in space applications. This research is centred around testing the thermal properties of an emerging polymeric material, polybenzoxazines. Polybenzoxazines offer many potential advantages over more traditional polymers of the same class including heat resistance, good electrical properties and flame retardance. Additionally, they confer other attractive characteristics such as: near zero volumetric change upon hardening, low water absorption, and high char yield.

This present work focuses on tailoring certain experimental parameters, e.g. particle size to influence the way in which these polymer systems breakdown during heating. Subsequently work has been carried out on a family of polybenzoxazines which vary by backbone and examines how these different backbones affect thermal degradation.

‘Walking Alongside’ The Dying in Ethiopia: An Ethnographic Study
Nicola Ayers

This ethnographic study provides a thick description of how care is provided by health care professionals and family members for those who are dying. In the context of Ethiopia, and as an ethnographer, I show how culture, community and faith come together to identify a fundamental concept of ‘walking alongside’ the person who is dying. I describe how ‘being lavish with time’, offering presence, protection, prayer, provision, greetings and proverbs are practical presentations of a caring community. I also discuss traditional support rituals for those who are grieving. This study, conducted during two long periods of fieldwork during the past year, describes community strategies for providing end of life care. The ‘walking alongside’ model may be applicable in future when planning community care in a developing economy.
EEG Oscillatory Activity During Working Memory Processes
Barbara Berger

Working memory (WM) is a complex system that enables us to function within our environment, to learn and to interact with others. A variety of cognitive processes such as short-term storage of information that is no longer available in the environment or comparison of new information with the one stored in long-term memory (LTM), are involved in WM operations. All of these separate processes have to work together in a co-ordinated fashion towards a goal and under supervision of some sort of attentional control mechanism. How do these processes interact, given that the WM network in the brain is vast and spans frontal as well as posterior regions? It has been found that rhythmical activities (i.e. oscillations) at different functionally specific frequency bands serve as communication- and coding mechanism.

This experimental verbal and visuo-spatial EEG study aims to explore the different roles of several oscillatory frequencies, how they interact and how information is conveyed. It tries to answer the unresolved question of how our LTM is embedded in WM operations. Findings could give us more insight into the basic mechanisms of our brain and how we are “wired” and moreover, shed light on how our brain manages everyday functioning.

HOMA Z Scores
Katie Cranfield

In Diabetes, the Homeostasis Model Assessment estimates steady state beta cell function (%B) and insulin sensitivity (%S), as percentages of a normal reference population. In diabetes research these are analyzed separately, but doing this focuses on only one variable when both are important in patients with diabetes and it also ignores the underlying relationship between them. Using this relationship, we created a technique which combines the two variables into one Z score that has a value of the amount of standard deviations away from the normal relationship we have for subjects with diabetes. By creating this new variable, analysis can be done to incorporate both measures and get a more realistic view of a patient’s progression. This is important because a rise in, for example %B, may be significant. However, if this coincides with a sharp fall in %S, this subject will be further away from our normal isoglyceamic line and this can only be shown clearly and more easily by using a HOMA Z Score instead of using these variables separately.
Aspects of String/Field Theory Dualities
Fabrizio Nieri

String theory is the most promising candidate to describe all the fundamental forces in nature within a unified framework. Five different types of string theories have emerged and they appear to be different manifestations of an underlying theory called M-theory. However, this theory remains poorly understood. To analyse string and M-theory, powerful tools are needed, one being the AdS/CFT correspondence. For instance, this correspondence identifies particular string theories with particular quantum field theories. Quantum field theory underpins most of theoretical physics today, and in particular particle physics.

I will introduce the concepts of quantum field and string theory and explain how they are related by the AdS/CFT correspondence and then focus on a specific example of such a correspondence and explain why it is useful having different descriptions of the same theory. I will also show how the AdS/CFT correspondence provides a realisation of the holographic principle which states the possibility of describing higher-dimensional physics in terms of lower-dimensional physics. Furthermore, I will show that one of the most fundamental quantities in quantum field theory, the Wilson loop, has a natural string interpretation. Finally, original results are presented, emphasising the role of the AdS/CFT correspondence from a phenomenological viewpoint.

Feasibility Study of Using Glass Beads as Dosimeter in Radiotherapy Application
Shakardokht Jafari

Radiotherapy is the gold standard technique for treatment of a wide range of tumours and, for many cancers, represents the non-invasive and most cost-effective treatment. Over recent years, the success of radiotherapy has caused more attention to be paid to spare the normal tissue surrounding the tumour – in order to reduce the healthy tissue complication probability and patient harm in ensuing years.

By conforming radiation field more tightly to the tumour shape, radiation treatment beams (or fields) will be smaller. Furthermore, the earlier diagnosis results in smaller lesions being presented. One of the challenges in advanced radiotherapy techniques to treat the small lesions is the challenge of small field dosimetry. Glass beads are small enough (2-3mm dimension) to be a dose measurement tool for a small radiation field. In this work, the feasibility of using glass beads as TL dosimeter is investigated for dose verification in radiotherapy application.
How Does the Biological Organisation of Transporter Proteins Impact Estradiol Disposition?

Joanna Sier

The liver is a vital organ with several functions playing a key role in endogenous processes such as cell signalling and glucose regulation and plays an important role as a detoxification system, protecting the body against toxic levels of chemicals.

Previous work has shown that the absorption, distribution, metabolism and excretion (ADME) of a substance are controlled by protein transporters found in cell membranes. The two main classes of transporters are: SLCs, involved in cellular uptake, and ABCs involved in the efflux of substances and their metabolites. The focus of this work is on the ABC transporters which remove chemicals from liver cells into both the bile (apical transport) and blood (basolateral transport). However, little is known about how these work together to optimally protect us from toxic levels of chemicals.

To study this we have generated a computer model to simulate how a liver cell manages the metabolism and clearance of the endogenous hormone, estradiol. We are validating the model with estradiol based cell assays and will manipulate the model to study the importance of the biological organisation and impact of individual transporter proteins on ADME.

Glucose Oxidase as an Anodic Enzyme in Biological Fuel Cells

Ross Milton

Enzymes can be utilised as biocatalytic components in biological fuel cells (BFCs). By electronically coupling an enzyme to an electrode, common fuels (for example, glucose and fructose) can be utilised as the fuel to be oxidised at a bio-anode in these BFCs. Pairing the bio-anode with an enzymatic bio-cathode that is capable of reducing oxygen to water results in the formation of a device that could be implantable, fuelled by glucose found in the bloodstream. Enzymatic BFCs have been demonstrated in living snails, clams and grapes. Enzymes can undergo direct electron transfer (DET), where electrons are transferred from the cofactor of the enzyme to the electrode by surface contact (where the cofactor is found at the surface of the enzyme) or conduction via advanced materials, such as carbon nanotubes and graphene. For enzymes with deeply buried cofactors (for example, glucose oxidase), mediated electron transfer (MET) is commonly employed where small diffusive redox-active species can shuttle electrons from the cofactor of the enzyme to the electrode. My work investigates the use of glucose oxidising enzymes as anodic enzymes for BFCs, either by DET or MET.
Modelling the Influence of Environmental Policy on ICT Procurement Using Agent Based Models
Andrew Larkham

With the recognition of the effects human activity has on the atmosphere, governments of the world create policies which encourage the reduction of greenhouse gas (GHG) emissions and the associated harmful weather changes. Globally, the information & communication technology (ICT) industry represents approximately 2% GHG emissions and absolute emissions are likely to rise as demand for hardware and services increase as the world economy grows.

In the United Kingdom (UK) the Carbon Reduction Commitment Energy Efficiency Scheme (CRCEES) will affect all large public and private sector organisations (representing 10% of the UK’s GHG emissions). These organisations tend to be large users of ICT and there is an incentive when purchasing new hardware or services to find low/reduced energy consuming options - and hence reduced associated GHG emissions. Therefore there are commercial implications as clients’ change their requirements and ICT providers have to adapt to the change in demand.

Using agent based modelling (ABM) to observe possible behavioural change in the purchase of ICT after the implementation of CRCEES, this research can be used to provide an insight into how ICT should respond to environmental policy.

Privacy Protection Versus Computer Forensics
Ahmad Al-Natour

This user study will focus on semantic analysis of files which contain potential confidential information about the users. The first phase of the study is to run a number of privacy protection software and computer forensic software on the users’ computers in order to eliminate any traces of confidential information regarding the users. The next phase will involve semantic analysis of files left on the system which supposedly was overlooked by the aforementioned software. Our hypothesis states that most programs fail to find files that contain confidential information based on semantic interpretation of the files’ contents and file name.
From Translator's Black Box to Translator's Tool Box
Joanna Gough

Translation is a multi-faceted activity that involves, amongst other processes, the simultaneous use of internal and external resources, i.e. the linguistic and world knowledge translators already possess and the resources they access externally to find new information.

Process-oriented translation research has begun to investigate internal translation processes, (taking place in the translators’ minds while they are translating), but little attention has been given to how they access and utilise the external resources available to them.

This research gap is further exacerbated by the fact that the way translators produce texts has recently dramatically changed due to the increased availability of translation technology and online resources. This leads to a situation where, whilst the amount of tools and resources available to translators is growing exponentially, little is known about the interaction between translators and these tools and resources.

My research hopes to fill this gap and seeks to identify distinctive patterns of behaviour (styles) with regard to the use of translation tools and resources.

To gather initial background data I have conducted a survey amongst translation professionals to find out their habits and preferences with regards to the use of Web-based tools and resources. I shall present findings based on 540 usable responses as well as initial results from the pilot study, which as intended to be a method feasibility study.
Poster Abstracts
Wednesday 30th January

Characterisation of LaBr₃:Ce Detector at Various Distance to Optimise the Source-to-Detector Distance
Hanan Aldousari

LaBr₃:Ce (cerium-doped Lanthanum Bromide) is a detector used in radiation medical imaging. The aim is to characterise the LaBr₃:Ce scintillation detector in terms of energy resolution, intrinsic efficiency, and absolute efficiency at varies source-to-detector distance (5, 10, 15, and 20 cm). Calibrated gamma-ray emitting radionuclide point sources were used [Na-22, Co-60, and Cs-137]. It is important to optimize the source-to-detector distance so that the best statistically significant counts are obtained for detecting changes in radiation experiments. Detector energy resolution was also determined for varying the shaping time constants of the amplifier (0.5, 2, 3, and 6 microseconds). The best energy resolution recorded was 4.5% at 511 keV photopeak. The variation of intrinsic photopeak efficiency with energy from 511-1332 keV for varying source-to-detector distance was determined. As expected, detector efficiency decreases as the gamma ray energy increases. The best efficiency of 21.8% was recorded at a 15cm source-to-detector distance. LaBr₃:Ce is shown to be the most effective scintillator crystal in gamma-ray spectrometry because it is the best combination of efficiency and energy resolution.

Activated Carbon/MWNT-Based Supercapacitors
Foivos Markoulidis

Novel supercapacitor cells with activated carbon-multiwall carbon nanotube (MWNT) nanocomposite electrodes were fabricated and tested. The electrode fabrication process involved various stages of mixing and dispersion of the MWNTs, rolling and coating of the AC/MWNT/binder paste on an aluminium foil substrate, which also served as current collector. An organic electrolyte was used, tetraethylammonium tetrafluoroborate (TEABF4), fully dissolved. All devices were of the electrochemical double layer capacitor (EDLC) type, incorporating a cellulose-based separator. The surface topography of the so fabricated electrodes was investigated with scanning electrode microscopy (SEM). The generated micrographs led to conclusions about sample preparation improvement, material selection and specimen quality. Overall cell performance was evaluated with a multi-channel potentiostat/galvanostat/impedance analyser. Each supercapacitor cell was subjected to Cyclic Voltammetry (CV) at various scan rates from 0.01 V/s to 1 V/s and Electrochemical Impedance Spectroscopy (EIS) with frequency range from 10 mHz to 1 MHz. Certain samples also underwent Charge-Discharge testing at various current densities. Ragone plots based on Cyclic Voltammetry and Charge-Discharge testing data were also derived. It was found that the addition of MWNTs raised capacitor performance in all areas, including specific capacitance, energy density and power density; while utilising different electrolyte solvents provided noteworthy improvement.
Anthony Bonello  
Composer, Conductor and Sound Artist

Anthony Bonello, composer, conductor and sound artist, completed his research at the University of Surrey having previously studied at the University of Malta and Conservatorio Statale di Musica in Florence. Anthony has conducted the University of Surrey Orchestra and is currently Director of Music for the Leatherhead Orchestra and Conductor of Accidentals wind band.

As well as teaching music, Anthony composes using various recording and sound-design tools, ranging from industry-standard software packages to audio programming languages and experimental software. Anthony focuses on treating projects individually and in the specific context for which they are required, whether this relates to acoustic instruments, electronic music or live presentations.

For the 2013 Postgraduate Research Conference, Anthony has composed a piece of music to represent individual and collaborative responses and emotions of the members of the organising committee as they have worked together over the last six months. Committee members provided numerical data and words that indicate the concerns, rewards and satisfaction they have shared over the past six months.

Heather Keens  
Professional Singer, Voice Teacher and Accent Coach, University of Surrey

Heather studied music at the Royal College of Music, London, where she was an undergraduate student and a postgraduate student in the Opera School. She has a Masters in Voice Studies from Central School of Speech and Drama. Heather has performed internationally in opera, theatre, music theatre, TV, radio and Concerts, with companies such as Pavilion Opera, Lumiere and Son Theatre Company, Three Choirs Festival, Channel 4, BBC and Artichoke Productions UK, as well as, Calculated Risks Opera, The Australian Opera, the Lyric Opera of Queensland, ABC TV and the Queensland Theatre Company in Australia. She currently teaches singing and voice at the University of Surrey and is a freelance trainer with Resonance Voice Company, London.