# NPL PPRIG Proton Therapy Physics Workshop 2015

## Day 1: 1st October 2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 AM</td>
<td>Arrival, Registration &amp; Coffee</td>
<td></td>
</tr>
<tr>
<td>10:00 AM</td>
<td>Welcome &amp; Setting the Scene</td>
<td>Professor Karen Kirby &amp; Russell Thomas</td>
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</tbody>
</table>

### Session 1: Treatment Planning

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15 AM</td>
<td><strong>Invited talk:</strong> Particles versus high precision photons</td>
<td>Prof Tony Lomax</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>A beam angle optimisation tool for proton therapy planning</td>
<td>Peter Sitch</td>
</tr>
<tr>
<td>11:20 AM</td>
<td>Treatment planning study methodology for comparison of proton and photon techniques</td>
<td>Dr Adam Aitkenhead</td>
</tr>
<tr>
<td>11:40 AM</td>
<td>Alpha-stable distributions to guide random walk implementations of proton dose deposition calculations</td>
<td>Prof Frank Van den Heuvel</td>
</tr>
<tr>
<td>12:00 PM</td>
<td><strong>Lunch &amp; poster session</strong></td>
<td></td>
</tr>
<tr>
<td>1:00 PM</td>
<td>Treatment plan verification using Monte Carlo simulations</td>
<td>Dr Francesca Fiorini</td>
</tr>
<tr>
<td>1:20 PM</td>
<td>Planning study comparing the use of photon radiation therapy compared to proton therapy for superior sulcus tumours (SSTs)</td>
<td>Swee Wong</td>
</tr>
<tr>
<td>1:40 PM</td>
<td>An analysis of plan robustness for oesophageal tumours: comparing volumetric modulated arc therapy and spot scanning proton therapy</td>
<td>Dr Samantha Warren</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Incorporating the effect of fractionation in the evaluation of proton plan robustness to setup errors</td>
<td>Matthew Lowe</td>
</tr>
<tr>
<td>2:20 PM</td>
<td><strong>Discussion:</strong> Roadmap for treatment planning</td>
<td>Dr Ranald Mackay</td>
</tr>
<tr>
<td>2:50 PM</td>
<td><strong>Coffee</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Session 2: Radiobiology

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:05 PM</td>
<td><strong>Invited talk:</strong> Relating proton treatments to photon treatments via the RBE - should we revise clinical practice?</td>
<td>Prof Harald Paganetti</td>
</tr>
<tr>
<td>3:50 PM</td>
<td>Expression levels of DNA repair proteins modulate their response to radiotherapy in glioblastoma cell lines</td>
<td>Natalie Mayhead</td>
</tr>
<tr>
<td>4:10 PM</td>
<td>Towards new radiation quantities for biologically-weighted dosimetry</td>
<td>Dr Hans Rabus</td>
</tr>
<tr>
<td>4:30 PM</td>
<td>Investigating the clinical implications of a variable RBE on proton dose fractionation across a clinical actively scanned spread-out Bragg peak</td>
<td>T I Marshall</td>
</tr>
<tr>
<td>4:50 PM</td>
<td><strong>Discussion:</strong> Roadmap for radiobiology</td>
<td>Dr Giuseppe Schettino</td>
</tr>
</tbody>
</table>
Day 2: 2nd October 2015

Session 3: Imaging and range verification

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 AM</td>
<td><strong>Invited talk:</strong> <em>The state of the art in imaging technology for radiotherapy</em></td>
<td>Prof Phil Evans</td>
</tr>
<tr>
<td>9:45 AM</td>
<td>A calibration study for an in-vivo proton therapy range verification technique for pediatric craniospinal irradiation using time resolved diode dosimetry</td>
<td>Allison Toltz</td>
</tr>
<tr>
<td>10:05 AM</td>
<td>Quantifying inter-fraction range uncertainty for proton therapy using daily MVCT</td>
<td>Dr Stacey McGowan</td>
</tr>
<tr>
<td>10:25 AM</td>
<td><strong>Coffee</strong></td>
<td></td>
</tr>
<tr>
<td>10:45 AM</td>
<td>Single-detector proton radiography for patient setup</td>
<td>Dr Paul Doolan</td>
</tr>
<tr>
<td>11:05 AM</td>
<td>Treatment verification in hadron therapy utilizing protons from annihilation and nuclear deexcitation</td>
<td>Dr Stephan Helmbrecht</td>
</tr>
<tr>
<td>11:25 AM</td>
<td><strong>Discussion:</strong> Roadmap for imaging + range verification</td>
<td>Prof Gary Royle</td>
</tr>
<tr>
<td>12:00 PM</td>
<td><strong>Lunch &amp; poster session</strong></td>
<td></td>
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</tbody>
</table>

Session 4: Patient verification and dosimetry

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 PM</td>
<td><strong>Invited talk:</strong> <em>Update on PRaVDA</em></td>
<td>Dr Tony Price</td>
</tr>
<tr>
<td>1:45 PM</td>
<td>Simulation of the secondary radiation field at proton therapy facilities</td>
<td>B Lutz</td>
</tr>
<tr>
<td>2:05 PM</td>
<td>Ion recombination in scanned particle beams</td>
<td>Dr Hugo Palmans</td>
</tr>
<tr>
<td>2:25 PM</td>
<td>Proton Calorimetry: From SuperNEMO to Proton Therapy</td>
<td>Dr Simon Jolly</td>
</tr>
<tr>
<td>2:45 PM</td>
<td><strong>Discussion:</strong> Roadmap for patient verification &amp; dosimetry</td>
<td>Richard Amos</td>
</tr>
<tr>
<td>3:20 PM</td>
<td><strong>End of workshop:</strong> closing remarks</td>
<td></td>
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<tr>
<td>3:30 PM – 4:30 PM</td>
<td>Closed session for PPRIG members</td>
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