

The Clatterbridge Cancer Centre   
NHS Foundation Trust

A course on  
**Radiobiology & Radiobiological  
Modelling in Radiotherapy**



28 category-1 CPD points  
(Royal College of Radiologists UK) awarded

**22 - 26 March 2015**

Leverhulme hotel  
Port Sunlight, Wirral, UK.

See also [www.clatterbridgecc.nhs.uk](http://www.clatterbridgecc.nhs.uk)

# PROGRAMME

(final)

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## FACULTY

<b>Dr. Colin Baker</b>	<b>Physics dept., Clatterbridge Cancer Centre (CCC) and Dept. of Physics, Liverpool Univ.</b>
<b>Professor Michael Brada</b>	<b>Radiotherapy dept. CCC, and Liverpool Univ.</b>
<b>Dr. Antony Carver</b>	<b>Research Physicist, CCC</b>
<b>Professor J. Don Chapman</b>	<b>West Kelowna, BC (formerly Head of Radiobiology, Fox-Chase CC, Philadelphia)</b>
<b>Professor Roger Dale</b>	<b>Imperial College, London</b>
<b>Dr. Charles Deehan</b>	<b>King's College, London</b>
<b>Dr. John Fenwick</b>	<b>CRUK/MRC Oxford Inst. for Radiation Oncology</b>
<b>Dr. Tiziana Rancati (guest speaker)</b>	<b>Prostate Cancer Program Fondazione IRCCS Istituto Nazionale dei Tumori Milan</b>
<b>Dr. Andrzej Kacperek</b>	<b>Head of Cyclotron Unit CCC</b>
<b>Dhvanil Karia</b>	<b>PhD student, Physics dept. CCC</b>
<b>Dr. Geoff Lawrence</b>	<b>(formerly Head of Imaging Physics, CCC)</b>
<b>Professor Trevor McMillan</b>	<b>Keele university</b>
<b>Professor Alan E. Nahum</b>	<b>Head of Physics Research CCC</b>
<b>Dr. Mike Partridge</b>	<b>CRUK/MRC Oxford Inst. for Radiation Oncology</b>
<b>Dr. Marco Schwarz</b>	<b>Proton Therapy Centre, Trento, Italy</b>
<b>Dr. Navita Somaiah</b>	<b>Institute of Cancer Research and Royal Marsden Hospital, Sutton</b>
<b>Dr. Isabel Syndikus</b>	<b>Consultant in Clinical Oncology CCC</b>
<b>Johan Uhrdin</b>	<b>RaySearch AB, Stockholm</b>
<b>Dr. Julien Uzan</b>	<b>Research physicist, Karolinska university hospital, Stockholm</b>
<b>Professor Catharine West</b>	<b>University of Manchester</b>

## Day Zero: Sunday 22<sup>nd</sup> March

17.00-20.00 (approx)	'Ice-Breaker', Leverhulme Hotel Drinks, nibbles, social interactions!
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## Day ONE: Monday 23<sup>rd</sup> March

08.30 - 09.25	<b>REGISTRATION</b>	(coffee)
09.40	WELCOME to CLATTERBRIDGE	Doug Errington
09.50	COURSE INTRODUCTION (1- and 4-day versions)	Alan Nahum
10.00 – 10.40	INTRODUCTION to RADIOBIOLOGY	Catharine West
10.45 – 11.35	Why QUANTITATIVE RADIOBIOLOGY? Does the LINEAR-QUADRATIC (L-Q) MODEL satisfy our needs?	Don Chapman
11.35 – 11.55	Coffee	
11.55 – 12.45	IONISING RADIATION (IR)-INDUCED DNA DAMAGE and REPAIR	Trevor McMillan
12.50 – 13.20	ISO-EFFECT CALCULATIONS in RADIOTHERAPY	Charles Deehan
13.20 – 14.20	Lunch	
14.20 – 15.10	The BIOPHYSICAL BASIS of the L-Q MODEL	Don Chapman
15.15 – 15.50	TUMOUR CELL KINETICS; OPTIMUM FRACTIONATION	John Fenwick
15.50 – 16.10	Coffee	
16.10 – 16.55	RADIOBIOLOGICAL MODELLING of BRACHYTHERAPY and HIGH-LET THERAPY	Roger Dale
17.00 – 17.30	COMPENSATING for 'GAPS' in RADIOTHERAPY TREATMENT SCHEDULES	Charles Deehan

	<b>END OF 1-DAY 'REFRESHER'</b>  Computer Lab opens (4-day course) LQ-survivor	Julien Uzan Dhvanil Karia
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## Day TWO: Tuesday 24<sup>th</sup> March

<b>08.30 – 09.20</b>	<b>How can we QUANTIFY the CHEMOTHERAPY CONTRIBUTION to RADIO-CHEMOTHERAPY TREATMENT (RCT)?</b>	<b>Roger Dale</b>
<b>09.25 – 10.15</b>	<b>INDUCTION of (SECOND) CANCERS by RADIATION</b>	<b>Geoff Lawrence</b>
<b>10.15 – 10.35</b>	<b>Coffee</b>	
<b>10.35 - 11.20</b>	<b>RADIOBIOLOGICAL ASPECTS of HEAVY-PARTICLE RADIOTHERAPY</b>	<b>Andrzej Kacperek</b>
<b>11.25 – 12.10</b>	<b>RADIOTHERAPY of NON-SMALL-CELL LUNG CANCER – where next?</b>	<b>Michael Brada</b>
<b>12.15 – 13.00</b>	<b>RADIOBIOLOGICAL CONSIDERATIONS in BREAST RADIOTHERAPY</b>	<b>Navita Somaiah</b>
<b>13.00 – 14.00</b>	<b>Lunch</b>	
<b>14.00 – 14.50</b>	<b>PROSTATE RADIOTHERAPY – RADIOBIOLOGICAL CONSIDERATIONS</b>	<b>Isabel Syndikus</b>
<b>15.00 – 16.30</b>	<b>Visit to Lady Lever Gallery (optional)</b>	
<b>15.00 – 18.00</b>	<b>COMPUTER LAB LQ-survivor; RayStation; BioSuite (“advanced” students)</b>	<b>Julien Uzan, Dhvanil Karia, Johan Uhrdin</b>
<b>16.00 – 16.20</b>	<b>Coffee</b>	
<b>19.00</b>	<b>Course Dinner</b>	<b>Sunlight Restaurant 2c Bromborough Road Bebington CH63 7RE</b>

## Day THREE: Wednesday 25<sup>th</sup> March

<b>08.30 – 08.50</b>	<b>INTRODUCTION to (Radio)BIOLOGICAL MODELS in RADIOTHERAPY</b>	<b>Alan Nahum</b>
<b>08.55 – 09.40</b>	<b>PREDICTING the INCIDENCE of NORMAL-TISSUE COMPLICATIONS: MATHEMATICAL MODELS for NTCP</b>	<b>Colin Baker</b>
<b>09.45 – 10.30</b>	<b>TUMOUR CONTROL PROBABILITY (TCP) MODELS</b>	<b>Alan Nahum</b>
<b>10.30 – 10.50</b>	<b>Coffee</b>	
<b>10.50 – 11.40</b>	<b>From QUANTEC onwards: UPDATE on DOSE- VOLUME PREDICTORS and NTCP MODEL PARAMETERS</b>	<b>Marco Schwarz</b>
<b>11.45 – 12.25</b>	<b>USING and INTERPRETING DOSE-VOLUME MODELS – STATISTICAL CONSIDERATIONS</b>	<b>John Fenwick</b>
<b>12.25 – 13.25</b>	<b>Lunch</b>	
<b>13.25 – 14.10</b>	<b>APPLICATIONS of TCP MODELLING</b>	<b>Alan Nahum</b>
<b>14.15 – 15.00</b>	<b>PREDICTIVE MODELS of PATIENT-REPORTED TOXICITY after HIGH-DOSE RT for PROSTATE CANCER: the ITALIAN EXPERIENCE of MULTI- CENTRIC PROSPECTIVE TRIALS</b>	<b>Tiziana Rancati (Guest speaker)</b>
<b>15.00 – 15.20</b>	<b>Coffee</b>	
<b>15.20 – 15.50</b>	<b>INTRODUCTION to BioSuite, BioFit, RayStation</b>	<b>Julien Uzan Anthony Carver Johan Uhrdin</b>
<b>15.55 – 18.00 (approx.)</b>	<b>COMPUTER LAB BioSuite, BioFit, RayStation</b>	<b>Julien Uzan, Antony Carver, Dhvanil Karia Johan Uhrdin</b>
<b>16.00 – 18.00</b>	<b>Poster viewing</b>	
	<b>Free Evening Computer Lab Open</b>	

## Day FOUR: Thursday 26<sup>th</sup> March

08.30 – 09.20	Use of EUD, TCP, NTCP for INDIVIDUALISING and OPTIMISING TREATMENT PLANS	Marco Schwarz
09.25 – 11.00	<b>COMPUTER LAB</b> RayStation; BioSuite; BioFit	Johan Uhrdin Julien Uzan, Dhvanil Karia, Anthony Carver
10.00 - 10.20 (approx)	<b>Coffee</b>	
11.00 - 11.40	FUNCTIONAL IMAGING in RADIOTHERAPY	Mike Partridge
11.45 – 12.25	The GENOMICS REVOLUTION and RADIOTHERAPY	Catharine West
≈ 12.30	<b>Lunch</b>	<i>Everybody !</i>
	(return of evaluation forms – thanks!)  Close of the Course	

***Thank you for coming – have a safe journey home.***