Sunday 16 September 2018

8:20-8:30 Welcome: Mark Oldham, Fang-Fang Yin, Ying Chiang Huang

8:30-10:30 Session: Clinical Challenges and Opportunities
   Moderators – Mark Oldham and Fang-Fang Yin

8:30-8:55 Invited Review – Dosimetry challenges and opportunities in modern RT
   Dan Low PhD,
   Department of Radiation Oncology, UCLA, California, USA

8:55-9:20 Invited Review – Medical Physics and Clinical Dosimetry in China
   Jianrong Dai PhD,
   Department of Radiation Oncology, Cancer Institute, Beijing, China

9:20-9:35 Evaluation of a Clinical Dose Accumulation Algorithm Using Deformable Gel Dosimetry
   Charles K Matrosic1, Shannon Holmes, Bryan Bednarz, and Wesley Culberson
   1Department of Medical Physics, School of Medicine and Public Health, University of Wisconsin – Madison, WI

9:35-9:50 Investigation of lung tumour peripheral doses using normoxic polymer gel and film dosimetry techniques
   A Venning1, M Mundayadan Chandroth, B Chick, B Waller and C Morgan
   1Mid-North Coast Cancer Institute, Port Macquarie Base Hospital, Port Macquarie, NSW, Australia

9:50-10:05 Feasibility of radiosurgery dosimetry using NIPAM 3D dosimeters and x-ray CT
   Justus Adamson1, Jaclyn Carroll, Michael Trager, Paul Yoon, Jacob Kodra, Fang-Fang Yin, Evan Maynard, Michelle Hilt, Mark Oldham, Andrew Jirasik
   1Department of Radiation Oncology, Duke University Medical Center, Durham, North Carolina, USA

10:05-10:20 Surface Dose Accuracy in VMAT Head & Neck Radiation Treatment Using Bolus
   KM Alexander1, J Gooding, LJ Schreiner and T Olding
   1Department of Physics, Queen’s University, Kingston, Ontario, Canada

10:20-10:50 Tea/Coffee Break

10:50-12:00 Session: Dosimetry and MRI Linacs
   Moderators – Yves De Deene and Geof Ibbott

10:50 – 11:15 Invited Review – Dosimetry and MRI Linacs I
   Simon Doran PhD,
   Institute of Cancer Research, Sutton, Surrey, UK

11:15 - 11:30 Polymer gel-based measurements of the isocenter accuracy in an MR-LINAC
   S Dorsch7, P Mann, A Elter, A Runz, S Klüter and C P Karger
   1Department of Medical Physics in Radiation Oncology, German Cancer Research Center (DKFZ), Heidelberg, Germany
11:30-11:45  Dose rate and fractionation dependence of methacrylic acid based polymer gels using optical and MRI techniques
Hannah J. Lee¹, Yvonne Roed, Geoffrey S. Ibbott
¹Department of Radiation Physics, UT MD Anderson Cancer Center, Houston, TX

11:45-12:00  Characterization of small PRESAGE® samples for measurements near the dosimeter edges
Filipa Costa¹, Simon Doran, John Adamovics, Simeon Nill, Ian M Hanson and Uwe Oelfke
¹Joint Department of Physics, The Institute of Cancer Research and The Royal Marsden NHS Foundation Trust, London, UK

12:00 – 1:00pm Lunch Break

1:00-3:00pm  Session: Dosimetry and MRI Linacs II
Moderators – Dan Low and Andy Beavis

1:00 – 1:25  Invited Review – The MD Anderson MRI Linac Experience
Geoff Ibbott PhD,
MD Anderson Cancer Center, Houston, TX

1:25 – 1:50  Invited Review – Dosimetry requirements and MRI Linacs II
Urszula Jelen PhD,
Medical Physics Department, Ingham Institute for Applied Medical Research, Liverpool, NSW, Australia

1:50-2:05  Evaluation of a lung-equivalent gel dosimeter for MR image-guided radiation therapy
BA McDonald¹, HJ Lee, and GS Ibbott
¹Department of Radiation Physics, UT MD Anderson Cancer Center, Houston, TX

2:05-2:20  Polymer gel dosimetry in the presence of a strong magnetic field
Y Roed¹, L Pinsky, and G Ibbott
¹Department of Physics, University of Houston, Houston, TX, USA

2:20-2:35  MRI-based iPAGAT polymer gel dosimetry using fast recovery spin echo sequences
K Fujino¹, K Ono, S Hayashi, K Hioki, M Miyazawa, Y Akagi and Y Hirokawa
¹High-precision Radiotherapy Center, Hiroshima Heiwa Clinic, Hiroshima, Japan

2:35 – 3pm BREAKOUT ACTIVITY!

3:00 – 3:20  Tea/Coffee Break

3:20-5:00  Session: Optical and Cherenkov Dosimetry (60mins: 4-5)
Moderators – Kevin Jordan and Simon Doran

3:20 – 345  Invited Review – Dosimetry from Cherenkov Imaging
Petr Bruza PhD,
Thayer School of Engineering, Dartmouth College, NH, USA
3:45-4:00 Cherenkov imaging of total skin electron irradiation (TSEI)
Timothy C. Zhu¹,
¹Dept. of Radiation Oncology, University of Pennsylvania, Philadelphia, PA, USA

4:00-4:15 Measurement of build-up region dose with optical cone-beam computed tomography Scanner
Sarah Garisto¹, Kevin Jordan
¹London Regional Cancer Program, London Health Sciences Centre, Canada

4:15-4:30 Feasibility study of a dry optical CT scanner using aspherical lenses
Yves De Deene,
School of Engineering, Macquarie University, North Ryde, Sydney, Australia

4:30-4:45 Preliminary characterization of the Duke Integrated-Lens Optical-CT scanner (DIOS)
Cielle Collins¹, Suk Whan Yoon, Jacob Kodra, John Adamovics, & Mark Oldham
¹Duke University, Durham, North Carolina, USA

4:45-5:00 Cause of cupping artifacts from radiochromic micelle gel dosimeters used in optical CT scanner measurement
Takaoki Takanashi¹, Kazuya Hayashi, Mikio Nemoto, Hiraku Kawamura, Shin-ichiro Hayashi and Hiroaki Gotoh
¹3D Gel Dosimeter Research Laboratory, Cluster for Science, Technology and Innovation Hub, Hirosawa, Wako, Saitam, Japan

Monday 17 September 2018

8:00 – 8:30 Invited Technical Review (Refresher): Fundamentals of 3D Dosimetry
J Schreiner PhD,
Cancer Center of South Eastern Ontario, Kingston, ON, Canada

8:30-10:30 Session: Small Fields, Radiosurgery and Pre-Clinical Irradiators
Moderators – Sven Back and John Schreiner

8:30 – 8:55 Invited Review – Pre-clinical and Small Field Dosimetry
Cheng Shie Wuu PhD,
Department of Radiation Oncology, Columbia University, New York, USA

8:30 – 9:20 Invited Review - SRS and SBRT and Advanced Dosimetry Requirements
Mark Oldham PhD,
Duke University Medical Center, Durham, USA

9:20-9:35 Verification of stereotactic cranial radiotherapy treatments with MR-based gel dosimeters: practical aspects
Filipa Costa¹, Evanthia Kousi, Anne Gasnier, Emma Wells, Caroline Lamb, Maria A Schmidt and Rollo Moore
¹Joint Department of Physics, The Institute of Cancer Research and The Royal Marsden NHS Foundation Trust, London, UK

9:35-9:50 Assessing CBCT-based patient positioning accuracy on the Gamma Knife IconTM via Presage® 3D absolute dosimetry
Andy Y. Xu¹, Yi-Fang Wang, John Admovics, and Cheng-Shie Wuu
¹Department of Radiation Oncology, Columbia University, New York, USA
9:50-10:05  Initial Commissioning Measurements of Respiratory Gated Liver VMAT Stereotactic Ablative Body Radiotherapy
KM Alexander1, A Kerr and T Olding
1Department of Physics, Queen’s University, Kingston, Ontario, Canada

10:05 – 10:20  BREAKOUT ACTIVITY!
The utility of 3D Dosimetry for small fields, SRS/SBRT and Pre-clinical

10:20-10:50  Tea/Coffee Break

10:50-12:00  Session: Chemical Dosimeters I
Moderators – Cheng Shie Wuu and Yves De Deene

10:50 – 11:15  Invited Review - Chemical Dosimetry
John Adamovics PhD,
Rider University, NJ, USA

11:15 – 11:30  Optimization for stability of the deformable FlexyDos3D radiation dosimeter and curing effects
M J Wheatley1, A S Balatinac, J T Booth and Y De Deene
1School of Engineering, Macquarie University, North Ryde, Sydney, Australia

11:30 - 11:45  Influence of the components on the dose response of a radiochromic gel dosimeter based on a polyvinyl alcohol - iodide complex
Shin-ichiro Hayashi1), Kaoru Ono, Keisuke Fujino, Sachie Fujimoto
1Department of Clinical Radiology, Faculty of Health Sciences, Hiroshima International University, Higashi-Hiroshima, Hiroshima, Japan

11:45 - 12:00  Preliminary investigation of a reusable radiochromic sheet for radiation dosimetry
Cielle Collins1, Jacob Kodra, Suk Whan Yoon, Robert Coakley, John Adamovics, Mark Oldham
1Duke University, Durham, North Carolina, USA

12:00 – 1:00pm  LUNCH BREAK

1:00-2:30  Session: Chemical Dosimetry II
Moderators – Mark Oldham and John Adamovics

1:00-1:15  Benzothiazole-containing tetrazolium salts as radiochromic indicators in gel dosimetry
Kalin I Penev1 and Kibret Mequanint
1Department of Chemical and Biochemical Engineering, the University of Western Ontario, London, ON, Canada

1:15-1:30  Development of a reusable PVA-GTA-I gel dosimeter for 3D radiation dose assessments
J Taño1, S Hayashi, S Hirota, CA Gonzales, H Yasuda
1Department of Radiation Biophysics, Research Institute for Radiation Biology and Medicine, Hiroshima University, 1 Kasumi 2-3, Minami-ku, Hiroshima, Japan

1:30-1:45  Development of an experimental 3-D tool based on radiochromic films to determine normal tissue doses in external radiotherapy
J Colnot1, G Garnier, S Zefkili, J-L Dumas, R Gschwind, C Huet
1:45 – 2:00 Initial performance evaluation of a 3D gel dosimeter based on modified tetrazolium compounds ClearView2

Rubin Hazarika¹, Kalin I Penev, Kibret Mequanint and Kevin Jordan
¹London Regional Cancer Program, London Health Sciences Centre, London, Canada

Afternoon and evening

SOCIAL EXCURSION TO WATERTOWN

Tuesday 18 September 2018

8:00 – 8:30 Invited Technical Review (Refresher): Making 3D Dosimeters
Kevin Jordan and Yves De Deene
London Regional Cancer Program, ON, Canada and Macquarie University, Sydney, Australia

8:30-10:30 Session: Heavy Particles and New Dosimetry Systems
Moderators – Geoff Ibbott and Sha Chang

8:30 – 8:55 Invited Review: Advanced Dosimetry for Heavy Ion Therapy
Jiade Lu PhD, Professor, Shanghai Proton and Heavy Ion Center (SPHIC), Fudan University Shanghai Cancer Center (FUSCC), CHINA

8:55 – 9:20 Invited Review: Proton Therapy and the potential for 3D Dosimetry
Sam Beddar PhD, Professor and Chief of Research, Department of Radiation Physics, UT MD Anderson Cancer Center, TX USA

9:20-9:35 Comparison of low dose proton and photon irradiation induced polymerization processes in advanced nMAG gels using Raman spectroscopy
N Šeperienė¹ and D Adlienen
¹Physics Department, Kaunas University of Technology, Studentu St.50, Kaunas, LT51368 Lithuania

9:35-9:50 An Investigation of Dosimetric Accuracy of A Novel PRESAGE Radiochromic Sheet and Its Clinical Applications
Yi-Fang Wang¹, Kevin Liu, John Adamovics, Cheng-Shie Wu
¹Department of Radiation Oncology, Columbia University Medical Center, New York, NY

9:50-10:05 Clear micelle gel dosimeter with nanoclay
Kazuya Hayashi¹, Mikio Nemoto, Takaoki Takanashi, Yoosuk Kang, Haruki Togo, Jun'ichi Kotoku, Takenori Kobayashi, Shin-ichiro Hayashi and Hiroaki Gotoh
¹Department of Chemistry and Life Science, Graduate School of Engineering Science, Yokohama National University, Yokohama, Kanagawa, Japan

10:05-10:20 Basic characteristics of an AQUAJORIT®-based VIPET polymer gel dosimeter
Mikio Nemoto¹, Ayumi Oe, Tomokazu Kotani, Daniel Antonio Sahade, and Toshimasa Hamada
10:20-10:50  
*Tea/Coffee Break*

**10:50-12:00  Session: New Dosimetry Systems**  
**Moderators – Kevin Jordan and Sam Beddar**

10:50-11:05  
**Novel Dual-Wavelength Optical-CT Imaging Method for Gel Dosimeter Readout**  
Yi Du¹, Xiangang Wang, Xincheng Xiang, Yves, De Deene  
¹Key Laboratory of Carcinogenesis and Translational Research (Ministry of Education/Beijing), Department of Radiotherapy, Peking University Cancer Hospital & Institute, Beijing, China

11:05-11:20  
**Evaporation and diffusion of chloroform with the deformable FlexyDos3D radiation dosimeter**  
*M J Wheatley¹, J T Booth and Y De Deene*  
¹School of Engineering, Macquarie University, North Ryde, Sydney, Australia

11:20-11:35  
**Radiation induced degradation of rhodamine 6G and 7-Diethylamino-4-methylcoumarin in nano-clay gel for use in dosimeter**  
*T. Maeyama¹, T. Takanashi*  
¹Department of Chemistry, School of Science, Kitasato University, Kanagawa, Japan

11:35-11:50  
**Gel dosimetry measurement of dose enhancement bismuth-based nanoparticles in radiation therapy**  
*Azimeh Rajaee¹, Lingyun Zhao², Shi Wang¹, Yaqiang Liu¹*  
¹Institute of Medical Physics and Engineering, Department of Engineering Physics, Tsinghua University, Beijing, China

11:50 – 12:10  
**BREAKOUT ACTIVITY !**

12:10 – 1:00pm  
**LUNCH BREAK**

1:00-3:00  
**Session: Brachytherapy and Motion**  
**Moderators – John Schreiner and Ben Mijnheer**

1:00 – 1:25  
**Invited Review: Dosimetry and Motion Management**  
*Sven Back PhD*,  
Associate Professor, Medical Radiation Physics, Lund University, Sweden

1:25-1:30  
**Validation of an Ultrasound-Guided Prostate HDR Brachytherapy Dose Delivery**  
*T Olding¹, KM Alexander, C Joshi and LJ Schreiner*  
¹Department of Physics, Queen’s University, Kingston, Ontario, Canada

1:30-1:45  
**High dose rate brachytherapy three-dimensional gel dosimetry using optical computed tomography readout**  
*DA DeVries¹, C Joshi and LJ Schreiner*  
¹Department of Physics, Queen’s University, Kingston, Ontario, Canada
1:45-2:00 Dose verification of dynamic MLC-tracked radiotherapy using small PRESAGE® 3D dosimeters and a motion phantom
Filipa Costa, Martin J Menten, Simon Doran, John Adamovics, Ian M Hanson, Simeon Nill and Uwe Oelfke
1Joint Department of Physics, The Institute of Cancer Research and The Royal Marsden NHS Foundation Trust, London, UK

2:00-2:15 Dose reconstruction including dynamic six-degree of freedom motion during prostate radiotherapy
C G Muurholm, T Ravkilde, S Skouboe, T Eade, D T Nguyen, J Booth, P J Keall and P R Poulsen
1Department of Physics and Astronomy, Aarhus University, Denmark

2:15-2:30 Development of an experimental 3-D tool based on radiochromic films to determine normal tissue doses in external radiotherapy
J Colnot, G Garnier, S Zefkili, J-L Dumas, R Gschwind, C Huet
1Institut de Radioprotection et de Sûreté Nucléaire (IRSN), Service de Recherche en Dosimétrie, Laboratoire de Dosimétrie des Rayonnements Ionisants, Fontenay-aux-Roses, France

2:30-2:45 Deformable gel dosimeter containing an X-ray visible dose sensitive target region
C J Watson, A U Yeo, J R Supple, M Geso, T Kron and R D Franich
1School of Science, RMIT University, Melbourne, Australia

2:45 – 3:05pm Tea/Coffee Break

3:05 – 4:00 Session: Dosimetry and Education
Moderators – Sven Back and Mark Oldham

Sha Chang PhD, Professor, UNC School of Medicine, Chapel Hill, NC, USA

Andy Beavis PhD, Head of Radiation Physics, Castle Hill Hospital, Cottingham, UK

3:35 – 3:50 Teaching the principles of X-ray CT and SPECT using optical CT, glowsticks and a scaled anthropomorphic phantom.
Yves De Deene, School of Engineering, Macquarie University, North Ryde, Sydney, Australia [WIP]

3:50 – 4:05 How important is the dose rate sensitivity of 2D and 3D radiation dosimeters?
Yves De Deene, School of Engineering, Macquarie University, North Ryde, Sydney, Australia

4:15 – 5:15 pm WORKSHOPS Kevin Jordan and John Schreiner
Wednesday 19 September 2018

8:00 – 8:30 Invited Technical Review (Refresher): Dosimetry Read-Out Techniques
Simon Doran and Andy Jirasek

8:30-10:30 Session: Dosimetry with EPIDS and end-to-end QA (70 mins: 4-5 talks)
Moderators – Andy Beavis and Petr Bruza

8:30 – 8:55 Invited Review: EPIDs and QA of advanced treatments
Ben Mijnheer PhD, FIOMP,
DEPT of Radiation Oncology, Netherlands Cancer Institute, Amsterdam , NETHERLANDS

8:55 – 9:20 Invited Review: IGRT 3D & QA: End to end QA IGRT
John Schreiner, PhD,
Chief Medical Physics, Cancer Center of Southeastern Ontario, Kingston, ON CANADA

9:20-9:35 EPID-based beam matching for linear accelerators using pixel sensitivity map
Baozhou. Sun1, Sreekrishna M. Goddu, Sasa Mutic, Bin Cai
1Department of Radiation Oncology, Washington University, St. Louis, MO, USA

9:35-9:50 Quantitative evaluation of transmission EPID daily imaging on a Halcyon Linac
P Jin1, Y H Xie, M Huang, T C. Zhu
1Department of Radiation Oncology, University of Pennsylvania, Philadelphia, PA USA

9:50-10:05 A sliding-window approach for improved VMAT dose calculation accuracy
J G Li 1, J-Y Park, N J Potter, B Lu, G Yan, C-R Liu and H N Alahmad
1Department of Radiation Oncology, University of Florida College of Medicine, Gainesville, FL USA

10:20-10:50 Tea/Coffee Break

10:50-12:10 Session: Various Topics II
Moderators – Cheng Shie Wuu and Simon Doran

10:50-11:05 Dosimetric Characteristics of Various Popular Multi-Leaf Collimators
Shidong Li,
Department of Radiation Oncology, Fox Chase Cancer Center at Temple University Hospital, Philadelphia, PA [WIP]

11:05-11:20 Multi-scale dosimetry with multi-scale Chinese reference phantoms
Rui Qiu1, Zhen Wu, Chunyan Li, Li Ren, Wenjing Wang, Ruiyao Ma, An kang Hu, Hongyu Zhu, Junchi Li.
1Department of Engineering Physics, Tsinghua University, Beijing, China

11:20-11:35 Breast shape 3-D PRESAGE® phantom as radiation dosimeter
K Iqbal1, K A Gifford, R G Lafrratta, S A Buzdar and G S Ibbott
1Clinical and Radiation Oncology Department, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan
A benchtop UV irradiator for 3D dosimetry laboratories with dosimetric considerations in a spinning NMR test tube

Yves De Deene
School of Engineering, Macquarie University, North Ryde, Sydney, Australia

Concluding Remarks, John Schreiner and Mark Oldham