Welcome from the Chair

Dear Colleagues and Friends,

The primary aims of the Mini-Micro-Nano Dosimetry and its Applications (MMND) workshop were to consolidate efforts to address development of solid state microdosimetry instrumentation and its applications in medicine and space, and to improve prostate cancer treatments through advanced quality assurance instrumentation and methods.

Since the founding the MMND (former MMD) - IPCT workshop, it has become an international forum for the discussion of advanced QA dosimetry instrumentation for radiation therapy and space, and advanced technologies for prostate cancer treatment. The fact that radiation therapy became more accurate for cancer treatment with the introduction of IMRT, IGRT, RapidArc, SBRT, innovative brachytherapy and synchrotron MRT, the demand for sophisticated real time and high temporal and spatial resolution, down to microns dosimetry methods and instrumentation for QA is increasing. Continuous growth and improvements of charged particle therapy technology and its spread through the World during the last decade demands a better understanding of RBE of ions and further development of computational and experimental micro–and nano-dosimetry for ions as well as new methods and instrumentation for proton and heavy ion radiotherapy QA. It is also related to new methods of radiotherapy delivery using fast and high power laser pulses for charged particle acceleration.

MMND 2014 is reflecting all these new challenges in radiotherapy and space dosimetry with a continuing consideration of theoretical and experimental nanoparticle science for the improvement of efficacy of radiation therapy and radioprotection of healthy tissue. I wish you productive and pleasant time during MMND IPCT 2014 in a beautiful Pacific Sheraton Mirage resort and I am sure each our workshop is a next step in improvement of cancer treatment with radiation.

Anatoly Rozenfeld
General Chair MMND IPCT 2014
Prof Reinhard Schulte
Reinhard Schulte is Professor of Radiation Medicine in the School of Medicine of Loma Linda University, and works as Translational Researcher on proton and ion therapy related technology and clinical developments in the James M. Slater Proton Treatment and Research Center, Department of Radiation Medicine, Loma Linda University Medical Center. He received his graduate degree in Physics (Diploma) from Dortmund University, Germany and his Doctorate in Medicine (Dr. med., summa cum laude) from the University of Cologne, Germany. He is Principal Investigator on an NIH-funded project to develop proton CT and participates in two large European Research Consortia related to proton therapy research. Dr. Schulte also has 25 years of experience in clinical proton therapy and is licensed physician and board certified in radiation oncology and radiology in the United States and Germany.

Dr Michael Scholz
Dr. Michael Scholz is head of the modelling group in the Biophysics Department at the GSI Helmholtz Centre for Heavy Ion Research in Darmstadt. He is responsible for the development of the Local Effect Model, a biophysical model that is used for biological optimization in treatment planning for ion beam tumor therapy. He is working in the field of radiation biophysics since 1987 and was involved in the pilot project for carbon ion therapy performed at GSI between 1997 and 2008, where about 440 patients have been treated.
Dr Taiga Yamaya

Taiga Yamaya, Ph. D, is a Team Leader of Imaging Physics Team at National Institute of Radiological Sciences (NIRS) in Japan. His research interests are next generation positron emission tomography (PET) instrumentations as well as developments of radiation detectors and image reconstruction algorithms. In Yamaya's laboratory, using their core technologies for depth-of-interaction (DOI) measurement, they are developing a novel DOI detector "X'tal Cube" and a new equipment concept of "OpenPET" for joint PET - therapy imaging.

Dr Hsiao-Ming Lu

Hsiao-Ming Lu, Ph.D. is the Director of Clinical Physics and Associate Professor in the Department of Radiation Oncology at Harvard Medical School and Massachusetts General Hospital, Boston, MA, USA. As a long time practitioner of radiotherapy physics, his main focus has been the general improvement of external beam therapy by photon or proton beams, in terms of treatment techniques, quality assurance, and workflow/efficiencies. His recent research interests include the management of proton beam range uncertainty by the means of in-vivo dosimetry and single detector based proton radiography/tomography.
Prof Mauro Carrara

Mauro Carrara works as Medical Physicist at the Department of Diagnostic Imaging and Radiotherapy at National Cancer Institute of Milano (Italy) where he is responsible for brachytherapy physics. He conducts research in several fields concerning quality control and dosimetry in high dose rate brachytherapy and the application of US or MR imaging for treatment planning. He has been invited to several national and international conferences to lecture on these subjects. Being part of the multidisciplinary Prostate Program of his Institution, he is as well involved in the development of non-linear models for acute and late toxicity prediction and the study of highly hypofractionated treatment schemes in prostate high dose radiotherapy. In 2006, he was officially awarded by the Major of Milan with the International Young Researcher Award “Amici di Milano”. He is a member of the European Society for Therapeutic Radiology and Oncology (ESTRO), American Brachytherapy Society (ABS) and Italian Association of Medical Physics (AIFM). For ESTRO and AIFM he was invited to conduct several courses in the fields of radiotherapy physics and mathematical non-linear models for pattern classification. Since 2007 he is Professor at the Department of Medicine and Surgery of the University of Milano.
Day 1
Monday, 20th October

8:00 Registration/Coffee

8:20 Welcome address (Anatoly Rozenfeld and Paolo Colautti)

Session 1: Synchrotron Microbeam Radiation Therapy - Overview
Chairs: Jean-Francois Adam and Michael Lerch

8:30 Invited Speaker 1
Daniel Häusermann
Australian Synchrotron, Victoria, Australia
THE AUSTRALIAN SYNCHROTRON IMAGING AND MEDICAL BEAMLNE: UP AND RUNNING, WHERE TO?

9:00 Invited Speaker 2
Elke Bräuer-Krisch
European Synchrotron Radiation Facility, Grenoble, France
THE CURRENT STATUS OF THE MRT VETERINARY TRIAL AT THE ESRF AND FUTURE PERSPECTIVES

9:30 Invited Speakers 3
Michael Lerch & Marco Petasecca (on behalf of 3DMiMiC)
Centre for Medical Radiation Physics, University of Wollongong, Australia
SILICON MINIDOSIMETERS AND REALTIME MONITORS FOR SYNCHROTRON MICROBEAM RADIATION THERAPY

10:00 Morning Tea

Session 2: Synchrotron MRT-Dosimetry-1
Chairs: Elke Bräuer-Krisch and Daniel Häusermann

10:30 Talks
10:30 Jean-Francois Adam
Grenoble Institut des Neurosciences - Université Joseph, Grenoble, France
MEDICAL PHYSICS ISSUES IN CONTRAST-ENHANCED SYNCHRONTRON STEREOTACTIC Radiotherapy Clinical Trials

10:45 Andrew Stevenson
Imaging and Medical Beamline, Australian Synchrotron, Victoria, Australia
QUANTIFYING RECOMBINATION EFFECTS FOR FREE-AIR ION CHAMBERS AT THE IMAGING & MEDICAL BEAMLNE, AUSTRALIAN SYNCHROTRON
11:00  Christopher Poole  
University of Melbourne, Department of Obstetrics & Gynaecology, Royal Women’s Hospital, Melbourne  
**A HIGH RESOLUTION IN-BEAM MONITOR FOR MICROBEAM RADIOTHERAPY**

11:15  Chris Hall  
Imaging and Medical Beamline, Australian Synchrotron, Victoria, Australia  
**RADIOCHROMIC FILM DENSITOMETRY FOR MICROBEAM X-RAY IRRADIATION**

11:30  Iwan Cornelius  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
**LARGE AREA THIN SILICON DETECTORS FOR ONLINE BEAM MONITORING IN MICROBEAM RADIATION THERAPY**

11:45  Pauline Fournier  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
**EXPERIMENTAL DETERMINATION OF THE ENERGY DEPENDENCE OF A SILICON SINGLE STRIP DETECTOR DEDICATED TO MICROBEAM RADIATION THERAPY APPLICATIONS**

**Session 3: Synchrotron MRT-Radiobiology**  
*Chairs: Moshi Geso and Moeava Tehei*

12:00  Invited Speaker 4  
Roger Martin  
Peter MacCallum Cancer Centre, Melbourne, Australia  
**NEW DNA-BINDING ANTIOXIDANTS AS TOPICAL RADIOPROTETERS: MECHANISM OF RADIOPROTECTION**

12:30 Lunch

**Session 3: Synchrotron MRT-Radiobiology (continuation)**

13:30  Talks  
13:30  Jeff Crosbie  
University of Melbourne Department of Obstetrics & Gynaecology, Victoria  
**AN EVALUATION OF BIOLOGICAL DOSE EQUIVALENCE BETWEEN SYNCHROTRON MICROBEAM RADIATION THERAPY AND CONVENTIONAL BROADBEAM RADIATION USING CLONOGENIC AND CELL IMPEDANCE ASSAYS**

13:45  Pavel Lobachevsky  
Peter MacCallum Cancer Centre, Melbourne, Australia  
**IMPLICATIONS OF THE SCATTERED RADIATION OF THE SYNCHROTRON BEAM FOR INVESTIGATION OF BYSTANDER EFFECTS**

14:00  Alesia Ivashkevich  
Radiation Oncology, Canberra Hospital, Australia  
**ADVANCES IN BIOLOGICAL DOSIMETRY**

14:15  Olga Martin  
Peter MacCallum Cancer Centre, Melbourne, Australia  
**SYNCHROTRON BROAD BEAM AND MRT RADIATION INDUCES DNA DAMAGE IN NORMAL MOUSE TISSUES DISTANT FROM THE IRRADIATED VOLUME**
14:30 Christopher Poole  
University of Melbourne, Department of Obstetrics & Gynaecology, Royal Women’s Hospital, Melbourne  
DETERMINING MICRODOSIMETRIC SPREAD AMONGST CELLS SUBJECT TO MICROBEAM RADIOTHERAPY USING MONTE CARLO SIMULATION

Session 4: Synchrotron MRT-Dosimetry-2  
Chairs: Marco Petasecca and Jeff Crosbie

14:45 Jean-Francois Adam  
Grenoble Institute des Neurosciences - Université Joseph, Grenoble, France  
PRECLINICAL TRIALS IN MINIBEAM STEREOACTIC RADIOSURGERY: A REPORT ON THEORETICAL AND EXPERIMENTAL DOSIMETRY AND DOSE ESCALATION PROTOCOLS

3:00 Afternoon Tea

Session 4: Synchrotron MRT-Dosimetry-2 (continuation)

15:30 Elizabeth Kyriakou  
University of Melbourne Department of Obstetrics & Gynaecology, Victoria  
USE OF OPTICAL MICROSCOPY METHOD TO CALCULATE PVDR’S FOR SYNCHROTRON MRT

15:45 Jayde Livingstone  
Imaging and Medical Beamline, Australian Synchrotron, Victoria, Australia  
CHARACTERISATION OF A HIGH SPATIAL RESOLUTION SYNTHETIC SINGLE CRYSTAL DIAMOND DETECTOR FOR DOSIMETRY IN SYNCHROTRON MICROBEAM RADIATION THERAPY

16:00 Bjarne Stugu  
Department of Physics and Technology, University of Bergen, Norway  
HIGH RESOLUTION FAST BEAM-MONITORS FOR MICROBEAM RADIATION THERAPY

16:15 Mathew Cameron  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
CHARACTERISATION OF A NOVEL 3D SILICON SINGLE STRIP DETECTOR FOR MICROBEAM RADIATION THERAPY (MRT) QUALITY ASSURANCE

16:30 Angela Kok  
SINTEF MiNaLab, Oslo, Norway  
MICROMACHINING AND MICROFABRICATION FOR MICRODOSIMETRY

16:50 Anatoly Rozenfeld  
Closing remarks
Day -2
Tuesday 21st October

8:00 Registration/Coffee

Session 1: Micro- and Nano-Dosimetry in Hadron Therapy
Chairs: Anatoly Rozenfeld and Giulio Magrin

8:30 Invited Speaker 5
Paolo Colautti
INFN Laboratori di Legnaro, Italy
MICRODOSIMETRY OF THERAPEUTIC HADRON BEAMS

9:00 Invited Speaker 6
Michael Scholz
GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, Germany
THE RELEVANCE OF DAMAGE CLUSTERING ON THE NANOMETER AND MICROMETER SCALE IN THE LOCAL EFFECT MODEL (LEM) AND THE GIANT-LOOP BINARY-LESION (GLOBLE) MODEL

9:30 Invited Speaker 7
Reinhard Schulte
Division of Radiation Research, Loma Linda University, Loma Linda, USA
NANODOSIMETRIC CHARACTERIZATION OF MIXED RADIATION FIELDS: STATUS AND PERSPECTIVES

10:00 Morning Tea

10:30 Talks
10:30 Valeria Conte
LNL-INFN, viale dell’Università, Legnaro, Italy
EXPERIMENTAL NANODOSIMETRY: THE LINK BETWEEN PHYSICS AND RADIOBIOLOGY

10:45 Anatoly Rozenfeld
Centre for Medical Radiation Physics, University of Wollongong, Australia
EXPERIMENTAL SOLID STATE MICRODOSIMETRY – PRESENT AND FUTURE

11:00 Giulio Magrin
EBG MedAustron GmbH, Wiener Neustadt
DIAMOND DETECTORS FOR RADIATION QUALITY MEASUREMENTS IN ION-BEAM THERAPY–SIMULATIONS AND EXPERIMENTAL TESTS

11:15 Julia-Maria Osinga
Department of Dosimetry for Radiation Therapy and Diagnostic Radiology, Physikalisch-Technische Bundesanstalt (PTB), Germany
ABSORBED DOSE TO WATER MEASUREMENTS IN A CLINICAL CARBON ION BEAM USING WATER CALORIMETRY – PROJECT OUTLINE AND PRELIMINARY EXPERIMENTS
**Session 2: Heavy Ion and Proton Therapy: Physics and Implementation**

**Chairs: Carl Rossi and Sabine Reinhardt**

11:30 Mark Reinhard  
Australian Nuclear Science and Technology Organisation (ANSTO), Australia  
**AUSTRALIAN HADRON THERAPY PROJECT**

11:45 John Boldeman  
Boldeman Consulting, Cronulla, Australia  
**TWO OPTIONS FOR AN AUSTRALIAN PARTICLE THERAPY FACILITY**

12:00 David Hinde  
Department of Nuclear Physics, Research School of Physics and Engineering, Australian National University, Australia  
**CAPABILITIES AND APPLICATIONS OF AUSTRALIA’S HEAVY ION ACCELERATOR FACILITY**

12:15 Edward Simpson  
Department of Nuclear Physics, Research School of Physics and Engineering, Australian National University, Australia  
**RECENT ADVANCES IN UNDERSTANDING THE REACTIONS OF LITHIUM ISOTOPES**

12:30 Alisher Kadyrov  
Department of Imaging and Applied Physics, Curtin University, Australia  
**ACCURATE CALCULATIONS OF STOPPING POWER FOR PROTON THERAPY**

12:45 Lunch and Poster Session

**Posters**

Reinhard Schulte  
Division of Radiation Research, Loma Linda University, Loma Linda, USA  
**MACRO- AND NANODOSIMETRIC EVALUATION OF THE PHASE II PROTON CT SCANNER WITH GEANT4 SIMULATIONS**

Haider Meriaty  
Nuclear Services, ANSTO, Australia  
**SECONDARY STANDARD DOSIMETRY LABORATORY (SSDL) – ANSTO**

Claudiu Porumb  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
**A NOVEL DUAL-VERIFICATION QUALITY ASSURANCE SYSTEM FOR EXTERNAL BEAM RADIOTHERAPY**

Kaiyang Li  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
**PETIPIX: AN ULTRA HIGH SPATIAL RESOLUTION SMALL ANIMAL PET SCANNER**

Zhangbo Han  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
**BRACHYVIEW: AN IN BODY IMAGING SYSTEM FOR REAL TIME QA IN HDR BRACHYTHERAPY**

Maegan Gargett  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
**MONTE CARLO SIMULATION OF THE DOSE RESPONSE OF A NOVEL 2D SILICON DIODE ARRAY FOR USE IN HYBRID MRI-LINAC SYSTEMS**
**Session 3: Particle Therapy Imaging**

*Chairs: Yujin Qi and Stefano Agosteo*

**13:30 Invited Speaker 8**

Taiga Yamaya  
National Institute of Radiological Sciences, Japan  
*DEVELOPMENT OF A NOVEL OPEN-TYPE PET SYSTEM FOR 3D DOSE VERIFICATION IN PARTICLE THERAPY*

**14:00 Talks**

14:00  **Stephan Helmbrecht**  
Institute of Radiation Physics, Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany  
*PARTICLE THERAPY PET – 12 YEARS OF CLINICAL EXPERIENCE AND FUTURE PERSPECTIVES*

14:15  **Hsiao-Ming Lu**  
Massachusetts General Hospital, Harvard Medical School, Boston, USA  
*SINGLE DETECTOR BASED PROTON IMAGING AND ITS APPLICATION IN REDUCING PROTON BEAM RANGE UNCERTAINTY*

14:30  **Reinhard Schulte**  
Division of Radiation Research, Loma Linda University, Loma Linda, USA  
*EMERGING TECHNOLOGIES FOR PARTICLE THERAPY PLANNING AND VERIFICATION: STATUS AND FUTURE OF PROTON IMAGING*

14:45  **Dieter Roehrich**  
Institute of Physics and Technology, University of Bergen, Bergen, Norway  
*EXTREMELY HIGH-GRANULARITY DIGITAL TRACKING CALORIMETER FOR PROTON COMPUTED TOMOGRAPHY*

**15:00 Afternoon Tea**

**15:30 Invited Speaker 9**

Carl Rossi  
Scripps Proton Therapy Center, San Diego CA, USA  
*INTENSITY-MODULATED PROTON THERAPY-BRIEF OVERVIEW*

---

**Session 4: Radiobiological Models in Hadron Therapy & Nanoparticles for Dose Enhancement**

*Chairs: Reinhard Schulte and Roger Martin*

**15:50 Talks**

15:50  **Moeava Tehei**  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
*SYNTHESIS OF POTENTIAL THERANOSTIC SYSTEM CONSISTING OF METHOTREXATE-IMMOBILIZED (3-AMINOPROPYL)TRIMETHOXYSILANE COATED A-Bi2O3 NANOPARTICLES FOR CANCER TREATMENT*
<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Institution</th>
<th>Presentation Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:05</td>
<td>Sally McKinnon</td>
<td>Centre for Medical Radiation Physics, University of Wollongong, Australia</td>
<td>GEANT4 SIMULATION OF DOSE ENHANCEMENT OF A PROTON BEAM BY NANOPARTICLES</td>
</tr>
<tr>
<td>16:20</td>
<td>Moshi Geso</td>
<td>RNIT, Australia</td>
<td>MICRODOSIMETRY WITH ALANINE EMBEDED WITH NANOPARTICLES</td>
</tr>
<tr>
<td>16:35</td>
<td>Mai Fukahori</td>
<td>Research Center for Charged Particle Therapy, National Institute of Radiological Sciences</td>
<td>ESTIMATION OF THE RECTAL AND URETHRAL NORMAL TISSUE COMPLICATION PROBABILITY PARAMETERS IN CARBON ION THERAPY FOR PROSTATE CANCER AND BIOLOGICAL CONSIDERATION</td>
</tr>
<tr>
<td>16:50</td>
<td>Michael Douglass</td>
<td>Department of Medical Physics, Royal Adelaide Hospital, Adelaide, Australia</td>
<td>DEVELOPMENT, TESTING AND APPLICATION OF A COMPLETE CELL GROWTH, IRRADIATION, REPAIR AND DEATH MODEL</td>
</tr>
<tr>
<td>17:05</td>
<td>Sianne Oktaria</td>
<td>Centre for Medical Radiation Physics, University of Wollongong, Australia</td>
<td>INDIRECT RADIO-CHEMO-BETA THERAPY: AN INNOVATIVE AND TARGETED APPROACH TO INCREASE BIOLOGICAL EFFICIENCY OF X-RAYS BASED ON ENERGY</td>
</tr>
<tr>
<td>17:20</td>
<td>Anatoly Rozenfeld</td>
<td></td>
<td>Closing Remarks</td>
</tr>
</tbody>
</table>
Day-3  
Wednesday 22\textsuperscript{nd} October  
ARDENT: Special Program

8:00 Registration/Coffee

Session 1: Monte Carlo Simulations on Micro-and Nano-scale  
\textit{Chairs: Susanna Guatelli and Zdenka Kuncic}

8:30 Invited Speaker 10  
Sebastien Incerti  
Centre National de la Recherche Scientifique (CNRS), France  
\textit{THE GEANT4-DNA PROJECT: OVERVIEW AND STATUS}

8:50 Talks

8:50 Carmen Villagrasa  
Institut de Radioprotection et Sûreté nucléaire (IRSN), France  
\textit{A MULTISCALE SIMULATION TOOL FOR ASSESSMENT OF RADIATION-INDUCED BIOLOGICAL DAMAGE IN ION BEAMS}

9:10 Rui Qiu  
Department of Engineering Physics, Tsinghua University, Beijing, China  
\textit{DEVELOPMENT AND APPLICATION OF MULTI-SCALE PHANTOMS FOR CHINESE REFERENCE MAN AND WOMAN}

9:30 Maegan Gargett  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
\textit{MONTE CARLO SIMULATION OF THE EFFECTS OF A 1 T TRANSVERSE MAGNETIC FIELD ON A CLINICAL IMRT DOSE DISTRIBUTION}

9:45 Leyla Moghaddasi  
Department of Medical Physics, Royal Adelaide Hospital, Adelaide, Australia  
\textit{MONTE-CARLO MODEL DEVELOPMENT FOR EVALUATION OF CURRENT CLINICAL TARGET VOLUME DEFINITION FOR GLOBLASTOMA USING BORON NEUTRON CAPTURE THERAPY}

10:00 Morning Tea

Session 2: Space Dosimetry  
\textit{Chairs: Paolo Colautti and Anatoly Rozenfeld}

10:30 Invited Speaker 11  
Jeff Sutton  
NSBRI, Houston, USA  
\textit{OVERVIEW OF THE SPACE MEDICINE PROGRAM AT THE NATIONAL SPACE BIOMEDICAL RESEARCH INSTITUTE}
10:50 Invited Speaker 12  
Larry Pinsky  
School of Physics, University of Houston, USA  
WHAT HAVE WE LEARNED IN TWO YEARS OF MEDIPIX IN SPACE ON THE ISS AND FUTURE PLANS

Session 3: Advancements in Radiation Detectors for Dosimetry  
Chairs: Dieter Roehrich and Gareth Moorhead

11:10 Invited Speaker 13  
Stefano Agosteo  
Politecnico di Milano, Dipartimento di Energia, Sezione di Ingegneria Nucleare, Milano, Italy  
EXPERIMENTAL MICRODOSIMETRY AT THE NANOMETRE LEVEL

11:30 Talks (ARDENT students updates)  
11:30 Linh Tran  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
3D-MESA “BRIDGE” SILICON MICRODOSIMETER FOR RBE STUDIES IN C-12 RADIATION THERAPY

11:45 David Bolst  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
CHARACTERISATION OF NOVEL SILICON MICRODOSIMETER FOR RBE DETERMINATION IN HEAVY ION THERAPY

11:55 Stuart George  
Centre for Medical Radiation Physics, University of Wollongong and CERN  
MAPPING THE ASYMMETRY IN THE SAA FLUXES USING THE MEDIPIX PARTICLE- BY-PARTICLE DIRECTIONAL INFORMATION

12:05 Alvin Sashala Naik  
Politecnico di Milano, Department of Energy, Milan, Italy  
MONTE CARLO SIMULATIONS FOR NEUTRON DOSIMETRY AND SPECTROMETRY USING CR-39 TRACK DETECTORS

12:15 Vincenzo Monaco  
University of Torino, Italy  
APPLICATION OF ULTRA-FAST SILICON DETECTORS AS BEAM MonITORS IN CHARGED PARTICLE THERAPIES

12:30 Chris Cassel  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
DOSIMETRY OF PULSED NEUTRON RADIATION FIELDS

12:40 Lunch
Session 4: Advancements in X-ray Radiation Detectors for Imaging  
Chairs: Chris Hall and Jeff Crosbie  
13:40 Invited Speaker 14  
Gareth Moorhead  
CSIRO Manufacturing Flagship, Australia  
HIGH SPEED X-RAY FLUORESCENCE IMAGING WITH THE MAIA DETECTOR

Session 5: Laser Driven Proton Therapy  
Chairs: Mark Reinhard and Alberto Fazzi  
14:00 Invited Speaker 16  
Sabine Reinhardt  
Ludwig-Maximilians Universität München, Germany  
A PIXEL DETECTOR SYSTEM FOR CLINICAL PHOTON AND LASER-ACCELERATED PROTON BEAMS  
14:30 Christopher Ilgner  
Helmholtz-Zentrum Dresden-Rossendorf, Germany  
THE CENTER FOR HIGH-POWER RADIATION SOURCES at HZDR – RESEARCH AND INSTRUMENTATION BEYOND MEDICAL THERAPY  
14:45 Rhys Preston  
CSIRO Mineral Resources National Research Flagship and CMRP, Australia  
PORTABLE DETECTORS FOR NEUTRON SURVEY IN MIXED RADIATION FIELDS

15:00 Afternoon Tea

Session 6: Innovative MOS based Detectors for QA Dosimetry  
Chairs: Dean Cutajar and Peter Metcalfe  
15:30 Invited Speaker 17  
Enrico Giulio Villani  
STFC Rutherford Appleton Laboratory, Particle Physics Dept., UK  
A MONOLITHIC 180 nm CMOS DOSIMETER FOR IN VIVO MEDICAL APPLICATIONS  
15:50 Talks  
15:50 Miguel Angel Carvajal Rodriguez  
ECsens, CITIC-UGR, Electronics Department, University of Granada, Spain  
COMMERCIAL MOSFETS AND RADFETS ELECTRICAL AND DOSIMETRIC CHARACTERIZATION  
16:05 Wei Loong Jong  
Clinical Oncology Unit, Faculty of Medicine, University of Malaya, Malaysia  
INTERFACE DOSIMETRY IN PHANTOM USING MOSKIN DETECTOR UNDER MEGAVOLTAGE PHOTON BEAMS
16:20  Mohamamd Javad Safari  
Clinical Oncology Unit, Faculty of Medicine, University of Malaya, Malaysia  
INVESTIGATION OF THE RADIATION DOSE DELIVERY TO THE SKIN AND EYE LENS OF A PHANTOM DURING INTERVENTIONAL CEREBRAL ANGIOGRAPHY PROCEDURES

16:35  Tina Pfeiler  
Heinrich Heine University of Dusseldorf, Germany  
BIOLOGICAL DOSE ASSESSMENT USING FLUORESCENT NUCLEAR TRACK DETECTORS IN ION BEAM CANCER THERAPY

Session 7: MRI LINAC Program  
Chair: Jeremy Booth and Mauro Carrara

16:50 Invited Speakers 18
Peter Metcalfe & Amy Walker  
Centre for Medical Radiation Physics, University of Wollongong, Australia  
DISTORTION CORRECTION FOR MRI TREATMENT PLANNING AND MRI LINACS

17:20  Anatoly Rozenfeld  
Closing remarks

Day-4

Thursday, 23rd October

8:00-16:30 Social Program, Options available on the Home Page

18:30-19:00 Pre Dinner drinks

Conference Dinner

19:15-19:45 Guest Speaker, Dr Carl Rossi, “INTENSITY-MODULATED PROTON THERAPY OF PROSTATE CANCER”, after entree.

20:30-20:50 Guest Speaker, Prof Geoff Taylor, “From the enigmatic to the obscure: the God particle, Dark Matter and the Large Hadron Collider”, after main meal.

22:00 End of Dinner
International Prostate Cancer Treatment Workshop 2014

Sheraton Mirage, Port Douglas, Australia
October 24\textsuperscript{th}-25\textsuperscript{th} 2014

mmnd-ipct.com cmrp@uow.edu.au
Welcome from the Chairs

As we move forward into the 21st century, it is clear that technology impacts upon biology. Prostate cancer treatment is undergoing many important paradigm shifts as improvements in our understanding of biology as well as advances in medical imaging, radiation dose delivery and innovative real time quality assurance devices are enabling rapid changes in the prostate cancer treatment landscape. There is no such thing as “business as usual.” We are pleased to be able to present an exciting and interactive program this year at IPCT, which is being held at Port Douglas. Not only is this program filled with exceptional faculty from around the world and within Australia, but also has beach time built in! I hope that you will agree that IPCT 2014 represents an unique opportunity to learn together with didactic as well as case based discussions with the leaders in the field in a relaxed atmosphere that Port Douglas provides!

Regards,

Prof Anatoly Rozenfeld

Dr Josh (Yoshiya) Yamada

Chairs, IPCT
Prof Mack Roach
Dr. Mack Roach III, a radiation oncologist, is an internationally renowned expert in the treatment and management of prostate cancer. His research addresses new therapies such as 3-D conformal and intensity modulated radiotherapy (IMRT) as well as brachytherapy for prostate cancer. Roach chaired one of the most important clinical trials comparing different strategies for locally advanced prostate cancer. He gained international recognition as an authority on treatment planning for prostate cancer and served as senior author for the guidelines for treatment planning published by the American College of Radiology. Roach earned a medical degree at Stanford University School of Medicine. He is a member of several professional societies including the American Society of Clinical Oncology, American Society for Therapeutic Radiology and Oncology, Radiation Therapy Oncology Group, National Cancer Institute's IMRT Working Group and American Joint Commission for Cancer Staging. He is chair of Radiation Oncology and a professor of radiation oncology, medical oncology and urology at UCSF.
IPCT - International Faculty

Dr Mitchell Kamrava

Dr. Mitchell Kamrava is an assistant clinical professor and member of the brachytherapy division in the Department of Radiation Oncology at the University of California, Los Angeles. After receiving his medical degree from the University of California, San Diego (UCSD) Medical School, he completed residency training at the National Cancer Institute, and further advanced his skills by doing a brachytherapy fellowship at the University of California, Los Angeles. He serves as a Co-editor for the Journal of Contemporary Brachytherapy as well as an editor for the journal Brachytherapy. He’s spoken on focal therapy for prostate cancer both nationally and internationally and has opened an investigator-initiated trial of prostate focal therapy. He was awarded a Career Development Award to investigate targeted tissue acquisition during prostate radiotherapy, and exploration of the effects of radiation treatment on neuroendocrine markers. Dr. Kamrava was also selected Super Doctor Southern California Rising Star in 2013 and 2014.

Dr Matthew Biagioli

Dr. Biagioli, MD completed his residency in radiation oncology at the University of Miami Sylvester Comprehensive Cancer Center followed by a fellowship in brachytherapy at Beth Israel Medical Center. He currently works as Clinical Director and Chief of Brachytherapy at the H. Lee Moffitt Cancer Center and Research Institute in Tampa Florida. Dr Biagioli’s clinical practice primarily involves the treatment of pelvic malignancies. His research interests include prostate HDR brachytherapy, bio-absorbable hydrogels, and texture analysis for image segmentation.
IPCT - International Faculty

Prof Carl Rossi
Dr Carl Rossi, MD, is a radiation oncologist specializing in proton beam therapy, specifically for prostate cancer and lymphomas. He is also the current medical director for the Scripps Proton Therapy Center, which will provide treatment to target tumors with high control and precision. In addition to treating a variety of cancers with radiation, it is also used to treat some non-cancerous conditions. He has a research focus on the quality of life and cure rate in prostate cancer and lymphoma treated with proton beam radiation. He believes in treating his patients as equal partners throughout the treatment process. This involves open, honest communication, including what the treatment will entail and the pros and cons of the treatment course. With this information patients can make informed decisions. He also wants his patients to feel supported in whatever path they choose to take with regard to their treatment plan. When he is not caring for patients or conducting research at Scripps Proton Therapy Center, he enjoys running, cycling, travelling and flying.

Prof Morten Høyer
Dr Morten Høyer, MD is Professor and Consultant at the Department of Oncology at Aarhus University Hospital. He has special interest in stereotactic radiotherapy of tumours of the brain, lung and liver and in radiotherapy of prostate cancer. His PhD at Aarhus University in 1994 was based on a thesis on studies of cancer cell kinetics and he had his postgraduate specialty training at Aarhus University Hospital and Copenhagen University Hospital, Herlev. He is involved in the establishment of the Danish Center for Particle Therapy and member of the board of the Danish Prostate Cancer Group.
Prof Hiroshi Tsuji

Hiroshi Tsuji is Director of the research Program for Carbon Ion therapy and Diagnostic Imaging at National Institute of Radiological Sciences (NIRS), where he has been since 1997. He also currently serves as Head of Clinical Oncology section in the hospital of the same institute. He received a M.D. from Hokkaido University in 1982, and a Ph.D. from Tsukuba University in 1996 for his study on proton radiotherapy of hepatocellular carcinoma. He has had 30 years of experience in clinical research on radiation oncology, including 8 years in Proton therapy and 17 years in carbon ion radiotherapy. The NIRS has more than 8,000 patients experience of C-ion RT, including more than 2,000 prostate cancers. He has actually been in charge of the treatment for these patients and advancing hypofractionation based on the outcomes obtained. His current research centers on standardization and clarification of charged particle therapy, for which he works on clinical trials of hypofractionated C-ion RT for common cancers as well as establishing new treatments for radio-resistant tumors. Particularly, effective usage of newly developed scanning irradiation is a current main concern.
Day 1
Friday, 24th October

06:30  Beach Activities
07:30  Registration/Coffee
08:00  Welcome from the Convenors
       Yoshiya Yamada and Anatoly Rozenfeld

Session: Introduction to Advanced Technology

*Moderator: Yoshiya Yamada, MSKCC, USA*

08:10  Hitoshi Ishikawa,
       University of Tsukuba, Japan
       PROTON THERAPY FOR PROSTATE CANCER: TSUKUBA UNIVERSITY EXPERIENCE

08:30  Hsiao-Ming Lu
       MGH, Harvard Medical School, USA
       PROSTATE TREATMENT USING ANTERIOR PROTON FIELDS

08:50  Hiroshi Tsuji
       NIRS, Japan
       STATUS OF CARBON ION CANCER THERAPY IN JAPAN

09:30  Matthew Biagioli
       Moffitt Cancer Centre, USA
       BRACHYTHERAPY: WHAT’S NEW?

10:00  Mack Roach
       UCSF Medical Centre, USA
       IMRT: What’s New?

10:30  Morning Tea
       Industrial Exhibition

11:00  Michael Jackson
       POWH, Australia
       PROTONS FOR PROSTATE: PANACEA OR PANGLOSS?

11:30  Hiroshi Tsuji
       NIRS, Japan
       CARBON-ION RADIOTHERAPY FOR PROSTATE CANCER

12:00  Mitch Kamrava
       UCLA Medical Centre, USA
       STEREOTACTIC BODY RADIOTHERAPY FOR LOCALIZED PROSTATE CANCER
12:30  Matthew Biagioli  
Moffitt Cancer Centre, USA  
BRACHYTHERAPY FOR LOCALIZED PROSTATE CANCER

13:00  Joseph Bucci  
St George Cancer Care Centre, Australia  
SALVAGE

13:30  Lunch

14:30  Panel Discussion: Cases  
Moderator: Yoshiya Yamada  
Participants: Hiroshi Tsuji, Mitch Kamrava, Mack Roach, Matthew Biagioli, Morten Høyer, Joseph Bucci, Michael Jackson  
Topics: Early, Intermediate, High Risk Prostate Cancer

16:30  Afternoon Tea  
Industrial Exhibition, Poster Display, Wine

Day 2  
Saturday, 25th October

06:30  Beach Activities

07:30  Registration/Coffee

Session: Physics/QA/New Technologies 1  
Moderators: Anatoly Rozenfeld

08:00  Annette Haworth  
Peter McCallum Cancer Centre, Australia  
THE USE OF MULTI-PARAMETRIC MRI AND BIOLOGICAL DOSE OPTIMISATION METHODS FOR FOCAL BRACHYTHERAPY

08:25  Paul Lovoi  
Woodtoga Holdings Company, USA  
NEW APPROACH TO HDR BRACHYTHERAPY DELIVERY

08:50  Jeremy Booth  
North Shore Cancer Centre, Australia  
CLINICAL APPLICATION MLC TRACKING TO PROSTATE RAPIDARC

09:10  Anatoly Rozenfeld  
CMRP, Uni of Wollongong, Australia  
ADVANCED QA DOSIMETRY FOR PROSTATE TREATMENT
09:30 Mauro Carrara  
National Cancer Centre, Milan Italy  
REAL TIME QA IN HDR BRACHYTHERAPY: MILAN NATIONAL CANCER CENTER EXPERIENCE

09:50 Sankar Arumugam  
Liverpool Hospital, Australia  
INITIAL VALIDATION OF AN IN-HOUSE SEED TRACKING SOFTWARE FOR ONLINE POSITION VERIFICATION DURING PROSTATE SBRT

10:10 Roger Martin  
Peter MacCallum Cancer Centre, Melbourne, Australia  
NEW DNA-BINDING ANTIOXIDANTS AS TOPICAL RADIOPROTectors

10:30 Morning Tea  
Industrial Exhibition

11:00 Panel Discussion: Difficult Cases  
Moderator: Yoshiya Yamada  
Participants: Hiroshi Tsuji, Mitch Kamrava, Mack Roach, Matthew Biagioli, Morten Høyer, Joseph Bucci, Michael Jackson  
Topics: Significant urinary sx, Prior pelvic RT, Inflammatory Bowel Disease, Extensive SV involvement

12:30 Lunch  
Industrial Exhibition

Session: Special Topics  
Moderators: Michael Jackson and Joseph Bucci

13:30 Morten Høyer  
UCSF Medical Centre, USA  
ADAPTATION BY A PLAN SELECTION STRATEGY AND DOSE ESCALATION IN RADIOTHERAPY FOR URINARY BLADDER CANCER

14:00 Mack Roach  
UCSF Medical Centre, USA  
THE ROLE OF ADVANCED IMAGING FOR LOCALIZED PROSTATE CANCER

14:30 Mitch Kamrava  
UCLA Medical Centre, USA  
FOCAL THERAPY FOR PROSTATE CANCER: SERIOUSLY OR SERIOUSLY?

15:00 Yoshiya Yamada  
SALVAGE

15:30 Mitch Kamrava  
UCLA Medical Centre, USA  
THE FUTURE OF PROSTATE RADIATION THERAPY: MOVING FROM RISK GROUPS TO PERSONALIZED MEDICINE
16:00  Afternoon Tea
       Industrial Exhibition

Session: Physics/QA/New Technologies 2
Moderator: Annette Haworth

16:30  Hiroaki Akasaka
       Kobe University Hospital, Japan
       EFFICACY OF PGA SPACER IN PARTICLE THERAPY: A NOVEL STRATEGY MAKING TEMPORAL
       SPACE BETWEEN TUMOR AND ADJACENT ORGANS

16:45  Minoru Sakama
       The University of Tokushima, Japan
       COMPACT DESIGNED AUTOMATION DEVICE FOR ACCURATE INDEPENDENT
       CALIBRATION OF BRACHYTHERAPY SEEDS OF IODINE-125

17:00  Mauro Carrara
       National Cancer Centre, Milan Italy
       ANALYSIS OF INTRACTION PROSTATE MOTION SAMPLED WITH CALYPSO
       ELECTROMAGNETIC TRANSPONDERS

17:15  Closing Remarks
       Yoshiya Yamada and Anatoly Rozenfeld

17:20  Beach Drinks, Communication with Industry

18:30  Dinner
       Own arrangements