

<https://agenda.infn.it/event/MCMA2017>

MCMA2017 - International Conference on Monte Carlo Techniques for Medical Applications - 15-18 October 2017, Napoli, Italy

### Scientific Programme

**Sunday October 15th**

**Centro Congressi Federico II - First Floor**

15:00-18:00 Conference Registration

15:00-17:45 Meeting Editorial Board Physica Medica

Reserved to associate editors and editorial board members

17:45-18.00 Galileo Galilei Award assignment

Physica Medica best paper in 2016

**18:00-20:00 Social program**

**Welcoming reception**

**Conference Venue** Centro Congressi, Università di Napoli Federico II, Via Partenope 36, 80121 Napoli, Italy

<https://www.google.it/maps/place/Centro+Congressi+Federico+II/@40.830096,14.2461965,15z/data=!4m5!3m4!1s0x0:0xf66695c27e799158!8m2!3d40.830096!4d14.2461965>

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MCMA2017 - International Conference on Monte Carlo Techniques for Medical Applications - 15-18 October 2017, Napoli, Italy

Scientific Programme

Monday October 16th	Centro Congressi Federico II, Hall: "Aula Magna"	Abstract ID	
08:00	Conference Registration		
08:15	Antonio Leal Plaza, Philippe Després and Paolo Russo	Conference opening	
		Welcome address of Academic authorities	
08:30	Alberto Del Guerra, University of Pisa & INFN, Italy	The dawn of PET Monte Carlo: a personal experience	232
09:00	Willi A. Kalender, University of Erlangen-Nuernberg, Germany	Monte Carlo methods for diagnostic radiology	245
	<b>Update on MC code/physics I</b>	<b>Chair: Frank Verhaegen, Maastricht Clinic, Netherlands</b>	
09:15	Frédéric Tessier (NRCC, Ottawa, Canada)	EGSnrc update: new features and legacy code upgrade	214
09:45	Ernesto Mainegra-Hing (NRCC, Ottawa, Canada)	Consistency of the atomic relaxation algorithm and new photo-electric cross section in EGSnrc	217
10:00	Reid Townson (NRCC, Ottawa, Canada)	Radionuclide decay scheme modelling in EGSnrc	162
10:15	David Rogers (Carleton University, Canada)	Improved kerma calculations with EGSnrc	93
	<b>10:30 Coffee break &amp; Poster session</b>		
	<b>Update on MC code/physics II</b>	<b>Chair: Frédéric Tessier, NRCC, Ottawa, Canada</b>	
11:30	Pablo Cirrone (INFN-LNS, Italy)	Review of Geant4 applications in radiation therapy	228
12:00	Susanna Guatelli (University of Wollongong, Australia)	Validation of Geant4 Fragmentation for Heavy Ion Therapy	22
12:30	Pedro Arce (CIEMAT, Spain)	Status and latest developments of GAMOS/GEANT4 framework	86
12:45	Xiaoya Wang (McGill University, Canada)	Assessment of RBED electron-impact ionization cross sections for Monte Carlo electron transport	165
13:00	Rowan Thomson (Carleton University, Canada)	Quantum versus classical Monte Carlo simulation of low energy electron transport in condensed media	88
	<b>13:15 Lunch</b>		
	<b>Update on MC code/physics III</b>	<b>Chair: Michael Fix, Inselspital-University of Berne, Switzerland</b>	
14:15	Francesc Salvat, Universitat de Barcelona, Spain	Modeling of inelastic collisions of charged particles in condensed matter	219
14:45	Gianfranco Paternò (University of Ferrara, Italy)	Geant4 implementation of inter-atomic interference effect in Small-Angle Coherent X-ray Scattering for materials of medical interest	176
15:00	Salvador García-Pereja (Hospital Regional Universitario de Málaga, Spain)	Ant colony algorithm for driving variance reduction techniques in Monte Carlo simulations	134
15:15	Felix Horst (THM University of Applied Sciences & GSI Helmholtz Centre for Heavy Ion Research, Germany)	Novel data relevant for helium ion therapy and their comparison with FLUKA nuclear reaction models	172
	<b>15:30 Coffee break &amp; Poster session</b>		
	<b>MC in brachytherapy</b>	<b>Chair: Luc Beaulieu, Université Laval, Canada</b>	
16:30	Luc Beaulieu, Université Laval, Québec, Canada	Monte Carlo dose calculations in brachytherapy	246
17:00	Rowan Thomson (Carleton University, Canada)	Brachytherapy source and applicator models for diverse Monte Carlo simulations with egs_brachy	87
17:30	Gabriel Famulari (McGill University, Canada)	Consequences of patient heterogeneities for intermediate-energy sources in post-implant assessment of prostate brachytherapy treatment plans.	41
17:45	Konstantinos A. Mountris (LaTIM INSERM, France)	ORACLE: A DVH-based inverse planning system for LDR prostate brachytherapy using MC dosimetry	141
18:00	Marc-André Renaud (McGill University, Montreal, Canada)	MC dose calculation and treatment planning for intensity modulated brachytherapy	215
	<b>18:15 Closing Day 1</b>		
	<b>Companion programme</b>	<b>See Conference website for excursions</b>	
	<b>Conference Venue: Centro Congressi, Università di Napoli Federico II, Via Partenope 36, 80121 Napoli, Italy</b>		
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### Scientific Programme

Monday October 16th	Centro Congressi Federico II, Hall: "Aula A"	Abstract ID	
<b>Parallel MC implementations</b>			
<b>Chair: Philippe Després, Université Laval, Canada</b>			
14:15	Angelo Schiavi (University of Rome, Italy)	Fred: A new GPU-based fast-MC code and its applications in proton beam therapy	161
14:30	Daniel Maneval (Université Laval, Canada)	Efficiency improvement in proton dose calculations with an equivalent restricted stopping power formalism	104
14:45	Julien Bert (LaTIM-INSERM, France)	Improved Woodcock tracking on Monte Carlo simulations for medical applications	131
15:00	Xun Jia (University of Texas Southwestern Medical Center)	Recent updates in GPU-based Monte Carlo simulation for radiation therapy	20
<b>15:30 Coffee break &amp; Poster session</b>			
<b>MC in particle therapy</b>			
<b>Chair: Giuseppe Battistoni, INFN Sezione di Milano, Italy</b>			
16:30	Silvia Muraro (INFN Pisa, Italy)	MC codes and Range Monitoring in Particle Therapy: the case of secondary charged particles	67
16:45	Brad Oborn (Illawarra Cancer Care Centre, Australia)	Monte Carlo modelling and experimental verification of a high resolution silicon diode array performance in proton beams and magnetic fields	63
17:00	Francesco Fracchiolla (APSS Trento, Italy)	Application of a Monte Carlo algorithm in dosimetric verification of pencil beam scanning proton therapy treatments	50
17:15	Pietro Pisciotta (University of Catania, Italy)	Monte Carlo dosimetric study for preclinical small animal hadrontherapy using Geant4 toolkit	35
17:30	Carla Winterhalter (PSI, Switzerland)	Comparison of two Monte Carlo calculation engines for proton pencil beam scanning	34
18:00	Andrea Mairani, Centro Nazionale di Adroterapia Oncologi	Monte Carlo-based RBE investigations in hadrontherapy	64
<b>18:30 Closing Day 1</b>			
<b>Companion programme</b>			
<b>See Conference website for excursions</b>			
<b>Conference Venue: Centro Congressi, Università di Napoli Federico II, Via Partenope 36, 80121 Napoli, Italy</b>			
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**Scientific Programme**

<b>Tuesday October 17th</b>		<b>Centro Congressi Federico II, Hall: "Aula Magna"</b>	<b>Abstract ID</b>
08:00	Conference Registration		
	<b>MC applications in imaging and nuclear medicine</b>	<b>Chair: Emiliano Spezi, Cardiff University, UK</b>	
08:30	Joao Seco, German Cancer Research Center (DKFZ) & University of Heidelberg, Heidelberg, Germany	Monte Carlo study of Helium CT (HeCT) imaging	25
09:00	George Dedes (LMU Munich, Germany)	Fluence modulated proton computed tomography	138
09:15	Natalia Roberts (University of Wollongong, Australia)	Modelling of a novel x-ray source for MR-guided radiotherapy	47
09:30	Elisa Fiorina (University of Torino, Italy)	Monte Carlo simulation tool for online treatment monitoring in hadrontherapy with in-beam PET	143
09:45	Antonio Sarno (University of Naples Federico II, Italy)	Breast Model Validation for Monte Carlo Evaluation of Normalized Glandular Dose Coefficients in Mammography	203
<b>10:00 Coffee break &amp; Poster session</b>			
	<b>MC models for radiation sources and beams</b>	<b>Chair: Grisel Mora, University of Lisbon, Portugal</b>	
11:00	Jan Seuntjens (McGill University, Canada)	A Monte Carlo perspective on small beam radiation therapy	216
11:30	Charlie Ma (Fox Chase Cencer Center, USA)	Investigation of Conformal Arc therapy utilizing Cobalt 60 beams	89
11:45	Caterina Cuccagna (TERA Foundation/ University of Geneva, Switzerland)	Beam characterization for the TULIP accelerator for protontherapy through Full Monte Carlo simulations	55
12:00	Pietro Pisciotta (University of Catania, Italy)	Characterization of an X-ray source based on laser-target interaction using the Geant4 Monte Carlo toolkit	135
12:15	Timo Ikonen (Varian Medical Systems)	Monte Carlo modeling of Varian TrueBeam photon beams with Geant4-based VirtualLinac and comparison to experiments	142
12:30	Tony Price (University of Birmingham, UK)	Code sharing of MC beam models for advanced radiotherapy.	201
12:45	Francesco Romano (NPL & LNS-INFN, Italy)	Geant4-based Monte Carlo simulations of a transport beam line for multidisciplinary applications of laser-driven proton beams	173
<b>13:00 Lunch</b>			
	<b>MC in radiobiology</b>	<b>Chair: Sébastien Incerti, Université de Bordeaux, France</b>	
14:15	Carmen Villagrasa, Institut de radioprotection et de sûreté nucléaire, France	Simulation of early radio-induced DNA damages using Geant4-DNA	24
14:45	Konstantinos Chatzipapas (University of Patras, Greece)	Validating Geant4-DNA for Double Strand Brakes (DSB): A preliminary study	75
15:00	Francesca Ballarini (University of Pavia & INFN Pavia, Italy)	The BIANCA biophysical model/MC code: calculations of radiation-induced cell damage in view of hadrontherapy treatments	37
15:15	Stewart Mein (DKFZ, Germany)	Monte Carlo calculation of RBE and in-vitro validation for helium ion-beam therapy	129
<b>15:30 Coffee break &amp; Poster session</b>			
	<b>MC for treatment planning and evaluation</b>	<b>Chair: Antonio Leal Plaza, University of Seville, Spain</b>	
16:30	Tony Popescu, University of British Columbia, Canada	Modern clinical applications of Monte Carlo simulations for in-vivo patient-specific QA	52
17:00	Joanna Cygler (The Ottawa Hospital, Canada)	Experimental verification of 4D Monte Carlo calculations of dose delivered to a deforming anatomy	15
17:15	Hiroaki Kumada (University of Tsukuba, Japan)	Verification of dose estimation for Monte-Carlo based treatment planning system for boron neutron capture therapy	122
17:30	Erik Traneus (RaySearch Laboratories AB, Sweden)	The Monte Carlo transport code for proton therapy planning dose calculations in the RayStation treatment planning system	221
17:45	Alessia Embiaco (University of Pavia, Italy)	FLUKA validation of MONET code for dose calculation in Hadrontherapy	18
18:00	David Rogers (Carleton University, Canada)	Fun with Monte Carlo: or how I keep learning radiation physics	110
<b>18:30 Closing Day 2</b>			
20:00	Conference dinner	<b>Restaurant "La Bersagliera". Address: Borgo Marinari, 10/11, 80132 Napoli. <a href="https://www.google.it/maps/place/La+Bersagliera/@40.8295241,14.2483912,15z/data=!4m5!3m4!1s0x0:0x55ba8ade1611d13b!8m2!3d40.8295241!4d14.2483912">https://www.google.it/maps/place/La+Bersagliera/@40.8295241,14.2483912,15z/data=!4m5!3m4!1s0x0:0x55ba8ade1611d13b!8m2!3d40.8295241!4d14.2483912</a></b>	
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Tuesday October 17th		Centro Congressi Federico II, Hall: "Aula A"	Abstract
08:00	Conference Registration		
	<b>MC applications in IGRT and dosimetry</b>	<b>Chair: Nick Reynaert, Centre Oscar Lambret, Lille, France</b>	
08:45	Roumiana Chakarova (Sahlgrenska University Hospital, Sweden)	An automated Monte Carlo QA system for volumetric modulated arc therapy: possibilities and challenges	16
09:00	Simon Kirchhof (DKFZ, Germany)	Monte-Carlo based CT Simulation of Virtual Patient Geometries	213
09:15	Salvatore Berenato (Cardiff University, UK)	Advanced personalised 3D dosimetry based on Monte Carlo simulation for Peptide Receptor Radionuclide Therapy	160
09:30	Bas Raaymakers, University Medical Center Utrecht, Netherlands	The promise of the MRI linac: simultaneous MRI and irradiation	223
<b>10:00</b>	<b>Coffee break &amp; Poster session</b>		
	<b>MC applications in micro-dosimetry</b>	<b>Chair: Philippe Després, Université Laval, Québec, Canada</b>	
11:15	Gabriel Famulari (McGill University, Canada)	Microdosimetry calculations for monoenergetic electrons using Geant4-DNA combined with a weighted track sampling algorithm	40
11:30	Martin Martinov (Carleton University, Canada)	Heterogeneous multiscale simulations of radiation therapy with gold nanoparticles	68
11:45	Yunzhi Ma (CHU de Québec & Université Laval, Canada)	OpenDNA: An OpenCL-based GPU Monte Carlo simulation code for Microdosimetry	184
12:00	Nicole Ackerman (Agnes Scott College, USA)	Geant4 Modeling of Targeted Radionuclide Therapy for Brain Metastasis	36
12:30	Floriane Poignant (IPNL, France)	Biophysical modelisation of gold nanoparticles radiosensitizing effects	182
<b>13:00</b>	<b>Lunch</b>		
	<b>MC applications in IGRT and dosimetry</b>	<b>Chair: Jan Seuntjens, McGill University, Canada</b>	
14:00	Francesco Romano (National Physical Laboratory, UK)	Monte Carlo calculated correction factors for a proton calorimeter in clinical proton beams	169
14:15	Gregory Delpon (ICO, Centre René Gauducheau, France)	Monte Carlo calculation of absorbed doses due to imaging sessions delivered to patients during Tomotherapy Image-Guided RadioTherapy courses	178
14:30	Victor Malkov (Carleton University, Canada)	Impact of the true sensitive volume on ion chamber response in magnetic fields	53
14:45	Elisa Jiménez-Ortega (University of Seville & IBIS, Spain)	A robust Monte Carlo Treatment Planning optimization algorithm for dose painting clinical implementation	177
15:00	Hugo Palmans, National Physical Laboratory, UK	Monte Carlo simulations on improved reference dosimetry	227
<b>15:30</b>	<b>Coffee break &amp; Poster session</b>		
	<b>MC applications in imaging and nuclear medicine</b>	<b>Chair: Francesc Salvat, Universitat de Barcelona, Spain</b>	
16:30	Guillaume Landry (LMU Munich, Germany)	Investigating the physics of a CBCT projection shading correction based on a prior CT	85
16:45	Sodai Tanaka (The University of Tokyo, Japan)	Proton imaging system using collimator with small holes	128
17:00	Janne Vignero (KULeuven, Belgium)	Contribution of coherent and incoherent scatter in grating-based phase-contrast imaging	159
17:15	Stefan Tessarini (ETH Zürich, Switzerland)	Monte Carlo simulations of x-ray grating interferometry based imaging systems	197
17:30	Younes Jourani (Centre Oscar Lambret Lille, France)	Clinical implementation of a Monte Carlo based QA platform for validation of Tomotherapy and Cyberknife treatment plans	222
17:45	Diyun Shu (Nanjing University of Aeronautics and Astronautics, China)	Evaluation of the clinical translation of an optimized Compton Camera during Boron Neutron Capture Therapy for melanoma patients	126
<b>18:00</b>	<b>Closing Day 2</b>		
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<b>20:00</b>	<b>Conference dinner</b>		
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### Scientific Programme

Wednesday October 18th		Centro Congressi Federico II, Hall: "Aula Magna"	Abstract ID
08:00	Conference Registration		
<b>MC applications in IGRT and dosimetry</b>		<b>Chair: Hugo Palmans, National Physical Laboratory, UK</b>	
08:30	Frank Verhaegen, Maastricht Clinic, Maastricht, the Netherlands Caterina Cuccagna (TERA Foundation/ University of Geneva, Switzerland)	The use of imaging information in Monte Carlo simulations	12
09:00		Advances in the FLUKA PET tools	183
09:30	John Dooley (Accuray Incorporated, USA)	Monte Carlo for CyberKnife Radiosurgery with the InCise Multileaf Collimator	145
09:45	Maxime Chauvin (Centre de Recherches en Cancérologie de Toulouse, France)	OpenDose: a Collaborative Effort to Produce Reference Dosimetric Data with Monte Carlo Simulation Software	155
10:00	Susanna Guatelli (University of Wollongong, Australia)	Simulation of Synchrotron-based Microbeam Radiation Therapy using Geant4	21
<b>10:15 Coffee break &amp; Poster session</b>			
<b>MC applications in imaging and nuclear medicine</b>		<b>Chair: Emiliano Spezi, Cardiff University, UK</b>	
11:15	Giuseppe, Battistoni (University of Milan, Italy)	The application of the FLUKA Monte Carlo code in medical physics	54
11:45	Alessandra Tomal (Univeridade Estadual de Campinas, Brazil)	Skin Model and its impact on Mean Glandular Dose in Digital Mammography	92
12:15	Michela Esposito (University of Lincoln, UK)	Monte Carlo simulations for imaging in proton therapy	139
12:45	Antonio Sarno (University of Naples Federico II, Italy)	Monte Carlo Evaluation of Glandular Dose Estimates in X-ray Breast Computed Tomography	33
13:00	Arthur Lalonde (Universite de Montreal, Canada)	Accurate extraction of tissues parameters for Monte Carlo simulations using multi-energy CT	113
13:15	<b>Antonio Leal Plaza, Philippe Després and Paolo Russo</b>	<b>Conclusions</b>	
13:30		<b>End of Conference</b>	
<b>Companion programme</b>		<b>See Conference website for excursions</b>	
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## Scientific Programme

Monday October 16th, Tuesday October 17th, Wednesday October 18th, Centro Congressi Federico II

**Note: all posters can be set in place from 16th Oct. on, and will be accessible during the whole length of the conference. Only posters of regularly registered presenters may be showed.**

**Note: One-hour long poster sessions are in coincidence with coffee breaks. Poster presenters should be attending at their poster for two poster sessions at least.**

**Note: The two Poster Halls will be located at the First floor and at the Third floor of the Conference Center, respectively. Please see indications for locating the position of your poster.**

Poster title	Primary author	Abstract ID
Elastic scattering in FLUKA code for MONDO experiment: characterisation of the secondary fast and ultrafast neutrons emitted in Particle Therapy	Dr. MARAFINI, Michela	1
<del>MONTE CARLO SIMULATION OF 18 MV MEDICAL LINEAR ACCELERATOR AND PERFORMING NEUTRONIC ANALYSES</del>	<del>Mr. YAZGAN, Cagri</del>	<del>2</del>
Inter-Comparision of the Flux to Dose Conversion Factors Recommended in ICRP-74 and ICRP-116 to Evaluate Radiation Dose Rates	Dr. HOANG, Sy Minh Tuan	3
<del>MONTE CARLO SIMULATION of MEDICAL LINEAR ACCELERATOR for FILTERED and FFF SYSTEMS</del>	<del>Mr. YAZGAN, Cagri</del>	<del>4</del>
Monte Carlo simulation studies on a beam monitor based on MPGD detectors for hadron therapy	Dr. ALTIERI, Palma Rita	5
<del>Determination of X-ray Contamination and Dosimetric Characteristics of Electron Beams produced by LIAC Intraoperative Radiation Therapy Accelerator Using Monte Carlo</del>	<del>Mr. TANHA, Kaveh</del>	<del>6</del>
<del>Monte Carlo Simulation of Radiation Treatment Planning for Pituitary Adenoma</del>	<del>Mr. TANHA, Kaveh</del>	<del>7</del>
<del>Monte Carlo based validation of Compton scattering for 5 MV and 10 MV photon beams using Aluminium and Tungsten targets</del>	<del>Mr. JAGTAP, Amol</del>	<del>10</del>
<del>Monte Carlo simulations for the beam quality factor of a parallel-plate ion chamber in the presence of magnetic field</del>	<del>Prof. YE, Sung-joon</del>	<del>13</del>
Montecarlo calculation of reaction cross sections for the production of innovative radionuclides	FONTANA, Andrea	14
<del>Optimum Parameter for Photon Radiotherapy Monte Carlo Dose Calculation Method in GPU and Cluster MPI Computation Environment</del>	<del>Mr. BAYHAQI, Yakub Aqib</del>	<del>17</del>
<del>Validation of the Monte Carlo GATE platform for the dosimetry of ocular protontherapy</del>	<del>Dr. LAOUES, Mostafa</del>	<del>19</del>
<del>Design Simulation of a Low Radiation Dose Producing Device</del>	<del>Prof. UTKU, Haluk</del>	<del>23</del>
<del>Development and validation of the Monte Carlo model of a widely diffused activity meter</del>	<del>Dr. ZAGNI, Federico</del>	<del>26</del>
<del>Implementation of very high energy electron grid therapy: Monte Carlo study of source definition</del>	<del>Dr. DELORME, Rachel</del>	<del>27</del>
Evaluation of silicon and diamond based microdosimetry for boron neutron capture therapy Quality Assurance	Dr. GUATELLI, Susanna	28
Assessment of Neutron Dose Equivalent during Line Scanning Proton Therapy using Dynamic Multi-Leaf Collimator	Mr. KIM, Dae-hyun	29
Facility shielding evaluation using Monte Carlo simulation for proton therapy	Prof. CHO, Sungkoo	30
MONTE CARLO SIMULATIONS OF INTENSITY MODULATED RADIOTHERAPY USING PRIMO SOFTWARE	Dr. ESPOSITO, Alessandro	31
<del>Considering Bragg curve degradation in particle therapy due to lung equivalent materials in Monte Carlo codes by applying a density modulation</del>	<del>Mr. BAUMANN, Kilian</del>	<del>32</del>
Investigating energy deposition in cellular targets using multiscale tissue models	Ms. OLIVER, Patricia	38
A Geant4-based simulation tool for irradiation of biological samples	Mr. ?EFL, Martin	39
Three-Dimensional Dose Evaluation of the Blood Irradiator using Monte Carlo Simulation	Prof. WU, Jay	42
Database of neutron shielding for a 250-MeV proton accelerator	Mr. LIN, Chun-cheng	43
Evaluation of Skin Doses during Manipulation of Radioactive Sources in Nuclear Medicine: a Comparison between Varskin Code and Geant4 Simulations	Dr. AMATO, Ernesto	44
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**Note: all posters can be set in place from 16th Oct. on, and will be accessible during the whole length of the conference. Only posters of regularly registered presenters may be showed.**

**Note: One-hour long poster sessions are in coincidence with coffee breaks and poster presenters should be attending at their poster for two poster sessions at least.**

**Note: Poster size should be no larger than A0 format.**

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