Third Annual Conference of the COST Action MultIChem

(Tbilisi State University, Tbilisi, Georgia, April 10-12, 2024)

Conference Program

Wednesday, April 10

$08^{50} – 09^{00}$	Conference opening
$09^{00} – 09^{30}$	**<u>Morning session I: Radiation-induced chemistry</u> (Chair: Cécile Sicard-Roselli)** **Nigel Mason**, University of Kent, Canterbury, United Kingdom *Multiscale Chemistry in the extreme – Chemistry across the Universe*
$09^{30} – 10^{00}$	**Petr Slavíček**, University of Chemistry and Technology, Prague, Czech Republic *Electrons in water: Birth, transport and reactivity*
$10^{00} – 10^{30}$	**Pamir Nag**, J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic *Probing electron-induced chemistry in liquid micro-jets*
$10^{30} – 11^{00}$	**Gérard Baldacchino**, Université Paris-Saclay, CEA, Gif-sur-Yvette, France *Fluorescence quenching versus fluorescent probe damage in protons Bragg peak analyzed by in line TCSPC measurements*
$11^{00} – 11^{30}$	Coffee break
$11^{30} – 12^{00}$	**<u>Morning session II: Irradiation-driven transformations of molecular systems</u>** **(Chair: Gérard Baldacchino)** **Alexey Verkhovtsev**, MBN Research Center, Frankfurt am Main, Germany *Exploration of irradiation-induced processes in molecular systems by means of irradiation-driven molecular dynamics*
$12^{00} – 12^{30}$	**Hidetsugu Tsuchida**, Quantum Science and Engineering Center, Kyoto University, Japan *Damage process of nucleotide molecules in the Bragg peak region of multi-ion radiotherapy*
$12^{30} – 13^{00}$	**Leo Sala**, J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic *Nanoscale modifications on DNA nanostructures for diverse applications: From lithography to nanophotonics*
$13^{00} – 14^{30}$	Lunch
$14^{30} – 15^{00}$	**<u>Afternoon session I: Irradiation-driven transformations, damage and fabrication of MesoBioNano systems</u> (Chair: Felipe Fantuzzi)** **Anatoli Popov**, Institute of Solid State Physics, University of Latvia, Riga, Latvia *Radiation effects in insulators and recent progress on radiation effects research*
$15^{00} – 15^{30}$	**Aleksandr Lushchik**, Institute of Physics, University of Tartu, Tartu, Estonia *Accumulation and thermal annealing of radiation-induced point defects in functional metal oxides*
$15^{30} – 16^{00}$	**Biljana Gaković**, VINČA Institute of Nuclear Sciences, University of Belgrade, Serbia *Parametric study of selective ablation and periodical structure formation on nano layer thin films using ultra-short laser pulses*
$16^{00} – 16^{30}$	Coffee break
$16^{30} – 16^{40}$	**<u>Afternoon session II: Short presentations</u> (Chair: Duncan Mifsud)** **Klaudia Cielinska**, University of Kent, Canterbury, United Kingdom *Atomistic modelling of positron channelling in periodically bent crystals with non-harmonic profiles*

16^{40} – 16^{50}	**Konstantinos Kaleris**, Hellenic Mediterranean University, Rethymno, Greece *Computational study of γ-ray radiation generated by novel acoustically driven crystalline undulators*
16^{50} – 17^{00}	**Emmanouil Kaniolakis Kaloudis**, Hellenic Mediterranean University, Rethymno, Greece *Progress on controlled multi-MHz acoustic excitation for ultrarelativistic positron beam crystalline undulators*
17^{00} – 17^{10}	**Dorothea Hallier**, Fraunhofer Institute for Cell Therapy and Immunology, Potsdam, Germany *A XPS study on how the presence of water influences the radiation damage to proteins*
17^{10} – 17^{20}	**Mariam Osepashvili**, Kutaisi International University, Kutaisi, Georgia *Models for cancer dynamics (carcinogenesis)*
17^{20} – 17^{30}	**Estefania Rossich Molina**, Fritz Haber Research Center for Molecular Dynamics, The Hebrew University of Jerusalem, Jerusalem, Israel *Machine Learning meets Molecular Dynamics: IR spectra of astrochemical relevant systems*

Thursday, April 11

	<u>Morning session I: Collision and radiation processes with biomolecular systems</u> **(Chair: Marc Benjamin Hahn)**
09^{30} – 10^{00}	**Jean-Christophe Poully**, CIMAP UMR 6252 (CEA/CNRS/ENSICAEN/Université de Caen Normandie), Caen, France *Cartilage upon ionizing radiation: From molecular processes to biological effects*
10^{00} – 10^{30}	**Dorothea Hallier**, Fraunhofer Institute for Cell Therapy and Immunology, Potsdam, Germany *In-situ monitoring of chemical and structural changes at single-stranded DNA-binding proteins during X-ray exposure*
10^{30} – 11^{00}	**Laura Carlini**, Institute of Structure of Matter-CNR, Monterotondo, Roma, Italy *Peptide bond formation and degradation in dipeptide*
11^{00} – 11^{30}	Coffee break
	<u>Morning session II: Dynamics and chemistry of molecules in the interstellar medium</u> **(Chair: Nigel Mason)**
11^{30} – 12^{00}	**Duncan Mifsud**, HUN-REN Institute for Nuclear Research (Atomki), Debrecen, Hungary *Sulphur radiation chemistry in solar system and interstellar environments: New results from the laboratory*
12^{00} – 12^{30}	**Gergő Lakatos**, HUN-REN Institute for Nuclear Research (Atomki), Debrecen, Hungary *Astrochemistry of calcium-carbonate – role of low energy ion-implantation*
12^{30} – 12^{45}	Conference photo
12^{45} – 14^{30}	Lunch
	<u>Afternoon session I: Dynamical processes involving metal nanoparticles</u> **(Chair: Martin Falk)**
14^{30} – 15^{00}	**Cécile Sicard-Roselli**, Institut de Chimie Physique, University Paris Saclay, Orsay, France *Lanthanide-based nanoparticles for radiation dosimetry*
15^{00} – 15^{25}	**Telma Marques**, Instituto Superior Técnico, Bobadela, Portugal *Impact of the coating of gold nanoparticles on hydroxyl radical production*
15^{25} – 15^{50}	**Robin Schürmann**, Physikalisch-Technische Bundesanstalt (PTB), Berlin, Germany *Metrology for innovative nanotherapeutics using synchrotron-based X-ray scattering and complementary methods*
15^{50} – 16^{20}	Coffee break

	<u>Afternoon session II: Irradiation-driven transformations of molecular and condensed matter systems</u> (Chair: Anatoli Popov)
$16^{20} – 16^{50}$	**Matija Zlatar**, Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Belgrade, Serbia *Insight into the excited state dynamics of transition metal complexes*
$16^{50} – 17^{15}$	**Cauê Souza**, University of Kent, Canterbury, United Kingdom *Multiscale simulation of photo-assisted chemical vapour deposition*
$17^{15} – 17^{35}$	**Jelena Maljković**, Institute of Physics, University of Belgrade, Belgrade, Serbia *Experimental and theoretical study of differential cross sections for the elastic electron scattering by aneasthetic molecules in the medium energy range*
$19^{00} – 22^{00}$	Conference dinner

Friday, April 12

	<u>Morning session I: Biomedical and technological applications of radiation</u> (Chair: Revaz Shanidze)
$09^{30} – 10^{00}$	**Richard Amos**, Department of Medical Physics and Biomedical Engineering, University College London, United Kingdom *Ultra-high dose rate ion-beam therapy: Understanding the FLASH effect*
$10^{00} – 10^{30}$	**Archil Chirakadze**, Tbilisi State University, Tbilisi, Georgia *Enhancing the biological effectiveness and safety of particle therapy by means of the adjunct combined therapeutic modalities*
$10^{30} – 11^{00}$	**Mariam Abuladze**, Kutaisi International University, Georgia *Comparison of proton therapy doses obtained with the Geant4 and matRad*
$11^{00} – 11^{30}$	Coffee break
	<u>Morning session II: Irradiation-driven transformations of biological systems</u> (Chair: Richard Amos)
$11^{30} – 12^{00}$	**Martin Falk**, Institute of Biophysics, Czech Academy of Sciences, Brno, Czech Republic *Local and global post-irradiation changes in chromatin architecture at DSB sites and in the entire nucleus and their significance for DSB repair and genome stability*
$12^{00} – 12^{30}$	**Agata Kowalska**, Department of Physics, Maritime University of Szczecin, Poland *Biological response of human lymphocytes to neutron irradiation produced by ^{252}Cf source*
$12^{30} – 13^{00}$	**Peter van Luijk**, University Medical Center Groningen / University of Groningen, Groningen, the Netherlands *Reducing the risk of radiotherapy-induced xerostomia using stem cell sparing treatment techniques: Moving to the next level*
$13^{00} – 13^{15}$	Conference closing
$13^{15} – 15^{00}$	Lunch
$15^{00} – 16^{30}$	**MultIChem Management Committee Meeting**