

# Towards understanding and modelling intense electronic excitation

First Working Group Meeting  
March 4, 2019  
Porto, Portugal

## AGENDA

<b>Monday, March 4, 2019</b>	
8:00 – 9:00	Registration (building FC6, hall)
9:00 – 9:20	Opening session
9:20 – 10:50	<b>Session I – oral presentations (7) + discussion</b>
10:50 – 11:10	Coffee Break
11:10 – 13:10	<b>Session II – oral presentations (9) + discussion</b>
13:10 – 14:30	Lunch
14:30 – 16:30	<b>Session III – oral presentations (9) + discussion</b>
16:30 – 18:00	<b>Poster session (w/ refreshments)</b>
18:00 – 19:00	<b>Workgroup meetings (building FC3 – Physics &amp; Astronomy)</b>
20:00	Dinner at restaurant <i>Torreão</i> (downtown Porto)

## DETAILED PROGRAMME

### ORAL PRESENTATIONS

#### SESSION I (9:20 – 10:50)

Chair: Eduardo Oliva (Universidad Politécnica de Madrid, Spain)

I.1	<b>Monolithic Metal-Semiconductor Nanowire Heterostructures for Nanoscale Devices and Sensor Applications</b> Alois Lugstein (Technische Universität Wien, Austria)
I.2	<b>Ultrafast transmissivity change in XUV irradiated Si<sub>3</sub>N<sub>4</sub>: effect of electronic diffusion and ballistic transport</b> Victor Tkachenko (University of Applied Sciences, Emden, Germany and Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany)
I.3	<b>Time-resolved pump-probe spectroscopy on metallic nanostructures</b> Rafael Fuentes Domínguez (University of Nottingham, UK)
I.4	<b>A phenomenological model of energy relaxation in disordered insulators irradiated by ultrafast proton pulses</b> Lorenzo Stella (Queen's University Belfast, UK)
I.5	<b>Exploring charge state effects in swift heavy ion irradiation of Graphene</b> Marko Karlusic (Ruđer Bošković Institute, Croatia)
I.6	<b>Ultra-short laser pulses irradiation of multi-layered thin films – Single to multi pulse regimes</b> Biljana Gakovic (University of Belgrade, Serbia)
I.7	<b>Plasma enhancement of hydrogen adsorption and intercalation to WS<sub>2</sub> nanoparticles</b> Alex Laikhtman (Holon Institute of Technology, Israel)

#### SESSION II (11:10 – 13:10)

Chair: Raquel González-Arrabal (Universidad Politécnica de Madrid, Spain)

II.1	<b>Selected Results from One and Two Colour Ionisation of Atoms in Intense EUV/X-ray and Optical Fields</b> John Costello (Dublin City University, Ireland)
II.2	<b>Measurement of the full electric field of octave-spanning light pulses with carrier-envelope phase dispersion-scan</b> Miguel Miranda (University of Porto, Portugal)

II.3	<b>High harmonic generation spectroscopy of laser induced phase transitions in strongly correlated systems</b> Rui E. F. Silva (Max-Born-Institute, Berlin, Germany)
II.4	<b>Multiscale modelling of ion collision-induced processes with complex molecular systems</b> Andrey Solov'yov (MBN Research Center, Frankfurt am Main, Germany)
II.5	<b>QDD – Quantum Dissipative Dynamics. An open source package to study dissipation in finite quantum systems</b> François Coppens (Université Paul Sabatier, Toulouse, France)
II.6	<b>Electronic excitation following irradiation with ultrashort-pulsed lasers: The role of nonthermal electrons</b> George Tsibidis (FORTH, Heraklion, Crete, Greece)
II.7	<b>Probing electron-hole plasma and dense exciton systems in solids by techniques based on nonlinear optics and photoluminescence spectroscopy</b> Gintautas Tamulaitis (Vilnius University, Lithuania)
II.8	<b>Progress on the ETM instability</b> Michael Tatarakis (Technological Educational Institute of Crete, Greece)
II.9	<b>Ultrafast laser-generated nano-acoustics waves, experimental methods for validation of theoretical simulations</b> Nektarios Papadogiannis (Technological Educational Institute of Crete, Greece)

## SESSION III (14:30 – 16:30)

**Chair: Tzveta Apostolova (New Bulgarian University, Bulgaria)**

III.1	<b>Evolution of solids into plasma under ps- to ns-pulses of XUV light: open questions</b> Nikita Medvedev (Institute of Plasma Physics and Institute of Physics, CAS, Prague, Czech Republic)
III.2	<b>Rydberg states in electron-cation scattering</b> Felix Iacob (West University of Timișoara, Romania)
III.3	<b>Intense electronic excitations and ionizations in electrical discharges in fluids</b> Karel Kolacek (Institute of Plasma Physics, CAS, Prague, Czech Republic)
III.4	<b>Multiscale simulation of radiation-induced dynamics and reactivity</b> Pablo De Vera (MBN Research Center, Frankfurt am Main, Germany)

III.5	<b>Development of a predictive simulation toolbox for advanced materials performance under extreme conditions: from electronic excitations to the atomistic and continuum modelling of surface damage</b> Roberto Iglesias (University of Oviedo, Spain)
III.6	<b>A toy model for estimating NEEC rates in selected light nuclei</b> Stoyan Mishev (New Bulgarian University, Bulgaria)
III.7	<b>Simulations on matter dynamics under fs laser excitation</b> Vasilios Dimitriou (Technological Educational Institute of Crete, Greece)
III.8	<b>Improved treatment of the photoionization process in the laser induced optical breakdown in the laser tissue interaction</b> Violeta Petrovic (University of Kragujevac, Serbia)
III.9	<b>Fast Non-Adiabatic Dynamics Simulations of Quantum Many-Body Systems</b> Sam Vinko (University of Oxford, UK)

## POSTER SESSION (16:30 – 18:00)

(first/presenting author shown)

P1	<b>Ab initio study of the structural, electronic and vibrational features of oxygen interstitials in Al<sub>2</sub>O<sub>3</sub> and MgAl<sub>2</sub>O<sub>4</sub></b> Aleksandrs Platonenko (University of Latvia)
P2	<b>Quantifying elastic and inelastic electron irradiation effects in transmission electron microscopy of 2D materials</b> Alexander Markevich (University of Vienna, Austria)
P3	<b>Multiscale modelling of biomaterials: applications to dosimetry aspects</b> Ángeles Cerdeira (University of Oviedo, Spain)
P4	<b>Spinel-nitride based radiation tolerant optical materials</b> Eduard Feldbach (University of Tartu, Estonia)
P5	<b>Free-volume transformation in functional glasses and ceramics studied by positron annihilation lifetime spectroscopy technique</b> Halyna Klym (Lviv Polytechnic National University, Ukraine)
P6	<b>Charges displaced by short laser pulses in solids</b> István Magashegyi (University of Szeged, Hungary)
P7	<b>Features of radiation damage caused by fast neutrons and swift heavy ions in wide-gap metal oxides</b> Jevgeni Shablonin (University of Tartu, Estonia)
P8	<b>Simulating picosecond carrier transport in SiO<sub>2</sub> with a finite-element hydrodynamic model following proton irradiation</b> Jonathan Smyth (Queen's University Belfast, UK)

P9	<b>EMcLAW: a Maxwell solver code with AMR</b> José Antonio Moreno (Universidad Politécnica de Madrid, Spain)
P10	<b>Structural dynamics in strongly driven materials</b> Klaus Sokolowski-Tinten (University of Duisburg-Essen, Germany)
P11	<b>Electronic excitation and spectroscopy of laser-produced plasmas</b> Matthias Müller (Laser-Laboratorium Göttingen e.V., Germany)
P12	<b>Ionic transport and Polarization effects under electric fields: Generalized Cabrera's Mott model from Modern Theory of Polarization</b> Nicolas Salles (CNR-IOM, Trieste, Italy)
P13	<b>Vibrational excitation and dissoactive recombination of molecular cations with electrons: application to H<sub>2</sub><sup>+</sup>, HD<sup>+</sup>, BeD<sup>+</sup> AND BeT<sup>+</sup></b> Nicolina Pop (Politehnica University Timisoara, Romania)
P14	<b>Visualization of ultrafast melting initiated from radiation-driven defects in solids</b> Samuel Murphy (Lancaster University, UK)
P15	<b>Primary collisional processes in gas-phase ethane and secondary chemical effects in polyethylene upon H<sup>+</sup> ion impact</b> Sándor Demes (Hungarian Academy of Sciences, Debrecen, Hungary)
P16	<b>Modelling of Gas-Puff Based Laser-Produced Plasma for EUV/ SXR-induced Non-equilibrium Effect Study</b> Serge Zakharov (Gamma Pulse, Palaiseau and EATS, Orsay, France)
P17	<b>Simulation of Single Particle Displacement Damage in Silicon</b> Thomas Jarrin (Université de Toulouse, France)
P18	<b>Non-equilibrium transport simulations with the Gollum code</b> V́ctor Manuel García-Suárez (University of Oviedo, Spain)
P19	<b>Field-free time of flight design for studying fragments emitted at low energy (0.1-2 eV) from molecules excited and ionized by ion impact</b> Zoltán Juhász (Hungarian Academy of Sciences, Debrecen, Hungary)
P20	<b>Comparison of thermal annealing of radiation damage in neutron, ion and fast electron irradiated functional materials for fusion applications</b> Anatoli Popov (University of Latvia)
P21	<b>Effect of laser surface texturing on cell integration for Ti/Zr multilayer thin film</b> Suzana Petrovic (University of Belgrade, Serbia)
P22	<b>Spectral characterization of EUV and SXR laser-plasma compact sources based on a double stream gas puff target for application in optical coherence tomography (OCT)</b> Antony Jose Arikatt (Military University of Technology, Warsaw, Poland)
P23	<b>Photo-induced Long-range Energy Transfers in Multichromophoric Systems and Molecular Aggregates for Functional Molecular Materials Investigated with Ultrafast Spectroscopies</b> Andrea Cannizzo (University of Bern, Switzerland)

P24	<b>Non-thermal time-dependent atomic physics in the interaction of X-ray</b> Elisa Vázquez (Universidad Politécnica de Madrid, Spain)
P25	<b>Large area fabrication of high-aspect-ratio metallic nanostructures</b> Raquel González-Arrabal (Universidad Politécnica de Madrid, Spain)
P26	<b>Stress relief of thin film coatings with pulsed fluxes of highly energetic ions</b> Iván Fernández (Nano4Energy, Madrid, Spain)
P27	<b>Modeling of the non-equilibrium dynamics of and plasma generation in materials exposed to X-ray laser irradiation</b> Tzveta Apostolova (Institute for Nuclear Research and Nuclear Energy, Sofia, Bulgaria)
P28	<b>Electron emission from fs-laser-irradiated plasmonic nanoparticles in different media and with different surfactants</b> Antonio Rivera (Universidad Politécnica de Madrid, Spain)
P29	<b>Using high electronic excitation to modify plasmonic nanostructures</b> Ovidio Peña-Rodríguez (Universidad Politécnica de Madrid, Spain)
P30	<b>Electronic excitation strategy in liver transplantation from cadaveric donors</b> M.E. Cornide-Petronio (IDIBAPS, Barcelona, Spain)
P31	<b>Relevance of detection of liver steatosis</b> M.E. Cornide-Petronio (IDIBAPS, Barcelona, Spain)
P32	<b>Swift ion-impact ionization of molecules: model calculations for estimating multiple ionization</b> Béla Sulik (Hungarian Academy of Sciences, Debrecen, Hungary)
P33	<b>Ultrafast Magnetization Dynamics of [CoFeB/Pd]5/Co exchange spring systems</b> Ana Vieira da Silva (University of Porto, Portugal)
P34	<b>Dual self-diffraction dispersion-scan for the simultaneous measurement of two ultrashort ultraviolet pulses produced by a multiplate continuum</b> Miguel Canhota (University of Porto, Portugal)
P35	<b>Broadband third-harmonic generation in multilayer graphene for the characterization of near single-cycle ultrashort light pulses</b> Tiago dos Santos Gomes (University of Porto, Portugal)
P36	<b>Nitrogen lasing from atmospheric filaments</b> Eduardo Oliva (Universidad Politécnica de Madrid, Spain)
P37	<b>Probing piezoelectric response by inelastic laser light-scattering in KNN</b> Mariana Gomes (University of Porto, Portugal)
P38	<b>Intense CEP-stable single-cycle 2.2 fs laser pulses from a dispersion-scan based fully in-line post-compressor</b> Helder Crespo (University of Porto, Portugal)