# COST Action CA20129 MultIChem
# Workshop
# "Irradiation-driven chemistry: Multiscale approach"
## CECAM Headquarters, EPFL campus, Lausanne, Switzerland
## March 14-15, 2022

***Scope***

The Workshop "Irradiation-driven chemistry: Multiscale approach" will discuss the recent achievements and current challenges in the multiscale investigation of radiation-induced phenomena behind ion-beam cancer therapy (IBCT), ranging from nanoscale mechanisms of radiation-induced biomolecular damage to radiotherapy treatment planning.

The workshop will bring together expert theoreticians and leaders in computational modeling, experimentalists and radiotherapy practitioners studying irradiation-driven damage of biomolecular systems and exploiting this knowledge in the development of IBCT. Therefore, the workshop will provide an interdisciplinary and intersectoral forum to discuss the current state-of-the-art; theoretical, experimental and technological challenges underlying modern radiotherapies of cancer; and possible multiscale computational solutions to address these challenges.

***Scientific Program***

***Monday, March 14***

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| $14^{30}$ - $16^{00}$ | **Workshop opening**<br>**Andrey V. Solov'yov**, MBN Research Center, Frankfurt am Main, Germany<br>*Multiscale approach for the physics behind ion-beam cancer therapy*<br>**Alexey Verkhovtsev**, MBN Research Center, Frankfurt am Main, Germany<br>*Atomistic approach for modeling irradiation-driven processes with radiosensitizing nanoparticles* |
| $16^{00}$ - $16^{30}$ | Coffee break |
| $16^{30}$ - $18^{00}$ | **Cécile Sicard-Roselli**, Institut de Chimie Physique, University Paris Saclay, France<br>*What do we need to know about radiosensitization to design the most efficient nanoparticle?*<br>**Olivier Tillement**, NH TherAguix, France<br>*Ultrasmall Hybrid Nanoparticle as radiosensitizer: AGuIX, from bench to bedside* |
| $19^{00}$ - $22^{00}$ | Social dinner |

***Tuesday, March 15***

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| $9^{00}$ - $10^{30}$ | **Nigel Mason**, University of Kent, Canterbury, United Kingdom<br>*What fundamental data do we need to understand radiation damage and next generation radiotherapies?*<br>**Ilia Solov'yov**, Carl von Ossietzky University Oldenburg, Oldenburg, Germany<br>*Computational modelling of irradiation driven molecular processes in biological systems* |
| $10^{30}$ - $11^{00}$ | Coffee break |
| $11^{00}$ - $12^{30}$ | **Thomas Schlathölter**, Zernike Institute for Advanced Materials, University of Groningen, the Netherlands<br>*Action spectroscopy as a tool for investigation of DNA radiation damage on the molecular level* |

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| | **Leo Sala**, J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic<br>*DNA origami nanostructures as tools to study radiation-induced damage to DNA* |
| $12^{30}$ – $14^{00}$ | Lunch |
| $14^{00}$ - $15^{30}$ | **Stefan Both**, University Medical Center Groningen, the Netherlands<br>*Towards high precession proton therapy*<br>**Kate Ricketts**, University College London, United Kingdom<br>*Current and future perspectives of radiotherapy treatment planning and delivery: towards biologically-targeted radiotherapy* |
| $15^{30}$ - $16^{00}$ | Coffee break |
| $16^{00}$ - $18^{00}$ | **Brendan Dromey**, Queen's University Belfast, United Kingdom<br>*Ultrafast Nanodosimetry: Tracking the role of nanostructure in the ultrafast response of matter to ionising radiation in real time*<br>**Michael Hausmann**, Kirchhoff-Institute for Physics, University of Heidelberg, Germany<br>*The nano-architecture of chromatin and DNA repair protein clusters in the cell nucleus after ionizing radiation attacks: a comparison of cancer and non-cancer cell response*<br>**Richard Amos**, Proton and Advanced Radiotherapy Group, Department of Medical Physics and Biomedical Engineering, University College London, United Kingdom<br>*Treatment planning for ion-beam cancer therapy: An overview* |
| $18^{00}$ - $18^{15}$ | Workshop closing |

***Venue and Travel Information***

The workshop will be hosted by the Headquarters of the European Centre for Atomic and Molecular Computations - Centre Européen de Calcul Atomique et Moléculaire (CECAM). The address of the venue is: Batochime building (room BCH 2103), Avenue de Forel 2, 1015 Lausanne.

The venue is located approx. 5 km away from the Lausanne main station (Lausanne-Gare) and can be easily reached by metro line m1 (the nearest station is "UNIL-Sorge").

The online public transport map of Lausanne is available here.

***Accommodation***

Participants are requested to book their own accommodation. Various accommodation options can be found (e.g. here) according to the daily allowance rate (see below).

Although we do not provide particular suggestions on accommodation, the participants may consider staying at the Tulip Inn hotel (Chemin du Cerisier 8-10, 1004 Lausanne) together with the organizers.

***Reimbursement of the travel expenses***

The MultIChem COST Action provides financial support to reimburse participants for their travel expenses. Detailed information about the COST reimbursement rules can be found in the Annotated Rules for COST Actions (see Section 3.1 "Travel reimbursement rules", pp. 82-88).

In order to be reimbursed you must receive an official invitation through e-COST indicating that you are eligible for the reimbursement. After the meeting, you will be required to fill in your online travel reimbursement request (OTRR) through the link you will find in the invitation email.

When arranging your travel and accommodation, please consider the following rules (see the Annotated Rules for COST Actions for complete and detailed information):

- Any transport you take in your country (airplane, train, bus, car…) is reimbursed based on the supporting documents provided (tickets for flights, trains and buses; proof of distance for car travel, e.g. by Google maps). Taxi, car rental, fuel and parking expenses are not eligible.

- For the flight ticket: it must be return and economy class ticket from the country of your primary affiliation (as registered in e-COST) to the country of the meeting. Seat reservation, luggage and cancellation insurance are eligible.

- Your stay in Switzerland should be covered under the Daily Allowance (DA). The DA for Switzerland is 198 €. The DA is intended to cover accommodation, meals and transport in the host country. No receipts will be required.

- The maximum DA rate that can be claimed is calculated according to the actual number of days you attend the meeting (as confirmed by your signature on the official attendance list for each day of the meeting), plus one day, permitting you to arrive on the day before the meeting and/or leave one day after.

- In the travel days, the DA is based on departure and arrival times (see p. 83 of the Annotated Rules for COST Actions).

***Other useful information***

Almost all Covid-19 restrictions have been recently lifted by Swiss authorities. This means that:
- There is no need to show a Covid certificate to attend the event or go to a restaurant.
- There are no catering restrictions.
- Masks are only mandatory in public transport. However, the participants may be asked to wear masks whenever they are not presenting or eating.
- Participants entering Switzerland from the Schengen States are not required to show proof of vaccination or negative tests upon entry. If your travel originates from other counties, you will have to present proof of vaccination that has been administered in full within the past 270 days. For further information, please see the webpage.

***CECAM Workshop "Multiscale modelling of irradiation-driven processes for emerging technologies"***

The MultIChem Workshop will be followed by a CECAM Workshop "Multiscale modelling of irradiation-driven processes for emerging technologies", which will be held in CECAM HQ during March 16-18, 2022.

The workshop will bring together expert theoreticians, experimentalists and technologists studying material properties and irradiation-driven processes relevant to selected emerging technologies (surface deposition techniques, nanofabrication, 3D nanoprinting using focused electron & ion beams, novel light sources). It will provide a forum for discussion of the current state-of-the-art, theoretical, experimental and technological challenges and possible multiscale computational solutions to address these challenges.

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