# NANOCHEMISTRY CAMP 2026

**19th – 26th September (Iseo, Camping del Sole, Italy)**

## NANOCHEMISTRY

Nanochemistry deals with the fundamental aspects of nanotechnology, straddling the boundaries of physics, chemistry, and biology. Nanotechnology is the science and technology of objects that have an intermediate size between larger molecules and the smallest structures we are currently able to manufacture; it is the science of objects with dimensions ranging from a few nanometers to hundreds of nanometers (1 nm is one billionth of a meter).

Nanochemistry has profound implications, encompassing both technological advancements and sustainable development. For instance, it has diverse effects on society, particularly in the electronics and energy sectors, resulting in the creation of compact, efficient devices and the advancement of battery technologies. Moreover, it has revolutionized medicine by facilitating targeted drug delivery and early disease detection through highly sensitive sensors. Additionally, nanochemistry significantly contributes to environmental sustainability by aiding in the removal of pollutants from water and air purification, as well as reducing resource consumption and environmental impact in material production.

## THE CAMP

The Nanochemistry Camp is an international residential summer school aimed at master's and doctoral students in chemistry and allied fields, where nanochemistry plays a key role. It delivers top-tier, cutting-edge insights on pivotal topics in nanochemistry, by featuring an original and innovative format that brings together students and globally renowned experts in (nano)chemistry, including Nobel laureates, in a comfortable and informal environment at one of the most beautiful campsites overlooking Lake Iseo (https://www.campingdelsole.it/en/).

The educational program includes 3-hour classes with each professor, consisting of about 1.5 hours of lecture followed by an equal amount of time for discussion. Additionally, the program incorporates community-building activities where students have the opportunity to engage with professors and each other regarding their research activities and future projects. To promote this interaction, poster pitch presentations, team-building activities, trekking, and responsible tourism outings are scheduled.

Master's and doctoral students, and young post-doctoral researchers are eligible to apply for the Camp. Admission is subject to selection by the Scientific Committee, based on the abstract of the scientific contribution, motivation letter, and CV.

## THE SPEAKERS

- JEAN-PIERRE SAUVAGE – Nobel Laureate in Chemistry 2016; Emeritus professor, University of Strasbourg;
- TIMOTHY CRAGGS – Senior lecturer of Biological Chemistry, University of Sheffield;
- SILVIA GIORDANI – Professor of Nanomaterials, School of Chemical Sciences at Dublin City University;
- BARBARA HISSA – Managing Editor, Beilstein Journal of Nanotechnology;
- OLDAMUR HOLLÓCZKI – Professor of Chemistry, University of Debrecen;
- AITOR MUGARZA EZPELETA – Catalan Institute of Nanoscience and Nanotechnology;
- GIANFRANCO PACCHIONI – Professor of Chemistry, University of Milano – Bicocca;
- MARÍA SANCHO ALBERO – Researcher, Institute of Nanoscience and Materials of Aragón, University of Zaragoza.

# AGENDA

**SATURDAY 19th SEPTEMBER**

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| Daytime | Participants' arrival to Iseo |
| 7.00 – 7.45 p.m. | Course and participants' introduction |
| 8.00 p.m. | Welcome dinner at the Camping's restaurant |

**SUNDAY 20th SEPTEMBER**

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| 9.00 – 10.30 a.m. | Seminar **BARBARA HISSA** \| Beilstein Journal of Technology<br><br>Title: *From Data to Publication: Mastering Manuscript Writing and Navigating the Open Access Landscape in Nanoscience and Nanotechnology*<br><br>Abstract: You've done the experiments, checked reproducibility, built your figures. How do you turn that work into a reputable and visible article? Ms Hissa will share practical tips on manuscript preparation and writing, then map out the open access landscape, from fee-based models to diamond open access (DOA) – an equitable, fee-free route that doesn't drain your funding or your university's budget. She will also introduce *BJNANO* (Beilstein Institute's DOA journal) to the Nanochemistry camp community. |
| 11.00 a.m. – 6.00 p.m. | Day trip to the picturesque island Monte Isola and hike to Santuario Madonna della Ceriola, with its breathtaking view on Lake Iseo |
| 8.00 p.m. | Dinner at the Camping's restaurant |

**MONDAY 21st SEPTEMBER**

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| 9.30 a.m. – 12.30 p.m. | Lecture **JEAN-PIERRE SAUVAGE** \| Nobel Laureate in Chemistry 2016, University of Strasbourg<br><br>Title: *Molecular machines and motors: A historical perspective*<br><br>Abstract: tbd |
| 1.00 p.m. | Lunch at the Camping's restaurant |
| 2.30 – 6.00 p.m. | Lakeview **POSTER SESSION** |
| 7.00 p.m. | Lakeview charity dinner by La Nuova Cordata at the Camping |

**TUESDAY 22nd SEPTEMBER**

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| 9.30 a.m. – 12.30 p.m. | Lecture **GIANFRANCO PACCHIONI** \| University of Milano-Bicocca<br><br>Title: *From Li Clusters to Single-Atom Catalysts: A Journey Across 50 Years of Nanocatalysis*<br><br>Abstract: This lecture will trace nearly five decades of research in cluster chemistry, from early studies of gas-phase clusters to recent advances in |

atomically precise nanocatalysts and single-atom catalysts. It will highlight how advances in experimental techniques, theory, and computation have transformed our understanding of cluster structure, stability, and reactivity, strengthening the links between nanoscience, surface chemistry, and heterogeneous catalysis. Emphasizing the interplay between theory and experiment, the lecture will illustrate key developments through examples from professor Pacchioni's research and personal anecdotes and will conclude with reflections on the evolution of scientific research over the past fifty years and its implications for the future.

1.00 p.m. Lunch at the Camping's restaurant

2.30 – 5.30 p.m. Lecture **AITOR MUGARZA EZPELETA** | Catalan Institute of Nanoscience

Title: *Building atomically precise nanomaterials with surface-assisted "LEGO chemistry": from synthesis to integration in devices*

Abstract: Bottom-up on-surface synthesis has demonstrated remarkable potential for creating carbon nanomaterials with atomic precision. By employing chemically tailored organic building blocks, this approach enables the rational construction of a broad range of carbon nanoarchitectures with tunable electronic and magnetic properties. Among the diverse nanostructures accessible through bottom-up synthesis, graphene nanostructures and two-dimensional metal–organic frameworks (2D MOFs) have emerged as particularly prominent platforms, owing to their potential applications in nanoelectronics, spintronics, sensing, catalysis, and beyond. In this lecture, professor Mugarza Ezpeleta will introduce the fundamentals of on-surface synthesis, provide an overview of the nanomaterials that can be fabricated using this approach, and discuss some of the key challenges involved in moving from the synthesis of atomically precise nanomaterials to their integration into functional devices.

7.30 p.m. Dinner conversation at *Duck Bistrot* with **GIANFRANCO PACCHIONI** | *Light and Shadow in Science: Pure Research, the Military, and Big Tech*

**WEDNESDAY 23rd SEPTEMBER**

9.30 a.m. – 12.30 p.m. Lecture **SILVIA GIORDANI** | Dublin City University

Title: *Carbon nano-materials: chemistry and biomedical applications*

Abstract: Carbon nanomaterials have emerged as a versatile class of functional nanomaterials with unique physicochemical properties that enable a broad range of biomedical applications. This tutorial will introduce the chemistry underlying the synthesis, functionalisation, and characterisation of carbon nanomaterials, with a particular focus on carbon nano-onions (CNOs), multi-layered fullerene nanoparticles with high surface area, tunable surface chemistry, and outstanding potential as nanocarriers for targeted drug delivery. The lecture will highlight recent advances in the engineering of CNOs for receptor-mediated cancer targeting, controlled drug release, molecular imaging, and theranostic applications, illustrating how rational surface design can improve therapeutic efficacy while reducing off-target toxicity. Current challenges and future opportunities for the clinical translation of carbon nanomaterials in precision nanomedicine will also be discussed.

1.00 p.m. Lunch at the Camping's restaurant

3.00 – 5.00 p.m. Kayak on Lake Iseo in Sporting Lido Sassabanek

7.30 p.m. Dinner at *Osteria Ai Cancelli*

**THURSDAY 24th SEPTEMBER**

9.00 a.m. – 12.00 p.m. Lecture **MARÍA SANCHO ALBERO** | University of Zaragoza

Title: *Extracellular vesicles and Nanoparticles: dangerous liaisons*

Abstract: The use of extracellular vesicles (EVs) as drug delivery carriers of therapeutic nanoparticles (NPs) is being deeply explored. Thanks to the natural targeting properties of EVs, they can provide NPs with tumour tropism to overcome some challenges related with the low accumulation of drug and NPs in tumoral cells. Professor Sancho Albero will discuss the combination of last advances in the nanotechnological field related with the EVs area to design and create promising therapeutic tools for cancer therapy.

12.30 p.m. Lunch at the Camping's restaurant

2.00 – 5.00 p.m. Lecture **OLDAMUR HOLLÓCZKI** | University of Debrecen

Title: *Computational methods for uncovering the physical chemistry and toxicity of nanoplastics*

Abstract: Nanoplastics have gained a lot of attention recently, since these pollutants are ubiquitous in the environment and they are potentially toxic. Experimental methods have limits in investigating these materials, hence computational and modeling methods are necessary to uncover their physical chemistry, including the ways they interact with the (bio)molecules in their vicinity. The versatile theoretical and modeling toolbox will be discussed through this exciting and important example, with the aim to highlight how these methods can be employed in material chemistry in general.

6.30 p.m. Guided tour to Berlucchi wine cellars and gala dinner with best poster award and attendance certificate ceremony

**FRIDAY 25th SEPTEMBER**

10.00 a.m. – 1.00 p.m. Lecture **TIMOTHY CRAGGS** | University of Sheffield

Title: *Single Molecules, Real Instruments: smFRET and FCS from Bench Prototype to Commercial Platform*

Abstract: Single-molecule fluorescence techniques — Förster resonance energy transfer (smFRET), fluorescence correlation and cross-correlation spectroscopy (FCS/FCCS) — offer a uniquely direct window onto biomolecular structure, dynamics, and interactions, resolving conformational states and kinetics that ensemble methods average away. Yet for two decades these methods remained largely confined to a handful of specialist labs, held back not by the underlying physics but by the difficulty of building, aligning, and running the instruments reliably. This workshop will trace the full arc from optical principle to commercial platform. It will begin with the fundamentals: what a photon actually tells us, how confocal smFRET and FCS/FCCS measurements are constructed, and why techniques such as alternating-laser excitation (ALEX) and burst analysis matter for extracting quantitative distances

and dynamics. It will then turn to instrument development itself — the engineering, alignment, detection, and data-analysis choices that separate a working bench prototype from a system that a non-specialist can operate and trust — and the parallel challenge of turning single-molecule data into robust, reproducible measurements. The second half will address a question rarely covered in technical courses: how a piece of academic apparatus becomes a company. Drawing on the experience of spinning a single-molecule platform out of the University of Sheffield, professor Craggs will discuss the transition from grant-funded prototype to a manufacturable, supportable product; the realities of commercialisation (customers, sales cycles, recurring revenue, consumables, and service); and the funding, team-building, and credibility challenges of building a scientific instrumentation business. Throughout, students will aim to be candid about what worked, what didn't, and where the genuine uncertainties remain. By the end, participants should understand both the measurement science of smFRET/FCS and the practical and commercial pathway by which such instruments reach the wider research and biopharma community. The session is intended for researchers curious about single-molecule methods, instrument developers, and anyone considering translating their own science into a product.

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| 1.30 p.m. | Lunch at the Camping's restaurant |
| 3.30 p.m. – 5.30 p.m. | Guided tour to Brescia city centre |
| 5.30 p.m. – 7.30 p.m. | Free time in Brescia |
| 7.30 p.m. | Dinner at Lestro Pizza Restaurant in Brescia |

**SATURDAY 26th SEPTEMBER**

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| Daytime | Participants' departure |