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# Special issue: molecular spectroscopy in the study of reaction mechanisms

Alberto Mezzetti* and Josefine Schnee

The 1st Thematic School "Vibrational and electronic spectroscopies applied to the study of reaction mechanisms – MECAREACT" (**https://mecareact.sciencesconf.org/**) was held in Paris, France, from June 18 to June 23, 2023. The School was organised by the Laboratory for Surface Reactivity (LRS), Sorbonne University, France, and by the French National Center for Scientific Research (CNRS). The School was open to PhD students but also to experienced researchers and technical staff both from the public and private sector. The School was a success: it was fully booked (100 participants including the 14 teachers), and attended by people coming from institutions from 16 different countries in the world. This special collection is devoted to the works presented at the School through poster sessions, whereas the lessons will be published in a forthcoming book by the *Royal Society of Chemistry*. A second edition of the school is scheduled to take place, still in Paris, in June 2025.

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The idea of the MECAREACT School ('Vibrational and electronic spectroscopies applied to the study of reaction Mechanisms' **https://mecareact.sciencesconf.org/**) takes its origin from informal talks among scientists in international conferences held from 2010 to 2019. It was clear that no specific training schools in the rapidly-evolving field of optical spectroscopies applied to the study of reaction mechanisms were being organized, with the noticeable exception of *operando* spectroscopy in catalysis.

Nevertheless, direct experience from the organizers showed that similar experimental, data treatment and data interpretation approaches were used by different communities, ranging from photochemistry to material science or biochemistry. Furthermore, new instruments are currently becoming available so that we assumed that such a school was timely and of broad scientific relevance.

This pushed us to organize the MECAREACT school (chaired by Dr Alberto Mezzetti, Sorbonne University and co-chaired by Dr Josefine Schnee, CNRS) with the additional objective to foster scientific exchanges among different scientific communities that often face similar problems and challenges.

Feedback from the attendees confirmed this feeling. The informal atmosphere – pushing students and teachers to discuss also during lunch breaks or evenings on specific issues – was also highly appreciated, as were the scientific visits to SOLEIL synchrotron or to Sorbonne University LRS laboratory.

We are particularly happy that also the response from the private sector was very strong. We had 7 private sponsors (along with 9 public or no-profit sponsors) and 5 of them showcased their instruments and/or gave a short presentation.

A particular thanks goes to the CECAM-MOSER (Centre Européen de Calcul Atomique et Moléculaire) that provided 4 fellowships for students committed to use computational methods to help understanding experimental data or peculiar reaction pathways.

We are confident that this first edition of the School represents a first step to establish MECAREACT, in the coming years, as a cornerstone in the field of optical spectroscopies applied to reaction mechanisms. The next edition is scheduled to take place in June 2025.

*Sorbonne Université, CNRS, Laboratoire de Réactivité de Surface, LRS, F-75005 Paris, France.*
*E-mail: alberto.mezzetti@sorbonne-universite.fr*