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TITLE

Dynamics of irradiation: From molecules to nanoobjects and from material science to biology

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We discuss microscopic mechanisms of irradiation in clusters and molecules. We consider the case of isolated molecules/clusters and/or in contact with an environment. We use Time Dependent Density Functional Theory (for electrons) coupled to Molecular Dynamics (for ions) and follow explicitly in time both irradiation and response of the system. Examples are taken from free metal clusters, from fullerenes, from molecules of biological interest and from clusters deposited on a surface or embedded in a matrix. We analyse in particular the properties of emitted electrons (photo electron spectra, angular distributions...) which constitute a key tool of analysis of the properties of irradiated clusters and molecules. We also discuss the possibility of pump and probe scenarios (opening the road to manipulation at the molecular scale) with help of dedicated laser pulses, exploring high laser frequencies towards the FEL regime and very short times scales down towards the attosecond domain.

Biography

Eric Suraud is distinguished Professor of Physics at Toulouse University in France and member of Institut Universitaire de France and of European Academy of Sciences. He has also had several high level responsabilities in the administration of research in France over the last decade. After a PhD in Paris and a 10 years activity in nuclear physics he turned towards electronic dynamics in the mid 1990's. He has published more than 150 papers in peer review journals and 6 books. He has been invited to more than 100 international conferences and gave many seminars in laboratories all over the world.