

# Press release

The Physics of Nanostructures Laboratory has been developing research including the investigation of fundamental phenomena (developing basic science) and the application of structured systems at the atomic level to solve current problems such as the production and storage of renewable energies. One of the research focuses is associated with the study of the surface properties of nanostructured materials. These properties are mainly established by the electrons present in the surface atoms of these nanomaterials. In this way, phenomena that alter the distribution of surface electrons directly influence the physicochemical characteristics of materials, which may improve or prevent the application of the nanostructure.

One of the effects of great impact on the properties of nanostructured catalysts is known as the Strong Metal-Support Interaction Effect (or SMSI effect), which manifests itself through electronic and geometric phenomena. Although the occurrence of this effect has been observed for more than 40 years, several questions regarding the nature of such effect have remained unanswered until then. Using a combination of experimental and computational techniques, this work revealed the mechanisms by which the electronic phenomena of the 'SMSI' effect occurs. The results obtained allowed the identification of the thermal and atmospheric conditions for the occurrence of electronic interactions, and with that the control of such phenomenon, enabling the engineering of nanocatalysts to tune such interaction whenever it is interesting.