

Design of materials in the Nanoscale: Taming the Plasma

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One of the most relevant scientific and technological challenges nowadays is the control of plasma processes and plasma/surface interaction to synthesize materials with structures ‘a la carte’ in the nanoscale. However, the lack of knowledge on complex plasma dynamics and plasma-induced processes on surfaces represents a serious obstacle for the development of such growth protocols. In the last years, the relevance of this issue has motivated the development of novel theories dealing with the transport of non-thermal species in the plasma and their assembly in the nanoscale, corroborated by means of fundamental experiments carried out in wisely-chosen conditions [1,2]. Results on this research will be presented, showing numerous thin films grown in our laboratory by plasma-assisted techniques, together with computer simulations of their growth. The good agreement between them as well as the high accuracy of the simulations, suggest that computer-aided design of materials in the nanoscale would be, to some extent, possible in the near future.

[1] 1. R. Alvarez, J.M. Garcia-Martin, M.C. Lopez-Santos, V.Rico, F.J. Ferrer, J. Cotrino, A.R. Gonzalez-Elipse, A. Palmero, *Plasma Processes and Polymers* **11**(6), 571-576 (2014).

[2] R. Alvarez, J. M. García-Martín, M. Macías-Montero, L. Gonzalez-Garcia, J.C. González, V. Rico, J. Perlich, J. Cotrino, A. R. González-Elipse, A. Palmero, *Nanotechnology* **24**, 045604/1-9 (2013).

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