Spanish researchers train Argentinean students

NanoforumEULA, 29 May 2008

Beginning of 2008, Mr. Juan Carlos Moreno-López, PhD. Student at the INTEC Laboratory of Physics of Surfaces and Interfaces in Santa Fe, Argentina, visited the LASUAM, Surfaces Laboratory in the Autónoma University of Madrid, Spain for three months, as part of the NanoforumEULA project. He learned to use high tech instruments necessary for his dissertation, for investigating properties of a new type of materials, metafullerenes, which consists of small football shaped molecules of metallic materials. The work is basic research, and for the moment it is not clear what will be the benefits for society.

What have you worked on during your visit?

I worked with a variable temperature scanning tunnelling microscope (*VT-STM*) working under ultra high vacuum (*UHV*) conditions. We started working on the preparation and characterization of graphene on *Ni*(111). As all surfaces brought from atmosphere pressure, the *Ni*(111) surface was contaminated, so it was necessary to clean it. To obtain a clean surface it is necessary to find the cleaning parameters, temperature of annealing, time and energy of bombardment, etc. When we were trying to find the cleaning parameters, we had a serious problem with the sample, so it was necessary to take out the sample from the UHV chamber and make a mechanical polish to the surface. By the fact that we did not have enough time to do this procedure, it was necessary to change the system of study. So, we decided to start working on a metafullerenes $Y@C_{82}$ over *Cu*(111) surface. As a consequence of this research we obtained interesting results. This has motivated my colleagues of the LASUAM to continue this study of metafullerenes, which may turn out in scientific publications.

Why is that important for your research and for progress in nanotechnology?

Fullerenes were first reported in 1985. The formation of metallofullerenes, specially those stable in air and organic solvents, has been reported only for few elements, Yttrium is one of them. The $Y@C_{82}$ have been intrigued by the unusual structure and properties of these molecules and by the many potential applications offered by them. Working with metafullerenes was a very important contribution to my formation. I worked with the same technique than I usually use in Argentina, I had the possibility to work with colleagues of another group, interchange experiences, consult with them experimental problems and learn new concepts and techniques.

Why did you come to this European research centre to do this project?

The Surface Science Laboratory at the Autónoma University in Madrid has the tradition of international scientific excellence, judged by the number and quality of their scientific publications.

What are the results? How will you disseminate them?

For me, the main result obtained from this interchange experience, was learning about new topics and improving my knowledge about techniques.

Is this the first contact between both organizations or is your visit part of existing collaboration?

No, our laboratories have been collaborating from a long time ago, so my visit is part of previous collaborations.

What are the plans for future collaboration?

Probably, some next visits to the LASUAM of other members of our group.

How may your project in the long term benefit the development of your country or Latin America in general?

I think that, learning in a group with international scientific excellence and give back the knowledge to Latin America, is a effective way to reduce the technological differences existing between Latin America countries and the so called, First World or Developed countries.

What are your plans for disseminating the results of your visit outside the research community in your country?

Recently, I had an interview with a local newspaper. I spoke about my visit to Spain and the NanoforumEULA project.

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About NANOFORUMEULA
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Professor Aviles Cetina is one of these visiting researchers. We also organise two workshops and fact finding missions in Mexico (held in August 2007) and Brazil (4-13 September 2008) enabling European researchers and industrialists to identify opportunities for establishing working relations.
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