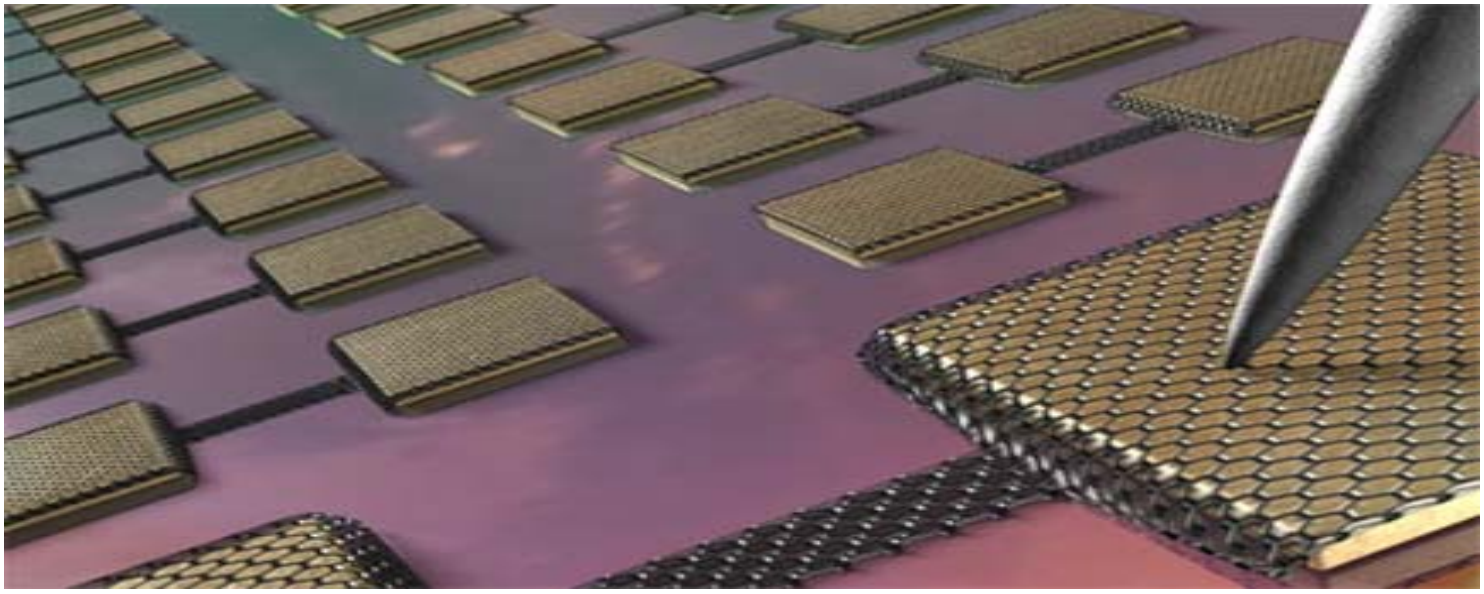
Workshops

Advanced Solutions for Science



New Horizons in Nanochemistry with SPM

University of Córdoba

Thursday 29th January 2015

Organized by:

Irida

Advanced Solutions for Science

NT-MDT

Collaborate:

IUIQFN

Instituto Universitario de Investigación en Química Fina y Nanoquímica

UNIVERSIDAD D CÓRDOBA

Workshop New Horizons in Nanochemistry with SPM

29th January 2015, University of Córdoba (Córdoba, Spain)

About the Workshop

This workshop will focus on general aspects of scanning probe microscopy on nanochemistry. We will have the participation of several speakers to evaluate new horizons using this technique.

Program

09:45 - 10:00h Registration

10:00 - 10:15h Workshop opening by Phd. Jose Carlos Gómez (Rector University of Córdoba, Spain)

10:15 - 11:00h "A General Introduction to AFM Technique"
Phd. Marcel Bus (Delft University of Technology, Delft, The Netherlands)

11:00 - 11:45h "Atomic Force Microscopy: Basic and Advanced Modes"
Phd. Stanislav I. Leesment (NT-MDT, Zelenograd, Russia)

11:45 - 12:15h Coffee break

12:15 - 13:00h "Friction Microscopy on the Nanoscale: New (Exciting) Applications to Material Science"
Phd. Enrico Gnecco (IMDEA Nanoscience, Madrid, Spain)

13:00 - 13:45h "Advanced SECM possibilities for Energy Devices Research by using an AFM "
Phd. Erik M. Kelder (Delft University of Technology, Delft, The Netherlands)

13:45 - 15:00h Lunch time

15:00 - 16:30h System presentation: Ntegra™ Platform a Versatile Nano-Tool – **Group 1** (max. 10 people)

16:30 - 18:00h System presentation: Ntegra™ Platform a Versatile Nano-Tool – **Group 2** (max. 10 people)

Irida
Advanced Solutions for Science

NT-MDT

Workshop New Horizons in Nanochemistry with SPM

29th January 2015, University of Córdoba (Córdoba, Spain)

About NT-MDT

NT-MDT enjoys more than of 20 years history in instrumentation created specifically for nanotechnology research, leading the field in originality, quality, and high tech development.

NT-MDT strives for next-generation SPM technology, whether it be in pure modularity that allows a university or industrial lab to start with a cost-effective core product and build to a grand, multi-user research center or the ultimate amalgamation of SPM with related technologies that has resulted in spectroscopy-based instruments that meld the world of imaging with the world of chemical analysis. **NT-MDT** believes passionately in pushing the envelope for rapid innovation while still delivering superb customer service.

NT-MDT offers expert service and applications development through more than 20 representative offices and distributor centers around the globe. The **NT-MDT** installed base has grown to over 4000 instruments, promoting the growth of both lab and research programs world-wide.

Whether you are engaged every day in nano research or just contemplating it, coupling your specific scientific knowledge and expertise with NT-MDT´s competence in instrument creation will undoubtedly ensure the best results possible.

About Speakers

Dr. Enrico Gnecco — **IMDEA Nanoscience, Madrid, Spain**

Enrico Gnecco is a Senior Scientist at IMDEA Nanoscience, Madrid. He started his research activities as undergraduate student at the University of Genova with experimental investigations of current noise in Hg and Tl based high Tc superconductors. His PhD thesis focused on nanotribology, i.e. the study of friction and wear processes on the nanometer scale. In the group of Ugo Valbusa he characterized the growth of amorphous carbon films by scanning probe microscopy, focusing on the relations between friction and self-affine properties of the surfaces. In the second part of his PhD he joined the group of Ernst Meyer in Basel, where he investigated basic friction mechanisms on atomically flat crystal surfaces in ultra high vacuum (UHV). The main result was the observation of a logarithmic velocity dependence of atomic friction, which was interpreted within a combination of the classical Tomlinson and Eyring models.

After his PhD E.G. joined the Swiss National Center of Competence of Research in Nanoscale Science, where he addressed other fundamental nanotribological processes, such as the wear onset on the atomic scale under vacuum conditions, the transition from stick-slip to superlubric regime of motion, and electromechanical methods to reduce friction down to negligible values. He also studied self-assembling of organic molecules on insulating surfaces by atomic force microscopy in UHV. In this context, an original way to trap molecules in rectangular nanopits produced by electron irradiation was introduced, and molecularly resolved images were obtained for the first time on alkali halides. E.G. is also interested in nanomanipulation performed by AFM on different systems, from metal clusters in ambient conditions to single molecules in UHV with the goal of evaluating the energy consumption accompanying the manipulation process.

E.G. co-authored about 70 peer-reviewed articles (including publications in Science, Nature Materials, PNAS and Nanoletters) and 4 book chapters. He also wrote the book "Nanoscale Processes on Insulating Surfaces" (World Scientific, 2009) with Marek Szymonski, and edited the book "Fundamentals of Friction and Wear on the Nanoscale" (Springer, 2007) with Ernst Meyer.

More Information: http://www.nanociencia.imdea.org/personas/investigadores/dr-enrico-gnecco

Irida Advanced Solutions for Science

NT-MDT

Workshop New Horizons in Nanochemistry with SPM

29th January 2015, University of Córdoba (Córdoba, Spain)

Dr. Erik M. Kelder — Delft University of Technology, Delft, The Netherlands

Erik M. Kelder is a Senior Scientist at Delft University of Technology. He started his research activities at the State University of Utrech on solid state chemistry. His PhD thesis focused on kinetics and characterization of CVD-grown BP under supervision of Prof. J. Schoonman at Delft University of Technology.

His research is focused on composite materials of organic and inorganic studied to obtain solutions for sustaining the mechanical and chemical behavior of lithium-ion batteries during charging and decharging cycles. Within his research novel polymers are being developed to enhance the energy storage density, the power performance and life time of rechargeable batteries, based on the lithium-air concept. The research is a cooperation between the OMI group and the Radiation Science and Technology Department.

Mr. Kelder has published 89 publications and more that 145 paper as a co-author. He also wrote the book "Nanoscale Processes on Insulating Surfaces" (World Scientific, 2009) with Marek Szymonski, and edited the book "Fundamentals of Friction and Wear on the Nanoscale" (Springer, 2007) with Ernst Meyer.

More Information: http://www.tnw.tudelft.nl/over-faculteit/afdelingen/chemical-engineering/research/nanostructured-materials/people/kelder/

Dr. Stanislav I. Leesment — NT-MDT, Zelenograd, Russia

Stanislav I. Leesment is a Senior Scientist at NT-MDT. He started his studies at Moscow Institute of Electronic Engineering (MIEE). His Phd thesis focused on equipment and methods for experimental physics at Moscow Institute of Physical Problems (MIPP).

After his PhD, S.L. joined the NT-MDT Co., where he worked in R&D Department as an application scientist. He is actually chief of the software development group at NT-MDT.

He has more than 15 years of experience in AFM, software development coordination, product presentation/demonstration, outsource management nanotechnology.

His interests are focused on AFM automation and control, and mechanical studies at the nanoscale.

Dr. Marcel Bus — Delft University of Technology, Delft, The Netherlands

Marcel Bus is a Research Engineer at Delft University of Technology. He was working as aservice engineer at Bester B.V. with a focus on product development and troubleshooting on chromatography and coulometric applications. In 2000 he was appointed at TUDelft as a specialist process analysis, where he expanded his experience with analytical methods. In 2006 he changed his main focus to scanning probe microscopy, coinciding with the Chemical Engineering department broadening its focus to chemical engineering at the nanoscale. He has more than 9 years of experience as scanning probe microscopist at Delft University of Technology on research on surfaces at the nanoscale level.

More Information: http://staff.tudelft.nl/M.Bus/

Irida Advanced Solutions for Science

NT-MDT

Other Information

- ✓ *Workshop is totally free*
- ✓ *Locations:*
  - *Lectures: Salón de Grados "Manuel Medina" del Paraninfo (Campus de Rabanales)*
  - *Demo-Live: Ground floor "Marie Curie" Building (Campus de Rabanales)*
- ✓ *Maximum Attendance:*
  - *Lectures: 90 people (max. capacity of meeting room)*
  - *Demo-Live: 20 people (2 groups; 10 people per group).*
- ✓ *If you wish to attend, please reply by e-mail (Info@irida.es) with the pre-registration form (Annex 1).*
- ✓ *We strongly recommend registration on time in order to collect badge and event material.*

Location Information and Map

http://www.uco.es/internacional/extranjeros/conocelauco/transportes-uco_en.html

Acknowledgements

We gratefully acknowledge Dr. Julián Morales from University of Córdoba by supporting us in providing facilities used at this event.

Irida
Advanced Solutions for Science

NT-MDT

Annex 1: Pre-Registration Form

Name & Surname	
University / Center Company	
Department / Group	
Position	
Phone Number	
E-Mail Address	

Attend the Lectures (Y/N)	
Attend Demo-Live (Y/N)	

Are you actually working with AFM/STM?
If you don't have an AFM/STM system, do you think it could be a useful tool for your research?
If you want to run your own samples, please, indicate what kind of samples, number of samples and what you want to analyze.

PRINT THIS DOCUMENT, COMPLETE IT

AND SEND TO info@irida.es

Irida
Advanced Solutions for Science

NT-MDT