Pan-American Advanced Studies Institute (PASI) on Nano and Biotechnology

November 13-22, 2006, San Carlos de Bariloche, Argentina

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Welcome

The 2006 Pan-American Advanced Studies Institute (PASI) on Nano and Biotechnology will take place in San Carlos de Bariloche, Argentina, from November 13 to 22. The event will convene scientists in the field to promote interactions and develop cooperative programs between diverse groups in the American continent. It will be aimed at the young investigator and it will include tutorials, specialized lectures, hands-on laboratory modules and poster sessions for the participating students (half from the US and half from Latin America). In addition, debate sessions will be organized to discuss critical science and technology issues related to the theme addressed in the tutorials and invited talks presented each day. Emphasis will be placed on the development and delivery of well-coordinated tutorials.

The PASI will address several topics including Nanomanufacturing, Single Molecule Electronics/Spectroscopy, Mechanics of Biosystems, MEMS/NEMS, Computational Nanomechanics and Multiscale design of advanced materials. For more detail information see the event program.

Bathed by the clear waters of Lake Nahuel Huapi, **Bariloche** is located on the West of the Province of Río Negro, 1,640 km from Buenos Aires City. Founded in 1902, San Carlos de Bariloche owes its name to Carlos Wiederhold, who set the first grocery in the area, and to the distortion of the term Vuriloche ("different people from behind or from the other side"), used to name the natives from the valleys located to the west of the Andes mountain range, before the arrival of the mapuche people. Since then, Bariloche has turned into one of the main tourist destinations in Argentina. The facilities designed by man, as well as the beauty offered by the natural environment, mingle in perfect harmony to satisfy the visitor. Mount Catedral, one of the most important ski resorts in Argentina, is visited more and more by enthusiasts of snow sports every winter season. The summers are synonym with adventure in Bariloche. The rough watercourses are ideal for the practice of rafting. The mountain paths are open for hiking, riding mountain bikes and horses across the thick forests, and the high peaks are a challenge for climbers.

PASI Sponsors

NSF | INTERNATIONAL INSTITUTE FOR NANOTECHNOLOGY | The American Academy of Mechanics | Conicet

This event is sponsored primarily by the National Science Foundation and the Department of Energy through award number OISE-0518782.

http://www.mech.northwestern.edu/PASI/

*NSF Pan-American Advanced Studies Institute Program (PASI) on Nano and Biotechnology – Argentina, Nov. 13-22, 2006**

Co-sponsored by

NU-International Institute for Nanotechnology,
Conicet, The American Academy of Mechanics
NU Nanoscale Science and Engineering Center, Northwestern University,
Foundation of Research Support to the State of Rio de Janeiro (FAPERJ)

Professor Horacio D. Espinosa (Director)
Professor Gustavo Buscaglia (Co-Director)
Professor Glaucio Paulino (Co-Director)

Funded by the International Division, DoE and
and the Mechanics and Materials Program Directed by Dr. Ken P. Chong

Course Outline

Monday- November 13

8:30-9:00 Opening Ceremony (H. D. Espinosa, G. Buscaglia, G. Paulino)
9:00-10:30 L1: Self-Assembled Monolayers and Applications (**R. Salvarezza**)
10:30-11:00 coffee break
11:00-12:00 L1: Self-Assembled Monolayers and Applications (**R. Salvarezza**)
12:00-1:00 lunch break
1:00-2:30 L2: Nanostructured multilayers of redox polymers and enzymes for molecular recognition and electrical signal generation (**E. Calvo**)
2:30-3:00 coffee break
3:00-5:30 L3: Electronic Structure Calculations and Applications (**G. Schatz**)

Tuesday- November 14

8:30-10:30 L4: Biological Nanomechanics (**R. Phillips**)
10:30-11:00 coffee break
11:00-12:00 L5: Disease Detection and Treatment (**W. Soboyejo**)
12:00-1:00 lunch break
1:00-2:00 L5: Disease Detection and Treatment (**W. Soboyejo**)
2:00-3:00 L6: Atomistic Modeling of DNA and Protein Structure (**G. Schatz**)
3:00-3:30 coffee break
3:30-5:00 L6: Atomistic Modeling of DNA and Protein Structure (**G. Schatz**)

Course Outline

Wednesday- November 15

8:30-10:30 L7: On the Karhunen-Loeve Basis for Continuous Mechanical Systems (**R. Sampaio**)
10:30-11:00 coffee break
11:00-12:00 L8: Multiscale Modeling (**G. Paulino**)
12:00-1:00 lunch break
1:00-2:00 L8: Multiscale Modeling (**G. Paulino**)
2:00-3:00 L9: MEMS devices for *in-situ* EM testing of nanostructures (**H. Espinosa**)
3:00-3:30 coffee break
3:30-5:00 L10: Microfluidic Probes for the Life Sciences (**H. Espinosa**)

Thursday- November 16

8:30-10:00 L11: Computational Nanomechanics (**S. Yip**)
10:00-10:30 coffee break
10:30-12:00 L11: Computational Nanomechanics (**S. Yip**)
12:00-1:00 lunch break
1:00-3:00 L12: Computational Modeling of NEMS (**S. Mukherjee**)
3:00-3:30 coffee break
3:30-5:00 L12: Computational Modeling of NEMS (**S. Mukherjee**)
5:00-6:30: break
6:30-9:30: ***Poster Presentation by Students and Other participants***

Friday- November 17

8:30-10:00 L13: MEMS/NEMS (**M. Roukes**)
10:00-10:30 coffee break
10:30-12:00 L13: MEMS/NEMS (**M. Roukes**)
12:00-1:00 lunch break
1:30-3:00 L14: Computational Modeling of Nano Probe Dynamics (**A. Lew**)
3:00-3:30 coffee break
3:30-5:00 L15: Nanotechnology in Brazil (**F. Rochinha**)

7:00 PM BANQUET

Course Outline

Monday- November 20

8:30-9:15 L16 NSF Programs in Nano Science and Engineering (**Ken Chong**)
9:15-10:30 L17: Nanomanufacturing (**Z. Fu**)
10:30-11:00 coffee break
11:00-12:00 L18: Introduction to Biomaterials and Biomolecular Self Assembly (**M. Olvera**)
12:00-1:00 lunch break
1:00-3:00 L19: Nanoelectronics-Device Physics and Fabrication Technology (**M. Hersam**)
3:00-3:30 coffee break
3:30-5:00 L19: Probing Molecular Electronics with Scanning Probe Microscopy (**M. Hersam**)

Tuesday- November 21

8:30-10:00 L20: Bioactive Nanostructures (**S. Stupp**)
10:00-10:30 coffee break
10:30-12:00 L21: Pattern Formation in Co-Assembled Cationic and Anionic Amphiphiles (**M. Olvera**)
12:00-1:00 lunch break
1:00-3:00 L22: X-ray Characterization of Nanomaterials (**M. Bedzyk**)
3:00-3:30 coffee break
3:30-5:00 L22: X-ray Characterization of Nanomaterials (**M. Bedzyk**)

Wednesday- November 22

8:30 AM-5:00 PM: Hands-on Laboratory Sessions (G. Nieva, A. Fainstein, H. Pastoriza)