



**THIN FILM RESEARCH
LABORATORY**

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NEW INFORMATION RESOURCE IN MATERIALS ANALYSIS

As a result of the huge success of the event « L'Analyse des matériaux : des solutions pour l'industrie » (AMSI2009) that took place last November, we are happy to share some of the presentations given that day. You can now download pdf presentations prepared by professors and research associates of the GCM and the CM2, as well as by some companies. These documents are only available in French. The topics are:

- L'analyse des matériaux en 2009
- Applications industrielles d'analyse de composition et de contaminants
- Techniques modernes de microscopie électronique et applications industrielles
- Analyse de cas et R&D industrielle
- L'importance des propriétés mécaniques de surface dans la performance des matériaux et systèmes : du laboratoire aux solutions industrielles

Link: www.gcmlab.ca/en/publications.php

\$1.3 M FOR INDUSTRY/UNIVERSITY COOPERATION

NanoQuébec, a not-for-profit organization whose mission is to foster innovation in nanotechnology in Québec, has announced a support program worth \$1.3M for industry/university cooperation.

The goal of NanoQuébec's Industry-University Support Program is to fund research projects that accelerate the nanotechnology development in response to the major challenges facing Quebec industry. It aims to foster technology partnerships between industry and the research community. It also seeks to motivate both Quebec-based and non-Quebec-based business to form research partnerships. Amounts granted for each project will vary from 100 k\$ to 250 k\$ and will cover a maximum of 50% of the total project costs.

The GCM can act as university partner for all these programs. Do not hesitate to contact us to discuss a project you have in mind.

For additional information: http://nanoquebec.ca/nanoquebec_w/site/fiche/14163

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HIGH RESOLUTION IMAGING BY ATOMIC FORCE MICROSCOPY (AFM)

Since its invention, AFM has become a technique of choice for the study of surfaces in materials science, nanotechnology and life sciences. To a great extent, it is its nanometer-level high resolution that has led to its tremendous popularity. Although new advanced uses of AFM have been developed, like molecular force measurement or mapping of a sample's magnetic characteristics, high resolution surface topography remains the main application of AFM.

The tip: the AFM core

The tip, with its control system, is the core of the AFM and largely determines its performances. Usually made of silicon or silicon nitride, the tip is like a nanofinger that gently scans the sample surface. It must be very sharpened to accurately survey the humps and troughs of the sample.

Three modes of operation

AFM can operate in three modes: contact, tapping and non contact. The contact mode utilizes the repulsive forces between the tip and the sample. The tapping mode, the most commonly used, makes the lever and the tip vibrate at its resonance frequency. The feedback system then follows the variations of the vibration amplitude, due to the tip-sample interaction. Finally, the non contact mode makes use of the attractive forces, but it is rarely used.

AFM, a versatile instrument

AFM has found applications in an impressive number of domains. In electronics and in the semiconductor business, technicians and engineers use the AFM to examine surface defects or to measure wafer roughness. In optics, AFM serves to measure the surface finish (or roughness) of a lens. In life sciences, AFM is the ideal tool to imagine proteins or DNA.



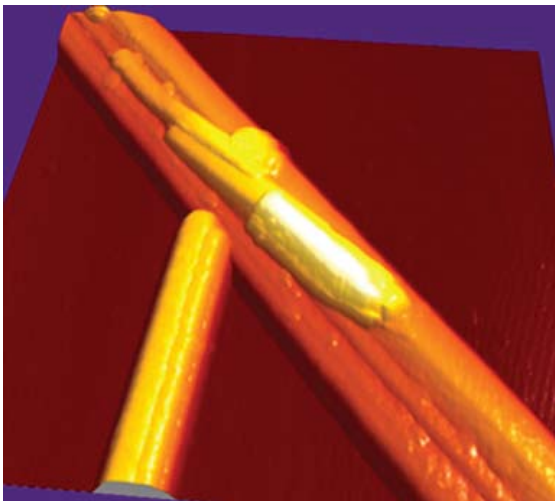
Le Dimension 3100 du GCM.

Benefits:

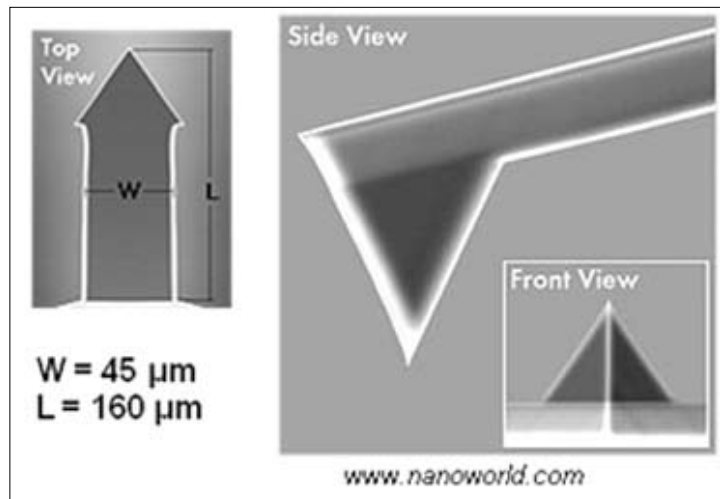
- Works with all types of samples (insulating, conductor, biological, etc)
- Excellent resolution (inferior to the nm)
- Can quantify roughness

Applications:

- Surface topography
- Roughness measurements
- 3D imaging



*Carbon nanotubes imaged by AFM
Ref : www.afmuniversity.org*



AFM tip