

McMaster University unveils world's most advanced microscope

October 20 2008

The most advanced and powerful electron microscope on the planet—capable of unprecedented resolution—has been installed in the new Canadian Centre for Electron Microscopy at McMaster University.

"We are the first university in the world with a microscope of such a high calibre," says Gianluigi Botton, director of the Canadian Centre for Electron Microscopy, professor of Materials Science and Engineering, and the project's leader. "The resolution of the Titan 80-300 Cubed microscope is remarkable, the equivalent of the Hubble Telescope looking at the atomic level instead of at stars and galaxies. With this microscope we can now easily identify atoms, measure their chemical state and even probe the electrons that bind them together."

Because we are at the very limits of what physics allows us to see, —"even breathing close to a regular microscope could affect the quality of the results," says Botton—the new microscope is housed in a stable, specially designed facility able to withstand ultralow vibrations, low noise, and minute temperature fluctuations. Operation of the instrument will also be done from a separate room to ensure results of the highest quality.

Built in the Netherlands by the FEI Company at a cost of \$15-million, the Titan cluster will examine at the nano level hundreds of everyday products in order to understand, manipulate and improve their efficiency, says John Preston, director of McMaster's Brockhouse Institute for Materials Research.

The microscope will be used to help produce more efficient lighting and better solar cells, study proteins and drug-delivery materials to target cancers. It will assess atmospheric particulates, and help create lighter and stronger automotive materials, more effective cosmetics, and higher density memory storage for faster electronic and telecommunication devices.

"The addition of the Titan 80-300 Cubed to the Centre's suite of microscopy instruments that include a Titan cryo-in situ solidifies Ontario's and Canada's lead in nanotechnology, and places us among the world's most advanced materials research institutions," says Mo Elbestawi, McMaster's vice-president, Research and International Affairs.

Source: McMaster University

Citation: McMaster University unveils world's most advanced microscope (2008, October 20)
retrieved 6 May 2024 from

<https://phys.org/news/2008-10-mcmaster-university-unveils-world-advanced.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--