

## NUS positions itself at nanotechnology frontier

**THE OFFICIAL LAUNCH** of the NUS Nanoscience and Nanotechnology Initiative (NUSNNI) was a defining moment. NUSNNI's string of successes has placed NUS at the cutting edge of a nascent and exciting global frontier in science and technology.

As one of the next big waves in science, nanotechnology – which centres on particles of miniscule proportions to a thousand millionth of a metre – has emerged as nothing short of revolutionary. The nanotech industry is expected to be worth US\$1,000 billion (S\$1,700b) worldwide by 2012.



Assoc Prof Chim (left) and Assoc Prof Choi receiving their award from Minister Shanmugaratnam

That NUS is riding this wave, there is no doubt. Two NUS researchers, Associate Professors Chim Wai Kin and Choi Wee Kiong have been able to use germanium nanocrystals that are 100,000 times smaller than the diameter of human hair as a reliable data storage device for computer memory. They have applied for patents in the U.S., Europe and Japan with Chartered Semiconductor. Assoc Prof Chim and Assoc Prof Choi of the Electrical and Computer Engineering Department received the inaugural NUSNNI Research Achievement Award 2004 during NUSNNI's official launch on 9 July.

Other NUS researchers have also made groundbreaking discoveries in nanotech. One is Associate Professor Liu Xiang Yu, whose research in the formation of well-ordered particles was published in the prestigious journal, *Nature*. His breakthrough can be applied in the medical field such as in intricate laser surgery to treat short-sightedness,

or in tissue engineering to stop the spread of disease in cells.

Since 2002, six patents have been filed by NUS researchers and 22 nano laboratories established on the NUS campus, mainly in the Science and Engineering Faculties. The Ministry of Education and Agency for Science, Technology and Research (A\*STAR) have injected more than \$15.5 million in funding for NUSNNI's R&D. In addition, NUS has set aside more than \$2 million for graduate scholarships in nano-related fields. With funding from the Economic and Development Board, an industry-oriented, research-based Master of Engineering in Nanoengineering has been started and scholarships provided.

Guest-of-honour at NUSNNI's launch, Education Minister Mr Tharman Shanmugaratnam gave figures on how nano research has picked up "dramatic momentum" in the last two years. "The nanotech economy is in fact already here," he said. "Venture capital funding in the nano fields now accounts for over five percent of all VC funds in the US." Nanotechnology, Minister Shanmugaratnam said, enables a whole new generation of products to be put together from the building blocks of nature, products which have the potential to do things that were previously inconceivable.

"Nanoscience and nanotechnology are areas of strategic importance to NUS because we believe they hold great promise," outlined NUS President Professor Shih Choon Fong. "Nanotechnology is making great impact in a wide range of areas and applications, including electronics, defence, transportation as well as biotechnical applications in medicine, healthcare and agriculture. Through NUSNNI, NUS will do its part to contribute to Singapore's efforts in developing nanotechnology as an engine of growth."

In conjunction with NUSNNI's launch, NUS also held its first international Nanoengineering and Nanoscience Congress from 7 to 9 July. It was attended by some 140 participants from 20 countries. More than 100 papers were presented on issues ranging from the commercialisation of nanotechnology to nanofabrication technologies used in the semiconductor, electronics and medical industries.