

Nanotechnology in Innovative and Enterprise Week (IEW) Conference 2009 Singapore

Abstract

Gathering leaders from the industry, investment community, and government agencies, Innovative and Enterprise Week (IEW) Conference 2009 showcased Singapore's effort to take technologies from laboratory to market. Nanotechnology was also presented as part of the innovation ready for commercialization. In this article, we share some exciting nano and clean technologies exhibited in IEW 2009 as well as the effort of Singapore government to nurture innovative local industry.

The first Innovative and Enterprise Week (IEW) Conference 2009 was organized in Singapore by Exploit Technologies, the commercialization arm of Singapore Agency for Science, Technology and Research (A*STAR), attracting total of about 400 participants during 3-day event, from 20-22 October 2009. IEW Conference 2009 featured technology exhibition, talks, workshops, industry roundtable sessions and networking activities with various target audience from entrepreneurs, executives of start-up and MNC, investors and government agencies. It aims to promote innovation and technology adoption among Singapore enterprises, support entrepreneurial activities, and encourage industry partnerships with a series of industry roundtables and industry forum.

Focusing on the technology exhibition, there were a number of projects involving nanotechnology such as nanoclay composites, gecko-like nanostructure, TiO₂ photocatalytic coating, sol-gel coating, and nanosponges as well as nano-related instruments such as nano-micro manipulator and NanoVis™ scanning probe microscope.

Institute of Materials Research and Engineering (IMRE) invented a method to produce polymer/clay nanocomposites with well-dispersed and well-exfoliated pristine clay that solves the problem of agglomeration of clay in polymer matrix and opens the door for the nanocomposites large-scale commercialization. Potential applications of the nanoclay composites include barrier packaging for food and beverage, flame retardant, nanocomposites in airframes, and heavy-duty industrial plastics. Nano-micro manipulator developed by Singapore Institute of Manufacturing Technology (SIMTech) is a 3 degree-of-freedom manipulator based on an amalgamation of compliant bearings and electromagnetic driving scheme, able to realize from micro to nanometric resolutions over a large workspace. It can be applied in various high-payload and high precision applications such as precision machine tools, stage for high precision optics and stage for visual inspection systems. A prototype has been developed and the technology is now ready for commercialization.

IZON Science was one of companies from New Zealand participated in IEW 2009 exhibition, as well as in Nanotech Europe 2009 last September. Founded in 2005, IZON focuses on measurement, analysis

and single particle control. Its technology is based on resizable nanopores. The nanopores can be opened, closed, and changed in size in real time through IZON's platform technology called SIOS, Scanning Ion Occlusion Spectroscopy. A few applications of SIOS include nanoparticle measurement (size, charge, and geometry), virology, molecular diagnostics, biomolecule analysis, environmental monitoring, and single particle gating and control.

In addition to nanotechnology, clean technology was also highlighted in one of the industry roundtable sessions. It was very interesting to see the demonstration of a battery-less remote controllable to be operated over a distance of 30m. The remote control prototype was developed in IMRE, based on piezoelectric technology and encoded digital signal. It only requires a mechanical push, therefore no leakage risk at all, to convert electrical energy by the piezoelectric energy generator and subsequently the information is sent to the receiving unit by means of a RF transmitting unit. The transducer can be customized for different energy requirements and applications, and it can be developed at lower cost and smaller size as compared to electro-magnetic transducer.

ENERV8, one of start-ups from New Zealand, has successfully developed special mats, called PowerTread, containing many water-filled pipelines that can be laid on the road and when moving objects such as vehicles pass over the mats, water flow is generated that can turn a turbine and thus generate electricity. The PowerTread has undergone extensive simulation, experiment, and on-site testing to ensure that the power outputs are realistic, and it is now being tested in few areas in Singapore.

While many technologies are ready for commercialization either by licensing or spin-off, funding/investment are necessary to ensure successful growth of the innovation and enterprise. SPRING Singapore, the enterprise development agency for growing innovative companies and fostering a competitive SME sector, presented its funding schemes available for the local enterprises. Starting from building entrepreneurial culture in the society to nurture innovative start-ups, SPRING Singapore has many schemes involved such as Young Entrepreneur Scheme (YES)! Startups, Technology Enterprise Commercialization Scheme (TECS), Incubator Development Programme (IDP), Start-up Enterprise Development Scheme (SEEDS), and Business Angels Scheme (BAS). In addition, SPRING Singapore also offers Innovation Voucher Scheme, each worth SGD5000 to local enterprises for eligible services at approved knowledge institutions in Singapore.

In summary, IEW Conference 2009 was a good platform to encourage technology adoption, investment in start-ups and industry partnership. IEW 2009 was also a meeting point for technology transfer offices from various research institutes in Singapore and selected countries overseas to showcase their technologies and share their tech-transfer experiences.



Welcome address of IEW Conference 2009 by Mr. Boon Swan Foo (Executive Chairman, Exploit Technologies)



Demonstration of battery-less piezoelectric driven remote control prototype – the person holding the control was standing at the opposite corner of the screen