

Nanotechnology

Changing the way we go about

EDWARD APURBA SINGHA

THINK about a world which can never be seen but really exists. Yes, this is the nanotechnology world which is not visible to the naked eye even with a light microscope.

It is denoted as nano because a nanometer is one-billionth of a meter, smaller than the wavelength of visible light and has a width hundred-thousand times less than a human hair. In general, nanotechnology makes sense when something measures within the range between 1 and 100nm.

It was 1986 when Eric Drexler introduced the term nanotechnology and from then on the nano world went through many revolutionary changes. Recently more than 13,000 patents have been registered in the US. Nanotechnology has broad spectrum approach that successfully attracts biologists, chemists, physicists and engineers.

Until recently, researchers discovered two nano-sized structures namely nanowires and carbon nanotubes. Nanowires has very small diameter -- near about 1 nanometer. Researchers have developed it to construct tiny transistors for computer chips and other digital accessories. But the advent of carbon nanotube blurred the prospects of nanowires.

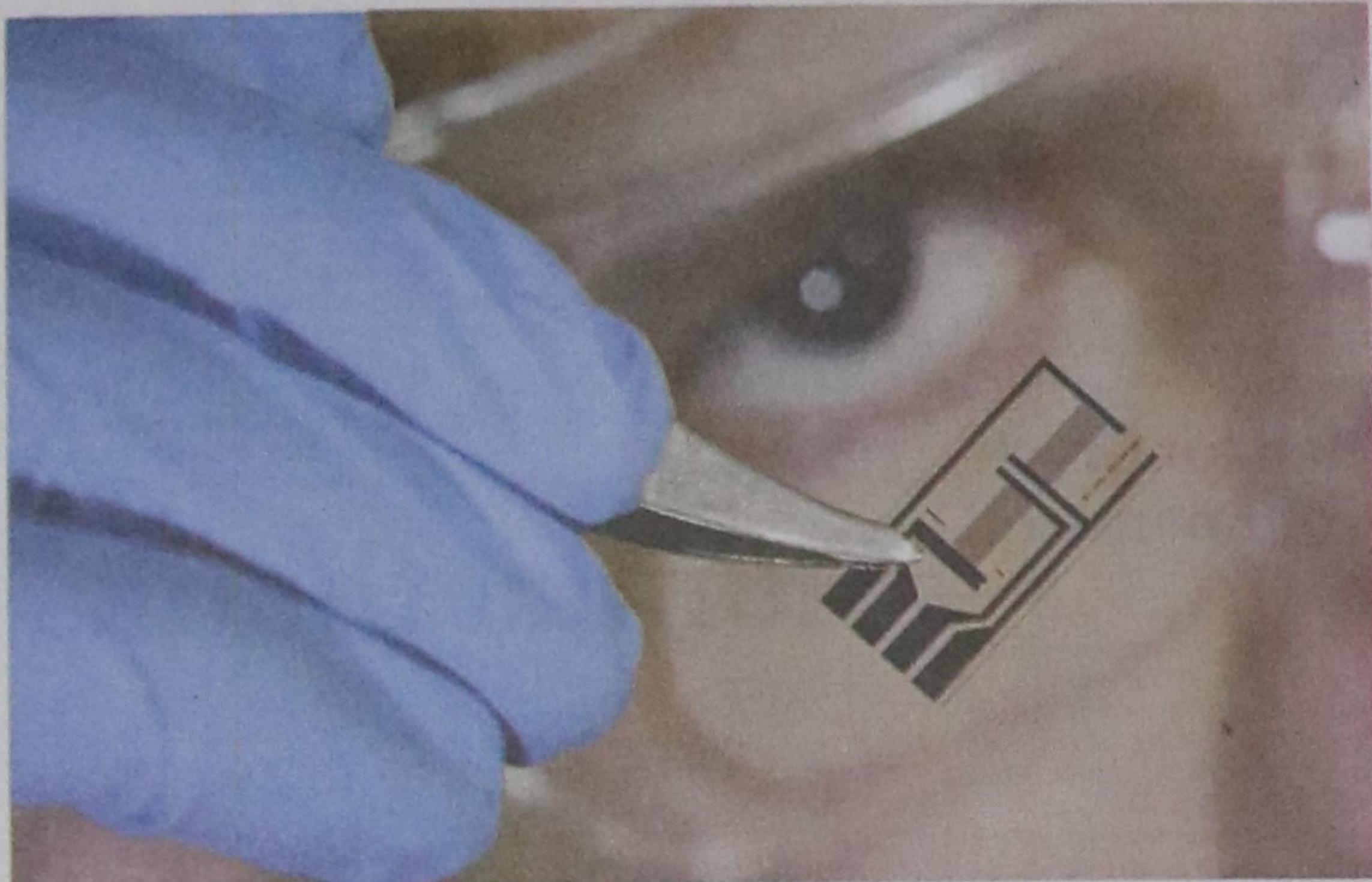
Basically carbon nanotube is a nano-size cylinder of carbon atoms. Imagine a sheet made of carbon atoms. If you roll the sheet and insert it into a tube then it becomes a carbon nanotube. Carbon nanotube properties depend on how you roll the sheet. Furthermore, although all carbon nanotubes are made of carbon, they can be very different from each other based on how the atoms are organised.

Due to the proper combination of atom, it is possible to develop a carbon nanotube which is hundreds of times stronger than steel, but six times lighter.

Modern day engineers seriously consider carbon nanotubes as a manufacturing element to produce cars and aircrafts. A relatively weightless vehicle ensures easy to handle opportunity and reduces fuel cost.

With the proper combination of atom it is possible to develop high quality semiconductor device. Scientists are still working on finding ways to make carbon nanotubes a realistic option for transistors in microprocessors and other electronics.

Nowadays nanotechnology is implemented in several areas which is very astonishing. Many sunscreen-manufacturing companies today use nanoparticles of zinc oxide or titanium oxide to



produce sunscreens. Older sunscreen ingredients are larger particles that are responsible for their whitish colour. Smaller particles are less visible, meaning that when you rub the sunscreen onto your skin, it doesn't give you a whitish tint.

Researchers are now thinking about the prospects of nanotechnology in apparel industry.

Integrating nanoparticles of zinc oxide, manufacturers can create clothes that act as protective shield to ultraviolet (UV) radiation. Some clothes have nanoparticles in the form of little hairs or whiskers that help repel water and other materials, making the clothing stain-resistant.

Nanotechnology has also its

presence in solar power technology. Researchers are currently exploring the prospects of nanotechnology-based solar cell against traditional silicon-based solar cell. This new category of solar cells derived from nanocrystals will be capable of converting sunlight into electricity at a fraction of the cost of silicon solar cells.

Silicon-based solar cells are made from a refined, highly purified silicon crystal, similar to those used in the manufacturing of integrated circuits and computer chips. The high costs of these silicon solar cells and their complex production process have generated interest in developing alternative photovoltaic technologies.

In medical science nanotechnology has a great significance. Nanotechnology has been

used to create new and improved imaging techniques to find small tumours. Researchers have shown that incredibly small iron oxide particles (nanoparticles) can be used with magnetic resonance imaging (MRI) to accurately detect cancers that have spread to lymph nodes, without requiring surgery.

In the near future, nanoscale devices may be available to detect the earliest stages of cancer while simultaneously delivering anticancer agents to the tumour. Early research has shown that nanoparticulate sensors can detect the cell death that occurs when a cancer cell succumbs to the effects of an anticancer drug.

It is worth mentioning that nanotechnology can effectively address the biological complexities. Nanorobots will mix with fluids programmed to attack and reconstruct the molecular structure of cancer cell and viruses. There's even speculation that nanorobots could slow or reverse the aging process, and life expectancy could increase significantly.

Environmental concern is a great issue in recent times. Nanotechnology can bring breakthroughs to eliminate environmental catastrophes. For instance, scientists could program airborne nanorobots to rebuild the thinning ozone layer. Nanorobots could remove contaminants from water sources and clean up oil spills. Manufacturing materials using the bottom-up method of nanotechnology also creates less pollution than conventional manufacturing processes.

Although nano world promises substantial changes in the traditional world, suspicion remains about its side effects because elements at the nanoscale behave differently than they do in their usual form.

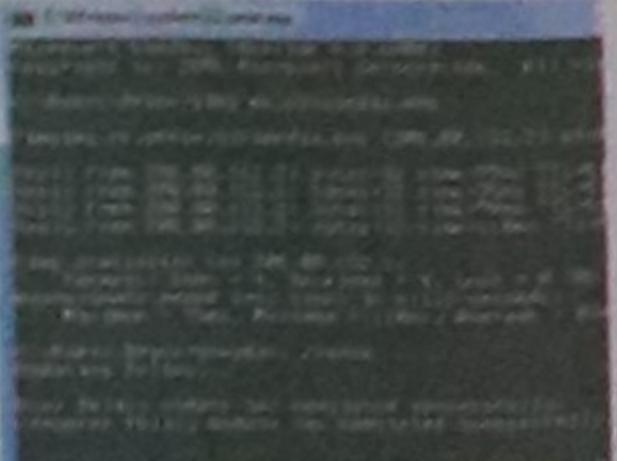
Some doctors worry that the nanoparticles are so small that they could easily cross the blood-brain barrier, a membrane that protects the brain from harmful chemicals in the bloodstream.

Nanotechnology may create some social obligations. For instance, this technology could be used to create more powerful weapons, both lethal and non-lethal. It may create imbalance in power which may result in unrest in the society. To deal with this phenomenon, some organisations have urged scientists and politicians to examine carefully all the possibilities of nanotechnology before designing increasingly powerful weapons.

In essence, there is no doubt that nanotechnology has the power to empower the modern civilization. But implementers should first thrash out the ethical aspects of this new age technology.

Command line interface

A command line interface (CLI) is a method of interacting with an operating system or software using a command line interpreter. This command line interpreter may be a text terminal, terminal emulator, or remote shell client such as PuTTY. The concept of the CLI originated when teletype machines (TTY) were connected to computers in the 1950s, and offered results on demand, compared to 'batch' oriented mechanical punch card input technology. Dedicated text-based CRT terminals followed, with faster interaction and more information visible at one time, then graphical terminals enriched the visual display of information. Currently personal computers encapsulate both functions in software.



TECHNEWS

CeBIT presents gadgets hot and weird

AFP, Hanover

THE world's biggest technology fair has opened in Hanover, allowing thousands of exhibitors to display the hottest and weirdest gadgets.

Some of the gadgets on display at the CeBIT IT fair included swimming goggles with an in-built underwater camera, a bamboo laptop and a pink crocodile PC case.

The technology fair, with 5,500 exhibitors, runs till March 9, allowing thousands of visitors to check out the hottest and also the weirdest gadgets.

A chilly wind is blowing across the vast exhibition cen-



Underwater digital camera mask



bamboo-covered laptop

tre, but when summer comes Liquid Image thinks its yellow goggles with an in-built digital camera are just the accessory.

On the top of the range model, which sells for 129 euros, the 5.0 megapixel camera and 16 megabit memory allows you to take up to 29 photos or 53 seconds of video up to a depth of 30 metres (100 feet), the firm says.

Also on show for eyewear was a pair of sunglasses from Chinese firm Xonix not only with an in-built camera but also with an MP3 player, while another from Taiwan's Inter Brands includes

music and bluetooth so you can use it as a phone.

But forget the glasses -- in the 21st century you can't be seen toting your laptop around in anything other than a pink, fake crocodile skin case, or so French firm Sweetcover would have you believe.

Their cases, which also come in other more traditional colours and materials including real leather, retail for around 70 euros (105 dollars) in Paris boutiques and soon elsewhere,

the firm's founder and president Raphael Taieb told AFP.

Not only will you avoid getting hot knees, he says, but the cover's high-tech design, which incorporates 70 different fabrics, ensures the computer will not overheat -- something which other luxury goods makers have failed to achieve with their prototypes, Taieb claims.

The cases will protect your laptop and turn it into a "subtle and seductive" piece of hardware, the company says. It has straps to keep the computer in place, is open at the sides and has holes in the back for cables.

Other bling-bling novelties included a Giorgio Armani mobile phone from Samsung and a Lamborghini laptop complete with the Italian sports car maker's badge and partly made of leather.

Its maker Asus was also showing off computers made partly out of bamboo -- to give it an eco-friendly style, a salesman at the Taiwanese firm's stand said. It has not yet decided whether to launch them on the market, however.

TECHSEMINAR

Huawei's seminar on enterprise network solution

STAR TECH DESK

CHINESE telecom giant Huawei Technologies (Bangladesh) organised a seminar titled 'Huawei Enterprise Network Solution' at a local hotel on February 28.

The seminar spotlighted different aspects of enterprise network solutions including finance network solution, campus network solution, IP telephony solution and enterprise terminal security management solution.

Tony Zhang Hui, chief executive officer (CEO), Huawei Technologies (Bangladesh), in his welcome note stated the necessity for high-end, cost-sensitive enterprise solutions for future data intensive activities.

Tiny Chen, head of datacommunication, Huawei Technologies (Bangladesh), in his presentation demonstrated the different enterprise solutions to modern communication networks. "Nowadays,



Tony Zhang Hui, CEO, Huawei Technologies Bangladesh speaks at the event

mainly the middle and low-end Datacom equipment is used.

Actually, Huawei middle and low-end Datacom equipment has already been widely deployed in the Telco network, such as Aitel, Banglalink, BTTB, Teletalk, Citycell, in the access layer and NMS network together with the high-end Datacom equipment in the IP backbone layer.

JAN Associates rewards ICT journalists

STAR TECH DESK

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LOHA ishoppe, authorised reseller for Macintosh products, recently introduced the latest Mac family member Macbook Air in the Bangladesh market, says a press release.

MacBook Air is .16 inches (.40 centimeters) thin at the front and .76 inches (1.9 centimeters) thick at the rear making it the thinnest laptop of all times.

World-leading computer chip maker Intel shrank one of its fast dual-core processors by 60 percent at Apple's urging to fit the power into MacBook Air.

The new Macbook Air comes with Intel Core 2 Duo 1.6 and 1.8 GHz clock speed processors. This notebook is capable of running Mac OS and Windows OS at a time.

The price of Macbook Air starts from Tk 14,800. For more information may visit Aloha ishoppe's web site aloahishoppe.com.bd.



Samity, said, "Nowadays actual growth

in the ICT sector could not be achievable without the support from the media. I personally believe involvement of media is a must in the ICT in order to create awareness and popularise cutting edge technology."



COLUMNIST Abir Hassan said, "It is wonderful to see the close association between media and IT industry. I believe this award reinvigorates ICT journalists to do more for the ICT industry and at the same time enrich their professional efficiency".

PHOTOTECH



LUCID TOUCH

This Microsoft handout photo shows Microsoft computer scientist Patrick Baudisch as he demonstrates LucidTouch, a touch screen for mobile devices on display at Microsoft TechFest 2008 in Redmond, Washington on March 4. This emerging technology allows people to touch devices from the back, creating the illusion of the device itself being semitransparent. Forty exciting new technologies created by Microsoft researchers show how computing enables new experiences, and how the basic tools of computer science are evolving to help all the sciences advance more rapidly.

PHOTO: AFP