Lianhe Zaobao
7 August 2004
Section 1, Page 13

Plastic semiconductors can be made into newspaper and computer chips

Paperless newspaper could become a reality in five years' time. Plastic computer chips, which will replace the silicon chips we use currently, may be available in the market soon.

Professor Sir Richard Friend, who discovered the semiconducting properties of plastics, is the man who has made these possible. Professor Sir Friend is Cavendish Professor of Physics, University of Cambridge. As the 55th Lee Kuan Yew Distinguished Visitor, he will be delivering lectures while in Singapore from 4 to 14 August 2004.

Most people know plastics are insulators. Plastics are traditionally used within the electronics industry for encapsulation to insulate conductors.

However, in 1989, Professor Sir Friend and his team found that plastic has semiconducting properties, and demonstrated their application in light-emitting diodes, transistors and photocells.

In an earlier interview with LHZB, Professor Sir Friend said this discovery might not supplant the current silicon semiconductors industry completely, since the silicon semiconductors industry has arrived at comprehensive production mechanisms and systems after decades of development.

“However, because plastic semiconductor displays are cheaper and easier to produce, we can develop applications which silicon semiconductors are not capable of. For instance, displays which can be rolled up.”

He said the plastic semiconductor is a revolutionary material. It can be printed directly onto plastic film or even paper.

At present, LED displays are complex in design and made up of many components. To make a plastic semiconductor display, inkjet printers can be used to deposit liquid polymers onto plastic film. Just add electrodes and you have an LED. Plastic semiconductor displays last several times longer than LEDs, and cost only half as much.

Philips Electronics applied the technology to mobile phone and electronic shaver displays, as well as the new generation of television sets.

Professor Sir Friend and his team founded Cambridge Display Technology (CDT) and Plastic Logic Ltd in 1992 and 2000 respectively to transfer these technologies to the electronics industry.

During his visit to Singapore, he will establish collaborations with Assistant Professor Dr. Peter Ho, Faculty of Science, NUS. Dr. Ho told reporters that they will be carrying out more fundamental research on plastic electronics.

Computers can come in the form of clothes, paper or plastic film

He said scientists will be able to replace silicon with plastics in the production of computer chips if the research succeeds. When that happens, computers will no longer be defined by desktop machines. Instead, computers can come in the form of clothes, paper or plastic film.

Prof Sir Friend will lecture on plastic electronics on 13 August at 6pm at NTU.