Singapore Government
PRESS RELEASE
Information Division, Ministry of Communications & Information, 36th Storey, PSA Building, 460 Alexandra Road, Singapore 0511. Tel: 2799794/5

88-TES-35

Release No.: 49/JUN
06-2/88/06/27

SPEECH BY DR TAY ENG SOON, MINISTER OF STATE (EDUCATION), AT THE OPENING CEREMONY OF THE FIRST ASIA-PACIFIC CONFERENCE ON CONDENSED MATTER PHYSICS AT THE NATIONAL UNIVERSITY OF SINGAPORE, LECTURE HALL 25, ON MONDAY, 27 JUNE 1988 AT 9.00 AM

May I first welcome most warmly the participants from overseas. It is indeed a pleasure and an honour for us to have you here in Singapore. I hope that you will have a very enjoyable stay here and will see something of our island republic before you leave. I understand that you come from some 31 countries with strong representations from India, Japan and the PRC. To my knowledge, for a scientific conference, today's conference is somewhat of a record for Singapore in terms of the number of countries who are participating. This speaks very clearly of the widespread interest that your topic - high temperature super-conductivity - is rousing amongst physicists all over the world. Some people have described the subject as the hotest topic in physics for many years - which is certainly the case judging by the discoveries and new findings reported in the scientific and popular media almost daily.

Once in a while, an astounding new discovery is made in science which promises to unlock a whole new field. The recent discovery of high temperature superconductors promises just such an exciting breakthrough. The prospects of new applications in existing as well as in undreamed-of areas are tremendous. Like the invention of the transistor in the late 1940's which has revolutionised the way we live and work, hot superconductors promise to revolutionise our lives and to open up whole new industries and technologies for the 21st century.

That is why we are all excited about it.

As long as superconductors could work only at or near liquid helium temperatures, they were only of scientific interest and had very limited commercial applications because of the very high cost of liquid helium. But all this changed in 1986 and 1987.

First was the dramatic breakthrough achieved by the two IBM researchers in Zurich, Messrs Muller and Bednorz. They discovered a copper oxide compound which became superconducting at a record-breaking temperature of 30°K, (Kelvin, i.e. -243°C) much higher than the best known superconductor. This started a search in a number of research laboratories in the US, Japan, China and India for new compounds which would have higher superconducting temperatures.

Within a space of only one year, the temperature has been pushed up first to 90 K (-183°C) and now to over 100°K (-173°C). Once the temperature went past the temperature of liquid nitrogen (77°K or -196°C), the prospects of vast new applications excited everyone - not just physicists but also engineers and industrialists. Liquid nitrogen, unlike liquid helium, is a cheap, plentiful, industrial product. We produce quick frozen food with liquid nitrogen. If superconductors can work above liquid nitrogen temperature, tremendous possibilities are opened, e.g. superfast microchips for computers, superpowerful magnets for medical and transportation applications, zero loss electrical cables for electrical power transmission, etc. That is the pot of gold at the end of the rainbow.

There is, of course, a big gap still between laboratory experiments and commercially practical superconducting materials. But the breakthrough has been achieved and thousands of researchers and technologists are now working on the new technology. I have no doubts new applications will be out soon.

We have a relatively small scientific and technological community in Singapore being a small country. But that should never deter our scientists and engineers from plunging into a new field such as the new superconducting compounds - especially as research funds are generously available at present. They should be bold and do so. Someone once told me that Silicon Valley, the powerhouse of the microchip technology has only about 300,000 workers of whom perhaps only a few percent are the key innovators. It is not numbers but quality of researchers that counts the most.

We have taken a step to become involved in biotechnology which we believe will be an important technology of the future by starting the Institute of Cell and Molecular Biology. The question is how can we get involved in the science and technology of the new superconductors? I suggest that the Physics & Chemistry Departments of the NUS should be the bodies to do so. They are well placed to do research on the new superconducting materials. The purpose should be to keep in touch and up-to-date with this fast-changing field so that when superconductors become practical products, Singapore will be able to move quickly into this field.

May I conclude by wishing all of you a very stimulating conference.

@@@@@@@@@@@@@@@@@@