



**For immediate release
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The Cable Guy

Thirty years after he worked out how to make glass fibres transmit data in the form of light and changed the face of telecommunications, Dr Charles Kao CBE FEng will receive the Prince Philip Medal of The Royal Academy of Engineering at Buckingham Palace on Tuesday 15 October.

In 1966 Charles Kao and his co-worker, George Hockham FEng, published research that today means a surgeon can conduct an operation on a patient via a video link anywhere in the world.

Their work on transmitting massive amounts of information through glass filaments the thickness of a human hair opened the way to worldwide direct dialling, cable TV and the Internet.

Kao is now researching the design of cable networks to handle the immense volumes of information that are being transmitted. The capacity of an individual optical fibre is still increasing towards one million, million bits (a terabit) per second early next century. 'It's like the M25,' he says, 'it was designed for expansion but already it is too small to cope with the traffic. One problem is that most of the telecom operators use up valuable network space monitoring who is calling where. They could throw away millions of lines of code by using standard subscription rates independent of the time and distance of individual calls.' He is advising the Hong Kong government on telecommunications policy. Hong Kong is the most dense telecom hub in the world, with six kilometres of optical fibre cable per kilometre of land and one telephone line for every two people.

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Kao thinks people are still groping to come to terms with the 'information age'. 'We are not familiar with the way we should behave,' he says, 'we must learn to work in groups and to share information rather than treat it as proprietary'. He wants to see intelligent systems that can filter the labyrinth of information that is available. 'A surgeon might need detailed scan information on a patient in the middle of an operation - we should be able to make relevant data accessible immediately,' he says. He has been involved in pilot schemes in Hong Kong like *Dial-a-Lecture*, where a videotaped lecture could be called up, supplemented with extra information as superscripts. 'This requires computer programs that find information in the way an expert librarian would, combing the maze of databases using ever more powerful search engines.'

The latest research in communication technology will enable the networks to carry even more data. At the advanced research laboratories of telecommunications equipment manufacturer Northern Telecom (Nortel) in Harlow (formerly Standard Telecommunications Laboratories, where Kao did his pioneering work), scientists are exploring next-generation optical switching technologies capable of handling more than one terabit per second of traffic. This is equivalent to 15 million simultaneous telephone calls or 200,000 video channels. The goal is a completely optical network without the need to digitise information electronically for switching or for transfer into people's houses.

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Notes for editors:

1. The Royal Academy of Engineering honours the UK's most distinguished engineers and aims to take advantage of the enormous wealth of engineering knowledge and experience that its one thousand Fellows possess. It exists to pursue, encourage and maintain excellence in the whole field of engineering to promote the advancement of the science, art and practice of engineering for the benefit of the public.
2. The Prince Philip Medal, instigated in 1989, is awarded to an engineer of any nationality who has made an exceptional contribution to engineering as a whole through practice, management or education. HRH Prince Philip, Duke of Edinburgh, is The Academy's Senior Fellow.
3. Only two other people have ever received the medal: the late Sir Frank Whittle OM CBE FEng FRS in 1991 for the development of the jet engine and Sir Denis Rooke CBE FRS FEng in 1992 for changing the face of the UK gas industry.

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