Behold the photon age

Now that the electron age is consigned to history, the photon age has dawned, as Prof John Costello explains.

Question: What doesn't have any mass but is energetic and can travel at the speed of light?
Answer: A photon.

In answer to the next question of what does a photon look like, it can be considered a small flash of light – a typical 11 watt bulb will bathe your livingroom with 30,000,000,000,000,000,000 visible photons each second!

Electronics, underpinned by the electron, was the dominant communications and information technology of the 20th century. We have now entered the 'photon century' where optics and photonics are already deployed alongside electronics to free up information bottlenecks. These will, in time, supplant electronics as the dominant component of all of our computing and communications devices and infrastructure. For example, this quirky quantum entity has been at the heart of the telecommunications revolution for more than 20 years. However, many optical telecommunications networks still convert light-based signals into voltage during your intercontinental telephone call.

At DCU one of our goals is to make novel measurements, materials and devices that can switch light signals in ways and at speeds that no other device today can match. These novel materials and concepts will lead to tiny switches that act like a blind on a window, opening and closing in a billionth of a second, allowing only an exact amount of light through – and only at the right wavelength.

Research in photonic sciences at DCU is conducted in three of our national research centres, namely the National Centre for Sensor Research (NCSR), National Centre for Plasma Science and Technology (NCPST) and the Research Institute for Networks and Communications Engineering (RINCE). Specifically, DCU's word-class activities can be broadly classified into three streams: ultrafast photonics, photonic materials, and bio-photonics.

More than 50 per cent of the Science Foundation Ireland Research Frontiers 2006 awards won by DCU researchers have been made to research groups working in photonic sciences, once again reinforcing the strength of the activity. A major 'Photonics 21' funding measure is expected to be announced as part of the EU Seventh Framework Programme, starting in 2007. Substantial funding of more than €2 billion for world-class research will be made available through highly competitive internationally peer-reviewed programmes by the Government as part of the Second National Development Plan (NDP2). Photonic scientists and engineers at DCU will be positioning themselves over the coming year to win a share of these funds and push their research frontiers even further.

Looking some decades into the future, our digital devices may not work with simple 0s and 1s, the binary language of current computer technology. Rather than associating a '1' with the presence of a photon and a '0' with its absence, future quantum computing devices will work with Qubits (or quantum bits) where the system lives in a superposition of states and not just 1 or 0. But let's not go there, just yet. For now the (immediate) future is bright and DCU's photonic scientists and engineers are shining a light on it

ICT Conference - Call for Papers

DCU and one of its partner Chinese universities, Hangzhou Dianzi University, are jointly organising a conference in the area of Information and Communications Technologies, to be held in Hangzhou between 18-19 October, 2006, as one of the activities of the 50th Anniversary of HDU.
The conference co-chairs are: Prof Eugene Kennedy, Member of Royal Irish Academy and Vice President for Research in DCU; Prof Leming Li, Member of Chinese Academy of Engineering, and Prof Lingling Sun, Vice President of Hangzhou Dianzi University.
Graduates of the School of Electronic Engineering and the School of Computing who work in the area of ICT are invited to submit research papers for inclusion in the conference. The closing date for submission of papers is 6 June 2006.

http://www.eeng.dcu.ie/ciict06/