

Internet and Laser

An **internet** (lowercase "i") is any network that **inter**connects smaller networks, such as those inside a building or between business offices. The **Internet** (uppercase) is an international network that connects thousands of internets to form an enormous global network. It is the largest and best-known computer network, connecting users around the world with telephones and computers.

In 1963, J.C.R. Licklider with the United States military division of ARPA (Advanced Research Projects Agency) started to link research computers together with his Intergalactic Computer Network, called ARPANET. By 1970, ARPANET was using packet switching, the transmission method that makes the Internet possible. In the 1980s, United States colleges developed smaller networks that led to the Internet. Today fiber-optic cables (tiny glass strands coated in plastic) allow computers and telephones to communicate on the World Wide Web by using laser light pulses.

A **laser** is made of dense, narrow beams of light created by the emission of high-energy molecules. People use lasers to send data in the form of light signals through fiber-optic cable. Albert Einstein first thought of lasers. He believed that if there were more photons

(very small increments of electromagnetic radiation) than electrons in light (or any other form of radiation), the energy difference could make (stimulate) an electron jump to a lower energy level, which would cause a photon to be emitted.

During the late 1960s, Charles Townes and Gordon Gould were among those who invented the process of **stimulated emission**. Stimulated emission is one way to create light by making photons come from lots of atoms. In stimulated emission, the electrons in a collection of atoms are pumped up to the same state of high energy. The electrons are stimulated by sending a weak beam of light. This leads to many of them giving off matching photons, greatly strengthening the original beam of light. The word "laser" is actually an acronym that stands for **light amplification by stimulated emission of radiation**.

Today lasers are used in entertainment and storage (discs), medicine (laser surgery), decoration (outdoor displays for concerts), stores (scan bar codes), industries (cut materials), and information delivery (fiber-optic cables).

Exercise:

1. What is the difference between an internet and the Internet? _____
2. Why would colleges and researchers want to be connected via an internet? _____
3. What does the word "laser" mean? _____
4. Name two uses for lasers. _____