

# The impact of the lasers technology on society essay sample



The name LASER is an acronym for Light Amplification by the Stimulated Emission of Radiation. In 1917, Albert Einstein first theorized about the process which makes lasers possible called " Stimulated Emission." In this paper, we can view the impact of the lasers technology on society from four perspectives: the strength, the weakness, the opportunity and the threat of Lasers Applications. To sum up, we will focus on the future of Lasers on society, assessing the real value of the Lasers technology.

The strengths:

Lasers, broadly speaking, are devices that generate or amplify light, just as transistors generate and amplify electronic signals at audio, radio or microwave frequencies. Since laser light can be focused to a very small point of light, lasers are used in CD players, in surgery, in communication, in welding, in cutting, in spectroscopy and in printing industry.

Looking at the advantage of the laser, we can find that there are four characteristic of laser light. Comparing with the other conventional technologies, one of the most frequently used characteristic of laser technology is that of coherent. That is, the emitted light waves are in phase with one another and are so nearly parallel that they can travel for long distances without spreading. Here light must be understand broadly, since lasers have covered radiation at wavelengths ranging from infrared range to ultraviolet and even soft x-ray range.

Take surgery as an example, when light is focused, the point of focus can become hot enough to burn the skin or human tissue, if the intensity of the

light is great enough. This characteristic can be used to perform surgery that results in less damage than it a knife or scalpel was used.

Another example of this may be given. Focusing a very high energy laser beam on a piece of metal can actually melt the metal. Equipment using high energy lasers are used in industry to accurately cut and weld sheets of metal.

As for surveying, everyone has seen laser pointers that will shine a narrow beam across the room. Other devices that use this characteristic are laser range-finders, price scanners, surveying equipment and laser weapons.

The laser has contributed to humanity as a powerful scientific tool for expanding human knowledge and in its many applications that help people directly.

Weaknesses:

Although there are lots of advantages of the lasers, we could identify the pitfall of the lasers. The laser beams could easily be adversely affected by atmospheric conditions, such as rain, fog, low clouds, and objects in the air, such a birds.

Scientists and engineers suggested a number of novel schemes to protect the light from interference, including shielding it in metal tubes and using specially designed mirrors and thermal gas lenses to navigate around bends.

Moreover, the laser is a kind of dangerous rays, when one dealing with lasers, because they can injure your eyes. Since a laser beam focuses to a

point that can get very hot, a beam shined in ones eyes may damage your retina.

Even though many lasers are supposed to be safe, do not let someone aim a laser pointer at your eyes. There have been cases of people becoming partially blind from laser pointers. Do avoid staring at the light from the scanners used in stores, just to be on the safe side.

Opportunities:

Laser applications appearing on the horizon will be even more astounding. The search for new energy sources will depend quite heavily on lasers, as will medical research and new military systems. It may be possible in the near future to initiate the release of fusion energy by using high-energy laser beams.

Through lasers, medical research can also be pushed into heretofore unknown realms. The highly collimated beam of a laser can be further focused to a microscopic dot of extremely high energy density. This makes it useful as a cutting and cauterizing instrument. A focused laser can act as an extremely sharp scalpel for delicate surgery, cauterizing as it cuts.

As for the welding and cutting technology, the highly collimated beam of a laser can be further focused to a microscopic dot of extremely high energy density for welding and cutting. For example, the automobile industry makes extensive use of carbon dioxide lasers with powers up to several kilowatts for computer controlled welding on auto assembly lines.

Let us take another example. The laser printer has in a few years become the dominant mode of printing in offices. It employs a semiconductor laser and the xerography principle. The laser is focused and scanned across a photoactive selenium coated drum where it produces a charge pattern which mirrors the material to be printed. This drum then holds the particles of the toner to transfer to paper which is rolled over the drum in the presence of heat.

#### Threat:

There are a variety of friendly and hostile lasers currently developed by military forces in the form of laser range finders and designators. Some of the lasers may have power levels unwarranted by range finder or designator applications, but it is not known whether these are intended as anti-personnel weapons. In addition, the technical approach used to protect against fixed frequency lasers cannot be applied to protection from the agile threat or even to the protection from a larger number of fixed frequency threats.

#### Conclusion:

To balance on, laser is light of special properties, light is electromagnetic wave in visible range. What is certain, however, is that the laser already has been adapted to warfare and that predictable advances in the military applications of it are expanding. Overall, the laser will contribute to humanity as a powerful scientific tool for expanding human knowledge and in its many applications that will help people directly.

Reference:

1. Gordon Gould, Charles Townes, Arthur Schawlow, Theodore Maiman . “ Laser History.” [http://inventors. about. com/library/inventors/blaser. htm](http://inventors.about.com/library/inventors/blaser.htm)
2. Ron Kurtus. “ Lasers”. 6 October 1999. [http://www. school-for-champions. com/science/lasers. htm](http://www.school-for-champions.com/science/lasers.htm)
3. Executive Summary (U) Laser Eye Protection. [http://nrac. onr. navy. mil/webpace/exec\\_sum/88lasereye. html](http://nrac.onr.navy.mil/webpace/exec_sum/88lasereye.html)