

Title:

Lasers - The New Mythical Gift Of Fire

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535

Summary:

In Greek mythology, the Titan Prometheus gave the gift of fire to Humanity. It provided warmth, light, and energy. Whether or not you believe that myth, humanity has learned to concentrate that light into beams of unimaginable power:

Lasers.

What does that word make you think of first? Science fiction ray guns? A secret agent strapped to a table while a metal-melting beam of light inches toward him? Or maybe the master thief throwing dust in the air to reveal a deadly m...

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Article Body:

In Greek mythology, the Titan Prometheus gave the gift of fire to Humanity. It provided warmth, light, and energy. Whether or not you believe that myth, humanity has learned to concentrate that light into beams of unimaginable power:

Lasers.

What does that word make you think of first? Science fiction ray guns? A secret agent strapped to a table while a metal-melting beam of light inches toward him? Or maybe the master thief throwing dust in the air to reveal a deadly maze of red laser beams guarding the treasure?

Those are all popular but outdated images of the laser. Today, lasers vanquish different foes such as unwanted hair, vision correction, and even tumors.

How is a beam of light able to delicately reshape the surface of the eye, yet still be able to cut steel?

LASER is an acronym for "Light Amplification by Stimulated Emission of Radiation." In this definition radiation doesn't refer to nuclear radiation, but

to electromagnetic radiation. The electromagnetic spectrum includes radio waves, microwaves, infrared light, visible light, ultraviolet radiation, and X-rays. Some light wavelengths are visible, and other are not unless special equipment is used (e.g., infrared cameras, night-vision goggles).

Lasers operate by concentrating the strength of various forms of light. The strengthened beam is an almost perfectly straight beam, called a coherent beam. "Coherent" means that almost all of the light energy (photons) are traveling in the same direction. The laser light energy stays focused on a smaller area with greater power.

Compare this to an incoherent light source such as a light bulb, which emits photons in many directions and at many wavelengths. This is the job of a bulb, because we want visible energy spread out as much as possible.

A flashlight also uses a light bulb, but also contains a curved mirror to approximate a more coherent beam. The light from the strongest commercial spotlight (essentially a giant flashlight) will disperse in the atmosphere after a relatively short distance. A laser beam can be bounced off the moon!

<http://sunearth.gsfc.nasa.gov/eclipse/SEhelp/ApolloLaser.html>

A closer analogy to a laser is a magnifying glass. Remember as a child how you got the sun's rays to focus on a tiny spot that got hot enough to burn? That's similar to what a laser does, unless you moved the magnifying glass. Then the focus was lost and the sunlight was no longer concentrated. Because the laser employs a coherent beam, that essentially means it stays focused no matter the distance! Think of it like an infinite magnifying glass.

Lasers can perform a multitude of different tasks at different power levels. Specific light wavelengths and beam strengths can be achieved by altering the light source, power source, and even the color of the light. This extreme versatility allows both the shaping of a delicate cornea and the cutting of industrial steel.

The laser in your CD player won't cut steel, but neither can the industrial laser play a music CD without destroying it. Matching the right laser power to the right job enables us to safely harness this magical new fire.

Learn more about medical lasers and laser hair removal by using the resources below.