EyeOn, LLC

Ionic technology

Far Infrared Rays

Until the year 1800, our knowledge of light was limited to only that which was observable with the human eye. German born, Sir Fredrick William Herschel, forever changed that. He used thermal probes (thermometers, with the bulbs blackened,) to discern the temperature differences between the colors presented in a spectrum of light being cast through a glass prism. He placed two other thermometers outside the spectrum as controls. He had observed that for each color measurement, the control temperatures were lower. And the temperatures increased from the violet to the red. He then measured beyond the red of the spectrum were there was no visible light emitted and found the highest temperature of all. He had become acquainted with the invisible spectra of light we now call infrared.

Roughly forty-seven years later, French born, J.B.L. Foucault, and A.H.L. Fizeau, proved that waves from the infrared spectrum behave the same as waves from the visible light spectrum capable of reflection, refraction and forming an interference pattern.

Infrared is known as the heat realm of the electromagnetic spectrum. Its wavelength is longer than visible light but shorter than microwaves, the next realm on the electromagnetic spectrum. Infrared light/radiation has varied wavelengths with the shortest of the infrared being the "coolest" or emitting little discernable heat, although electromagnetic waves of any frequency will heat surfaces, which absorb it. Infrared radiation is defined by water absorption and is often subdivided into:

* NIR – near infrared (0.75-1.4μm) well suited for fiber optic communication
* SWIR short wavelength infrared (1.4-3μm) increased water absorption
* MWIR mid wavelength infrared (3-8 μm) objects at room temperature will emit radiation at this length.
* LWIR long wavelength infrared (8-15μm) military & industrial applications
* FIR far infrared (15-1,000μm) soft tissue resonates at this length

Infrared radiation is radiation due to heat. This is the radiation produced by the motion of atoms and molecules in an object. The higher the temperature, the more the atoms and molecules move and the more infrared radiation they produce. Any object, which has a temperature i.e., anything above absolute zero (-459.67 degrees Fahrenheit or -273.15 degrees Celsius or 0 degrees Kelvin) radiates in the infrared. Absolute zero is the temperature at which all atomic and molecular motion ceases. Even objects that we think of as being very cold, such as an ice cube, emit infrared. When an object is not quite hot enough to radiate visible light, it will emit most of its energy in the infrared. For example, hot charcoal may not give off light but it does emit infrared radiation, which we feel as heat. The warmer the object, the more infrared radiation it emits.[1] Heat can be transferred from one place to another by three methods: conduction in solids, convection of fluids (liquids or gases), and radiation through anything that will allow radiation to pass. The method used to transfer heat is usually the one that is the most efficient. If there is a temperature difference in a system, heat will always move from higher to lower temperatures.[2] Both conduction and convection require matter to transfer heat. Radiation is a method of heat transfer that does not rely upon any contact between the heat source and the heated object. For example, we feel heat from the sun even though we are not touching it. Heat can be transmitted though empty space by thermal radiation. Thermal radiation (often called infrared radiation) is a type electromagnetic radiation (or light).

[1] http://coolcosmos.ipac.caltech.edu
[2] http://coolcosmos.ipac.caltech.edu

Radiation is a form of *energy transport consisting of electromagnetic waves traveling at the speed of light. No mass is exchanged and no medium is required.*

Objects emit radiation when high energy electrons in a higher atomic level fall down to lower energy levels. The energy lost is emitted as light or electromagnetic radiation. Energy that is absorbed by an atom causes its electrons to "jump" up to higher energy levels. All objects absorb and emit radiation. When the absorption of energy balances the emission of energy, the temperature of an object stays constant. If the absorption of energy is greater than the emission of energy, the temperature of an object rises. If the absorption of energy is less than the emission of energy, the temperature of an object falls.3[3]

The electromagnetic spectrum consists of the following bands presented first by the shortest wavelength and progressing to the longest wavelength:

Gamma ray	X-ray	Ultraviolet
Visible spectrum	Infrared	Microwave
Radio waves		

The highest energy can be found in the shortest wavelengths (Gamma ray, X-ray, and Ultraviolet) and are the most dangerous. Radiation from the longer wavelengths has lower energy and is less harmful, such as infrared, microwaves and radio.

Outside of infrared heat lamps and thermography or thermal imaging, few North Americans are familiar with the medical benefits of far infrared waves. Japan has been utilizing infrared thermal systems for many decades. Among the elite, Far Infrared lights and saunas are currently the rage throughout Japan, Europe and beyond.

When tested upon humans, Far Infrared Rays have shown to have the following effects:

*Infrared radiation penetrates deeply, up to 2" – easily passes through the dermal layers.
*Increases blood flow – bringing oxygen and nutrients to cells facilitating oxygen exchange rate while preventing thrombus formation. Particularly beneficial to soft tissue injuries.
*Musculoskeletal Improvements with Infrared heat – of particular relief to those with rheumatoid arthritis.
*Decrease of pain and swelling.
*Relief of muscle spasm

Myriad other claims of success by medical doctors using FIR treatment range from elimination of toxins from the system to treating bronchial asthma, bronchitis and impaired immune defense system.

How does FIR help heal?

Our tissues normally produce infrared energy for warmth and tissue repair. Tissue production of infrared energy is associated with a variety of healing responses. The Far-infrared travels the path of fresh water between the cells thus correcting the water molecules bond angle to a perfect hexagonal shape that then collects a total of 6 water molecules to form a collective microtubule of water. The microtubule then creates a fiber optic response that aligns all the molecules to respond to the correct mechanisms of the blueprint of the DNA. Once far-infrared is within the body at its total capacity, the body it is repealed. This occurs in all living forms of life and in any material that has moisture or a water molecule within its pores, such as cement which becomes 4-5 times stronger.[4]

[3] http://coolcosmos.ipac.caltech.edu
[4] MPS Global, Inc. and Daiugin Research on Far-Infrared Radiant Heat. Remediation and Industrial Applications. Pomona, CA. © 2004