

## INVISIBLE LIGHT

radio	microwave	infrared	visible	ultraviolet	x-rays	gamma rays
-------	-----------	----------	---------	-------------	--------	------------

higher frequency & lower wavelength & more energy ----->>>

### Infrared

Anything not at absolute zero emits this radiation (hotter things are more blue, then white, then red)

Tungsten light bulbs emit lots of IR (so do CFLs)

Heat lamps

Spying/special mission operations [x-ray backscatter also used to find illegal immigrants in trucks]

Trees and clouds (sleeping under them)

Earth surface temperatures

Weather satellites

Stinger missiles

Pit vipers & mosquitoes

Remote controls

To keep houses cool you can use infrared cool roofs

Infrared astronomy and firefighting (particles of smoke is smaller than the infrared)

### Ultraviolet

Black lights emit UV to help see things that fluoresce

Detergents - absorbing UV and emitting it as visible light (fluorescence)

Sunburn / Windburn (same thing)

Disinfection via UV because it causes mutations in DNA

Cancer from mutations of DNA

Ozone created by UV light. O<sub>2</sub> broken into O & O which then recombine with O<sub>2</sub> to make O<sub>3</sub> – ozone

Ozone Hole – over the South Pole

Created by CFCs and Freon... very good at turning ozone into O<sub>2</sub>

This problem is currently stable and not really related to global warming

medical technology	type of wave	what it senses
x-rays	x-rays	bones – emit x-rays when the stop
CAT (computer aided tomography)	x-rays	heavy elements (bones)
PET (positron emission tomography)	gamma rays	drink a positron emitter, positron hits an electron and emits a gamma ray and the particles are annihilated, region that doesn't work is blank, hyperactive will be bright
thermography	infrared	new technique – breast cancer
MRI (magnetic resonance imaging)	magnets detect wobble in the hydrogen nuclei	soft tissue (lots of hydrogen)
ultrasound	high frequency sound waves	unborn fetuses

Ultrasound also use to clean things, and for sonar (bats & submarines)