## The Electromagnetic Spectrum

The Electromagnetic Spectrum, as this chart shows, takes in the span of frequencies from normal household AC current to X-rays and Gamma rays. The greater the number of cycles per second, the higher the frequency is of the electromagnetic signal, and this frequency of cycles is referred to in numbers of "Hertz."

The frequencies involved in our standard AC electrical currents produce electromagnetic fields – EMFs. Household AC at 50 to 60 Hertz produces Extremely Low Frequency, ELF fields.

Extremely Low Frequency, ELF – indicated in Hertz, Hz

Very Low Frequency, VLF - indicated in Hertz, Hz

Radio Wave Frequency, RF - indicated in millions of Hertz, in MegaHertz, MHz (HF. VHF and UHF are below 1 GHz)

**Microwave Frequency, MW** – indicated in billions of Hertz, in *GigaHertz*, *GHz* 

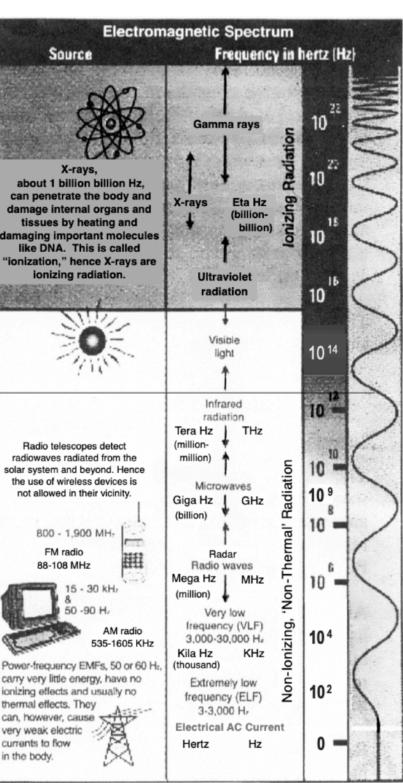
This should help demystify the Hertz designations on wireless devices.

As can be seen on the chart here, at 1 billion billion Hz, X-rays penetrate the tissues of the body and cause damage through heating and through the ionization of DNA. Hence these frequencies are called *ionizing radiation*.

Radiation in frequencies below visible light down to ELF do not cause damage to bodily tissues through ionization and overt heating. Therefore, these frequencies are called **non-ionizing** and **'non-thermal' radiation**. For a long time it was put forth that these radiations simply do not and cannot damage tissues or interfere with bodily functions, though quite the contrary was already known. Decades ago, in 1971, the U.S. Office of Naval Medical Research issued a report documenting over 100 medical effects as consequences of these radiations, many of them serious such as reproductive prob-lems and DNA damage, cognitive, emotional and psychological disorders. It is now known that these non-ionizing frequencies trigger the Voltage-Gated Calcium Channels in the cell membrane. These frequencysensitive VGCCs are key regulatory mechanisms in bodily systems, such as for the heartbeat and for the production and regulation of many hormones and all of the neurotransmitters. To begin learning about this, just search for the short YouTube, "Wireless Radiation Causes Health Effects Via VGCC: Dr. Martin Pall PhD." Dr. Pall brings together the research results from over 20,000 studies.

**3G / 4G** – lower, longer range wireless radiation that goes up to about 2.8 GHz. 5G - Range 1: 450 MHz to 6 GHz. Range 2: 24.25 GHz to 52.6 GHz.

radiation Tera Hz THz (million-Radio telescopes detect radiowaves radiated from the million) solar system and beyond. Hence the use of wireless devices is Microwaves not allowed in their vicinity. Giga Hz GHz (billion) 800 - 1,900 MH FM radio Radar 88-108 MHz Radio waves Mega Hz MHz 15 - 30 kH (million) -90 H Very low frequency (VLF) AM radio 3,000-30,000 Hz 535-1605 KHz KHz Kila Hz Power-frequency EMFs, 50 or 60 Hz, (thousand) carry very little energy, have no Extremely low ionizing effects and usually no frequency (ELF) thermal effects. They 3-3,000 H, can, however, cause very weak electric currents to flow Hertz Hz in the body.



Credit is gratefully given to CellSensor<sup>™</sup> for the help of this chart. Important frequency clarifications have been added to it for use here with a detailed text. (The CellSensor™ is a rudimentary and inexpensive EMF/WiFi detector.)