The Electromagnetic Spectrum

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| Radio Waves |  |
| * Longest \_\_\_\_\_\_\_\_\_\_\_, lowest \_\_\_\_\_\_\_\_\_\_\_\_\_
* Wavelength range:\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_
* Usually described by their \_\_\_\_\_\_\_\_\_\_\_\_
* Different types of radio waves (from high f to low f are: \_\_\_\_\_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_
* AM stands for \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is given in \_\_\_\_\_\_\_
* FM stands for \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is given in \_\_\_\_\_\_\_
* 1st Radio waves were transmitted/detected by \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_
* The first “wireless” radio device was invented by:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by Earth’s atmosphere

Cosmic Connection:* SETI:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Closely related to \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ events
 | Guglielmo Marconi (1874-1937)http://en.wikipedia.org/wiki/Guglielmo\_Marconi |
| Microwaves |  |
| * Name means:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Wavelength range:\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_
* Non-ionizing; when absorbed they cause \_\_\_\_\_\_\_\_,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.* First developed during \_\_\_\_\_\_\_ and used for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Causes:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calculating the Speed of Light = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_c = \_\_\_\_\_\_\_\_\_\_\_\_\_\_% error = Cosmic Connection:\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_ detected the \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ (CMBR). Left over radiation from the \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_. Uniform to 1 part in 1 \_\_\_\_\_\_\_\_\_\_\_\_. (Nobel Prize in 1978) | Telescope used by Penzias and Wilson at Bell Labs<http://www.pbs.org/wgbh/aso/databank/entries/dp65co.html> |

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| Infrared Rays |  |
| * Name means:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* a.k.a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Wavelength range:

 Near:\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Mid:\_\_\_\_\_\_\_\_\_\_\_\_\_ Far:\_\_\_\_\_\_\_\_\_\_\_\_\_* Uses: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* Discovered in 1800 by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ using a prism and a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Non-ionizing; when absorbed they cause atoms to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cosmic Connection:Great indicator of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Google Image Search |
| Visible Light |  |
| * Small band of frequencies that the \_\_\_\_\_\_\_\_\_\_ of the eye responds to.

--Color receptors:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_--Black/white receptors:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* Longest wave, lowest frequency: \_\_\_\_\_\_\_\_\_\_\_\_\_
* Shortest wave, highest frequency: \_\_\_\_\_\_\_\_\_\_\_\_\_
* First separated into the visible spectrum by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cosmic Connection:-Identifying atomic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-Lightcurves of extrasolar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Biographyonline.net |

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| Ultraviolet Rays |
| * Wavelength range:\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_
* Discovered in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_--Tried to find “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” past the violet end of the spectrum after hearing about Herschel’s heat rays. White Silver Chloride turned dark when exposed to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Named the new wavelength “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”* 3 Kinds: UVA:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 UVB:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ UVC:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* UVB and C destroy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* UVB produces vitamin \_\_\_\_\_\_\_ in skin up to \_\_\_\_\_\_\_\_\_\_IUs per min. Regulates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, immunity, and blood pressure.
* Uses: http://en.wikipedia.org/wiki/Johann\_Wilhelm\_Ritter
*
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| X-Rays |  |
| * Wavelength range:\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_
* Discovered in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* Man-made x-rays are made by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tube that generates high \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to accelerate \_\_\_\_\_\_\_\_\_ (cathode). The high velocity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ collide with a metal target usually \_\_\_\_\_\_\_\_\_\_\_\_\_\_, (\_\_\_\_\_\_\_\_\_\_\_) .
* Uses:

Hard: Soft: |  <http://nobelprize.org/nobel_prizes/physics/laureates/1901/rontgen-bio.html> |

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| Gamma Rays |  |
| • Wavelength:\_\_\_\_\_\_\_\_\_\_\_\_ • Discovered in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_• Produced by :Gamma-ray astronomy: Started in late 1960/early 1970 with the \_\_\_\_\_\_\_\_\_\_ satellite. Was used to detect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but instead found \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Ground-based gamma-ray detection: |  |
| Cosmic Rays |
| \*Not technically light, but travel at or close to c.• Discovered in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_• Energetic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_originating from \_\_\_\_\_\_\_\_\_\_\_\_\_\_• May be:http://en.wikipedia.org/wiki/Victor\_Francis\_Hess |