



**Highly Commended**

# **Science Writing**

## **Year 5-6**

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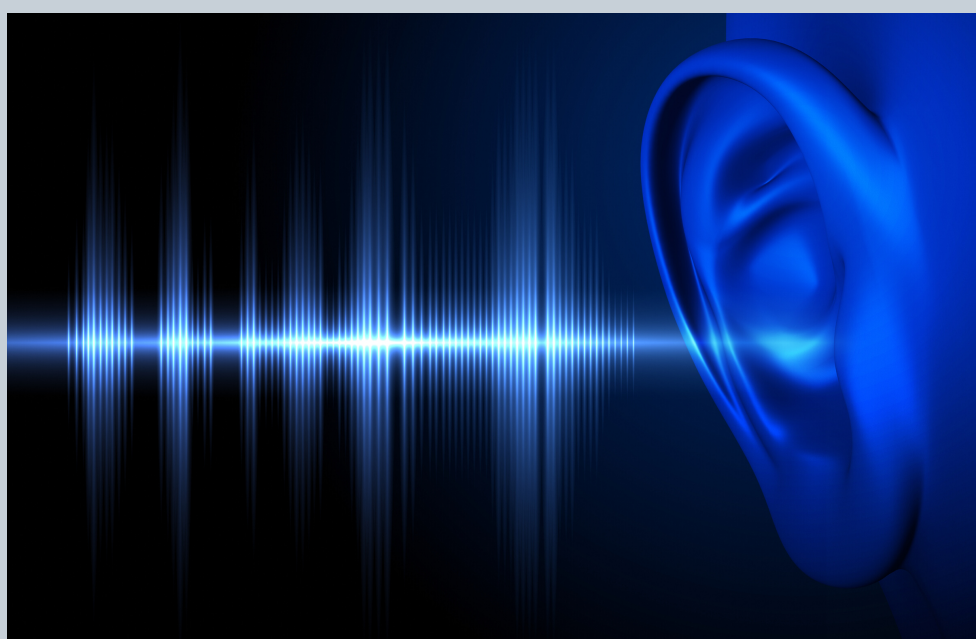
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# HIDDEN WAVES AND THE SCIENCE BEHIND THEM

First of all, what are hidden waves? Hidden waves are frequencies that travel through a medium such as air or water and will move energy from one place to another. There are many types of hidden waves found everywhere, but in this report only four hidden waves will be explored.

## Sound waves

Sound waves are one of the more common hidden waves. Sound waves are vibrations that propagate as an acoustic wave through medium. By essentially turning up or down the pitch of any sound it changes the way we hear that sound. To extend more on sound waves you first need to know how they travel. The vibrations of sound travel in a wave pattern which explains the name sound waves. Sound waves move when an object vibrates and sends more vibrations to other surrounding objects. Sound waves can travel through any air, solid or liquid objects as long as it contains particles to bounce off of. Sound waves are very important in science because it can lead to many new discoveries. The Greek mathematician and philosopher Pythagoras used sound waves in the sixth century to discover the relationship between the length of a vibrating string and tone, also known as the first law of string.

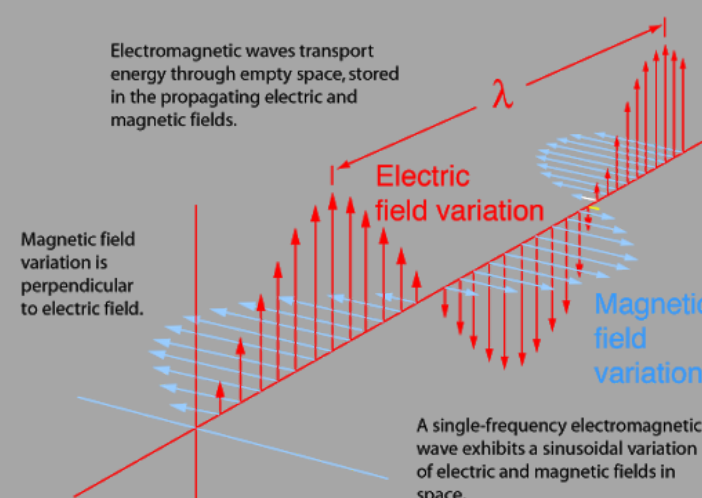


Greek mathmiticain and philosopher pythagros

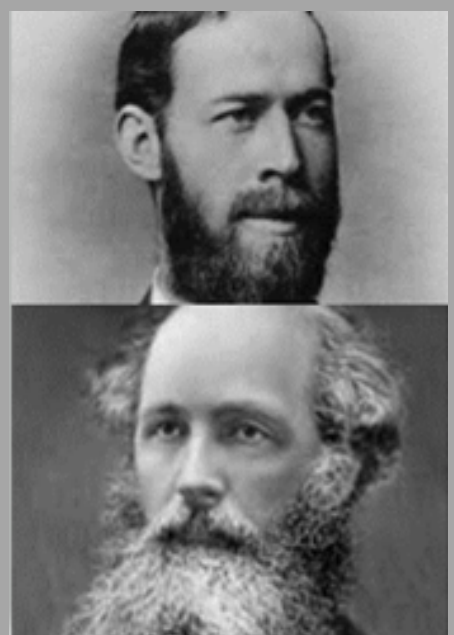


## Electromagnetic waves

Electromagnetic waves also known as Electromagnetic radiation refers to the waves in the Electromagnetic field. Electromagnetic waves can be found in instant communication, data and heat/invisible heat to name a few. To understand Electromagnetic waves, you have to know how there formed. Electromagnetic waves are formed when an electric field comes in contact with a magnetic field. All magnetic fields are created by charged particles. Electromagnetic waves were first discovered in 1887 when physicist Heinrich Hertz demonstrated the existence of Electromagnetic waves that were predicted by fellow scientist James Maxwell by producing radio waves. when James Maxwell and Henrich Hertz discovered Electromagnetic waves, it unlocked a gate way to new inventions such as a hairdryer and vacuum cleaner.

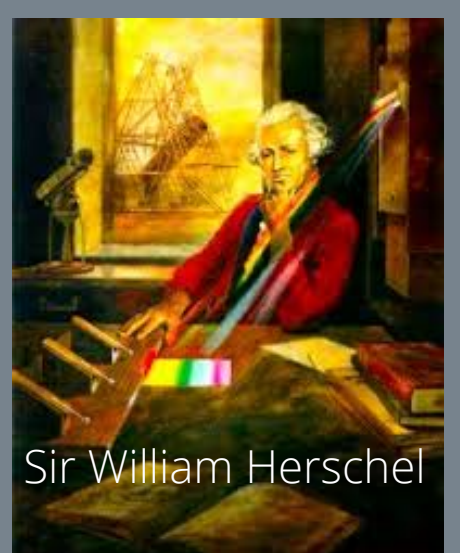
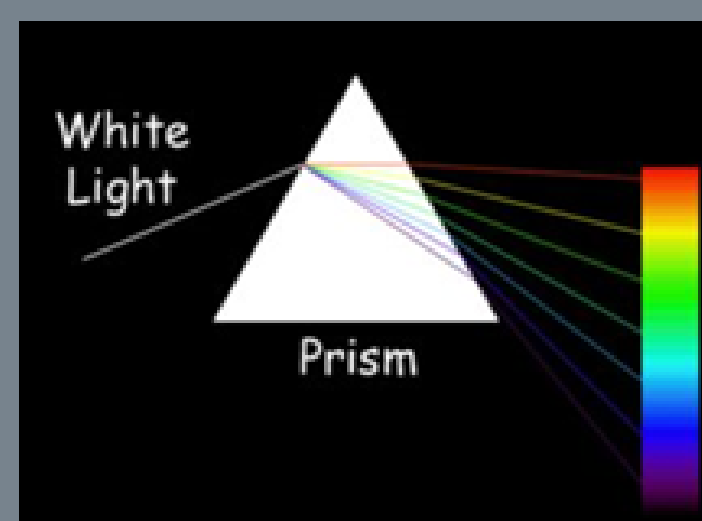


Henrich Hertz and James Maxwell



## Infrared waves

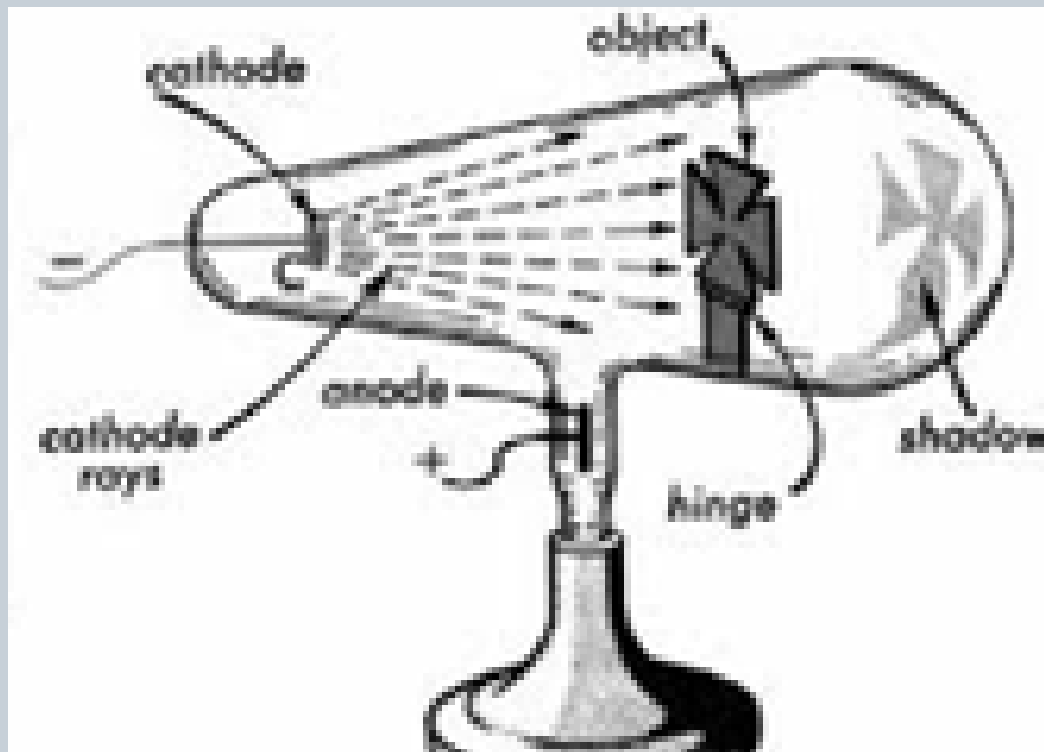
Infrared waves, or Infrared light is a part of the Electromagnetic spectrum. An electromagnetic spectrum comprises of the span of all electromagnetic radiation. Humans detect the Infrared waves as heat instead of waves because the waves are invisible to the human eye. Infrared waves were discovered in the 1800s by astronomer Sir William Herschel. Sir William Herschel discovered Infrared waves using sunlight and a thermometer. He used a prism in which the sunlight would pass through, the thermometer was used at the red end of the visible spectrum. The thermometer was used to measure the ambient air temperature in the room. When Sir William Herschel discovered Infrared waves, it changed the science community, particularly space exploration. One of the biggest contenders of space exploration is NASA because they send multiple drones to learn about infrared waves.



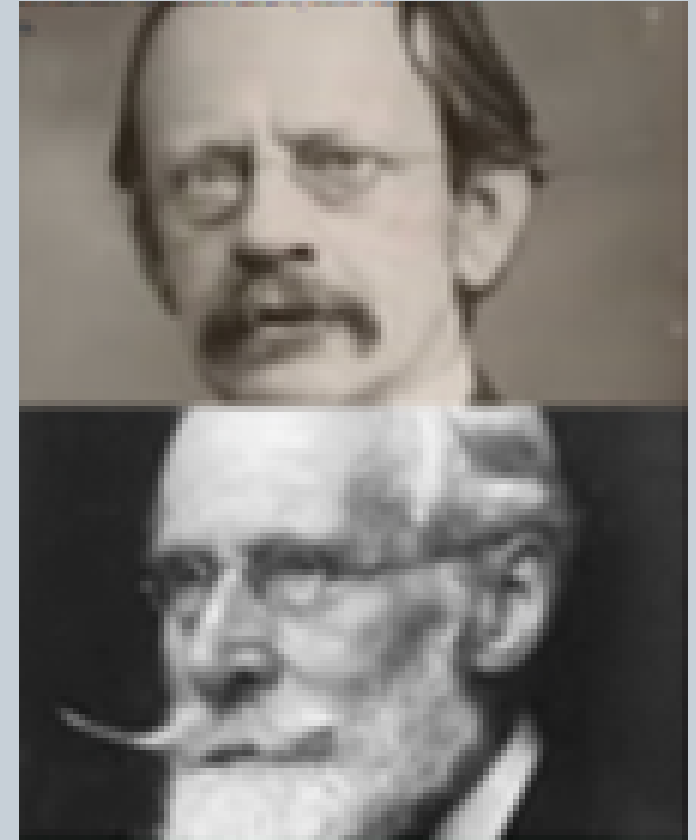
Sir William Herschel

## Plasma waves

In Physics, plasma waves are an interconnected set of particles and fields which propagate in a periodically repeating fashion. One of the three principles in plasma waves is particle collision with the rate being less than the plasma-oscillation frequency. Plasma waves were discovered by British physicist sir JJ Thomson in 1897, although plasma waves were firstly identified by Sir William Crooks using a Crooks tube. A Crook's tube is a sealed glass tube with very little air inside, in which two electrodes can pass through. When high voltage is applied between two electrodes. Which electrons are emitted from the cathode and are accelerated toward the anode. For a long time, science and technology institutions explore interstellar sound in space, using our solar system and the upper ionosphere contains fully ionised gas more commonly known as plasma. Plasma waves also play an important role in planetary envelopes in astrophysical plasmas.



Sir JJ Thomson and  
sir William Herschel



With all the information we have explored, it is easy to say there is an infinite number of hidden waves, some have been discovered some are still hidden.

## Bibliography

- [https://science.nasa.gov/ems/07\\_infraredwaves](https://science.nasa.gov/ems/07_infraredwaves)
- [http://coolcosmos.ipac.caltech.edu/cosmic\\_classroom/classroom\\_activities/herschel\\_bio.html](http://coolcosmos.ipac.caltech.edu/cosmic_classroom/classroom_activities/herschel_bio.html)
- [http://www.sloughhistoryonline.org.uk/ixbin/hixclient.exe?a=query&p=slough&f=generic\\_theme.htm&\\_IXFIRST\\_=1&\\_IXMAXHITS\\_=1&%3Dtheme\\_record\\_id=sl-sl-infrared&s=1MBABDA5YeF](http://www.sloughhistoryonline.org.uk/ixbin/hixclient.exe?a=query&p=slough&f=generic_theme.htm&_IXFIRST_=1&_IXMAXHITS_=1&%3Dtheme_record_id=sl-sl-infrared&s=1MBABDA5YeF)
- <https://sciencing.com/7-types-electromagnetic-waves-8434704.html>
- <https://economictimes.indiatimes.com/definition/electromagnetic-waves>
- <http://meche.mit.edu/news-media/hidden-ocean-waves>
- <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/internal-tide>
- <https://study.com/academy/lesson/how-magnetic-fields-are-created.html>
- [https://imagine.gsfc.nasa.gov/science/toolbox/history\\_multiwavelength1.html](https://imagine.gsfc.nasa.gov/science/toolbox/history_multiwavelength1.html)
- <https://nationalmaglab.org/education/magnet-academy/history-of-electricity-magnetism/pioneers/james-clerk-maxwell>
- <https://study.com/academy/lesson/how-does-sound-travel-lesson-for-kids.html>
- <https://science.howstuffworks.com/sound-info5.htm>
- <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/internal-tide>
- <https://www.jpl.nasa.gov/spaceimages/details.php?id=PIA17045>
- <https://www.infoplease.com/encyclopedia/science/physics/concepts/crookes-tube>
- <https://www.britannica.com/science/plasma-state-of-matter/Waves-in-plasmas>
- <https://www.jstor.org/stable/74692?seq=1>
- <https://www.jpl.nasa.gov/nmp/st5/SCIENCE/magnetosphere.html>
- <https://www.who.int/peh-emf/about/WhatisEMF/en/>
- <https://www.britannica.com/science/electromagnetic-radiation>
- <https://arxiv.org/ftp/arxiv/papers/1404/1404.0509.pdf>
- <https://www.newcastle.edu.au/research-and-innovation/centre/csp/research/plasma-waves#:~:text=Plasma%20waves,give%20an%20overall%2C%20neutral%20plasma.>
- <https://ntrs.nasa.gov/search.jsp?R=19840006155>

