

Women in STEM

When we talk about STEM, we mean jobs that are in Science, Technology, Engineering and Maths. Do you like those subjects in school?

Can you think of any jobs people would do that are STEM?

Did you know:

35% of people studying a subject in STEM are women.

19% of people studying engineering are women.

22% of people working in a STEM job are women.

That's not a lot of women.

Why do you think less girls study and work in STEM?

Anyone can do these jobs.

We are going to find out more about one North East woman working in STEM.

Danielle George

Danielle was born and went to school in the North East. She is a Professor in Microwave Communication Engineering and has even worked with NASA (National Aeronautics and Space Administration) and ESA (European Space Agency).

Danielle investigates and works with electromagnetic waves. There are different types of electromagnetic waves and they all have different uses in our everyday lives.



Prof Danielle George. Tintype portrait captured when Prof George was speaker at the Great North Greats Symposium for people age 16-18, Discovery Museum, Newcastle.

Have you ever heard of these types of electromagnetic waves?

Light waves, X-rays, Radio waves and Microwaves.

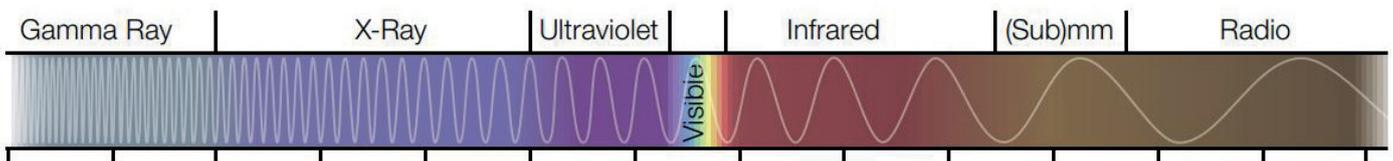
Danielle has worked mostly with radio and microwaves.

Microwaves are used to cook food, but also can be used to help send information long distances.

We can see all kinds of colours around us because of light waves or rays.

We can see red, orange, yellow, green, blue, indigo, and violet light waves.

These waves are known as visible light.



But there are other light waves that we can't see like infrared and ultraviolet waves. Sometimes other animals can see light waves that we can't. Snakes can see infrared light and bees can see ultraviolet light! There are other types of light rays that we can't see as well called gamma rays, millimetre waves, submillimetre waves, x-rays and radio waves. This is known as the electromagnetic spectrum.



Stars and galaxies give off or emit all kinds of light. We can see the visible light with a normal telescope but if we want to see the other types of light, we must use a special radio telescope to help.

Danielle worked on a project to help build ALMA (Atacama Large Millimeter Array) which is the largest observatory in the world. It has 66 radio telescopes and is used to research how stars and galaxies begin. She was the UK lead for amplifiers. Amplifiers make the signal stronger so that the images collected have more details.

Experiment – Amplify your hearing!

- Find a partner and sit 2 metres away from them
- Person 1 should read out a sentence from your favourite book
- Person should sit and listen
- Now Person 1 read the sentence again whilst person 2 listens with their hand behind their ear. Do you notice a difference?
- Swap roles and try again

You should notice that it sounds better and louder. Your hand is reflecting the sound waves into your ear. It is helping to capture more sound. This is why radio telescopes have big curved (parabolic) dishes. It helps them capture more radio waves.

Why not try...

- Blow up a balloon and hold it up to your ear
- Tap on the side of the balloon away from your ear
- What does it sound like?

Why not find out...

Can you find out any information about other famous women who have worked in STEM subjects?