

Magnificent magnetosphere

DID YOU KNOW THE EARTH HAS A GIANT MAGNETIC FIELD WHICH INTERACTS WITH A STREAM OF PARTICLES FROM THE SUN? WITHOUT THE AMAZING MAGNETOSPHERE, LIFE ON EARTH WOULD NEVER HAVE EVOLVED.

Fields of force

Have you ever wondered how magnets can stick to a fridge door without glue? The secret is an invisible force called magnetism. When certain objects are magnetic, they can pull other magnetic objects towards them or push them away from a distance. The Earth is a giant magnet with a magnetic field that stretches tens of thousands of kilometres into space.

A protective force.

If the solar wind reached the Earth's surface it would destroy the atmosphere and cause severe damage to life. Instead, the magnetosphere protects the Earth from the affects of the solar wind.

A strong effect

The Sun's solar wind (see right) is a stream of charged particles, like electrons and protons. The magnetosphere is formed by the solar wind interacting with the Earth's magnetic field. It's invisible and continually changing as it's buffeted by the solar wind.

Natural magnets

Magnetism was first discovered thousands of years ago when people noticed that lodestone, a type of mineral containing magnetite, could attract iron. This magnetic attraction occurs along the field lines of the magnet, which come together at points called poles. On Earth, these poles are located north and south, which is why a compass needle always points north. But occasionally the Earth's magnetic field can flip causing the poles to swap around! The last time this happened was 780,000 years ago.

Particles everywhere

Have you ever rubbed a balloon on your head or jumper and then held it near small bits of paper? When you do this, you create a 'charge' on the particles on the balloon's surface and this charge 'attracts' the paper. Opposite charges repel and like charges attract. The world and your own body is made up of countless trillions of particles constantly in action!

Can it break?

While the magnetosphere has sheltered our planet from harsh solar winds and radiation for millions of years, massive blasts of solar radiation can crack the Earth's magnetic shield. This can temporarily disrupt radio signals, power grids and GPS navigation. Much of today's technology, like electronic payments and smartphones, rely on these signals!

Earth's awesome core

The Earth's inner core is made up of solid iron and nickel surrounded by a liquid outer core. The Earth's magnetic field is thought to be generated by electric fields formed as heat moves out from the metal core.

www.wasp.edu.au