NASA FLIES SPACECRAFT THROUGH SEVERAL MAGNETIC EXPLOSIONS...ABOVE EARTH!

The famous space exploration agency known as NASA has finally made their first ever observations from, what they call, the heart of a 'Magnetic Reconnection' event that has a special thanks towards the Magnetospheric Multiscale Mission. This mission is referred to as (MMS).

This specific mission, that consists of four exactly identical spacecraft's, has been launched back in March of 2015. The goal is to observe the different reactions inside of the magnetosphere in which scientists have only been able to previously witness inside reconnection inside of the laboratory.

This research that has been published in an article hosted on the popular journal 'Science', has revealed a revelation that the magnetic reconnection is indeed dominated by the physics of the electrons. Thus bringing scientists just one step closer to completely understand the phenomenon.

What on earth is magnetic reconnection, and more importantly, why is it important?

As we look at magnetic reconnection in which only occurs when the magnetic fields are collided and then realign. Occasionally, this can cause extremely powerful explosions that spread across the darkness of space. This then converts the magnetic energy into another form of energy in which we call Kinetic, or thermal energy.

Those explosions possess the ability to be able to put other satellites, advanced spacecraft's, and even astronauts that are floating around in space at a great risk. This also provide a dramatic impact upon our planet by providing large solar flares and even large coronal ejections that has the ability to become a state of active geomagnetic storms. These Geomagnetic storms can become so powerful that our communications and other electronics become disabled.

The magnetic reconnections is of the biggest main drivers in the realm of space radiation, it also happens to be one of the key forces that drives other particles into accelerating throughout space.

October 16th, 2015, the MMS had traveled upon a straight line through these magnetic reconnection event right at the boundaries of where the Earth's magnetic fields actually touches our sun's magnetic field. This whole process only lasted just a few brief seconds in order to have all 25 sensors aboard each of the spacecraft to collect several thousands of observations.

Jim Burch, who is the principle investigator of the MMS and is also the lead author of the research experimentation has stated;
"We received results faster than we could have expected. By seeing magnetic reconnection in action, we have observed one of the fundamental forces of nature"

He then proceeds onto informing us that, "The decades-old mystery is what do the electrons do, and how do the two magnetic fields interconnect. Satellite measurements of electrons have been too slow by a factor

of 100 to sample the magnetic reconnection region. ‘

‘The precision and speed of the MMS measurements, however, opened up a new window on the universe, a new ‘microscope’ to see reconnection “continues Jim.

The ability of reconnection is indeed a force that is as fundamental in the darkness of space, just like the gravity here on Earth, as according to NASA.

This mystery still continues to surround us as to why exactly a few magnetic connections are that of the explosive type, and others are constantly steady. In either case, the local particles that are involved with the magnetics are then thrown away from each other thus creating a crossing magnetic boundaries. These magnetic boundaries have never been able to be crossed in any other way and resulting in a massive amount of energy.

This new MMS that has obtained observations has revealed to scientists that when two of the magnetic fields finally collide, the electrons are then shot away in perfectly straight lines from the original event, even if at speeds of hundreds of miles per second. They race across the magnetic boundaries that would, normally, divert them.

Once they are finally across those boundaries, then the particles start to begin to create a curvature, thus creating a 'U-Turn' in response to the new fields of magnetics in which they encounter.

Combining the observations then aligns with a known computer simulation that we call 'Crescent Model'. The persistent, as well as the characteristics, of the newly created crescent shape inside of the electron distributions provides suggestions to the scientists that the physics of such electrons is in fact at the direct heart of understand just exactly how the magnetic field lines can accelerate the particles.

The co-author of the research paper, Roy Torbert, has said;

"This shows us that the electrons move in such a way that electric fields are established and these electric fields in turn

produce a flash conversion of magnetic energy'

'The encounter that our instrument were able to measure gave us a clearer view of an explosive reconnection energy release and the role played by electron physics. "

Magnetospheric Multiscale Mission has successfully been upon just over 4,000 trips throughout the magnetic boundaries all around the globe since the initial launch, and more surprisingly, it has flown through that of a magnetic reconnection event five more times.

The revolutionary scientists state that the information bestowed upon them is going to be an ongoing research that is highly crucial during a time that space exploration will then become more of a reliant upon satellites as well as preparing the astronauts on their journey onto Mars.

Below is a video that captures the magnetic reconnection in action;

Sources: RT { } Giphy { } Science { } YouTube { }