Skeleton Of Sun's Atmosphere Reveals Its True Nature

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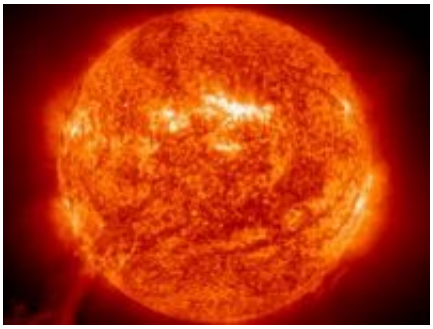

The Sun's outer atmosphere or corona is incredibly complex, as shown in observations from space. It is also extremely hot, with a temperature of over a million degrees by comparison with that of the Sun's surface of only 6000 degrees. Scientists have now made a major breakthrough in understanding this complexity by studying the ‘skeleton’ of the magnetic field.

A team of scientists from St Andrew’s University will present the results on Monday 16 April at the Royal Astronomical Society National Astronomy Meeting in Preston. "It is the Sun's magnetic field that dominates the behaviour of the corona and determines its structure", said team member Andrew Haynes, “and our work is a key step forward in understanding its structure”.

Until now the complexity of the magnetic field has baffled solar scientists. Professor Eric Priest first proposed the concept of the solar skeleton in 1996. It consists of the key elements on which the complex shape of the magnetic field is built. "We realised", added Dr Clare Parnell, "that by constructing the skeleton of the field, we could unravel this complexity and hopefully determine how the corona is heated".

Dr Parnell and colleagues have managed to develop a computer experiment, which simulates the complex structure of the corona and have found that the coronal heating is focused in specific parts of the skeleton. "In future", she added, "we should be able to compare this type of analysis with dramatic new observations from the recently launched Hinode spacecraft and thereby really nail down the heating mechanism".

The work of the St Andrew's team indicates that the solar skeleton changes continually and has a much richer structure than anyone imagined. Their work is a building block in astronomers' efforts to better understand events such as the solar flares and coronal mass ejections that eject billions of tonnes of matter into space.

Source: Royal Astronomical Society