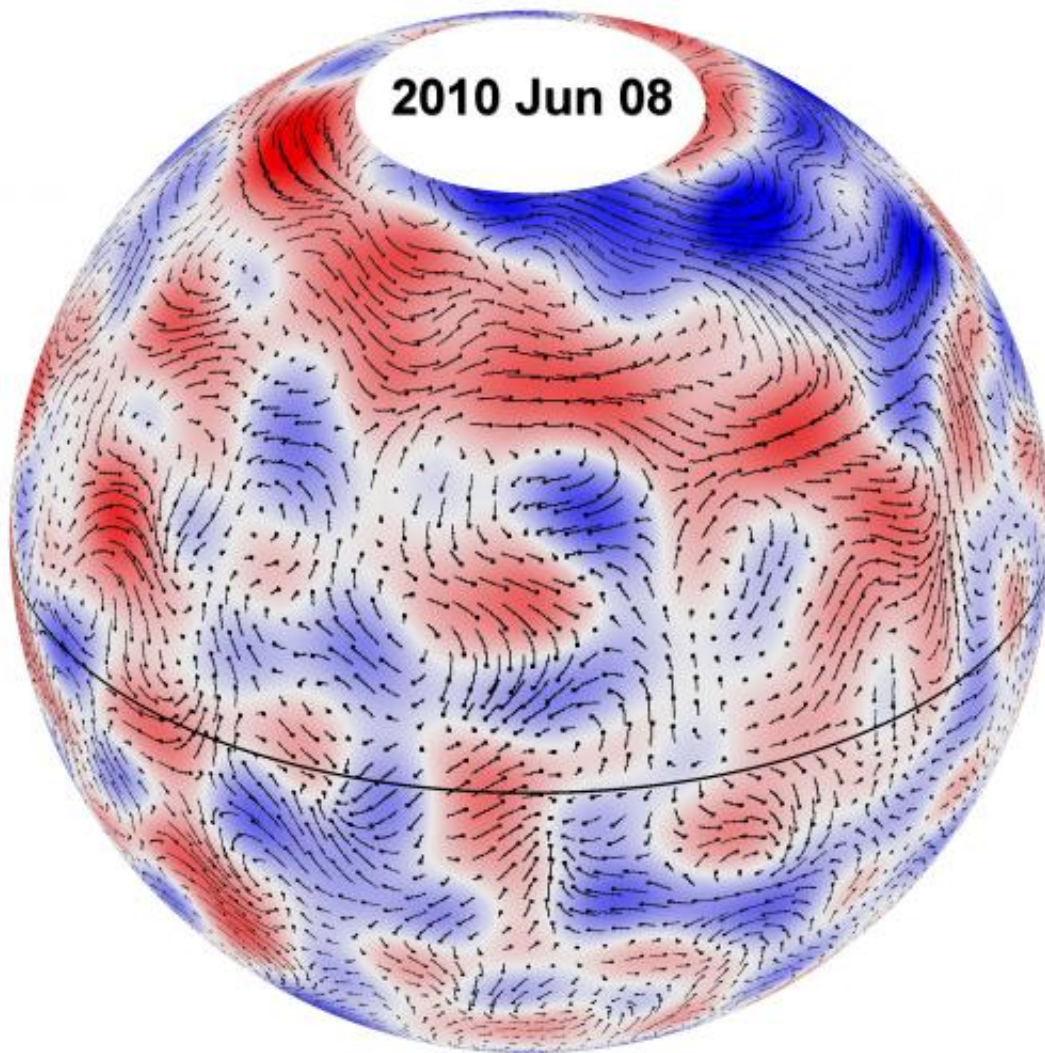


Researchers find giant convection cells on the Sun

December 6 2013, by Bob Yirka



Giant cell flow trajectories on the Sun for June 8, 2010. The underlying cell pattern shows westerly winds in red and easterly winds in blue. Credit: David Hathaway/NASA

(Phys.org) —A trio of researchers with affiliations with NASA and several U.S. institutions has found the elusive giant convection cells suspected for nearly a half century to exist on and within the sun. In their paper published in the journal *Science*, the team describes how they used data from a NASA observatory that captured solar information every 45 seconds over a several month period which allowed the researchers to track the slow movement of the giant cells.

The sun generates a lot of heat in its core, of course—heat that is conveyed to its outer portions and eventually into space. That process occurs due to convection, and scientists have known about two types of convection sources (known as cells) for quite some time: granules and super granules—the former are small and travel very rapidly while the latter are planet sized and travel less swiftly. Scientists have suspected for half a century that there is a third type of cell, a giant, also at play and that they have perhaps an even bigger impact on moving not just heat through the sun, but magnetism as well. In this new effort, the researchers report that they've been able to definitively identify such cells, moving them from theory, to an observed phenomenon.

The reason that researchers have had so much difficulty in identifying [giant cells](#), is because they move so slowly. In finally finding them, the researchers have discovered that they move only at about ten meters per second—which when compared with the immense size of the sun, means they are not really going to stand out. To get past that problem, the researchers looked at minute-by-minute data from NASA's Solar Dynamics Observatory. Averaging the data allowed for observation of large groups of super granules being moved by something else—giant cells.

Besides proving theory correct, identifying giant cells on the [sun](#) might help to better predict solar events that have a direct impact on us—solar flares, [coronal mass ejections](#), etc.—all can wreak havoc on man-made

electronics. Figuring out how to predict such events and to determine their size in advance could go a long way towards helping to build a system to automatically shut down sensitive equipment before such an event occurs.

More information: Giant Convection Cells Found on the Sun, *Science* 6 December 2013: Vol. 342 no. 6163 pp. 1217-1219 [DOI: 10.1126/science.1244682](https://doi.org/10.1126/science.1244682)

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