Solar physicist says weak sun produces record solar outburst

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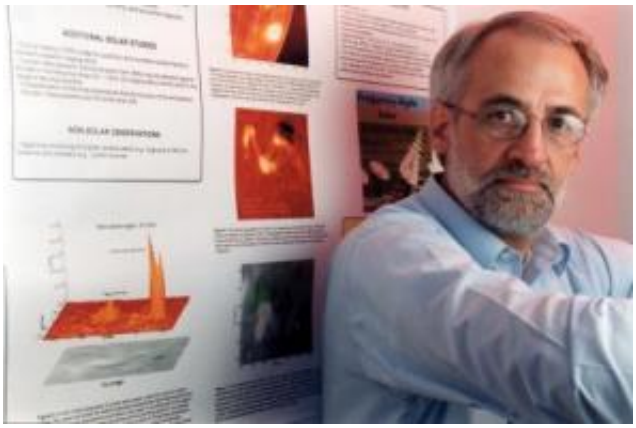

Dale Gary, Solar Physicist. Credit: New Jersey Institute of Technology

A solar outburst, which can play havoc with global positioning systems and cell phone reception, bombarded Earth, Dec. 6, 2006, with a record amount of radio noise, said solar physicist Dale Gary. Gary, who confirmed the news today, is a professor and chair of the department of physics at New Jersey Institute of Technology (NJIT). "Reports of significant events worldwide are still coming in as late as yesterday afternoon," said Gary. Due to a computer software failure, initial research reports in the U.S. downplayed the outbursts.

"The odd thing about this outburst was that the Sun is supposed to be at the minimum phase of its 11-year cycle," said Gary. "Nevertheless, the disruption lasted more than an hour, produced a record amount of radio noise, and caused massive disruptions of Global Positioning Satellite (GPS) receivers world wide."

Since 1997, Gary has directed Owens Valley Solar Array (OVSA), one of the world's leading research facilities to study the sun's impact upon earth. Using special instruments, Gary and researchers at NJIT's Center for Solar-Terrestial Research study solar outbursts. The National Science Foundation and NASA support the work.

A complex sunspot on the Sun was responsible for the outburst, which occurred Dec. 6, 2006 at 3:45 p.m. EST, said Gary. Before the outburst, the radio output of the Sun in the GPS broadcasting band was 54 on the scale of solar flux units. During the outburst, associated with a large solar flare, the radio noise reached around 1 million solar flux units, according OVSA instruments.

"This reading is more than 10 times the previous record, and calls into question scientists' assumptions of the extent to which the Sun can interfere with GPS and wireless communications," Gary said. "OVSA's results are especially useful because they monitor the same right-hand circular polarization that the GPS satellites use for broadcasts. Most other radio instruments measure total intensity rather than circular polarization, which undercounts the noise effect on GPS signals."

The recognition of the record-setting nature of the burst was delayed because the US Air Force Radio Solar Telescope Network (RSTN) reported lower numbers--13,000 solar flux units. But after OVSA researchers triple-checked their figures, it appeared that NJIT's group was correct. Cornell University researchers later independently confirmed OVSA findings.

"The Cornell researchers gave us indirect evidence of a burst at least 10 times the strength reported by RSTN," said Gary. "Eventually we learned," he added, "that the RSTN report pertained only to the beginning of the burst, and the recording was stopped early due to a software error. At the same time, additional quantitative reports of effects on GPS receivers also point to a burst up to 1 million solar flux units."

"When colleagues elsewhere, learned of the burst

and saw the OVSA numbers, they just said, ‘Wow,’" said Gary. Gary expects to see more important results emerge from the data. "Early examination of the data taken during the burst, ought to provide a gold-mine of scientific information about how the Sun produces such amazing events," Gary said. "Ultimately we hope to understand these bursts well enough to predict them and their effect on wireless systems on Earth."

Source: New Jersey Institute of Technology