Beat: Miscellaneous

NASA`s planet-hunting telescope appears broken, future uncertain

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USPA News - NASA`s Kepler spacecraft has lost two of its reaction wheels, and it appears likely that the telescope`s planet-hunting days are over, the U.S. space agency confirmed on Wednesday, but data yet to be analyzed ensures scientific discoveries will continue for years. NASA mission managers said it found Kepler, which was launched in March 2009 and was named after German astronomer Johannes Kepler who lived in the 17th century, was found in safe mode during a semi-weekly contact on Tuesday.

The spacecraft was also found to be in Thruster-Controlled Safe Mode during contact earlier this month. "The root cause is not yet known, however the proximate cause appears to be an attitude error," the space agency said in a statement. "The spacecraft was oriented with the solar panels facing the sun, slowly spinning about the sun-line. The communication link comes and goes as the spacecraft spins." Mission officials said they attempted to return to reaction wheel control as the spacecraft rotated into communication, and commanded a stop rotation. "Initially, it appeared that all three wheels responded and that rotation had been successfully stopped, but reaction wheel 4 remained at full torque while the spin rate dropped to zero," the Kepler team said, explaining this is a clear indication of an internal failure within the reaction wheel, likely a structural failure of the wheel bearing. The telescope needs at least three of its four wheels operating, and the loss of reaction wheel 4 would follow the loss of another wheel last year, leaving only two wheels operational. "It`s unlikely that the spacecraft will be able to return to the high pointing accuracy that enables its high-precision photometry," the team said. The Kepler team will now complete preparations to enter Point Rest State, which is a loosely-pointed, thruster-controlled state that minimizes fuel usage while providing a continuous X-band communication downlink. The software to execute that state was loaded to the spacecraft last week, and last night the team completed the upload of the parameters the software will use. "The spacecraft is stable and safe, if still burning fuel," the team wrote in the statement. "Our fuel budget is sufficient that we can take due caution while we finish our planning. In its current mode, our fuel will last for several months. Point Rest State would extend that period to years." NASA said it would take the next weeks to assess its options, which include steps to attempt to recover wheel functionality and to investigate the utility of a hybrid mode, using both wheels and thrusters. No decision has been made yet whether to end data collection if the telescope is determined to be broken. But even if a decision is taken to end data collection, NASA said it has substantial quantities of data on the ground that is yet to be fully analyzed, ensuring that the string of scientific discoveries will continue for years to come. Kepler completed its primary 3.5-year-mission and entered an extended mission phase in November 2012. The space telescope looks for planet signatures by measuring tiny decreases in the brightness of stars caused by planets crossing in front of them. So far, the spacecraft has identified 132 "exoplanets" that could potentially be habitable and another 2,700 possible candidates.

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UPA United Press Agency LTD

483 Green Lanes
UK, London N13NV 4BS
contact (at) unitedpressagency.com
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