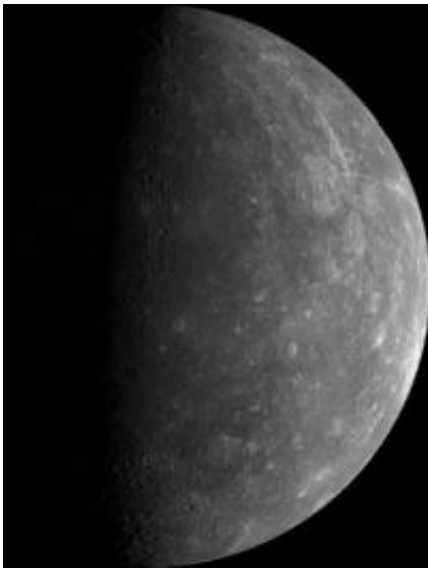


Mercury's comet-like appearance spotted by satellites looking at the Sun

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Mercury. Photo courtesy of NASA

Scientists from Boston University's Center for Space Physics reported today that NASA satellites designed to view the escaping atmosphere of the Sun have also recorded evidence of escaping gas from the planet Mercury. The STEREO mission has two satellites placed in the same orbit around the Sun that the Earth has, but at locations ahead and behind it. This configuration offers multi-directional views of the electrons and ions that make up the escaping solar wind. On occasion, the planet Mercury appears in the field of view of one or both satellites.

In addition to its appearance as a bright disk of reflected sunlight, a "tail" of emission can be seen in some of the images. Announcing this new method of observing Mercury and trying to understand the nature of the gases that might make up this tail feature were the topics presented at the European Planetary Science Congress meeting in Rome today.

It has been known that Mercury exhibits comet-like features, with a coma of tenuous gas surrounding the planet and a very long tail extending in the anti-sunward direction. From Earth, observations of both of these features can be done using light from sodium gas sputtered off the surface of Mercury. The Sun's [radiation pressure](#) then pushes many of the sodium atoms in the anti-solar direction creating a tail that extends many hundreds of times the physical size of Mercury. "We have observed this extended sodium tail to great distances using our telescope at the McDonald Observatory in Texas," Boston University graduate student Carl Schmidt explained, "and now the tail can also be seen from satellites near Earth." Much closer to Mercury, several smaller tails composed of other gases, both neutral and ionized, have been found by NASA's MESSENGER satellite as it flew by Mercury in its long approach to entering into a stable orbit there.

"What makes the STEREO detections so interesting is that the brightness levels seem to be too strong to be from sodium," commented Schmidt, lead author on the paper presented at EPSC.

Of special interest is the way the tail feature was spotted in the STEREO data. It was not found by the Boston University team, but by Ian Musgrave, a medical researcher in Australia who has a strong interest in astronomy. Viewing the on-line data base of STEREO images and movies, Dr. Musgrave recognized the tail and sent news of it to Boston asking the BU team to compare it with their observations.

"A joint study was started and now we have found several cases, with

detections by both STEREO satellites,” explained Jeffrey Baumgardner, Senior Research Associate in the Center for Space Physics at Boston University, and the designer of the optical instruments that discovered the exceptionally long sodium tail.

The current focus of the team is to sort out all of the possibilities for the gases that make up the tail. Dr. Christopher Davis from the Rutherford Appleton Laboratory in Chilton, England, a member of the STEREO team responsible for the camera systems on both satellites, is working closely with the Boston University group on refining the brightness calibration methods, and determining the precise wavelengths of light that would get through the cameras’ filters.

“The combination of our ground-based data with the new STEREO data is an exciting way to learn as much as possible about the sources and fates of gases escaping from Mercury,” said Michael Mendillo, Professor of Astronomy at Boston University and director of the Imaging Science Lab where the work is being done. “This is precisely the type of research that makes for a terrific Ph.D. dissertation,” Mendillo added.

Source: Europlanet

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