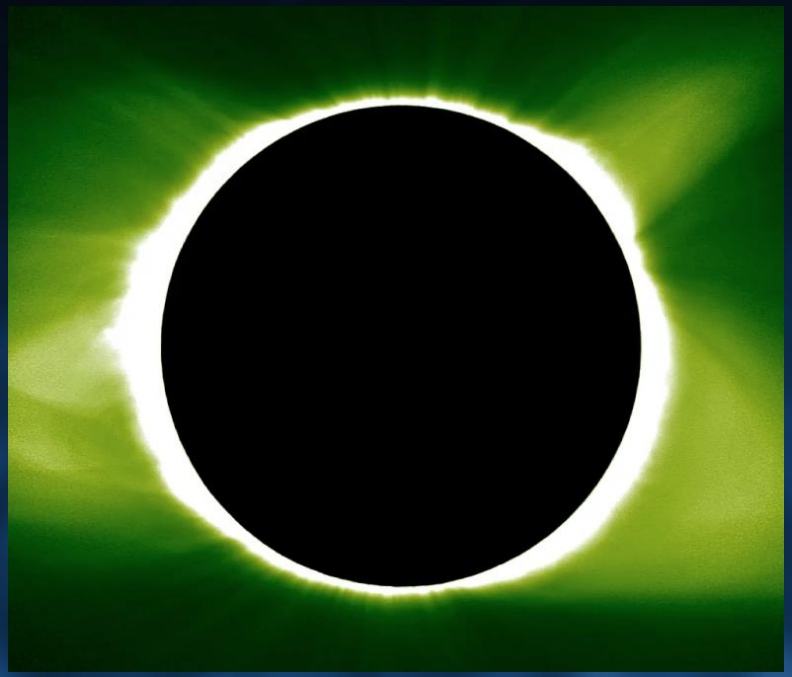
Updates from NASA-funded eclipse science

At the fall meeting of the American Geophysical Union, researchers presented at a press briefing about initial findings based on observations of the Sun and Earth gathered during the solar eclipse on Aug. 21, 2017. NASA funded 11 ground- and air-based studies during the eclipse. Select updates are below.

Amir Caspi of the Southwest Research Institute led a team to use telescopes mounted on NASA's twin WB-57 jets to extend observational time of the eclipse from just over two and half minutes on the ground to more than seven and a half minutes between the two planes. Caspi and his team gathered data in both visible and infrared light to understand the dynamics of the inner corona that could help explain the region's extraordinarily hot temperatures. The infrared data is the first data set of its kind. Data processing and analysis is underway.



When data analysis is completed, calibrated data from telescopes on WB-57 jets during the Aug. 21, 2017, total solar eclipse will help reveal key details about magnetic waves in the Sun's corona. Such waves may help us understand how the solar atmosphere reaches temperatures a thousand times hotter than the solar surface.

Greg Earle, from Virginia Tech, used the eclipse as a natural laboratory to test models of the ionosphere's effects on communications signals. The team's modeling suggested that the eclipse would allow radio signals to travel farther during the eclipse than they would on a normal day because of a drop in the number of energized particles in the ionosphere. Using a plethora of radio transmitters and receivers – including reports from thousands of ham radio operators – Earle's team validated their model, a step towards understanding less predictable changes in the ionosphere that can impact the reliability of our communications and navigation signals.

Jay Herman, from NASA Goddard Spaceflight Center, discussed how NASA's EPIC instrument on NOAA's DSCOVR provided top-notch views of the eclipse shadow from space, which also enabled a better understanding of Earth's energy balance. EPIC provided new observations that show a drop of 10% in the light reflected from Earth during the eclipse. This number will improve models of how clouds reflect energy away from our planet.