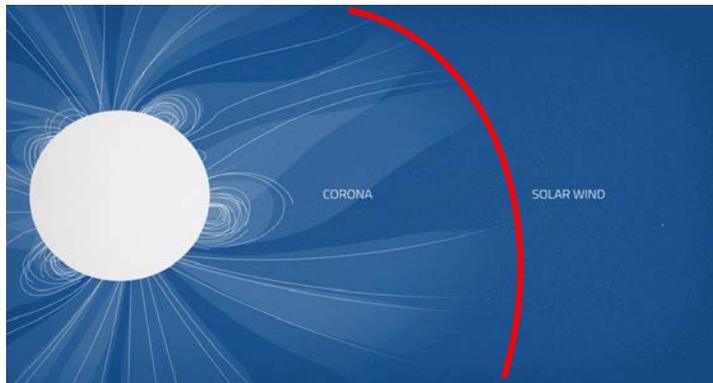


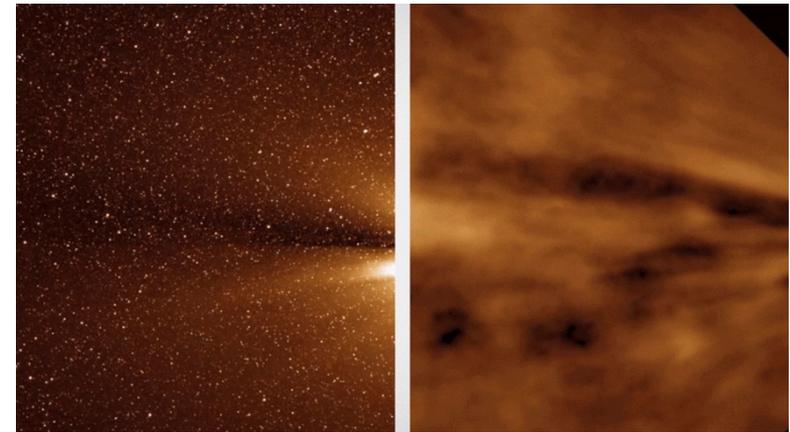
Images From Sun's Edge Reveal Origins of Solar Wind

What is the science question? How and where does the structured solar corona transition into the turbulent solar wind of interplanetary space?

What are the findings? An algorithm was used to dim the appearance of bright stars and dust in images of the faint solar wind. This innovation enabled us to observe the transition from the corona to the solar wind at a region about 20 million miles from the sun. The fluctuations we quantified are barely resolvable in STEREO, much smaller than e.g. CMEs, but they are large compared to Earth's magnetosphere, and drive global magnetospheric dynamics. These fluctuations in the newly formed solar wind are present every day, all over, and form the 'ground state' variability of space weather. They are to space weather what thunderstorms are to terrestrial weather: they comprise the level of variability and (albeit smaller) the hazard that exists somewhere practically every day.



As you go farther from the sun, the magnetic field strength drops faster than the pressure of the solar material. Eventually, the material starts to act more like a gas, and less like a magnetically structured plasma.



Views of the solar wind from NASA's STEREO spacecraft (left) and after computer processing (right). It also gives us the first video of the solar wind itself in this previously unmapped region.

What is the impact? Defining the details of this boundary helps us learn more about our solar neighborhood, which is bathed throughout by solar material. This space environment must be understood to better model space weather and safely explore beyond our planet.

Why does it matter to non-scientists? How cool it is that we are measuring this region of space for the first time? No instrument has ever measured this transition in situ (even Helios didn't go close enough to the Sun). This gives us a large scale view of one of the amazing places Solar Probe Plus will make direct in situ measurements.