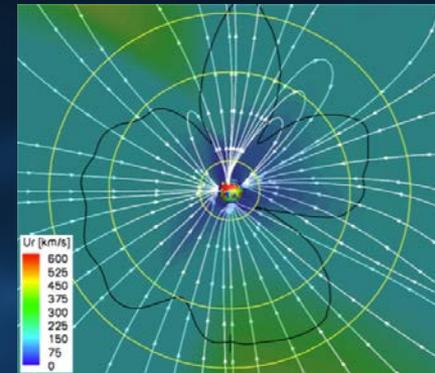
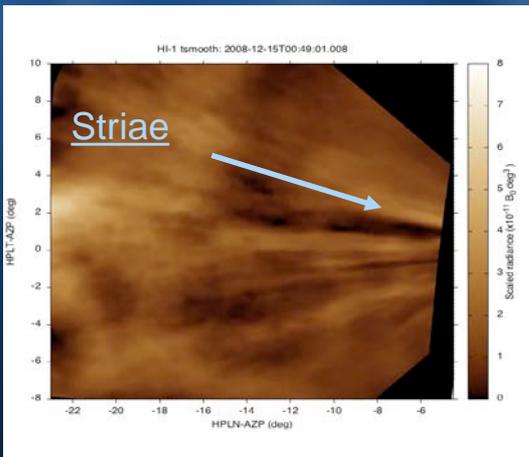


The NASA HQ-based Heliophysics Talk Series hosted Dr. Craig DeForest to discuss his research on imaging the top of the solar corona – *a transition zone that was invisible to scientists until the Heliospheric Imager aboard STEREO was launched into space.*

DeForest's research provides scientists with the first direct observation of the outer limits of the solar corona itself and data on solar wind dynamics; two aspects of space that directly affect Earth systems. Scientists are working to understand how the solar wind transitions from the solar atmosphere or corona into space. Two surfaces in the solar corona were studied: the Alfvén surface, where plasma disconnects from the sun, and the $\beta=1$ surface, where magnetically directed flow changes to ordinary hydrodynamic flow. STEREO's deep-field imaging instruments provided unprecedented spatial resolutions allowing the scientists to observe these important solar wind transitions for the first time.



The black line represents the Alfvén surface in an MHD model.
Credit: Cohen 2015



DeForest's team also provides insight into why the solar wind at Earth might be 100x hotter than models using a simple expansion of the wind from the sun predict. Bright, dense radial streaks, or striae dominate the solar corona and appear to break up under hydrodynamic instabilities observed in the $\beta=1$ surface causing large-scale turbulence. This turbulence may be responsible for heating the solar wind to the levels seen at Earth. **NASA's STEREO spacecraft provide the only observations of these interactions in this region of space.**

Still capture of a video showing the outer limits of the solar corona. Credit: DeForest et al.