



Interpreting the Logo for the NASA PUNCH Mission

PUNCH is an acronym: *Polarimeter to UNify the Corona and Heliosphere*

The colorful logo for PUNCH is complex, echoing the complexity of the system being studied by this NASA *Small Explorer* mission. The oval shape is reminiscent of an egg, symbolizing the birth of a new era in heliophysics as PUNCH helps to revolutionize the science and prediction of *space weather*.



The four largest yellow stars at the top symbolize the four PUNCH spacecraft spread out in Sun-synchronous Earth orbit to observe the *solar wind* and *space weather* within the entire *volume* of space between Sun and Earth (inner heliosphere).

One of the yellow “stars” is different than the other three, symbolizing the narrow-field imager (NFI) – a coronagraph focused on the Sun’s outermost layers (corona). The other three yellow “stars” represent the three wide-field imagers (WFIs) whose fields of view cover the rest of the inner heliosphere.



The four PUNCH cameras work together as one instrument, observing the polarized white light of *both* the outer solar corona and the *solar wind* of the inner heliosphere as a **single unified system**. This is sure to reveal new insights about how the corona expands outward to become the solar wind, and to provide continuous, 3D imaging and tracking of solar storms and other *space weather* occurring in the wind.

The “yolk” of the logo’s “egg” is the Sun itself, represented by the orange sphere at the bottom. The outward rays represent the radial structures of the corona and solar wind that expand in all directions from the Sun to fill and define the entire Solar System. The orange, swoosh-y wave fronts extending outward represent *space weather* such as Coronal Mass Ejections (CMEs) and other structures that disrupt the solar wind and are potentially harmful to astronauts and spacecraft.

Turquoise swooshes near the top of the logo represent shock waves in interplanetary space triggered by CMEs, Stream-Interaction Regions (SIRs), and other types of large-scale *space weather* phenomena.

To the upper right of the Sun there is a collection of small clumps extending outward. These symbolize two previously observed phenomena that PUNCH can study in greater detail: 1) inherent turbulence that forms in the solar wind as it travels away from the Sun, and 2) smaller blobs (micro-storms) that are ejected from the Sun. Although these solar wind structures are small compared to the Sun, they are large compared to Earth and thus can have substantive effects on our space environment. PUNCH can image and track both larger- and smaller-scale solar wind structures with unprecedented resolution.

Finally, the field of white stars at the top of the logo represents the real starfield, which PUNCH sees very well. The stars remind us that the Sun is our *nearest* star – the one that touches our world with its solar wind, the one whose storms make our auroral lights, and the one upon which all our lives depend.