

# SWRI-LED PUNCH MISSION

## SCIENCE TEAM

- **40** members
- **4** continents
- **7** countries
- **90°** field of view
- **180,000,000** miles across
- **3** dimensions

## SWRI'S WFI

- Views from **18 to 180 solar radii**, or **45 degrees**, away from the Sun in the sky
- Images the faint outermost portion of the solar corona and the solar wind itself
- Reduces direct sunlight by over **16 orders** of magnitude or a factor of **10 million billion** — the ratio between the mass of a human and the mass of a cold virus

Measuring **1,500,000°F** plasma  
Traveling **250** miles/second

**EVERY SECOND, OVER 300,000 TONS OF MATERIAL LEAVE THE SUN AND STREAK OUTWARD INTO SPACE.**

This solar wind impacts everything in the solar system, including Earth, causing the beautiful northern and southern lights. It also creates space weather, which threatens our power grids, satellites and astronauts. NASA's Polarimeter to Unify the Corona and Heliosphere (PUNCH) mission will integrate our understanding of the Sun's corona as it transitions into the solar wind. Four suitcase-sized spacecraft, designed and built by Southwest Research Institute, are synchronized to serve as a single "virtual instrument" to capture roughly a quarter of the sky, centered on the Sun. PUNCH will continuously track the solar wind in 3D for the first time, to help us better understand the Sun, the solar wind and their effects on humanity.



## MISSION

- 4** spacecraft = **1** virtual instrument
- ~**8,000** miles across
- 3** carry Wide-Field Imagers (WFIs)
- 1** carries a Narrow Field Imager



## 3D DATA

As electron particles scatter sunlight, the waves of light become aligned in a particular way — this is polarized light. Using polarizing filters allows scientists to measure motion in 3D to discern the trajectory and speed of coronal mass ejections as they move through the inner solar system.

- **3** raw images every **4** minutes
- **3** polarizing filters
- Unpolarized calibration image every **8** minutes
- **4** spacecraft working together
- Synchronized to **1** second

