

# NASA sending spacecraft straight into sun's glittering crown

August 10 2018, by Marcia Dunn

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In this photo provided by NASA, astrophysicist Eugene Parker, center, stands with NASA Associate Administrator for the Science Mission Directorate Thomas Zurbuchen, left, and United Launch Alliance President and Chief Executive Officer Tory Bruno in front of the ULA Delta IV Heavy rocket with NASA's Parker Solar Probe onboard, Friday, Aug. 10, 2018 at Cape Canaveral Air Force Station, Fla. Humanity's first-ever mission into a part of the Sun's atmosphere called the corona, is scheduled to launch early Saturday. (Bill Ingalls/NASA via AP)

NASA is sending a spacecraft straight into the sun's glittering crown, an atmospheric region so hot and harsh any normal visitor would wither.

Set to launch early Saturday, the Parker Solar Probe is as heat-resistant as a spacecraft gets, essential for exploring our star closer than ever before.

The U.S. got a glimpse of the sun's glowing, spiky crown, or corona, during last August's coast-to-coast total solar eclipse. "Well, Parker Solar Probe's going to be in there," said project scientist Nicola Fox of Johns Hopkins University.

Here's why the Parker spacecraft is so tough and why scientists are so hot for this first-of-its-kind mission:

## SUPERHERO-WORTHY SHIELD

Parker's lightweight heat shield is just 4 ½ inches (11 centimeters) thick. But it can withstand 2,500 degrees Fahrenheit (1,370 degrees Celsius) as well as extreme radiation, thanks to its high-tech carbon. Although the corona reaches millions of degrees, it's a wispy, tenuous, environment and so the spacecraft won't need to endure such severe temperatures. The 8-foot (2.4-meter) shield will face the sun during the close solar encounters, shading the science instruments in the back and keeping them humming at a cool 80 degrees Fahrenheit (27 degrees Celsius). As one scientist notes, this is a shield Captain America would envy.



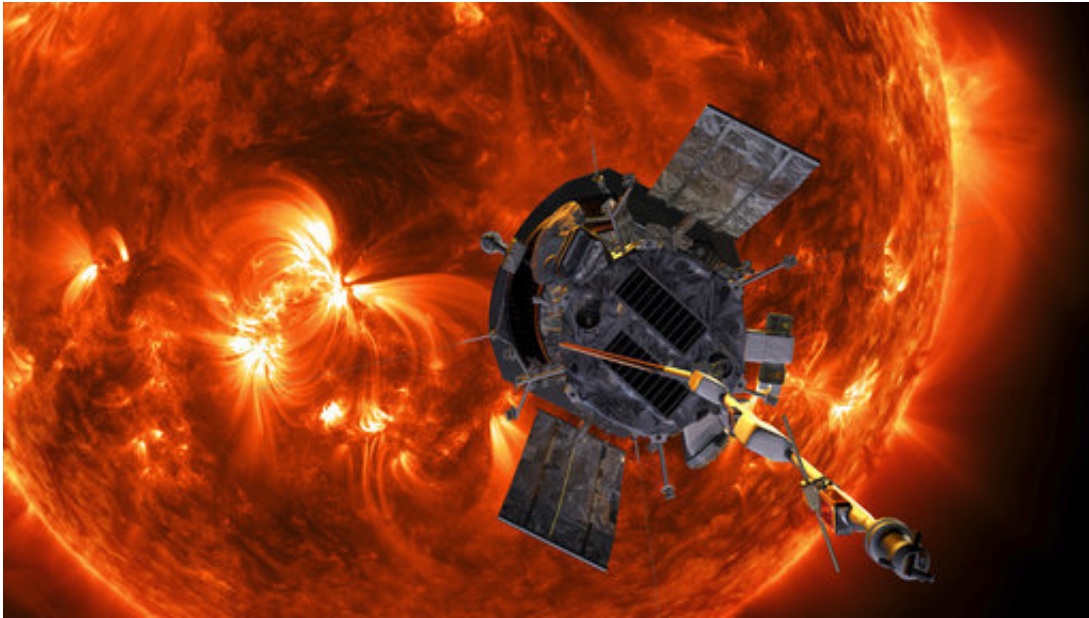
In this Thursday, Aug. 9, 2018, astrophysicist Eugene Parker attends a news conference about the Parker Solar Probe named after him, at the Kennedy Space Center in Florida. Sixty years ago, the young astrophysicist proposed the existence of solar wind. Many were skeptical and told him to read up on it first "so you don't make these killer mistakes," he recalls. (Kim Shiflett/NASA via AP)

## SEVEN YEARS IN HOT PURSUIT

The spacecraft's path to the sun runs past Venus. It will fly by our solar system's hottest planet seven times over seven years, using the gravity of Venus to shrink its own oval orbit and draw increasingly closer to the sun. The first Venus flyby is in October, followed by the first dip into the sun's corona in November. There will be 24 orbits between Venus and the sun, with the final three putting Parker closest to the sun—just 3.8 million miles (6 million kilometers) out—in 2024 and 2025. That's a scant 4 percent of the 93 million miles (150 million kilometers) between

Earth and the sun.

## BREAKING RECORDS



This image made available by NASA shows an artist's rendering of the Parker Solar Probe approaching the Sun. It's designed to take solar punishment like never before, thanks to its revolutionary heat shield that's capable of withstanding 2,500 degrees Fahrenheit (1,370 degrees Celsius). (Steve Gribben/Johns Hopkins APL/NASA via AP)

The records will start falling as soon as Parker takes its first run past the sun.. The current close-to-the-sun champ, NASA's former Helios 2, got within 27 million miles (43 million kilometers) in 1976. Parker will come within 15.5 million miles (25 million kilometers) in November and then start beating its own record. During its closest solar approaches, the spacecraft will hurtle through the corona at 430,000 mph (690 kph), setting a speed record.



## SOLAR SCIENCE

Our yellow dwarf star is, in many ways, a mystery. The outreaching corona is hundreds of times hotter than the sun's actual surface, confounding scientists. In addition, physicists don't know what's driving the solar wind, the supersonic stream of charged particles constantly blasting away from the sun. By being right in the thick of it, Parker should provide some answers, shedding light not only on our star but the billions of others out there.



In this Thursday, Aug. 9, 2018 photo, astrophysicist Eugene Parker sits between Johns Hopkins University project scientist Nicola Fox, left, and NASA's science mission chief Thomas Zurbuchen, during a news conference about the Parker Solar Probe at the Kennedy Space Center in Florida. It's the first time NASA has named a spacecraft after someone who's still alive. (AP Photo/Marcia Dunn)

## PARKER THE MAN

Sixty years ago, a young astrophysicist at the University of Chicago, Eugene Parker, proposed the existence of solar wind. Many were skeptical and told him to read up on it first "so you don't make these killer mistakes," he recalls. Vindication came with NASA's Mariner 2 spacecraft in 1962. Parker is now 91 years old and at Cape Canaveral with his family to witness his first launch—a Delta IV Heavy rocket with the spacecraft bearing his name. It's the first time NASA has named a [spacecraft](#) after someone who's still alive. In an interview with The Associated Press on Thursday, Parker noted from a publicity standpoint, "it absolutely wipes out everything else" in his career. "At my age, it gets fatiguing. But of course, I enjoy it."



This July 6, 2018 photo made available by NASA shows the Parker Solar Probe

in a clean room at Astrotech Space Operations in Titusville, Fla., after the installation of its heat shield. NASA's Parker Solar Probe will be the first spacecraft to "touch" the sun, hurtling through the sizzling solar atmosphere and coming within just 3.8 million miles (6 million kilometers) of the surface. (Ed Whitman/Johns Hopkins APL/NASA via AP)

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