

# The Coolest, Hottest Mission under the Sun!!

*Dr. Nicola J. Fox*

*Parker Solar Probe Project Scientist*

*JHU/Applied Physics Laboratory*

## Parker Solar Probe

*A NASA Mission to Touch the Sun*

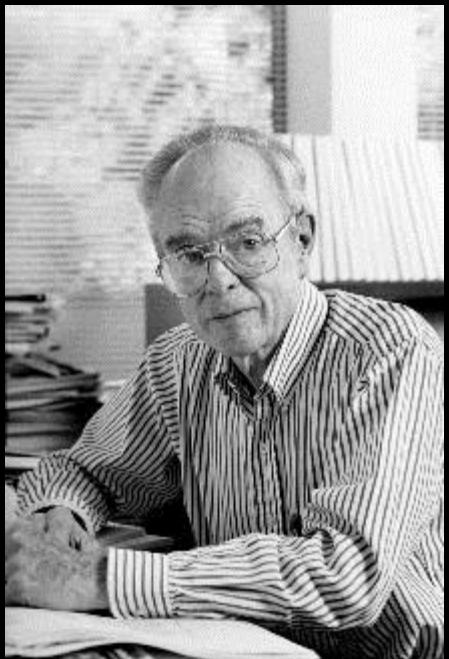
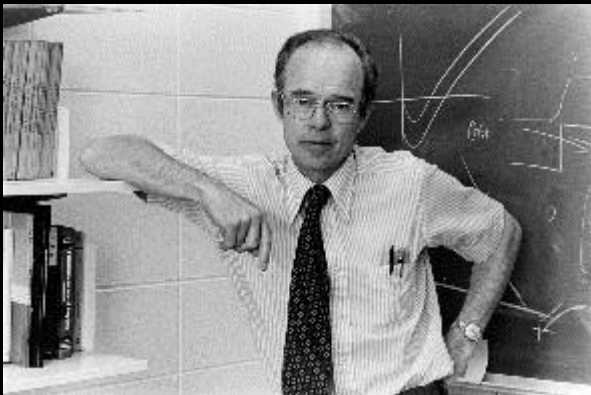
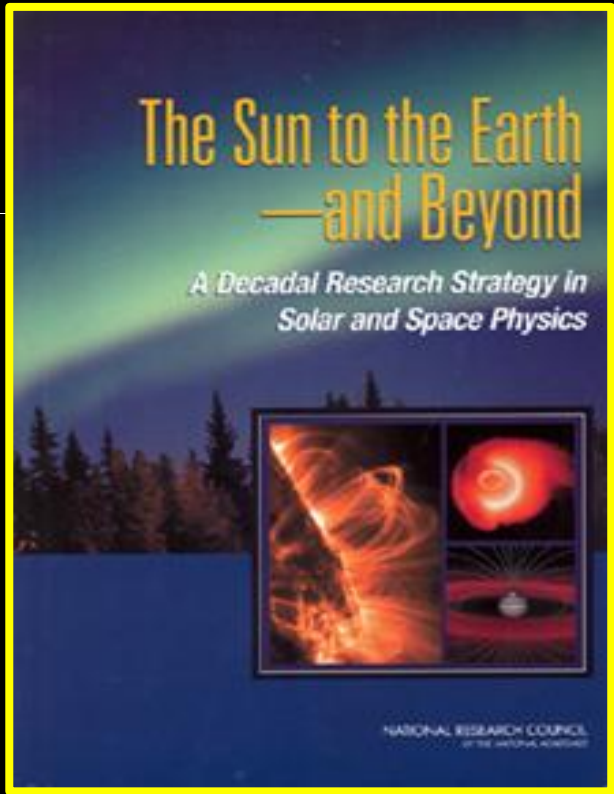
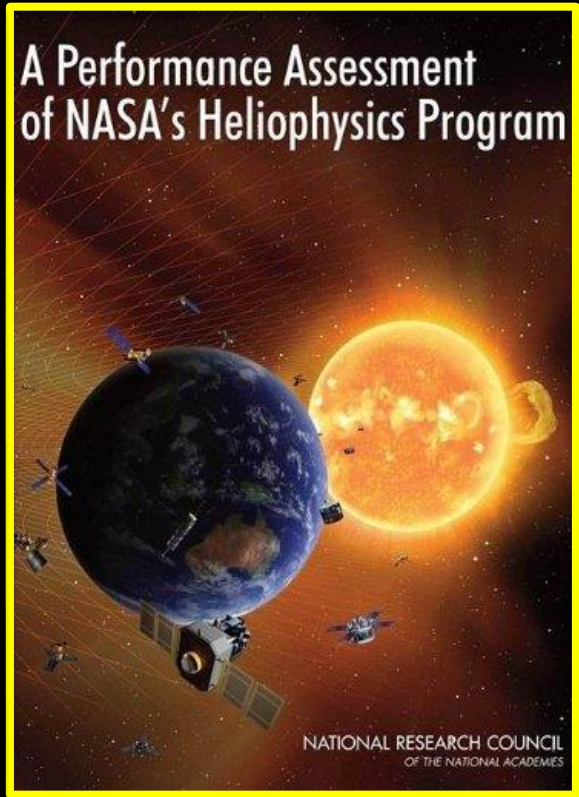
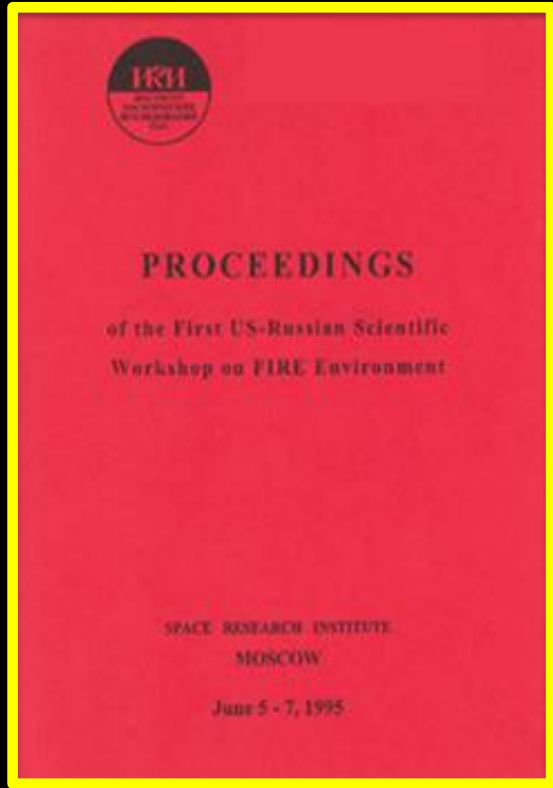
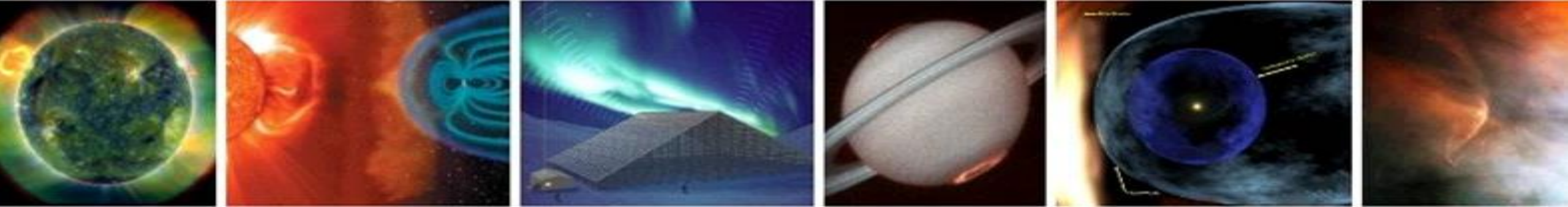






**DR. J. A. VAN ALLEN**







# We are PARKER SOLAR PROBE!



## Parker, meet Parker



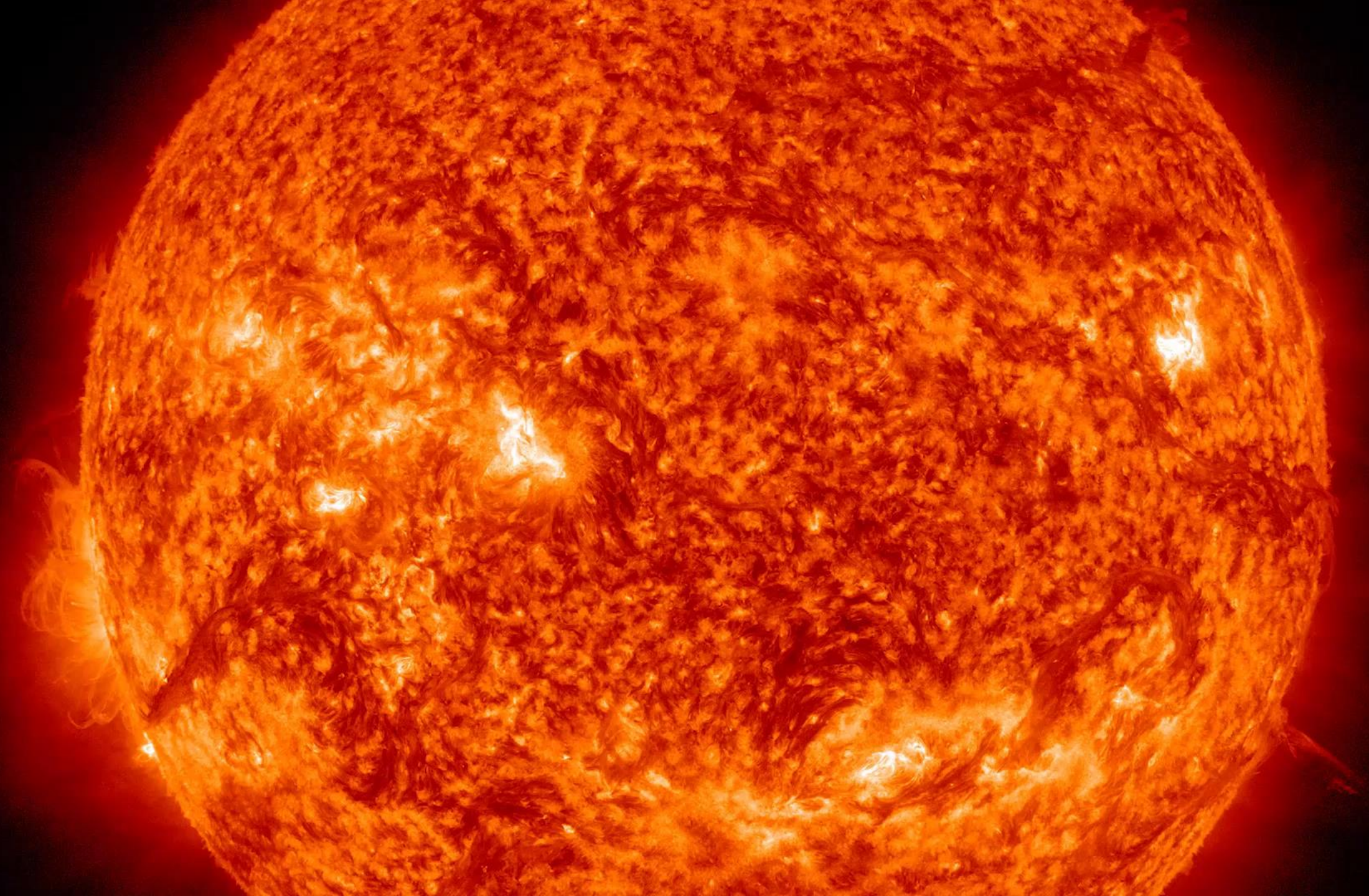


# Why haven't we gone to the Sun yet?



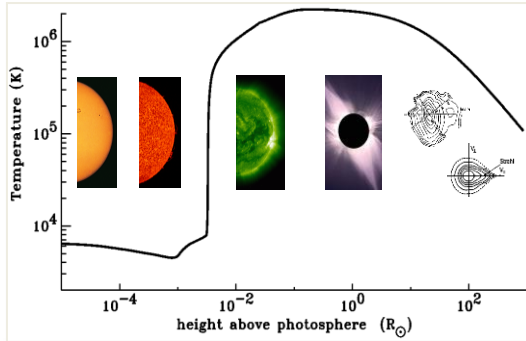
***It took the same technological leap from a rotary phone to an iPhone X for Parker Solar Probe to become a reality***



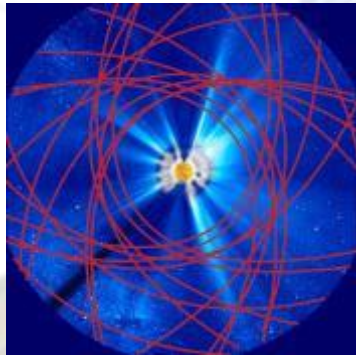




# Parker Solar Probe Science

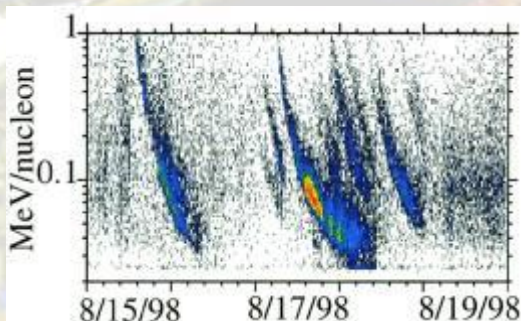


- To determine the structure and dynamics of the Sun's coronal magnetic field, understand how the solar corona and wind are heated and accelerated, and determine what mechanisms accelerate and transport energetic particles.



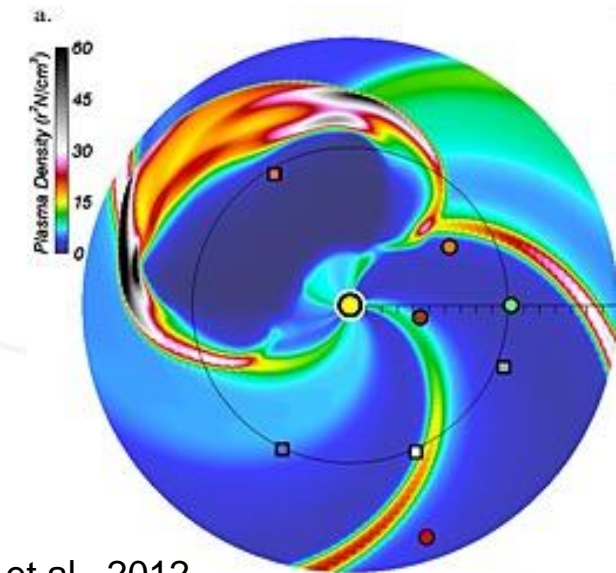
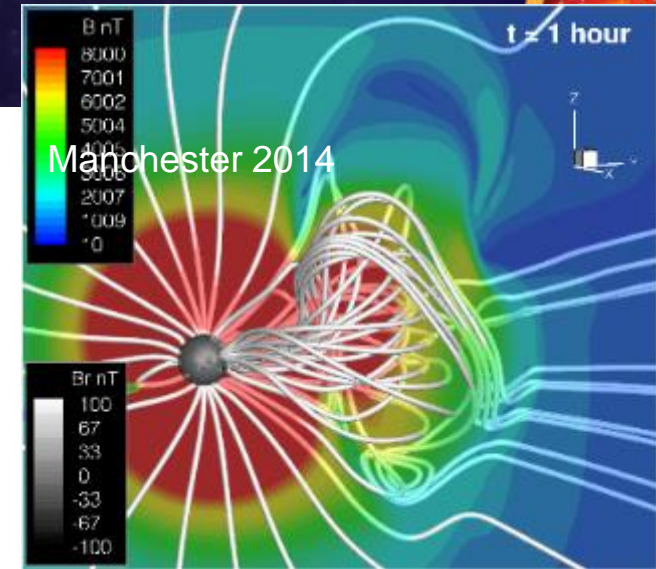
## Detailed Science Objectives

- Trace the flow of energy that heats and accelerates the solar corona and solar wind.
- Determine the structure and dynamics of the plasma and magnetic fields at the sources of the solar wind.
- Explore mechanisms that accelerate and transport energetic particles.



# Modeling: Providing the missing piece

- In-situ data from within 0.25 AU will be available shortly after each orbit for ingestion into the coronal, solar wind and global heliospheric models
- PSP would also benefit invaluable from knowing the *mapping between the spacecraft and the solar surface* though each orbit
- Global simulations of CMEs would provide critical context when we fly through CMEs
- Contact [Nicky.Fox@jhuapl.edu](mailto:Nicky.Fox@jhuapl.edu) or [Nour.Raouafi@jhuapl.edu](mailto:Nour.Raouafi@jhuapl.edu)

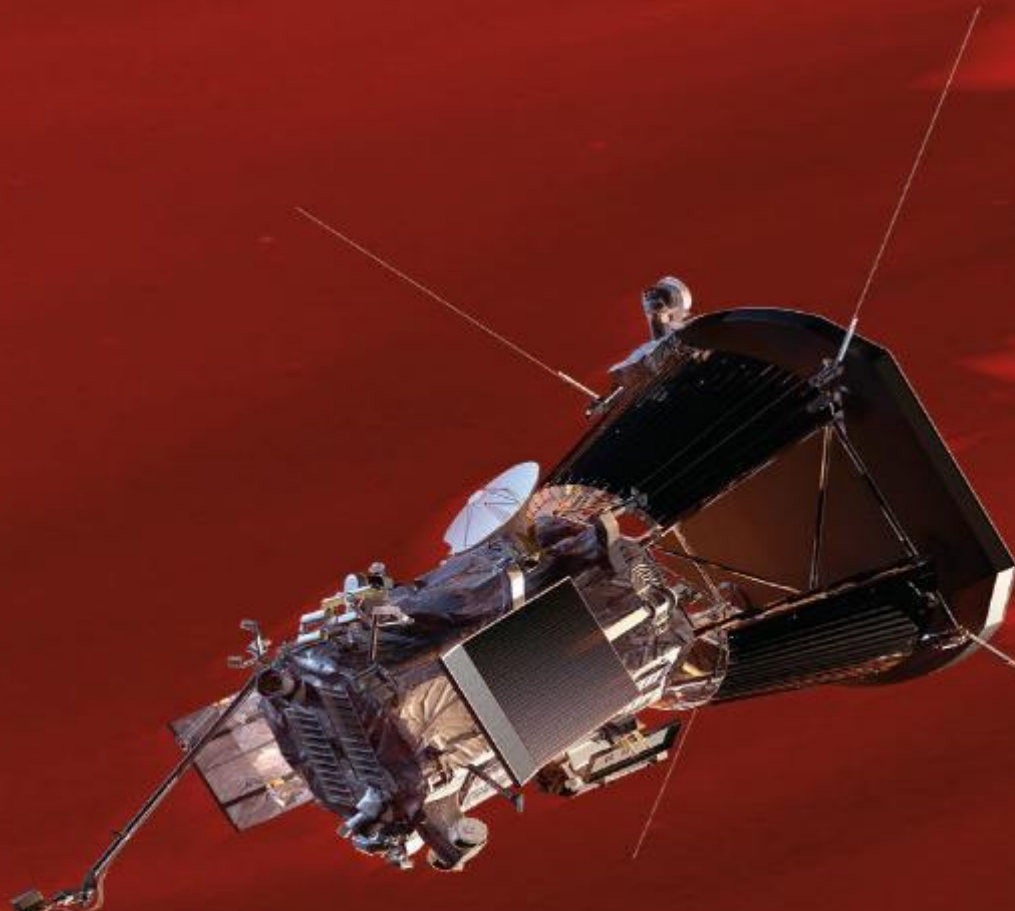


Baker et al., 2012



## *Launch*

- Launch Window: July 31 – August 19, 2018
- Launch Site: NASA's Kennedy Space Center, Florida
- Launch Vehicle: Delta IV-Heavy with Upper Stage





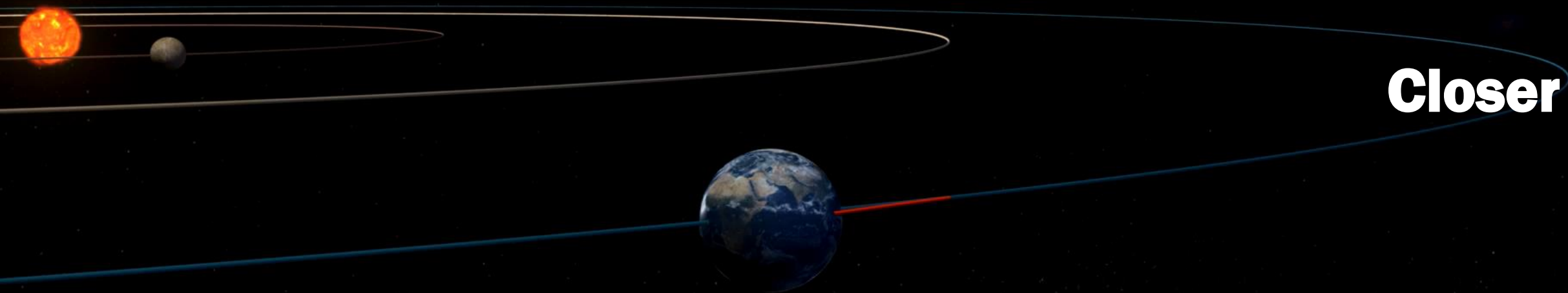




**Faster**

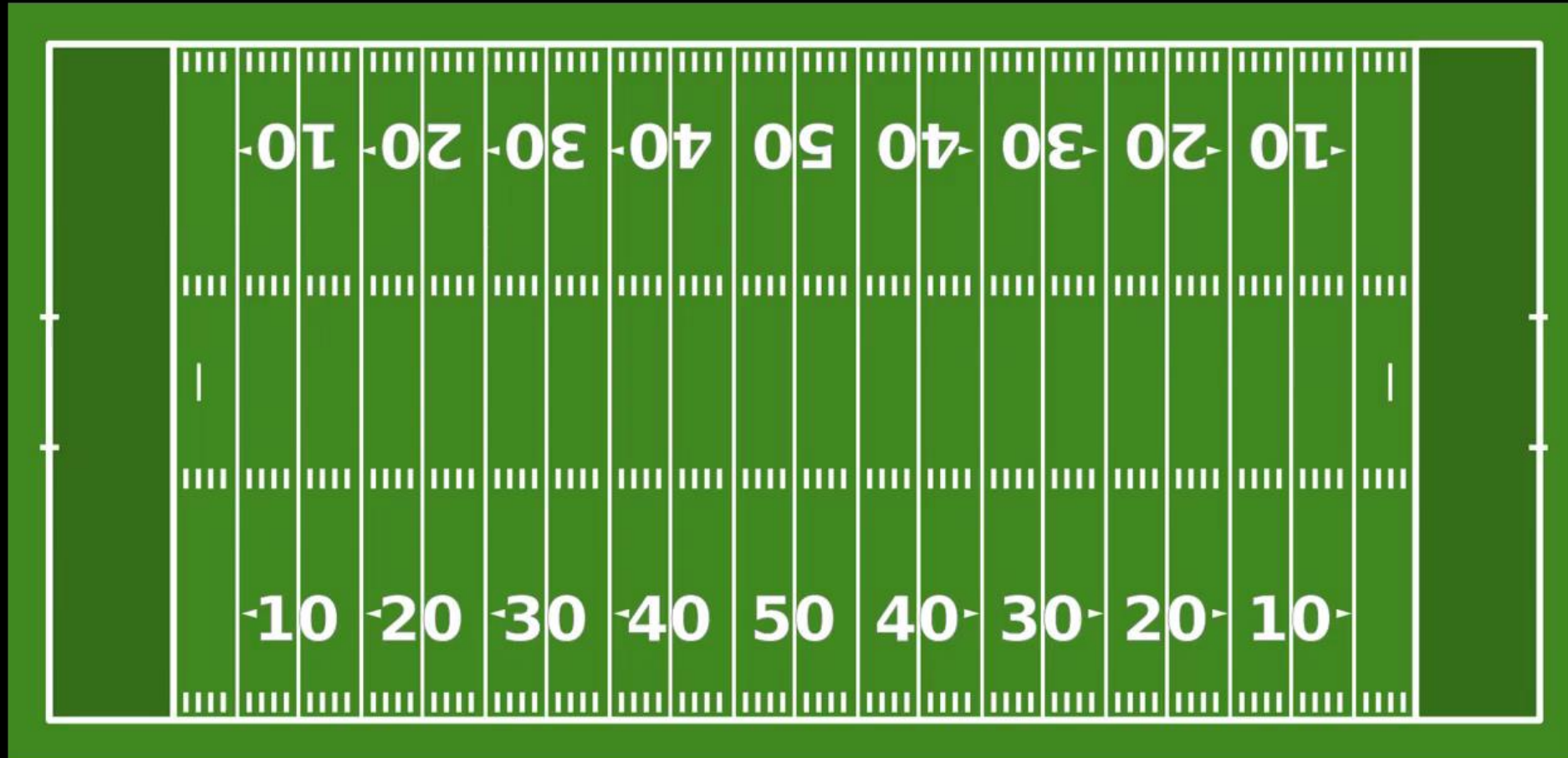
**Hotter**

**Closer**





If the distance from the Earth to the Sun was one football field...



Object sizes not to scale.



# Anti-Ram Facing View

SWEAP PI

Justin Kasper  
University of Michigan



At closest approach, the front the heat shield will be at 1,400°C (2500 °F), but the payload will be near room temperature



**FIELDS PI**

Stuart Bale (UC, Berkeley)

**ISOIS PI**

David McComas  
(Princeton)

**WISPR PI**

Russ Howard  
(Naval Research Lab)

685 kg max launch wet  
mass

Reference Dimensions:

S/C height: 3 m

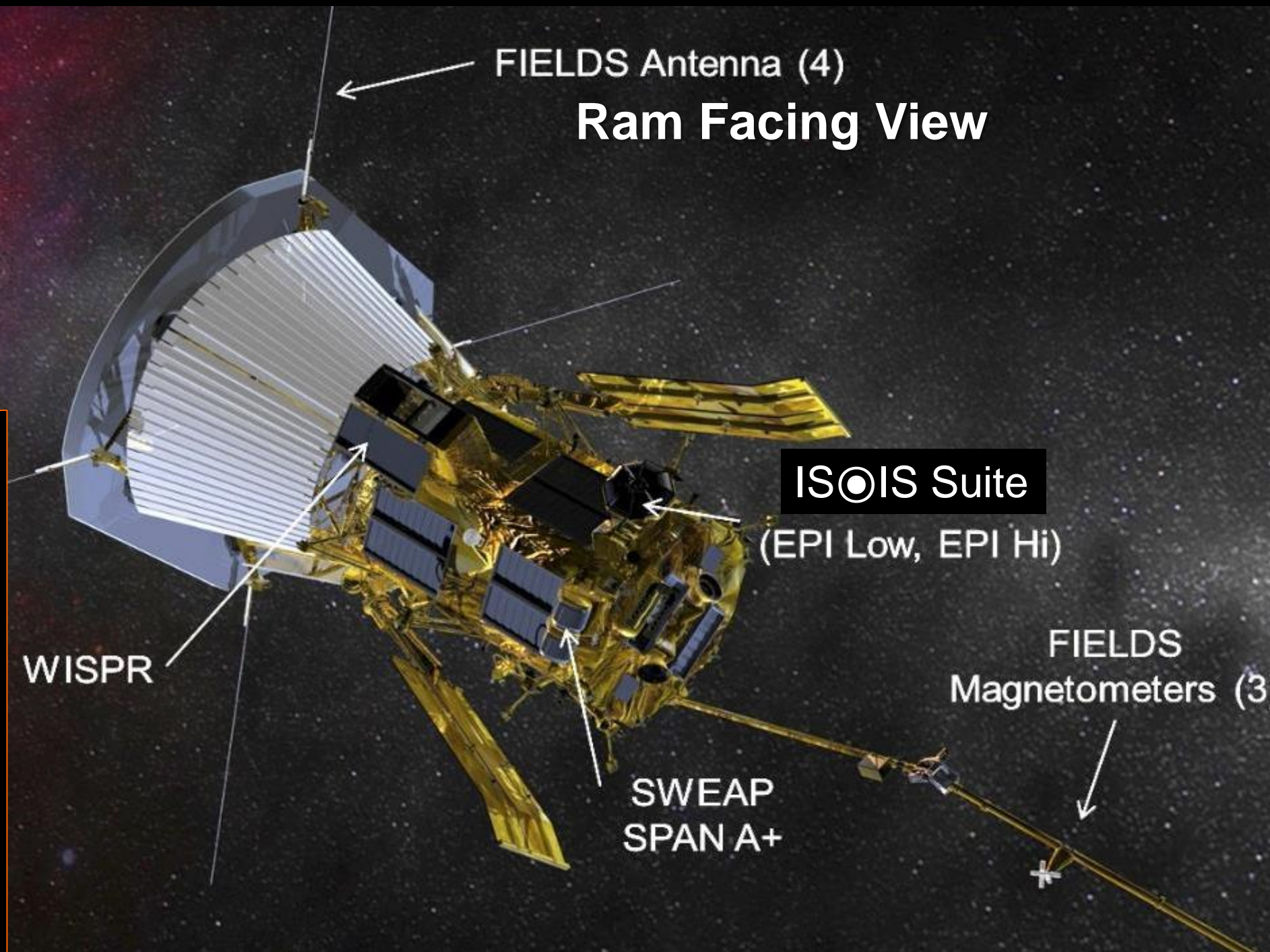
TPS max diameter: 2.3 m

S/C bus diameter: 1 m

C-C Thermal protection  
system

Actively cooled solar  
arrays

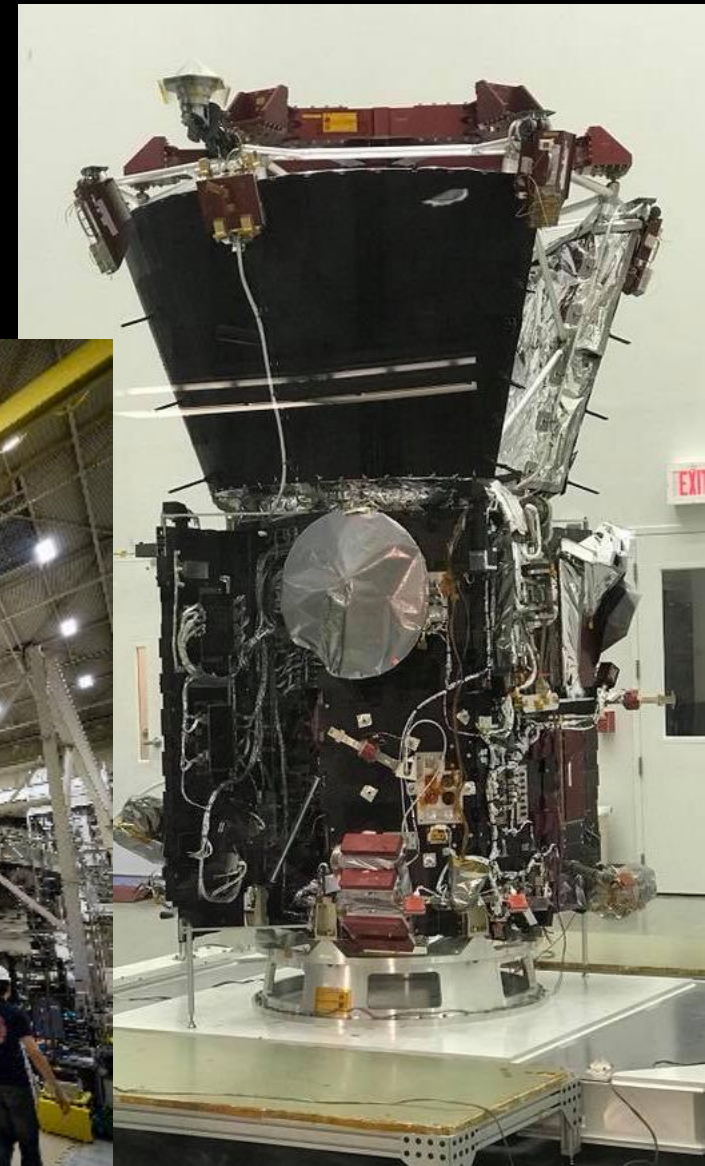
Wheels for attitude  
control







# Finishing environmental testing



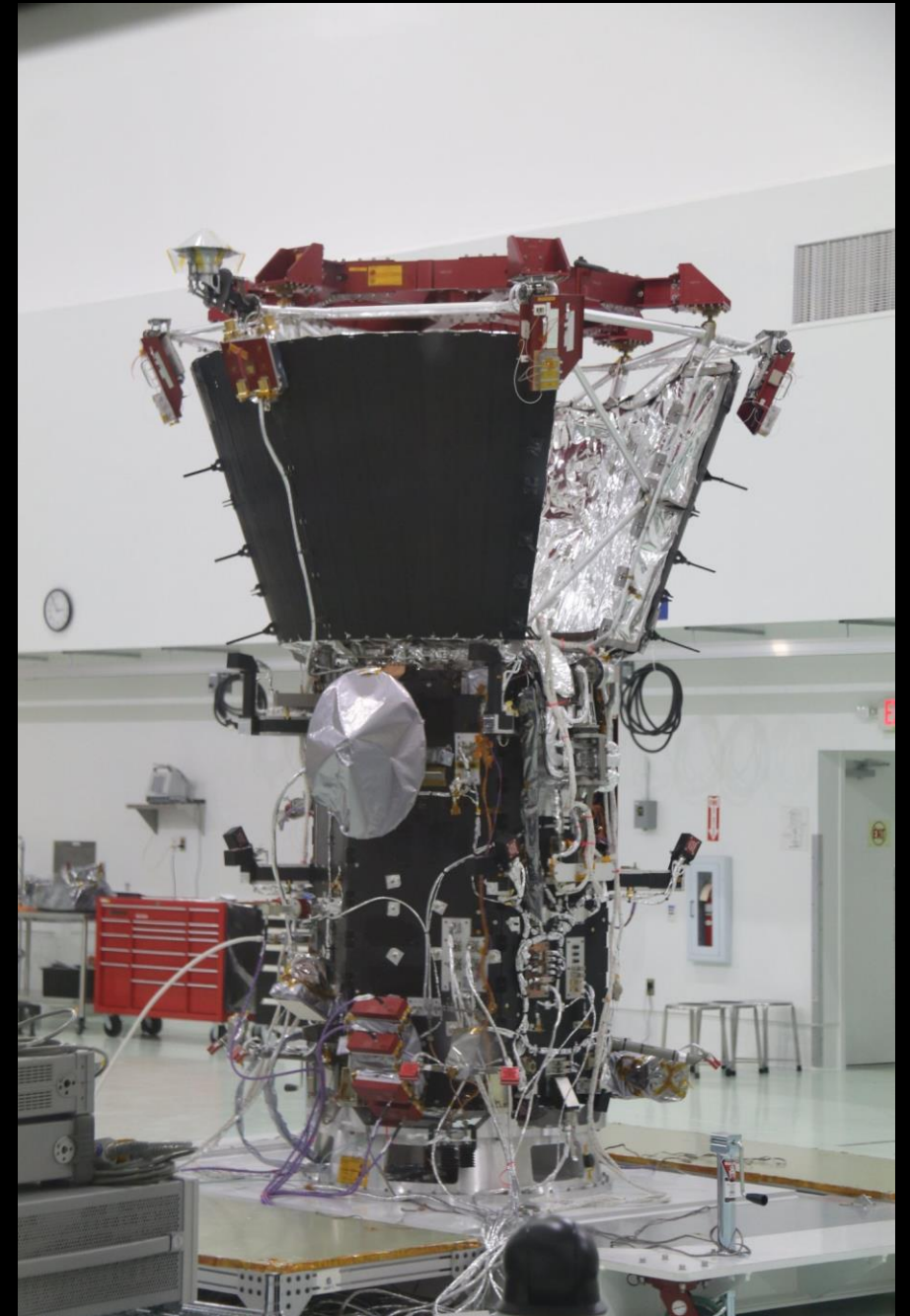


# Transitioning to Florida





# PSP arrives at her temporary home





# Delta IV Heavy baby – 'cos that's the way we roll





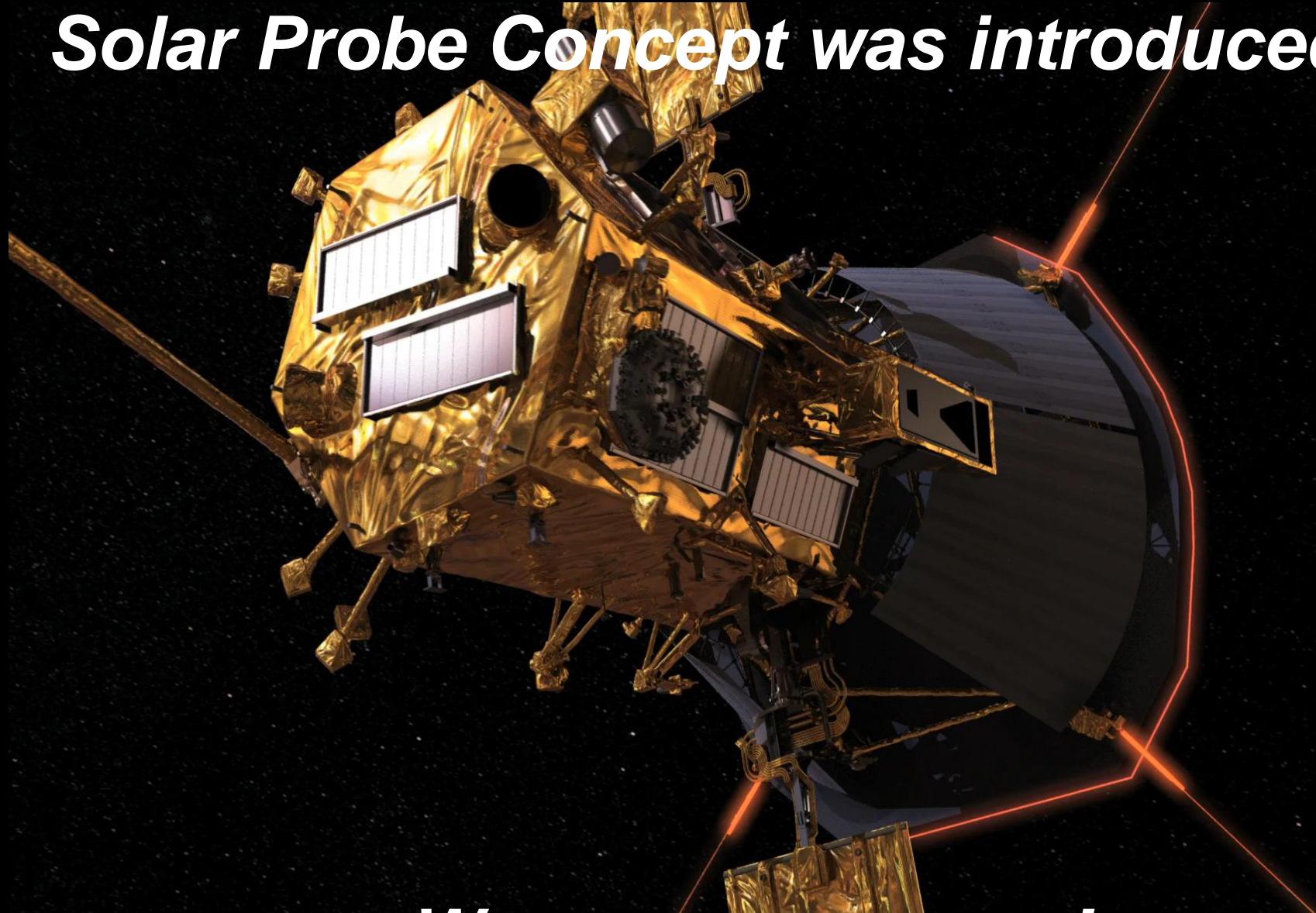
# Send Your Name to the Sun!



▪ [Go.nasa.gov/HotTicket](http://go.nasa.gov/HotTicket)



***It has been almost 60 years since the Parker  
Solar Probe Concept was introduced. . .***



***We are on our way!***

- <http://parkersolarprobe.jhuapl.edu>
- Facebook: @parkersolarprobe
- Twitter: @parkersunprobe
- Twitter: @solargirl2018
- Send your name to the Sun
  - [Go.nasa.gov/HotTicket](http://Go.nasa.gov/HotTicket)

