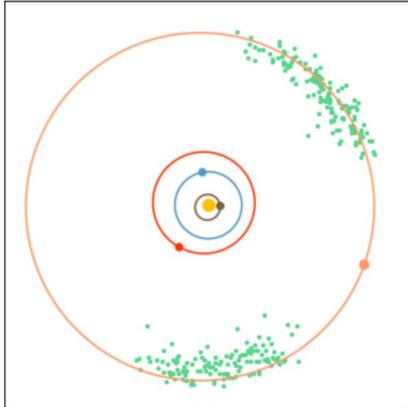


# MAKE YOUR OWN LUCY SPACECRAFT PAPER MODEL

## Mission Overview:

NASA's Lucy Mission will be the first to explore a population of small bodies known as Jupiter's Trojan asteroids. These outer Solar System asteroids orbit the Sun in two clouds "ahead of" and "behind" the gas giant Jupiter. These Trojans provide a never-before-explored sample of the remnants of our early Solar System.



*The position of the Trojan Asteroids (in green) relative to the orbits of the planets: Venus (gray), Earth (blue), Mars (red) and Jupiter (orange).*

Lucy is scheduled for launch in October, 2021. During its twelve (12) year mission, Lucy will visit seven (7) targets. These targets are on six (6) different orbits around the sun, a record for any single space mission.

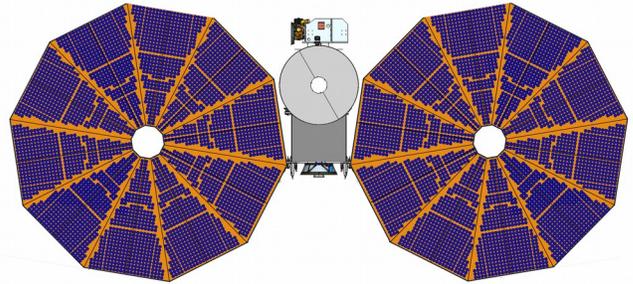


*Artistic rendition of the A. afarensis fossil specimen nicknamed Lucy*

The Lucy mission is named after the fossilized skeleton of an early hominin (whose name, in turn, was inspired by the Beatles' song "Lucy in the Sky With Diamonds"). Just as that Lucy fossil provided unique insights into humanity's evolution, the Lucy mission promises to revolutionize our knowledge of the formation of the Solar System.

## Lucy Spacecraft:

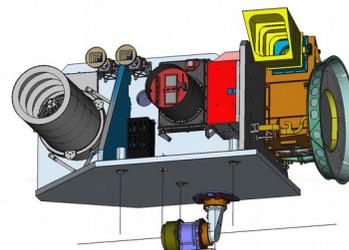
The spacecraft is almost 50 ft (15.7 m) wide; each solar panel is almost 24 ft (7.2 m) wide.



*Artist rendition of the Lucy Spacecraft*

## Lucy Instruments:

Lucy's main remote sensing instruments are on the Instrument Pointing Platform (IPP). These are: **L'Ralph** (composed of the Multi-spectral Visible Imaging Camera, MVIC – the color visible imager, and the Linear Etalon Imaging Spectral Array, LEISA – the infrared imaging spectrometer), **L'LORRI** (LONg Range Reconnaissance Imager – the high spatial resolution imager), **L'TES** (Thermal Emission Spectrometer – for measuring the thermal infrared), and **T2CAM** (Terminal Tracking CAMera, visible imager for navigation) .



*Artist rendition of the Instrument Pointing Panel*

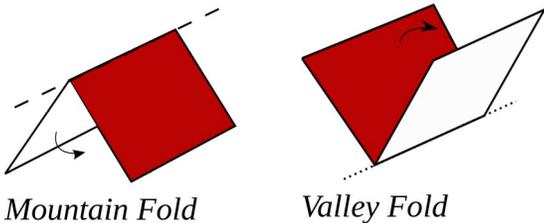
Additionally, Lucy's 6.5 ft (2m) wide **High-Gain Antenna** is both used to communicate with Earth and determine the masses of the Trojan targets.



**Making your own Lucy Spacecraft Model – Approximate scale 1:50**

Equipment and techniques:

- Print out of the Lucy components (preferably with a color printer), thicker paper will help, but will require that you score the paper before folding
- Scissors
- Glue and/or tape
- Folds you will need:



Mountain Fold

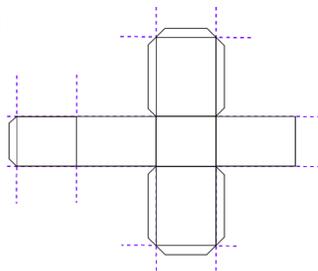
Valley Fold

**Step 1) Construction**

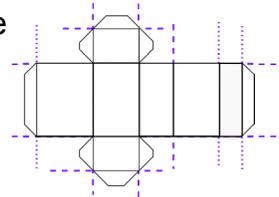
Carefully cut out the spacecraft components one at a time, paying attention to how you will fold them. Be very careful not to cut off any white tabs. Fold each component as indicated (and described below). Dashed lines indicate “mountain folds” dotted lines indicate “valley folds.” If using thick paper, you may need to score the paper before folding.

Components:

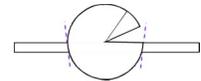
a) *Spacecraft Bus*: Fold the six (6) sides of the spacecraft and the seven (7) tabs using mountain folds. Take care not to fold along the extra lines on the back and top of the spacecraft.



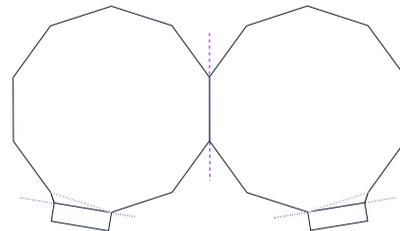
b) *Instrument Pointing Platform (IPP)*: Note the three (3) folds that are valley folds. Fold the six (6) sides of the IPP, the support structure, and the eight (8) tabs.



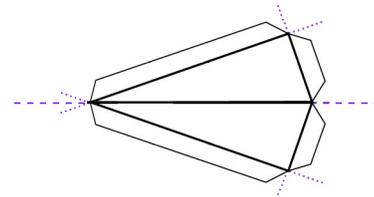
c) *High-Gain Antenna*: Do not cut off the white wedge with the arrow pointing to it. There are two (2) mountain folds for the support structure



d) *Left Solar Panel*: Note that there are valley folds between the two (2) gray tabs and the solar panel, but there is no fold between the white triangles and the solar panels



e) *Left Support Strut*: Note that the four (4) trapezoidal tabs are valley folds and there are no folds between the white triangles and gray triangles.



f) *Right Solar Panel*: See notes from the left panel

g) *Right Support Strut*: See notes from the left support strut



## Step 2) Assembly

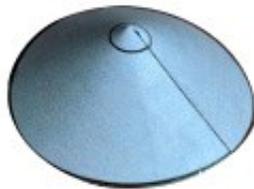
a) *Spacecraft Bus*: Use glue or tape to make a box out of the spacecraft bus, tucking the tabs inside.



b) *IPP*: Use glue or tape to fold the instrument platform into a box with a support structure below it. Take care not to glue the gray white and white tabs together.



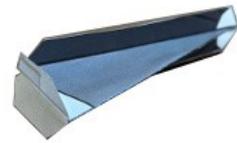
c) *High-Gain Antenna*: The antenna is covered by protective material, therefore it is an outwards pointing cone. Tuck and glue/tape the white tab underneath to create a cone. Tuck the support tabs behind the antenna.



d) *Right Solar Panel*: Fold the solar along the dashed line. Glue or tape the front and back of the solar panel together, being careful to keep the gray tabs free.



e) *Right Support Strut*: Fold the support strut along the dashed line. Glue or tape the support strut into a triangle, being careful to keep the four tabs (gray, primarily black, and primarily white) free.

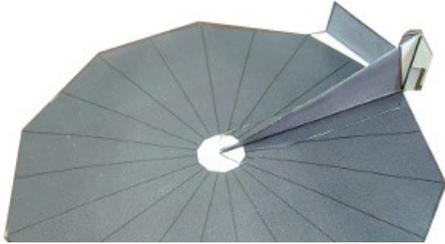


f) *Left Solar Panel*: Repeat as with the right panel.

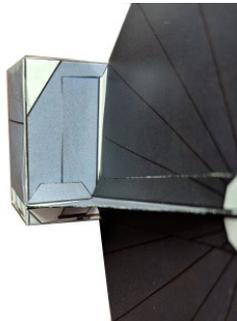
g) *Left Support Strut*: Repeat as with the right strut.

### Step 3) Integration

a) Carefully line up the right support strut with the right solar panel. Glue or tape the support strut to the panel.



b) Repeat with the left Solar Panel and support strut



c) Identify the left side of the spacecraft bus. Align the left solar panel and support to the left side (note the position of the thruster on the strut tab). Glue or tape the panel and support structure to the side of the spacecraft.



d) Repeat with the right solar panel and support strut on the right side of the spacecraft.

e) Identify the top of the spacecraft. Align the IPP with the top of the spacecraft (note the white and gray tabs to indicate orientation). Glue the IPP to the spacecraft.



f) Identify the front of the spacecraft. Glue or tape the high-gain antenna to the front of the spacecraft.



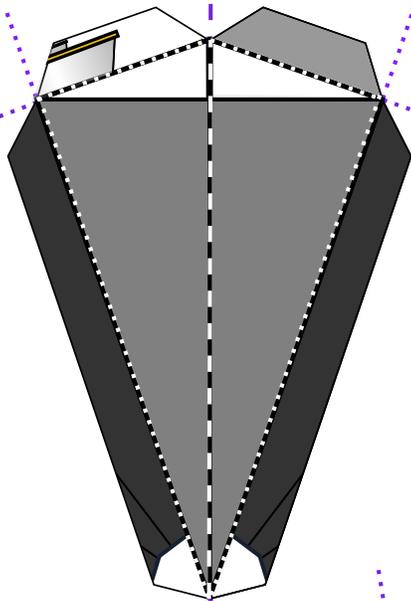
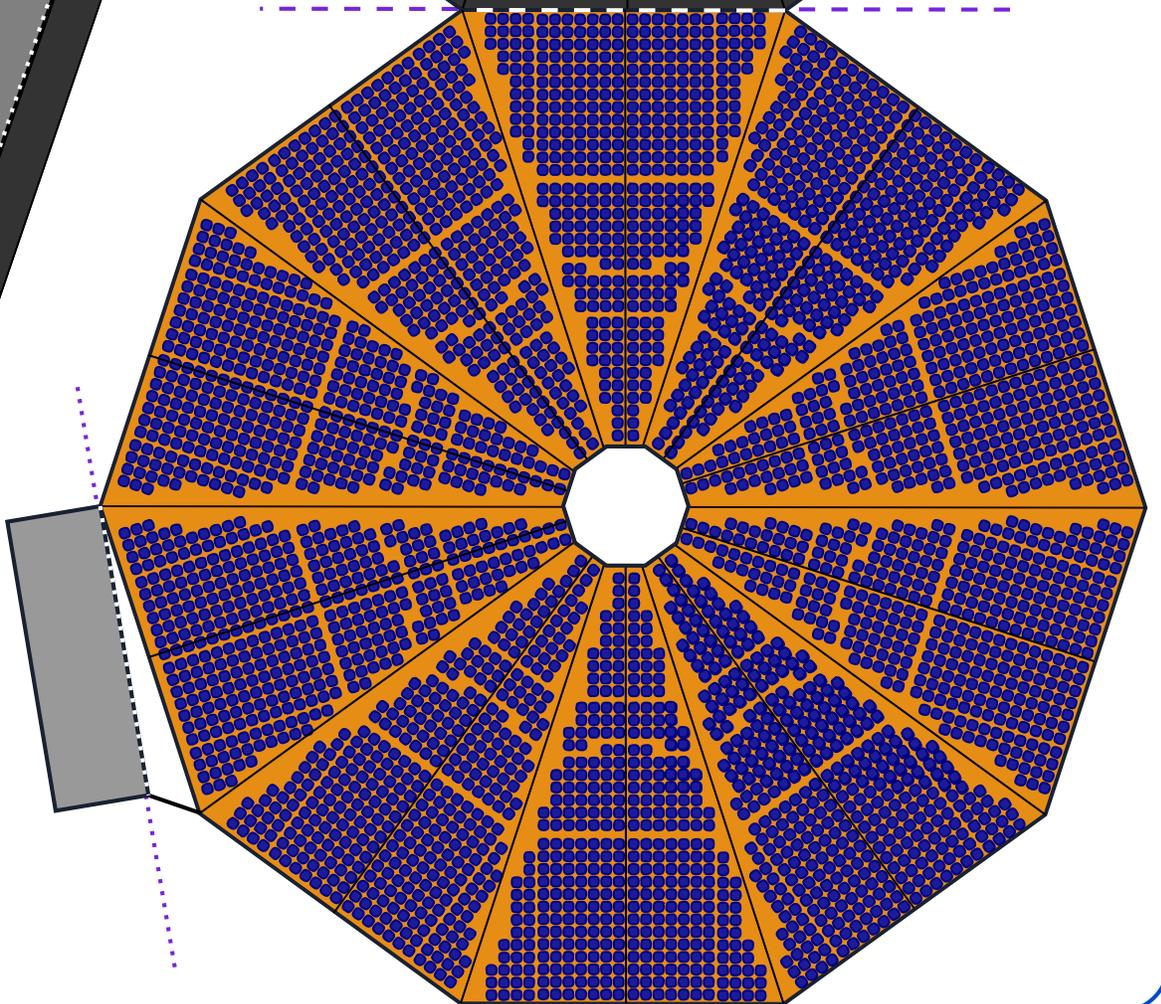
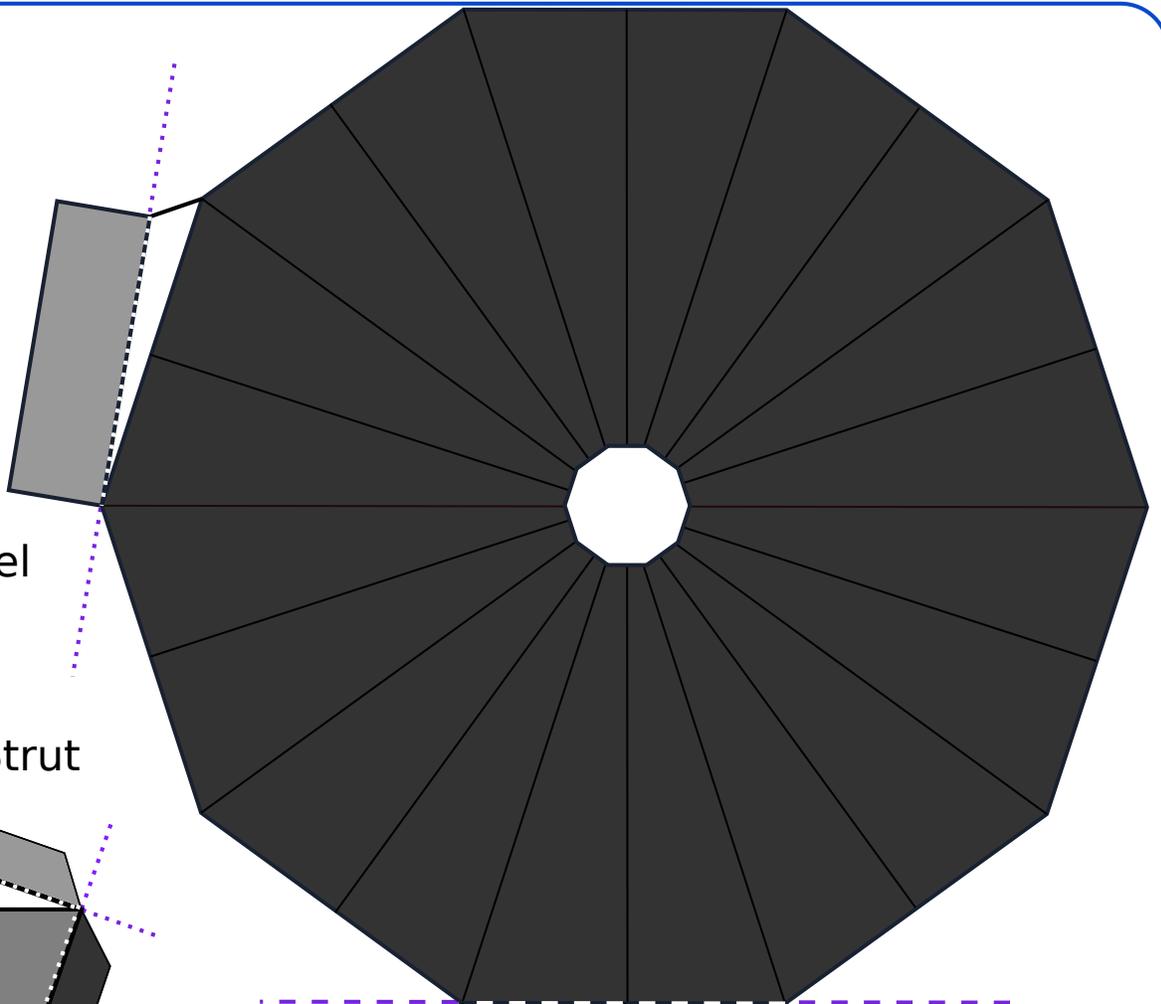
g) Enjoy your Lucy Spacecraft!

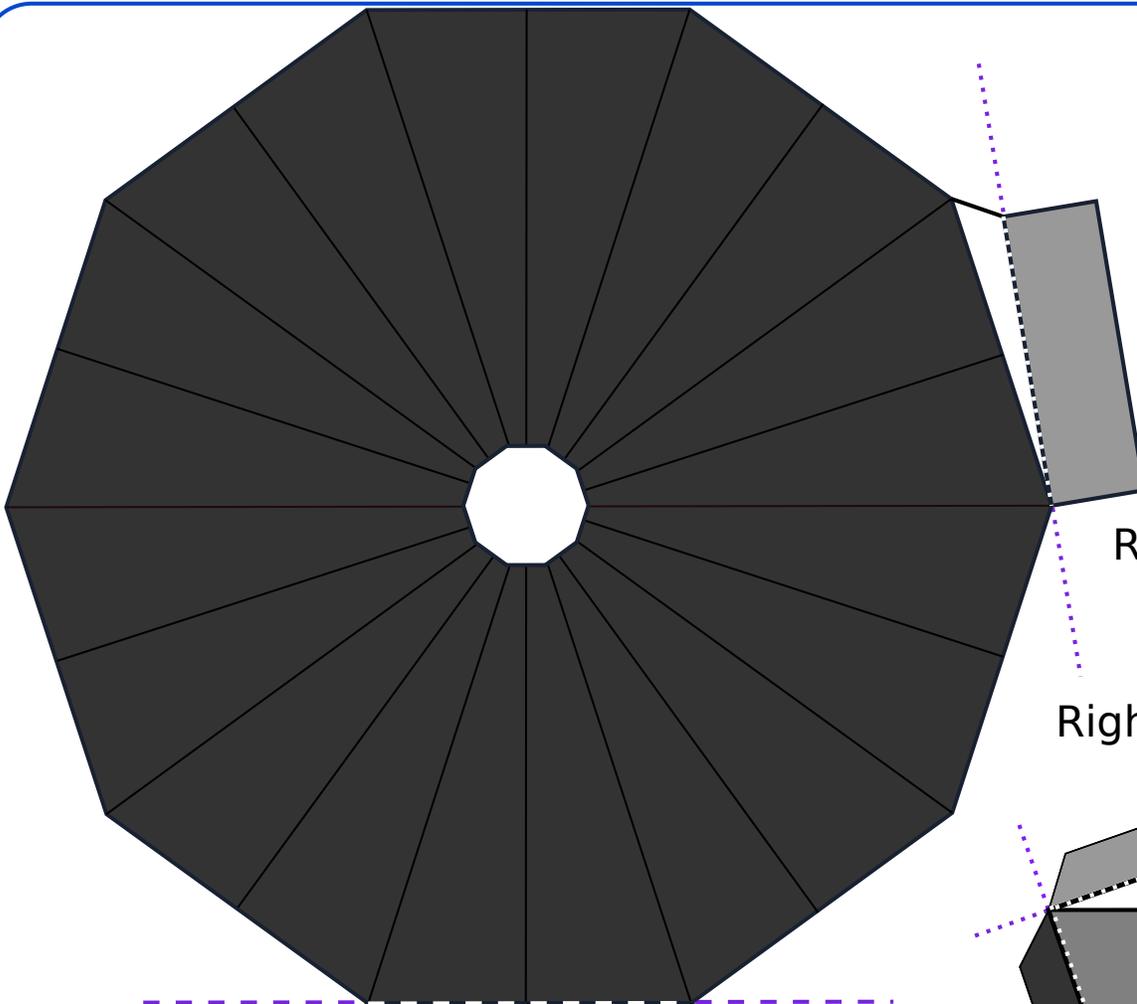




Left Solar Panel

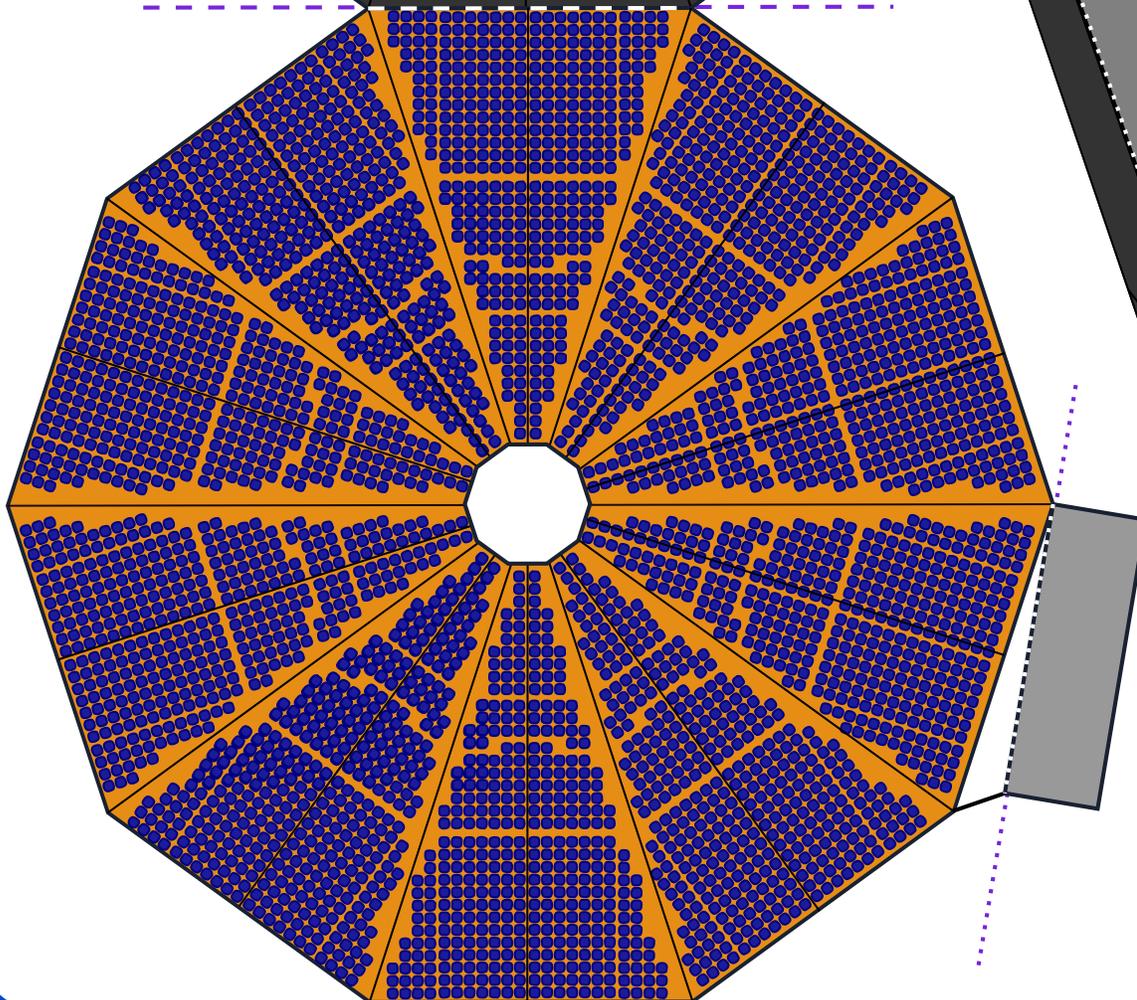
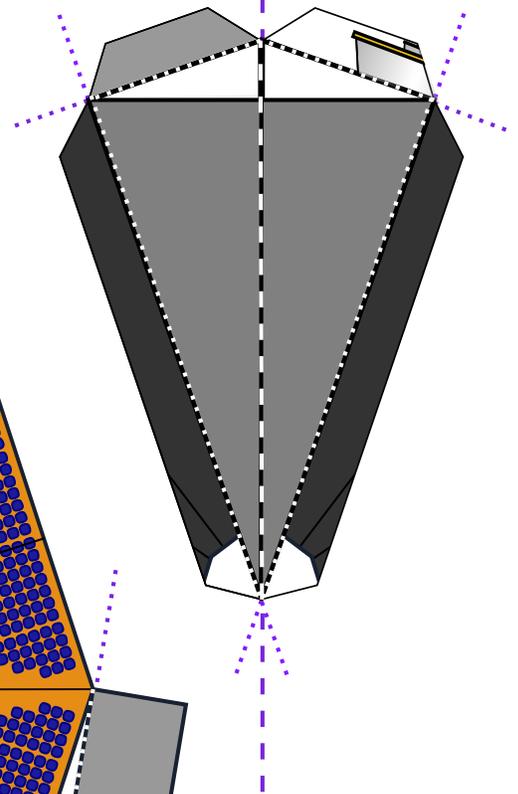
Left Support Strut





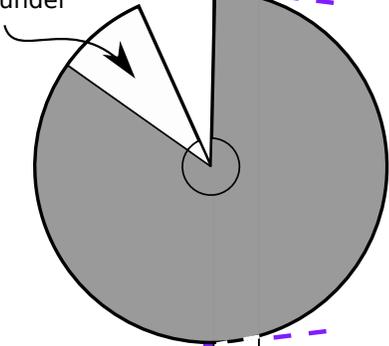
Right Solar Panel

Right Support Strut



# High-Gain Antenna

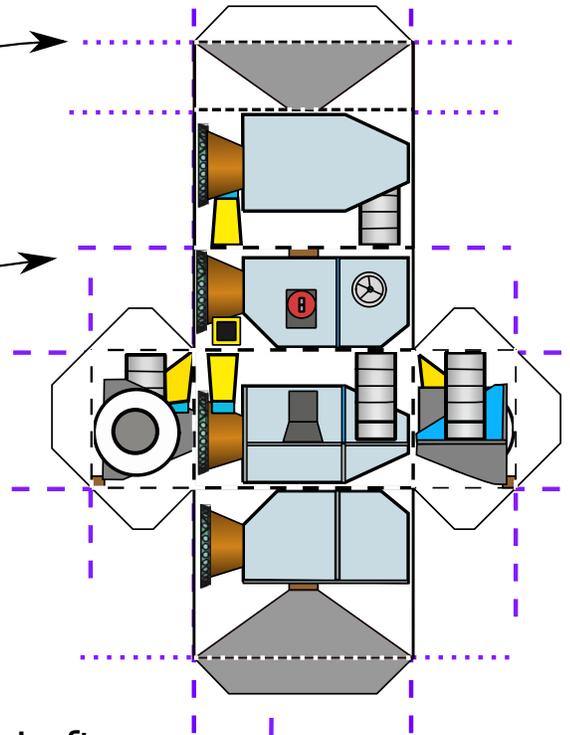
Tuck under



# Instrument Pointing Platform

Valley fold  
(out of the page)

Mountain fold  
(in to the page)



Back

Left

Right

Front

Spacecraft Bus

Top

