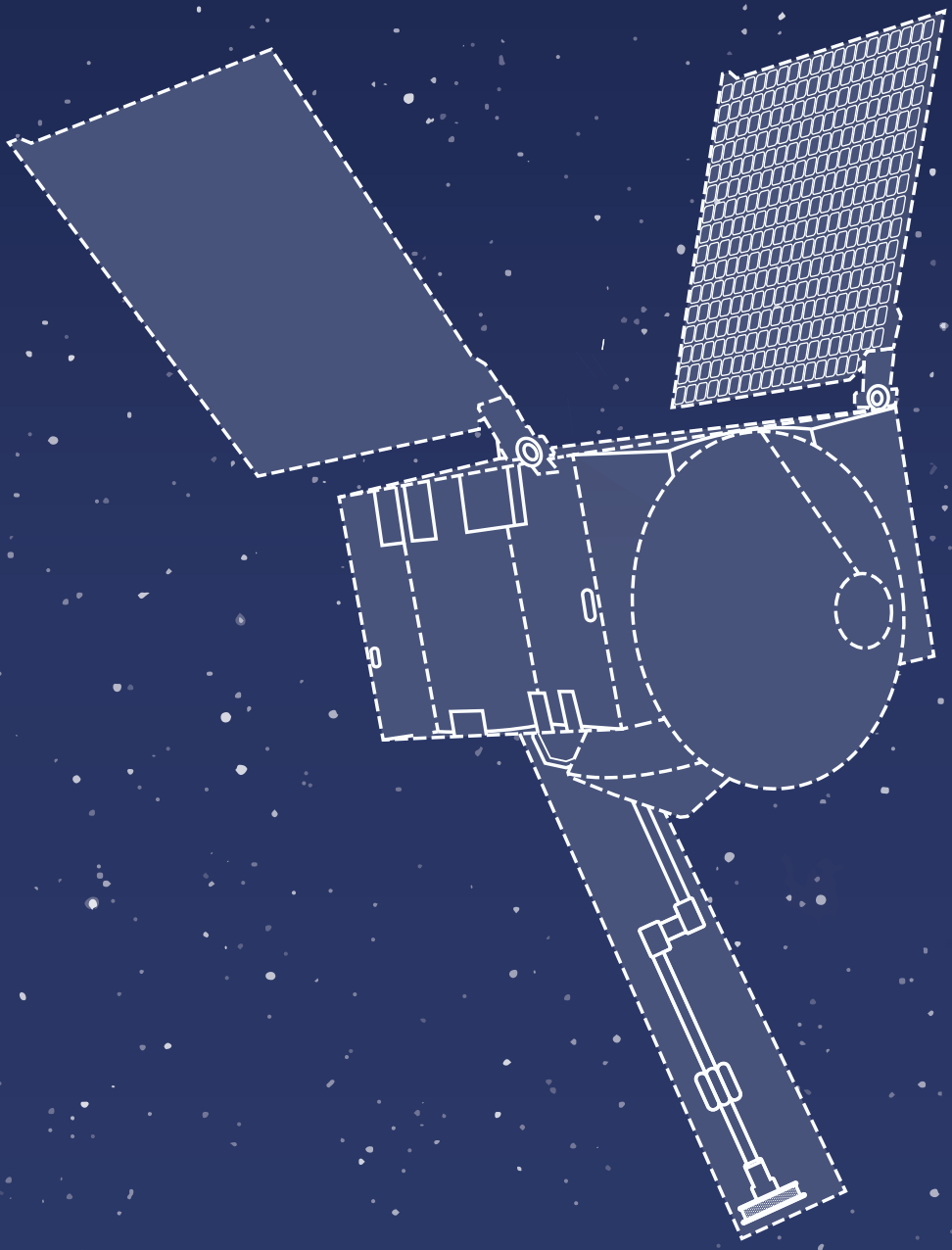
OSIRIS-REx

PAPER SPACECRAFT MODEL



OSIRIS-REx
ASTEROID SAMPLE RETURN MISSION

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The Origins, Spectral Interpretation, Resource Identification, Security - Regolith Explorer (OSIRIS-REx) mission is the first U.S. mission to fly to, study, and retrieve a pristine sample of an asteroid and return it to Earth for further study. The OSIRIS-REx spacecraft's target is asteroid Bennu, a near-Earth carbonaceous asteroid and one of the most potentially hazardous to Earth. Bennu has been studied in detail by ground- and space-based telescopes, greatly reducing mission risk and providing strong evidence for the presence of material available for sampling.

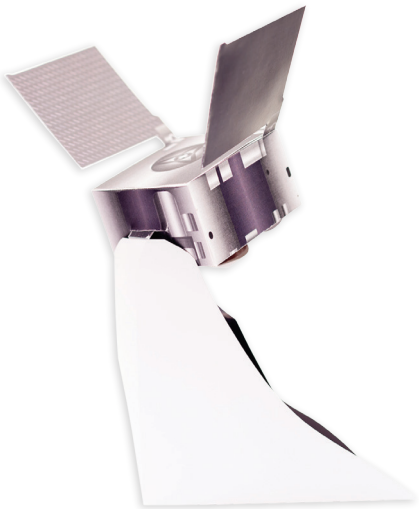
Asteroids are the leftover debris from the solar system formation process that began more than 4 billion years ago. Studying the sample from Bennu will revolutionize our understanding of the early solar system and teach us much about planetary history and the origin of life.

OSIRIS-REx will expand our knowledge of the hazards and resources in near-Earth space and serve as a precursor to future asteroid missions.

Where in the world is your #PaperSpacecraft?
Share a picture with us on social media,
and don't forget to tag our account:

OSIRISREx

OSIRIS_REx



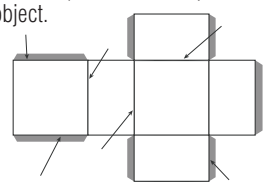




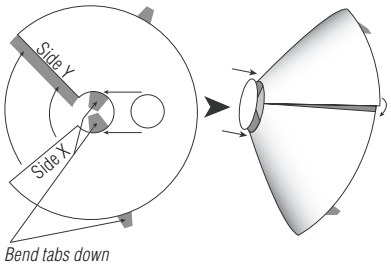
PRE-ASSEMBLY

❶ Carefully cut along the borders of all Spacecraft parts. Do not cut off white tabs or cut through dotted or solid lines on the Spacecraft pieces.

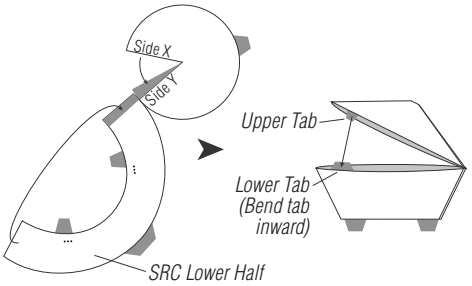
❷ To easily fold the Spacecraft Bus (A), lightly score the main folds of the Spacecraft (all sides and tabs) with a dull, pointed object.



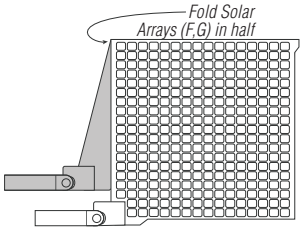
❸ Bend the High Gain Antenna (HGA) (B) into a cone with the colored side out. Glue or tape side X over top of the tab on Side Y. Next, attach the HGA Top (C) by bending the tabs on the HGA (B) down and glueing or taping the HGA Top (C) to the tabs.



❹ Bend the top white circle of the Sample Return Capsule (SRC) (D) into a cone, colored side out. Glue or tape Side X over top of the tab on Side Y. Next, repeat this process on the lower half of the SRC (D). Lastly, bend the lower tab down and glue or tape the upper tab onto the lower tab to close the SRC (D).



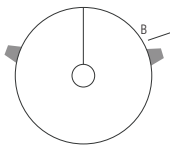
❺ Fold Solar Arrays (F, G) in half. Glue or tape to keep the two halves together in order to make one solid piece. Repeat with the second Solar Array.



SPACECRAFT ASSEMBLY

❶ Fold the Spacecraft Bus (A) along the lines shown in Pre-Assembly Step 2. Don't tape or glue yet.

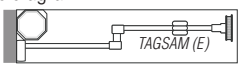
❷ Align the HGA (B) with the dotted circle on the Spacecraft Bus (A), then use the tabs to glue or tape the HGA (B) to the Spacecraft Bus (A).

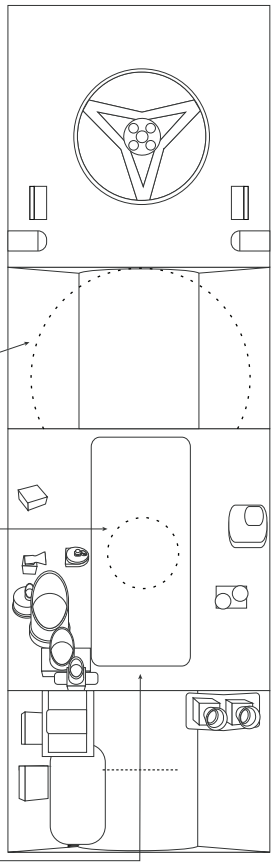


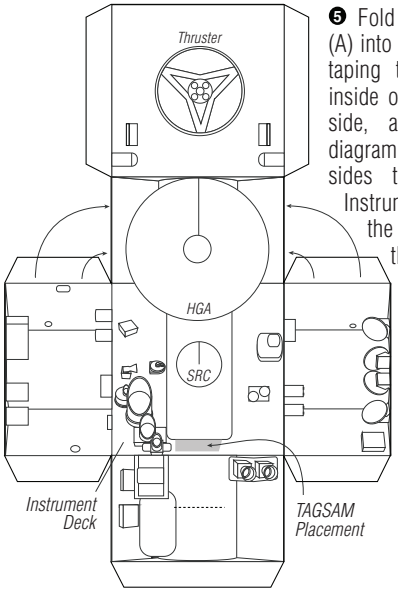
❸ Align the SRC (D) with the dotted circle on the Spacecraft Bus (A), then use the tabs to glue or tape the SRC (D) to the Spacecraft Bus (A).



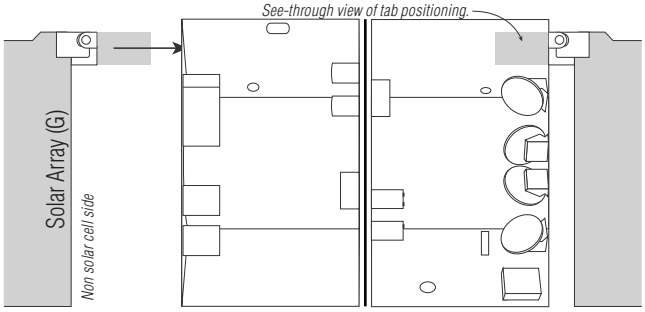
❹ Fold the Touch-And-Go Sample Acquisition Mechanism (TAGSAM) (E) in half and fold the tab at a 90˚ angle. Glue or tape the tab to the Spacecraft Bus (A), as shown on the diagram.







❺ Fold the Spacecraft Bus (A) into a box by glueing or taping the tabs onto the inside of its corresponding side, as shown in the diagram. Start with the four sides that surround the Instrument Deck, and tape the tabs to the inside of the box as you go. Leave the side with the Thruster open for the installation of the Solar Arrays.



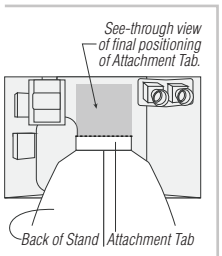
❻ Install the Solar Arrays (F, G) and glue or tape tabs to the inside of the Spacecraft Bus (A). Each Solar Array should run parallel to the side of the Spacecraft Bus that it is installed on (see diagram). The solar cell side should face inward toward the Thruster. Once installed, carefully and slightly bend the Solar Arrays down at their point of attachment, so that together the two Solar Arrays form a V shape. Close the top of the Spacecraft by glueing the tabs onto their respective slides, similar to Step 5.

❼.1 Refer to the stand diagram below. On the Attachment Tab, cut on the dotted line and fold the left and right rectangles behind the middle rectangle. Tape or glue after folding each rectangle.

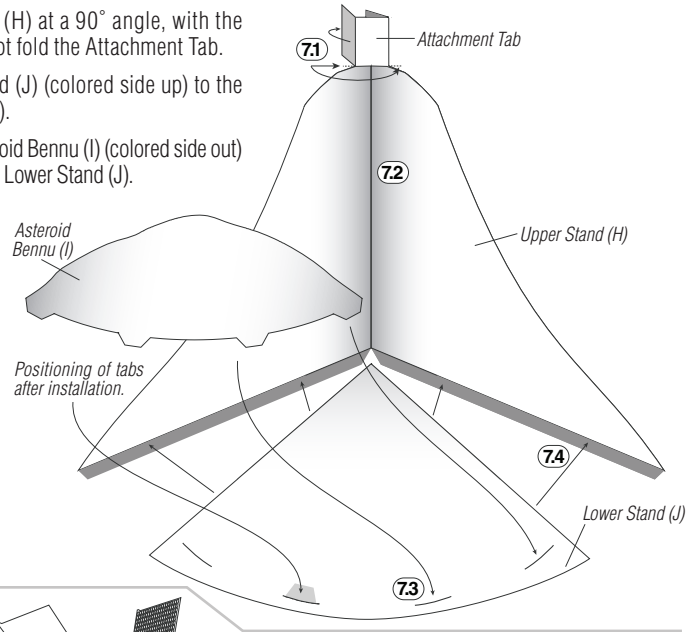
❼.2 Fold the Upper Stand (H) at a 90˚ angle, with the stars on the interior - do not fold the Attachment Tab.

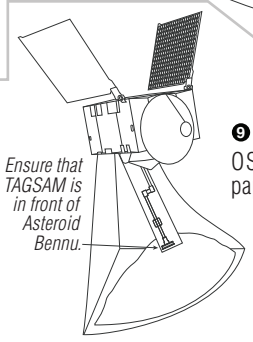
❼.3 Attach the Lower Stand (J) (colored side up) to the tabs on the Upper Stand (H).

❼.4 Attach the tabs on Asteroid Bennu (I) (colored side out) onto their respective lines on Lower Stand (J).



❽ Use a craft knife to cut a slit on the dotted line. Place the completed Spacecraft on the Attachment Tab of the completed stand. Do not glue or tape.





❾ Enjoy your OSIRIS-REx paper model!

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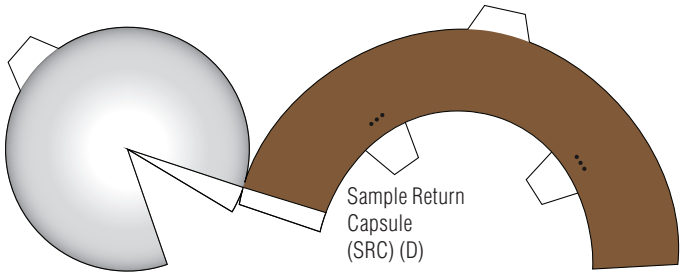
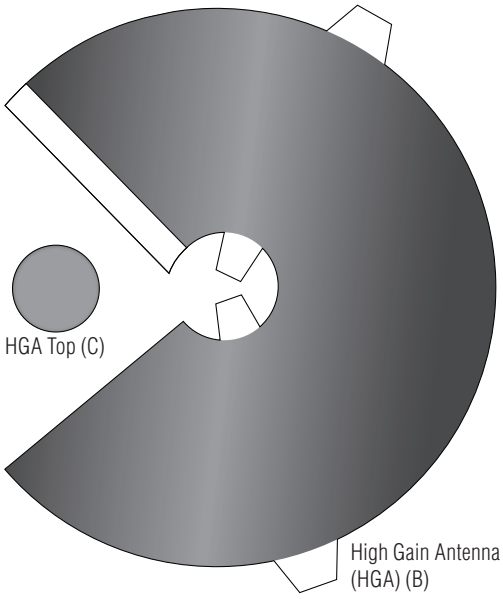
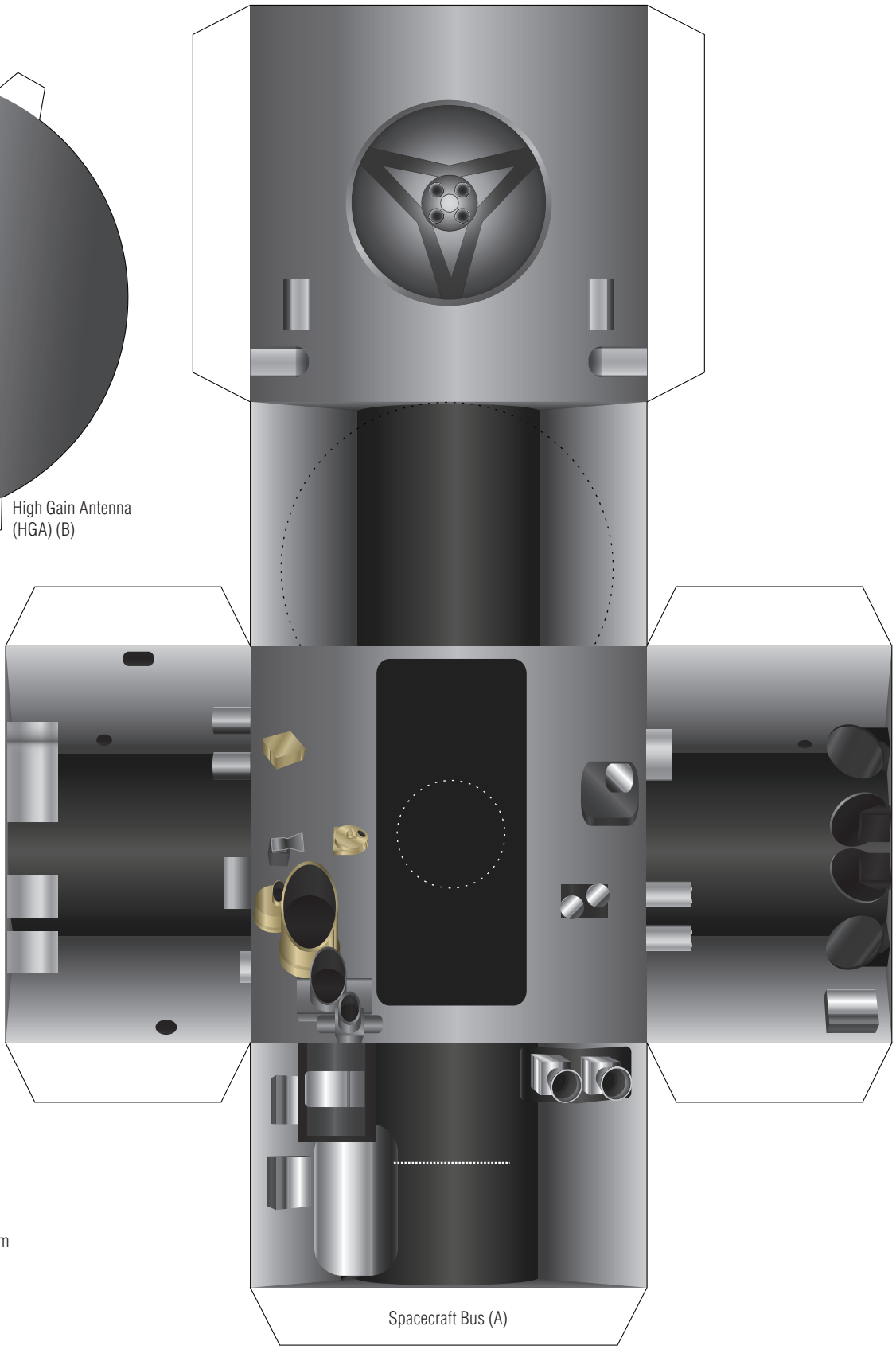




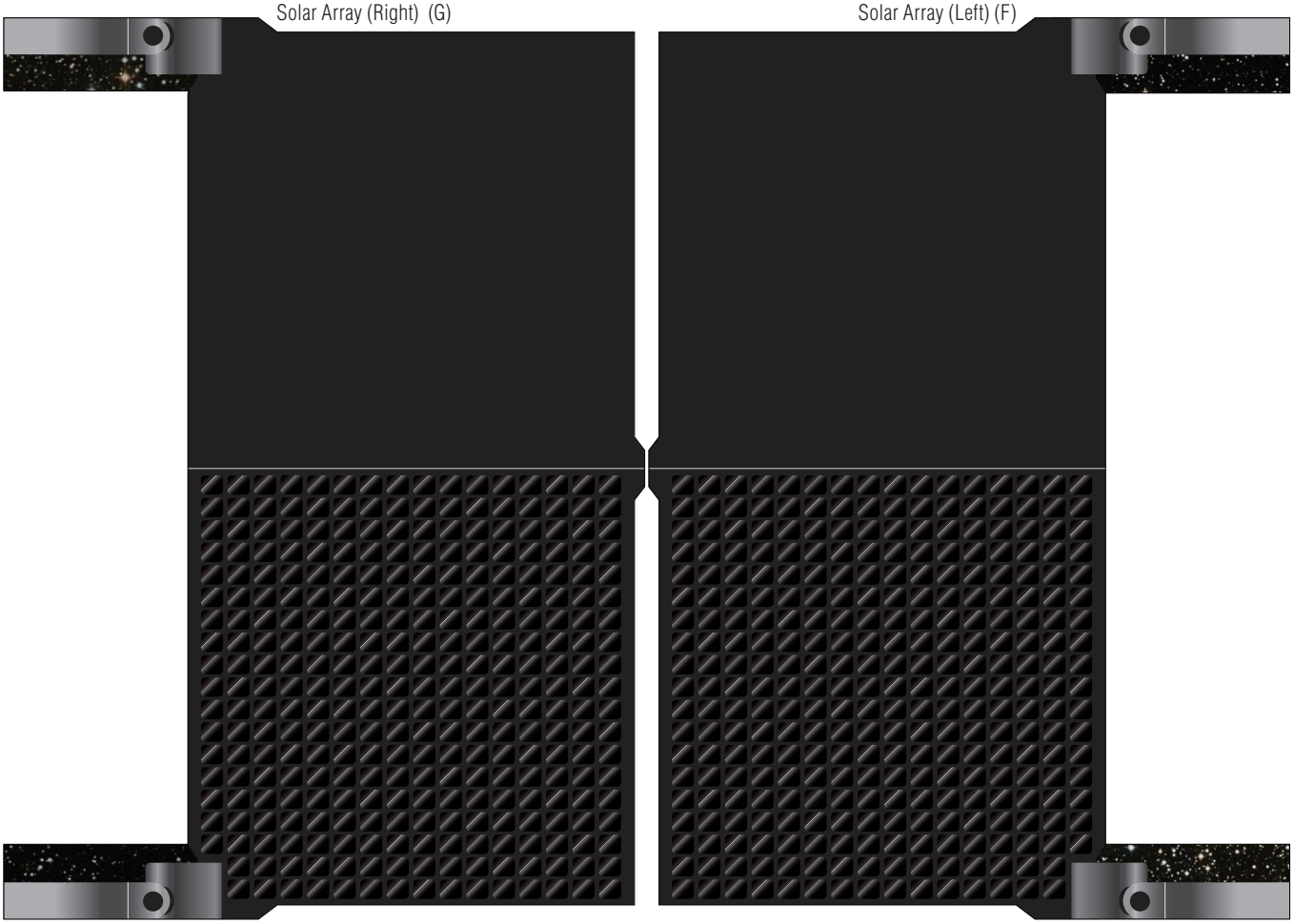


Touch-And-Go Sample Acquisition Mechanism
(TAGSAM) (E)

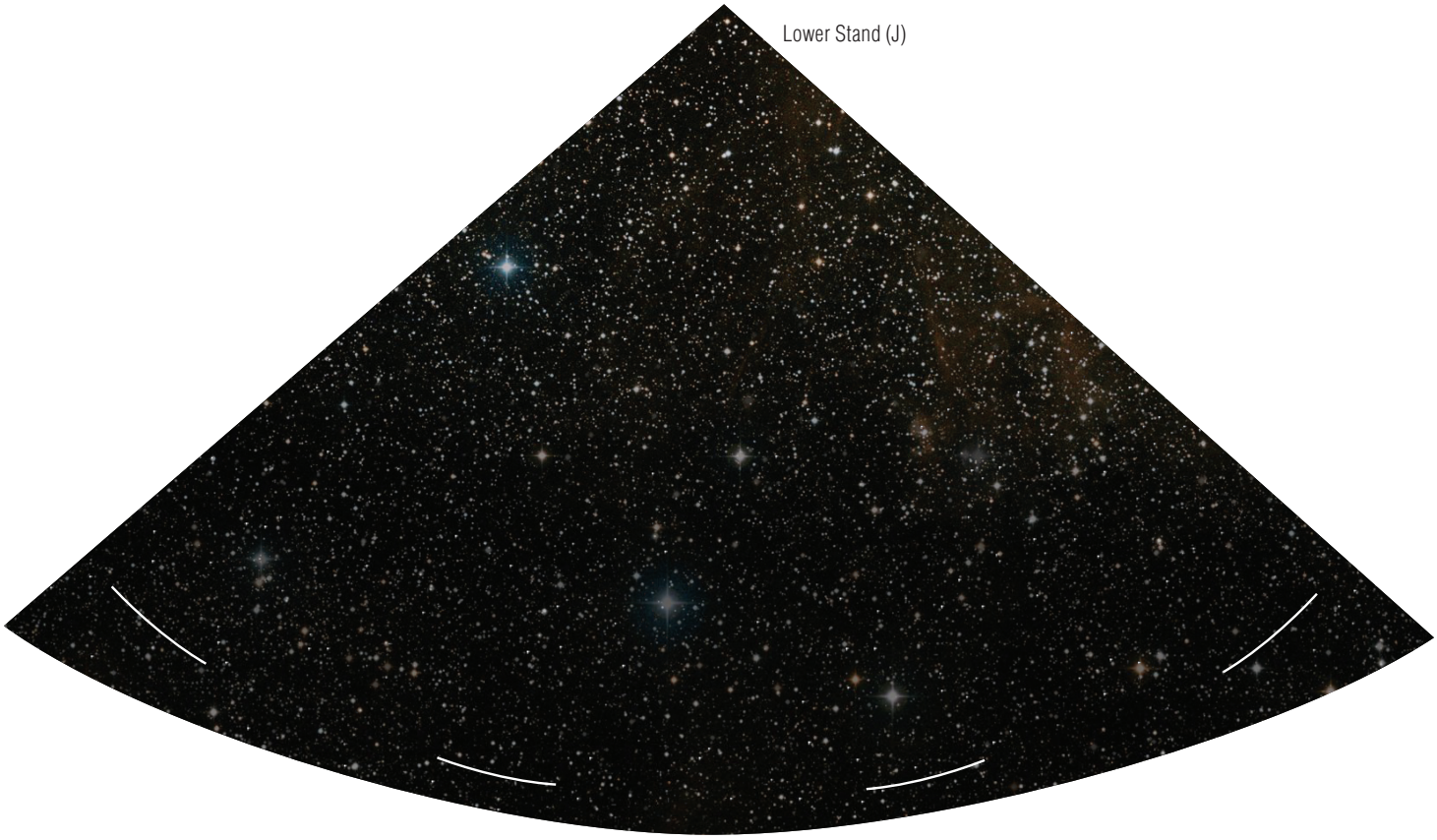


Solar Array (Right) (G)

Solar Array (Left) (F)



Lower Stand (J)



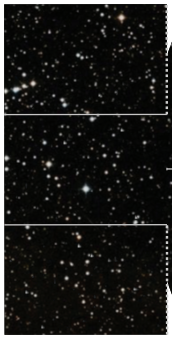
Tips for your OSIRIS-REx paper model:

• Kids, have an adult help you - do not use scissors or craft knives without adult supervision!

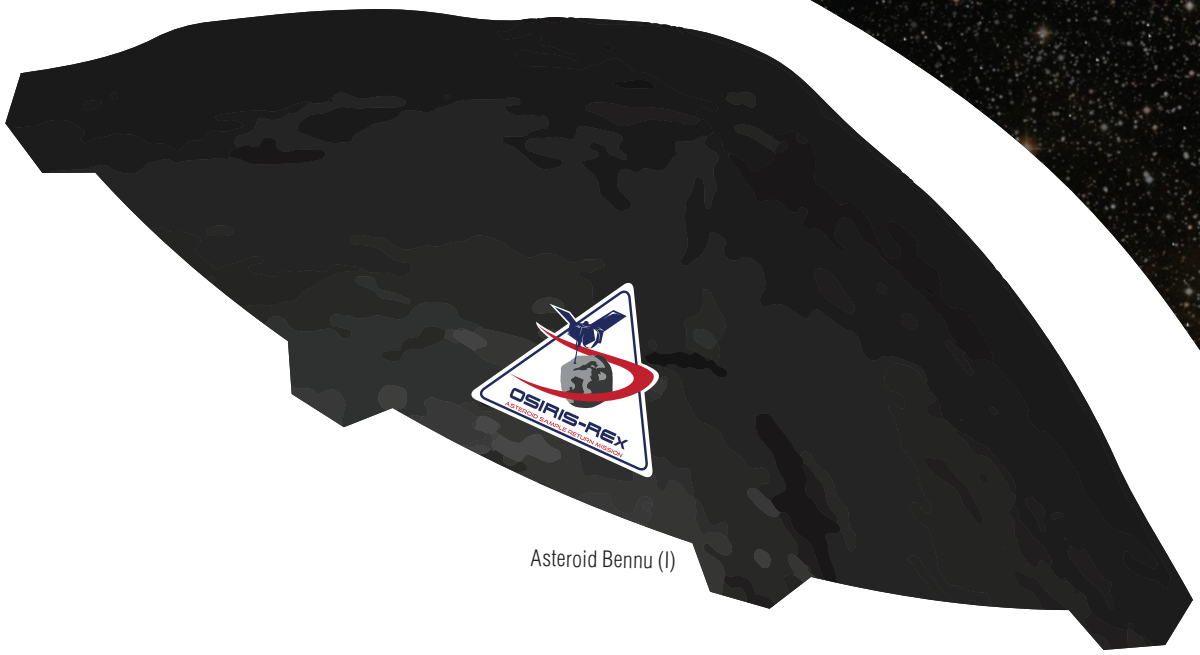
• For best results, use card stock and print in color.

• Tools needed: scissors, craft knife and cutting mat (or cardboard), glue and/or tape.

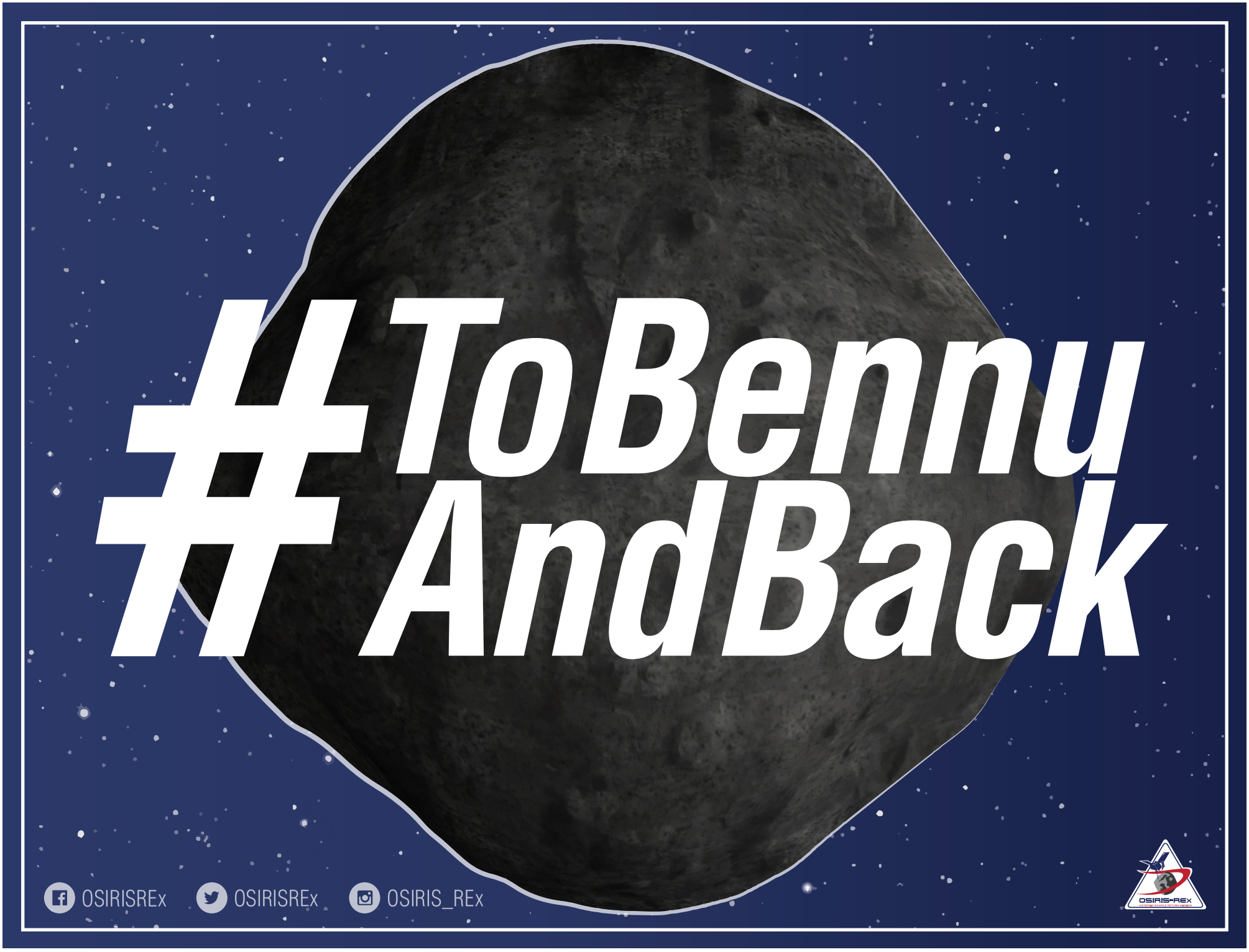
• When printing on cardstock, the slits may need to be cut longer to accomodate the thicker paper.



Upper Stand (H)



Asteroid Bennu (I)


#ToBennu
AndBack
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