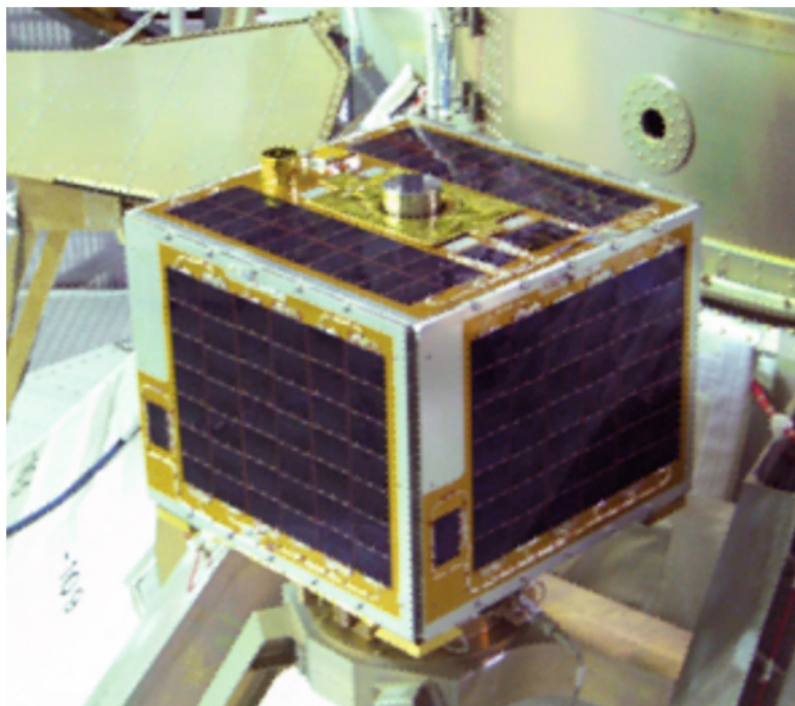


Sprite-Sat 1



Onboard the satellite was a miniature gallery of art, etched onto a silicon wafer by photolithography, making this mission also one of the first art exhibitions in outer space.

A nickname "RISING" was given to the SPRITE-SAT. "RA-I-JI-N" is the god of thunder and lightning in Japanese mythology. The nickname plays on the similar sound of the English word "rising" and the Japanese god "Raijin."

The SPRITE-SAT spacecraft designed and built by Tohoku University was successfully launched into space on January 23rd, 2009 on a Japanese H-IIA rocket.

SPRITE-SAT has now started its mission to observe Sprites and Terrestrial Gamma-ray Flashes (TGF). The spacecraft was developed by the faculty and students of Tohoku University, with technical support from external mentors experienced in satellite development. Students played a leading role in the assembly and testing of the spacecraft, giving a unique opportunity for hands-on education in space science and space engineering.

Mission Objectives of SPRITE-SAT

SPRITE-SAT is a micro satellite in the size of 50 cm cube and weighing less than 50-kg, under the development by Tohoku University. The satellite will conduct scientific observation of atmospheric luminous emissions called "sprites". The specific mission objectives are the following two points:

(1) The "sprites" are a type of Transient Luminous Events (TLE) observed in the middle atmosphere (typically 40-90 km altitude, from upper Stratosphere to Mesosphere), which were first discovered in 1989. It is considered that large scale thunderstorms are capable of producing such luminous events over the clouds, but a true mechanism is still under the veil.

Although extensive studies have been carried out in these years, no clear model has yet established for their horizontal structure, because it is difficult to observe from the ground based instruments. SPRITE-SAT will look down the sprites from orbit then identify the horizontal structure and physical relationships of the sprites and the cloud-to-ground lightnings. It will also provide a clear figure of the global distribution of the events.

SPRITE-SAT will reveal the mechanism of such mysterious luminous events.

(2) Brief bursts of gamma-rays coming from space have been observed since the 1960s, but recent observations suggest that shorter bursts of gamma-rays occur in the earth's atmosphere. Such bursts are called the Terrestrial Gamma-ray Flashes (TGF).

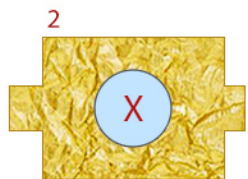
The flashes are considered generated by high-energy photons in the atmosphere and a strong relationship is inferred with the thunderstorms and the transient luminous events, such as sprites. SPRITE-SAT also equips dedicated sensors to observe the TGF. Simultaneous observation of TLE and TGF, particularly with high precision on the timing of these events, will reveal a new model to describe the relationship of these phenomena.

Zach's



PaperSat Designs
Spacecraft Paper Models

Sprite-Sat 1



Glue to cardstock
 Cut out the blue area

Poke small hole in middle of the black dot on top of the model.



5



If going to install the main mast, poke a small hole in middle of the black dot.



6

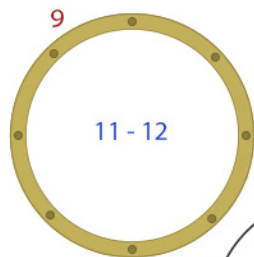
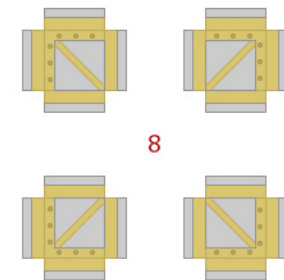
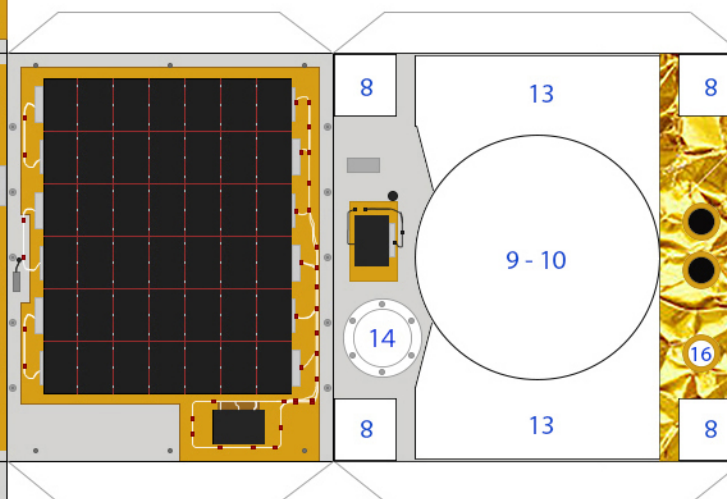
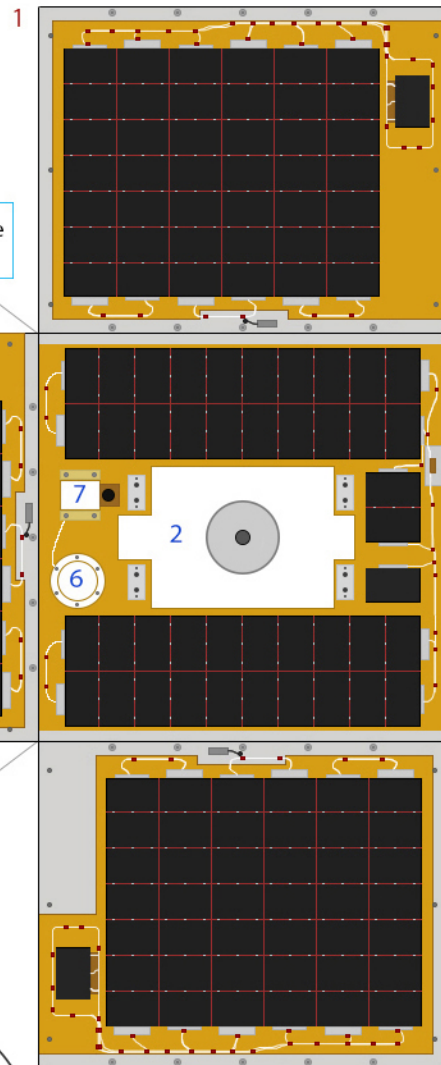


7



Glue to two layers of cardstock

Cut a wooden rod around 2 mm diameter, the same length as the line below, colored light grey or silver for the main mast.



11 - 12

Former
 Glue to cardstock



14

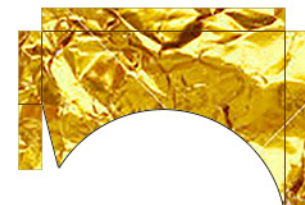


15

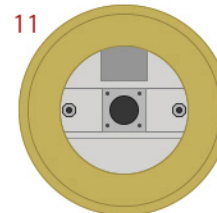
Glue to two layers of cardstock



16



13



11

Former
 Glue to cardstock

10



12

