

LISA Pathfinder

By GA - Dec 2015



The 'LISA' stands for Laser Interferometer Space Antenna, an earlier concept for a spaceborne observatory for gravitational waves, and now used to describe a class of missions based on the original LISA concept. LISA Pathfinder will test key technology for future LISA-like space missions to study the gravitational Universe.

launched on December 3, 2015, on a Vega rocket from Europe's spaceport in Kourou, French Guiana, on its way to demonstrate technology for observing gravitational waves from space which are ripples in the fabric of spacetime, predicted a century ago by Albert Einstein's General Theory of Relativity.

Einstein's theory predicts that these fluctuations should be universal, generated by accelerating massive objects. However, they have not been directly detected to date because they are so tiny. For example, the ripples emitted by a pair of orbiting black holes would stretch a million kilometre-long ruler by less than the size of an atom.

At its core is a pair of identical 46 mm gold-platinum cubes separated by 38 cm, which will be isolated from all external and internal forces acting on them except one: gravity.

The mission will put these cubes in the purest free-fall ever produced in space and monitor their relative positions to astonishing precision, laying the foundations for gravitational wave observatories in space. Such future missions will be key partners to the ground sites already searching for these elusive cosmic messengers. Space and ground experiments are sensitive to different sources of gravitational waves, both opening up new possibilities to study some of the most powerful phenomena in the Universe.

Gravitational waves are the next frontier for astronomers. We have been looking at the Universe in visible light for millennia and across the whole electromagnetic spectrum in just the past century', says Alvaro Giménez Cañete, ESA's Director of Science and Robotic Exploration.

"But by testing the predictions made by Einstein one hundred years ago with LISA Pathfinder, we are paving the road towards a fundamentally new window on the Universe."

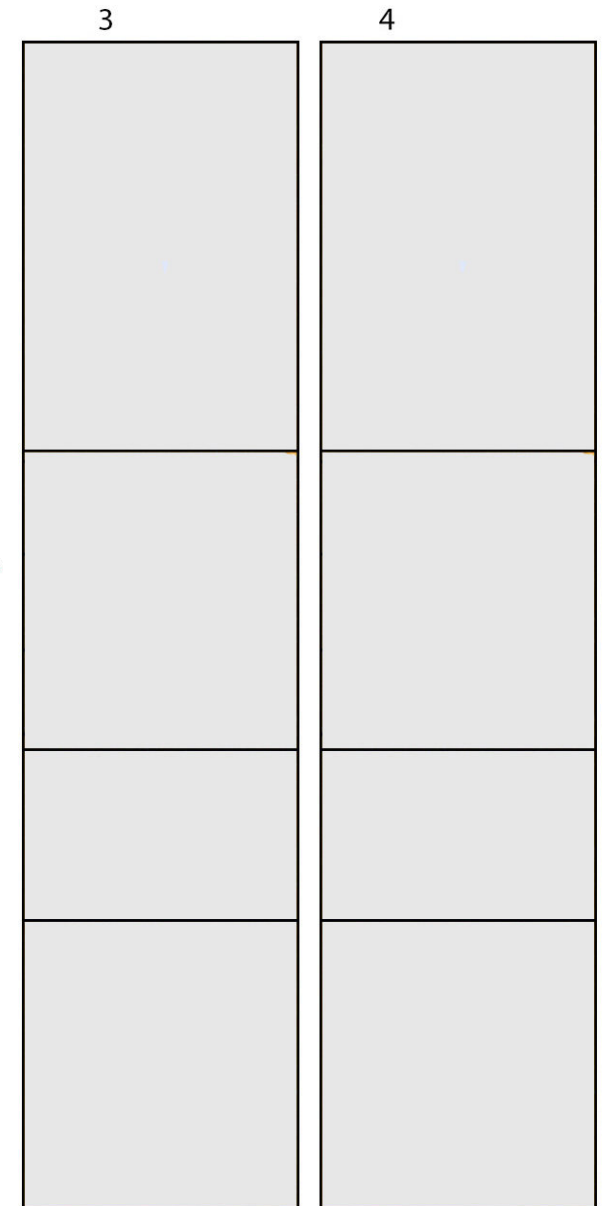
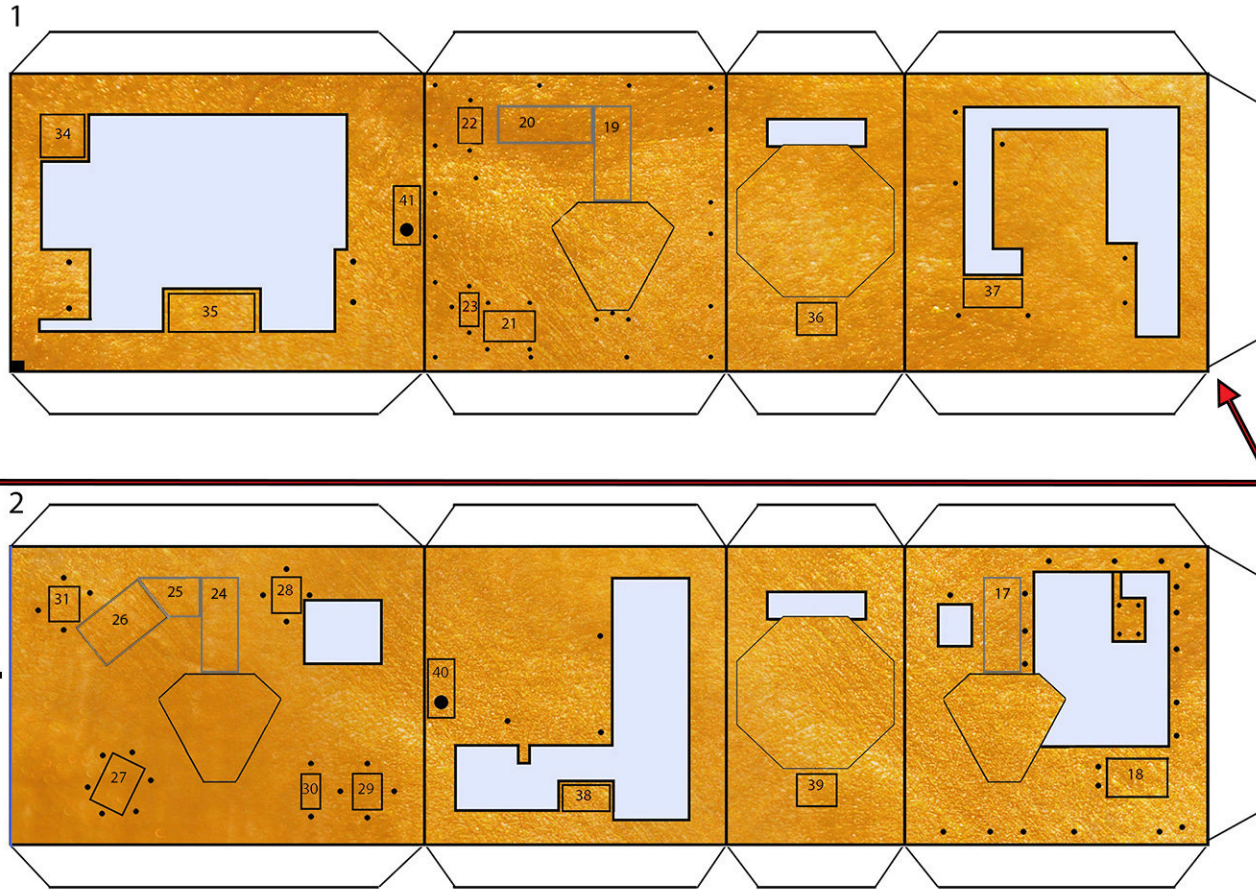
LISA Pathfinder will operate as a physics laboratory in space. Over an intense period of six months, mission scientists will analyse the data received on Earth from each day's operations .

The LISA Pathfinder mission will test in flight:

- Inertial sensors
- Interferometry between free floating test masses
- Drag Free and Attitude Control System (DFACS)
- Micro-Newton propulsion technology: FEED (Field Emission Electric Propulsion) and colloidal thrusters of NASA/JPL.

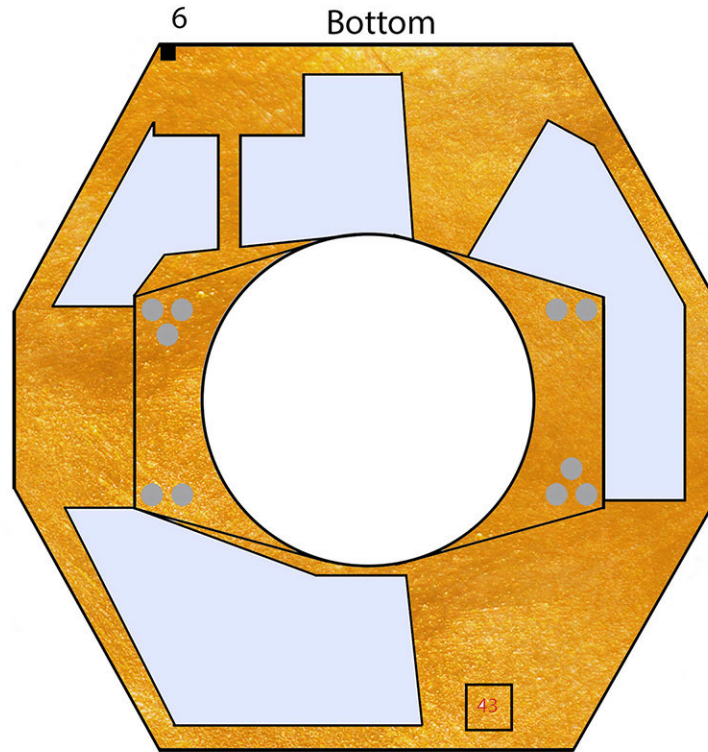
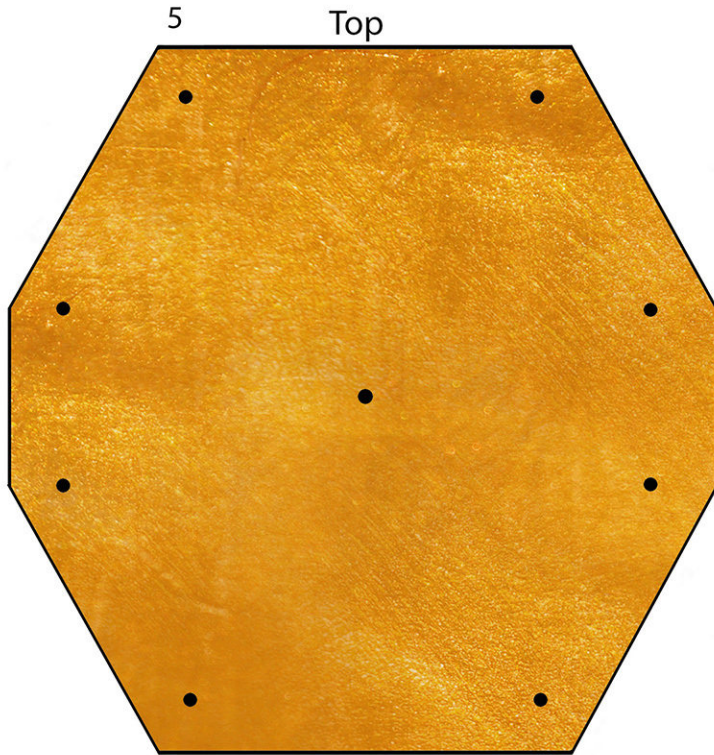
LISA Pathfinder is an ESA-led mission. It involves European space companies and research institutes from France, Germany, Italy, The Netherlands, Spain, Switzerland, UK, and the US space agency NASA.

LISA Pathfinder



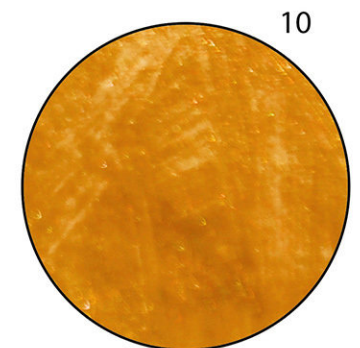
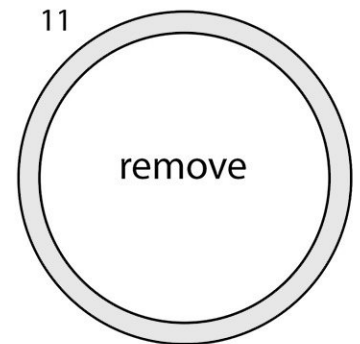
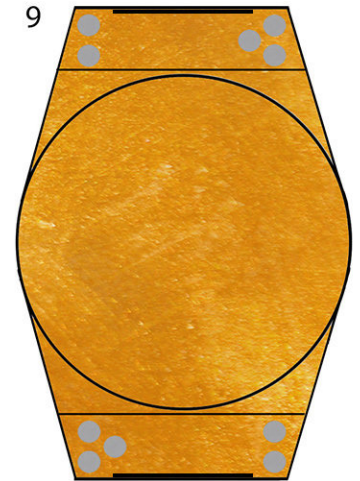
Remove the light glue areas. Glue the **blue line** on 2 over the black line at the tab on 1.
 Score and fold - **Don't glue the remaining two ends to form an Octagon shape.**
 Cut and glue matching sections of the grey strips (part 4) to the backside of 1 and 2 with grey color showing through the cutouts.
 Glue the ends together to form an Octagon shape spacecraft bus.

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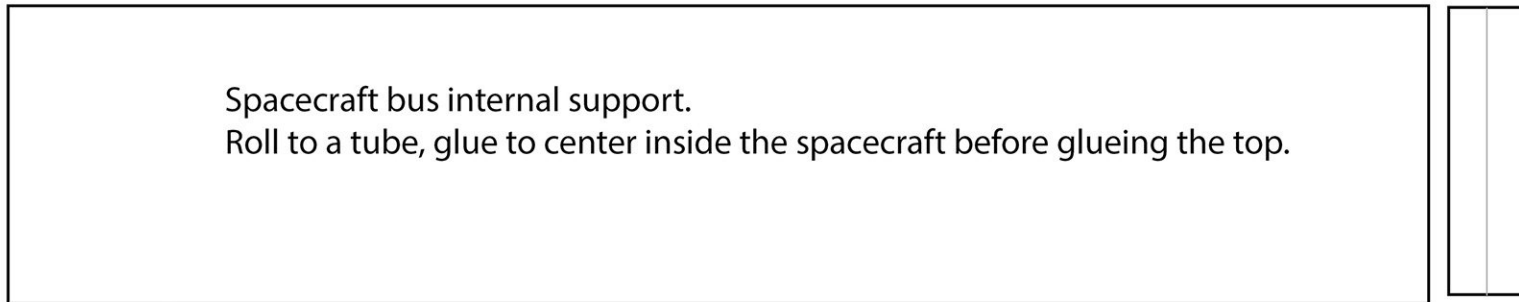


Cut out the light glue areas, Glue PART 7 to the BACKSIDE - light grey showing.

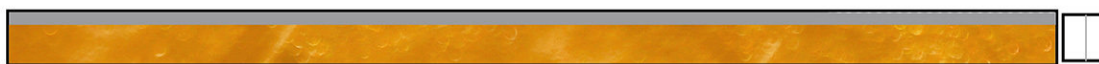
Glue to cardstock, then cut



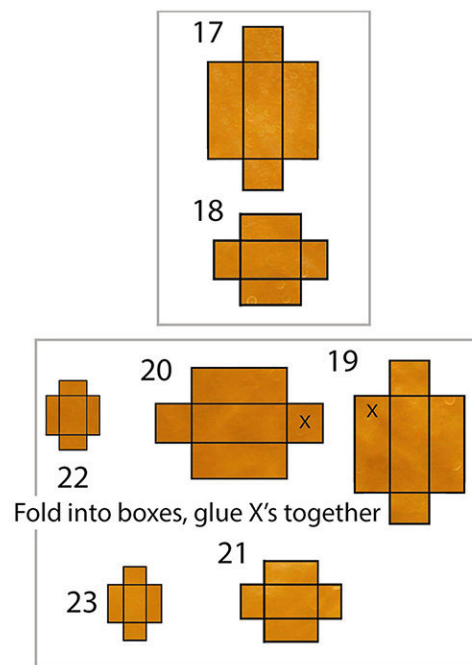
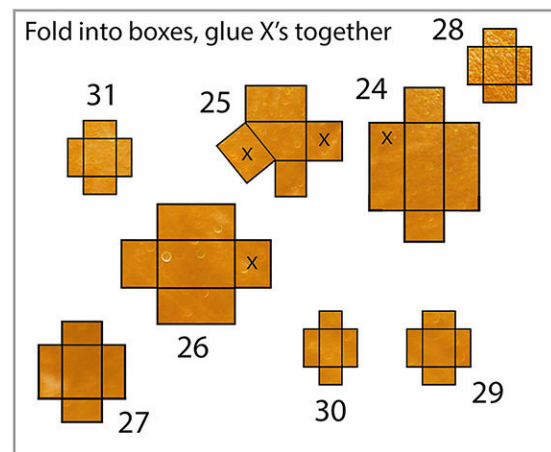
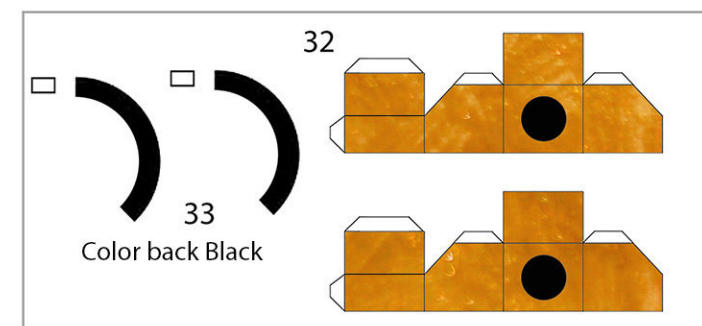
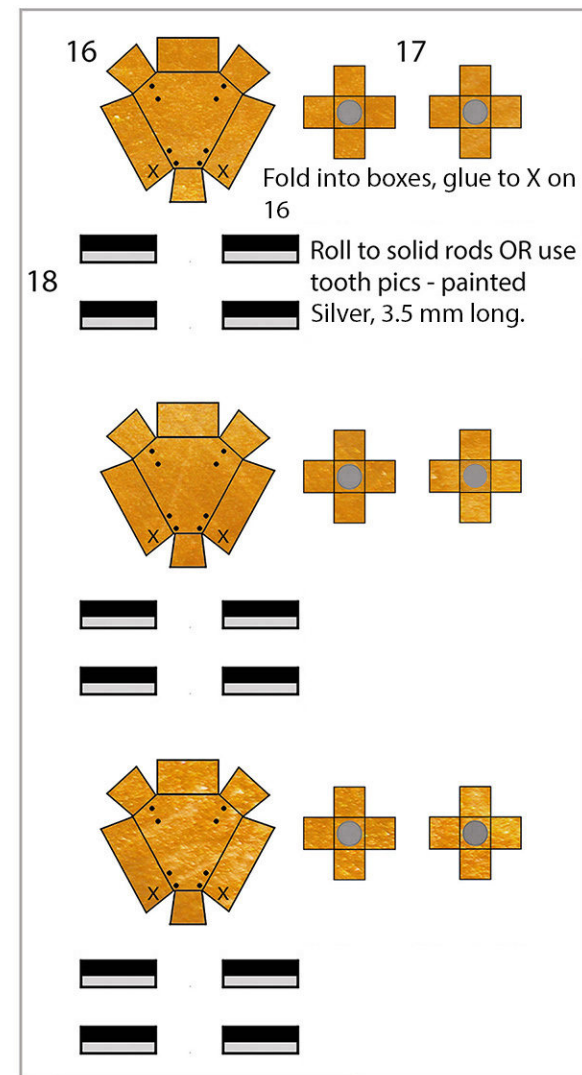
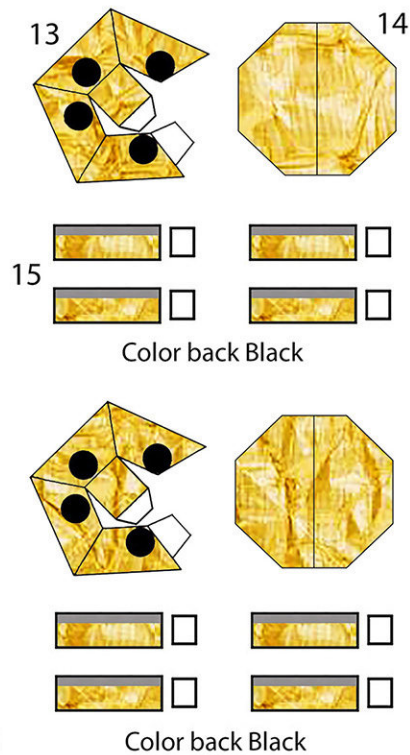
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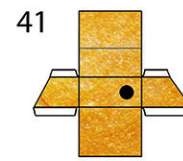
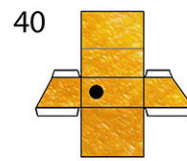
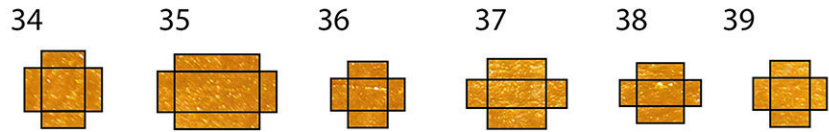
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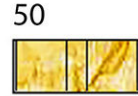
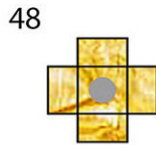
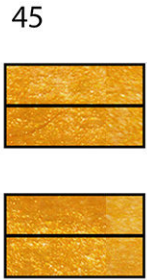
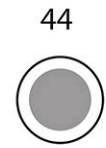
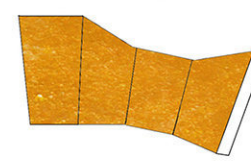
A regular hexagon is shown, oriented with two horizontal sides. The top side is labeled with the number 7, indicating its length. The hexagon is filled with a light gray color and has a black outline.



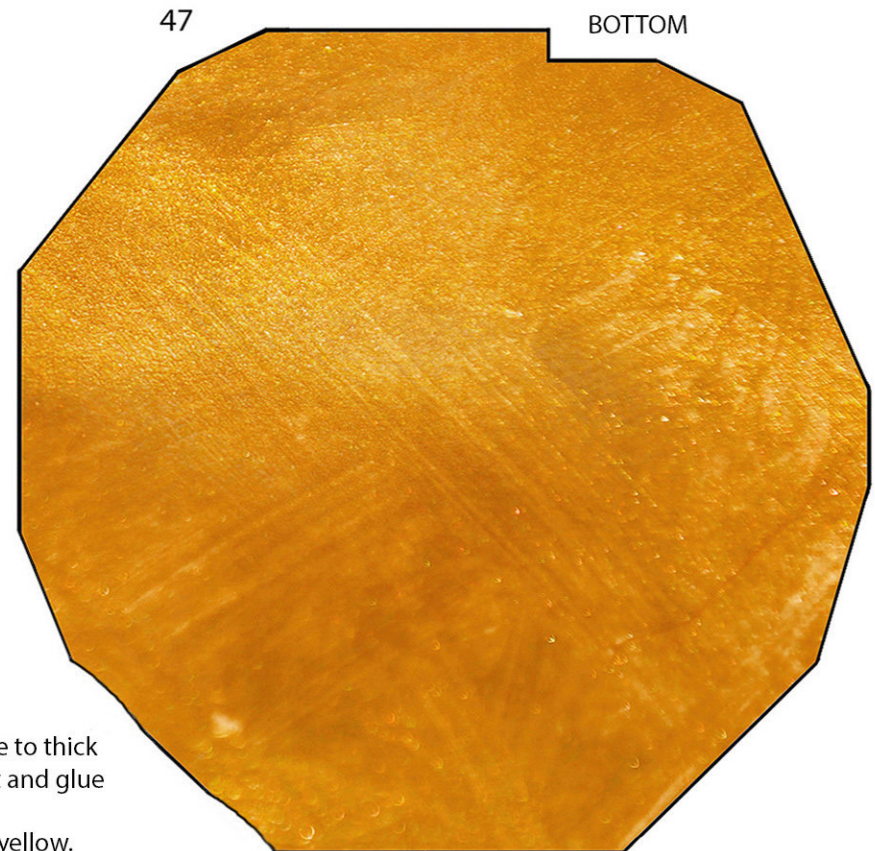
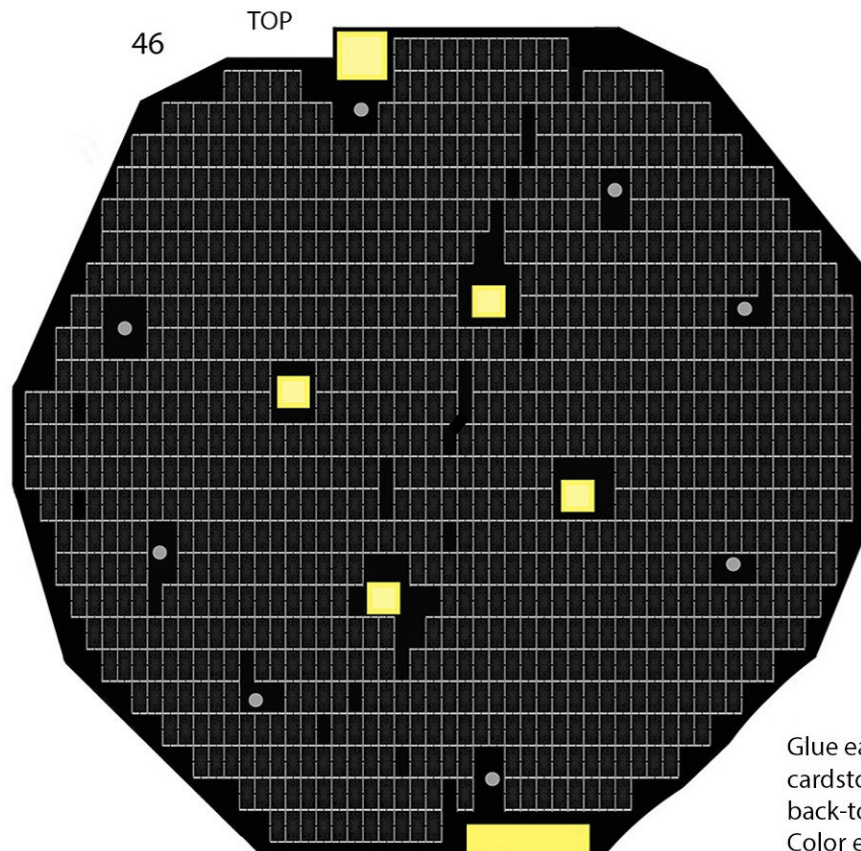
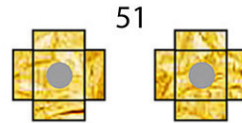
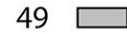
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42
Glue to cardstock



54 - Solar panel mounts.
Roll to solid rods OR use tooth pics,
colored dark yellow - 4 mm long.



Glue each of these to thick
cardstock, cut out and glue
back-to-back.
Color edges dark yellow.