

# Aunt Lyni!

## Happy Birthday



Frustum-shaped star finder,  
celestial sphere, pinpoint planetarium

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Sun, Planets, Moon Positions

Birthday Edition

## Frustarium

### Your Birthday Sky

As the Earth orbits the Sun, the Sun appears to move along the ecliptic through the Celestial Sphere, circling once every year.

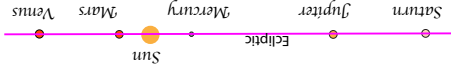
So on your birthday the Sun is in the same spot on the ecliptic that it was on the day you were born.

The other planets also appear to move along the ecliptic as they orbit the Sun, but their orbits are either shorter or longer than one earth year, so they are not in the same spot every year.

The stars are so far away that they do not appear to move at all during your lifetime.

### The Ecliptic

The best way to understand the night sky is through the classical idea of the ecliptic. Earth and the planets orbit the Sun in nearly the same plane (the ecliptic plane), and the Moon orbits the Earth in close to the same plane. So we see the Sun, Moon, and planets in nearly one line across the sky (the ecliptic). As the Earth rotates daily, the celestial sphere appears to rotate, and the Sun, Moon, and planets rise and set in sequence along the ecliptic. The Sun and planets move slowly along the ecliptic through the Zodiac constellations that divide it, with their sequence and apparent motion changing based on where they are in their orbits. Due to the Earth's tilt, the ecliptic is tilted and the Sun crosses the celestial equator during Spring and Fall equinoxes in its annual cycle.



### Construction Instructions

- 1) Poke out holes for stars using a push-pin.
- 2) Fold up along dashed lines.
- 3) Tape together edges with clear tape.

### Viewing Instructions

- 1) Look in from below to see constellations.
- 2) In a small darkened room, shine cellphone light in from below to see stars on ceilings and walls.

Never look at the sun except through eclipse glasses.

Selected constellations, asterisms, and bright stars shown. Sun, Moon, and planets not to scale.

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