

# IS ANYONE HOME? HOME?



Your guide to exoplanet habitability  
(for life as we know it)

## PLANETS

### ORBITS

How and where a planet orbits its star is very important for its habitability.



Planets in **eccentric orbits** — or those experiencing **dramatic changes in tilt** — could have **extreme seasons**.



Planets which orbit **too closely to each other** can affect the stability of each other's orbits and climates.

Habitable planets are likely found in the **Goldilocks zone**, meaning they're just the right distance from their star for **liquid water to exist on the surface**.

### MAGNETIC FIELDS

On Earth, magnetic fields are produced by a **spinning molten iron core**.

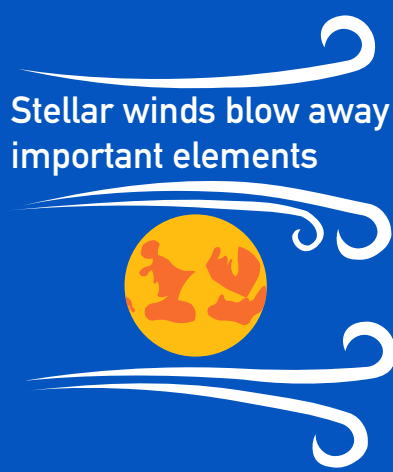
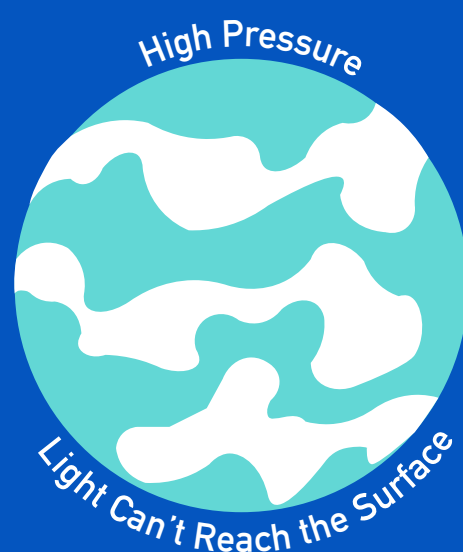


The field **protects the planet's atmosphere** from harmful activity from its star, which could impact the habitability for some forms of life.



### PLANET SIZE

The size of a planet plays a large role in **how much atmosphere it can hold**.



Planets that are **too large** hide their surfaces under **atmospheres much thicker than Earth's**.

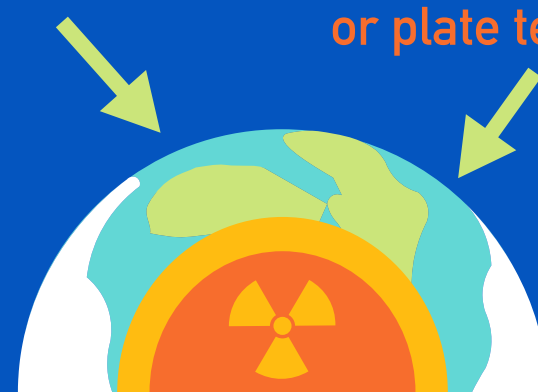
**Small planets** can't keep their stars' stellar winds from **blowing away their atmospheres**.

### COMPOSITION

A planet must include the elements needed for life.

**Water**, especially liquid water, is considered the key component for life.

But too much of them could **disrupt the planet's chemistry, climate or plate tectonics**.



**Radioactive elements** help drive **life-supporting processes** like plate tectonics and magnetic field formation.

### SOURCES

Based on "Impact of Space Weather on Climate and Habitability of Terrestrial Type of Exoplanets," Airapetian et al. (2019).  
Specific contributions from Ravi Kumar Kopparapu, Wade Henning and Joshua Schlieder.

