



# Discussion

# 2019 Sagan Summer Workshop

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# Astrobiology poll

Will evidence of extant life on an exoplanet be detected by 2040?

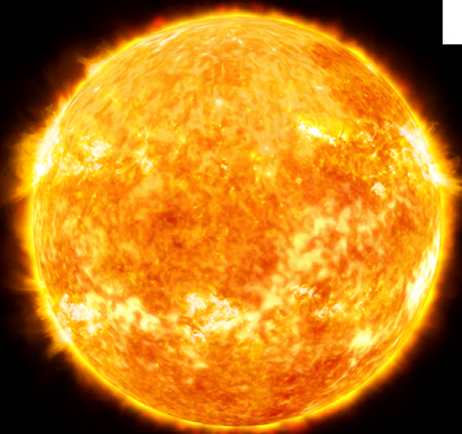
Why or why not?

Let's vote.

<https://forms.gle/mfWwxXk3MhpZB8GK8>

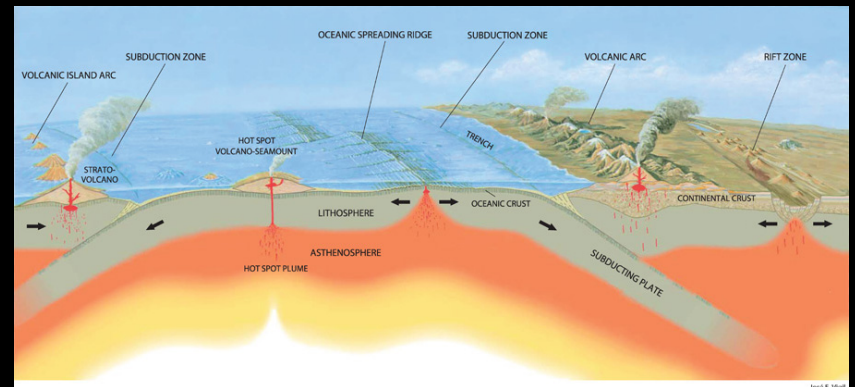
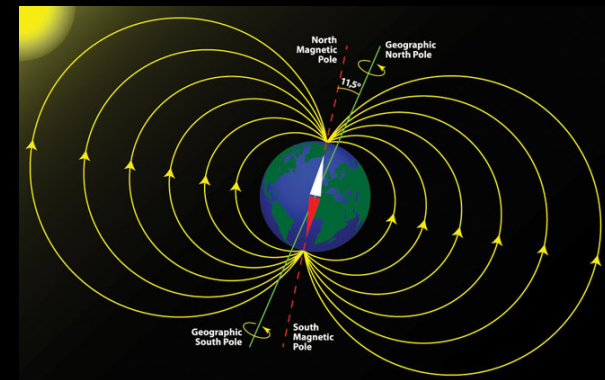
# Questions

After water, what things are most important for making a planet habitable?



The Periodic Table of the Elements

| Group    | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13  | 14  | 15  | 16  | 17  | 18  |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| Period 1 | H  | He |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |
| Period 2 | Li | Be | B  | C  | N  | O  | F  | Ne |    |    |    |    |     |     |     |     |     |     |
| Period 3 | Na | Mg | Al | Si | P  | S  | Cl | Ar |    |    |    |    |     |     |     |     |     |     |
| Period 4 | K  | Ca | Sc | Ti | V  | Cr | Mn | Fe | Co | Ni | Cu | Zn | Ga  | Ge  | As  | Se  | Br  | Kr  |
| Period 5 | Rb | Sr | Y  | Zr | Nb | Mo | Tc | Ru | Rh | Pd | Ag | Cd | In  | Sn  | Sb  | Te  | I   | Xe  |
| Period 6 | Cs | Ba | Lu | Hf | Ta | W  | Re | Os | Ir | Pt | Au | Hg | Tl  | Pb  | Bi  | Po  | At  | Rn  |
| Period 7 | Fr | Ra | Lr | Rf | Db | Sg | Bh | Hs | Mt | Ds | Rg | Cn | Uut | Uuq | Uup | Uuh | Uus | Uuo |



# Questions

Can we observe those important things on exoplanets?

# Questions

Can a planet orbiting an M dwarf star be habitable?