

# Expoplanet Recommendation Report

## 1) Planet Chosen For Recommendation

a) Name: Kepler-452b

b) Host Star Type: G-Type Star (Sun Like)

c) Distance from star: 1.046 AU

d) Within habitability zone closer to inner edge

2) Kepler-425b stands out from the rest of the selection due to its highly Earth-like qualities. It orbits a G-Type Star, the exact same type of the sun. Moreover, it is roughly the same distance from its star as the Earth is. Although it is slightly on the colder side, it boasts a liveable surface temperature of  $-8^{\circ}\text{C}$ . It is on the heavier side, but it is not too massive to where it becomes unlivable, instead it likely has a strong atmosphere. Although its water and chemical contents are unknown, its Earth-like conditions make it a promising choice.

## 3) Rubric Score Summary

| Factor         | Score | Explanation  |
|----------------|-------|--|
| Habitable Zone | 3/5   | In the zone but close to inner edge                |
| Star Type      | 4/5   | G-Type Star, Stable, No Radiation, but not as long |

|                          |     |   |
|--------------------------|-----|---|
|                          |     | life-span as K-type   |
| Planet Size              | 5/5 | Larger mass that is livable and can hold a very strong atmosphere |
| Water Presence           | 0/5 | Unknown   |
| Atmosphere               | 2/5 | Unknown composition but gravity suggests strong atmosphere        |
| Surface Temp             | 3/5 | -8°C, Cold, Water can Freeze, but livable                         |
| Chemical Building Blocks | 0/5 | Unknown   |

**Total Score: 17/35**

4) Kepler- 452b excels in its Earth-like qualities and potential for a very suitable atmosphere. Although TRAPPIST-1e scored higher than it, its unstable star, thin atmosphere, and lower temperatures made it the less ideal choice. Kepler-70b, on the other hand, boasts a temperature hotter than many stars. WASP-43b also fell short due to its high

atmospheric pressure and temperature, fostering an unlivable surface temperature. Kepler-442b shows similar promises to Kepler-452b, but falls short being too close to its star and not within the habitable zone.

- 5) The limitations of this conclusion is the unknown chemical composition of the planet. It boasts nice conditions, but those mean nothing if the planet itself is chemically incapable of harboring life. This planet has great potential, but if the presence of water, atmospheric composition, or chemical building block composition fall short, it will ultimately be a disappointment.
- 6) Scientific uncertainty can influence exploration priorities tremendously in that if exploration were to occur, it would be immensely costly and time consuming. Thus, it would be in our best interest to explore something we have the least uncertainties over. In this instance, Kepler-452b is a high risk high reward exoplanet.