



Program: "A Little Lunacy"
- **Howard Knytych**

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Greg Smith – editor.

Meeting: March 16, 2022
Hybrid/Zoom meeting 7 Pm

The Klingons are nearby

On a clear night a few weeks ago while on the Oregon coast, I looked to the west with my binoculars and came across a configuration of stars both dim and bright that reminded me of a spaceship from the tv show Star Trek the Next Generation. It was a Klingon Bird of Prey. When I looked at my star chart, I realized that I was seeing the constellation Perseus. The way the arms and the body aligned in the sky that night had the profile of the Bird of Prey as seen from the front. As I have mentioned before, look at the constellations with a different view. This time I did not realize what I was seeing, and my mind made up a new diagram for the stars that I was looking at. I have to be honest; I have had trouble finding Perseus in the night sky before. This time I was looking right at it and still did not recognize it. The bright star Mirfak was the gun port of the Klingon war vessel. The arms of Perseus were the wings of the ship. I had fun drawing my own constellation and naming it.

Even knowing that what I was seeing was Perseus, I could not see the figure of a man holding the head of medusa. The variable star Algol, which is supposed to hang from Perseus's hand, hangs toward the horizon at this time of year, is supposed to be medusa's head. The ancients noticed the changing brightness of the star and associated it with evil. Stars are not supposed to change. A changing star must be the work of a demon or the Devil. An Arabic name was Ra's al-ghul or head of the ghul (ogre). In Hebrew it was called rosh ha Satan (Satan's Head.)

I saw it as a medium bright white star, It was easy for my mind to draw a new picture in the sky. Easier than I had imagined.

Go ahead and look at the sky, if you don't know what the constellation's name is, make up your own. Connect the stars any way you want to and draw your own pictures in the sky.

**Every Day is a Star Filled Day,
Every Night is a Starry Night**



Super Habitability Planets



Superhabitable planets: Alien worlds that may be more habitable than Earth

Bigger, better, more suited for biology; let's not overlook superhabitable planets with potential.

By Charles Q. Choi Contributions from Vicky Stein

A superhabitable planet is a world that might have an even better chance at hosting life than our own home, Earth.

Because Earth is the only known inhabited planet and its life depends on liquid water, efforts to identify [exoplanets](#) that could host life focus on Earth-like worlds. But some researchers think there are other types of planets that could offer conditions for life as good as — or even better than — [Earth](#). In fact, some scientists argue that focusing only on Earth-like worlds might be too "anthropocentric and geocentric," blinding us to the possibilities of exobiology.

"We are so over-focused on finding a mirror image of Earth that we may overlook a planet that is even more well-suited for life," Dirk Schulze-Makuch, an astrobiologist at Washington State University and the Technical University of Berlin, told Space.com.

To search for potentially superhabitable exoplanets, Schulze-Makuch and his team investigated the Kepler Object of Interest Exoplanet Archive, focusing on 4,500 planetary systems that likely possessed rocky planets within their [stars'](#) habitable zones, where liquid water can persist. The researchers published their findings in a 2020 paper in the journal [Astrobiology](#).

In addition to looking at planetary systems with yellow dwarf stars like our [sun](#), the scientists also looked at orange dwarf stars, which are cooler, dimmer and less massive than our sun.

"Our sun is actually not the best kind of star for hosting a planet with lots of life on it," Schulze-Makuch told Space.com.

Orange dwarf stars are about 50% more common than yellow dwarfs in the Milky Way. Whereas our sun has a lifetime estimated at less than 10 billion years, orange dwarfs have lifetimes of 20 billion to 70 billion years. Since complex life took about 3.5 billion years to appear on Earth, the longer lifetimes of orange dwarf stars could give planets within their habitable zones more time to develop life and accrue biodiversity.

Earth is about 4.5 billion years old, so the researchers speculated the sweet spot for life would be a planet between 5 billion to 8 billion years old.

The size and mass of a planet can also influence how well it can support life; the researchers wrote. A rocky planet that is larger than Earth would have more habitable surface area, and potentially a thicker, more stable atmosphere. A planet with about 1.5 times Earth's mass would likely retain its interior heat longer, which in turn would help keep its core molten and its protective magnetic field active for a greater timespan in which life might have the chance to arise and evolve.

Worlds that are slightly warmer than Earth by about 8 degrees Fahrenheit (5 degrees Celsius) might be superhabitable, since they could have larger tropical zones which on Earth foster more biodiversity. However, warmer planets might also need more moisture, since greater heat could expand deserts.

In addition, planets with the same amount of land area as Earth but broken up into smaller continents might be more habitable. When continents become particularly large (such as Earth's past continent Gondwana, about 500 million years ago), their centers are far from oceans, often rendering the interiors of large continents vast, inhospitable deserts. Moreover, Earth's shallow waters have a greater biodiversity than its deep oceans, so scientists speculate that planets with shallower waters could support more life.

All in all, Schulze-Makuch and team identified 24 potentially superhabitable planets. None of these worlds met all the criteria the researchers drew up for superhabitable planets, but one did meet at least two — KOI 5715.01.

KOI (Kepler Object of Interest) 5725.01 is a planet about 5.5 billion years old and 1.8 to 2.4 times Earth's diameter orbiting an orange dwarf about 2,965 light-years away. It might have an average surface temperature about 4.3 degrees F (2.4 degrees C) cooler than that of Earth, but if it has more greenhouse gases than Earth to trap heat, it might be superhabitable, the researchers wrote.

Schulze-Makuch's own favorite potentially superhabitable world from these 24 was KOI 5554.01. This planet is about 6.5 billion years old, with a diameter 0.72 to 1.29 times that of Earth, orbiting a yellow dwarf about 700 light-years from Earth.

"I really liked the average surface temperature — about 27 degrees C [80 degrees F]," Schulze-Makuch said. "And it's probably about Earth's size, and a little bit older than Earth."

All 24 of these potentially superhabitable planets are more than 100 light-years from Earth. This makes them too far for NASA's Transiting Exoplanet Survey Satellite (TESS) spacecraft to capture high-quality images from to learn more about them.

Still, Schulze-Makuch noted that future spacecraft, such as the newly launched James Webb Space Telescope, NASA's LUVOIR space observatory mission concept and the European Space Agency's PLATO space telescope, could shed light on these worlds.

"We caution that while we search for superhabitable planets, that doesn't mean that they necessarily contain life," Schulze-Makuch said. "A planet can be habitable or superhabitable but uninhabited."

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If you're thrilled by the idea of exoplanets, poke around the NASA Exoplanet Archive yourself! If you want to read more about how different and bizarre other planets might be, dive in to astronomer Michael Summers and physicist James Trefil's 2017 book "Exoplanets: Diamond Worlds, Super Earths, Pulsar Planets, and the New Search for Life beyond Our Solar System." And for anyone looking to dream about living on another world, get lost in this [TED playlist](#) about becoming — and thriving as — an extraterrestrial.

Bibliography

- Brennan, Pat. "The Habitable Zone | The Search For Life." Exoplanet Exploration: Planets Beyond our Solar System, April 2, 2021. <https://exoplanets.nasa.gov/search-for-life/habitable-zone>.
- Schulze-Makuch, Dirk, René Heller, and Edward Guinan. "In Search for a Planet Better than Earth: Top Contenders for a Superhabitable World." *Astrobiology* 20, no. 12 (December 1, 2020): 1394–1404. <https://doi.org/10.1089/ast.2019.2161>.

☞ **March 2022 Meeting** ☞

DATE: Wednesday March 16, 2022

TIME 7 pm

PLACE: Hybrid/Zoom , at your own home or come join us at R .A. Long High School science wing Rm 130

PROGRAM A Little Lunacy - Howard Knytych

Moon Phases

1st Qtr.: Thu March 10th, **Full:** Fri March 18th **3rd Qtr.:** Thu March 24th, **New: Thu** March 31st
Fri April 8th Sat Apr 16th Thu Apr 24th Sat Apr 30th

The Star Report is posted on the clubs website: 1. It is listed in the blog portion of the website.

Minutes of the February FOG Meeting

In person attending were Tom Meek, Gali Gonzalez, Ed Mitchel Stephanie and Steven Foster, Allen Severson, Ethan Richert, On **Zoom** : Howard Knytych, Ted Gruber, Steve Powell, Bruce Picket, Chuck Ring, and Becky Kent.

Mark Thorson presented a Video on What the L2 point is out in space and how the Webb Telescope orbits this empty spot in space.

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Next Month's Newsletter Deadline

The deadline for items in next month's newsletter is:

**Wednesday: seven
days before next meeting.**

**Please feel free to send in
your thoughts and experiences
about your astronomical
adventures.**

Submit your material by E-mail
to: gryth@msn.com

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