Translating a Scholarly Article for a Public Audience

von Bloh, W. and M. Cuntz, S. Franck, and C. Bounama. (2011). Habitability of the Goldilocks planet Gliese 581g: results from geodynamic models. *Astronomy & Astrophysics*. 528. https://doi.org/10.1051/0004-6361/201116534

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Below is a sample student translation of this scholarly article. This student chose to translate the findings in the article into a press release.

PRESS RELEASE
Life May Be Possible on Other Planets

New data shows that a new planet found outside of our solar system may be habitable for life.

RALEIGH (SEPTEMBER 18, 2014)—A study from the Potsdam Institute for Climate Impact Research shows that a planet in another solar system is in the perfect position to harbor life. Additionally, the quantity of possible habitable planets in our galaxy is much greater than expected.

Gliese 581*g* is one of up to six planets found to be orbiting the low-mass star Gliese 581, hence its name. Gliese 581*g* and its other planetary siblings are so-called "Super Earths," rocky planets from one to ten times the size of our Earth. This entire system is about twenty light-years away from our Sun. W. Von Bloh, M. Cuntz, S. Franck, and C. Bounama from the Potsdam Institute for Climate Impact Research chose to research Gliese 581*g* because of its size and distance from its star, which make it a perfect candidate to support life.

A planet must be a precise distance away from a star in order to sustain life. This distance is referred to as the habitable zone. According to von Bloh et al., the habitable zones "are defined as regions around the central star where the physical conditions are favorable for liquid water to exist at the planet's surface for a period of time sufficient for biological evolution to occur." This "Goldilocks" zone can be affected by a number of variables, including the temperature of the star and the composition of the planet.

The actual distance of Gliese 581*g* from its star is known: the goal of this study was to find out if the planet is capable of supporting life at that distance. The researchers began by finding the habitable zone of the star Gliese 581—specifically, the zone that allowed for

photosynthesis. Photosynthesis is the production of oxygen from organic life forms and is indicative of life. In order for the planet to harbor this kind of life, a habitable zone that allows for a specific concentration of CO2 in the atmosphere as well as liquid water would have to be found.

The scientists used mathematical models based on Earth's known attributes and adjusted different variables to find out which scenarios yielded the best results. Some of these variables include surface temperature, mass of the planet, and geological activity. The scientists also considered settings where the surface of the planet was all-land, all-water, or a mix of both.

Considering all of these scenarios, von Bloh et al, determined that the habitable zone for Gliese 581*g* is between 0.125 and 0.155 astronomical units, where an astronomical unit is the distance between the Earth and the Sun. Other studies conclude that the *actual* orbital distance of Gliese 581*g* is 0.146 astronomical units. Because Gliese 581*g* is right in the middle of its determined habitable zone, the error and uncertainty in the variables that remain to be determined are negligible.

However, the ratio of land to ocean on the planet's surface is key in determining the 'life span" of the habitable zone. The habitable zone can shift over time due to geological phenomena caused by a planet having more land than ocean. According to von Bloh et al., a planet with a land-to-ocean ratio similar to ours would remain in the habitable zone for about seven billion years, shorter than Gliese 581*g*'s estimated age. In other words, if Gliese 581*g* has an Earth-like composition, it cannot sustain life. But if the ratio is low (more ocean than land), the planet will remain in its habitable zone for a greater period of time, thus allowing for a greater chance of life to develop.

The researchers conclude that Gliese 581*g* is a strong candidate for life so long as it is a "water world." According to the authors, water worlds are defined as "planets of non-vanishing continental area mostly covered by oceans."

The discovery of Gliese 581*g* being a strong candidate for sustaining life is especially important considering the vast quantity of planets just like it. According to NASA's *Kepler Discoveries* web page, the Kepler telescope alone has found over 4, 234 planet candidates in just five years. With the collaboration of other research, 120 planets have been deemed "habitable," according to *The Habitable Exoplanets Catalog.*

"Our results are another step toward identifying the possibility of life beyond the solar system, especially concerning Super-Earth planets, which appear to be more abundant than previous surmised," say the authors. More and more scientists are agreeing with the idea that extraterrestrial life is probable, given the abundance of Earth-like planets found in our galaxy already. If this is true, humanity will be one step closer to finding its place in the universe.

"[W]e have to await future missions to identify the pertinent geodynamical features of Gl[iese]581*g*…to gain insight into whether or not Gl[iese] 581*g* harbors life," write the researchers. The science community agrees: continued focus in researching the cosmos is necessary to confirm if we have neighbors.

Reflective Analysis

How do the rhetorical contexts for the scholarly article and the press release compare?

TIME and PLACE

The article was published by the journal, *Astronomy & Astrophysics* in 2011. The press release appeared in Raleigh, NC, three years later.

AUTHOR

Two of the authors, von Bloh and Bounama, are affiliated with the Potsdam Institute for Climate Impact Research, a German government-funded research institute, so they are scientific researchers who receive their funding from this organization. Their affiliation is stated on the article, which helps establish their credibility (*ethos*).

I am a student translating this article for readers who are not scientists. I had to be clear and accurate in my translation in order to be taken seriously by my readers.

STRUCTURE

The scholarly article uses a long and technical title, an abstract, and the IMRAD (Introduction, Methods, Results, and Discussion), structure common to scientific articles. My press release is much shorter and relies upon a catchy title, an epigraph, and an introduction to concisely convey the findings and a memorable conclusion to help the reader grasp the importance of these findings. The scholarly article ends with a sense of what should come next in the research rather than a reflection about what this might mean for humanity as my press release does. My readers are not scientific researchers, but they do think about life on other planets.

LANGUAGE

The authors freely use words specific to the field of astronomy and scientific research: "luminosity estimate of Gl 581," "Rayleigh number," "lithosphere," etc. I was not familiar with

those terms. I noticed the use of passive voice ("habitable zone is calculated"), which is also a hallmark of scholarly writing in the sciences. I used words the general public could understand, and where I had to use complex terms, I explained them in the press release for my audience. Mostly I summarized and paraphrased the findings in the article so that my audience could understand them more easily.

REFERENCE CONVENTIONS

The presence of cited sources throughout the "Goldilocks" article and the list of references at the end tell me that the *genre* of this piece is a scholarly journal article whose *purpose* is to present new findings (the topic of the article) to fellow scholars in the field.

I did not cite sources in my press release because that type of reference convention is not part of the press release *genre*. I used quotations sparingly and made clear to the reader that those words belonged to the authors of the article.

The article relies heavily on mathematical equations to explain the methods and findings, which a scholarly audience would expect in order to test the findings; I used data just once. My choices were driven by the genre conventions of the press release, my audience, and my purpose, which was to inform the general public in simplified terms about the technical, but important findings, of this study.

*What is the **purpose** behind my communication of the research findings?*

The obvious purpose behind writing a press release is to let the general public know that the possibility for life on other planets exists outside of the movies and science fiction; however, promoting the Potsdam Institute for Climate Impact Research and the researchers, as well as possibly securing future funding, are also goals of the press release.