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The Lost World of Venus

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Abstract: ***This research delves into the potential existence of prehistoric life on Venus, Earth's neighboring twin, by examining the dimensional similarities, atmospheric conditions, and other life - supporting factors shared by both planets. Supported by photographic evidence and previous studies, this investigation presents the possibility of contemporary microbial life and hypothesizes the existence of past human - like life on Venus. Furthermore, it theorizes the migration of the last surviving organisms from Venus to Earth, challenging current beliefs regarding human evolutionary history. This study also explores potential causes for the extinction of life on Venus and discusses the implications for Earth's future, considering how our planet might face a similar fate.***

Keywords: Venus, Life, Earth, Humans

1. Introduction

The exploration of extraterrestrial life has long captivated scientific inquiry, with Venus, Earth's neighboring twin, emerging as a subject of profound interest. This research aims to investigate the potential existence of prehistoric life on Venus by examining the striking similarities between Venus and Earth in terms of dimensional attributes, atmospheric conditions, and other factors conducive to supporting life. Through the analysis of photographic evidence and the synthesis of previous studies, this research proposes the presence of contemporary microbial life and postulates the existence of ancient human - like civilizations on Venus.

Additionally, this study theorizes the migration of the last surviving beings from Venus to Earth, presenting a provocative challenge to the prevailing theories of human evolution. By considering the hypothetical reasons behind the annihilation of life on Venus, this research seeks to draw parallels with Earth's potential future, raising critical questions about the sustainability of life on our own planet. Through this multifaceted exploration, we aim to contribute to the broader understanding of planetary habitability and the dynamic processes that influence the emergence and extinction of life. This research also seeks to postulate that, if Venus was once capable of sustaining life and subsequently transitioned to an uninhabitable state due to factors that will be discussed herein, a similar trajectory could potentially ensue for Earth. By examining the processes and mechanisms that could have rendered Venus inhospitable, this study aims to draw analogies to Earth's future, considering the possibility that our planet might undergo analogous existential transformations.

2. Literature Review

A study published in September 2019 proposed that Venus might have possessed surface water and maintained habitable conditions for approximately 3 billion years, potentially persisting in this state until 700 to 750 million years ago. If this hypothesis is accurate, it would have provided a substantial temporal window for the emergence of life and the potential evolution of microbial organisms to more complex aerial forms. Subsequent research and advanced climate models have since examined this hypothesis, leading to varying conclusions and further debate regarding Venus's climatic and biological history.

Reported on October 26, 2023, new studies stated that Venus may have exhibited plate tectonics in ancient times, suggesting the possibility of a more habitable environment capable of supporting life forms. This hypothesis implies that Venus could have sustained conditions conducive to life. Given the scarcity of comprehensive analysis on Venusian

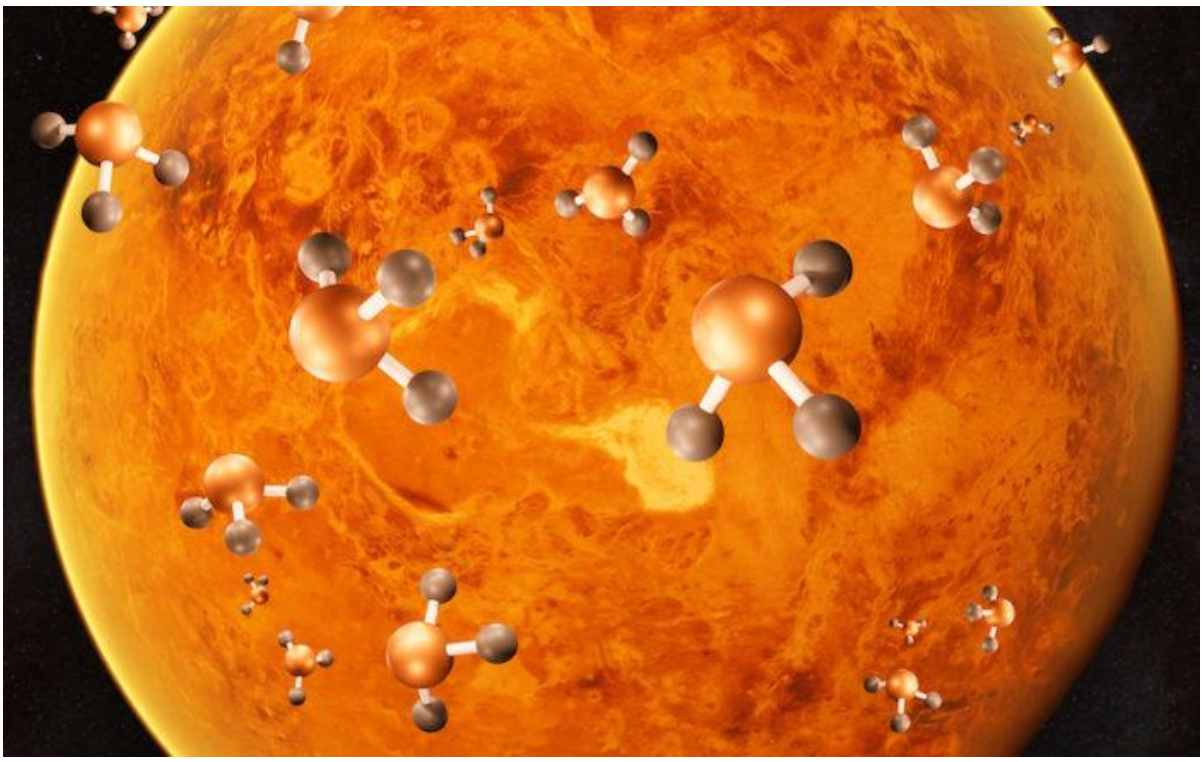
surface material, the discovery of evidence for past life remains plausible, contingent upon the deployment of a probe capable of withstanding Venus's current extreme surface conditions. However, the planet's resurfacing over the past 500 million years significantly diminishes the likelihood that ancient surface rocks potentially containing biosignatures, such as those associated with the mineral tremolite have survived to the present.

According to computer models developed by scientists at NASA's Goddard Institute for Space Studies (GISS) in New York, Venus may have possessed a shallow liquid - water ocean and maintained habitable surface temperatures for up to 2 - 3 billion years during its early history. These advanced climate simulations suggest that Venus could have sustained conditions conducive to liquid water, indicating a prolonged period of potentially habitable environmental conditions. While the discussion thus far has centered on the potential existence of advanced organisms on Venus in its distant past, contemporary speculation also extends to the possibility of microbial life within Venus's atmosphere. Current research suggests that the harsh conditions on the planet's surface may preclude life, but the upper atmosphere could harbor microbial life forms.

Observations of the atmosphere's composition and recent findings have fueled ongoing debate about the potential for extremophiles or other microorganisms thriving in these high - altitude regions. It has been postulated that hypothetical microorganisms residing in Venus's atmosphere might utilize ultraviolet (UV) radiation from the Sun as an energy source. This hypothesis could account for the dark lines, referred to as "unknown UV absorbers, " observed in UV imagery of Venus. The presence of these unknown UV absorbers led Carl Sagan to propose in 1963 that microorganisms in the upper atmosphere might be responsible for absorbing UV light.

In August 2019, astronomers identified a persistent pattern of UV light absorption and variations in albedo in Venus's atmosphere, attributed to these "unknown absorbers. " This phenomenon could potentially involve novel chemical compounds or, intriguingly, large populations of microorganisms residing at high altitudes in the Venusian atmosphere. Furthermore, in January 2020, evidence emerged indicating that Venus is likely experiencing volcanic activity within the past 2.5 million years. The volcanic byproducts could serve as a source of essential nutrients for any potential microorganisms inhabiting the Venusian atmosphere, providing further insight into the possible biogeochemical processes at play on the planet.

The detection of phosphine (PH_3) in Venus's atmosphere by the Atacama Large Millimeter Array (ALMA) telescope was announced in September 2020. This discovery was significant because phosphine is not linked to any known abiotic production methods present or possible under Venusian conditions. However, the detection has been disputed by several subsequent studies. Phosphine is not expected to persist in the Venusian atmosphere due to its reactions with water and carbon dioxide under ultraviolet radiation. On Earth, PH_3 is associated with anaerobic ecosystems and may indicate life on anoxic planets. Related studies suggested that the initially claimed concentration of phosphine (20 parts per billion) in the clouds of Venus could indicate a plausible amount of life.



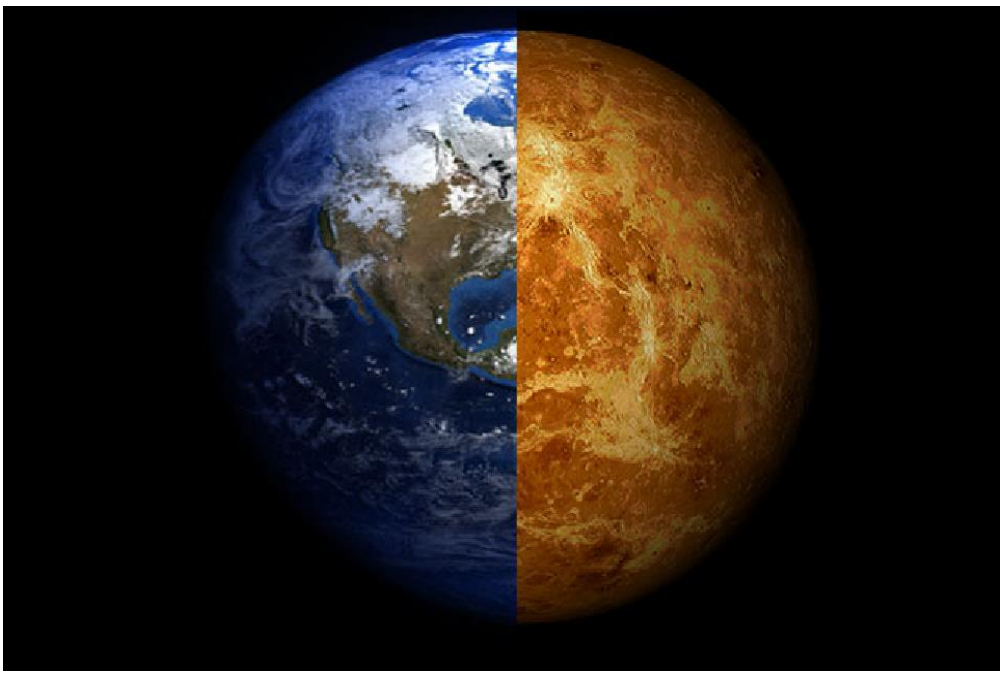
Modeling and Simulation: A recent study compared five climate simulations of Venus's past, suggesting that the planet could have supported liquid water and a temperate climate for at least three billion years. Venus, which formed 4.5 billion years ago, could have had temperatures ranging from 68°F to 122°F. However, between 700 and 750 million years ago, a massive release of carbon dioxide from the planet's rocks drastically altered its climate. Michael Way of

the Goddard Institute of Space Science, who presented his findings at the 2019 European Planetary Science Congress - Division for Planetary Sciences Joint Meeting, hypothesizes that Venus may have maintained a stable climate for billions of years before a near - global resurfacing event transformed it into the inhospitable world we see today. Previous studies, including Way's 2016 research, and data from NASA's Pioneer mission in the 1980s, suggested that Venus might have had an ocean. Despite Venus receiving more sunlight than Earth, simulations show it could still support surface temperatures suitable for liquid water.

The study conducted five simulations: three with Venus's current topography and varying ocean depths, and two with Earth's topography, including a deep ocean and an ocean world. These simulations indicated that Venus experienced a rapid cooling phase a few billion years after its formation, leading to an atmosphere dominated by nitrogen, with minimal carbon dioxide and methane. Around 700 million years ago, volcanic activity likely released massive amounts of carbon dioxide, leading to a runaway greenhouse effect and the extreme temperatures observed today.

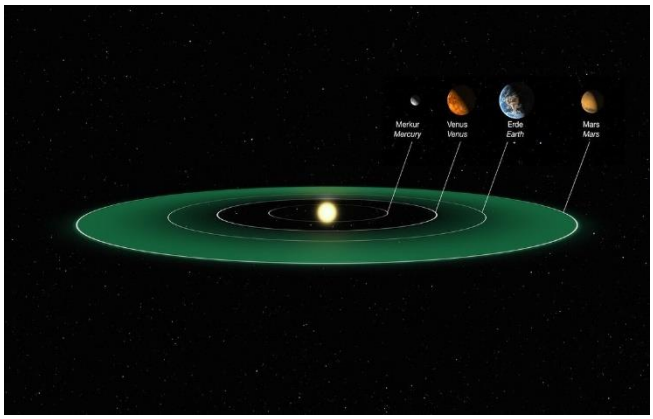
3. Results

In terms of their respective sizes, masses, and compositions, Venus and Earth exhibit considerable similarities. Earth possesses a mean radius of 6, 371 kilometers and a mass of 5, 972, 370, 000 quadrillion kilograms, whereas Venus has a mean radius of approximately 6, 052 kilometers and a mass of 4, 867, 500, 000 quadrillion kilograms. Consequently, Venus is approximately 94.99% the size of Earth and possesses 81.5% of its mass. These dimensional parameters suggest that Venus meets the primary criteria for supporting life, given its comparable physical characteristics to Earth.



According to data from NASA, the gravitational acceleration on Venus is approximately 8.87 m/s². This value corresponds to about 90% of Earth's gravity, implying that an individual weighing 100 kg on Earth would weigh approximately 90 kg on the surface of Venus. The surface gravity of Venus is but one of the many attributes that closely parallel those of Earth. Venus possesses approximately 86% of Earth's volume and about 82% of its mass. Additionally, the planet's density is nearly identical to that of Earth, measured at 5.243 g/cm³.

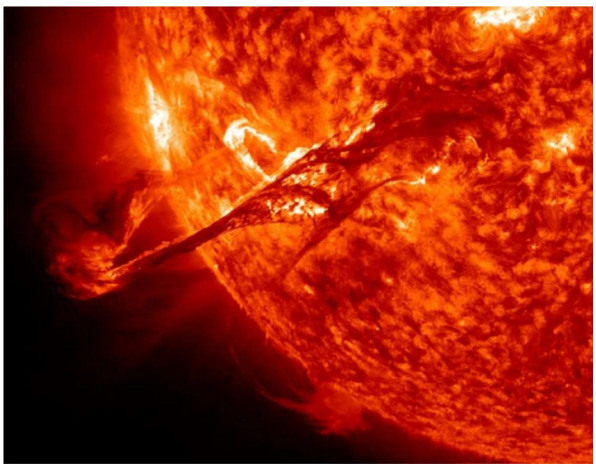
The Goldilocks Zone, or the circumstellar habitable zone, refers to the optimal region surrounding a star where conditions are favorable for the presence of liquid water on a planetary surface. This zone is characterized by a delicate balance of temperature, neither excessively hot nor exceedingly cold, allowing for the potential sustenance of life. Venus, akin to Earth, resides within this habitable zone of our solar system.



There is compelling evidence that Venus once harbored life - supporting elements and factors, such as the presence of water in its past. This bolsters our hypothesis regarding the potential for life on Venus. In subsequent sections of this paper, we will explore various theories concerning the extinction of life on Venus and discuss the possibility that Venus may have played a role in the emergence of life on Earth.

4. Discussion

The reviewed evidence suggests that Venus once exhibited conditions conducive to life, with a potential habitable environment lasting up to 3 billion years. Recent studies and climate models reveal that Venus could have supported surface water and a stable climate before experiencing a dramatic shift due to extensive carbon dioxide release. The possibility of microbial life in Venus's upper atmosphere, driven by UV radiation, adds complexity to our understanding of its past habitability. Although the detection of phosphine remains contentious, it hints at intriguing biochemical processes. Collectively, these findings underscore Venus's potential as a once - habitable world and highlight the need for further exploration to understand its role in the broader context of planetary habitability and the origins of life.



Our research and findings suggest that Venus was once a habitable environment, potentially hosting some form of life. However, the transition to its current inhospitable state is a complex issue. Several theories may explain this dramatic transformation:

Theory 1 - Solar flares might have played a pivotal role in Venus's transition to an inhospitable environment by dramatically increasing UV radiation and solar wind. This intensified exposure could have accelerated atmospheric stripping, severely depleted the atmosphere and exacerbated the greenhouse effect. The resultant surge in surface temperatures and climate destabilization would have rendered the planet's conditions lethal for any existing life forms, leading to their extinction.

Theory 2 - **Runaway Greenhouse Effect** - A massive accumulation of greenhouse gases, particularly carbon dioxide, could have triggered a runaway greenhouse effect, causing a rapid and extreme rise in surface temperatures and creating conditions too harsh for life.

Theory 3 - Elevated levels of solar radiation from intense solar flares may have significantly increased UV exposure, potentially destroying surface life and contributing to a more hostile environment.

Theory 4 - Extensive volcanic eruptions could have released vast quantities of greenhouse gases, exacerbated the greenhouse effect and caused drastic changes in climate that would have been detrimental to any life forms.

These were the theories regarding the potential annihilation of life on Venus, but now we will delve into the intriguing possibility that life on Earth could have originated from Venus, offering a compelling narrative of interplanetary exchange and the seeding of our planet with the precursors to biological complexity:

Theory 1 - Another intriguing hypothesis proposed by me states that Venus could have hosted an advanced civilization akin to humanity. In this scenario, as Earth faces potential annihilation in the future, akin to our current plans to colonize Mars, these advanced beings could have viewed Earth as a suitable replacement and migrated here. This speculative theory challenges our present understanding of human evolution and raises profound questions about the potential for interplanetary migration and the influence of extraterrestrial civilizations on the development of life on Earth. If substantiated, this hypothesis would profoundly alter our perspective on the origins and development of human civilization, suggesting a complex interplay of cosmic events and intelligent agency in shaping the history of our planet. It would invite reevaluation of the factors contributing to the

rapid advancement of Homo sapiens and the unique ecological niche they came to occupy on Earth. Further exploration and interdisciplinary research would be required to assess the plausibility and implications of such a transformative hypothesis in the context of both terrestrial and extraterrestrial science.

Theory 2 - Speculations have arisen concerning the potential for life on Venus to have reached Earth through lithopanspermia, facilitated by the ejection of icy bolides capable of preserving multicellular organisms during extended interplanetary journeys. Current hypotheses suggest that Venus might have harbored conditions conducive to habitability at certain epochs. It is postulated that complex life forms could have evolved on the radiation - exposed surface of Venus and subsequently been transported to Earth via asteroids. This framework aligns with observed patterns in the fossil record where there are abrupt appearances, diversifications, and extinctions of highly developed life forms during the Cambrian and Ordovician periods. Moreover, it provides a plausible explanation for the remarkable genetic diversity that emerged during these geological epochs.

Conclusion: In conclusion, the research explores Venus as a once - potentially habitable planet with conditions similar to Earth, where the presence of liquid water and a stable climate may have persisted for billions of years. Various theories, including solar flares, a runaway greenhouse effect, volcanic activity, and UV radiation, are proposed to explain Venus's transition to its current inhospitable state. Moreover, the paper examines hypotheses regarding the potential transfer of life from Venus to Earth via mechanisms like lithopanspermia, suggesting that Venus could have hosted microbial life or even advanced civilizations. This challenges traditional perspectives on the origin and evolution of life on Earth, positing interplanetary exchange as a possible influence. Overall, the findings underscore the significance of Venus in understanding planetary habitability and the origins of life within our solar system, emphasizing the need for continued exploration and interdisciplinary research to unravel its complex history and potential contributions to the development of life on Earth.

Looking forward, future research in the study of Venus and its potential past habitability, as well as its influence on Earth's biological history, could focus on several promising avenues:

- **Exploration Missions**: Continued and enhanced exploration missions to Venus, including orbiter missions, landers, and atmospheric probes, can provide deeper insights into its current and past conditions. This includes investigating surface features, atmospheric composition, and potential biosignatures.
- **Climate Modeling and Simulations**: Advancements in climate modeling and simulations specific to Venus can help reconstruct its past climates and understand the mechanisms responsible for its environmental transformation. This includes refining models to simulate early Venusian conditions and their evolution over geological time scales.
- **Remote Sensing Techniques**: Developments in remote sensing technologies, such as improved spectroscopic methods and radar imaging, can offer detailed observations of Venus's surface and atmosphere, potentially revealing evidence of past water bodies, geological activity, and atmospheric dynamics.
- **Search for Biosignatures**: Techniques for detecting biosignatures, both in Venus's atmosphere and potentially within surface materials, can be advanced. This includes refining methods for detecting complex organic molecules and biomarkers that could indicate past or present life.

Final Views: Modern humans, based on current scientific understanding, have existed for approximately 300, 000 years, although our ancestral lineage extends much further back. In contrast, Venus has existed for nearly 4.5 billion years, presenting a vast timeframe for potential biological processes and the development of life. Given this immense age, it would be premature to dismiss the possibility of life on Venus in its earlier epochs. Continued research in this field holds significant promise. Investigating Venus's geological history, surface conditions, and atmospheric composition could provide crucial insights into its past habitability and potential for harboring life. Such studies may uncover evidence of microbial life or other forms of biological activity that could offer profound implications for understanding the origins of life not only on Venus but also its potential influence on the development of life on Earth. Moreover, exploring Venusian environments through advanced missions, enhanced analytical techniques, and interdisciplinary approaches could reveal key clues about the broader context of planetary habitability within our solar system. These efforts may ultimately reshape our understanding of the conditions necessary for life's emergence and evolution, potentially unraveling fundamental aspects of our own origins as humans. In essence, by continuing to investigate Venus's ancient history and potential for past or present life, we open avenues to explore profound questions about life's persistence and diversity across celestial bodies, offering a deeper perspective on our place in the universe and the interconnectedness of planetary evolution. If global warming and emission of greenhouse gases is not curbed then earth could end up becoming like Venus.

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