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Research Article

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ASTRO PHYSICS SCIENCE RESEARCH: THERE MAY BE SIGNIFICANT ICE, LIQUID GAS, AND WATER UNDERGROUND ON MARS

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ABSTRACT

Nowadays, many scientists are still puzzled about whether there is any liquid water inside Mars; many of them emphasize different explanations, but none provide a definitive answer. It is difficult to examine the inner core of Mars. Usually, they use telescopes for radioactive wave measurement, but these activities often lead to a wide range of results. In this Astro Physics Science Research, we will utilize a new conceptual approach to indicate that a significant amount of liquid water may exists underground on Mars. This will introduce a new understanding of Mars' interior.Many research studies suggest that there could be a lot of ice inside Mars; it might seem true or nothing definitive is confirmed. This means their research might indicate there is no water inside, as their estimates always have a wide range. This implies that most of their studies need more confidence in their validity, especially in their experimental assumptions. So, in this research paper, we will develop a new concept that may align well with their approach, and we will use their findings, particularly from NASA, to improve and modify our concept assumptions, leading to a more solid underlying mechanism.

Keywords: Mars Ice, Mars liquid gas, Underground water, Mars Ocean.

INTRODUCTION

Historically, there has been little evidence supporting the idea that liquid water once flowed on the surface of Mars. In this Astro Physics Science Research paper, we provide a mechanism to explain the indication that a significant amount of liquid ice-forming water is present underground on the Mars and another similar planet (more important). This research offers new insights into this concept. We estimate that liquid water existed on Mars over 3.45-3.5 billion years ago (est.). This paper suggests that Mars once resembled Earth's environment, with an atmosphere and ocean. However, due to the cooling effect of Mars's magnetic pole, the disappearance of its atmosphere, low air pressure, and water vapor content made it difficult for liquid water to exist and remain stable, causing some of the water to escape into space. This study indicates that water may have been preserved as ice caps beneath Mars, due to heavy bombardment in the past, and the extreme weather condition that leads to cracks in the surface of Mars, which causes water to leak and become trapped in the inner core of Mars, and notes that Mars is farther from the sun. Extreme temperature variations ranging from the average from the average temperature on Mars is around-60°C (-76°F), but temperatures can soar to about 20°C (68°F) during the day at the equator and plummet to as low as-140°C (-220°F) or even colder at night [1] or near the poles,could cause surface contraction and expansion, leading to cracks. The research suggests these cracks might trap water, which then becomes ice with some residual liquid water within the ice.

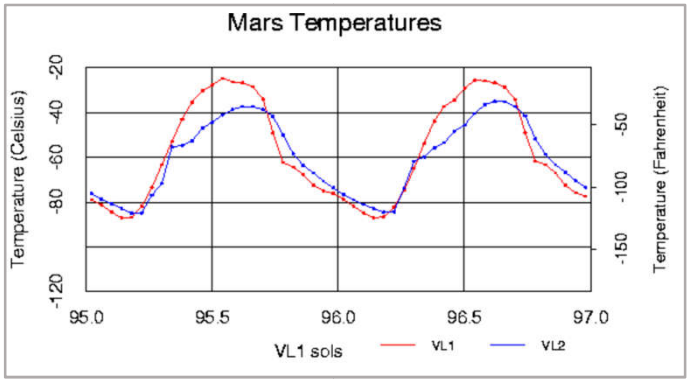

Figure 1: Mars Weather Conditions [1]

Expansion and contraction caused by extreme weather may affect Mars and generate seismic waves that help map the planet's interior. This paper will present a study analyzing sea wave segmentation from the Marsquake crack and space rock impacts detected by NASA [2]. These types of earthquake activities are similar to the behavior of Mars' seismic waves recently detected by NASA [3]. In the case of Mars, we believe there are types of seismic waves inside, as the crust beneath the area on the backside of Mars might contain a liquid ice formation, possibly the liquid ice of water remaining beneath the surface of Mars.

The concept of cold contraction and thermal expansion creates a kind of underground adiabatic expansion that causes a fragment to crack inside Mars. Beneath the surface, this may transform into a pulse that shifts into adiabatic contraction, resulting in cracks on the Mars surface. These cracks can trap water underneath the surface. As the internal pressure compresses and decompresses, it may generate a form of vacuum compression, which eventually brings a large amount of liquid ice water underground, forming Ice and also produces icy-liquid water, making Mars a potential underground water resource planet.

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The fundamental formation of Mars remains unclear. Indeed, Mars has a period of time far away from the Sun as it orbits, while there is a period of time that is far from Earth. Possibly due to an inadequate internal structure. One theory suggests the presence of a trapped core of ice and liquid inside Mars.

We believe that the imbalance in movement caused Mars to shift at a direct angle billions of years ago. According to the Mars and star-migration theory, NASA found numerous impact craters, indicating that Mars was hit by rocks from outer space. These impacts would have caused cracks, allowing surface water to seep into underground caves. Many scientists previously believed that Mars may have had an ocean. Still, as the Martian magnetic field weakened, the atmosphere was gradually stripped away by solar protons, leading to the evaporation of the Martian ocean. However, our research suggests that rocks from space that hit the surface of Marscould have created cracks where liquid water could have escaped beneath the Martian surface. Furthermore, the trapped ocean water may have become ice due to Mars' weather conditions. We also believe that Mars may contain both liquid and frozen water and trapped energy gases due to intense surface pressures.In addition, we also strongly believed that the extreme weather conditions on Mars caused cracks in the surface of Mars, which led to water leaking into the caves beneath of Mars.

According to the latest image from NASA [4], observing an ocean-like pattern on Mars is possible. This pattern may suggest that there used to be river deltas on the planet, indicating the existence of ancient oceans. River water on Mars could support the research paper's suggestion that Mars once had oceans. The interaction of water with the planet's surface and the formation of cracks could have trapped liquid water inside the planet, potentially leading to the formation of ice beneath its surface.Scientists have detected Martian seismic waves using an unmanned probe; this paper suggests and concludes that there is an area of pores and fractures filled with liquid ice water deep inside Mars. These ice-liquid water reserves are significant enough to have formed an ocean covering Mars billions of years ago. Based on the discovery by NASA, this paper predicts that Mars could have had an environment suitable for life in the past or even now; it is believed that some form of life may have existed on Mars until now.

There are sufficient reserves to form an ocean capable of covering Mars

This study collected the data from NASA open source with over 2 Martian data points between 2010 and 2025 [4]. After analyzing the data, we estimated a substantial ice-forming liquid reservoir 25 to 38 kilometres below the surface of Mars. This reservoir far exceeds the amount of ice water formation previously thought to have existed. It contains enough potential energy to cover Mars, with ice-gas-liquidise-water depths reaching 20 to 21 kilometres. Although these ice-forming groundwater resources are too deep to be mined, this aquifer could serve as a "shelter" for existing energy resources.

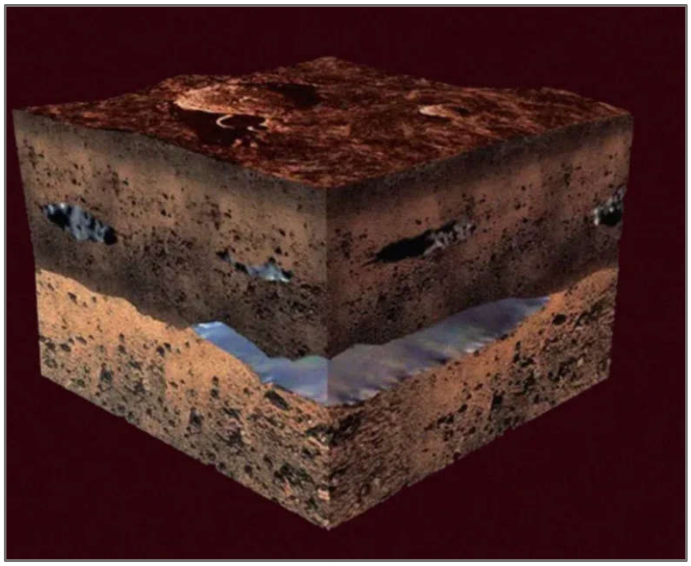

Figure 2: Calibration of Mars' inner core(Est.) (Cc: NASA)

Rivers and lakes existed on Mars billions of years ago

This paper suggests that the liquid ice form of water found on Mars may have originated from the rivers and lakes that once existed billions of years ago. This ice likely seeped into the Martian ground through cracks in the rocks. According to our projections in the above, the Martian crust may remain warm enough at certain depths to support ice-liquid water. In contrast, at shallower depths on the far side of Mars, where sunlight rarely reaches, water would freeze into solid ice. This significant possibility of liquid water raises the chances of past or present life or microorganisms on Mars, as it could provide suitable conditions for supporting life. This idea is further supported by the presence of life in deep mines and on the seafloor on Earth, suggesting that deep underground aquifers on Mars might also be capable of harboring life.

Numerous pieces of data from NASA [5] support the presence of river channels, deltas, and lake sediments on Mars. These findings align with our hypothesis that liquid water once existed on the Martian surface. However, this watery period ended over 3.45-3.5 billion years ago when Mars lost its atmosphere. This study suggests that most of the water on Mars did not escape into space but instead seeped into the planet's crust, likely due to the space rock bombardment and the conditions we mentioned.

According to NASA [6], space exploration in 1997 and 2025 respectively has identified significant heavy bombardment around the northern surface of Mars, which may indicate the presence of past segmentation and cracks. Based on these findings, this paper suggests that there could be some caves beneath Mars's surface. Besides these caves and cracks, water on Mars might be trapped inside these caves, leading to the formation of pure water ice, gas ice, and other types of ice inside these underground caves that is cover up by the surface.This research paper suggested that the water trapped in the backside of Mars could have affected its tilt by 0.000000000000000000000001 to 0.000000000000000000000002 degrees (Est.), potentially influencing star migration earlier.

Additionally, this paper suggests that due to uneven bombardment, there may be an irregular pattern of impacts on the south face of Mars; this could cause cracks to develop differently and influence ice distribution. Some ice may contain gas, while others could be pure water ice. This imbalance in bombardment might create varying pressures inside Mars, leading to different patterns of ice spread and gas presence within the ice. Considering the whole planet, including

its backside, it is proposed that an orange structure may exist, with some areas possibly containing liquid ice and others showing ice formations within cave cracks. This orange surface on Mars, along with internal ice formations, could significantly change the planet's appearance. Evaporation might also cause surface desiccation, while ice remains within Mars's inside crater.

This research paper's projection is well supported by NASA data, suggesting that due to uneven bombardment on the south face of Mars, cracks would develop differently, potentially affecting ice distribution. Some of the ice may contain gas, while others may be pure water ice. This uneven bombardment may create varying pressures inside Mars, leading to different patterns in ice distribution and the presence of gas within the ice. Considering the entire planet, including the backside, it is proposed that an orange structure may be present, with some areas possibly containing liquid ice and others having ice formations within cave cracks. The formation of this orange structure condition within Mars's ice is supported by NASA evidence. These orange surfaces beneath the ice could significantly alter Mars's appearance. Evaporation may also cause the surface to desiccate, while ice remains within Mars's Halmant crater.

Based on data and images from NASA [7], this research paper strongly suggests that there is liquid ice water format deep below the surface of Mars. By analyzing impact craters on the surface of Mars, the researchers inferred the presence of liquid water approximately 25 to 28 kilometres below the surface. It is believed that Mars lost most of its surface water over billions of years, leaving it dry and dusty. However, some water may have been trapped in cracks and turned into ice. This research suggests that this ancient water may have either escaped into space or still exists on the far side of Mars. This groundbreaking suggestion strongly supports the presence of water and this paper predicts there will/may have microbial life on Mars.

In addition, this paper suggests that liquid water may have flowed on the surface of Mars in the past. The research provides new insights into this idea and confidently estimates that liquid water existed on Mars over 3.45-3.5 billion years ago(Est.). At that time, Mars had an atmosphere and an ocean similar to Earth, but due to the loss of its atmosphere, Mars faced shallow air pressure and water vapor content. Some water may have been preserved as ice caps within the Martian crust. This research paper also suggests that further exploration of Mars by NASA and the China Space Agency may reveal more evidence to support these ideas. Additionally, our paper predicts that there may be forms of life or microorganisms on Mars due to the presence of water, which is a crucial ingredient for life.

CONCLUSION

This research paper presents new insights into the idea that liquid water existed on Mars over 3.45-3.5 billion years ago (Est.). We suggest that Mars may have had an environment similar to Earth's, with an atmosphere and oceans covering its surface. However, the cooling effect of the Martian magnetic field led to the disappearance of the atmosphere, resulting in a thin air layer, a lack of stabilization, and some of the water being lost to space. This study proposes that water may be preserved as ice caps beneath the Martian surface due to heavy bombardment, and the greater distance from the sun may have created extreme temperature ranges from +20 degrees to -140 degrees Celsius. These temperature fluctuations could have caused contraction and expansion, cracking the surface of Mars. As a result, the water on the surface of Mars may have leaked into caves and become trapped inside the core before vaporizing.

This research indicates that water might have seeped into these cracks and become trapped, forming ice with some liquid water mixed in. Hope this article benefits the world and humanity.

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[4] Research in PNAS reports on InSight NASA mission findings about water in Martian crust.
[5] Reviews and assessments of Mars's water inventory in NASA-accessible repositories, including studies on polar ice deposits, surface ice, and ancient water bodies.
[6] PDS Mars Exploration Rovers Data Release 25.NASA-564.
[7] The NASA dataset for the 2025 Mars water inventory release can be accessed via the Planetary Data System (PDS) with metadata updated as of August 22, 2025. NASA.

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