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Martian Life: A Possibility-remote Exploration of Martian Subsurface

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Abstract

The momentum for the search for life in the universe beyond Earth has resurged recently driven by Earth-like planets results from the Kepler space telescope as well as major financial support from wealthy individuals.

There is also the question of whether there was life elsewhere in the universe.

Since 2008, I have been developing a technology that would enable remote subsurface research of cosmic objects such as planets like Mars. This article discusses and describes the results achieved.

Keywords: Life beyond earth; Martian life; Water on mars; Kepler space Telescope; Mars rover

Introduction

The question of whether life exists elsewhere apart from Earth is of fundamental importance. It is a question being asked more widely, more scientifically, more hopefully these days. This is in contrast to the past, often for valid reasons [1].

In the past few weeks and months, there have been positive public statements issued by prominent NASA scientists [2]. For example, surface liquid water flow on Mars is now factual [3]. A fact that increases the possibility of existence of life many fold.

NASA now expects to find signs of life beyond Earth [2]. Other Space agencies outside of the USA such as the European Space Agency (ESA) have become more active in the search. Even highly wealthy individuals from Russia [4] and USA [5] have pledged huge financial backing for Astrobiology focused research institutes such as the Search for Extra-terrestrial Intelligence (SETI) agency

So where is the focus for all this resurgent interest in extra-terrestrial life search? Mars, Europa, Enceladus, Titan, Venus, Calisto and Ganymede are at the top of the list so far [6].

We are now in a positive extra-terrestrial search environment. So much so that NASA's chief scientist has expressed optimism of finding exo-Earth life in the next 10-20 years [2]. Further, a Russian billionaire has pledged US$100 Million [4] to support research to achieve the same aim within a similar period.

Sometime in 2007-2008 I embarked on research to find a way to view behind surfaces. The result was ASTIR (Advanced Space Time Image Recovery). Along with other subsurface applications for ASTIR, I have been using it to remotely explore the subsurface of Mars and other cosmic locations.

The objective of this brief article is to share some of the result I have been able to attain while conducting the same search for exo-Earth life on Mars.

Method

Why did I not just use existing imaging technology? Key provisos were:

1. The equipment must be affordable.
2. The equipment must be able to operate remotely.
3. The equipment must deliver visual results not data.
4. The equipment must deliver real images not simulations.
5. Ideally, the equipment must be able to deliver still images/photos as well as motion images/videos.
6. The equipment must be able to view sufficiently deeply enough under Martian geological surfaces.
7. The equipment must be safe to operate.

MRI, x-ray, IR, Ultrasound, Molecular Imaging and similar were all discounted due to one or more of the above provisos. I therefore decided to develop ASTIR which would meet the provisos mentioned. Table 1 depicts a comparison of some of these technologies with ASTIR.

Comparison of sub-surface imaging technologies (Table 1)

Key:

ASTIR–Advanced Space Time Image Recovery

MRI–Magnetic Resonance Imaging

CT–Computer Tomography

GPR–Ground Penetrating Radar

IR–Infra Red

UV–Ultra Violet

T-ray–Tera-Hertz (sub-millimetre)

	ASTIR	X-ray	MRI	Ultra–sound	CT	GPR	IR	UV	TZ-ray
1-Emits radiation or wave	No	Yes	Yes	Yes	Yes	Yes	Yes/No	Yes/No	Yes
2-Operate over Internet	Yes	No	No	No	No	No	No	No	No
3-Child can operate	Yes	No	No	No	No	No	No	No	No
4-Use any camera	Yes	No	No	No	No	No	No	No	No
5-Fit in pocket	Yes	No	No	No	No	No	No	No	No
6-Use batteries	Yes	No	No	No	No	No	No	No	No
7-Less than US$10	Yes	No	No	No	No	No	No	No	No
8-Cost over US$10k	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes
9-Cost over 100k	No	Yes/No	Yes	No	Yes/No	No	No	No	Yes/No
10-Real photos & videos	Yes	No	No	No	No	No	No	No	No
11-Requires radiation shielding	No	Yes	Yes	Yes	Yes	No	Yes/No	Yes/No	Yes/No
12-Health&safety warnings	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
13-100s of Km distance	Yes	No	No	No	No	No	Yes/No	Yes/No	No
14-Use 100 yr-old images	Yes	No	No	No	No	No	No	No	No
15-Use 100 yr- old X-ray images	Yes	No	No	No	No	No	No	No	No

Table 1: Subsurface Imaging Technology Comparison Table.

- Emits a radiation or wave to the human body or target area (most are potentially dangerous in terms of health, pregnancy, cell damage, heart pacemaker, medical implant or detection by enemy).
- Subsurface images can be captured in real-time directly over the Internet or corporate LAN.
- A five year-old child can use the image capture device.
- Image capture equipment can be any of the following:

phone camera, tablet camera, webcam, compact digital camera, public security camera, satellite camera, Earth to Space camera, Space rover camera, drone camera, surveillance camera or Space based camera.

- Image capture device can fit in a small pocket.
- Image capture device can use miniature batteries.
- Image capture device can cost less than US$10 apiece.
- Image capture equipment typically costs over US$10,000 to own and operate.
- Image capture equipment typically costs well over US$100,000 to own and operate.
- Captures images in real color and as photos and videos.
- Requires special enclosure or radiation shielding to operate.
- Health and safety warnings issued by national public health and safety agencies regarding radiation or wave emitted to be within certain safety levels.
- Subsurface of target area can be imaged at 100s of kilometers away from the image capture device.
- Subsurface of images captured since the last 100 years can be produced.
- X-ray images captured since the last 100 years can be enhanced by sub-surface imaging them with ASTIR.

ASTIR (Advanced Space Time Image Recovery)

ASTIR is able to utilize a combination of ambient radiation to recover otherwise invisible or unnoticeable features under a surface. The surface in question can be soil, clay, ice, snow, rock, mist, dust, skin, bone and more.

ASTIR only requires still or motion images from a digital image capture device to produce subsurface still and motion imagery. It uses original normal images as input which it then processes and outputs as a result image.

To be certain that ASTIR is indeed able to provide subsurface detail; exhaustive tests were conducted over several years, all the while, improving ASTIR.

Sample surfaces tested included sand, dust, rock, haze, ice, snow, clay, soil, concrete, paint, mud, skin, bone, fossil, foliage, steel, heat-resistant tiles (as used on NASA's space shuttles), cosmic gas, cosmic dust and more.

Some example result images are shown below. Each original image is shown beside its ASTIRized result image which we can refer to as an ASTIR scan.

Results

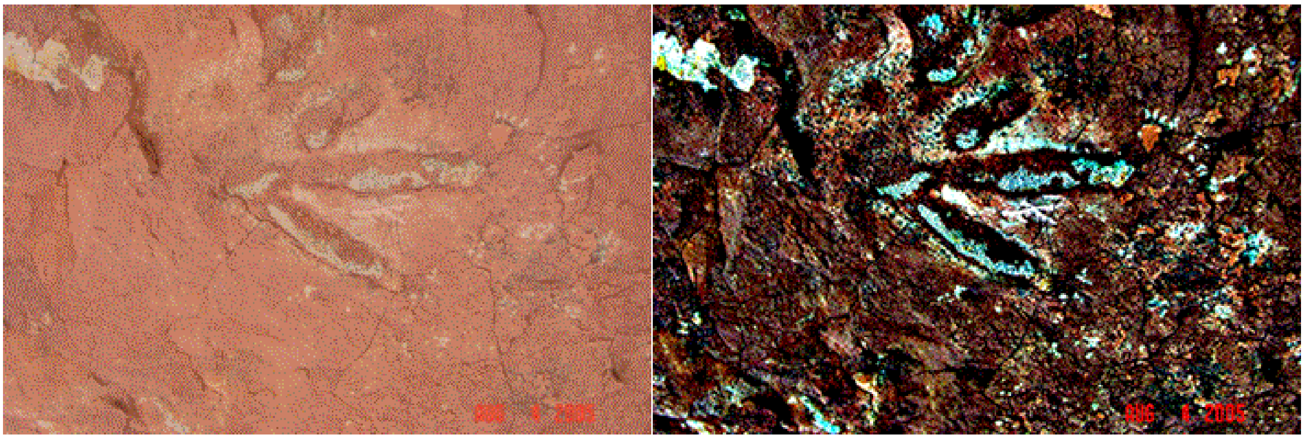
Example technology verification result images

Before commencing remote testing of the Martian surface, it is necessary to first ensure the ASTIR technology can recover subsurface images. This must be true for various surface types as well as for near objects and distant objects.

It is worth noting that the quality of ASTIR scans depends heavily on the original captured images. The higher the quality of the original image, the higher will be the quality of the ASTIR scan.

The definition of quality in this case includes resolution, blur, shadow, ambient radiation and other factors.

The following are sample results of the ASTIR tests to verify that subsurface and hidden features can be revealed using ASTIR (Figures 1-7).



Figures 1: Left is normal image showing dinosaur track. Right is an ASTIR scan showing dinosaur track [7]. *Note: leaves and seeds/berries features recovered by ASTIR.

Figure 2: Left is normal image showing snow covered street and air. Right is an ASTIR scan showing snow covered street and air [8]. *Note: revealed buildings, pavement and street stones etc.

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Figure 3: Left is normal image showing rock. Right is an ASTIR scan showing rock.

Figure 4: Left is normal image showing skin of foot. Right is an ASTIR scan showing skin of foot.

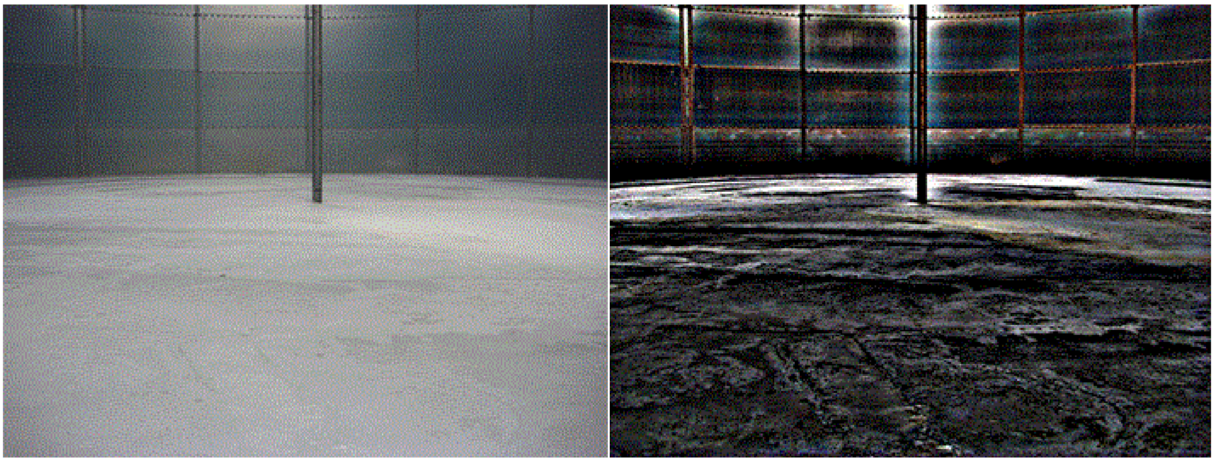

Figure 5: Left is normal image showing concrete floor and metal panels. Right is an ASTIR scan showing concrete floor and metal panels.

Figure 6: Left is normal image showing Haze. Right is an ASTIR scan showing Haze. *Note: Extensive ground features revealed by ASTIR [9].

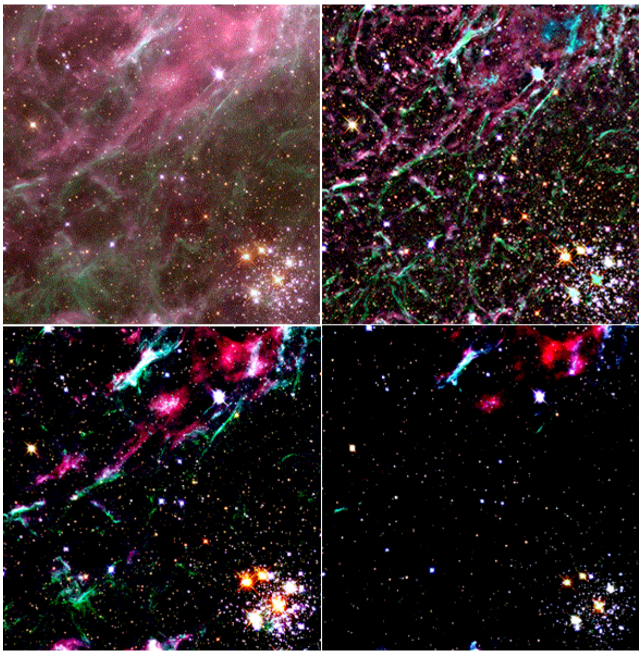

Figure 7: Top left is normal image showing Cosmic dust and gas-Tarantula Nebula(by NASA) [10]. Top right is an ASTIR scan level 1 showing Cosmic dust and gas–Tarantula Nebula. Bottom left is an ASTIR scan level 2 showing Cosmic dust and gas–Tarantula Nebula. Bottom left is an ASTIR scan level 3 showing Cosmic dust and gas–Tarantula Nebula.

Martian subsurface test result images

Scientists believe that Mars did not have extensive plate tectonic events as occurred and still occurs on Earth [11]. Many believe these events heavily contributed to the loss of the vast majority of the physical evidence of Earth's past life-forms that existed during the first billion years or more of life on Earth.

Imagine the archaeological treasure trove we would find as we emerged as modern humans tens of thousands of years ago if Earth too, had not lost so much to plate tectonic activity. Paradoxically, plate tectonics very likely was the engine that created the geological conditions on Earth that nurtured development of life.

Nevertheless, as we wondered at this treasure of archaeological remains, we may not even need to dig far, if at all, before discovering more of what existed a billion years before we emerged.

On Mars, this possibility exists [12-14], should there have been life on the planet.

The following are resulting ASTIR scans using original NASA images of Eberswalde Crater [15] and Erebus Crater [16] areas (Figures 8-23).

Figure 8: ASTIR scan of Eberswalde Crater (Original image [15] by NASA).

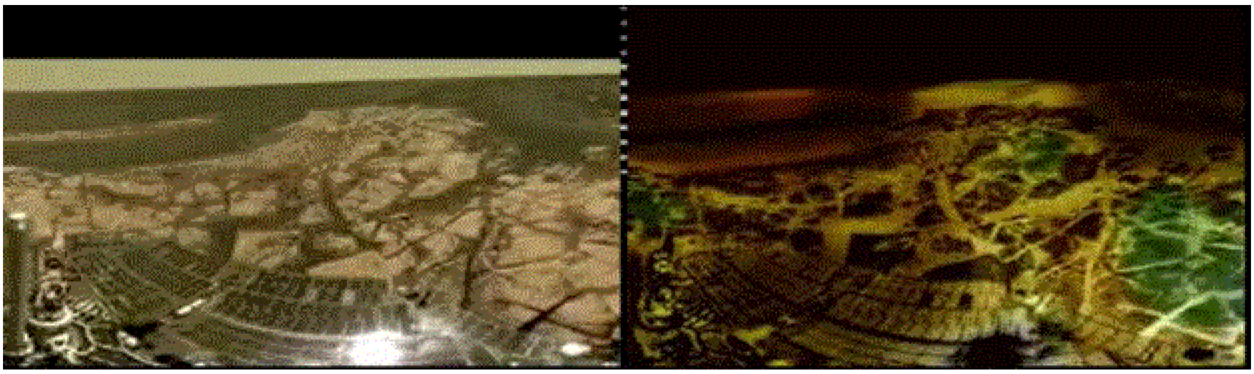

Figure 9: Erebus Crater-Left is original image [16] by NASA. Right is an ASTIR scan showing evidence of preserved biological remains 1. NASA's Opportunity Rover can be clearly seen.

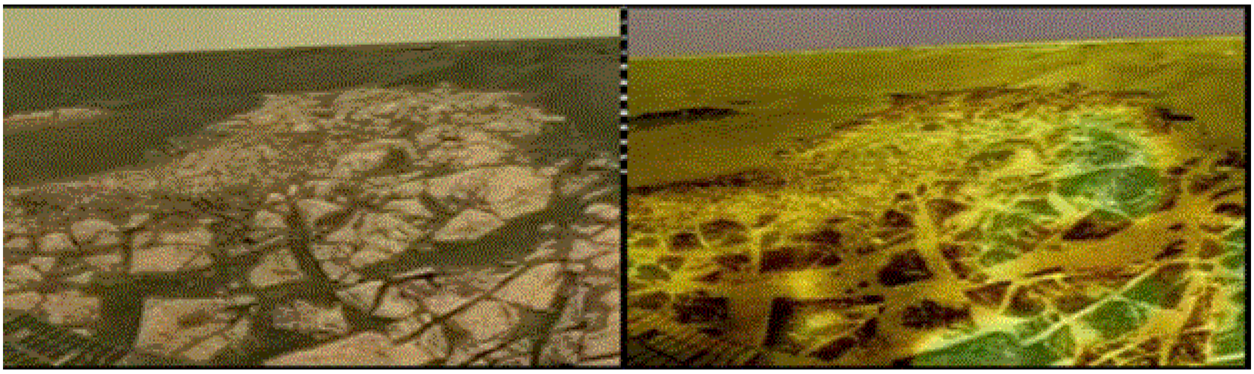

Figure 10: Left is original image [16] by NASA. Right is an ASTIR scan showing evidence of preserved biological remains 2.

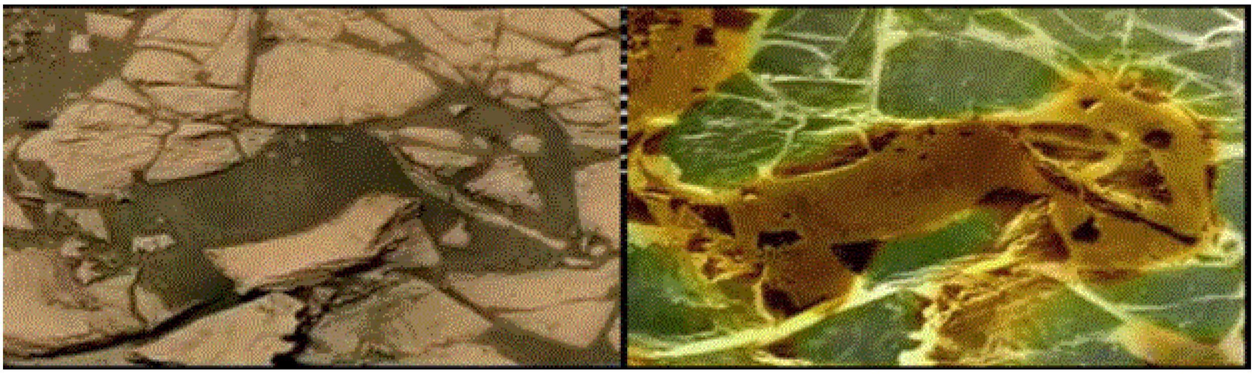

Figure 11: Left is original image [16] by NASA. Right is an ASTIR scan showing evidence of preserved biological remains 3. Close up of possible Martian life-forms.

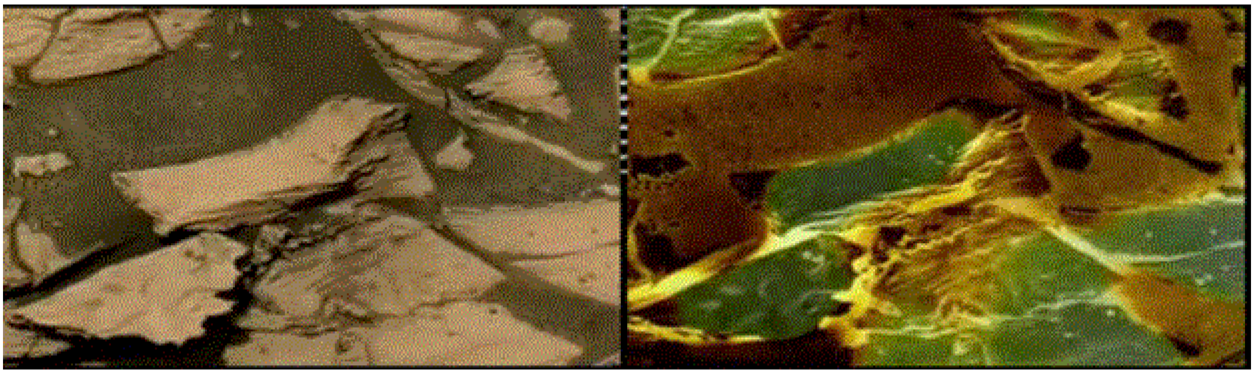

Figure 12: Left is original image [16] by NASA. Right is an ASTIR scan showing evidence of preserved biological remains 4. Close up of possible Martian life-forms.

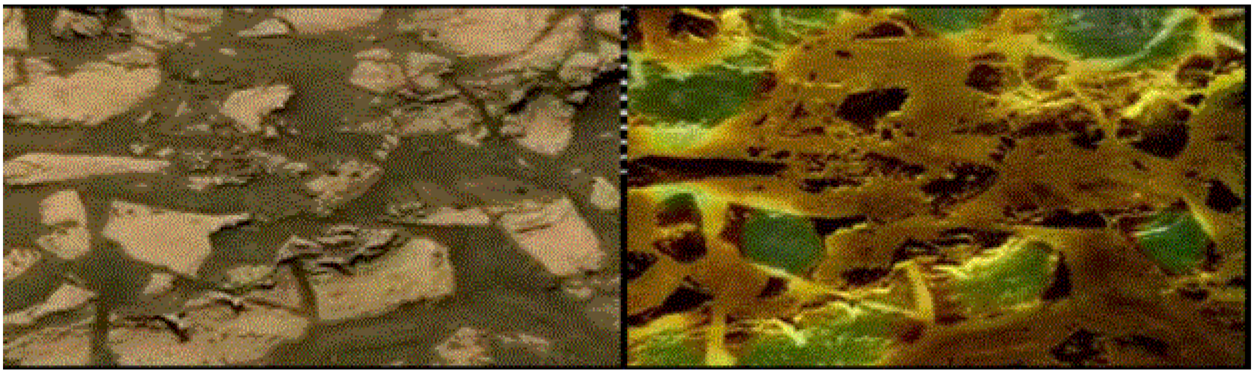

Figure 13: Left is original image [16] by NASA. Right is an ASTIR scan showing evidence of preserved biological remains 5. Close up of possible Martian life-forms.

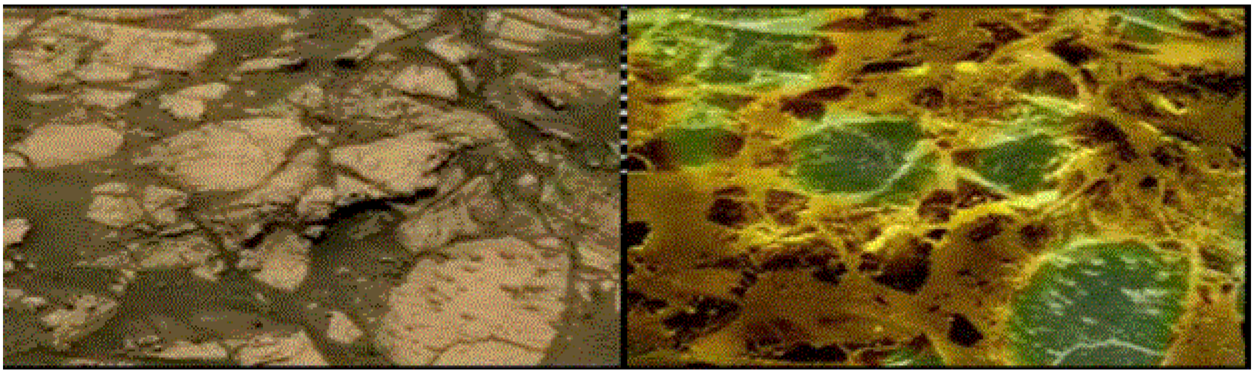

Figure 14: Left is original image [16] by NASA. Right is an ASTIR scan showing evidence of preserved biological remains 6. Close up of possible Martian life-forms.

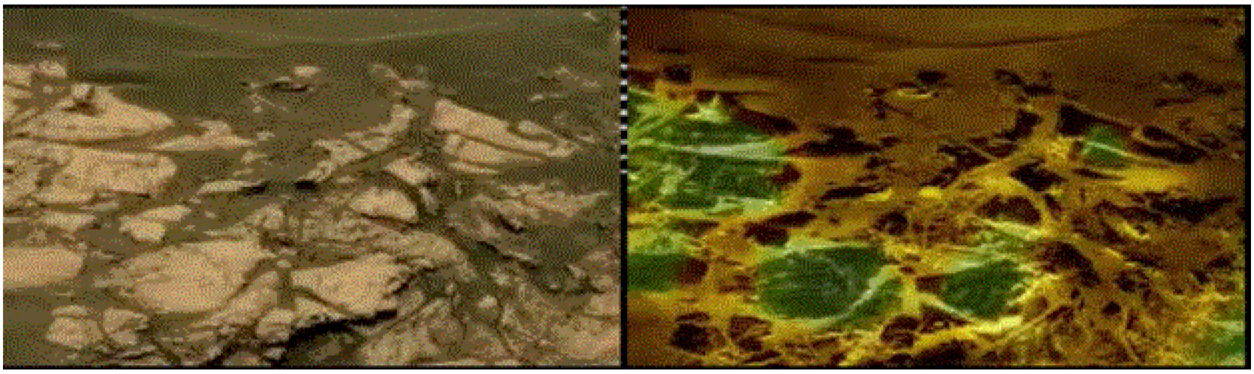

Figure 15: Left is original image [16] by NASA. Right is an ASTIR scan showing evidence of preserved biological remains 7. Close up of possible Martian life-forms.

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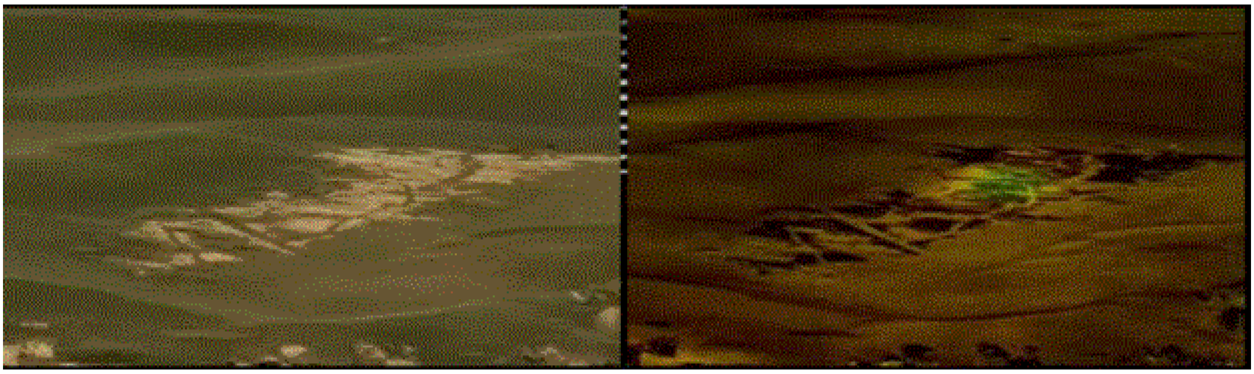

Figure 16: Left is original image [16] by NASA, on the right is an ASTIR scan showing evidence of straight edge objects/structure.

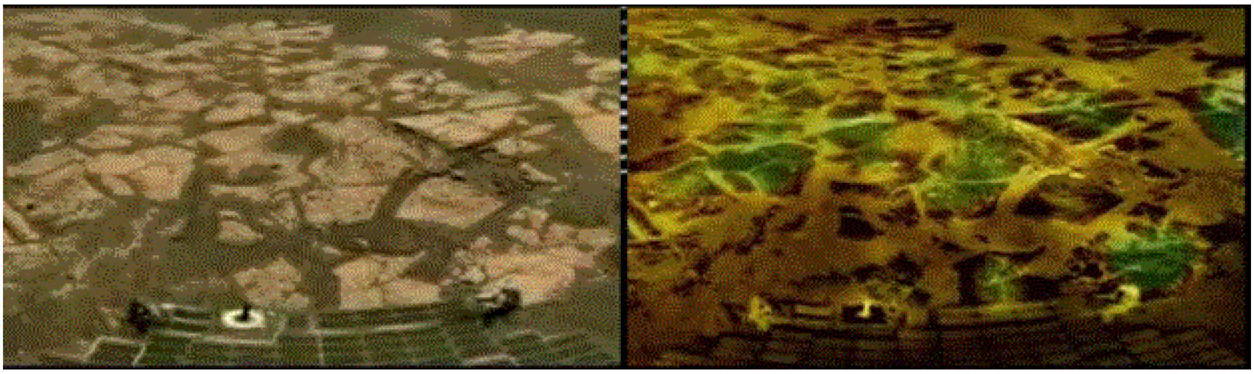

Figure 17: Left is original image [16] by NASA, on the right is an ASTIR scan showing evidence of preserved biological remains 8. Close up of possible Martian life-forms and NASA's Opportunity Rover.

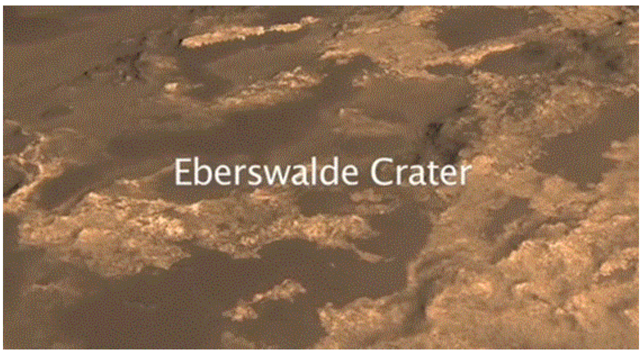

Figure 18: Original NASA image [15] of Eberswalde Crater.

Figure 19: ASTIR scan of Eberswalde Crater area 1. Note objects revealed at edge of this crater and in the muddy sediment.

Figure 20: ASTIR scan of Eberswalde Crater area 2. Note objects revealed at edge of this crater and in the muddy sediment. Close-up 1.

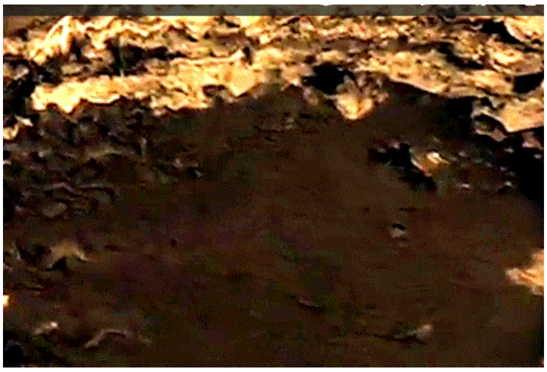

Figure 21: ASTIR scan of Eberswalde Crater area 3. Note objects revealed at edge of this crater and in the muddy sediment. Close-up 2.

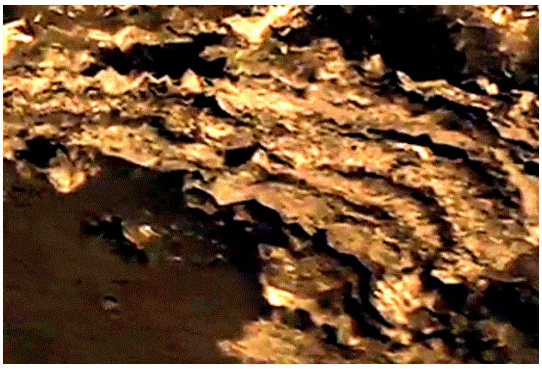

Figure 22: ASTIR scan of Eberswalde Crater area 4. Note objects revealed at edge of this crater and in the muddy sediment. Close-up 3.

Figure 23: ASTIR scan of Eberswalde Crater area 5. Note objects revealed at edge of this crater and in the muddy sediment. Close-up 4.

Conclusion

The technology verification tests on various surfaces confirmed that subsurface and hidden images can indeed be revealed by ASTIR. The surfaces were of objects near (on Earth) and far (in Space).

The results of using ASTIR on the Martian surface yielded subsurface and hidden features of the planet's surface. The subsurface ASTIR scans of the Erebus Crater area that surrounded NASA's Opportunity Rover appear to reveal images of preserved biological remains. They also appear to reveal features of possible deliberate structures.

The above result was only possible due to an ability to recover subsurface features. No doubt, when these Martian areas and beyond are excavated and the samples carefully studied, similar conclusions will be reached.

It would thus appear that there was possibly life; complex life, on Mars. As flowing liquid water has been confirmed on Mars' surface [3], there may also be the possibility that life still exists on Mars but had long withdrawn below the surface [17] due to the harsh surface conditions.

These results and images are shared with the hope of generating feedback and insight to further our search for life beyond our planet.

Note 1

- When Galileo Galilei presented his observational results of the skies, he would not only have had to describe in detail his use of the technology called the 'telescope' but also describe comparisons of the 'alternative technologies' such as religious and philosophical paradigms that existed as de-facto guides to the cosmic bodies above.

- Similarly, an explanation of the reasons why Einstein utilized 'thought experiments' as compared to the alternative methods (some obvious, some not) would not have been out of place in describing the results and conclusions he was able to achieve.

- The Kepler Space Telescope is a tool based on a technique of monitoring notable drops in relative light intensity from cosmic

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objects [18]. The telescope's inspirational discoveries of new distant planets (some assumed to be potentially habitable) are widely accepted yet; the telescope does not render visual imagery of these newly discovered planets. A comparison of alternative planet search methods contributes to collective knowledge and plausibility of Kepler's search methods and the subsequent conclusions drawn and widely accepted. However, follow-up will still be required to finally confirm its results.

The author assumes the readership of the journal has broad scientific knowledge including of the various imaging technologies available. It would therefore be remiss of this paper to present results without reasonable explanation of the technology that has enabled the results and the reasons for selecting it versus alternatives. This is especially true given the unique nature of the technology and the intangibility of the target object in space.

Note 2

- Clear evidence has been presented in the paper which depicts real images of subsurface features achieved on Earth using the aforementioned technology. The logic of being able to utilize the same technology to acquire subsurface features on Mars is also clear. Notably, the 'input' images used to derive this Martian subsurface imagery are 100% original NASA/JPL images of the Martian surface:

- Link to original NASA video of Possible Landing Sites On Mars for Mars Science Laboratory Rover (http://mars.nasa.gov/mro/videos/mro/movies/20090527a/Looking_at_Landing_Sites_for_MSL/mroland20090527-480.mov)
- Link to original NASA video of Mars Rover at Erebus Crater.
- (http://mars.nasa.gov/mer/gallery/video/movies/opportunity/MER-BErebusPanorama.mp4)

Archaeological excavation on Earth is an acceptable method of acquiring evidence, whether for the past existence of life on Earth that became extinct a billion years ago or for dinosaurs that existed until well over a hundred million years ago. The ASTIR technology has been shown to be able to provide subsurface spectral imagery on Earth and it has been utilized to do the same on Mars. In fact, the Martian surface is significantly more conducive to successful subsurface spectral image recovery due to the relatively undisturbed, dusty surface and stronger presence of highly penetrative radiation compared to Earth.

Thus, ASTIR can reveal presence of archaeological and paleontological objects and structures covered by dust on Mars more readily than on Earth even before physical digging of Martian surface. This includes imagery of apparent lifeform remains preserved just under near-frozen Martian dust as described in this paper. It is left for subsequent missions to Mars which will incorporate actual physical digging capabilities to confirm the existence of past Martian lifeform discoveries that ASTIR is alluding to.

References

1. https://en.wikipedia.org/wiki/Alien_autopsy
2. http://news.discovery.com/space/alien-life-exoplanets/signs-of-alien-life-by-2025-says-nasa-chief-scientist-150408.htm
3. https://www.nasa.gov/press-release/nasa-confirms-evidence-that-liquid-water-flows-on-today-s-mars
4. http://www.bloomberg.com/news/articles/2015-07-20/billionaire-yuri-milner-pledges-100-million-to-seek-alien-life
5. http://www.seti.org/seti-institute/project/details/fact-sheet
6. http://www.smithsonianmag.com/science-nature/where-solar-system-are-we-most-likely-find-life-180949994/?no-ist
7. http://3.bp.blogspot.com/_abbvHARSrt8/TT-iG5B-49I/AAAAAAAAAsQ/NFHEkKdsypM/s1600/Cub+Creek+Dinosaur+Tracks%252C+photo-John+Mayers%252C+BLM%252C+Vernal%252C+UT%252C+2005.JPG
8. http://www.chinatravelca.com/wp-content/uploads/Xian-City-Walls-snow-Ginny.jpg
9. https://en.wikipedia.org/wiki/McDonnell_Douglas_F-15E_Strike_Eagle#/media/File:F-15E_gbu-28_release.jpg
10. http://apod.nasa.gov/apod/ap990407.html
11. http://www.space.com/17087-mars-surface-marsquakes-plate-tectonics.html
12. http://news.nationalgeographic.com/news/2010/10/101103-science-space-mars-water-life-fossils-oceans/
13. http://news.discovery.com/space/alien-life-exoplanets/has-curiosity-found-fossilized-life-on-mars-150106.htm
14. http://www.nbcnews.com/id/4480097/ns/technology_and_science-space/t/avoiding-f-word-mars/#.VnEGOo9OLIU
15. http://mars.nasa.gov/mro/videos/mro/movies/20090527a/Looking_at_Landing_Sites_for_MSL/mroland20090527-480.mov
16. http://mars.nasa.gov/mer/gallery/video/movies/opportunity/MER-BErebusPanorama.mp4
17. http://news.discovery.com/space/alien-life-exoplanets/looking-for-martians-drill-baby-drill-130408.htm
18. http://kepler.nasa.gov/Mission/QuickGuide/