

Re: terraforming

Source: <http://sci.tech-archive.net/Archive/sci.space.history/2005-02/2004.html>

From: Brad Guth (ieisbradguth_at_yahoo.com)

Date: 02/21/05

Date: 21 Feb 2005 14:46:41 -0800

Alfred Montestruc,

I hope this follow-up reply isn't sharing too much information.

Besides the solar illuminated environment that's tremendously hot and nasty (as it should be whenever there's such an unobstructed 1.4 kw/m² having nearly 89% of the visible spectrum absorbed), there's also the secondary issues of hard-X-rays and of Gamma rays to contend with. Atmosphere is what significantly cuts that impact down to a dull roar (Earth having roughly 10 tonnes/m² plus the Van Allen zone of death on our side). However, residing upon the lunar nighttime side is certainly damn cold but, at least it isn't exactly ever totally dark because of the absolute vibrance of starlight is typically twice as bright as is here upon Earth, and of whatever becomes earthshine is actually too bright to even safely look directly at. However, as to the broader spectrum sensitive Kodak eye or that of an unfiltered CCD, the illumination of the Sirius star system and of many similar near-UV and UV/a stars are 512~1024 times as intensified from whatever's observed here upon Earth, whereas the IR spectrum remains somewhat of a constant (slightly more intensified) but, upon the moon we must also include whatever's being reflected as secondary IR that's nicely derived off the raw solar illuminated lunar surface that's also representing an absolutely terrific cosmic morgue of what a surface collected debris field of meteorites and impact related shards that's entirely uneroded and thus sharp as a tack, plus otherwise comprised of mostly dark lunar basalt (not the sorts of 55+% reflective nature of those phony baloney NASA/Apollo surface EVA obtained images, but as depicted by their truthful sorts of images as NASA/Apollo obtained from orbit).

The following link to the ROSAT images were of various levels of moon hard-X-rays having been greatly moderated by way of what our Van Allen expanse (roughly 70,000 km worth) which tends to filter/moderate a fair amount of such, and even so the ROSAT measurements clearly impress upon the notion that the solar impacted moon is indeed chuck full of being hard-X-ray nasty, and that's not by any small degree.

http://www.airynothing.com/high_energy_tutorial/sources/moon.html

"You may have noticed that there were a few dots of X-rays in the Moon's dark half. Here, the moon is not reflecting the Sun's X-rays,

sci.space.history: Re: terraforming

since it is not in the direct light of the Sun. Instead, charged particles (like protons and electrons) in the Sun's solar wind can reach the far side of the Moon, and they produce X-rays in much the same way that cosmic rays produce gamma-rays on the Moon. Read the next section of the gamma-ray Moon to learn about that."

"The Moon is brighter in gamma rays than the quiet Sun! In fact, the most sensitive gamma-ray detector flown to date, EGRET aboard the CGRO satellite, was not able to detect the quiet Sun. (The Sun goes into periods of extreme activity, during which it is called an active Sun; the Sun is said to be quiet when it is not experiencing such activity.)"

I'm not your all-knowing radiation expert here but, I believe Gamma rays can be even nastier to our DNA than X-rays.

Here's a few other interesting spectrums of the moon, most of which are indicating as expectedly somewhat serious reactions due to the fact that our moon has not a worthy atmosphere as to attenuate and/or spectrum filter squat.

http://coolcosmos.ipac.caltech.edu/cosmic_classroom/multiwavelength_astronomy/multiwavelength_museum/moon.htm

http://www.airynothing.com/high_energy_tutorial/sources/moon.html

<http://chandra.harvard.edu/photo/2003/moon/>

<http://www.rednova.com/news/display/?id=12386>

This next document is simply another example that's way over my dyslexic limited three-brain-cell head. In other words, it says quite a lot without actually saying much of anything that you or I comprehend (as intended), but it also manages to infer upon the aspects of primary and secondary radiation as being somewhat unexpectedly nasty as compared to the original NASA/Apollo data. Notice how this document and of just about every other document that has the all-knowing NASA stamp of approval, having been based upon hard scientific data of specific numbers has consistently avoided being all that specific as to the hard-science of what such X-rays and Gamma rays actually amount to in terms of the surface intensity/m² or whatever. So, here comes the unavoidably subjective interpretations from such data and images, that which is what's driving my speculations as to the minimum of 100:1 and as much as 1000:1 intensity differential existing between being raw solar impacted as opposed to being situated within the sub-frozen protective shade of lunar nighttime, and even of that much is excluding upon the nastier solar flare and other horrific out-burst of solar energies as continually recorded by the SOHO satellite, of which the lack of any significant lunar atmosphere allows such solar flak to impact with almost no measurable reduction in intensity and/or velocity.

http://hea-www.harvard.edu/~maxim/papers/darkmoon_wargelin/darkmoon_wargelin.pdf

As to watering the moon; You can certainly transport fully contained units of water and/or ice to the moon (though I don't have any clue as to how we could safely get any of that physically onto the surface

without involving an impact phase of essentially vaporising everything to a fairlywell). Until there's a substantially increased layer of an atmosphere (at the very least 0.01 bar), the likes of free water or even ice openly surviving is not going to stay put for long.

Physically impacting the moon so as to vaporising roughly 1e6:1 of the basalt into releasing it 50% mass of O2 is certainly one viable method of initiating the terraforming process of accomplishing the terraforming of our moon. Besides such an atmosphere accommodating the containment of water and/or ice, the need for greatly reducing the raw solar and cosmic influx is absolutely imperative, however 0.01 bar or roughly 100 kg/m2 simply isn't going to suffice for essentially naked moonsuit EVAs, whereas a full tonne/m2 or 0.1 bar is going to start to work on our behalf (still barely survivable without a moonsuit). If the mixture of 50% O2 is augmented with much heavier elements than merely N2 (actually N2 isn't much good for anything), then perhaps there's a chance of short-term surviving without a moonsuit.

Going underground, such as into hollow rilles and/or into a substantial geode pocket, as preferably having 100+ meters of solid basalt between yourself and that of whatever's freely impacting the lunar surface is what's going to cut the mustard, thereby saving your sorry butt in more ways than you think. Of course, the interior of my CM/ISS is offering far more than 10 tonnes/m2 of shielding (I believe that I was thinking about accommodating 50 t/m2 as surrounding the 1e6 m3 ISS abode) and, thank God that it's residing 64,000 km off the moon and thus nowhere near being closely surrounded by millions of m2 of clumping moon-dirt and even nastier dark scorching-hot basalt that's radiating at everything from toasty IR to DNA lethal Gamma rays in every which way but lose.

Of course, robotics can be configured for surviving such an environment, and of having the likes of such interactive instruments and of those nifty SAR image receiving apertures deployed upon the surface of the moon is certainly offering one hell of an opportunity as towards planetary and even deep space radar imaging on steroids (for example 0.1 m/pixel of Titan at not 10% the cost of what we've seen via probe, or 10 mm/pixel of Venus and Mars shouldn't be all that unobtainable, and obviously impending NEOs could all become nailed down once and for all).

Even the notion of deploying a fully interactive and if need be adaptive optical secondary mirror for that of boosting conventional optical/visual magnification is somewhat impressive, although I don't honestly believe the open nature of any such raw optical lens or mirror is going to survive for long within the fairly nasty gauntlet of whatever the moon is continually gathering, as well as running itself into at 30+ km/s. Once again, a robust atmosphere is what's needed, and even if that's CO2/Rn is good enough for shielding such robotics, and even as per somewhat moderating the thermal extremes (a key factor in holding onto the likes of O2).

sci.space.history: Re: terraforming

Of course I always appreciate some of the usual mainstream status quo feedback, such as the offering of 'Horse manure' contributed by lord whomever 'amontestru...@yahoo.com' is, that comes along with the same usual crapolla of absolutely no hard-science, at least I uncovered nothing of any such science study/report or otherwise even a link as to anything related to the supposed hard-science of water/ice in space. Exactly whom's kidding whom?.

I do believe the near absolute vacuum of space somewhat alters the supposed 'triple point' factor of boiling and/or vaporising said water (since there's actually no such wet/steam phase to water in space; it's either a solid block of 'ice' or it's an extremely low density 'vapor' of molecules with absolutely nothing surviving in between), as would even be the case at the near vacuum of 0.01 bar as per existing upon Mars, whereas upon Mars said water has to remain as sub-frozen and/or physically covered by something fairly substantial, especially as the Mars tropical day wears on, said water from ice would boil off into becoming clouds of vapor and, Mars has damn few clouds that aren't mostly of CO₂ and dry-ice.

I take notice as to how no specifics as to the tonnage of those sodium atoms being excavated away from the moon, just the subjective notion that it hardly amounted to anything. Well, I'm one of those village idiots that would honestly I'd like to know the tonnage. Don't suppose there's going to be any reply to that.

BTW; thanks for the link:

http://www.sv.vt.edu/classes/MSE2094_NoteBook/96ClassProj/pics/941.jpg

of which this graphic also seems to specify that of transporting and/or of existing within extremely low pressure, as such it seems there's no freaking way of sustaining water in the raw without such returning to vapor. Since there's no way of physically deploying even the likes of your 'Horse manure' to the surface of the moon (without it impacting and thereby vaporising), I'll have to ask as to what have you planned and/or imagined as for the contained delivery of said water to the lunar surface?

I totally agree that the extremely sub-frozen lunar nighttime is about the only survivable environment for the likes of water as ice, as well as survivable for whomever is within a suitable EVA moonsuit could possibly survive for days before requiring the transplant of banked bone marrow, plus a good amount of ductape for patching all of those through-holes created by dust-bunnies and bits of sand arriving at 30+km/s, as otherwise God forbid a small pebble and your sorry butt is all but history.

BTW No.2; it's easier said than accomplished as to shade whatever from the sun unless you're situated within the lunar nighttime and/or via earthshine, as per the surrounding lunar landscape that's absolutely scorching hot by the raw solar spectrum day is also sharing off a great deal of IR spectrum energy that's emitting such energy in every which

Re: terraforming

sci.space.history: Re: terraforming

way imaginable, thus you'll need a great deal of physical shade that's also shading the surrounding lunar terrain for nearly as far as the eye can see. Of course, going underground is your best alternative for a whole lot more life saving reasons than being shaded.

I'm entirely for the honorable process and obtainable goal of terraforming our moon, although perhaps initially on behalf of robotics, then establishing the LSE-CM/ISS from which the final phase of efficiently pulverising our moon with loads of its own basalt. As you've mentioned, and I'll reaffirm that it'll take a great deal of atmospheric tonnage from vaporised basalt before man actually gets the opportunity as to walk anywhere upon the moon, or even within the moon. Although, for now above the moon is doable.

Regards, Brad Guth / GASA-IEIS
<http://guthvenus.tripod.com/gv-topics.htm>