

## Re: Why NASA should focus on the Moon, not Mars – Henry Spencer

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- *From:* Totorkon <[aertrion@xxxxxxxx](mailto:aertrion@xxxxxxxx)>
  - *Date:* Wed, 26 Nov 2008 23:14:07 –0800 (PST)
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On Nov 26, 7:20 pm, Brian Thorn <[bthor...@xxxxxxxxxxxxxxxx](mailto:bthor...@xxxxxxxxxxxxxxxx)> wrote:

On Tue, 25 Nov 2008 20:41:05 –0800 (PST), Totorkon

<[aertr...@xxxxxxxx](mailto:aertr...@xxxxxxxx)> wrote:

What if it is a shorted wheel motor or broken gear on a field expedition. Humans can't repair it without parts or in a clumsy pressure suit. Loss of a machine mission to faulty equipment is a setback far better than the first corpses on mars.

Right. Spare parts cannot be carried. Designing the rover to have easily replaceable critical parts like the Hubble Space Telescope is never going to happen, and its is totally impossible to have a redundant rover on standby back at the base in the worst case scenario. Oh, wait...

Phoenix offers an example of an automated lab.

Which wasn't much of a lab by terrestrial standards and barely worked.

A crewed mars mission was part of the Bush VSE.

Only by Bush 43 saying "and eventually to Mars" in his VSE introduction speech. Otherwise, no details whatsoever, and the emphasis was hugely on the Moon. There is no Mars expedition in the planning stages.

Think of what a lunar rover robot with solar wings or an rtg could do. It could easily cover half the moon in a year.

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Whiskey Tango Foxtrot, over? We already know what solar powered rovers can do. Spirit and Opportunity have done a few miles between them in nearly five years. The RTG-powered Mars Science Laboratory is being designed with expectations of a 12 mile excursion, and that's for two years.

The Moon is not an easier destination. In fact, it may be harder due to harsher nighttime conditions and 100% vacuum.

It could dwell at interesting selenological sites sending back millions of pictures at a full range of magnifications. It could send back more than a ton of samples for a landed weight equal to one lem.

One LM was 33,000 lbs.

Mars Science Laboratory will be about 2,000 lbs and is running \$1.9 billion so far. You do the math. These wonderful robots ain't cheap.

Given a \$100B pricetag for iss (closer to twice that),

It's somewhere around \$30 billion, actual hardware costs to date. Add in another \$3 billion a year for the Shuttle launches and we're in the \$50–75 billion range (depending on whether you count the entire Shuttle budget to ISS, despite Hubble missions and the like). Clinton capped its budget at \$24 billion, and of course it blew past that, causing Bush 43 to cut things like the Hab module and CRV (that's why he put O'Keefe the beancounter in charge of NASA.)

The oft-reported "\$100 billion" cost figure originates in NASA forecasts back before Columbia, but included Station and Shuttle support through 2015, the original ISS end of mission. Of course, with Shuttle retiring in 2010, a big chunk of that high cost will be reduced after 2010.

Why do so many critics keep throwing around dishonest numbers like "\$200 billion"? Scare tactics when all else fails to sway bystanders to your side?

estimates range up to \$1T to put a crew on mars.

Cite? Even the outrageous Space Exploration Initiative under Bush 41, which included everything and the kitchen sink, was "only" \$500 billion. And NASA was laughed off of Capitol Hill, with Administrator

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Truly eventually quitting because of that debacle. There is no chance anything that huge will ever come close to Congressional approval.

Zubrin, on the other hand, was promising manned Mars missions for \$30–50 billion in his 1990s Case For Mars heyday.

NASA is forecasting the new lunar program to cost around \$105 billion, and that includes something like a 15% cushion for busted budgets. (And when you see \$100 billion or \$200 billion thrown around, remember that Congress just handed Wall Street \$700 billion free and clear.) The Mars missions will eventually be able to use much of the lunar infrastructure (Ares V and the Orion ferry, or under alternative architectures, improved EELVs and orbital propellant depots) so some of it will already be paid for.

Good luck selling that to a nation  
nearing a depression.

We're not nearing a depression. Scare tactics again?

Brian

If my intent were to provoke an articulate argument for a crewed mars landing... mission accomplished.

If international contributions are included, the pricetag of the completed iss will exceed \$100B. That \$T for mars has been thrown around, albeit by critics. Zubrin's estimate is a quarter of the apollo program cost, which does seem overly optimistic.

The mer rovers in their prime could generate almost a kWhr/day, even with the high incident angle of the sunlight. Careful design of solar 'wings' could quadruple that. At an average 1mph for ten hours a day, circumnavigation of the planet would take less than four years, a rover lifespan that has already been exceeded.

Expanded robotic exploration does have some things going for it.

Commercial spinoffs of technology development are likely to be greater than the manned alternative.

The process can be piecemeal, building on experience and following up on discoveries made by previous missions.

The missions can be carried on smaller launchers, with the potential for competition.

The most efficient, but too slow for lifeforms, solar powered ion

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propulsion, would benefit the development of the lightest and longest lasting space solar panels.

Dependable Mars adapted machinery will be essential for human survival. Field testing makes perfect.

The more information the public has about mars, the more excitement that can be generated, the greater the support for a second planet with people.

The emphasis should be on the water, CO2, near earthly length of day and radiation shielding. If the mission is configured so that most of what's needed to survive comes from the resources in place, there might be a lot more support for a wayout outpost of human habitation.

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