

Transcript

Title: Matthew Shaw (3MT 2021 Competition)

Creator: Matthew Shaw

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I love the Moon!

Wouldn't it be cool to live there? I want to build a house, with a deck. Decent view. The Earth!

One issue. I don't know if you knew this, but it turns out it costs a lot of money to take things to the Moon. Current estimate is 35 thousand dollars per kilogram. How many kilograms does your house weigh? I don't think I can afford that deck.

Unless! And here's a thought, instead of bringing it all with me, what if I could just make it there? From local resources? Now, metal extraction on the Moon is not something that's been studied much, there's a bit of a gap in the knowledge there. But that's OK, because that's what I do. I'm an extractive metallurgist, which means it's my job to, extract, metals (it's very much in the name) from rocks. Rocks are made up of metals and oxygen stuck together, and we take the metals out.

Now, it is a little difficult, because if you take the processes we use on earth and you just kind of throw them at the Moon. They don't really work. Because the surface of the Moon is a pretty extreme place. Think about it, there's a lot of sunlight up there, there's low gravity, there's no air! You're in the vacuum of space! And if we want to build this deck, and we do! We're committed now. These conditions are hurdles we need to overcome. But what if instead of having to overcome them. we could use them? That would be good. Here's the thesis.

If you take a rock on earth, and heat it up enough, it will melt, and then, it will vaporise. And when it vaporises the metal and the oxygen actually split apart, which is what we want, right? Now, we don't do it like that here on Earth, because, it takes WAY too much energy, but. I've shown, through thermodynamic analysis, and laboratory testwork melting rock samples in the Swinburne Solar Simulator. I've shown that one way to reduce the energy requirement for vaporisation, is to do it in a vacuum. Guess what we have lot of on the Moon? A vacuum!

So. If we take Moon rocks, in a vacuum (they're already there), we hit them with concentrated sunlight until they vaporise. Then we can get oxygen and we can get metals. And the oxygen, we can breathe (which is pretty useful!) and with the metal... Well, with the metal I reckon I can build that deck! Yes! Or. maybe, a radio telescope, or a fleet of solar power satellites, or a Moon base. It's pretty exciting.

So next time you're out at night, I want you to look for the Moon, it's normally up, sometimes slightly sideways, and just think about what you're seeing. Think about the intense sunlight up there,

the lack of air, the vacuum, and the fact that despite those things one day we could live there. Maybe in a house. Maybe, with a deck, with what is, lets be honest... a pretty awesome view.

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