Hello my name is Diane Linne, I’m a Senior Research Engineer at The NASA Glen Research Center.

One area that we are working on is trying to find out how we can make oxygen both to fill our propellant tanks for the ascent vehicle to come home and also for breathing air.

We now believe that there is quite a bit of water in the soil either as bound water or as hydrated minerals.

That’s what we’re working on, on this rig here.

So what we have here is a bin of simulated Mars soil, on top, we have heater plates that will be baking the soil.

But we need to, turn up the soil so that the soil is exposed to the high temperatures.

SO I was in my garden one day, roto-tilling my garden and I thought, “Well why can’t we roto-till the Mars soil?”
So we're going to be putting this in our bin here and turn up the soil, while we're heating it and then, we can expose the hydrogen and it will get heated and the hydrogen will come off.

We have a fan in here that will then blow the hydrogen, the moist air and we'll capture it downstream in a condenser.

Now we have water for drinking water, but more importantly, we can split that water up and combine the hydrogen back with the carbon-dioxide in the air and now we can make methane and more oxygen, so now we have oxygen for our propellant tanks and the fuel, methane.

And that's how our astronauts are going to get off Mars and come back home to earth.