

Moons

Cryovolcanism on Enceladus

DAVID ROTHERY:

Well, Enceladus now - that's a much smaller satellite than Jupiter's active satellites. It's only few hundred kilometres across, and nobody expected Enceladus to be an exciting place. Its surface is very intensely ridged and fractured. The crust has clearly been broken and shunted around a lot.

But the real surprise is, over the southern hemisphere, close to the south pole, you can see jets of crystallised water ice, with ammonia and various organic compounds being jetted into space. So clearly inside Enceladus, there's either a layer that's completely molten, or just, maybe, below the south pole, a pod of molten material, which is going to be salty water. And there's something to pressurise it, to jet it out into space.

Stuff has been collected by the Cassini mission, there is a particle detector that was designed to detect particles captured in Saturn's magnetic field, but having got to Saturn and found the active jets, or the geysers, on Enceladus, they flew through those plumes and sampled the material.

[MUSIC PLAYING]

MICHELE DOUGHERTY:

This is the image that we took when we went really close to Enceladus, and you can clearly see this large plume of water vapour coming off from the south pole. It's a gorgeous image.

NARRATOR:

As Cassini has shown us that water definitely exists under Enceladus's ice, that makes it a fantastic place to search for evidence of extraterrestrial life.

MICHELE DOUGHERTY:

The reason that this discovery is so amazing is that it's telling us that there's water underneath the surface of Enceladus. And in the plume itself, there is water vapour, there are ice crystals, and there are organic compounds - nitrogen, carbon, hydrogen-- all the things you would need for the basic building blocks of life.

NARRATOR:

Michele and her colleagues are currently working on building much smaller probes that will be able to analyse the plumes jetting out from Enceladus. They look for more evidence of life. Ice in space may take us one step closer to finding out if other life forms have evolved in our Solar System.