Grade 12 Earth and Space Science

SES4U

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Chapter 2

Our Solar System

2.1 The wonders of the Solar System: Episode: 5

- After he sees the tubeworms at the bottom of the ocean... The underwater city is one of the most bizarre environments on our planet. It's built around a **Hydrothermal bent**, a volcanic opening in the Earth's crust that pumps out clouds of sulphurous chemicals water heated to nearly 300 Celsius.

For life to exist, we only need three things:

- right **chemistry** set. Human body is made up with 40 elements, but actually 96% of human is only made of four of them, carbon, nitrogen, oxygen and hydrogen.
- We need a **power source**. We need a battery, something to make a flow of electrons that powers the processes of life. Most life on Earth uses the power of the sun.
- We need some kind of **medium** for life to play itself out in, for process to happen. On the Earth, the medium is **water**.

What is the **fundamental link** that is driving the search for life in our solar system?

- The link between liquid water and life.

For life to get a foothhold, you need more than that. You need areas of **standing water**.

So large deposites of gypsum on the surface of Mars tells you that there must have been big areas of **water**.

What gas has been detected in the atmosphere of Mars? **Methane**

Which of the Jupiter's moons has the greatest chance of finding life? **Europa**

If there lis life out there in the solar system, it will almost certainly be simple **single-celled** organisms like bacteria eking out an existence in the most hostile of environments.

There is only one world where the laws of phyiscs have conspired to combine all these features in one place. On Earth:

- The temperature and atmosphere pressure are just right to allow oceans of liquid water to exist on the surface of the planet.
- Magnetic
- allow that life to evolve into such complex creatures as ourselves requiers one more ingredient. And that's **time**