Life on Venus

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Researchers have announced that they have spotted the **fingerprint of phosphine in Venus' atmosphere, at an altitude where temperatures and pressures are similar to those here on Earth at sea level.** High in the toxic atmosphere of the planet Venus, astronomers on Earth have discovered signs of what might be life.

Life on Venus

- Researchers at Cardiff University in Wales and the Massachusetts Institute of Technology have just published a paper in the journal Nature Astronomy in which they claim to have found a **smelly, toxic gas-phosphine**, high in the thick clouds of the Venusian atmosphere.
- **On Earth, phosphine is produced by certain types of bacteria.** It is considered as a **marker for life.** Phosphine – a **phosphorus atom with three hydrogen atoms** attached – is highly toxic to people.
- **Venus is Earth's closest planetary neighbor.** Similar in structure but slightly smaller than Earth, it is the second planet from the sun. Earth is the third. **Venus is wrapped in a thick, toxic atmosphere that traps in heat.** Surface temperatures reach a scorching 880 degrees Fahrenheit (471 degrees Celsius), hot enough to melt lead.
- Some scientists have suspected that the Venusian high clouds, with mild temperatures around 86 degrees Fahrenheit (30 degrees Celsius), **could harbor aerial microbes that could endure extreme acidity.** These clouds are around 90% sulphuric acid. Earth microbes could not survive that acidity.
- The astronomers have not collected specimens of Venusian microbes, nor have they snapped any pictures of them.

But with powerful telescopes, they have detected the chemical.

- After much analysis, the scientists assert that something now alive is the only explanation for the chemical's source.

Phosphine on Earth

- **On Earth, microorganisms in anaerobic environments** (ecosystems that do not rely on oxygen) **produce phosphine.** These include sewage plants, swamps, rice fields, marshlands, lake sediments and the excrements and intestinal tracts of many animals. Phosphine also arises non-biologically in certain industrial settings.
- To produce phosphine, Earth bacteria take up phosphate from minerals or biological material and add hydrogen.

Telescope Used

- The international scientific team first spotted the phosphine using the **James Clerk Maxwell Telescope in Hawaii** and confirmed it using the **Atacama Large Millimeter/submillimeter Array (ALMA) radio telescope in Chile.**
- Earth-based telescopes like those used in this research help scientists study the chemistry and other characteristics of celestial objects.