

## IL-14

### Venusian phosphine: a ‘Wow!’ signal in chemistry?

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I will discuss the recent detection of phosphine (PH<sub>3</sub>) gas, at ppb levels, in the cloud decks of Venus. I will present initial observations that led to the detection of phosphine gas in the Venusian atmosphere, discuss the critique and controversies behind the discovery and present most recent re-analysis of the phosphine data with new evidence for spatial and temporal variability. Phosphine is an unexpected component of an oxidized environment of Venus. Therefore, if PH<sub>3</sub>'s presence in Venus' atmosphere is confirmed, it is highly likely to be the result of a process not previously considered plausible for Venusian conditions. The source of atmospheric phosphine could be unknown geo- or photochemistry—though we have not yet found a process that can reach anywhere near the observed phosphine abundance. An even more extreme possibility is that strictly aerial microbial biosphere produces PH<sub>3</sub>. While modern Venus appears to be hostile to life as we know it, the planet likely had liquid surface water oceans as recently as ~700 million years ago. During my talk I will discuss the astrobiological potential of Venus and planned space missions designed to study the mysterious Venusian clouds.