

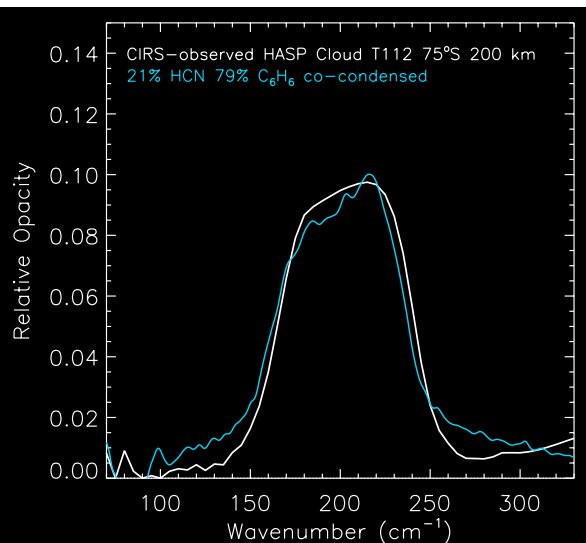
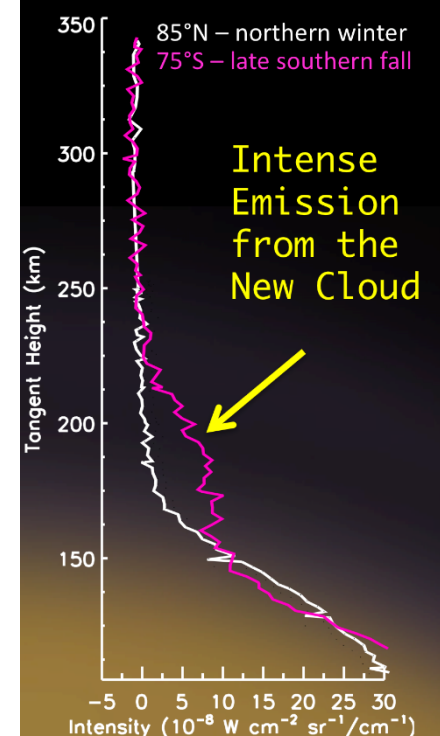
Noxious Ice Cloud Discovered in Titan's Stratosphere

What is the science question?

What do Titan's stratospheric clouds tell us about its changing dynamics, temperatures, and vapor compositions with its seasons?

What were your findings?

- Cassini CIRS observed a chemically new, never before seen, benzene (C_6H_6)—hydrogen cyanide (HCN) hybrid cloud formed via co-condensation in Titan's early southern winter polar stratosphere.
- This new noxious hybrid ice cloud is observed higher in altitude and is chemically different than the stratospheric clouds observed 10 years earlier in Titan's northern winter polar stratosphere.
- Laboratory ice analogs demonstrate that the co-condensed ice contains a 4:1 ratio of C_6H_6 to HCN.



What was the impact?

Titan's meridional circulation reversal is the main cause for these observed seasonal variations – this drives different temperatures and relative abundances of the organic gases.

Why does it matter to non-scientists?

Unlike Earth, Titan's stratospheric ice clouds are composed of more than a dozen noxious organic compounds, such as HCN. These ices will eventually precipitate and send sediment down to Titan's surface, where they may serve as a favorable site for driving prebiotic organic synthesis.