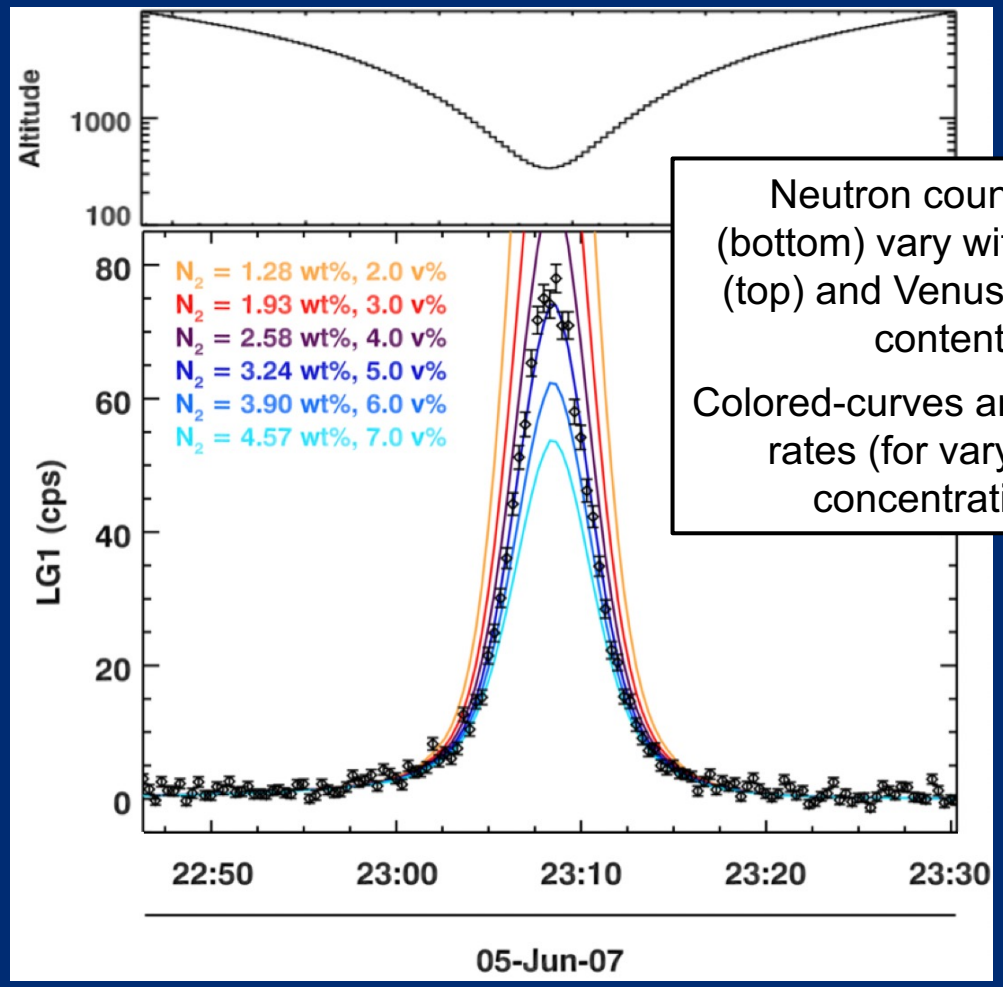
Altitude-dependent nitrogen concentrations in Venus' atmosphere

- On 5 June 2007, the Mercury-bound MESSENGER spacecraft flew by the planet Mercury.
- MESSENGER neutron spectrometer measurements during this flyby provided the **first measurement of the nitrogen content of Venus' atmosphere at altitudes between 60 and 100 km.**
- Our result, **5.0±0.4 v% N_2**, is significantly higher than the value of 3.5 v% N_2 reported for the lower atmosphere (<50 km altitude).
- Our discovery of altitude-dependent variations in the N_2 content of the atmosphere defies early expectations of homogeneous composition below 100 km.



Neutron count rates (bottom) vary with altitude (top) and Venus' nitrogen content.

Colored-curves are modeled rates (for varying N_2 concentration.)

MESSENGER-measured neutron fluxes reveal 5.0±0.4 v% N_2 for altitudes >50 km, 40% higher than the value at low altitudes.