

Lecture 35 — The Nature of Extraterrestrial Life

Early atmosphere

- ▶ Early Atmosphere was probably less reducing
- ▶ Gas Giants have atmospheres that are highly reducing
- ▶ CH_4 , NH_3 , H_2O , H_2
- ▶ but UV leads to
- ▶ CO_2 , CO , N_2 , H_2O (mildly reducing)
- ▶ Nitrogen
 - ▶ N_2 is 78% of earth's atmosphere
 - ▶ comes from outgassing from subsurface rock
 - ▶ life on earth helps explain the *persistance* of Nitrogen in our atmosphere
 - ▶ lightening produces NO, (fixing the nitrogen)
 - ▶ rain washes NO into the soil, thus Nitrogen should disappear
 - ▶ denitrifying bacteria break the nitric oxides apart, returning N to the atmosphere

Miller Experiment

