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## Cosmic Hydrogen and Ice Loss Lines

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**W**e explain the overall equilibrium-temperature-dependent trend in the exoplanet mass-radius diagram, using the escape mechanisms of hydrogen and relevant volatiles, and the chemical equilibrium calculation of molecular hydrogen (H<sub>2</sub>) break-up into atomic hydrogen (H). We identify two Cosmic Hydrogen and Ice Loss Lines (CHILLs) in the mass-radius diagram. Gas disks are well known to disperse in ten million years. However, gas-rich planets may lose some or almost all gas on a much longer timescale. We thus hypothesize that most planets that are born out of a hydrogen-gas-dominated nebular disk begin by possessing a primordial H<sub>2</sub>-envelope. This envelope is gradually lost due to escape processes caused by host-stellar radiation.

### Biography

Li Zeng has completed his PhD at the age of 26 years from Department of Astronomy, Harvard University and postdoctoral studies from Department of Earth & Planetary Sciences, Harvard University. He is currently a research associate of Prof. Stein Jacobsen's Geo- and Cosmochemistry Group in the Department of Earth & Planetary Sciences. He has published papers on water worlds.

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