

## Climate Evolution of Mars

# Yutaka Abe[1]

[1] Earth Planetary Sci., Univ. Tokyo

The surface environment of paleo-Mars is thought to be substantially different from the present Martian environment. In contrast to the present dry, cold environment, there are many fluvial features on Mars. A conventional view of the evolution of the Martian environment was that the early Mars was a wet and warm environment and then evolved to the present cold, dry environment. Though such a transition may be true as a baseline scenario, many unresolved issues exist. The environment of Mars might have been always dry and cold intervened by some episodic warm and wet events. Observation by the Mars Global Surveyor provided many unresolved questions as well as new high quality informations. The magnetic stripes found on the Southern Hemisphere and fresh-looking gullies are among them. Old questions such as the origin of the Northern Hemisphere low-lands, hypothetical oceans on the Northern Hemisphere, origin and evolution of the Tharsis highland, and hypothetical early plate tectonics are still unresolved. These problems are not unrelated problems from the climate evolution. Paleoclimatology itself has many problems such as the CO<sub>2</sub>-condensation, the greenhouse effect by CO<sub>2</sub> cloud, and the effect of obliquity variation on climate. It is a very difficult task to establish a unified scenario for the solution of these various problems. Here, we review these various problems as a starting point of the challenging trial for the understanding the climate evolution of Mars.