

Abstract Submitted  
for the 4CF14 Meeting of  
The American Physical Society

**The effect of orbital dynamics on early Mars climate<sup>1</sup>** GREGORY COLLEDGE, JOHN ARMSTRONG, Weber State University, VIRTUAL PLANETARY LABORATORY COLLABORATION — In this research, we considered the impact of the orbital dynamics on the possibility of liquid water on Mars. The Nice II model of our solar system suggests that the giant gas planets migrated into positions of orbital resonance. Using an N-body simulator and a simple climate model, we put Jupiter and Saturn into various resonant orbits and observed the effects. We found that a 2:1 resonance had the highest chance of warming Mars enough to sustain liquid water on the surface. At the same time, liquid water would have been maintained on Earth. Future research efforts include observing the effects of the migration period, as well as the long term stability of the climates of Earth and Mars.

<sup>1</sup>Thanks to the NSF and the Virtual Planetary Laboratory

Gregory Colledge  
Weber State University

Date submitted: 11 Sep 2014

Electronic form version 1.4