

Is the sunset on Mars really blue?

Takashi Nakakushi[1]; Yu-suke Imazaki[2]; Yasumitsu Ohmoto[2]; Masanao Sumiyoshi[2]; Hiroki Yamamoto[2]

[1] Human and Environmental Studies, Kyoto Univ.; [2] Sci., Kyoto Univ.

<http://www.gaia.h.kyoto-u.ac.jp/~kushio/chigaku/>

This is a preliminary report of a series of laboratory experiments on Mars "blue" sunset, conducted by the Planetary Science Team, in Experimental Practice in Earth Science B, on the course of Faculty of Integrated Human Studies, Kyoto University.

The Mars "blue" sunset comes from its aerosol conditions different from the Earth's: thin atmosphere (about 1/100-1/200 of the Earth's) and rich dust particles. Theories explain that less contribution from molecular scattering (i.e., Rayleigh scattering) makes the sunset less red, and more contribution from dust scattering (i.e., Mie scattering) makes it bluer. However, it is said that the "blue" sunset does not always occur. The occurrence will, therefore, and very naturally, depend on the aerosol conditions, similarly to the Earth.

Then, a question pops out quite naturally: "When?" --- needless to say, this question lies a more natural question: "Is it true?" We have never seen it with our own eyes!

Reportedly, the Mars regolith resembles the Earth's sands. And the wavelength dependence of Mie scattering basically depends on the particle size distribution and the refractive indice; colored scattering shows that the particle distribution (size and species) are very sharp. These two points are what we must refer. Our experiments are very simple; a tube between a light source and a video camera, which are poured or circulated with powders. We have examined various types of particles, and we have obtained a suspected "blue-colored" scattered light. Although this paper presents the images and movies at this point, our experiment is still continuing, searching for the "blue" sunset.