

## Is the sunset on Mars really blue? II

# Takashi Nakakushi[1]; Kuniyuki Furukawa[1]; Satoshi Sakai[2]

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

This is a preliminary report of a series of laboratory experiments on Mars "blue" sunset. 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, we do not know whether "blue" sunsets always occur or not. Actually, the NASA Mars lander Opportunity reported that a bluer sunset than Mars Pathfinder saw probably due to the 2001 global dust storm. The occurrence and appearance 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 Earth's clay minerals and contains a plenty of hematite. 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 are the key points.

Our experiments are very simple: We crashed and milled a red brick, filtered the powder into 1-2 microns, and finally scattered it in a water cistern. We observed the attenuated light which came out through the cistern.

Although this paper presents the images and movies at this point, our experiment is still continuing, searching for the "blue" sunset.