

A Comment on the Article by L.V. Ksanfomality “Results of the New Processing of Images Obtained from the Surface of Venus in a TV Experiment Onboard the Venera-9 Lander (1975)”

A. S. Selivanov and Yu. M. Gektin

Russian Scientific-Research Institute of Space Instrument Making, Moscow, Russia

Received January 12, 2012

DOI: 10.1134/S0038094612050097

The Venus surface panoramas were first obtained in the period of 1975–1982 using the Soviet vehicles Venera-9, -10, -13, and -14 and panoramic television cameras installed on them (the developments of the RSRISIM) (Selivanov et al., 1976; 1983). Their processing and study enabled a realistic view of the surface of the nearest planet. Although the experiments were notable for extreme technical complexity (Selivanov et al., 1979), their performance was entirely successful. However, the scientific aspect of the results were studied insufficiently deeply in the earlier published articles. In addition, the scientific publications processed and used only a part of the panoramas, and a significant number remained unstudied. The results of their systematic study have been presented and partially published only now (Ksanfomality, 2012), 30 and 37 years after the event. In the new work, L.V. Ksanfomality has considered anew the materials obtained from Venera-9 in 1975, which has enabled him to distinguish interesting objects that are believed, by the author, to be possibly related to the existence of specific forms of life under high-temperature conditions. This subject is relevant, not only in connection with new suppositions about possible forms of life not based on carbon and liquid water (Jones, 2007), but also to the discovery of a specific class of extra-solar planets. The possibility of the existence of life under conditions that are analogous to moderately high temperatures (735 K) and the oxygen-free CO₂-atmosphere of Venus was repeatedly considered in the literature cited in the work discussed. The authors came to the conclusion that it was not impossible to meet life on Venus, for example, in microbiological forms. The possibility of life that evolved from the early stage of planetary history under changing conditions is also considered. Although the temperature range of 725–755 K near the planetary surface is sure to be unacceptable for terrestrial forms of life, thermodynamically it is no worse than terrestrial conditions. The author points out that although the properties of the environment and acting chemical agents are not known, they have never been searched for.

Thanks to new computer processing of the Venera-9 data, the clarity of the images was successfully improved. The methods and quality of processing used by L.V. Ksanfomality do not call for comments. The results obtained 37 years ago have acquired new properties. We believe that, in the absence of new similar missions to Venus, the data presented in the article show that the scientific significance of the results achieved in the television experiments of the Venus missions has not yet been exhausted.

The absence of any suppositions about the physical-chemical nature of a hypothetical liquid medium (section 5) can be regarded as a disadvantage of the work, although the search for the answer to this question will probably prove to be very difficult.

L.V. Ksanfomality noted in the article that we, as the authors of the television experiment, should be proud of the fact that, not only has anybody managed to repeat it for almost four decades, but also that its scientific value has persisted so long.

REFERENCES

- Jones, B.W., *Life in the Solar System and Beyond*, Chichester: Praxis Publ., 2004; Moscow: Mir, 2007.
- Ksanfomality, L.V., Venus as a Natural Laboratory for Search of Life in High Temperature Conditions: Events on the Planet on March 1, 1982, *Solar Syst. Res.*, 2012, vol. 46, no. 1, pp. 41–53.
- Selivanov, A.S., Chemodanov, V.P., Naraeva, M.K., et al., TV Experiment on the Venus Surface, *Kosm. Issl.*, 1976, vol. 14, no. 5, pp. 674–677.
- Selivanov, A.S., Chemodanov, V.P., Naraeva, M.K., et al., TV Devices for Transmitting Panorama Images from “Venera-9” and “Venera-10”, in *Pervye panoramy poverkhnosti Venery* (First Panoramas of the Venus Surface), Keldysh, M.V., Ed., Moscow: Nauka, 1979, pp. 45–57.
- Selivanov, A.S., Gektin, Yu.M., Gerasimov, M.A., et al., Continuation of the Venus Surface TV Research by Landing Probes, *Kosm. Issl.*, 1983, vol. 21, no. 2, pp. 176–182.