

WORKSHOP ON THE KAVERI BASIN ECOSYSTEM DEVELOPMENT

The Workshop on the Kaveri Basin Ecosystem Development sponsored by Department of Environment, Government of India will be held during 10–12 January 1985 at Bhavan's Gandhi Vidyashram Campus, Kodaikanal, Tamilnadu.

A set of background papers is being prepared by experts on 1) The Biographical features of the Kaveri, floristic and faunistic wealth, 2) Water resources—flow pattern, pollution load, catchment problems, dams, irrigation, power generation, 3) Agricultural activity associated with Kaveri including intense cultivation using modern agricultural practices, 4) Forestry, wild life, soil erosion and other aspects associated with the Kaveri, 5) Industries, land use pattern and human settlements, 6) Kaveri in the life of

the people as reflected in culture, language and literature, fine arts, folk culture, tribal life.

After a plenary session, the workshop will constitute itself into working groups and enunciate proposals for research, field studies and action on different aspects of the Kaveri Basin Ecosystem. The Madras Science Foundation will integrate the discussions, recommendations and the various research proposals emanating at the workshop and publish the same as a reference document for funding agencies.

For further details please contact Dr C. R. Krishna Murthi, Convenor, Workshop on Kaveri Basin Ecosystem Development, 'Swati', 27, Dr Radhakrishna Salai, Mylapore, Madras 600 004.

JAMNALAL BAJAJ FOUNDATION AWARDS, BOMBAY—EIGHTH JAMNALAL BAJAJ AWARDS, 1985

AWARD I: A cash Award of rupees one lakh annually to an individual/individuals and/or an institution/institutions for outstanding contribution in any one or more fields of constructive work.

AWARD II: A cash Award of rupees one lakh annually to an eminent scientist/scientists and/or institution/institutions for outstanding contribution in the field of application of science and technology for rural development, particularly for the benefit of the weaker sections of the people.

AWARD III: A cash Award of rupees one lakh annually, founded in memory of Smt. Jankidevi Bajaj, to a woman/women or an institution/institutions predominantly conducted by women for outstanding

contribution to women's uplift, child welfare, rehabilitation of mentally retarded and physically handicapped women and children through scientific research, education, health, medical care, social reforms or Gandhian constructive work.

Individuals and institutions recommended earlier would also be eligible for consideration for the Awards for 1985, provided the sponsors recommend their names again on the basis of the questionnaire.

The last date for receipt of nominations (recommendations) is *31st December 1984*.

The questionnaire and further particulars may be had from The Hon. General Secretary, (Shri P. J. Joshi), Jamnalal Bajaj Foundation, Bajaj Bhavan, 2nd Floor, Nariman Point, Bombay 400 021.

NEWS

VENUS: STUDY OF ATMOSPHERE

By Oleg Borisov

Soviet and American Venus probes have made it possible to study the physical conditions on the surface of this planet, to find out the chemical composition of the Venusian atmosphere and the cloud cover and to

understand the processes taking place in near-Venus space. Soviet probes have even transmitted several TV pictures of Venus's hot surface at their landing sites. But until recently the large-scale detailed face of

Venus, unlike the lunar surface, has been unknown: dense clouds without a single break prevented photography from orbit.

It has turned out that the problem can be resolved by using radio waves of a definite length to which the Venusian atmosphere is transparent. The first experiments in this direction began in the '60s when Soviet and American scientists carried out radar studies of Venus. At that time it was established from reflected signals that Venus's surface is inhomogeneous. Later, at the largest American stations at Arecibo and Goldstone a radio image of Venus's hemisphere turned to the Earth (in the period when Venus and the Earth were the closest to each other) was obtained. However, spatial resolution—that is, the smallest size of the visible features of the surface—amounted just to 10–20 km. In 1980, a map of the heights of a fairly wide strip in the equatorial zone was compiled on the basis of the data provided by the radio altimeter of Pioneer—Venus, a satellite launched by the USA. But in that experiment attempts to obtain a detailed picture of Venus's topography failed too. Mountain ridges, craters and rift valleys are not discernible on the map, in the same way as they are not discernible on the Moon during observations from the Earth using the naked eye. Due to such unclear viewing scientists cannot judge the degree of the planet's geological activity and hence its evolution.

The designers of the *Venera-15* and *Venera-16* probes set as their objective the scanning of Venus's northern areas (which so far are the blank spot for observers) using a much higher spatial resolution—one or two kilometres. The first series of pictures transmitted by Soviet *Venera* probes have shown the total reliability of all onboard instrumentation.

Venera-15 and *Venera-16* carry radio transmitters and aerials of directional radiation. They "illuminate" the parts of the surface which lie to the side of the path of the flight. Since different features of the spot of the relief, which is radiated by radio waves at an angle to the horizon, lie at different distances from the satellite radar, these features move with respect to it at different angular velocities. As a result, waves reflected back by different features of the surface are received at the satellite at intervals and due to the Doppler effect they differ also in frequency. These factors contribute to the construction of the image.

Sophisticated instrumentation with high-speed computers constructs the radar image of the strip radiated by radio waves (the strip on the surface is 100 km in width and 7,000 km in length) before the

beginning of each new circuit. Such strips are then connected and the mosaic of individual radio photos produce the (until now unknown) picture of the surface of cispolar areas of Venus.

Before obtaining the full-scale map of Venus one cannot draw fundamental conclusions about its neogeological structure. But the initial chapters of evolution can be traced by studying the pictures coming from the far-off planet.

The diversity of geological structures is clearly discernible on the first radio pictures. One can see, for instance, a lowland extending for many kilometres. It is almost featureless. Is this a solidified lava sea? The plateau breaks off sharply and the radar systems see a young folded land which stretches for 600 km along the satellite's path and consists of many parallel ridges. Then we see craters so typical of other planets. One of them has the shape of an ellipse 80 by 60 km in size. It possesses a central peak. The craters give way to an almost structureless plain. Only rare hills, individual ridges and rare domes, originating from formerly active volcanoes, are visible. The meandering ridges are also of volcanic origin. Scientists have noted that similar ridges are often encountered on basalt lowlands of lunar maria.

Venera probes continue their movement around Venus, and features of other dimensions and configurations appear, for instance, large ring structures 300 to 500 km in diameter. Apparently these are craters of bodies which are like asteroids in size. (Asteroids were incident on Venus in ancient times—more than 3,000 million years ago). This chronology is buttressed by pictures where craters are intersected by younger folded formations.

The preparation of the detailed map of the relief of Venus will make it possible to solve one of the most agonising problems associated with that planet. Analysis of the data of the mass-spectrometry of the Venusian atmosphere carried out during previous missions to Venus has shown that the traces of moisture contained in Venus's atmosphere have interesting features. For instance, from the present correlation of deuterium and hydrogen in it one can conclude that the original mass of water on Venus accounted for at least 0.3% of the mass of the Earth's oceans. These are quite solid seas. The conclusion will be confirmed if a future detailed map of the Venusian surface present topographic proofs of the effect of water in the early periods of Venus's history (*Soviet Features*, Vol. XXIII, No. 128, Friday, August 17, 1984).