EGS XXVII. General Assembly, Nice France, 24 April 2002

PS2 Mars exploration programmes For the Oral Programme:

SEASONAL CHANGE AND ANNUAL APPEARANCE OF BIOGENIC DARK DUNE SPOTS ON MARS

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We analyzed several thousand Dark Dune Spots (DDSs) of the southern polar region of Mars from images by the Mars Global Surveyor Mars Orbiter Camera. This study revealed the shape, the pattern and the morphological dynamics of the spots. The time sequence of DDSs, i.e. seasonal change and annual appearance, were interpreted as resulting from possible biological activity of putative Mars Surface Organisms.

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PS2 Mars exploration programmes For the Oral Programme:

POSSIBLE BIOMARKERS ON MARS AND THE MARS EXPRESS MISSION

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Interesting objects called dark dune spots (DDSs) were discovered in 1998 on the images made by the Mars Global Surveyor (MGS). DDSs, also observed also in 1999 and 2001, from winter to summer on the dark dune fields, are prevalent in the polar regions of Mars. The recently suggested process of origin of DDSs by pure frost sublimation is not compatible with a few important features we have observed by detailed analysis of a series MGS narrow angle images. We argue that sublimation processes should be combined with biological activity of hypothetical Mars Surface Organisms. The ESA Mars Express Mission will carry out detailed exploration of DDS formation on the Martian polar surface.

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PS1.04 Exobiology in the Solar system For the Oral Programme:

DDS-MSO HYPOTHESIS: PRESENCE OF LIFE ON MARS

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The formation, development and characteristic features of the Martian dark dune spots (DDSs) in the Polar Region can be explained by assuming the activity of Mars Surface Organisms (MSOs). In winter, with the first rays of sunlight the MSOs start to warm up, activate themselves and evaporate the bottom of the CO_2 ice cover above them and melt H_2O ice around them whereby their growth and reproduction become possible. With time the CO_2 ice shield becomes thinner and thinner, until it evaporate through up to the surface. Immediately a very intense evaporation of water begins in the unprotected region culminating in the appearance of the dark, underlying soil. The complete evaporation of liquid water stops the life conditions of MSOs and they desiccate.