EXOMARS STATUS AND LANDING SITE SELECTION.

J. L. Vago[1], D. S. Rodionov[2], O. Witasse[1], G. Kminek[1], L. Lorenzoni[1], the LSSWG[3], and the ExoMars Team, [1]European Space Agency, ESTEC, the Netherlands (jorge.vago@esa.int), [2]IKI, Moscow, Russia.

[3]Landing Site Selection Working Group: F. Westall, H. G. Edwards, L. Whyte, A. G. Fairén, J.-P. Bibring, J. Bridges, E. Hauber, G. G. Ori, S. Werner, D. Loizeau, R. Kuzmin, R. M. E. Williams, J. Flahaut, F. Forget, J. L. Vago, D. Rodionov, O. Korablev, O. Witasse, G. Kminek, L. Lorenzoni, O. Bayle, L. Joudrier, V. Mikhailov, A. Zashirinsky, S. Alexashkin, F. Calantropio, and A. Merlo.

ExoMars is a cooperative programme between ESA and ROSCOSMOS, with NASA contributions. ExoMars includes two missions, one in 2016 and another in 2018.

The 2016 mission includes two elements: an orbiting satellite (Trace Gas Orbiter, TGO) devoted to the study of atmospheric trace gases and subsurface water, with the goal to acquire information on possible ongoing biological or hydrothermal rock alteration processes; and an Entry, Descent, and landing Demonstrator Module (EDM) to achieve a successful soft landing on Mars and demonstrate technologies for the 2018 mission landing. The TGO will also provide data communication services for surface missions landing on Mars, nominally until end 2022. The mission will be launched in January 2016 using a Proton rocket and arrive to Mars in October 2016.

The 2018 mission will deliver a 310-kg mass rover and an instrumented landed platform to the surface of Mars. The mission will pursue one of the outstanding questions of our time by attempting to establish whether life ever existed on Mars.

The Rover will be able to travel several kilometres searching for traces of past and present signs of life. It will do this by collecting and analysing samples from surface outcrops and from the subsurface. The rover's Pasteur payload contains: panoramic instruments (wide-angle and high-resolution cameras, an infrared spectrometer, a ground-penetrating radar, and a neutron detector); a subsurface drill capable of reaching a depth of 2 m to collect specimens; contact instruments for studying rocks and collected samples (a close-up imager and an infrared spectrometer in the drill head); a Sample Preparation and Distribution System (SPDS); and the analytical laboratory, the latter including a visual and infrared imaging spectrometer, a Raman spectrometer, and a Laser-Desorption, Thermal-Volatilisation, Derivatisation, Gas Chromatograph Mass Spectrometer (LD + Der-TV GCMS). The very powerful combination of mobility with the ability to access locations where organic molecules can be well preserved is unique to this mission.

After the Rover has egressed, the Platform will carry out scientific environmental measurements at the landing site. The mission is scheduled to launch in May 2018 and arrive to Mars in January 2019.

ExoMars is considered a necessary preparatory step for the future realisation of an international Mars Sample Return (MSR) mission during the second half of the next decade. This presentation will describe the status of the ExoMars project (including science objectives, instrumentation, and upcoming milestones) as well as report on the progress achieved toward the identification of suitable landing sites for the ExoMars 2018 mission. A dedicated poster (by Flahaut et al., this meeting) will further expand on the latter subject.

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References: [1] ExoMars: ESA's Next Step in Mars Exploration, Vago et al. (2013) ESA Bulletin 155; [2] http://exploration.esa.int/mars/48088-mission-overview/; [3] http://exploration.esa.int/mars/53462-call-for-exomars-2018-landing-site-selection/; [4] Flahaut et al., this meeting.