

Close-Up Imager CLUPI on board the rover of the European Mars Mission EXOMARS

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The CLose-UP Imager (CLUPI) imaging experiment will be designed to obtain high-resolution colour and stereo images of rocks from the ExoMars rover (Pasteur payload). The close-up imager is a robotic equivalent of one of the most useful instruments of the field geologist: the hand lens.

Imaging of surfaces of rocks, soils and wind drift deposits is crucial for the understanding of the geological context of any site where the Pasteur rover will be active on Mars. The purpose of the Close-up imager is to look an area of about 4 cm x 4 cm of the rocks at a focus distance of 10 cm. With a resolution of approx. 35 micrometer/pixel, many kinds of rock surface and internal structures can be visualized: crystals in igneous rocks, fracture mineralization, secondary minerals, details of the surface morphology, sediment components, sedimentary structures, soil particles. It is conceivable that even textures resulting from ancient biological activity can be seen, such as fine lamination due to microbial mats (stromatolites) and textures resulting from colonies of filamentous microbes.

CLUPI is a powerful highly integrated miniaturized low-power robust imaging system with no mobile part, able to operate at very low temperature (-120°C). The opto-mechanical interfaces will be a smart assembly in titanium sustaining wide temperature range. The concept benefits from well-proven heritage: Proba, Rosetta, MarsExpress and Smart-1 missions...

The close-up imager CLUPI on the ExoMars Rover will be described together with its capabilities to provide important information significantly contributing to the understanding of the geological environment and could identify outstanding potential biofabrics (stromatolites...) of past life on Mars.