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Enhancing the effectiveness of the ExoMars PanCam instrument for astrobiology

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The ExoMars rover is the first element of the ESA Aurora programme and is slated to deliver the Pasteur exobiology payload to Mars by 2015. The 760 gramme Panoramic Camera will provide multispectral stereo images with 34 deg horizontal field-of-view (1.1 millirad/pixel) and high resolution (135 microrad/pixel) colour monoscopic "zoom" images with 5 deg horizontal field-of-view. The stereo Wide Angle Cameras (WAC) are based on Beagle 2 Stereo Camera System heritage [1].

The Panoramic Camera instrument is designed to fulfil the digital terrain mapping requirements of the mission [2] as well as providing multispectral geological imaging, colour and stereo panoramic images, solar images for water vapour abundance and dust optical depth measurements and to observe retrieved subsurface samples before ingestion into the rest of the Pasteur payload. Additionally the High Resolution Camera (HRC) can be used for high resolution imaging of interesting targets detected in the WAC panoramas and of inaccessible locations on crater or valley walls. In short, PanCam provides the overview and context for the ExoMars experiment locations required to enable the exobiology aims of the mission.

In addition to these baseline capabilities further enhancements are possible to PanCam to enhance it's effectiveness for astrobiology and planetary exploration:

1. Rover Inspection Mirror (RIM)

2. Organics Detection by Fluorescence Excitation (ODFE) LEDs [3-6]

3. UVIS broadband UV Flux and Opacity Determination (UVFOD) photodiode

4. Electro-optical Distance Measurement (EDM)

5. Wide angle mirror (WAC)

This paper will discuss the scientific objectives and resource impacts of these enhancements.

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