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# The PanCam instrument for the Rosalind Franklin (ExoMars 2020) rover

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## Abstract

The scientific objectives of the ExoMars Rosalind Franklin rover [1] are designed to answer several key questions in the search for life on Mars. In particular, the unique subsurface drill will address some of these questions for the first time, such as the possible existence and stability of sub-surface organics. PanCam [2] will establish the surface geological and morphological context for the mission, working in collaboration with other context instruments. Here, we describe the PanCam scientific objectives in geology, atmospheric science and 3D vision. We discuss the design of PanCam, which includes a stereo pair of Wide Angle Cameras (WACs), each of which has an 11 position filter wheel, and a High Resolution Camera (HRC) for high resolution investigations of rock texture at a distance. The cameras and electronics are housed in an optical bench that provides the mechanical interface to the rover mast and a planetary protection barrier. The electronic interface is via the PanCam Interface Unit (PIU), and power conditioning is via a DC-DC converter. PanCam also includes a calibration target mounted on the rover deck for radiometric calibration, fiducial markers for geometric calibration and a rover inspection mirror.

## References:

Vago, J.L., F. Westall, A.J. Coates, et al., *Astrobiology*, 17(6-7), 471-510, doi:10.1089/ast.2016.1533, Jul 2017. [2] Coates, A.J., R. Jaumann, A.D. Griffiths, et al., *Astrobiology*, 17 (6-7), 511-541, DOI: 10.1089/ast.2016.1548, Jul 2017.

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