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Detectors and imaging sensor concepts for future planetary mission

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Imaging systems play an important role in nearly all planetary exploration missions.

There are drives for global mapping of planetary surfaces, multi-spectral observations, high spatial resolution as well as high sensitivity and high radiometric resolution.

At the other hand the design of imaging systems for planetary exploration is driven by several challenging aspects. The definition of planetary space missions with inhospitable environment require design approaches to operate in extreme temperature and cosmic radiation. In addition mass and power budget of the system shall be minimized, whereas the scientific aims, the functionality and operationality remain challenging and hence require applying sophisticated technologies.

The question arise what are the most promising concepts and technologies of detectors and imaging sensors for future planetary missions.

The authors have worked on many imaging systems for planetary space missions and they try to give an answer on this question by comparison of existing technologies and concepts in respect to their performance and applicability in planetary space missions. Emphasis is given to high resolution imaging in planetary remote sensing and surface based in-situ imaging in the UV-VIS/NIR spectral range.