

The Mars Webcam Interview

An exclusive interview with the lead designer (**Bart Dierickx**) and project manager (**Dirk Uwaerts**) about the development of what eventually became known as the Mars Webcam. "It was never the intention to start a live stream from Mars."

► **Bart, Dirk, it was recently brought to our attention that the VMC (visual monitoring camera), aka "the Mars Webcam" has become the most popular planetary orbiting instrument amongst amateur astronomers, students and teachers. I believe that you were the designers of this instrument.**

► **Dirk:** The objective was to design, develop and test a novel micro camera chip, to be used as a miniature monitoring camera for space applications. Compact and with as few components as possible.

► **Bart:** The design was fully CMOS technology and allowed for an easy combination of control logic, ADC, interfaces and image compression circuitry. The "Mars Webcam" is based on the IRIS-1 image sensor (Integrated Radiation-tolerant Imaging System).

"The creation of the 'Mars Webcam' started in 1997 with the development of the Visual Telemetry System"

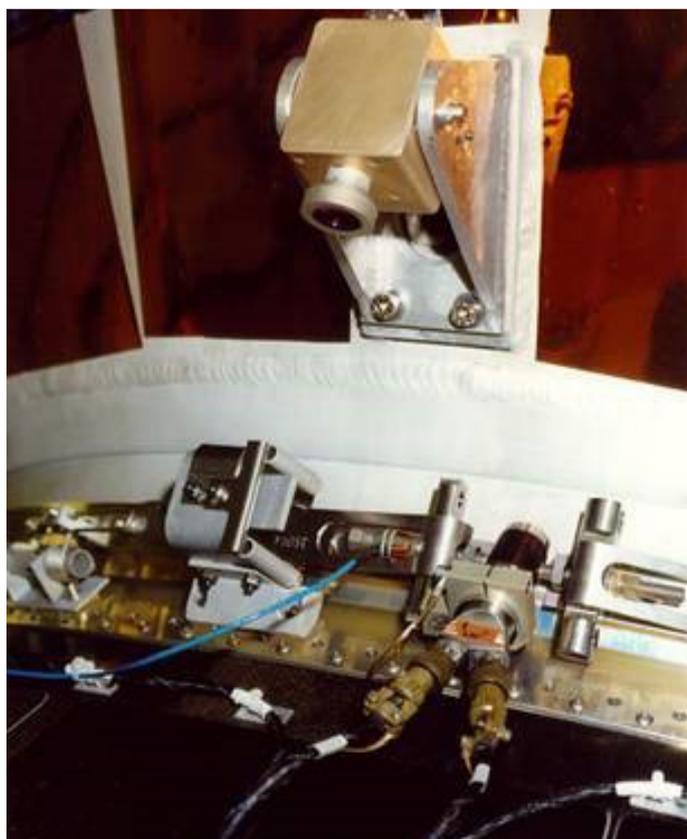


The VTS camera

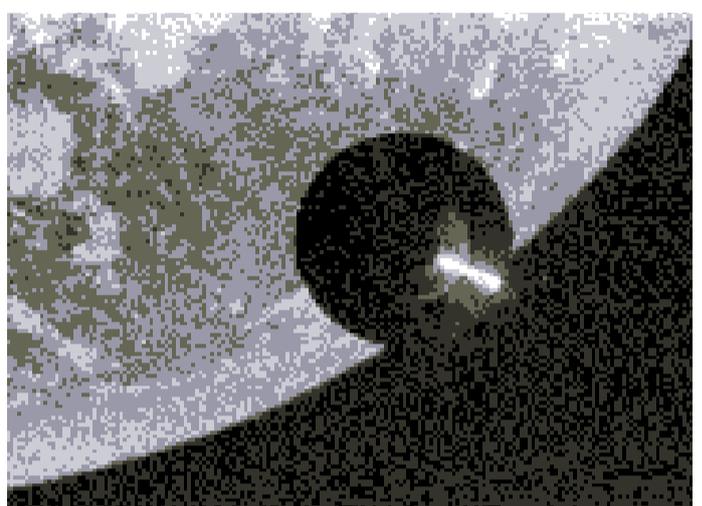
► **What was the origin of this camera? Why was it created?**

► **Bart:** It all started in 1997 with its predecessor the "VTS" - the Visual Telemetry System. After the debacle of the Ariane 501 launch in 1996, ESA commissioned a "little" monitoring camera for the on-board observation of spacecraft activities.

► **Dirk:** We were part of the project as project supervisor and designer and had to create in a few months the first CMOS camera ever used in space missions. The VTS was based on the logarithmic Fuga15d and mounted on the ESA launch vehicle Ariane 502.



The VTS attached to the satellite



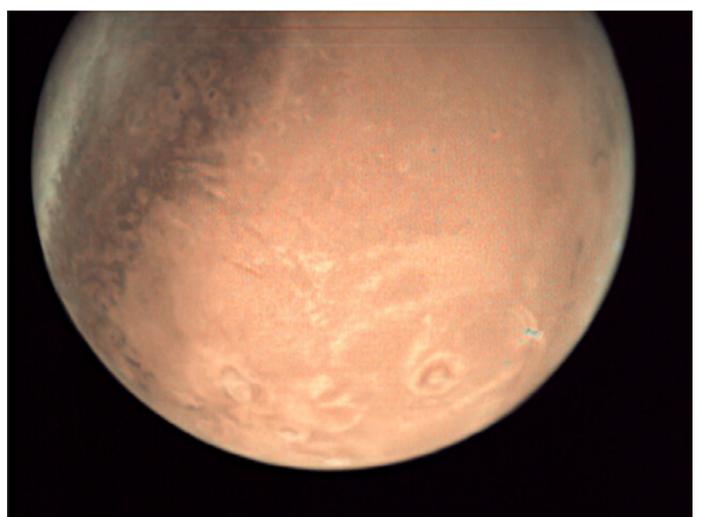
The VTS camera witnessed the separation of SPELTRA from MAQSAT-H

► **Hence the successor of this project was the Visual Monitoring Camera (VCM) IRIS-1?**

► **Bart:** After that (VTS), the successor was developed, the "VMC". It uses the IRIS-1 colour or black and white camera chip and has direct interfacing to the spacecraft's telemetry system, not requiring a bulky camera master unit.

► **Dirk:** VMC cameras have been used successfully on the XMM and Cluster II (space missions by ESA), to verify spacecraft separation and solar panel deployment.

► **Bart:** The VCM on the actual Mars Express that took off in June 2003 during Europe's first Mars expedition, was used to monitor the separation of the Beagle 2 lander. The Beagle dramatically failed, but the Mars Express with the IRIS-1 VCM is still in orbit and alive and is re-baptized the "Mars Webcam".



Picture of Mars by the VMC / Mars Webcam

► **For this reason, the VMC is not just an ordinary camera in an extraordinary place? What are the unique features of the design?**

► **Bart:** The IRIS Pixel used the "high fill factor patent" (the base of the Imec spinoff "FillFactory"). It allowed for that time an extraordinary high light sensitivity.

► **Dirk:** The challenges were particularly interesting for this project. CMOS imagers were immature and there was sparse knowledge on radiation tolerance of CMOS imagers in space. It is still operational until today - not really bad...

► **Bart:** We are most challenged by projects that have never been done before and to see how far we can go.

► **As far as Mars apparently?**

► **Dirk:** To create a Mars "Webcam" was never the intention, but it is nice to know that our baby is space legacy today.