

**FULLY CONTROLLING MARS RECONNAISSANCE ORBITER CONTEXT CAMERA IMAGES AND PRODUCING VISUALLY STABLE MOSAICS.** S.J. Robbins<sup>\*1</sup>, M.R. Kirchoff<sup>1</sup>, R.H. Hoover<sup>1</sup>.  
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**Introduction:** The Context Camera (CTX) aboard NASA's *Mars Reconnaissance Orbiter (MRO)* [1] has been returning high-resolution and -quality data of Mars' surface for over a decade, with >98% of the planet imaged in good quality. Images often have ~100s meter offsets from each other and a controlled ground source, resulting in seam mismatches when mosaicking and poor matches to other, high-resolution datasets. We developed an efficient, accurate workflow within *ISIS3* (USGS's *Integrated Software for Imagers and Spectrometers v3*), driven by Python scripts, to automate much of the control process to create a fully controlled dataset, which we have proven so far by mosaicking Mare Australe ("MC-30;" south of -65°N, or 4.7% of Mars' surface), now in press [2]. We have also done other regions of Mars, totaling >25% of its surface.

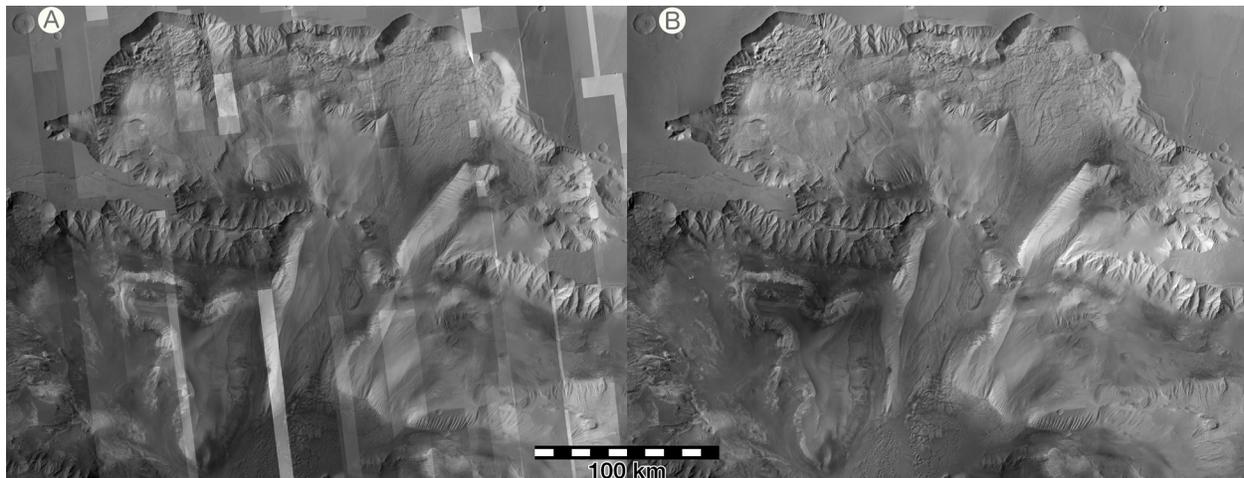
The CTX instrument is also poorly calibrated, and mitigating factors like seasonal changes and atmospheric clouds and aerosols prevent seamless mosaics from being constructed. While [3] have presented a

workflow to create the appearance of a seamless product by mosaicking images along lines of minimal contrast, we have developed a different method of empirical photometric/cosmetic control [4], which uses a reference source to produce an equalized product that minimizes brightness mismatches. At the time of this writing, the method [4] is in review and photometric source [5] is in press.

At the Mappers' Meeting, we will present this work if given the opportunity.

**References:** [1] Malin et al. (2007). doi:10.1029/2006JE002808. [2] Robbins et al. (2020). "Fully Controlled 6 meters per pixel Mosaic of Mars' South Polar Region." doi:10.1029/2019E006231. [3] Dickson et al. (2018). LPSC #2480 doi:10.1029/2010JE003755. [4] Robbins et al. (in rev.) "Empirical Photometric Control of Mars Context Camera Images." [5] Robbins (2020) "Mars' Red ... Reflectivity Averaged Over Mars Year 24–28 from Mars Orbiter Camera." doi:TBD

**Funding:** This work was funded internally by Southwest Research Institute.



**Figure 1:** Sample, 162 image mosaic centered on Ophir Chasma, (A) cartographically and (B) cosmetically controlled.