

Peer Reviewed Publications

Gross, C., Al-Samir, M., Bishop, J.L., Poulet, F., Postberg, F., Schubert, D. (2024). Prospecting in-situ resources for future crewed missions to Mars. *Acta Astronautica*, Volume 223, Pages 15-24, ISSN 0094-5765, <https://doi.org/10.1016/j.actaastro.2024.07.003>

Ovchinnikova, A., Jaumann, R., Walter, S. H. G., **Gross, C.**, Zuschneid, W., Postberg, F. (2024). A modeling approach for water and sediment transport in Jezero crater on Mars based on new geomorphological evidence. *Icarus*, 426, 116349, ISSN 0019-1035, <https://doi.org/10.1016/j.icarus.2024.116349>

Jaumann, R., Tirsch, D., Adeli, S., Bahia, R., Michael, G., le Deit, L., Grau Galofre, A., Head, J., Bohacek, E., **Gross, C.**, Walter, S. G. H., & Hiesinger, H. (2024). Geological Record of Water and Wind Processes on Mars as Observed by the Mars Express High Resolution Stereo Camera. *Space Science Reviews*, 220(4), 45. <https://doi.org/10.1007/s11214-024-01076-z>

Wilk, K. A., Bishop, J. L., Weitz, C. M., Parente, M., Saranathan, A. M., Itoh, Y., **Gross, C.**, Flahaut, J., & Seelos, F. (2024). Characterization of aqueous alteration and formation of salty exposures at Ius Chasma, Mars. *Icarus*, 408, 115800. <https://doi.org/https://doi.org/10.1016/j.icarus.2023.115800>

Bishop, J. L., **Gross C.**, Danielsen, J., Parente, M., Murchie, S. L., Horgan, B., Wray, J. J., Viviano, C., Ehlmann, B. L., Seelos, F. P. (2020). Multiple mineral horizons in layered outcrops at Mawrth Vallis, Mars, signify changing geochemical environments on early Mars. *10.1016/j.icarus.2020.113634*

Poulet, F., **Gross, C.**, Horgan, B., Loizeau, D., Bishop, J. L., Carter, J., Orgel, C. (2020). Mawrth Vallis, Mars: a fascinating place for future in situ exploration - *Astrobiology* –Volume 20, Issue 2. <https://doi.org/10.1089/ast.2019.2074>

Bishop, J. L., Fairén, A. G., Michalski, J. R., Gago-Duport, L., Baker, L. L., Velbel, M. A., **Gross, C.**, and Rampe, E. B. (2018) Surface clay formation during short-term warmer and wetter conditions on a largely cold ancient Mars. *Nature Astronomy*, v. 2, p. 206-213

Al-Samir, M., Nabhan, S., Fritz, J., Winkler, A., Bishop, J. L., **Gross, C.**, Jaumann, R. (2017). The paleolacustrine evolution of Juventae Chasma and Maja Valles and its implications for the formation of interior layered deposits on Mars. *Icarus*, Available online 27 December 2016, ISSN 0019-1035, <https://doi.org/10.1016/j.icarus.2016.12.023>

Michael, G.G., Walter, S.H.G., Kneissl, T., Zuschneid, W., **Gross, C.**, McGuire, P.C., Dumke, A., Schreiner, B., van Gasselt, S., Gwinner, K., Jaumann, R. (2016). Systematic processing of Mars Express HRSC panchromatic and colour image mosaics: Image equalisation using an external brightness reference. *Planetary and Space Science* 121; 18-26

Noel, A., Bishop, J.L., Al-Samir, M., **Gross, C.**, J. Flahaut, McGuire, P.C., Seelos, F., Weitz, C., Murchie, S. (2015). "Mineralogy, Morphology and Stratigraphy of the Light-Toned Interior Layered Deposits at Juventae Chasma". *Icarus*, doi:10.1016/j.icarus.2014.09.033

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McGuire, P.C., Bonnici, A., Bruner, K.R., **Gross, C.**, Ormö, J., Smosna, R.A., Walter, S. and Wendt, L. (2014). The Cyborg Astrobiologist: Matching of Prior Textures by Image Compression for Geological Mapping and Novelty Detection. *International Journal of Astrobiology* 13 (3): 191–202 (2014), doi:10.1017/S147355041300037

Dohm, J. M., Miyamoto, H., Ori, G. G., Fairén, A. G., Davila, A. F., Komatsu, G., Mahaney, W. C., Williams, J.-P., Joye, S. B., Di Achille, G., Oehler, D. Z., Marzo, G. A., Schulze Makuch, D., Acocella, V., Glamoclija, M., Pondrelli, M., Boston, P., Hart, K. M., Anderson, R. C., Baker, V. R., Fink, W., Kelleher, B. P., Furfaro, R., **Gross, C.**, Hare, T. M., Frazer, A. R., Ip, F., Allen, C. C. R., Kim, K. J., Maruyama, S., McGuire, P. C., Netoff, D., Parnell, J., Wendt, L., Wheelock, S. J., Steele, A., Hancock, R. G. V., Havics, R. A., Costa, P., and Krinsley, D. (2011). An inventory of potentially habitable environments on Mars: Geological and biological perspectives. *Analogs for Planetary Exploration: Geological Society of America Special Paper 483, Pages 317–347, doi:10.1130/2011.2483 (21)*

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Roush, T.L., Marzo, G.A., Fonti, S., Orofino, V., Blanco, A., **Gross, C.**, Wendt, L. (2011). Assessing Spectral Evidence of Aqueous Activity in Two Putative Martian Paleolakes. *Icarus, Volume 214, Pages 240-245*

Wendt, L., **Gross, C.**, Kneissl, T., Sowe, M., Combe, J.-P., LeDeit, L., McGuire, P.C., Neukum, G. (2011). Sulfates and iron oxides in Ophir Chasma, Mars, based on OMEGA and CRISM observations. *Icarus, Volume 213, Pages 86-103*

Davila, A., **Gross, C.**, Marzo, G.A., Fairén, A.G., Kneissl, T., McKay, C.P., Dohm, J.M. (2011). A large sedimentary basin in the Terra Sirenum region of the southern highlands of Mars. *Icarus, Volume 212, Pages 579-589*

Foing, B.H., Stoker, C., Zavaleta, J., Ehrenfreund, P., Thiel, C., Sarrazin, P., Blake, D., Page, J., Pletser, V., Hendrikse, J., Direito, S., Kotler, M., Martins, Z., Orzechowska, G., **Gross, C.**, Wendt, L., Clarke, J., Borst, A.M., Peters, S.T.M., Wilhelm, M.-B., Davies, G.R. and ILEWG EuroGeoMars 2009 Team. (2011). Field astrobiology research in Moon–Mars analogue environment: instruments and methods. *International Journal of Astrobiology, Cambridge University Press, doi: 10.1017/S1473550411000036*

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McGuire, P.C., **Gross, C.**, Wendt, L., Bonnici, A., Souza-Egipsy, V., Ormö, J., Díaz-Martínez, E., Foing, B.H., Bose, R., Walter, S., Oesker, M., Ontrup, J., Haschke, R. and Ritter, H. (2010). The Cyborg Astrobiologist: testing a novelty detection algorithm on two mobile exploration systems at Rivas Vaciamadrid in Spain and at the Mars Desert Research Station in Utah. *International Journal of Astrobiology, 9: 11-27 Cambridge University Press doi:10.1017/S1473550409990358*

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Conference Abstracts

Gross, C., Al-Samir, M., Bishop, J. L., Poulet, F., Postberg, F., Schubert, D. (2024). Resource Reconnaissance for Future Crewed Missions to Mars. Europlanet Science Congress 2024, held 8-13 September, 2024 at Freie Universität, Berlin, Germany. Online at <https://www.epsc2024.eu/>, id. EPSC2024-807

Ovchinnikova, A., Jaumann, R., Walter, S. H. G., **Gross, C.**, Zuschneid, W., Postberg, F. (2024). Water and Sediment Transport Processes in Jezero Crater. Europlanet Science Congress 2024, held 8-13 September, 2024 at Freie Universität, Berlin, Germany. Online at <https://www.epsc2024.eu/>, id. EPSC2024-748

Bishop, J. L., Meusburger, J. M., Talla, D., Weitz, C. M., Parente, M., **Gross, C.**, Saranathan, A. M., Itho, Y., Gruendler, M. R. D., Howells, A., Yeşilbaş, M., Hiroi, T., Schmitt, B., Maturilli, A., Al-Samir, M., Bristow, F., Lafuente, B. and Wildner, M. (2024). Characterizing the New Mineral FeSO₄OH on Mars and Describing its Geochemical History and Association with Other Sulfates. Europlanet Science Congress 2024, held 8-13 September, 2024 at Freie Universität, Berlin, Germany. Online at <https://www.epsc2024.eu/>, id. EPSC2024-289

Bishop, J. L., Weitz, C. M., Parente, M., **Gross, C.**, Saranathan, A. M., Itho, Y., Meusburger, J. M., Gruendler, M. R. D., Talla, D., Howells, A. (2024). Characterizing Fe Hydroxysulfate at Aram Chaos and the Juventae Chasma Plateau to Constrain the Geochemical History of Mars. Tenth International Conference on Mars, held 22-25 July, 2024 in Pasadena, California and Virtually. LPI Contribution No. 3007, 2024, id.3428

Weitz, C. M., Bishop, J. L., Parente, M., Itho, Y., Saranathan, A., Al-Samir, M., **Gross, C.** (2024). Analyses of the Sulfates Within Juventae Chasma Using New CRISM Processing Techniques. Tenth International Conference on Mars, held 22-25 July, 2024 in Pasadena, California and Virtually. LPI Contribution No. 3007, 2024, id.3356

Bishop, J. L., Weitz, C. M., Parente, M., **Gross, C.**, Saranathan, A. M., Itho, Y., Meusburger, J. M., Gruendler, M. R. D., Al-Samir, M. (2024). Investigating Sulfate Alteration on the Juventae Chasma Plateau to Reconstruct the Ancient Geochemical History. 55th Lunar and Planetary Science Conference, Abstract # 3040

Bishop, J. L., Gruendler, K. E. W., Parente, M., Saranathan, A. M., **Gross, C.** (2023). Investigating the Diversity of Phyllosilicates and Sulfates at Mawrth Vallis, Mars and the Implications for Changing Environmental Conditions. 55th Annual Meeting of the Division for Planetary Sciences, id. 217.06. *Bulletin of the American Astronomical Society*, Vol. 55, No. 8 e-id 2023n8i217p06

Gruendler, K. E. W., Bishop, J. L., Parente, M., Saranathan, A. M., **Gross, C.** (2023). Characterization of Moist Environments at Mawrth Vallis, Mars Through Comparison with Volcanic Alteration on the Island of Kauai. 55th Annual Meeting of the Division for Planetary Sciences, id. 212.02. *Bulletin of the American Astronomical Society*, Vol. 55, No. 8 e-id 2023n8i212p02

Schreiner, B. P., **Gross, C.**, Jaumann, R., Neesemann, A., Walter, S. H. G. (2023). Virtual Reality: Visualisation of Mars Image Data from HRSC, CTX and HiRISE for Public Outreach and Research. 54th Lunar and Planetary Science Conference, Abstract # 2806

Gross, C., Munteanu, R. R. C., Walter, S. H. G., Patermann, L., Schreiner, B., Jaumann, R., HRSC/Mars Express Teams. (2023). 20 Years of High Resolution Stereo Camera Image Releases of ESA's Mars Express Mission. 54th Lunar and Planetary Science Conference, Abstract # 1951

- Bishop, J. L., Parente, M., Saranathan, A. M., **Gross, C.**, Itho, Y., Elwood Madden, M. E. (2023). Diverse Phyllosilicate Assemblages in the Mawrth Vallis Channel. *54th Lunar and Planetary Science Conference, Abstract # 1913*
- Walter, S. H. G., **Gross, C.**, Neesemann, A., Munteanu, R., Jaumann, R., Postberg, F., Bell, J. (2022). An Interactive Virtual Hiking Map for Jezero Crater, the Mars 2020 Perseverance Rover Landing Site. *European Planetary Science Congress (EPSC), Grenada, Spain, 18-23 September, <https://doi.org/10.5194/epsc2022-32>*
- Schreiner, B. P., **Gross, C.**, Neesemann, A., Walter, S. H. G., Postberg, F. (2022). Virtual Reality: Visualisation of Mars HRSC Image Data for Public Outreach and Research. *53rd Lunar and Planetary Science Conference, Abstract #1921*
- Gross, C.**, Al-Samir, M., Bishop, J. L., Poulet, F., Schubert, D., Zabel, P. (2022). Prospecting In-Situ Resources for Future Manned Missions to Mars. *53rd Lunar and Planetary Science Conference, Abstract #1946*
- Walter, S. H. G., Neu, D., **Gross, C.**, Neesemann, A., Balthasar, H., Jaumann, R., Postberg, F. (2022). An Interactive Virtual Hiking Map for the Mars 2020 Perseverance Landing Site, Jezero Crater. *53rd Lunar and Planetary Science Conference, Abstract #1921*
- Bishop, J. L., Parente, M., Saranathan, A. M., Itho, Y., **Gross, C.** (2021). The Clay Sulfate Transition at Mawrth Vallis and Implications for Changes in the Geochemical Environment and Climate. *AGU Fall Meeting, New Orleans, LA, Abstract P24A-09*
- Al-Samir, M., **Gross, C.**, Schubert, D. (2021). A Plausible Formation Model for the Maja Valles Outflow Channel System. *52nd Lunar and Planetary Science Conference, Abstract #1491*
- Bishop, J. L., Weitz, C. M., Parente, M., **Gross, C.**, Saranathan, A. M., Itho, Y., Al-Samir, M. (2021). Correlating Sulfates with the Aqueous Geochemical History at Juventae Chasma, Mars. *52nd Lunar and Planetary Science Conference, Abstract #1082*
- Gross, C.**, Balthasar, H., Dumke, A., Neu, D., Schreiner, B., Walter, S., Jaumann, R. (2021). Looking Back to 17 Successful Years of High Resolution Stereo Camera Image Release of ESA's Mars Express Mission. *52nd Lunar and Planetary Science Conference, Abstract #1480*
- Neesemann, A., Walter, S. H. G., **Gross, C.**, Jaumann, R., Gwinner, K., Michael, G. G., Schreiner, B. P., Zuschneid, W., Neu, D., Balthasar, H., Raberhge, C., Riedel, C., Kersten, E., Tirsch, D. (2021). High-Precision Topographic Map of the Mars 2020 Landing Site as Part of the MC-13E Syrtis Major Quadrangle Digital Terrain Model. *52nd Lunar and Planetary Science Conference, Abstract #2509*
- Wilk, K. A., Bishop, J. L., Itho, Y., Saranathan, A. M., Parente, M., Weitz, C. M., Flahaut, J., **Gross, C.**, Seelos, F. (2021). Characterizing Unusual Deposits at Ius Chasma, Mars. *52nd Lunar and Planetary Science Conference, Abstract #1322*
- Gross, C.**, Bishop, J. L. (2020). Tracking Layered Deposits Across the Dichotomy Boundary into the Northern Lowlands of Mars. *51th Lunar and Planetary Science Conference, Abstract # 2278*
- Ehrlich, J., **Gross, C.** (2020). Morphological Mapping of Becquerel Crater, Mars and Comparison of Light-Toned Layered Deposit Formation Theories. *51th Lunar and Planetary Science Conference, Abstract # 1988*
- Bishop, J. L., **Gross, C.**, Danielsen, J., Perrin, S., Miura, J., Usabal, G., Sessa, A., Wray, J. (2019). Multiple Mineral Horizons at Mawrth Vallis, Mars, Represent Changing Environmental Conditions. *EPSC-DPS Joint Meeting, id. EPSC-DPS2019-1175*

Weitz, C. M., Bishop, J. L., Flahaut, J., **Gross, C.**, Saranathan, A. M., Itoh, Y., and Parente, M. (2019). Evidence for Hesperian Acidic Alteration in Ius Chasma. *Ninth International Conference on Mars, LPI Contribution # 2089, id.6240*

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Michael, G. G., Walter, S. H., Zuschneid, W., **Gross, C.**, Schreiner, B., and Gwinner, K. (2019). Brightness Equalization for Mars Images as Applied to HRSC Image Mosaics. *4th Planetary Data Workshop - Flagstaff, Arizona. LPI Contribution # 2151, id.7058*

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Hiesinger, H., Bernhardt, H., Reiss, D., Tirsch, D., Jaumann, R., Hauber, E., Head, J. W., Michael, G., Williams, D. A., Bishop, J. L., Poulet, F., Muller, J. P., **Gross, C.**, Gwinner, K., Adeli, S., and Fanara, L., Neukum Crater in Noachis Terra, Mars (2018). Absolute Model Ages and Stratigraphy. *Proceedings EGU General Assembly Conference, Volume 20, p.13328*

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Bishop, J. L., Fairén, A. G., Michalski, J. R., Gago-Duport, L., Baker, L. L., Velbel, M. A., **Gross, C.**, and Rampe, E. B. (2017). Diverse Early Aqueous Environments and Climate on Mars Revealed by the Phyllosilicate Record. *Proceedings Fourth International Conference on Early Mars: Geologic, Hydrologic, and Climatic Evolution and the Implications for Life, Volume 2014, Abstract # 3030*

Bishop, J. L., Baker, L., Fairén, A. G., Michalski, J. R., Gago-Duport, L., Velbel, M. A., Gross, C., and Rampe, E. B. (2017). Implications of Martian Phyllosilicate Formation Conditions to the Early Climate on Mars. *AGU Fall Meeting Abstracts, Abstract # P31F-04.*

Gross, C., Carter, J., Poulet, F., Loizeau, D., Bishop, J.L., Horgan, B., Michalski, J. (2017). Mawrth Vallis – An auspicious destination for the ESA and NASA 2020 landers. *48th Lunar and Planetary Science Conference, Abstract # 2194*

Bishop, J.L., Baker, L.L., Fairén, A.G., **Gross, C.**, Velbel, M.A., Rampe, E.B., Michalski, J.R. (2017). Unraveling the diversity of early aqueous environments and climate on Mars through the phyllosilicate record. *48th Lunar and Planetary Science Conference, Abstract # 1804*

Bishop, J.L., **Gross, C.**, Tirsch, D., Tornabene, L.L., Carter, J., Erkeling, G. (2016). Impacts on Mars: Excavation and/or Hydrothermal Alteration. *79th Annual Meeting of the Meteoritical Society, Abstract # 6462*

Gross, C., Poulet, F., Michalski, J., Horgan, B., Bishop, J.L. (2016). Mawrth Vallis – Proposed Landing Site for EXOMARS 2018/2020. *47th Lunar and Planetary Science Conference, Abstract # 1421*

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McGuire, P.C., Audouard, J., Dunker, **Gross, C.**, Kneissl, T., Michael, G., Ody, A., Poulet, F., Schreiner, B., van Gasselt, S., Walter, S.H.G., Wendt, L., Zuschneid, W. (2016). True- and False-Color HRSC+OMEGA Image Mosaics of Mars. *47th Lunar and Planetary Science Conference, Abstract # 1031*

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Bishop, J. L., **Gross, C.**, Parente, M., Wray, J., Horgan, B., Viviano-Beck, C., Seelos, F. (2015). The transition from neutral to acidic alteration at Mawrth Vallis as observed from the mineralogical record. *2015 GSA Annual Meeting, Baltimore, Maryland, 1-4 November, Abstract # 260648*

Bishop, J. L., **Gross, C.** (2015). Bentonite composition and stratigraphy at Mawrth Vallis, Mars. *Euroclay and The Clay Minerals Society 52nd Annual Meeting, Edinburgh, Scotland, 5-7 July, Abstract # 314*

Michael, G., Walter, S., McGuire, P., Kneissl, T., van Gasselt, S., **Gross, C.**, Schreiner, B., Zuschneid, W. (2015). Systematic Processing of Mars Express HRSC Image Mosaic Quadrangles. *European Geosciences Union General Assembly, Vienna; Geophysical Research Abstracts, Vol. 17, EGU2015-6956*

Gross, C., Carter, J., Tornabene, L. L., Sowe, M., Bishop, J. L. (2015). Stratified Phyllosilicate-bearing Deposits within Impact Craters in the Northern Plains of Mars. *46th Lunar and Planetary Science Conference, Abstract # 1817*

Bishop, J. L., **Gross, C.**, Wray, J. J., Horgan, B., Viviano-Beck, C. E., Seelos, F. P. (2015). Acid Alteration at Mawrth Vallis between the older Fe/Mg-rich Clays and the younger Al/Si-rich Clays. *46th Lunar and Planetary Science Conference, Abstract # 1455*

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