

Virginia Claire Gulick, Ph.D.
SETI Institute Senior Research Scientist
NASA Ames Research Center
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EDUCATION:

PhD in Geosciences, Planetary Sciences joint program Univ. of Arizona, 1993
Thesis: "Magmatic Intrusions and Hydrothermal Systems on Mars"
(Grad advisor: Victor R. Baker; co-advisor: Robert G. Strom)

MS in Geosciences, Planetary Sciences joint program, Hydrology minor Univ. of Arizona, 1987
Thesis: "Origin and Evolution of Valleys on the Martian Volcanoes: The Hawaiian Analog"
(Grad advisor: Victor R. Baker; co-advisor: Robert G. Strom)

BA in Geosciences, minors in Geography and German Rutgers Univ., 1983
Thesis: "The Coral Sea Sediment Study"
(Advisors: Gail S. Ashley (Rutgers), Floyd W. McCoy (Dir. New Core Lab, Lamont-Doherty))

PROFESSIONAL POSITIONS:

Research Professor, Lunar and Planetary Lab, University of Arizona	August 2021- present
SETI Institute Chair of the Planetary Exploration group	2015- present
SETI Institute Science Council member	2015- present
SETI Inst. Senior Research Scientist (grantee/contractor at NASA Ames)	2011- present
SETI Inst. Research Scientist (grantee/contractor at NASA Ames)	1996 - 2011
NRC Postdoctoral Research Fellow, NASA Ames	1993 - 1996
NASA's Planetary Geology/Geophysics Grad. Research Fellow, Univ. of Arizona	1990 - 1993
Grad. Research Assistant/Associate, Univ. of Arizona, Geosciences	1984 - 1990
NASA's Planetary Geology/Geophysics Undergrad Research Fellow, Univ. of Arizona	1983
Undergrad. Research Assistant, New Core Lab, Lamont-Doherty Geol. Obs.	1982- 1983
Undergrad. Research Assistant, Geosciences, Rutgers University	Summer 1982

RESEARCH INTERESTS:

Fluvial and hydrothermal studies on Mars and Earth
Paleo-environmental and paleoclimatic change studies on Earth and Mars
Raman spectroscopy

We are continuing to build a Raman spectral and image database of over 2000 rocks, minerals, and sediments from our sample library (that we have been collecting for the past 20 years) to support planetary surface missions to Mars, the Moon, and other rocky solar system bodies. We are also in the process of obtaining thin section, IR, and XRD data of our samples.

These samples contain many Mars and lunar analog type samples collected from various terrestrial analog sites and elsewhere. Many of these samples also contain biosignatures.

- Developing automated spectral and image classifiers and reasoning layers for planetary exploration and for use in terrestrial applications
- Geomorphologic, hydrologic, hydrogeologic, and terrestrial analog studies
- Automated science analysis tool development for online use
- Collaborative interdisciplinary studies
- Mentoring and working collaboratively with junior and senior undergrads, graduate students, and post-doctoral researchers
- Collaborating with colleagues in several science and engineering disciplines

CURRENT RESEARCH ACTIVITIES:

Origin of the Osuga Valles (Mars) Terminal Depressions (cavi). Working with Ph.D. student Roy Naor (Weissman Institute) to test the hypothesis that these depressions might have formed by subsurface salt dissolution by catastrophic floods using a terrestrial analog Ze'elim Fan Sinkholes near the Dead Sea, Israel located at the termini of flood channels.

Understanding Gully Formation on Mars. Analysis of HiRISE Digital Terrain Models (DTM) for detailed slope studies of gully systems. Both detailed geomorphic and drainage mapping of gully systems and spatially associated landforms and also quantitative analyses are used to understand Mars' paleoenvironments and paleo-microclimatic implications. Results will be input into Mars Global Climate Models to test, for example, the hypothesis that some gully systems (e.g., Lyot and Bamberg Craters central peak gullies) experienced distinct meteorological conditions (e.g., orographic) compared to surrounding areas during the late Amazonian. A similar approach is planned for some Martian valley systems. Working with Ph.D. student Natalie Glines (USCS), Dr. Henrik Hargitai (Eötvös Loránd University), and numerous previous and current interns and research assistants.

Arctic Gully Systems as Analogs for Martian Gully Systems. ArcticDEM combined with World View high-resolution stereo images and other available data are being used to study Arctic gully systems and their environments. These terrestrial data sets permit for the first-time studies of terrestrial systems from orbit with similar resolution to HiRISE. Working with Ph.D. student Natalie Glines (USCS), Dr. Henrik Hargitai (Eötvös Loránd University) and Dr. Craig Kochel (Bucknell).

Automated Raman Spectral Analysis Algorithms. Developing automated classifiers to identify multiple minerals in Raman spectra of natural samples. Working with Tim Johnsen, currently a PhD student at UC-Irvine.

PLANETARY MISSION PARTICIPATION:

NASA Mars Science Lab Landing Site Selection Steering group member	2007 – 2010
NASA MSL Landing site selection website (Marsoweb) Science Lead	2007 – 2010

NASA MRO HiRISE Science Co-I Fluvial/Hydrothermal Science Leads	2001 – present
NASA MRO HiRISE HiWeb Image Suggestion Web Development Lead	2001 – 2015
NASA MRO HiRISE Education and Public Outreach Lead	2001 – 2010
NASA MER Landing Site Selection Steering Group Member	2001 – 2004
NASA MER Landing Site Selection Workshop Organizer	2000 – 2004
NASA MER L.S. Selection Website (Marsoweb) Science Lead	2000 – 2004
NASA Mars Surveyor Landing Site Selection Steering Group member	1998 – 2000
NASA Mars Surveyor Landing Site Selection Workshop Organizer	1998 – 2000
NASA Mars Surveyor Landing Site Selection MS Marsoweb lead	1998 – 2000
NASA Magellan (Venus) Mission team, Radar Investigation group	1990 – 1993

HONORS AND AWARDS:

NASA Group Achievement Award: MRO HiRISE Science Team	2011
Certificate of Appreciation for Outstanding Contribution Towards the Success of the NASA Ames Exploration Center	2004
NASA JSC Group Achievement Award: Astronaut-Rover Interaction Remote Field Test Project Team	1999
NASA Ames-JSC Certificate of Appreciation in Recognition of Dedication During Astronaut-Rover Interaction (ASRO) Field Experiment	1999
Certificate of Recognition from Office of External Affairs, Ames Research Center, for Providing Valuable Contributions to the Mars Virtual Exploration CD-ROM and Curriculum Supplement	1998
NASA-appointed member of the Mars Landing Site Selection Steering Group	1998 – 2010
NASA-appointed science consultant for the Mars Surveyor Geodesy & Cartography working group	1998 – 1999
Award for Contributions to the Atacama Desert Trek Field Experiment, The Robotics Institute, Carnegie Mellon University	1997
Invited formal debate: Was the Early Martian Climate Warm or Cold? Conference on Early Mars, LPI, Houston, Debaters: Gulick (Cold) vs. Jakosky (Warm)	1997
Certificate of Achievement for Tireless Enthusiasm, Dedication, and Hard Work in the NASA Ames Space Sciences Division	1996

COMMUNITY ACTIVITIES:

Organizer, MRO HiRISE team meeting at NASA Ames and field trip to the 9/9 – 11/2019 Pinnacles National Park.
https://docs.google.com/document/d/1j_Q2bqFHf9b5hL_0boxzZqU5i6LOBzjh7QTGIVEYQbc/edit#heading=h.iszj2sdy29zp

Co-organizer, Geological Society of America's Rocky Mountain Section Session and Fieldtrip on Mega-floods, Paleohydrology, and Fluvial Processes on Earth and Beyond: In Recognition of the Scientific Contributions of Victor R. Baker, May, 15-19, 2016.	2016
Co-organizer, NASA's Workshop on Martian Gullies: Theories and Tests, LPI Houston	2008
Co-convener, New Developments in the Study of Fluvial Systems on Mars session, AGU Fall meeting	2008
NASA Panel proposal review member or sub panel chief on numerous MDAP, MFRP, PGG, PDART, and Mars Technology Reviews	2000-2015
Organizer, First Landing Site Workshop for the 2003 Mars Exploration Rovers, NASA Ames Research Center, January 24-25, 2001.	2001
Co-Convener, NASA's Volcano/Ice Interaction on Earth and Mars Conference and field trips, Reykjavik, Iceland, August 2000, University of Reykjavik Co-Convener, abstract volume preparation and website development	2000
Organizer, Mars Surveyor Landing Site Selection Workshop (SUNY-Buffalo) abstract volume preparer/editor and website w/ abstracts & presentations	1999
NASA-appointed science consultant for the Mars Surveyor Geodesy& Cartography working group	1998 – 1999
Organizer, NASA Ames Mars Surveyor Landing Site Selection Workshop abstract volume preparer/editor and website w/ abstracts & presentations	1998
Co-organizer, Mars 2005 Sample Return Workshop, NASA Ames, 3/25-25/1997	1997
Invited formal debate: Was the Early Martian Climate Warm or Cold? Conference on Early Mars, LPI, Houston	1997

COURSES TAUGHT:

The Planets (Astronomy 105G) at NMSU	Spring 1997
Planetary Exploration (Astronomy 330G) at NMSU	Spring 1998

SELECTED CLASS LECTURES: GUEST LECTURER:

New Evidence for Aqueous Paleo-Environments on Mars, Stanford Univ. 11/2017, 11/21/2019 Physics of the Solar System Graduate Class (Geol. Sci 122/222)	
Gully Formation on Mars: Did Water Play a Role? UC-Santa Cruz,	10/26/2018

Gully Formation on Mars: Did Water Play a Role? San Jose State University,	10/2018
What Makes a Habitable Planet? Stanford University (Geol. Sci. 122/222)	11/17/2016
New Evidence for Water Activity on Mars as seen by MRO, San Jose State Univ.,	11/3/2016
Evidence for Water on Mars, Stanford University	11/4/2004, 2/25/2016
Evidence for Water on Mars, UC-Santa Cruz,	1/13/2015
Understanding Mars: A New Era of Exploration, Stanford University	11/4/2010, 10/18/2012
The New Era of Mars Exploration, Stanford Univ.	01/29/2004, 4/10/2006, 10/2007, 10/10/2013
Imaging Mars Up Close with MRO HiRISE: How You Can Get Involved! Santa Clara University	5/26/2006
Imaging Mars Up Close with MRO HiRISE, UC-Santa Cruz,	10/15/2005
The Changing View of Mars from Viking to MGS, Stanford Univ.	4/1999

NRC/NPP POST-DOCTORAL FELLOWS:

Dr. Mary Urquhart (Associate Professor, Science/Math Education, UT-Dallas	1999 – 2002
Dr. Alexandra Davatzes (Associate Professor, Earth and Environmental Science, Temple University)	2008 – 2010
Dr. J. Alexis Palmero Rodriguez (senior NPP postdoc; Senior Scientist, Planetary Sciences Institute)	2013 – 2015
Dr. Henrik Hargitai (senior NPP postdoc; Associate Professor, Eötvös Loránd University, Budapest)	2015 – 2017

GRADUATE RESEARCH ASSISTANTS/INTERNS:

Dr. Susan Lederer (PhD astronomy NMSU; now at NASA JSC)	Summer 1994
Mr. Robert L. Morris (MS in EE NMSU; now at SETI Institute)	1998 – 2003
Dr. Mark Ruzon (PhD Computer Sciences Stanford, now at Google, Inc.)	1998 – 2001
Dr. Esfandiar Bandari (PhD in C.S., CMU, MBA Stanford; now CEO/founder of Textnomics, Inc.)	1999 – 2000
Dr. Xiaojin Shi (PhD student in C.S.- UC Santa Cruz, now at Apple, Inc.)	2003 – 2004
Mr. Shawn Hart (B.S., M.S. Geosciences, UCSC; Now a web designer/ developer at ENGIN Creative)	2003 – 2010
Mr. Sascha Ishikawa (C.S. Engineer at UCSC, now research software engineer at RAND Corp.)	2003 – 2013
Dr. Kathrine Auld (Univ. of AR geology; now Science Dept. Chair, NW AR Community College)	Spring 2010
Mr. Patrick Freeman (M.S. Physics, UCSC; Particle Physics PhD student at Univ. of Birmingham, UK)	2012– 2017

Mr. Genesis Berlanga (PhD student in Earth & Planetary Sciences at UCSC)	2017– 2018
Ms. Natalie Glines (PhD. Student at UCSC and working with me at SETI Inst.)	2013 – present
Mr. Tim Johnsen (PhD student at UC-Irvine and working with me at SETI Inst.) University, and working with me at SETI Inst.)	2015– present

UNDERGRADUATE RESEARCH ASSISTANTS/INTERNS:

Dr. Kevin Hand (Dartmouth Physics undergrad., Physics & Mech. Eng., Stanford, now at JPL)	1999 – 2000
Ms. Alicia Horton (B.S. Geosciences UC-Santa Barbara)	2002 – 2003
Mr. Addison Huegel (BA Physics, UC- Berkeley; now Principal at BlockGroup)	2003 – 2004
Ms. Vickie Siegel (Geosciences grad student UCSC, now Field Ops Director at Stone Aerospace)	2003 – 2004
Ms. Carly Narlesky (B.S. Environmental Engineering, MIT; now at MBK Engineers, Sacramento)	2012 – 2014
Ms. Debra Hernandez (B.S. and M.S., Cal Poly Geology; now Geologist at Stantec)	2013 – 2014
Ms. Sarah Bass Ortega (SETI Inst. Stem Researcher and Teacher intern (STAR) (B.A. Math SJSU; 2011; Single Subject Teaching Credential in Math 2013, M.S. Aerospace Engineering SJSU 2018, SJSU Amador high school math teacher 2014-present))	Summer 2014
Mr. Luis Valenzuela (B.S.EE CalPoly); Currently PhD student in EE at UCSB	2014 – 2015
Mr. Jason Angell (B.S. Physics, NYU; Python developer at Rockstar Games)	2015 – 2016
Mr. Sean Corrigan (B.S. Astrogeophysics, Colgate Univ.; M.S. Earth & Environmental Sciences, Wesleyan Univ.)	2016 – 2017
Ms. Paige Morkner (B.S. Geology CalPoly, M.S. Geology at W. WA Univ., now Geologist at Leidos)	2015 – 2017
Mr. Tyler Paladino (B.S. UCSC Earth Science; now PhD student, Geology at ID State U.)	2017 – 2018
Ms. Khanh Luu (CalPoly Geoscience)	Summer 2017
Mr. Richard Nelson (UCSC Earth Science; now CA State Water Resources Control Board)	Summer 2017
Ms. Saira Hamid (GA State U. Geosciences, now Ph.D. Student at ASU)	2017 – 2018
Ms. Teresa Langenkamp (Miami Univ. Geology, now Ph.D. Student at CO State University)	2018 – 2019
Ms. Rowan Huang (Geosciences, BYU; now LPL PhD grad student at U. AZ)	2018 – present
Ms. Emma Rogers (Geosciences, Purdue Univ.)	Summer 2020
Mr. Tim Johnsen (B.S. Physics, UC Irvine, M.S. Data Analytics, SJSU; Now PhD student at UC-Irvine)	2015 – present

Ms. Natalie Glines (B.S. Astronomy and Geology, Mt Holyoke; now PhD student at UCSC) 2013 – present

Ms. Maci Harrell (Earth and Atmospheric Sciences, GA Tech) Summer 2021

High School Interns:

Ms. Laura Smith (Los Gatos high school intern; UCLA geology) Summer 1994

Mr. Evan Coleman (H.S. intern; Currently a PhD student in Physics, Stanford, NSF Fellow) Summer 2013

Mr. Anuj Desai (B.S., Engineering Mathematics and Statistics, UC Berkeley; now working at Microsoft AI) Summer 2014

WEBSITES DEVELOPED:

HiWeb: <https://marsoweb.nas.nasa.gov/HiRISE/hiweb/marsbrowser/index.html> Mars browser and access to HiRISE’s Image Suggestion Facility. It was developed (2006-2010) in collaboration with Glenn Deardorff (ARC, code TN). It is still being used by the HiRISE team to submit and prioritize HiRISE image suggestions from the team and public. Funded by MRO HiRISE.

HiMap: <https://pirlwww.lpl.arizona.edu/~jangel/himap/> HiWeb Image Suggestion Interface. A newer, alternative interface to the HiRISE Image Suggestion Facility. Also accessible from HiWeb splash page. Developed in collaboration with Jason Angell (www.jangel.org)(NASA Intern/SETI Inst. Research assistant, now python developer with Rocket Games, Inc.). Funded by MRO HiRISE and the NASA Internship program (<https://intern.nasa.gov>).

NASA ClickWorkers (revised): <http://jangel.pythonanywhere.com> This website was developed in collaboration with Jason Angell who was an NYU undergraduate in physics. It allows users to identify, label, delineate, and catalog six different geologic features on HiRISE images. Funded by the NASA Internship program.

NASA ClickWorkers: (<http://www.nasaclickworkers.com/index.php>) An effort to build on the original Clickworkers sites and to provide an archived site for HiRISE Clickworkers and Clickworkers (Classic). Collaboration with UCSC Professor James Davis and his computer graphics students as part of a class project.

HiRISE Clickworkers: The original site (clickworkers.arc.nasa.gov/hirise.html) is defunct, but most of the original site’s capabilities has been archived at <http://www.nasaclickworkers.com/classic/hirise.html>). This was part of HiRISE’s EPO effort and provided online opportunities for students and the public to mark and catalog 11 different landforms and geologic features (with tutorials) in both HiRISE and Mars Global Surveyor images. Users were also able to mark interesting features on the MGS images for HiRISE to acquire images of. Funded by MRO HiRISE EPO (2008-2010).

HiRISE Quest Challenges: (<https://marsoweb.nas.nasa.gov/HiRISE/quest/all/>) As part of our HiRISE Education and Public Outreach (EPO) effort, we worked with NASA Quest to put on 8 HiRISE Image Suggestion Challenges for students from Fall 2007- Spring 2010. We had live web events where we discussed Mars geology and how to submit a HiRISE image suggestion and answered student questions. Over 13,000 students from around the world participated. See the following 2010 Challenge announcement for more information: <http://www.spaceref.com/news/viewstr.html?pid=33797> . Funded by MRO HiRISE EPO (2007-2010)

HiRISE Learning and Activity Center: This interactive website is now defunct but contained Mars-HiRISE Activity books for all grade levels, HiRISE tutorials, and activities including online games, jigsaw and crossword puzzles to learn more about Mars geology. Can provide digital copies upon request. Funded by HiRISE Education and Public Outreach (2007-2010).

Clickworkers: Our original site was developed in 2000-2001 in collaboration with Bob Kanefsky (NASA ARC/Code TI). Clickworkers was the original crowdsourcing (citizen science) website for planetary science. The original Clickworkers website is now defunct, but much of the original site is archived (<https://nasaclickworkers.com/classic>). Read our [2001 LPSC abstract](#) for a summary of our results! Read about how we got started on pages 61-63 in Jeff Howe's 2008 book "[Crowdsourcing: Why the Power of the Crowd Is Driving the Future of Business](#)". Partially funded by a NASA Ames Directors Discretionary Fund in 2000.

SUMMARY OF PUBLICATIONS:

PEER-REVIEWED BOOK CHAPTERS:

Cady, Sherry L., John R. Skok, Virginia C. Gulick, Jeff A. Berger, Nancy W. Hinman 2018. Chapter 7 - Siliceous Hot Spring Deposits: Why They Remain Key Astrobiological Targets. From Habitability to Life on Mars, Pages 179-210. <https://doi.org/10.1016/B978-0-12-809935-3.00007-4> .

Chapman, Mary G.; Allen, Carlton C.; Gudmundsson, Magnus T.; Gulick, Virginia C.; Jakobsson, Sveinn P.; Lucchitta, Baerbel K.; Skilling, Ian P.; Waitt, Richard B. 2000. Volcanism and Ice Interactions on Earth and Mars. In Environmental Effects on Volcanic Eruptions: From Deep Oceans to Deep Space. Edited by James R. Zimbelman and Tracy K.P. Gregg. New York: Kluwer Academic/Plenum Publishers, 39 pgs. https://www.amazon.com/Environmental-Effects-Volcanic-Eruptions-Oceans-ebook/dp/B000WE5L2Q/ref=tmm_kin_swatch_0?encoding=UTF8&qid=&sr=

Baker, V. R., Komatsu, G., Gulick, V. C., Parker, T. J. 1997. Channels and Valleys. In Venus II: Geology, Geophysics, Atmosphere, and Solar Wind Environment 757-796, University of Arizona press. 757pgs.

https://www.google.com/books/edition/Venus_II_geology_Geophysics_Atmosphere_a/b93IEgkPquoC?hl=en

Gulick, V.C. (1996) John Playfair (invited article). Encyclopedia of Earth Science, Macmillan Reference USA, Simon and Schuster Macmillan, New York, pp. 868-869.

Baker V.R., Gulick V.C., Kargel J.S. (1993), Hydrology & water resources of Mars. in Resources of Near-Earth Space. Lewis & Matthews, eds. Univ. of AZ Press, Tucson, 765-798.

Baker V.R., Carr M.H., Gulick V.C., Williams C.R., Marley M.S. (1992) Channels & valley networks. in Mars. Kieffer, Jakosky, & Snyder, eds. Univ. of AZ Press, Tucson, 493-522.

PEER-REVIEWED JOURNAL PUBLICATIONS:

Bishop, Janice L., Merve Yeşilbaş, Nancy W. Hinman, Zachary F. M. Burton, Peter A. J. Englert, Jonathan D. Toner, Alfred S. McEwen, Virginia C. Gulick, Everett K. Gibson, Christian Koeberl 2021. Martian Subsurface Cryosalt Expansion and Collapse as Trigger for Landslides in revision. Science Advances, 7: abe4459. <https://advances.sciencemag.org/content/advances/7/6/eabe4459.full.pdf>

Glines, Natalie H. and Virginia C. Gulick (in revision). Paleolakes and Channels on the Floor of Lyot Crater, Icarus.

Hinman Nancy, Janice Bishop, Virginia Gulick, Julia Kotler-Dettmann, Paige Morkner, Genesis Berlanga, Ruth Henneberger, Peter Bergquist, C. Richardson, Malcolm Walter, Lindsay MacKenzie, Roberto Anitori, and Jill Scott. 2021. Targeting Mixtures of Jarosite and Clay Minerals for Mars Exploration. American MINERALOGIST, 106 (8), pgs. 1237-1254. <https://doi.org/10.2138/am-2021-7415>

Johnsen T.K. and Gulick V.C. (in revision). A Multimodal Network for Mineral Classification. Computers and Geosciences.

Johnsen, Timothy K; Marley, Mark S; Gulick, Virginia C; 2020. A Multilayer Perceptron for Obtaining Quick Parameter Estimations of Cool Exoplanets from Geometric Albedo Spectra Publications of the Astronomical Society of the Pacific 132 1010 44502. <https://iopscience.iop.org/article/10.1088/1538-3873/ab740d>

Gulick Virginia C., Natalie Glines, Shawn Hart and Patrick Freeman 2018. Geomorphological Analysis of Gullies on The Central Peak of Lyot Crater, Mars. Geological Society, London, Special Publications, 467, 233265, 5 December 2018. <http://dx.doi.org/10.1144/SP467.17>

Hargitai HI, Gulick VC, Glines NH 2019. Evolution of the Navua Valles region: Implications for Mars' paleoclimatic history. Icarus 330, doi.org/10.1016/j.icarus.2019.04.024

- Hargitai, H.I. Gulick, V.C., Glines, N.H. 2018. Paleolakes of Northeast Hellas: Precipitation, Groundwater-fed, and Fluvial Lakes in the Navua–Hadriacus–Ausonia Region. *Astrobiology*, vol. 18, no. 11. <https://doi.org/10.1089/ast.2018.1816>
- Hargitai, H., Gulick, V. 2018: Late Amazonian Aged Channel-and-Island Systems East of Olympus Mons, Mars. In: *Dynamic Mars*, Soare, R.J., Conway, S.J., Gallagher, C.J., Clifford, S.M., eds, Elsevier. ISBN-13: 978-0128130186 (In print).
- Hargitai H., V. Gulick, N. Glines 2018. The Geology of the Navua Valles Region of Mars. *Journal of Maps*, <https://doi.org/10.1080/17445647.2018.1496858>
- Hargitai, H.I., Gulick, V.C., and Glines, N.H. 2017. Discontinuous drainage systems formed by highland precipitation and ground-water outflow in the Navua Valles and southwest Hadriacus Mons regions, Mars. *Icarus* v. 294, 15 September 2017, Pages 172-200, <https://doi.org/10.1016/j.icarus.2017.03.005>
- Rodriguez, J.A.P. et al. +V. Gulick. 2016. Tsunami waves extensively resurfaced the shorelines of an early Martian ocean? *Scientific Reports*, 2016, <https://doi.org/10.1038/srep25106>
- Rodriguez, J.A.P., Zarroca, M., Linares, R., Gulick, V., Weitz, C.M., Yan, J., Fairén, A.G., Miyamoto, H., Platz, T., Baker, V. and Kargel, J., Glines, N. and Higuchi, K. 2016. Groundwater flow induced collapse and flooding in Noctis Labyrinthus, Mars. *PSS*, 124, 1-14. <https://doi.org/10.1016/j.pss.2015.12.009>
- Rodriguez, J. Alexis P., Jeffrey S. Kargel, Victor R. Baker, Virginia C. Gulick, Daniel C. Berman, Alberto G. Fairén, Rogelio Linares, Mario Zarroca, Jianguo Yan, Hideaki Miyamoto & Natalie Glines 2015. Erratum: Martian outflow channels: How did their source aquifers form, and why did they drain so rapidly? *Scientific Reports* 5, 15092 (2015). <https://doi.org/10.1038/srep15092>
- Rodriguez, J.A.P. et al., (including V. C. Gulick) 2015. Martian outflow channels: How did their source aquifers form, and why did they drain so rapidly? *Nature Scientific Reports* 09/2015; 5:13404. <https://doi.org/10.1038/srep13404>
- Baker, V.R., C.W. Hamilton, D. Burr, V.C. Gulick, G. Komatsu, W. Luo, J.W. Rice, Jr., J. A. P. Rodriguez 2015. Fluvial Geomorphology of Earth-like Planetary Surfaces: A Review, *Geomorphology* 245, 145-182, <https://doi.org/10.1016/j.geomorph.2015.05.002>
- Rodriguez, J.A.P., Thomas, P., Gulick, V., Baker, V., Fairén, A.G., Kargel, J., Jianguo, Y., Miyamoto, H., Glines, N., 2015. Did the Martian outflow channels mostly form during the Amazonian Period? *Icarus*, <https://doi.org/10.1016/j.icarus.2015.04.024>
- Ishikawa, S.T. and Gulick, V.C. 2013. An Automated Mineral Classifier Using Raman Spectra. *Computers & Geosciences* 54, pgs. 259-268. <https://doi.org/10.1016/j.cageo.2013.01.011>

- Rodriguez, J.A.P., Gregory J Leonard, Thomas Platz, Kenneth L Tanaka, Jeffrey S Kargel, Alberto G Fairén, Virginia Gulick, Victor R Baker, Natalie Glines, Hideaki Miyamoto, Yan Jianguo, Midori Oguma 2015. Erratum to “New insights into the Late Amazonian zonal shrinkage of the Martian south polar plateau” [Icarus 248 (2015) 407–411], Icarus, 252, page 228. <https://www.sciencedirect.com/science/article/pii/S0019103515000159?via%3Dihub>
- Rodriguez, J.A.P., Gregory J Leonard, Thomas Platz, Kenneth L Tanaka, Jeffrey S Kargel, Alberto G Fairén, Virginia Gulick, Victor R Baker, Natalie Glines, Hideaki Miyamoto, Yan Jianguo, Midori Oguma 2015. New insights into the Late Amazonian zonal shrinkage of the Martian south polar plateau. Icarus 248, 407-411. <https://doi.org/10.1016/j.icarus.2014.08.047>
- Rodriguez, J. P., Platz, T., Gulick, V., Baker, V.R., Fairén, A.G., Kargel, J., Yan, J., Miyamoto, H., Glines, N. 2015. Did the Martian Outflow Channels Mostly Form During the Amazonian Period? Icarus 257, p. 387-395. <https://doi.org/10.1016/j.icarus.2015.04.024>
- Rodriguez, J.A.P., Gulick, V.C., Baker, V.R., Platz, T., Fairén, A.G., Miyamoto, H., Kargel, J., Rice, J.W., Glines, N., 2014. Evidence for Middle Amazonian catastrophic flooding and glaciation on Mars. Icarus 242, 202–210. <https://doi.org/10.1016/j.icarus.2014.06.008>
- McEwen, A.S., Ojha, L., Dundas, C.M., Mattson, S.S., Byrne, S., Wray, J.J., Cull, S.C., Murchie, S.L., Thomas, N. and Gulick, V.C., 2011. Seasonal Flows on Warm Martian Slopes. Science, 333, 740-743.
- McEwen, A.S., et al., including V. Gulick. (2010). The High-Resolution Imaging Science Experiment (HiRISE) during MRO’s Primary Science Phase (PSP). Icarus 205, 2-37. <https://doi.org/10.1016/j.icarus.2009.04.023>
- Banks, Maria E; McEwen, Alfred S; Kargel, Jeffrey S; Baker, Victor R; Strom, Robert G; Mellon, Michael T; Gulick, Virginia C; Keszthelyi, Laszlo; Herkenhoff, Kenneth E; Pelletier, Jon D; 2008 High Resolution Imaging Science Experiment (HiRISE) observations of glacial and periglacial morphologies in the circum-Argyre Planitia highlands, Mars Journal of Geophysical Research: Planets 113 E12. <https://doi.org/10.1029/2007JE002994>
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