

Curriculum Vita

Alfred S. McEwen

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EDUCATION:

B.S. 1975 Forest Biology, SUNY ESF
B.S. 1982 Geology, Northern Arizona University
M.S. 1985 Geology, Northern Arizona University
PhD. 1988 Planetary Geology, Arizona State University

EMPLOYMENT:

6/75-10/77: Peace Corps, Guatemala. Reforestation and soil conservation.
1/78-8/80: Soil Conservationist, Soil Conservation Service, Connecticut and Pennsylvania.
1/81-8/96: U.S. Geological Survey, Branch of Astrogeology, Flagstaff, Arizona.
8/96-present: Lunar and Planetary Lab (LPL) and Department of Planetary Sciences, University of Arizona.
Regents Professor since 2019.

HONORS AND AWARDS:

1982: Award from Nat. Assoc. of Science Teachers for geology field camp, Northern Arizona University.
1985, 1990: Special Achievement Awards, USGS
1990-present: numerous invited talks and colloquia
1993: Superior Service Award, USGS
1996-present: Multiple NASA Group Achievement Awards – Galileo, Cassini, MGS, LRO, MRO
1999: Mars crossing asteroid 1988 QD1 (Gene and Carolyn Shoemaker), named (7750) McEwen.
2007: Shoemaker lecture, fall AGU, on “The geology of Mars as seen by MRO’s HiRISE”
2011: NASA’s Distinguished Public Service Medal
2015: AGU Whipple award
2015: UA College of Science Galileo Circle Fellow
2019: UA Regents Professor
2019: G.K. Gilbert award, GSA
2020: GSA Fellow

EXTRAMURAL CITIZENSHIP

Member of: American Geophysical Union (AGU), Geological Society of America (GSA), Division of Planetary Sciences (DPS)/American Astronomical Society
Co-convenor of special sessions (AGU, EPSC, others), 2000-2025
Organizer for 2001 special section of JGR-Planets on Geology and Geophysics of Io (19 papers).
Organizing Committee for the Jupiter Conference (Boulder, June 2001); other conferences
Icarus editorial board, 2001-2
Chairperson of Large Satellites Panel, National Academy of Sciences Decadal Survey, 2001-2002.
Member of Committee on Planetary and Lunar Exploration, National Academy of Sciences, 2008-10
Mars/MEPAG Science Advisory Groups for Mars Science Orbiter, Mid-Range Rover, Special Regions 2, and Mars International Collaboration, 2007-2017
Phoenix landing site review board, 2008
Mars Science Laboratory (MSL) landing site steering committee, 2008-2011
Outer Planets Assessment Group Committee (OPAG), 2016-2021 (chair 2016-2018)
Member of Planetary Sciences Subcommittee to NASA Advisory Council, 2016-2017
Member of AGU Planetary Sciences awards committee, 2025-2026
Member of International Mars Exploration Working Group, 2025-2026

EXPERIENCE IN PLANETARY SPACECRAFT EXPERIMENTS:

1989: Guest Investigator with the Voyager imaging team for Neptune encounter.
1990-2002: Galileo Interdisciplinary Scientist associated with the Solid State Imaging team; lead role in planning and analysis of Io observations.
1991-2018: Cassini Imaging Science Subsystem (ISS) Team; ISS observations of Titan
1992-1994: Clementine advisory committee and science team.
1992-2000: Participating Scientist on Mars Observer/MGS, for the Mars Orbital Camera.
2001-2003: Participating Scientist on Mars Odyssey THEMIS.

2001-2025: PI of HiRISE on Mars Reconnaissance Orbiter (Co-I after 2025)
 2005-present Co-Investigator, Lunar Reconnaissance Orbiter Camera (LROC)
 2008-2009 PI of Io Volcano Observer (IVO) mission concept study
 2009-2012 PI of PIDD grant on focal-plane system for a radiation-hard camera
 2010, 2014, 2019 PI of Io Volcano Observer proposals for Discovery Mission
 2010-2012 PI of the High resolution Stereo Color Imager (HiSCI) on the ESA/NASA ExoMars Trace Gas Orbiter
 2012-present Co-I of CaSSIS for the ESA/Roscosmos ExoMars TGO
 2015-present Deputy-PI of the Europa Imaging System (EIS) on Europa Clipper
 2020-2021 PI of Io Volcano Observer (IVO) Phase A study
 2024-6 Detector technology development for Moon and Mars via Open University
 2025-6 Participant in Phase A study for high-resolution Mars camera for ESA Lightship

Peer-Reviewed Publications

- McEwen, A.S., Soderblom, L.A., 1983, Two classes of volcanic plumes on Io. *Icarus* 55, 191-217.
 McEwen, A.S., Matson, D.L., Johnson, T.V., Soderblom, L.A., 1985, Volcanic hot spots on Io: Correlation with low albedo calderas. *J. Geophys. Res.* 90, 12345-12380.
 McEwen, A.S., 1986, Tidal reorientation and the fracturing of Jupiter's moon Europa. *Nature* 321, 49-51.
 McEwen, A.S., Soderblom, L.A., Matson, D.L., Johnson, T.V., Lunine, J.I., 1986, Calculated occultation profiles of Io and the hot spots. *Geophys. Res. Lett.* 13, 201-204.
 McEwen, A.S., 1986, Exogenic and endogenic albedo and color patterns on Europa. *J. Geophys. Res.* 91, 8077-8097.
 Moore, J.M., McEwen, A.S., Albin, E.F., Greeley, R., 1986, Topographic evidence for shield volcanism on Io. *Icarus* 67, 181-183.
 McEwen, A.S., 1988, Global color and albedo variations on Io. *Icarus* 73, 385-426.
 Gaskell, R.W., Synnott, S.P., McEwen, A.S., Schaber, G.G., 1988, Large scale topography of Io: Implications for internal structure and heat transfer. *Geophys. Res. Lett.* 15, 581-584.
 McEwen, A.S., Johnson, T.V., Matson, D.L., Soderblom, L.A., 1988, The global distribution, abundance, and stability of SO₂ on Io. *Icarus* 75, 450-478.
 McEwen, A.S., Lunine, J.I., Carr, M.H., 1989, Dynamic geophysics of Io. In Belton, M.J.S., West, R.A., Rahe, J., eds., *Time Variable Phenomena in the Jovian System*, NASA SP 494, pp. 11-46.
 McEwen, A.S., Malin, M.C., 1989, Dynamics of Mount St. Helen's 1980 pyroclastic flows, rockslide avalanche, lahars, and blast. *J. Volcanol. Geotherm. Res.* 37, 205-231.
 McEwen, A.S., 1989, Mobility of large rock avalanches: Evidence from Valles Marineris, Mars. *Geology* 17, 1111-1114.
 Smith, B.A. et al., 1989, Voyager 2 at Neptune: Imaging Science Results. *Science* 246, 1422-1449.
 McEwen, A.S., Lunine, J.I., 1990, Comment on 'The surface of Io: A new model' by Bruce Hapke. *Icarus* 84, 268-274.
 Eliason, E.M., McEwen, A.S., 1990, Adaptive box filters for removal of random noise from digital images. *Photogram. Eng. & Remote Sensing* 55, 453-458.
 McEwen, A.S., 1990, Global color and albedo variations on Triton. *Geophys. Res. Lett.* 17, 1765-1768.
 Stansberry, J.A. et al., 1990, Zonally averaged thermal balance and stability models for nitrogen polar caps on Triton. *Geophys. Res. Lett.* 17, 1773-1776.
 Hansen, C.J., McEwen, A.S., Ingersoll, A.P., and Terrile, R.J., 1990, Surface and airborne evidence for plumes and winds on Triton. *Science* 250, 421-424.
 Hillier, J. et al., 1991, The wavelength dependence of Triton's light curve. *JGR* 96, 19211-19215.
 McEwen, A.S., 1991, Photometric functions for photoclinometry and other applications. *Icarus* 92, 298-311.
 McEwen, A.S., 1991, New Martian Paradigms. *Reviews of Geophys., Supplement*, 290-296.
 Belton, M.J.S. et al., 1992, Lunar impact basins and crustal heterogeneity - New western limb and far side data from Galileo. *Science* 255, 570-576.
 Stansberry, J.A. et al., 1992, Triton's surface-atmosphere energy balance. *Icarus* 99, 242-260.

- Lucchitta, B.K., Clow, G.D., Geissler, P.E., McEwen, A.S., Schultz, R.A., Singer, R.B., and Squyres, S.W., 1992, The canyon system on Mars, in Kieffer, H.H., Jakosky, B.M., Snyder, C.W., and Matthews, M.S., eds., *Mars: Tucson, Ariz., University of Arizona Press*, p. 453-492.
- Duffield, W., Heiken, G., Foley, D., and McEwen, A., 1993, Oblique synoptic images, produced from digital data, display strong evidence of a "new" caldera in southwestern Guatemala. *J. Volcanol. Geotherm. Res.* 55, 217-224.
- Greeley, R., Kadel, S.D., Williams, D.A., Gaddis, L.R., Head, J.W., McEwen, A.S., Murchie, S.L., Nagel, E., Neukum, G., Pieters, C., Sunshine, J.M., Wagner, R., and Belton, M.J.S., 1993, Galileo imaging observations of lunar maria and related deposits: *J. Geophys. Res.* 98, 17,183-17,205.
- Pieters, C.M. et al., 1993, Crustal diversity of the Moon: Compositional analyses of Galileo solid state imaging data. *JGR* 98, 17127-17148.
- Head, J.W. et al., 1993, Lunar impact basins: New data for the western limb and far side (Orientale and South Pole-Aitken basins) from the first Galileo flyby. *JGR* 98, 17149-17182.
- McEwen, A.S., Gaddis, L., Hoffmann, H., Neukum, G., Pieters, C., Head, J., 1993, Galileo observations of post-Imbrian lunar craters during the first Earth-Moon flyby: *J. Geophys. Res.* 98, 17,207-17,231.
- Belton, M.J.S., Greeley, R., Greenberg, R., McEwen, A., and 19 others, 1994, Galileo multispectral imaging of the North Polar and eastern limb regions of the Moon. *Science* 264, 1112-1115.
- Helfenstein, P. et al., 1994, Galileo photometry of Asteroid 951 Gaspra. *Icarus* 107, 37-60.
- Carr, M.H. et al., 1994, The geology of Gaspra. *Icarus* 107, 61-71.
- Nozette, S. et al, 1994, The Clementine Mission to the Moon: Scientific Overview. *Science* 266, 1835-1839.
- McEwen, A.S., Robinson, M., Eliason, E., Lucey, P., Duxbury, T., and Spudis, P., 1994, Clementine observations of the Aristarchus region of the Moon. *Science* 266, 1858-1862.
- McEwen, A.S., 1995, SO₂-rich equatorial basins and epeirogeny of Io. *Icarus* 113, 415-422.
- Sartoretti, P. et al., 1995, Post-Voyager brightness variations on Io. *JGR* 100, 7523-7530.
- Chapman, C.R., 1995, Discovery and physical properties of Dactyl, a satellite of asteroid 243 Ida. *Nature* 374, 783-785.
- Belton, M.J.S. et al., 1995, Bulk density of asteroid 243 Ida from the orbit of its satellite Dactyl. *Nature* 374, 785-788.
- Geissler, P., Thompson, W.R., Greenberg, R., Moersch, J., McEwen, A., and Sagan, C., 1995, Galileo multispectral imaging of Earth. *J. Geophys. Res.* 100, 16,895-16,906.
- Carr, M.H. et al., 1995, The Galileo Imaging Team plan for observing the satellites of Jupiter. *JGR* 100, 18935-18956.
- Gaddis, L., McEwen, A., and Becker, T., 1995, Compositional variations on the Moon: Recalibration of Galileo solid-state imaging data for the Orientale region and farside. *J. Geophys. Res.* 100, 26,345-26,355.
- Belton, M.J.S., and 33 others including A.S. McEwen, 1996, Galileo's first images of Jupiter and the Galilean satellites. *Science* 274, 377-385.
- Helfenstein, P. et al., 1996, Galileo Photometry of Asteroid 243 Ida. *Icarus* 120, 48-65.
- Veverka, J. et al., 1996, Ida and Dactyl: Spectral Reflectance and Color Variations. *Icarus* 120, 66-76.
- Sullivan, R. et al., 1996, Geology of 243 Ida. *Icarus* 120, 119-139.
- McEwen, A.S., J.M. Moore, and E.M. Shoemaker, 1997, The Phanerozoic impact cratering rate: Evidence from the farside of the Moon. *J. Geophys. Res.* 102, 9231-9242.
- McEwen, A.S., and M.S. Robinson, 1997, Mapping of the Moon by Clementine. *Advances in Space Research* 19, pp. 1523-1533.
- Spencer, J.R., A.S. McEwen, M.A. McGrath, P. Sartoretti, D.B. Nash, K.S. Noll, and D. Gilmore, 1997, Volcanic resurfacing of Io: Post-repair HST imaging. *Icarus* 127, 221-237.
- Keszthelyi, L., and A.S. McEwen, 1997, Thermal models for basaltic volcanism in Io. *GRL* 24, 2463-2466.

- McEwen, A.S., D.P. Simonelli, D.R. Senske, K.P. Klaasen, L. Keszthelyi, T.V. Johnson, P.E. Geissler, M.H. Carr, and B.J.S. Belton, 1997, High-temperature hot spots on Io as seen by the Galileo Solid State Imaging (SSI) Experiment. *Geophys. Res. Lett.* 24, pp. 2443-2446.
- Schenk P., A. McEwen, T. Davenport, A. Davies, K. Jones, and B. Fessler, 1997, Geology and Topography of Ra Patera, Io, in the Voyager era: Prelude to eruption. *GRL* 24, 2467-2470.
- Spencer, J.R., P. Sartoretti, G.E. Ballester, A.S. McEwen, J.T. Clarke, and M. McGrath, 1997. The Pele plume (Io): Observations with the Hubble Space Telescope. *GRL* 24, 2471-2474.
- Simonelli, D.P., et al., 1997, Io: Galileo evidence for major variations in regolith properties. *GRL* 24, 2475-2478.
- Davies, A.G., A.S. McEwen, R. Lopes-Gautier, L. Keszthelyi, R.W. Carlson, and W.D. Smythe, 1997, Temperature and Area Constraints of the South Volund Volcano on Io from the NIMS and SSI Instruments during the Galileo G1 Orbit. *GRL* 24, 2447-2450.
- Klaasen, K.P. et al., 1997, Inflight performance characteristics, calibration, and utilization of the Galileo SSI camera. *Optical Eng.* 36, 3001-3027.
- Keszthelyi, L., and A.S. McEwen, 1997, Magmatic differentiation of Io. *Icarus* 130, 437-448.
- Keszthelyi, L., McEwen, A., 1997, Thermal models for basaltic volcanism on Io. *Geophys. Res. Lett.* 24, 2463-2466.
- Grier, J.A., and A.S. McEwen, 1997. The small-comet hypothesis: An upper limit to the current impact rate on the Moon, *Geophys. Res. Lett.* 24, pp. 3105-3108.
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- Geissler, P. E. et al., 1998, Evidence for non-synchronous rotation of Europa. *Nature* 391, 368.
- Malin, M.C. et al. 1998, Early Views of the Martian Surface from the Mars Orbiter Camera of Mars Global Surveyor. *Science* 279, 1681-1685.
- McEwen, A.S. et al., 1998, Active volcanism on Io as seen by Galileo SSI. *Icarus* 135, 181-219.
- Carr, M.H., A.S. McEwen, K.A. Howard, F.C. Chuang, P. Thomas, P. Schuster, J. Oberst, G. Neukum, and G. Schubert, 1998, Mountains and calderas on Io: Possible implications for lithosphere structure and magma generation. *Icarus* 135, 146-165.
- McEwen, A.S. et al., 1998, High-temperature silicate volcanism on Jupiter's moon Io, *Science* 281, 87-90.
- Helfenstein, P. et al., 1998, Galileo Observations of Europa's Opposition Effect. *Icarus* 135, 41-63.
- Clark, B.E. et al., 1998, Multispectral Terrain Analysis of Europa from Galileo Images. *Icarus* 135, 95-106.
- Geissler, P.E. et al., 1998, Evolution of Lineaments on Europa: Clues from Galileo Multispectral Imaging Observations. *Icarus* 135, 107-126.
- Moore, J.M. et al., 1998, Large Impact Features on Europa: Results of the Galileo Nominal Mission. *Icarus* 135, 127-145.
- Thomas, P.C. et al., 1998, The Shape of Io from Galileo Limb Measurements. *Icarus* 135, 175-180.
- Pappalardo, R.T. et al., 1998, Grooved Terrain on Ganymede: First Results from Galileo High-Resolution Imaging. *Icarus* 135, 276-302.
- Davies, M.E. et al., 1998, The Control Networks of the Galilean Satellites and Implications for Global Shape. *Icarus* 135, 372-376.
- Klaasen, K.P. et al., 1999, Calibration and performance of the Galileo solid-state imaging system in Jupiter orbit. *Optical Eng.* 38, 1178.
- McEwen, A.S., M.C. Malin, M.H. Carr, and W.K. Hartmann, 1999, Voluminous volcanism on early Mars revealed in Valles Marineris, *Nature* 397, 584-586.
- Hartmann, W.K., et al., 1999, Evidence for recent volcanism on Mars from crater counts, *Nature* 397, 586-589.
- Thomas, P.C., et al., 1999, Bright dunes on Mars, *Nature* 397, 592-594.
- Lopes-Gautier, R., A. McEwen, et al., 1999, Active volcanism on Io: Distribution and variations in activity, *Icarus* 140, 243-264.
- Geissler, P., A. McEwen, et al., 1999, Global color variations on Io, *Icarus* 140, 265-282.

- Keszthelyi, L., A. McEwen, and G. Taylor, 1999, Reviving the hypothesis of a mushy global magma ocean in Io, *Icarus* 141, 415-419.
- Geissler, P.E., A.S. McEwen, W. Ip, M.J.S. Belton, T.V. Johnson, W. Smyth, A.P. Ingersoll, 1999, Galileo Imaging of Atmospheric Emissions from Io, *Science* 285, 870-874.
- Pappalardo, R.T. et al., 1999, Does Europa have a subsurface ocean? Evaluation of the geological evidence. *JGR* 104, 24015-24056.
- Keszthelyi, L., A. McEwen, Th. Thordarson, Terrestrial analogs and thermal models for Martian flood lavas, *J. Geophys. Res.* 105, 15,027-15,049, 2000.
- Phillips, C.B., et al., The search for current geologic activity on Europa. *J. Geophys. Res.* 105, 22,579-22,598, 2000.
- James, P.B., et al. The 1997 Spring Regression of the Martian South Polar Cap: Mars Orbiter Camera Observations. *Icarus* 144, 410-418, 2000.
- McEwen, A.S., and 25 others, Galileo at Io: Results from high-resolution imaging. *Science* 288, 1193-1198, 2000.
- Spencer, J.R., Rathbun, J., Travis, L., Tamppari, L., Barnard, L., Martin, T., and McEwen, A., Io's thermal emission from the Galileo Photopolarimeter-Radiometer. *Science* 288, 1198-1201, 2000.
- Lopes-Gautier, R., and 15 others, A close-up look at Io from Galileo's Near-Infrared Mapping spectrometer. *Science* 288, 1201-1204, 2000.
- Kieffer, S.W., Lopes-Gautier, R., McEwen, A., Smythe, W., Keszthelyi, L., Carlson, R., Prometheus: Io's wandering plume. *Science* 288, 1204-1208, 2000.
- Grier, J.A., McEwen, A.S., Lucey, P.G., Milazzo, M.P., and Strom, R.G., The optical maturity of ejecta from large rayed lunar craters. *JGR-Planets* 106, 32,847-32,862, 2001.
- McEwen, A.S., Introduction to the special section: Geology and geophysics of Io, *J. Geophys. Res.* 106, 32,959-32,962, 2001.
- Davies, A.G., et al., Thermal signature, eruption style and eruption evolution at Pele and Pillan on Io, *J. Geophys. Res.* 106, 33,079-33,104, 2001.
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- Lopes, R.M.C., et al., Io in the near infrared: NIMS results from the Galileo fly-bys in 1999 and 2000, *J. Geophys. Res.* 106, 33,053-33,078, 2001.
- Milazzo, M.P., L. Keszthelyi, and A.S. McEwen, Observations and initial modeling of lava-SO₂ interactions at Prometheus, Io, *J. Geophys. Res.* 106, 33,121-33,128, 2001.
- Moore, J.M., et al., Landform degradation and slope processes on Io: The Galileo view, *J. Geophys. Res.* 106, 33,223-33,240, 2001.
- Radebaugh, J., L. P. Keszthelyi, A. S. McEwen, E. P. Turtle, W. Jaeger, M. Milazzo, Paterae on Io: A new type of volcanic caldera?, *J. Geophys. Res.* 106, 33,005-33,020, 2001.
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- Turtle, E.P., et al., Mountains on Io: High-resolution Galileo observations, initial interpretations, and formation models, *J. Geophys. Res.* 106, 33,173-33,200, 2001.
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- Grier, J.A., and A.S. McEwen, The lunar record of recent impact cratering, in *Accretion of Extraterrestrial Matter Throughout Earth's History*, Ed. B. Peucker-Ehrenbrink and B. Schmitz, Pergamon, pp. 403-422, 2001.
- Burr, D.M. and A.S. McEwen 2002. Recent extreme floods on Mars. In: *The Extremes of the Extremes: Extraordinary Floods* (ed. by Á. Snorrason, et al.) (Proc. of a Symp. at Reykjavik, July 2000). Publ. no. 271, IAHS Press, Wallingford, Oxfordshire, UK.
- Burr, D.M., J.A. Grier, L.P. Keszthelyi, A.S. McEwen, Repeated Aqueous Flooding from the Cerberus Fossae: Evidence for Very Recently Extant, Deep Groundwater on Mars, *Icarus* 159, 53-73.
- Williams, D. A., J. Radebaugh, L. Keszthelyi, A. McEwen, R. Lopes, S. Doute, R. Greeley, Geologic mapping of the Chaac-Camaxtli region of Io from Galileo imaging data, *Icarus*.
- McEwen, A.S., Keszthelyi, L., Lopes, R.M.C., Schenk, P., and Spencer, J.R., 2004. The lithosphere and surface of Io, chapter 14 of *Jupiter*, Edited by Bagenol, F., et al.
- Beyer, R.A., A.S. McEwen, and R.L. Kirk, 2003, Meter-scale slopes of candidate MER landing sites from point photogrammetry. *J. Geophys. Res.* 108, Issue E12, pp. ROV 26-1.
- Christensen, P.R., et al., 2003. Morphology and composition of the surface of Mars: Mars Odyssey THEMIS results, *Science* 300, 2056-2061.
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- Porco, C.C., West, R.A., McEwen, A.S., et al., Cassini imaging of Jupiter's atmosphere, satellites, and rings. *Science* 299, 1541-1527, 2003.
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- Richardson, J., Lorenz, R.D., and McEwen, A., 2004, Titan's surface and rotation: New results from Voyager 1 images, *Icarus* 170, 113-124.
- Porco, C., et al., Cassini Imaging Science: Instrument Characteristics And Anticipated Scientific Investigations At Saturn, *Space Science Reviews* 115, 363-497.
- Geissler, P.G., Alfred McEwen, Carolyn Porco, Darrell Strobel, Joachim Saur, and Joseph Ajello, R. West, 2004. Cassini Observations of Io's Visible Aurorae, *Icarus* 172, 127-140.
- Geissler, P., A.S. McEwen, C.B. Phillips, L.P. Keszthelyi, and J. Spencer, 2004. Surface Changes on Io during the Galileo Mission. *Icarus* 169, 29-64.
- Radebaugh, J., et al. 2004. Observations and Temperatures of Io's Pele Patera from Cassini and Galileo Spacecraft Images. *Icarus* 169, 65-79.
- Turtle, E.P., and 13 others 2004. The final Galileo SSI observations of Io: Orbits G28-I33. *Icarus* 169, 3-28.
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