

JAMES RAY ZIMBELMAN

EDUCATION:

- 1984: Ph.D. in Geology, Arizona State Univ., Tempe, Arizona
Dissertation: "Geologic interpretation of remote sensing data for the Martian volcano Ascræus Mons"
- 1978: M.S. in Geophysics and Space Physics, University of California at Los Angeles, Los Angeles, California
- 1976: B.A. in Physics and Mathematics (Double major), Northwest Nazarene College, Nampa, Idaho

POSITIONS HELD:

- 1988-Pres Senior Geologist, Center for Earth and Planetary Studies, National Air and Space Museum, Smithsonian Institution, Washington, D.C.
Planetary Geology - Analysis of high-resolution remote sensing data of Mars; geologic mapping of Mars and Venus; studies of long lava flows on the terrestrial planets; paleoflood features on Mars and Earth; field studies of volcanic, pluvial and aeolian terrains.
NASM activities - Chair, CEPS (02-07); Earth Sciences Review Committee (1988-90, 2000-2, 4-8); Professional Accomplishments Evaluation Committee (1991-6); public lectures for Smithsonian; Curator, "Exploring The Planets" (98-02); Lead Curator, new Exploring the Planets (2016-20); promoted to Senior level (2018); retired (9-30-20); Emeritus status (2020).
- 1986-1988 Staff Scientist, Lunar and Planetary Institute, Houston, Texas, and
1984-1986 Visiting Post-Doctoral Fellow, LPI, Houston
Planetary Geology - Analysis of high-resolution thermal infrared and imaging data from the equatorial region of Mars; image processing applications for photogeologic analysis; field studies of volcanic and aeolian features; reduced gravity observations of granular flows.
LPI activities - Co-Director of Summer Intern Program (1985-1988); Seminar Chairman (1985-87); Project Scientist for NASA-sponsored study project: "Mars: Evolution of Volcanism, Tectonism, and Volatiles" (1987-1988); public lectures.
- 1986-1988 Lecturer, University of Houston at Clear Lake, Houston, Texas (Graduate-level classes)
1988: Remote Sensing (with Steve Williams, LPI).
1987: Mars: Geologic and climatic history (with Steve Clifford, LPI).
1986: Remote Sensing.

SELECTED HONORS AND ACTIVITIES:

G. K. Gilbert Award, GSA Planetary Geology Division (2020)
Promoted to Senior Geologist, Smithsonian/NASM (2018)
Lead Curator for new “Exploring the Planets” (Gallery 205; 2016-2020)
Ronald Greeley Distinguished Service Award, GSA Planetary Geology Division (2013)
Guest Editor, Planetary Dunes special issue of Icarus (2013-14; published 2/15/14)
Member, Editor Search Committee for JGR-Planets, AGU (2010)
Member, Human Exploration of Mars Science Advisory Group, MEPAG (2007-8)
Secretary, Planetary Sciences section, American Geophysical Union (2006-8)
Chairman, CEPS/NASM (2002-7)
Group Chief, Mars Fundamental Research Review Panel, NASA (2004)
Elected Fellow, Geological Society of America (1999)
Chairman, Management Operations Working Group, PG&G, NASA (1999-02)
Chairman, Planetary Geology and Geophysics Review Panel, NASA (1997-9)
Professional Achievement Award, Northwest Nazarene University (1995)
Chairman, Mars Surveyor ‘98 Instrument Review Panel, NASA (1995)
Officer, Planetary Geology Division, Geological Society of America (1994-8)
Chairman, RPIF Directors and Data Managers Group, NASA (1994-7)
Chairman, Professional Accomplishments Evaluation Committee, NASM (1994-5)
Chairman, Planetary Cartography Working Group, NASA (1991-4; member, 1995)
Director, Regional Planetary Imaging Facility, NASM (1989-02)
Science Flight Team, Viking Mission to Mars (IRTM) (1977-80)
Summa Cum Laude, Northwest Nazarene College (1976)
Who's Who in American Universities and Colleges (1976)
Freshman Physics Award, Northwest Nazarene College (1973)
Salutatorian, The Dalles High School, The Dalles, Oregon (1972)

SELECTED TELEVISION/RADIO INTERVIEWS:

Senate Capitol studio, Sen. Dornan (N. Dakota) (7/97) (Pathfinder)
NBC Nightly News, reporter Robert Hager (2000) (Mary Bourke)
MSNBC, reporter Savannah Guthrie (8/1/08) (Phoenix, Water on Mars)
PBS News Hour, reporter Miles O’Brien (3/16/11) (Beyond exhibit)
Fox Channel 5 (Wash. station), reporter Doug McElway (4/8/11) (Gov shutdown)
CNN (Wolf Blitzer show), plus ABC 7, CBS 9, VOA, WTOP (6/5/12) (Venus transit)
BBC World News (Washington studio), 5/31/13 (asteroid 1998QE2 close approach)
Deutsche Welle (Germany), 12/2/14 (Mars missions)
German radio 7/8/15 (Pluto/New Horizons)
NBC national, ABC local 7/13/15 (New Horizons)
BBC World News TV and radio (8/2, 8/15) (space-themed dance, Kennedy Center)
WMAL radio (9/25/15) (super moon eclipse)
CBS Evening News, reporter Chip Reed (7/25/18) (sub-ice polar lake on Mars)
WTOP radio, reporter John Arron (Perseid meteors) 8/12/20
Smithsonian Channel “Making Tracks on Mars” (program proposed by JRZ) 2/14/21

PRESENTATIONS ON CAPITOL HILL, CONGRESSIONAL OFFICE BUILDINGS:

Mars Geology (House-Rayburn, 7/97)

Spacecraft Tour of the Solar System (Senate-Dirkson, 5/99)

Mars Rovers (House-Rayburn, 7/06), with John Grant (also CEPS/NASM)

ORGANIZATION MEMBERSHIPS:

American Geophysical Union (1985-2020)

Geological Society of America (1987-pres)

International Cartographic Association (1995-2009)

International Association of Volcanology and Chemistry of Earth's Interior (1998-2016)

SELECTED RESEARCH GRANTS: (JRZ, Principal Investigator)

"1:500,000 scale geologic mapping of the Memnonia region of Mars" NAGW -1390 (NASA) Planetary Geology & Geophysics Program, 1987-90, \$10K.

"1:500,000 scale geologic mapping of the Tharsis Montes on Mars" NAGW-1390 (NASA) PG&G, 1990-95, \$50K.

"Geologic and tectonic implications for paleoslopes on Venus" NAGW-3734 (NASA), Venus Data Analysis Program, 1993-4, \$64K.

"Evaluation of the controlling influence of topography on the emplacement of large flow fields" NAGW-3364 (NASA), PG&G, 1996-7, \$34K.

"Long lava flows on the terrestrial planets" NAG5-4164 (NASA) PG&G, 1998-03, \$181K.

"Evaluation of the paleoflood hypothesis for Mars and Earth through investigation of unconfined fluvial processes" NAG5-8153 (NASA) Mars Data Analysis Program, 1999-01, \$146K.

"Field investigations of pluvial and aeolian features in the southwestern United States as analogs to features on Mars" NAG5-12746 (NASA) MFRP, 2003-5, \$100K. E/PO augmentation, \$45K over three years.

"Evaluation of lava flow emplacement conditions on the terrestrial planets" NAG5-4164 and NNG04GJ21G (NASA) PG&G, 2005-7, \$101K.

"Evaluation of ripple and dune landforms and processes on Mars using MGS and Odyssey data" NNG04GN88G (NASA) MDAP, 2005-7, \$135K.

"Geologic mapping of the Medusae Fossae Formation on Mars" NNX07AP42G (NASA) PGG, 2008-10, \$93K.

"Field investigations of pluvial features in the western United States as analogs to features on Mars" NNX07AQ71G (NASA) MFRP, 2007-9, \$126K.

- “Emplacement of long non-channeled lava flows on the terrestrial planets” NNX08AM18G (NASA) PGG, 2008-9, \$31.5K.
- “Morphometric analysis of small sand dunes on Mars” NNX08AK90G (NASA) MDAP, 2008-11, \$174K.
- “Evaluation of the remote identification of inflated lava flows on the terrestrial planets” NNX09AD88G (NASA) PGG, 2009-11, \$198K.
- “Field study of an inflated lava flow and monitoring of sand dunes” (Smithsonian Endowments – Becker), 2010, \$15.7K
- “Characterization of small sand dunes on Mars” NNX12AJ38G (NASA) MDAP, 2012-2018, \$330K.
- “Making Tracks on Mars” Smithsonian Channel Mission Critical program, 2020, \$500K.
- “Exploring the Planets” NASM, gift to fund the new gallery, 2021, \$10M.

PUBLICATIONS:

Books

- Zimbelman, J.R., and T.K.P. Gregg, Eds. (2000) Environmental effects on volcanic eruptions: From deep oceans to deep space, Kluwer Academic/Plenum Publishers, New York, 266 p, ISBN 0-306-46233-8.
- Lorenz, R.D., and J.R. Zimbelman (2014) Dune Worlds: How windblown sand shapes planetary landscapes, Springer/Praxis Publishers, New York, 308 p, ISBN 978-3-540-89724-8.
- Zimbelman, J.R., D.A. Crown, P.J. Mouginis-Mark, and T.K.P. Gregg (2021) The Volcanoes of Mars, Elsevier Publishers, New York, 260 p, ISBN 978-0-12-822876-0, doi:10.1016/C2016-0-03694-X.

Selected Refereed Articles and Maps

- Zimbelman, J.R., and H.H. Kieffer (1979) Thermal mapping of the north equatorial and temperate latitudes of Mars, J. Geophys. Res., **84**, 8239-8251.
- Zimbelman, J.R., and R. Greeley (1982) Surface properties of ancient cratered terrain in the northern hemisphere of Mars, J. Geophys. Res., **87**, 10181-10189.
- Zimbelman, J.R. (1985) Estimates of rheologic properties for flows on the Martian volcano Ascraeus Mons, Proc. Lunar Planet. Sci. Conf. 16th, J. Geophys. Res., **90**, D157-D162.
- Zimbelman, J.R. (1986) Surface properties of the Pettit wind streak on Mars: Implications for sediment transport, Icarus, **66**, 83-93.

- Fink, J.H., and J.R. Zimbelman (1986) Rheology of the 1983 Royal Gardens basalt flows, Kilauea volcano, Hawaii, Bull. Volc. **48**, 87-96.
- Zimbelman, J.R., and L.A. Leshin (1987) A geologic evaluation of thermal properties for the Elysium and Aeolis quadrangles of Mars, Proc. Lunar Planet. Sci. Conf. 17th, J. Geophys. Res., **92**, E588-E596.
- Forsythe, R.D., and J.R. Zimbelman (1988) Is the Gordii Dorsum escarpment on Mars an exhumed transcurrent fault?, Nature, **336**, 143-146.
- Mouginis-Mark, P.J., L. Wilson, and J.R. Zimbelman (1988) Polygenic eruptions on Alba Patera, Mars, Bull. Volc., **50**, 361-379.
- Wells, G.L., and J.R. Zimbelman (1989) Extra-terrestrial arid surface processes, In Arid Zone Geomorphology (D. Thomas, ed.), pp. 335-358, Belhaven Press, London.
- Fink, J.H., and J.R. Zimbelman (1990) Longitudinal variations in rheologic properties of lavas: Puu Oo basalt flows, Kilauea volcano, Hawaii, In IAVCEI Proceedings in Volcanology, Vol. 2, Lava Flows and Domes, (J.H. Fink, ed.), Springer-Verlag, New York, 157-173.
- Zimbelman, J.R., and K.S. Edgett (1992) The Tharsis Montes, Mars: Comparison of volcanic and modified landforms, Proc. Lunar Planet. Sci., Vol. 22, pp. 31-44, Lunar and Planetary Institute, Houston.
- Squyres, S.W., S.M. Clifford, R.O. Kuzmin, J.R. Zimbelman, and F. Costard (1992) Ice in the martian megaregolith, in Mars, (H. Kieffer et al., eds.), pp. 523-554, UA Pr.
- Zimbelman, J.R., R.A. Craddock, R. Greeley, and R.O. Kuzmin (1992), Volatile history of Mangala Valles, Mars, J. Geophys. Res., **97**, 18,309-18,317.
- Dollfus, A., M. Deschamps, and J.R. Zimbelman (1993), Soil texture and granulometry at the surface of Mars, J. Geophys. Res., **98**, 3413-3429.
- Robinson, M.S., P.J. Mouginis-Mark, J.R. Zimbelman, S.S.C. Wu, K.K. Ablin and A.E. Howington-Kraus (1993), Chronology, eruption duration, and atmospheric contribution of the martian volcano Apollinaris Patera, Icarus, **104**, 301-323.
- Williams, S.H. and J.R. Zimbelman (1994), Desert pavement evolution: An example of the role of sheetflood, J. Geology, **102**, 243-248.
- Zimbelman, J.R., R.A. Craddock, and R. Greeley (1994), Geologic map of the MTM -15147 quadrangle, Mangala Valles region of Mars, U.S. Geol. Survey Misc. Invest. Series Map I-2402, scale 1:500,000.
- Scott, D.H., and J.R. Zimbelman (1995), Geologic map of Arsia Mons volcano, Mars, U.S. Geol. Survey Misc. Invest. Series Map I-2480, scale 1:1,000,000.

- Zimbelman, J.R., S.H. Williams, and V.P. Tchakerian (1995), Sand transport paths in the Mojave Desert, southwestern United States (In Desert Aeolian Processes, V. Tchakerian, Ed.), pp. 101-129, Chapman and Hall, New York.
- Zimbelman, J.R., and S.H. Williams (1996) Wind streaks: Geological and botanical effects on surface albedo contrast, Geomorphology, **17**, 167-185.
- Edgett, K.S., B.J. Butler, J.R. Zimbelman, and V.E. Hamilton (1997) Geologic context of the Mars radar "Stealth" region in southwestern Tharsis, J. Geophys. Res., **102**, E9, 21545-21568.
- Chapman, M.G., and J.R. Zimbelman (1998) Corona associations and their implications for Venus, Icarus, **132**, 344-361.
- Scott, D.H., J. Dohm, and J.R. Zimbelman (1998) Geologic map of Pavonis Mons volcano, Mars, U.S. Geological Survey Misc. Invest. Series Map I-2561.
- Zimbelman, J.R. (1998) Emplacement of long lava flows on planetary surfaces, J. Geophys. Res., **103**, B11, 27503-27516.
- Zimbelman, J.R. (2000) Non-active dunes in the Acheron Fossae region of Mars between the Viking and Mars Global Surveyor eras, Geophys. Res. Lett., **27(7)**, 1069-1072.
- Zimbelman, J.R. (2001) Image resolution and the evaluation of genetic hypotheses for planetary landscapes, Geomorphology, **37**, Nos. 3-4, 179-199.
- Zimbelman, J.R., and A.K. Johnston (2001) Improved topography of the Carrizozo lava flow: Implications for emplacement conditions, Volcanology in New Mexico, New Mexico Museum of Natural History and Science, Bulletin 18, (L.S. Crumpler and S.G. Lucas, Eds.), p. 131-136.
- Zimbelman, J.R., and S.H. Williams (2002) Chemical indicators of separate sources for eolian sands in the eastern Mojave Desert, California, and western Arizona, Bull. Geol. Soc. Am., **114**, no. 4, 490-496.
- Bradley, B.A., S.E.H. Sakimoto, H. Frey, and J.R. Zimbelman (2002) The Medusae Fossae Formation: New perspectives from Mars Global Surveyor, J. Geophys. Res. Planets, **107**, E6, 10.1029/2001JE001587.
- Zimbelman, J.R., and A.K. Johnston (2002) New precision topographic measurements of the Carrizozo and McCarty's basalt flows, New Mexico, New Mexico Geological Society Guidebook, 53rd Field Conference, p. 121-127.
- Zimbelman, J.R. (2003) Flow field stratigraphy surrounding Sekmet Mons volcano, Kawelu Planitia, Venus, J. Geophys. Res. Planets, **108**, E5, 10.1029/2002JE001965.

- Wilson, S.A., and J.R. Zimbelman (2004) The latitude-dependent nature and physical characteristics of transverse aeolian ridges on Mars, J. Geophys. Res. Planets, **109**, E10003, 10.1029/2004JE002247.
- Williams, R.M.E., J.R. Zimbelman, and A.K. Johnston (2006) Morphological attributes of alluvial fans indicative of formation process: A case study in southwestern California with application to Mojave Crater fans on Mars, Geophys. Res. Lett., **33**, L10201, doi: 10.1029/2005GL025618.
- Bourke, M.C., M. Balme, R.A. Beyer, K.K. Williams, and J. Zimbelman (2006) A comparison of methods used to constrain the height of sand dunes on Mars, Geomorphology, **81**, 440-452, doi: 10.1016/j.geomorph.2006.04.023.
- Ghatan, G.J., and J.R. Zimbelman (2006) Paucity of candidate coastal constructional landforms along proposed shorelines on Mars: Implications for a northern lowlands-filling ocean, Icarus, **185**, 171-196, doi: 10.1016/j.icarus.2006.06.007.
- Crumpler, L.S., J.C. Aubele, and J.R. Zimbelman (2007) Chapter 4: Volcanic features of New Mexico analogous to volcanic features on Mars, in "The Geology of Mars: Evidence from Earth-based Analogues" (M. Chapman, Ed.), Cambridge Univ. Press, 95-125.
- Zimbelman, J.R., and S.H. Williams (2007) Chapter 9: Aeolian features in the western United States as analogs to wind-related features on Mars, in "The Geology of Mars: Evidence from Earth-based Analogs" (M. Chapman, Ed.), Cambridge Univ. Press, 232-264.
- Garry, W.B., J.R. Zimbelman, and T.K.P. Gregg (2007) Analysis of a long channeled lava flow near Ascraeus Mons volcano, Mars, J. Geophys. Res. Planets, **112**, E08007, doi: 10.1029/2006JE002803.
- Zimbelman, J.R., W.B. Garry, A.K. Johnston, and S.H. Williams (2008) Emplacement of the 1907 Mauna Loa basalt flow as derived from precision topography and satellite imaging, J. Volc. Geotherm. Res. **177**, 837-847, doi: 10.1016/j.volgeores.2008.01.042.
- Balme, M., D.C. Berman, M.C. Bourke, and J.R. Zimbelman (2008) Transverse aeolian ridges (TARs) on Mars, Geomorphology, **101**, 707-720, doi: 10.1016/j.geomorph.2008.03.011.
- Mandt, K.E., de Silva, S.L., Zimbelman, J.R., and Crown, D.A. (2008) The origin of the Medusae Fossae Formation, Mars: Insights from a synoptic approach, J. Geophys. Res. Planets **113**, E12011, doi: 10.1029/2008JE003076.
- Williams, R.M.E., R.P. Irwin, and J.R. Zimbelman (2009) Evaluation of paleohydrologic models for terrestrial inverted channels: Applications to Mars, Geomorphology, **107**, 300-315, doi: 10.1016/j.geomorph.2008.12.015.
- Zimbelman, J.R., R.P. Irwin, S.H. Williams, F. Bunch, A. Valdez, and S. Stevens (2009) The rate of granule ripple movement on Earth and Mars, Icarus, **203**, 71-76, doi: 10.1016/j.icarus.2009.03.033.

- Mandt, K., D. Wyrick, S. de Silva, and J. Zimbelman (2009) Distinct erosional progressions in the Medusae Fossae Formation, Mars, indicate contrasting environmental conditions, Icarus, **204**, 471-477, doi: 10.1016/j.icarus.2009.06.031.
- Zimbelman, J.R., L.J. Griffin (2010) HiRISE images of yardangs and sinuous ridges in the lower member of the Medusae Fossae Formation, Mars, Icarus, **205**, 198-210, doi: 10.1016/j.icarus.2009.04.003.
- Zimbelman, J.R. (2010) Transverse Aeolian Ridges on Mars: First results from HiRISE images, Geomorphology, **121**, 22-29 (Planetary Dunes Special Issue), doi: 10.1016/j.geomorph.2009.05.012.
- Berman, D.C., M.R. Balme, S. Rafkin, M.C. Bourke, and J.R. Zimbelman (2011) Transverse Aeolian Ridges (TARs) on Mars II: Distributions, orientations, and ages, Icarus, **213**, 116-130, doi: 10.1016/j.icarus.2011.02.014.
- Zimbelman, J.R., and S.P. Scheidt (2012) Hesperian age for western Medusae Fossae Formation, Mars, Science, **336**, 1683, (June 29), doi: 10.1126/science.1221094.
- Zimbelman, J.R., S.H. Williams, and A.K. Johnston (2012) Cross-sectional profiles of sand ripples, megaripples, and dunes: A method for discriminating between formational mechanisms, Earth Surf. Proc. Landforms, **37**, 1120-1125, doi: 10.1002/esp.3243.
- Irwin, R.P., and J.R. Zimbelman (2012) Morphometry of Great Basin pluvial shore landforms: Implications for paleolake basins on Mars, J. Geophys. Res. Planets, **117**, E7004, doi: 10.1029/2012JE004046.
- Garry, W.B., M.S. Robinson, J.R. Zimbelman, J.E. Bleacher, B.R. Hawke, L.S. Crumpler, S.E. Braden, and H. Sato (2012) The origin of Ina: Evidence for inflated lava flows on the Moon, J. Geophys. Res. Planets, **117**, E00H31, doi: 10.1029/2011JE003981.
- Shockey, K.M., and J.R. Zimbelman (2013) Analysis of transverse aeolian ridge profiles derived from HiRISE images of Mars, Earth Surface Proc. Landforms, **38**, 179-182, doi: 10.1002/esp.3316.
- Zimbelman, J.R., M.C. Bourke, and R.D. Lorenz (2013) Recent developments in planetary aeolian studies and their terrestrial analogs, Aeol. Res., **11**, 109-126, doi: 10.1016/j.aeolia.2013.04.004.
- de Silva, S.L., M.G. Spagnuolo, N.T. Bridges, and J.R. Zimbelman (2013) Gravel-mantled megaripples of the Argentinean Puna: A model for their origin and growth with implications for Mars, Geol. Soc. Am. Bull., **125 (11/12)**, 1912-1929, doi: 10.1130/B30916.1.
- McGovern, P.J., M.E. Rumpf, and J.R. Zimbelman (2013) The influence of lithospheric flexure on magma ascent at large volcanoes on Venus, J. Geophys. Res., **118**, 2423-2437, doi: 10.1002/2013JE004455.

- Zimbelman, J.R., and S.P. Scheidt (2014) Precision topography of a reversing sand dune at Bruneau Dunes, Idaho, as an analog for Transverse Aeolian Ridges on Mars, *Icarus*, **230**, 29-37, doi: 10.1016/j.icarus.2013.08.004.
- Rooney, T.O., I.D. Bastow, D. Keir, F. Mazzarini, E. Movsesian, E.B. Grosfils, J.R. Zimbelman, M.S. Ramsey, D. Ayalew, and G. Yirgu (2014) The protracted development of focused magmatic intrusion during continental rifting, *Tectonics*, **33(6)**, 875-897, doi: 10.1002/2013TC003514.
- Bridges, N.T., M.G. Spagnuolo, S.L. de Silva, J.R. Zimbelman, and E.M. Neely, (2015) Formation of gravel-mantled megaripples on Earth and Mars: Insights from the Argentinean Puna and wind tunnel experiments, *Aeol. Res.*, **17**, 49-60, doi: 10.1016/j.aeolia.2015.01.017.
- Zimbelman, J.R., W.B. Garry, J.E. Bleacher, and D.A. Crown (2015) Volcanism on Mars, in *Encyclopedia of Volcanism*, 2nd Ed. (H. Sigurdsson, Ed.), Academic Press, 717-728.
- Craddock, R.A., S. Tooth, J.R. Zimbelman, S.A. Wilson, T.A. Maxwell, and C. Kling (2015) Temporal observations of a linear sand dune in the Simpson Desert, central Australia: Testing models for dune formation on planetary surfaces. *J. Geophys. Res. Planets*, **120**, doi: 10.1002/2015JE004892.
- Zimbelman, J.R., S.P. Scheidt, S.L. de Silva, N.T. Bridges, M.G. Spagnuolo, and E.M. Neely (2016) Aerodynamic roughness height for gravel-mantled megaripples, with implications for wind profiles near TARs on Mars. *Icarus*, **266**, doi: 10.1016/j.icarus.2015.11.008.
- Foroutan, M., and J.R. Zimbelman (2016) Mega-ripples in Iran: A new analog for transverse aeolian ridges on Mars. *Icarus*, **274**, 99-105, doi: 10.1016/j.icarus.2016.03.025.
- Bleacher, J.E., T.R. Orr, A.P. de Wet, J.R. Zimbelman, C.W. Hamilton, W.B. Garry, L.S. Crumpler, and D.A. Williams (2017) Plateaus and sinuous ridges as the fingerprints of lava flow inflation in the eastern Tharsis plains of Mars. *J. Volc. Geotherm. Res.*, doi: 10.1016/j.jvolgeores.2017.03.025.
- Zimbelman, J.R., and M.B. Johnson (2017) Surface slope effects for ripple orientation on sand dunes in Lopez crater, Terra Tyrrhena region of Mars, *Aeol. Res.*, **26**, 57-62, doi: 10.1016/j.aeolia.2016.08.007.
- Foroutan, M., and J. Zimbelman (2017) Semi-automatic mapping of linear-trending bedforms using 'self-organizing maps' algorithm, *Geomorphology*, **293**, 156-166, doi: 10.1016/j.geomorph.2017.05.016.
- Chiasera, B., T.O. Rooney, G. Girard, G. Yirgu, E. Grosfils, D. Ayalew, P. Mohr, J.R. Zimbelman, M.S. Ramsey (2018) Magmatically assisted off-rift extension: The case for broadly distributed strain accommodation, *Geosphere*, **14(4)**, doi: 10.1130/GESo1615.1.

- Foroutan, M., G. Steinmetz, J.R. Zimbelman, C.R. Duguay (2019) Megaripples at Wau-an-Namus, Libya: A new analog for similar features on Mars, Icarus, **319**, 840-851, doi: 10.1016/j.icarus.2018.10.021.
- Banks, M.E., L.K. Fenton, N.T. Bridges, P.E. Geissler, M. Chojnacki, K.D. Runyon, S. Silvestro, J.R. Zimbelman (2018) Patterns in mobility and modification of middle- and high-latitude southern hemisphere dunes on Mars, J. Geophys. Res. Planets, **123**, 3205-3219, doi: 10.1029/2018JE005747.
- Zimbelman, J.R. (2019) The transition between sand ripples and megaripples on Mars, Icarus, **333**, 127-129, doi: 10.1016/j.icarus.2019.05.017.
- Valdez, A., J.R. Zimbelman (2020) Great Sand Dunes, in Inland Dunes of North America, Dunes of the World (N. Lancaster, P. Hesp, eds.), pp. 239-285, doi: 10.1007/978-3-030-40498-7_7.
- Mouginis-Mark, P.J., J.R. Zimbelman (2020) Rafted pumice: A new model for the formation of the Medusae Fossae Formation, Mars, Icarus, **343**, doi: 10.1016/j.icarus.2020.113684.
- Hamilton, C.W., S.P. Scheidt, M.M. Sori, A.P. de Wet, J.E. Bleacher, P.J. Mouginis-Mark, S. Self, J.R. Zimbelman, W.B. Garry, P.L. Whelley, L.S. Crumpler (2020) Lava-rise plateaus and inflation pits in the McCarty flow, New Mexico: An analog for pahoehoe-like lava flows on planetary surfaces. J. Geophys. Res. Planets, **125** (7), e2019JE005975, doi: 10.1029/2019JE005975.
- Foroutan, M., J.R. Zimbelman (2020) Evaluation of large data sets for Transverse Aeolian Ridges (TARs) on Earth and Mars, Planet. Sp. Sci., **189**, doi: 10.1016/j.pss.104966.
- Zimbelman, J.R., Foroutan, M. (2020) Dingo Gap: Curiosity went up a small Transverse Aeolian Ridge and came down a megaripple. J. Geophys. Res. Planets, **125**, e2020JE006489, doi: 10.1029/2020JE006489.