

# Timothy A. Goudge

## Curriculum Vitae

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The University of Texas at Austin  
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### Research Interests

My science is driven by interests in: using remote sensing data to investigate the record of surface processes on planetary bodies; quantitative analysis of infrared spectroscopic data to remotely characterize mineralogy; and understanding how distinct boundary conditions on planetary surfaces affect sedimentary processes.

### Education

**Brown University**, Providence, Rhode Island, USA

2015

**Doctor of Philosophy (PhD) in Geological Sciences**

Dissertation Title: *Paleolakes on Mars: Insights into timing, morphology, and mineralogy.*

Advisors: Jim Head and Jack Mustard

2012

**Master of Science (ScM) in Geological Sciences**

Advisors: Jim Head and Jack Mustard

**Queen's University**, Kingston, Ontario, Canada

2009

**Bachelor of Science (BSc) in Geological Engineering**

Focus in Geotechnical Engineering; Graduated Honors, 1<sup>st</sup> Class

### Professional Experience

Starting 1/2019

**Assistant Professor**

Department of Geological Sciences, Jackson School of Geosciences,  
The University of Texas at Austin

2015 – Present

**Jackson School Distinguished Postdoctoral Fellow**

Jackson School of Geosciences, The University of Texas at Austin

2010 – 2015

**Graduate Student Research Assistant**

Department of Geological Sciences, Brown University

### Refereed Journal Publications

**2018:**

1. Bramble, M. S., **T. A. Goudge**, R. E. Milliken, and J. F. Mustard (2018), Testing the deltaic origin of fan deposits at Bradbury crater, Mars, *Icarus*, *in press*, DOI: 10.1016/j.icarus.2018.09.024.
2. Hughes, C. M., B. T. Cardenas, **T. A. Goudge**, and D. Mohrig (2018), Deltaic deposits indicative of a paleo-coastline at Aeolis Dorsa, Mars, *Icarus*, *in press*, DOI: 10.1016/j.icarus.2018.08.009.

3. Kocurek, G., R. C. Martindale, M. Day, **T. A. Goudge**, C. Kerans, H. J. Hassenruck-Gudipati, J. Mason, B. T. Cardenas, E. I. Petersen, D. Mohrig, D. S. Aylward, C. M. Hughes, and C. M. Nazworth (2018), Antecedent aeolian dune topographic controls on carbonate and evaporite facies: Jurassic Todilto Member, Wanakah Formation, Ghost Ranch, New Mexico, USA, *Sedimentology*, *in press*, DOI: 10.1111/sed.12518.
4. **Goudge, T. A.**, and C. I. Fassett (2018), Incision of Licus Vallis, Mars from multiple lake overflow floods, *J. Geophys. Res.*, *123*, 405–420, DOI: 10.1002/2017JE005438.
5. Cardenas, B. T., D. Mohrig, and **T. A. Goudge** (2018), Fluvial stratigraphy of valley fills at Aeolis Dorsa, Mars: Evidence for base-level fluctuations controlled by a downstream water body, *Geol. Soc. Amer. Bull.*, *130*, 484–498, DOI: 10.1130/B31567.1.
6. Liu, Y., **T. A. Goudge**, J. G. Catalano, and A. Wang (2018), Spectral and stratigraphic mapping of hydrated minerals associated with interior layered deposits near the southern wall of Melas Chasma, Mars, *Icarus*, *302*, 62–79, DOI: 10.1016/j.icarus.2017.11.006.
7. **Goudge, T. A.**, D. Mohrig, B. T. Cardenas, C. M. Hughes, and C. I. Fassett (2018), Stratigraphy and paleohydrology of delta channel deposits, Jezero crater, Mars, *Icarus*, *301*, 58–75, DOI: 10.1016/j.icarus.2017.09.034.
8. Salvatore, M. R., **T. A. Goudge**, M. S. Bramble, C. S. Edwards, J. L. Bandfield, E. S. Amador, J. F. Mustard, and P. R. Christensen (2018), Bulk mineralogy of the NE Syrtis and Jezero crater regions of Mars derived through thermal infrared spectral analyses, *Icarus*, *301*, 76–96, DOI: 10.1016/j.icarus.2017.09.019.

**2017:**

9. de Haas, T., S. J. Conway, F. E. G. Butcher, J. Levy, P. M. Grindrod, **T. A. Goudge**, and M. R. Balme (2017), Time will tell: Temporal evolution of martian gullies and paleoclimatic implications, *Geol. Soc. London Spec. Pub.* *467*, *in press*, DOI: 10.1144/SP467.1.
10. **Goudge, T. A.**, J. M. Russell, J. F. Mustard, J. W. Head, and S. Bijaksana (2017), A 40,000 year record of clay mineralogy at Lake Towuti, Indonesia: Paleoclimate reconstruction from reflectance spectroscopy and perspectives on paleolakes on Mars, *Geol. Soc. Amer. Bull.*, *129*, 806–819, DOI: 10.1130/B31569.1.
11. **Goudge, T. A.**, R. E. Milliken, J. W. Head, J. F. Mustard, and C. I. Fassett (2017), Sedimentological evidence for a deltaic origin of the western fan deposit in Jezero crater, Mars and implications for future exploration, *Earth Planet. Sci. Lett.*, *458*, 357–365, DOI: 10.1016/j.epsl.2016.10.056.
12. Levy, J. S., **T. A. Goudge**, J. W. Head, and C. I. Fassett (2017), Candidate volcanic and impact-induced ice depressions on Mars, *Icarus*, *285*, 185–194, DOI: 10.1016/j.icarus.2016.10.021.

**2016:**

13. **Goudge, T. A.**, C. I. Fassett, J. W. Head, J. F. Mustard, and K. L. Aureli (2016), Insights into surface runoff on early Mars from paleolake basin morphology and stratigraphy, *Geology*, *44*, 419–422, DOI: 10.1130/G37734.1.
14. Weider, S. Z., L. R. Nittler, S. L. Murchie, P. N. Peplowski, T. J. McCoy, L. Kerber, C. Klimczak, C. M. Ernst, **T. A. Goudge**, R. D. Starr, N. R. Izenberg, R. L. Klima, and S. C. Solomon (2016), Evidence from MESSENGER for sulfur- and carbon-driven explosive volcanism on Mercury, *Geophys. Res. Lett.*, *43*, 3653–3661, DOI: 10.1002/2016GL068325.

**2015:**

15. **Goudge, T. A.**, K. L. Aureli, J. W. Head, C. I. Fassett, and J. F. Mustard (2015), Classification and analysis of candidate impact crater-hosted closed-basin lakes on Mars, *Icarus*, *260*, 346–367, DOI: 10.1016/j.icarus.2015.07.026.
16. Weber, A. K., J. M. Russell, **T. A. Goudge**, M. R. Salvatore, J. F. Mustard, and S. Bijaksana (2015), Characterizing clay mineralogy in Lake Towuti, Indonesia, with reflectance spectroscopy, *J. Paleolimnol.*, *54*, 253–261, DOI: 10.1007/s10933-015-9844-4.
17. **Goudge, T. A.**, J. F. Mustard, J. W. Head, C. I. Fassett, and S. M. Wiseman (2015), Assessing the mineralogy of the watershed and fan deposits of the Jezero crater paleolake system, Mars, *J. Geophys. Res.*, *120*, 775–808, DOI: 10.1002/2014JE004782.
18. Dickson, J. L., J. W. Head, **T. A. Goudge**, and L. Barbieri (2015), Recent climate cycles on Mars: Stratigraphic relationships between multiple generations of gullies and the latitude dependent mantle, *Icarus*, *252*, 83–94, DOI: 10.1016/j.icarus.2014.12.035.
19. **Goudge, T. A.**, J. F. Mustard, J. W. Head, M. R. Salvatore, and S. M. Wiseman (2015), Integrating CRISM and TES hyperspectral data to characterize a halloysite-bearing deposit in Kashira crater, Mars, *Icarus*, *250*, 165–187, DOI: 10.1016/j.icarus.2014.11.034.

**2014:**

20. **Goudge, T. A.**, J. W. Head, L. Kerber, D. T. Blewett, B. W. Denevi, D. L. Domingue, J. J. Gillis-Davis, K. Gwinner, J. Helbert, G. M. Holsclaw, N. R. Izenberg, R. L. Klima, W. E. McClintock, S. L. Murchie, G. A. Neumann, D. E. Smith, R. G. Strom, Z. Xiao, M. T. Zuber, and S. C. Solomon (2014), Global inventory and characterization of pyroclastic deposits on Mercury: New insights into pyroclastic activity from MESSENGER orbital data, *J. Geophys. Res.*, *119*, 635–658, DOI: 10.1002/2013JE004480.
21. Izenberg, N. R., R. L. Klima, S. L. Murchie, D. T. Blewett, G. M. Holsclaw, W. E. McClintock, E. Malaret, C. Mauceri, F. Vilas, A. L. Sprague, J. Helbert, D. L. Domingue, J. W. Head, **T. A. Goudge**, S. C. Solomon, C. A. Hibbitts, and M. D. Dyar (2014), The low-iron, reduced surface of Mercury as seen in spectral reflectance by MESSENGER, *Icarus*, *228*, 364–374, DOI: 10.1016/j.icarus.2013.10.023.

**2012:**

22. **Goudge, T. A.**, J. F. Mustard, J. W. Head, and C. I. Fassett (2012), Constraints on the history of open-basin lakes on Mars from the composition and timing of volcanic resurfacing, *J. Geophys. Res.*, *117*, E00J21, DOI: 10.1029/2012JE004115.
23. Watters, T. R., S. C. Solomon, C. Klimczak, A. M. Freed, J. W. Head, C. M. Ernst, D. M. Blair, **T. A. Goudge**, and P. K. Byrne (2012), Extension and contraction within volcanically buried impact craters and basins on Mercury, *Geology*, *40*, 1123–1126, DOI: 10.1130/G33725.1.
24. **Goudge, T. A.**, J. W. Head, J. F. Mustard, and C. I. Fassett (2012), An analysis of open-basin lake deposits on Mars: Evidence for the nature of associated lacustrine deposits and post-lacustrine modification processes, *Icarus*, *219*, 211–229, DOI: 10.1016/j.icarus.2012.02.027.

**2011:**

25. Head, J. W., C. R. Chapman, R. G. Strom, C. I. Fassett, B. W. Denevi, D. T. Blewett, C. M. Ernst, T. R. Watters, S. C. Solomon, S. L. Murchie, L. M. Prockter, N. L. Chabot, J. J. Gillis-Davis, J. L. Whitten, **T. A. Goudge**, D. M. H. Baker, D. M. Hurwitz, L. R.

Ostrach, Z. Xiao, W. J. Merline, L. Kerber, J. L. Dickson, J. Oberst, P. K. Byrne, C. Klimczak, and L. R. Nittler (2011), Flood volcanism in the northern high latitudes of Mercury revealed by MESSENGER, *Science*, 333, 1853–1856, DOI: 10.1126/science.1211997.

## **First-Authored Conference Abstracts and Presentations**

### *\*Oral presentation*

1. **\*Goudge, T. A.**, C. I. Fassett, and D. Mohrig (2018), Characterizing the record of paleolake outlet canyon incision on Mars, *49<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1574.
2. **\*Goudge, T. A.**, C. I. Fassett, and D. C. Mohrig (2017), Constraining canyon incision driven by lake overflow floods on early Mars, *2017 AGU Fall Meeting*, Abstract EP43G-03 (Invited).
3. **\*Goudge, T. A.**, and C. I. Fassett (2017), The importance of lake overflow floods for early martian landscape evolution: Insights from Licus Vallis, *Fourth International Conference on Early Mars*, Abstract 3025.
4. **Goudge, T. A.**, B. L. Ehlmann, C. I. Fassett, J. W. Head, J. F. Mustard, N. Mangold, S. Gupta, R. E. Milliken, and A. J. Brown (2017), Jezero crater, Mars as a compelling site for future in situ exploration, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1197.
5. **\*Goudge, T. A.**, D. Mohrig, B. T. Cardenas, C. M. Hughes, and C. I. Fassett (2017), Stratigraphy and evolution of delta channel deposits, Jezero crater, Mars, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1195.
6. **Goudge, T. A.**, and C. I. Fassett (2016), Knickpoints and hanging valleys of Licus Vallis, Mars, *2016 AGU Fall Meeting*, Abstract EP41B-0909.
7. **\*Goudge, T. A.**, D. Mohrig, B. T. Cardenas, C. M. Hughes, J. S. Levy, and C. I. Fassett (2016), Stratigraphy and paleohydrology of delta channel deposits, Jezero crater, Mars, *2016 GSA Annual Meeting*, Abstract 22-5 (Invited).
8. **Goudge, T. A.**, D. Mohrig, B. T. Cardenas, C. M. Hughes, J. S. Levy, and C. I. Fassett (2016), Sedimentology of the Jezero crater western fan deposit: 2. Secular changes in the style of channelization, *47<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1656.
9. **\*Goudge, T. A.**, R. E. Milliken, J. W. Head, J. F. Mustard, and C. I. Fassett (2016), Sedimentology of the Jezero crater western fan deposit: 1. Evidence for a deltaic origin and implications for future exploration, *47<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1122.
10. **Goudge, T. A.**, C. I. Fassett, and C. Schwartz (2015), Constraining paleolake activity on Mars from outlet valley morphometry, *2015 AGU Fall Meeting*, Abstract P53D-2157.
11. **Goudge, T. A.**, J. F. Mustard, J. M. Russell, and J. W. Head (2015), Paleolake deposits on Mars: Perspectives on source-to-sink mineralogy from Lake Towuti, Indonesia, *46<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1191.
12. **\*Goudge, T. A.**, K. L. Aureli, J. W. Head, J. F. Mustard, and C. I. Fassett (2015), Candidate closed-basin lakes on Mars: Insights into timing and intensity of fluvial activity, *46<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1190.

13. **\*Goudge, T. A.**, J. F. Mustard, J. W. Head, and J. M. Russell (2014), Source to sink mineralogy in Lake Towuti, Indonesia from reflectance spectroscopy: Insights into paleolake deposits on Mars, *2014 GSA Annual Meeting*, Abstract 170-11.
14. **\*Goudge, T. A.**, J. W. Head, J. F. Mustard, C. I. Fassett, and K. L. Aureli (2014), Insights from paleolake hydrologic setting: A comparison of hydrologically open and candidate hydrologically closed basins on Mars, *Eighth International Conference on Mars*, Abstract 1367.
15. **Goudge, T. A.**, J. F. Mustard, J. W. Head, and J. M. Russell (2014), Source to sink mineralogy in Lake Towuti, Indonesia: Perspectives on open-basin lakes on Mars, *45<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1190.
16. **Goudge, T. A.**, J. W. Head, J. F. Mustard, and C. I. Fassett (2014), A transported origin for alteration minerals within the Jezero Crater, Mars paleolake basin: Evidence from catchment and delta mineralogy, *45<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1164.
17. **\*Goudge, T. A.**, J. F. Mustard, J. W. Head, C. I. Fassett, and J. M. Russell (2013), Assessing catchment and delta mineralogy within the Jezero Crater paleolake system: A combined mapping and terrestrial analog approach, *2013 GSA Annual Meeting*, Abstract 11-8.
18. **Goudge, T. A.**, J. F. Mustard, J. W. Head, and M. R. Salvatore (2013), Integrating CRISM and TES hyperspectral data to characterize a massive kaolin-group mineral deposit in Kashira Crater, Mars, *44<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1377.
19. **Goudge, T. A.**, J. F. Mustard, J. W. Head, and C. I. Fassett (2013), Jezero Crater paleolake, Mars: Assessing the nature and provenance of alteration minerals and carbonates, *44<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1376.
20. **\*Goudge, T. A.**, J. F. Mustard, J. W. Head, and M. R. Salvatore (2012), Integrating CRISM and TES data to constrain the modal mineralogy of hydrated mineral deposits on Mars – A pan-spectral approach, *2012 GSA Annual Meeting*, Abstract 60-10.
21. **Goudge, T. A.**, J. F. Mustard, and J. W. Head (2012), Geologic history of a paleolake in Kashira Crater, Mars and a comparison to terrestrial lacustrine mineralogy, *Third International Conference on Early Mars*, Abstract 7040.
22. **\*Goudge, T. A.**, J. F. Mustard, J. W. Head, and C. I. Fassett (2012), Constraints on the history of open-basin lakes on Mars from the timing of volcanic resurfacing, *43<sup>rd</sup> Lunar and Planetary Science Conference*, Abstract 1328.
23. **Goudge, T. A.**, J. W. Head, L. Kerber, D. T. Blewett, B. W. Denevi, S. L. Murchie, N. R. Izenberg, W. E. McClintock, G. M. Holsclaw, D. L. Domingue, J. J. Gillis-Davis, Z. Xiao, R. G. Strom, J. Helbert, and S. C. Solomon (2012), Global inventory and characterization of pyroclastic deposits on Mercury: New insights into pyroclastic activity from MESSENGER orbital data, *43<sup>rd</sup> Lunar and Planetary Science Conference*, Abstract 1325.
24. **Goudge, T. A.**, J. F. Mustard, J. W. Head, and C. I. Fassett (2011), Constraints on the history of open-basin lakes on Mars from the timing of volcanic resurfacing, *2011 AGU Fall Meeting*, Abstract P31E-1737.
25. **\*Goudge, T. A.**, J. W. Head, J. F. Mustard, and C. I. Fassett (2011), Open-basin lakes on Mars: A global analysis of associated lacustrine and post-fluvial deposits, *The Second Moscow Solar System Symposium*, Abstract 2MS<sup>3</sup>-PS-03.

26. **Goudge, T. A.**, J. F. Mustard, J. W. Head, and C. I. Fassett (2011), Open-basin lakes on Mars: A study of mineralogy along a paleolake chain, *42<sup>nd</sup> Lunar and Planetary Science Conference*, Abstract 2244.
27. **Goudge, T. A.**, J. W. Head, J. F. Mustard, and C. I. Fassett (2011), A comprehensive look at martian open-basin lake morphology, *42<sup>nd</sup> Lunar and Planetary Science Conference*, Abstract 2131.

### **Co-Authored Conference Abstracts and Presentations**

1. Cardenas, B. T., G. Kocurek, D. Mohrig, T. Swanson, C. M. Hughes, S. C. Brothers, and **T. A. Goudge** (2018), Ancient environmental forcings recorded in aeolian stratigraphy: An Earth analog to aeolian strata on Mars, *49<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2971.
2. Brown, A. J., **T. A. Goudge**, and C. E. Viviano (2018), Olivine-carbonate mineralogy of Jezero crater, *49<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1761.
3. Bramble, M. S., J. F. Mustard, C. I. Fassett, and **T. A. Goudge** (2018), Stratigraphy of the Northeast Syrtis Major Mars 2020 landing site and the ejecta of Jezero crater, Mars, *49<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1705.
4. Cardenas, B. T., **T. A. Goudge**, C. M. Hughes, D. Mohrig, J. Mason, T. Swanson, and J. S. Levy (2018), Testing the preservation of river channel properties in Earth analogs to martian fluvial sinuous ridges, *49<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1541.
5. Schorghofer, N., J. S. Levy, and **T. A. Goudge** (2018), Seasonal frost as source of liquid water on Mars, *49<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1388.
6. Hassenruck-Gudipati, H., **T. A. Goudge**, and D. Mohrig (2017), Inundation and draining of the Trinity River floodplain associated with extreme precipitation from Hurricane Harvey, east Texas, USA, *2017 AGU Fall Meeting*, Abstract NH23E-2810.
7. Swartz, J. M., D. C. Mohrig, S. P. S. Gulick, and **T. A. Goudge** (2017), Tracking channel behavior of the Rio Grande River, Texas, USA: Backstepping avulsions and coastal bend cutoffs, *2017 AGU Fall Meeting*, Abstract EP13D-03.
8. Daniller-Varghese, M. S., E. Smith, D. C. Mohrig, **T. A. Goudge**, H. J. Hassenruck-Gudipati, W. M. Koo, J. Mason, J. M. Swartz, and J. Kim (2017), Influence of waves and tides on upper slope turbidity currents and their deposits: An outcrop and laboratory study, *2017 AGU Fall Meeting*, Abstract EP13C-1651.
9. Cardenas, B. T., **T. A. Goudge**, C. M. Hughes, J. S. Levy, and D. Mohrig (2017), Justifying martian fluvial sinuous ridge measurements using Earth analog stratigraphy, *Fourth International Conference on Early Mars*, Abstract 3060.
10. Salvatore, M., **T. Goudge**, M. Bramble, C. Edwards, J. Bandfield, E. Amador, J. Mustard, and P. Christensen (2017), Bulk mineralogy of the Northeast Syrtis and Jezero crater regions of Mars derived through thermal infrared spectral analyses, *Fourth International Conference on Early Mars*, Abstract 3058.
11. Petersen, E. I., J. W. Holt, J. S. Levy, and **T. A. Goudge** (2017), New constraints on surface debris layer composition for martian mid-latitude glaciers from SHARAD and HiRISE, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2767.
12. Brown, A. J., C. E. Viviano-Beck, **T. A. Goudge**, and K D. Putirka (2017), Carbonate mineralogy of the Jezero crater watershed, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2346.

13. Bramble, M. S., **T. A. Goudge**, R. E. Milliken, and J. F. Mustard (2017), Testing the deltaic origin of fan deposits at Bradbury crater, Mars, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2210.
14. Cardenas, B. T., **T. A. Goudge**, C. M. Hughes, D. Mohrig, and J. S. Levy (2017), Stratigraphic architecture of compound channel-filling deposits in the Cedar Mountain and Morrison Formations, Utah: Stratigraphic analogs to martian sinuous ridges, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1946.
15. Cardenas, B. T., D. Mohrig, and **T. A. Goudge** (2017), Fluvial stratigraphy at Aeolis Dorsa, Mars records base level changes and backwater sedimentation controlled by a fluctuating downstream body of standing water, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1938.
16. Salvatore, M. R., **T. A. Goudge**, M. S. Bramble, C. S. Edwards, J. L. Bandfield, E. S. Amador, J. F. Mustard, and P. R. Christensen (2017), Bulk mineralogy of the northwest Isidis region of Mars derived through thermal infrared spectral analyses, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1154.
17. Fassett, C. I., and **T. A. Goudge** (2017), Hydrological modeling of the Jezero crater outlet-forming flood, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1145.
18. Gearon, J. H., J. S. Levy, and **T. A. Goudge** (2017), Making sense of chaos: Geomorphic investigations of martian chaos terrain, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1121.
19. Shover, K. R., **T. A. Goudge**, J. S. Levy, J. W. Holt, and C. I. Fassett (2017), Waning intensity of hydrological activity on Mars captured by fan/valley system mass balance, *48<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1106.
20. Aylward, D., J. M. Swartz, **T. A. Goudge**, and D. Mohrig (2016), Alongshore distribution of washover deposits: Hurricane Ike and the Texas coast, 2008, *2016 AGU Fall Meeting*, Abstract EP11A-0964.
21. Ellis, T., H. J. Hassenruck-Gudipati, D. Mohrig, and **T. A. Goudge** (2016), Investigating the relationship of Late Pleistocene terrace formation and channel dynamics within the Texas Gulf Coast plain, *2016 AGU Fall Meeting*, Abstract EP13B-1037.
22. Lim, Y., J. S. Levy, **T. A. Goudge**, and W. Kim (2016), Controls of ice cover on Arctic delta morphodynamics and depositional processes, *2016 AGU Fall Meeting*, Abstract EP12B-06.
23. Petersen, E. I., J. S. Levy, J. W. Holt, E. A. McKinnon, and **T. A. Goudge** (2016), The effect of surface roughness on shallow radar sounding of debris-covered glaciers in Deuteronilus Mensae, Mars, *47<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2618.
24. Lim, Y., J. S. Levy, W. Kim, and **T. A. Goudge** (2016), Experimental investigation of the effect of ice cover on delta morphology: How “warm and wet” were martian paleolake environments, *47<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2443.
25. Cardenas, B. T., A. B. Bryk, **T. A. Goudge**, C. M. Hughes, and D. Mohrig (2016), Determining paleoflow direction of martian channel belts using preserved channel-bend asymmetry: Case study at Aeolis Dorsa, Mars, *47<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2367.
26. Hughes, C. M., B. T. Cardenas, **T. A. Goudge**, and D. Mohrig (2016), Deltaic deposits indicative of a paleo-coastline at Aeolis Dorsa, Mars, *47<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2139.

27. Shover, K. R., **T. A. Goudge**, J. S. Levy, J. W. Holt, and C. I. Fassett (2016), Unraveling ancient martian hydrological conditions through mass balance studies of sedimentary fans, *47<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2057.
28. Weider, S. Z., L. R. Nittler, S. L. Murchie, P. N. Peplowski, T. J. McCoy, L. Kerber, C. M. Ernst, **T. A. Goudge**, R. D. Starr, N. R. Izenberg, R. L. Klima, J. W. Head, and S. C. Solomon (2016), Evidence from MESSENGER for sulfur- and carbon-driven explosive volcanism on Mercury, *47<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1217.
29. Mustard, J. F., S. M. Wiseman, **T. A. Goudge** (2015), Mechanisms for olivine carbonation at the Nili Fossae/Isidis basin boundary, Mars: Evidence for intense surface aqueous activity or low temperature surface alteration, *2015 GSA Annual Meeting*, Abstract 21-11.
30. Mustard, J. F., **T. A. Goudge**, M. S. Bramble, B. L. Ehlmann, J. W. Head, J. L. Dickson, C. I. Fassett, and K. M. Cannon (2015), Jezero crater watershed, Isidis basin, sulfate deposits and Syrtis Major: A compelling exploration zone for human exploration, *First Landing Site/Exploration Zone Workshop for Human Missions to the Surface of Mars*, Abstract 1034.
31. Fassett, C. I., **T. A. Goudge**, J. W. Head, and J. F. Mustard (2015), Open-basin lakes and the climate and surface environment of early Mars, *46<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1880.
32. Dickson, J. L., J. W. Head, and **T. A. Goudge** (2014), Burial, inversion, modification and removal of gullies on Mars: Clues to gully formation and evolution from detailed stratigraphic relationships, *Eighth International Conference on Mars*, Abstract 1442.
33. Mustard, J. F., S. M. Wiseman, and **T. A. Goudge** (2014), Carbonate in Nili Fossae at the Noachian-Hesperian boundary: Importance of post-Syrtis hydrologic systems?, *Eighth International Conference on Mars*, Abstract 1344.
34. Kerber, L., S. Besse, J. W. Head, D. T. Blewett, and **T. A. Goudge** (2014), The global distribution of pyroclastic deposits on Mercury: The view from orbit, *45<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2862.
35. Aureli, K. L., **T. A. Goudge**, J. W. Head, and C. I. Fassett (2014), Classification of candidate impact crater-hosted closed-basin lakes on Mars, *45<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2369.
36. Dickson, J. L., J. W. Head, L. Barbieri, and **T. A. Goudge** (2014), Evolution of the latitude dependent mantle on Mars: Thickness estimates and evidence for cyclical emplacement as revealed by Late Amazonian gullies, *45<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1680.
37. Grigsby, B., D. Turney, S. Murchie, D. Buczkowski, H. Nair, K. Seelos, C. Viviano, and **T. Goudge** (2014), Pursuing STEM: How Mars Exploration Student Data Teams (MESDT) students are preparing for their future in science, technology, engineering and math (STEM) related careers through authentic Mars research, *45<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1557.
38. Nittler, L. R., S. Z. Weider, R. D. Starr, N. Chabot, B. W. Denevi, C. M. Ernst, **T. A. Goudge**, J. W. Head, J. Helbert, R. L. Klima, T. J. McCoy, and S. C. Solomon (2014), Sulfur-depleted composition of Mercury's largest pyroclastic deposit: Implications for explosive volcanism and surface reflectance of the innermost planet, *45<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1391.



39. Wiseman, S. M., J. F. Mustard, **T. A. Goudge**, and B. L. Ehlmann (2013), Topographic analysis of carbonate-bearing deposits in Nili Fossae on Mars, *2013 GSA Annual Meeting*, Abstract 11-10.
40. Gillis-Davis, J., **T. A. Goudge**, J. W. Head, Z. Xiao, and P. K. Byrne (2013), The spatial and topographic distribution of pit craters on Mercury, *44<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 2422.
41. Aureli, K. L., J. W. Head, **T. A. Goudge**, and C. I. Fassett (2013), An analysis of candidate closed-basin lakes in impact craters on Mars, *44<sup>th</sup> Lunar and Planetary Science Conference*, Abstract 1244.
42. Head, J. W., D. Marchant, C. Fassett, J. F. Mustard, **T. Goudge**, and K. Aureli (2013), Lessons from the McMurdo Dry Valley lakes for closed and open-basin lakes on Noachian Mars: “warm and wet” or “cold and icy”?, *ASLO 2013 Aquatic Sciences Meeting*, Abstract 11001.
43. Gillis-Davis, J. J., M. M. Markley, **T. A. Goudge**, J. W. Head, Z. Xiao, and K. Gwinner (2012), Large pit craters of Mercury: Global distribution and occurrence, *43<sup>rd</sup> Lunar and Planetary Science Conference*, Abstract 2288.
44. Head, J. W., S. C. Solomon, C. I. Fassett, S. L. Murchie, L. M. Prockter, M. S. Robinson, D. T. Blewett, B. W. Denevi, T. R. Watters, J. L. Whitten, **T. A. Goudge**, D. M. H. Baker, D. M. Hurwitz, P. K. Byrne, and C. Klimczak (2012), Effusive volcanism on Mercury from MESSENGER mission data: Nature and significance for lithospheric stress state and mantle convection, *43<sup>rd</sup> Lunar and Planetary Science Conference*, Abstract 1451.
45. Head, J. W., C. R. Chapman, R. G. Strom, C. I. Fassett, B. W. Denevi, D. T. Blewett, C. M. Ernst, T. R. Watters, S. C. Solomon, S. L. Murchie, L. M. Prockter, N. L. Chabot, J. J. Gillis-Davis, J. Whitten, **T. A. Goudge**, D. M. Baker, D. M. Hurwitz, L. R. Ostrach, Z. Xiao, W. J. Merline, L. A. Kerber, J. L. Dickson, J. Oberst, P. K. Byrne, C. Klimczak, and L. R. Nittler (2011), Widespread and voluminous flood volcanism in the northern high latitudes of Mercury revealed by MESSENGER: Relation to global volcanic processes, *2011 AGU Fall Meeting*, Abstract P43E-10.
46. Hurwitz, D. M., J. W. Head, M. T. Zuber, D. E. Smith, G. A. Neumann, R. G. Strom, C. I. Fassett, B. W. Denevi, D. T. Blewett, C. M. Ernst, T. R. Watters, S. C. Solomon, P. K. Byrne, C. Klimczak, S. L. Murchie, L. M. Prockter, N. L. Chabot, J. J. Gillis-Davis, **T. A. Goudge**, D. M. Baker, L. R. Ostrach, Z. Xiao, W. J. Merline, J. L. Dickson, J. Oberst, and L. R. Nittler (2011), Lava erosion on Mercury: Model results using new observations from MESSENGER, *2011 AGU Fall Meeting*, Abstract P41A-1591.
47. Klimczak, C., T. R. Watters, P. K. Byrne, C. M. Ernst, S. C. Solomon, **T. A. Goudge**, J. W. Head, and Z. Xiao (2011), Strain analysis of extension in volcanically flooded impact craters on Mercury, *2011 GSA Annual Meeting*, Abstract 142-10.
48. Watters, T. R., S. C. Solomon, J. W. Head, C. M. Ernst, B. W. Denevi, M. S. Robinson, C. Klimczak, and **T. A. Goudge** (2011), Extension in the northern plains of Mercury, *2011 GSA Annual Meeting*, Abstract 142-9.
49. Fassett, C. I., B. W. Denevi, J. L. Whitten, **T. A. Goudge**, D. M. H. Baker, D. M. Hurwitz, L. R. Ostrach, Z. Xiao, P. Byrne, and C. Klimczak (2011), Widespread and voluminous flood volcanism in the northern lowlands of Mercury revealed by MESSENGER, *2011 GSA Annual Meeting*, Abstract 142-6.

### **Invited Talks**

2018

McMaster University, School of Geography &amp; Earth Sciences Seminar

2018	Queen's University, Department of Geological Sciences and Geological Engineering Seminar
2018	The University of Texas at Austin, Department of Geological Sciences Seminar
2018	Stanford University, Department of Geological Sciences Seminar
2017	AGU Fall Meeting
2017	NASA Marshall Space Flight Center, NSSTC Space Science Seminar
2017	NASA Ames Research Center, Space Science & Astrobiology Division Seminar
2017	USGS Menlo Park, Geology, Minerals, Energy and Geophysics Group Seminar
2017	Southwest Research Institute, Space Science and Engineering Division Seminar
2017	NASA Jet Propulsion Laboratory, Seminar
2017	Rice University, Sedimentology Seminar
2017	58 <sup>th</sup> Brown-Vernadsky Microsymposium
2017	The University of Texas at Austin, UT Institute for Geophysics Seminar
2017	SETI Institute, Weekly Colloquium
2016	University of Manitoba, Department of Geological Sciences Seminar
2016	The University of Texas at Austin, DeFord Lecture Series (Department of Geological Sciences Seminar)
2016	GSA Annual Meeting
2013	MIT, Planetary Internal Colloquium Series (PICS)

### **Academic Honors and Awards**

2018 – Present	National Center for Earth-Surface Dynamics 2 Synthesis Postdoctoral Fellowship
2015 – 2017	Jackson School Distinguished Postdoctoral Fellowship, The University of Texas at Austin
2012 – 2015	Natural Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship
2012, 2013	GSA Northeastern Section Student Travel Grant
2010 – 2011	First Year Graduate Fellowship, Brown University
2008 – 2009	J. P. Bickell Foundation Mining Scholarship, Queen's University
2008 – 2009	Gartner Lee Scholarship in Geological Engineering, Queen's University
2007 – 2008	J. J. Denny Memorial Scholarship in Geological Engineering, Queen's University
2006 – 2008	Morley E. Wilson Scholarship in Geological Sciences, Queen's University
2006 – 2007	Annie Bentley Lillie Book Prize for First Year Calculus, Queen's University
2005 – 2008	Dean's Scholar, Queen's University
2005 – 2006	Dean's Award, Queen's University

2005 – 2006            Dean's Entrance Scholarship in Applied Science, Queen's University

### **Professional Service**

2016 – Present            Judge for Dwornik Award at Lunar and Planetary Science Conference

2015 – Present            Peer Reviewer for *Geology*; *Scientific Reports*; *Journal of Geophysical Research – Planets*; *Icarus*; *Planetary and Space Science*; *Planetary Data System (PDS)*

2015 – Present            Review Panelist and External Reviewer for NASA ROSES

2015 – Present            Judge for Outstanding Student Paper Award at American Geophysical Union Fall Meeting

2014 – Present            Lead advocate for Jezero crater paleolake as a landing site for the NASA Mars 2020 rover

2018                        Judge for Jackson School of Geoscience Research Symposium

2018                        Program Committee for 49<sup>th</sup> Lunar and Planetary Science Conference

2017                        Session Co-Chair at 48<sup>th</sup> Lunar and Planetary Science Conference

2014                        Session Co-Chair at 2014 GSA Annual Meeting

2011 – 2012                Brown Graduate Student GeoClub Co-president

### **Teaching Experience**

2016                        **Instructor**  
Mars Sedimentology (GEO291), co-taught with David Mohrig, Department of Geological Sciences, The University of Texas at Austin

2014 – 2018                **Guest Lecturer**  
Brown University: Limnology (GEOL 1150); Advanced Remote Sensing (GEOL 2330)  
The University of Texas at Austin: Planetary Geology and Geophysics (GEO391)

2014                        **Graduate Teaching Assistant**  
Mars, Moon, and the Earth (GEOL 0050), Department of Geological Sciences, Brown University

2014                        **Sheridan Teaching Certificate I – Reflective Teaching**  
The Harriet W. Sheridan Center for Teaching and Learning, Brown University

2007 – 2008                **Undergraduate Teaching Assistant**  
Earth's Physical Environment (APSC 151), Department of Geological Sciences and Geological Engineering, Queen's University

### **Field Experience**

2018                        Trinity River, TX; Green River, UT

2017                        Rio Grande River, TX; Ghost Ranch, NM Texas Gulf Coast (3 days); Trinity River, TX

2016                        Coos Bay, OR; Green River, UT; Trinity River, TX; Wax Lake Delta, LA

2015                        North Loup River, NE

2013 Meridan, CT; Bavaria, Germany

### **Public Outreach**

2011 – 2016 Volunteer for Mars Exploration Student Data Teams (MESDT)  
2011 – 2015 Vartan-Gregorian Elementary School Volunteer Science Teacher  
2014 Guest Speaker at University of Maryland Observatory, and  
Skyscrapers, Inc.  
2012 – 2014 Vartan-Gregorian Elementary School Volunteer Science Teacher  
Program Organizer  
2011 Judge for Athena Science Challenge

### **Professional Associations**

2015 – Present Sigma Xi (Full Member)  
2012 – Present Geological Society of America (GSA)  
2011 – Present American Geophysical Union (AGU)  
2011 – Present Geological Association of Canada (GAC)