Erik Fischer

Curriculum Vitae

Contact Information

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Education

Ph.D. Climate and Space Sciences and Engineering, 2018
University of Michigan, Ann Arbor, MI, USA
Thesis: "Experimental Study of the Formation of Liquid Saline Water on Mars"
Advisors: Professor Nilton O. Rennó, Dr. Germán Martínez

M.S.E., Aerospace Engineering, **University of Michigan**, Ann Arbor, MI, USA 2012

B.S. equivalent (4 years), Aerospace Engineering, **TU Braunschweig**, Germany 2011

Appointment

Research Fellow, **University of Michigan** 2018 – present

Awards and Honors

NASA MSL Extended Mission-1 Group Achievement Award 2017

NASA MSL Group Achievement Award 2015

DAAD (German Academic Exchange Service) Full Scholarship 2011-2012

TU Braunschweig Scholarship 2010-2011

Teaching

GERMAN 232: Scientific German Winter 2013 – Winter 2018
Regular guest lectures in 4 credit undergraduate course, University of Michigan

ASTRO 142: **From the Big Bang to the Milky Way** Fall 2012
Graduate Student Instructor in 3 credit undergraduate course, University of Michigan

Computer Science for Engineers Summer 2010
Student Instructor in 6 credit undergraduate course, TU Braunschweig

Materials Science Winter 2009 – Winter 2010
Student Instructor in 5 credit undergraduate course, TU Braunschweig

Professional Service

Peer reviewer for *Nature Astronomy, Earth and Planetary Science Letters*, *Planetary and Space Science, Earth Moon and Planets, and Canadian Journal of Physics*

NASA Solar System Workings program panel, 2018, 2019

Science outreach: Invited talk, Ann Arbor Science & Skeptics, Ann Arbor, MI, 2014

Memberships

American Geophysical Union (AGU) 2013 – present

Sigma Gamma Tau 2011 – 2018

Mission Participation

NASA Mars Science Laboratory, team member of REMS instrument 2013 – present

NASA Mars 2020, team member of MEDA instrument 2018 – present

Publications

10. Martínez, G. M., A. Vicente-Retortillo, E. Fischer, N. O. Rennó, H. Savijärvi, A. R., Vasavada, M. T. Lemmon, S. D. Guzewich, and J. Gómez-Elvira, Atmospheric radiative forcing at Gale Crater, Mars, during the 2018/Mars Year 34 global dust storm, *Journal of Geophysical Research: Planets* (in preparation), 2019.

9. Savijärvi, H., G. M. Martínez, **E. Fischer**, N. O. Renno, L. K. Tamppari, A. Zent, and A.-M. Harri, Humidity observations and column simulations for a warm period at the polar Mars Phoenix lander site, *Icarus* (under review), 2019.

8. **Fischer, E.**, G. M. Martínez, N. O. Rennó, L. K. Tamppari and A. Zent, Relative Humidity on Mars: New Results from the Phoenix TECP Sensor, *Journal of Geophysical Research: Planets (early view)*, 2019.

7. Rennó, N., R. Backhus, C. Cooper, J. M. Flatico, **E. Fischer**, L. C. Greer, M. J. Krasowski, T. Kremic, G. M. Martínez, N. F. Prokop and A. Vicente-Retortillo, A Simple Instrument Suite for Characterizing Habitability and Weathering: The Modern Aqueous Habitat Reconnaissance Suite (MAHRS), *Astrobiology, 19(7)*, 2019.

6. Martínez, G. M., C. N. Newman, A. De Vicente-Retortillo, **E. Fischer**, N. O. Renno, M. I. Richardson, A. G. Fairén, S. D. Guzewich, R. M. Haberle, O. Kemppinen, M. T. Lemmon, M. D. Smith, M. de la Torre-Juárez and A. R. Vasavada, The Modern Near-Surface Martian Climate: A Review of In-situ Meteorological Data from Viking to Curiosity, *Space Science Reviews*, *212*(1-2), 295-338, 2017.

5. **Fischer, E.**, G. M. Martínez, and N. O. Rennó, Formation and persistence of liquid brine in the Martian polar region: Experimental analysis throughout the diurnal cycle at the Phoenix landing site, *Astrobiology, 16(12)*, 937-948, 2016.

4. **Fischer, E.**, Searching for liquid brine on Mars using Raman spectroscopy, *Física de la Tierra, 28*, 181-195, 2016 (invited).

3. Martínez, G. M., **E. Fischer**, N. O. Rennó, E. Sebastián, O. Kemppinen, N. Bridges, C. S. Borlina, P.-Y. Meslin, M. Genzer, A.-M. Harri, A. Vicente-Retortillo, M. Ramos, M. de la Torre Juárez, F. Gómez, J. Gómez-Elvira and the REMS Team, Likely frost events at Gale crater: Analysis from MSL/REMS measurements, *Icarus, 280*, 93-102, 2016.

2. **Fischer, E.**, G. M. Martínez, H. Elliott, and N. O. Rennó, Experimental evidence for the formation of liquid saline water on Mars. *Geophysical Research Letters*, *41*(13), 4456-4462, 2014.

1. Martínez, G. M., N. O. Rennó, **E. Fischer**, C. S. Borlina, B. Hallet, M. de la Torre-Juárez, A. Vasavada, M. Ramos, V. Hamilton, J. Gómez-Elvira, R. M. Haberle, and the REMS Team, Surface Energy Budget and Thermal Inertia at Gale Crater: Calculations

from Ground-Based Measurements, *Journal of Geophysical Research: Planets*, 119.8: 1822-1838, 2014.

Presentations

Fischer, E., Martínez, G.M., Renno, N.O., 2018. Analysis of Recalibrated Phoenix Relative Humidity Sensor Data. European Planetary Science Congress, vol. 12. Berlin, Germany.

Fischer, E., Martínez, G.M., Renno, N.O., 2018. The Phoenix Lander's Relative Humidity Sensor Calibration: New Results and Analysis. Lunar and Planetary Science Conference, vol. 49. The Woodlands, TX, USA.

Fischer, E., Martínez, G.M., Renno, N.O., 2017. Results of the Phoenix Relative Humidity Sensor Recalibration. American Geophysical Union. New Orleans, LA, USA.

Fischer, E., Martínez, G.M., Neamati, D., Renno, N.O., 2017. The Formation of Frost and Liquid Brines on Spacecraft Materials at Mars Environmental Conditions. AAS/Division for Planetary Sciences Meeting Abstracts, vol. 49. Provo, UT, USA.

Fischer, E., Martínez, G.M., Renno, N.O., 2017. Recalibration and Analysis of the Phoenix Relative Humidity Sensor Data. Lunar and Planetary Science Conference, vol. 48. The Woodlands, TX, USA.

Fischer, E., Martínez, G.M., Renno, N.O., 2017. Experimental Recreation of the Diurnal Cycle at the Phoenix Landing Site - Investigating the Formation and Persistence of Brine. 6th Mars Atmosphere Modeling and Observation Workshop. Granada, Spain.

Martínez, G. M., McConnochie, T., Rennó, N. O., Meslin, P.-Y., **Fischer, E.**, Vicente-Retortillo, A., Borlina, C. S., Kemppinen, O., Genzer, M., Harri, A.-M., de la Torre-Juárez, M., Zorzano, M.-P., Martín Torres, F. J., Bridges, N., Maurice, S., Gasnault, O., Gómez-Elvira, J., Wiens, R. and the REMS team, 2016. Diurnal Variation of Atmospheric Water Vapor at Gale Crater: Analysis from Ground-Based Measurements. European Geosciences Union. Vienna, Austria.

Fischer, E., Martínez, G.M., Renno, N.O., Tamppari, L., Zent, A., 2015. Analysis of the Phoenix Mission's Thermal and Electrical Conductivity Probe (TECP) Relative Humidity Data. American Geophysical Union. San Francisco, CA, USA.

Renno, N.O., **Fischer, E.**, Martínez, G.M., 2015. Experimental Confirmation of Liquid Brines on Mars. American Geophysical Union. San Francisco, CA, USA.

Martínez, G.M., **Fischer, E.**, Renno, N.O., Sebastián, E., Kemppinen, O., Bridges, N., Borlina, C.S., Meslin, P.-Y., Genzer, M., Harri, A.-M., Vicente-Retortillo, A., Ramos, M., de la Torre Juárez, M., Gómez, F., Gómez-Elvira, J., and the REMS Team, 2015. Analysis of Likely Frost Events and Day-to-Night Variability in Near-Surface Water Vapor at Gale. American Geophysical Union. San Francisco, CA, USA.

Zandonadi, D., Jr., Renno, N.O., **Fischer, E.**, 2015. WET – A soil wetness sensor for Mars. 66th International Astronautical Congress, Jerusalem, Israel.

Martínez, G.M., Renno, N.O., **Fischer, E.**, de la Torre-Juarez, M., Meslin, P-Y., Kemppinen, O., Genzer, M., Harri, A-H., Ramos, M., Borlina, C., Schröder, S., Gómez-Elvira, J., and the REMS team, 2015. Potential sub-micrometer-thick frost events and soil water content at Gale Crater: Calculations from MSL/REMS measurements. Lunar and Planetary Science Conference, The Woodlands, TX, USA.

Martínez, G.M., **Fischer, E.**, Renno, N.O., de la Torre-Juarez, M., Meslin, P-Y., Kemppinen, O., Genzer, M., Harri, A-H., Ramos, M., Borlina, C., Schröder, S., Gómez-Elvira, J., and the REMS team, 2014. Study of potential sub-micrometer-thick frost

events and soil water content at Gale Crater. American Geophysical Union. San Francisco, USA.

Fischer, E., Martínez, G.M., Elliott, H., Renno, N. O., 2014. Experimental Evidence for the Formation of Liquid Brines on Mars. Abgradcon 2014. Troy, NY, USA.

Martínez, G.M., **Fischer, E.**, Elliott, H., Borlina, C., Renno, N.O, 2014. Physisorbed liquid-like Water in Mars Gale Crater? Abgradcon 2014. Troy, NY, USA.

Fischer, E., Martinez, G., Elliott, H., Borlina, C., Renno, N.O., 2014. Experimental Demonstration of the Formation of Liquid Brines under Martian Polar Conditions in the Michigan Mars Environmental Chamber. In EGU General Assembly Conference Abstracts (Vol. 16), Vienna, Austria.

Fischer, E., Martinez, G.M., Elliott, H.M., Borlina, C.S., Renno, N.O., 2013. The Michigan Mars Environmental Chamber: Preliminary Results and Capabilities. American Geophysical Union. San Francisco, CA, USA.

Fischer, E., Backhus, R.F., Elliott, H.M., Martinez, G.M., Renno, N.O., 2013. A Miniature Soil Wetness Sensor to Detect Brines on Mars and Beyond. Astrobiology Graduate Conference 2013. Montreal, CAN.

Martínez, G.M., Renno, N., Elliott, H., **Fischer, E.**, 2013. Current Evidence of Liquid Water on Mars. Astrobiology Graduate Conference 2013. Montreal, CAN.

Martinez, G.M., Renno, N.O., Hoffman, J.H., Elliott, H., **Fischer, E.**, 2013. Near Surface Water Vapor Pressure and Relative Humidity on Mars: New Values Obtained from the Phoenix Mars Spectrometer. 44th Lunar and Planetary Science Conference. The Woodlands, TX, USA.

Martinez, G.M., Renno, N.O., Elliott, H., **Fischer, E.**, 2013. Present-Day Liquid Water on Mars: Theoretical Expectations, Observational Evidence, and Preferred Locations. The Present-Day Habitability of Mars Conference. Los Angeles, CA, USA.

Elliott, H., Martinez, G.M., **Fischer, E.**, Renno, N.O., 2013. Laboratory Experiments to Study the Martian Water Vapor Cycle. The Present-Day Habitability of Mars Conference. Los Angeles, CA, USA.