

## PUBLICATION LIST OF DR. ALIAN WANG

### Papers published in peer reviewed journals (88):

#### 2016

1. Pierre Haenecour, Christine Floss, Thomas J. Zega, Thomas K. Croat, Alian Wang, B. L. Jolliff and Paul Carpenter (2016), **Presolar Silicates in the Matrix and Fine-grained Rims around Chondrules in Primitive CO3.0 Chondrites: Evidence for Pre-accretionary Aqueous Alteration of the Rims in the Solar Nebula**, *submitted to GCA*.
2. X. H. Fu, Alian Wang, M. (2016), **Characterizing amorphous silicates in extraterrestrial materials I: polymerization effects on spectral features of silicate glasses**, *Submitted to JGR-Planet, in revision*.
3. Alian Wang, Pablo Sobron, Mianping Zheng, Fanjing Kong, Yu-Yan Sara Zhao, (2016), **Salts with high Degrees of Hydration and Biosignatures Preserved in the Subsurface at a Hyperarid Region on Tibet Plateau – Implication to Mars**, *submitted to Astrobiology, in revision*.
4. Fanjing Kong, Mianping Zheng, Bin Hu, Alian Wang, Nina Ma, Pablo Sobron (2016), **A Mars Analog site on Tibet Plateau: Evolution and Environments**, *submitted to Astrobiology, in revision*.
5. William H. Farrand, Jeffrey R. Johnson, Melissa S. Rice, Alian Wang, James F. Bell III, (2016), **VNIR Multispectral Observations of Aqueous Alteration Materials by the Pancams on the Spirit and Opportunity Mars Exploration Rovers**, *American Mineralogists, Vol 101, 2005-2019*.
6. Z. C. Wu, Alian Wang, Z. C. Ling (2016), **Spectroscopic Study of Perchlorates and Other Oxygen Chlorides in a Martian Environmental Chamber**, *EPSL, 452, 123-132*.
7. Pierre Haenecour, Christine Floss, Jordi José, Sachiko Amari, Katharina Lodders, Manavi Jadhav, Alian Wang, and Frank Gyngard, (2016) **Coordinated Analysis of two Graphite Grains from the Co3.0 Lap 031117 Meteorite: First Identification of a Co Nova Graphite and a Presolar Iron Sulfide Subgrain**, *Accepted by The Astrophysical Journal, in press*.
8. Alian Wang, Bradley Jolliff, Yang Liu, Kathryn Connor, (2016), **Setting Constraints on the Nature and Origin of the two Major Hydrous Sulfates on Mars, kieserite and polyhydrated sulfate**, *JGR-Planet* doi: 10.1002/2015JE004889.

#### 2015

9. Zongcheng Ling, Bradley L. Jolliff, Alian Wang, Chunlai Li, Jianzhong Liu, Jiang Zhang, Bo Li, Lingzhi Sun, Jian Chen, Long Xiao, Jianjun Liu, Xin Ren, Wenxi Peng, Huanyu Wang, Xingzhu Cui, Zhiping He, Jianyu Wang.(2015) **Correlated compositional and mineralogical investigations at the Chang'e-3 landing site**, *Nature Communications*, DOI: 10.1038/ncomms9880.
10. Zongcheng Ling, Alian Wang (2015) Spatial distributions of secondary minerals in the Martian meteorite MIL 03346,168 determined by Raman spectroscopic imaging, *J. Geophys. Res.*, 120,

1141–1159, doi:10.1002/2015JE004805.

11. Stephen M. Seddio, Randy L. Korotev, Bradley L. Jolliff, Alian Wang (2015), **Silica polymorphs in lunar granite: Implications for granite petrogenesis on the Moon**, *American Mineralogist*, **V100**, 1533–1543.
12. Alian Wang, John J. Freeman, Bradley L. Jolliff, (2015), **Understanding the Raman Spectral Features of Phyllosilicates**, *Journal of Raman Spectroscopy*, *v10*, DOI: 10.1002/jrs.4680
13. Jie Wei, Alian Wang, James L. Lambert, David Wettergreen, Nathalie Cabrol, and Kimberley Warren-Rhodes, Kris Zacny, (2015), **Automated subsurface soil analysis by the Mars Micro-beam Raman Spectrometer (MMRS) on-board Z e rover in the Atacama: a terrestrial test for planetary exploration**, *Journal of Raman Spectroscopy*, *v10*, DOI: 10.1002/jrs.4656
14. Liu Yang, Alian Wang, (2015), **Dehydration of Na-jarosite, Ferricopiapite, and Rhomboclase at Temperatures of 50  C and 95  C: Implications for Martian Ferric Sulfates**, *Journal of Raman Spectroscopy*, *v10*, DOI: 10.1002/jrs.4655
15. Wang Alian, R. L. Korotev, B. L. Jolliff, Z. C. Ling (2015), **Raman Imaging of Extraterrestrial Materials**, *Planetary and Space Science*, **V112**, P23-34, [doi:10.1016/j.pss.2014.10.005](https://doi.org/10.1016/j.pss.2014.10.005)

#### **2014**

16. Wang Alian, Yuhang Zhou (2014) **Experimental Comparison of the Pathways and Rates of the Dehydration of Al-, Fe-, Mg-, and Ca-Sulfates under Mars Relevant Conditions**, *ICARUS*, **234**, 162-173
17. T. M. McCollom, B. L. Ehlmann, Alian Wang, B. M. Hynek, B. Moskowitz, and T. S. Berqu , (2014) **Detection of Iron Substitution in Natroalunite and Potential Implications for Mar**, *Am. Minerals.*, **99**, 948-964.

#### **2013**

18. Sobron P, Lefebvre C, Leveille R, Koujelev A, Haltigin T, Du H, Wang A, Cabrol N, Zacny K, and Craft J. (2013) Geochemical profile of a layered outcrop in the Atacama analogue using laser-induced breakdown spectroscopy: Implications for Curiosity investigations in Gale. *Geophysical Research Letters*, **40**, 1965-1970.
19. Takir D., J.P. Emery, H. Y. McSween Jr., C. A. Hibbitts, R. N. Clark, N. Pearson, and Alian Wang (2013), **Nature and degree of aqueous alteration in CM and CI carbonaceous chondrites**, *Meteoritics & Planetary Science* **1–20**, doi: 10.1111/maps.12171.
20. Wang Alian, William C. Feldman, Michael T. Mellon, Mianping Zheng, (2013) **The Preservation of Subsurface Sulfates with Mid-to-high Degree of Hydration in Equatorial Regions on Mars**, *ICARUS*, **226**, 980-991.
21. W. G. Kong, B. L. Jolliff, Alian Wang (2013) **Ti distribution in grain size fractions of Apollo soils 1084 and 71501**, *ICARUS*, **226**, 891-89.
22. **Special report 1: Understanding Martian sulfates**, *By International Innovation, October 2013*.
23. **Special report 2 : Ready to fly: Raman Spectroscopy in Planetary Analysis**, *by Spectroscopy , Dec 21, 2013*

24. **Special report 3: Successful dry run for the 2020 Mars Mission, by WUSTL Newsroom, July 2013**
25. **Special report 4: Will this work on Mars? Testing the limits in Atacama Desert, by The Weather Channel, June 2013**

### 2012

26. Chou I-Ming, Robert R. Seal II, Alian Wang (2012), **The stability of sulfate and hydrated sulfate minerals near ambient conditions and their significance in environmental and planetary sciences**, *Journal of Asian Earth Sciences*, <http://dx.doi.org/10.1016/j.jseaes.2012.11.027>
27. Wang Alian, Ling Z. C. Freeman J. J. (2012) **Stability field and Phase Transition Pathways of Hydrous Ferric Sulfates in the Temperature Range 50 °C to 5 °C: Implication for Martian Sulfates**, *Icarus*, 218, 622-643, doi:10.1016/j.icarus.2012.01.003.
28. Sobron P., Wang A. (2012) **LIBS spectral data processing and calibration of sulfate targets with application to Mars exploration**. *Spectrochimica Acta Part B*, 68, 1-16, doi:10.1016/j.sab.2012.01.002.

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29. Wang Alian, J. J. Freeman, I-Ming Chou, B. L. Jolliff (2011), **Stability of Mg-sulfates at -10°C and the Rates of Dehydration/Rehydration Processes under Mars Relevant Conditions**, *J. Geophys. Res.*, Res., 116, E12006, doi:10.1029/2011JE003818.
30. Sobron P., Alian Wang (2011), **A planetary environment and analysis chamber for combined in-situ spectroscopic measurements on selected materials under planetary relevant environments**, *J. Raman Spectroscopy*, DOI 10.1002/jrs.3017.
31. Kong, W. G., Alian Wang, and I-M. Chou (2011), **Determination of phase boundary between kornelite and pentahydrated Ferric Sulfate by humidity buffer technique and Raman spectroscopy at 0.1 Mpa**. *Chemical Geology*, Vol 284, 333-338.
32. Wang Alian, and Z. C. Ling (2011), **Ferric Sulfates on Mars – A Combined Mission Data Analysis of Salty Soils at Gusev Crater and Laboratory Experimental Investigations**. *J. Geophys. Res.*, 116, E00F17, doi:10.1029/2010JE003665.
33. Ling Z. C., Alian Wang, Bradley L. Jolliff (2011), **Mineralogy and Geochemistry of four Lunar Soils by Laser-Raman Study**, *Icarus*, 211, 101-113, doi:10.1016/j.icarus.2010.08.02.
34. Kong W. G., Alian Wang, John J. Freeman<sup>n</sup> and Pablo Sobron (2011), **A Comprehensive Spectroscopic Study of Synthetic Fe<sup>2+</sup>, Fe<sup>3+</sup>, Mg<sup>2+</sup>, Al<sup>3+</sup> Copiapite**, *J. Raman Spectroscopy*, doi:10.1002/jrs.2790.

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35. Ling Z. C., Alian Wang (2010), **A Systematic Spectroscopic Study of Eight Hydrous Ferric Sulfates Relevant to Mars**, *Icarus*, 209, 422-433, doi:10.1016/j.icarus.2010.05.009.
36. Rice M.S., J.F. Bell III, E.A. Cloutis, A. Wang, S.W. Ruff, M.A. Craig, D.T. Bailey, J.R. Johnson, P.A. de Souza Jr., W.H. Farrand (2010), **Silica-rich deposits and hydrated minerals at Gusev**

**Crater, Mars: Vis-NIR spectral characterization and regional mapping**, *Icarus*, 205, p375-395.

37. R. E. Arvidson, J. F. Bell III, P. Bellutta, N. A. Cabrol, J. G. Catalano, J. Cohen, L. S. Crumpler, D. J. Des Marais, T. A. Estlin, W. H. Farrand, R. Gellert, J. A. Grant, R. N. Greenberger, E. A. Guinness, K. E. Herkenhoff, J. A. Herman, K. D. Iagnemma, J. R. Johnson, G. Klingelhöfer, R. Li, K. A. Lichtenberg, S. A. Maxwell, D. W. Ming, R. V. Morris, M. S. Rice, S. W. Ruff, A. Shaw, K. L. Siebach, P. A. de Souza, A. W. Stroupe, S. W. Squyres, R. J. Sullivan, K. P. Talley, J. A. Townsend, A. Wang, J. R. Wright, A. S. Yen (2010), Spirit Mars Rover Mission: Overview and selected results from the northern Home Plate Winter Haven to the side of Scamander crater, *Journal of Geophysical Research*, V115, DOI: 10.1029/2010JE003633

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38. Wang Alian, John J. Freeman, Bradley, L. Jolliff (2009), **Phase Transition Pathways of the Hydrates of Magnesium Sulfate in the Temperature Range 50 °C to 5 °C: Implication for Sulfates on Mars**, *J. Geophys. Res.*, 114, doi:10.1029/2008JE003266.

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39. Wang Alian, J. F. Bell III, Ron Li, J. R. Johnson, W. Farrand, E. A. Cloutis, R. E. Arvidson, L. Crumpler, S. W. Squyres, S. M. McLennan, K. Herkenhoff, S. W. Ruff, A. T. Knudson, Wei Chen, R. Greenberger, and the Athena Science Team (2008), **Light-Toned Salty Soils and Co-existing Si-rich Species Discovered by the Mars Exploration Rover Spirit in Columbia Hills**, *J. Geophys. Res.*, 113, E12S40, doi:10.1029/2008JE003126.
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41. S.W. Squyres, R.E. Arvidson, S. Ruff, R. Gellert, R.V. Morris, D. W. Ming, L. Crumpler, J.D. Farmer, D.J. Des Marais, A.Yen, S.M. McLennan, W. Calvin, J.F. Bell, III, B.C. Clark, A. Wang, T.J. McCoy, M.E. Schmidt, P.A. de Souza, Jr. (2008) **Discovery of Silica-Rich Deposits on Mars by the Spirit Rover**, *Science*, vol320, p1063-1067.
42. John J. Freeman, Alian Wang, Karla E. Kuebler and Larry A. Haskin (2008), **Characterization of Natural Feldspar by Raman Spectroscopy for Future Planetary Exploration**, *Canadian Mineralogist* 46 (6), 1477-1500.

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43. Johnson J. R., J.F. Bell III, E. Cloutis, M. Staid, W.H. Farrand, T. McCoy, M. Rice, A. Wang, A. Yen (2007), **Mineralogic Constraints on Sulfur-rich Soils from Pancam Spectra at Gusev Crater, Mars**. *Geophysical Research Letters*, Vol. 34, L13202, doi:10.1029/2007GL029894.

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44. Kuebler K. E., Jolliff B. L.; Wang A., and Haskin L. A. (2006), **Extracting olivine (Fo-Fa) compositions from Raman spectral peak positions**, *Geochim. Cosmochim. Acta*, V70, p6201-6222.

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47. Wang Alian, L. A. Haskin, S. W. Squyres, B. L. Jolliff, L. Crumpler, R. Gellert, C. Schröder, K. Herkenhoff, J. Hurowitz<sup>7</sup>, N. J. Tosca, W. H. Farrand, Robert Anderson, A. T. Knudson, (2006), **Sulfate Deposition in Subsurface Regolith in Gusev Crater, Mars**, *J. Geophys. Res.* 111, E02S17, doi:10.1029/2005JE002513.
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49. D. W. Ming, D. W. Mittlefehldt, R. V. Morris, D. C. Golden, R. Gellert, A. Yen, B. C. Clark, S. W. Squyres, W. H. Farrand, S. W. Ruff, R. E. Arvidson, G. Klingelhöfer, H. Y. McSween, D. S. Rodionov, C. Schröder P. A. de Souza, Jr., and A. Wang, (2006), **Geochemical and Mineralogical Indicators for Aqueous Processes in the Columbia Hills of Gusev Crater, Mars**, *J. Geophys. Res.*, 111, E02S12, doi:10.1029/2005JE002560.
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51. H. Y. McSween, M. B. Wyatt, R. Gellert, J. F. Bell III, R. V. Morris, K. E. Herkenhoff, L. S. Crumpler, K. A. Milam, K. R. Stockstill, L. Tornabene, R. E. Arvidson, P. Bartlett, D. Blaney, N. A. Cabrol, P. R. Christensen, B. C. Clark, J. A. Crisp, D. J. Des Marais, T. Economou, J. D. Farmer, W. Farrand, A. Ghosh, M. Golombek, S. Gorevan, R. Greeley, V. E. Hamilton, J. R. Johnson, B. L. Jolliff, G. Klingelhoef, A. T. Knudson, S. McLennan, D. Ming, J. E. Moersch, R. Rieder, S. W. Ruff, C. Schroeder, P. A. de Souza Jr., S. W. Squyres, H. Wänke, A. Wang, A. Yen, J. Zipfel, (2006), **Characterization and petrologic interpretation of olivine-rich basalts at Gusev Crater, Mars**, *J. Geophys. Res* 111, E02S10, doi:10.1029/2005JE002477.

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54. A. S. Yen, Ralf Gellert, Christian Schröder, Richard V. Morris, James F. Bell III, Amy T. Knudson, Benton C. Clark, Douglas W. Ming, Joy A. Crisp, Raymond E. Arvidson, Diana Blaney, Johannes Brückner, Philip R. Christensen, David J. DesMarais, Paulo A. de Souza Jr, Thanasis E. Economou, Amitabha Ghosh, Brian C. Hahn, Kenneth E. Herkenhoff, Larry A. Haskin, Joel A. Hurowitz, Bradley L. Jolliff, Jeffrey R. Johnson, Göstar Klingelhöfer, Morten Bo Madsen, Scott M. McLennan, Harry Y. McSween, Lutz Richter, Rudi Rieder, Daniel Rodionov, Larry Soderblom, Steven W. Squyres, Nicholas J. Tosca, Alian Wang, Michael Wyatt, Jutta Zipfel, (2005) **An integrated view of the chemistry and mineralogy of martian soils, *Nature*, V436, p49-54, doi:10.1038/nature03637**
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