

**Fourth Mars 2020 Landing Site Workshop  
October 16-18, 2018**

**Day 1/October 16, 2018**

**8:30 am      Introduction**

8:30 am      M. Meyer and J. Grant  
*Welcome, Opening Remarks, Logistics (15 min)*

8:45 am      M. T. Wallace and J. B. McNamee  
*Project Status (15 min)*

9:00 am      A. Chen  
*Landing Safety Assessment (15 min)*

9:15 am      K. Farley, K. Williford, and K. Stack Morgan  
*Science Objectives, Landing Site Working Group Operation Scenarios, and Site Assessment Criteria (15 min)*

**9:30 am      Broad Approaches to Site Selection I: Biosignatures**

9:30 am      F. Westall  
*How and Where to Find Signatures of Chemotrophic Microorganisms in Martian Rocks (10 min)*

9:40 am      D. C. Catling, T. Bosak, W. W. Fischer, J. P. Grotzinger, J. A. Hurowitz, D. D. Sasselov, R. E. Summons, J. D. Sutherland, J. W. Szostak, and the Simons Collaboration on the Origin of Life  
*A search for prebiotic signatures on Mars with the 2020 rover mission (10 min)*

9:50 am      J. Michalski  
*Managing Our Photosynthetic Bias in the Exploration for Biosignatures on Mars (10 min)*

10:00 am      M.-P. Zorzano and J. Martín-Torres  
*Landing Sites and Mars Sample Return: Environmental Implications on Present Day Habitable Samples? (10 min)*

**10:10 am      Broad Approaches to Site Selection II: Site Comparisons - Mineralogy**

10:10 am      F. Seelos, K. Frizzell, S. Cartwright, and the CRISM SOC  
*A regional view of surface spectral/color variability at the 2020 candidate sites derived from CRISM mapping data (10 min)*

10:20 am      M. Parente, Y. Itoh, A. Saranathan  
*A New Generation of CRISM Data Products (10 min)*

10:30 am      R. Arvidson  
*CRISM-based inter-comparisons of mineral absorption strengths for the four final 2020 rover candidate landing sites (10 min)*

10:40 am      F. Poulet, A. Martinez, D. Loizeau, J. Carter, L. Riu  
*Modal mineralogy of the terrains surrounding the Mars2020 landing sites in Nili and implications on the past geochemical conditions (10 min)*

10:50 am      E. Noe Dobrea and R. Clark  
*Mineralogy of the Candidate Mars 2020 Landing Sites Using Tetracorder (10 min)*

11:00 am      M. Salvatore  
*Squeezing More Science Out of Our Orbiters: Using the Mars 2020 Rover and Returned Samples to Ground Truth Spectral Data Sets (10 min)*

11:10 am      B. Bruner  
*Meteorites and Minerals Associated with the Origin of Life (10 min)*

11:20 pm      Discussion (30 min)

**11:50-12:50    Lunch**

**12:50 pm      Broad Approaches to Site Selection III: Site Comparisons – Chronology and Magnetism**

12:50 pm      F. Calef, I. Daubar, and N. Warner  
*Potential for Absolute Age Dating a Volcanic Unit for Crater Retention Age Calibration at the Mars 2020 Proposed Landing Sites (10 min)*

- 1:00 pm C. Quantin-Nataf, L. Mandon, B. Bultel, and S. Werner  
*Rock Age Diversity of Each Mars 2020 Site and Their Potential for Crater Chronology Calibration (10 min)*
- 1:10 pm B. Bultel, C. Quantin-Nataf, S. C. Werner  
*Selection of Units to Obtain Reliable Calibration of the Martian Cratering Chronology: Lessons Learned from Lunar Science (10 min)*
- 1:20 pm A. Mittelholz and B. Weiss  
*The Mars 2020 Candidate Landing Sites: A Magnetic Field Perspective (10 min)*
- 1:30 pm Broad Approaches to Site Selection IV: Sample Cache Considerations**
- 1:30 pm H. M. Sapers, A. Pontefract, G. R. Osinski, C. S. Cockell, C. M. Caudill, J. F. Mustard, K. M. Cannon, L. L. Tornabene  
*Science value and biogenetic potential of impact lithologies: relevance to Mars 2020 landing sites (10 min)*
- 1:40 pm C. D. K. Herd, J. Filiberto, and T. Usui  
*Igneous lithologies at the Mars 2020 Landing Sites: Prospects for achieving MSR science goals (10 min)*
- 1:50 pm M. Wadhwa, L. Borg, Y. Amelin, T. Kleine, and W. Cassata  
*Sample Requirements and Considerations for Future Geochronologic Investigations in Earth-Based Laboratories of Samples Cached During the Mars 2020 Mission (10 min)*
- 2:00 pm Discussion (30 min)
- 2:30 pm Discussion of Final Candidate Sites**
- 2:30 pm Columbia Hills I: Science Considerations**
- 2:30 pm S. W. Ruff, V. Hamilton, D. Rogers, C. Edwards, B. Horgan, and M. Van Kranendonk  
*From Planetary Evolution to Potential Biosignatures: Achieving Mission Success with the Mars 2020 Rover and Instrument Suite at the Columbia Hills Site (20 min)*

- 2:50 pm A. Longo, J. W. Rice, Jr., and S. W. Ruff  
*Science and Public Engagement Opportunities in the Columbia Hills Landing Ellipse (10 min)*
- 3:00 pm K. A. Campbell, T. Djokic, M. J. Van Kranendonk, S. W. Ruff, J. D. Farmer, C. Sriaporn, K. M. Handley, M. Millan, B. Teece, D. M. Guido  
*Origin and Significance of Opaline Silica Deposits at Columbia Hills (15 min)*
- 3:15 pm J. W. Rice, Jr., F. Chuang, D. Crown, D. Berman, V. Baker, P. Haughton, W. Nemecek and R. Slingerland  
*New Results from Geologic Mapping of Gusev Crater: Implications for Extended Mission Targets (15 min)*
- 3:30 pm M. J. Van Kranendonk, S. Ruff, K. A. Campbell, and T. Djokic,  
*A Mars 2020 Mission to Columbia Hills: Risk Minimization through Ground Truth. (15 min)*
- 3:45 pm Discussion (15 min)
- 4:00 pm Columbia Hills II: Operations Scenarios**
- 4:00 pm Mars 2020 Landing Site Working Group  
*Operations Scenarios (60 min)*
- 5:00 pm Discussion (45 min)
- 5:45 pm End of Day 1

**Day 2/ October 17, 2018**

- 8:30 am Talks Related to Jezero, NE Syrtis, and Midway**
- 8:30 am J. F. Mustard, M. S. Bramble, C. H. Kremer and A. C. Pascuzzo  
*Outstanding Mars and Planetary Science Questions from Returned Samples Collected from NE Syrtis, Midway and/or Jezero Delta (15 min)*
- 8:45 am E. L. Scheller and B. L. Ehlmann  
*Composition, Impact Deformation, and Geological History of Noachian Basement in the Surrounding of the Isidis Impact Basin (15 min)*

- 9:00 am L. Hallis, A. Macartney, L. Daly, A. O'Brien, N. Mari, B. Cohen, and M. R. Lee  
*Carbon Sequestration on Mars: Possible Insights from the MG Carbonate/Olivine Lithologies at NE Syrtis or Jezero Crater (15 min)*
- 9:15 am C. H. Kremer, J. F. Mustard, M. S. Bramble  
*Possible Clastic Origin for Olivine-Rich Rocks in the Nili Fossae Region: Implications for NE Syrtis, Midway, and Jezero Landing Site Science (15 min)*
- 9:30 am Discussion (15 min)
- 9:45 am NE Syrtis and Midway I: Science Considerations**
- 9:45 am J. R. Skok  
*The Environmental Evolution of the NE Syrtis Region (15 min)*
- 10:00 am E. S. Amador and B. L. Ehlmann  
*The Circum-Isidis Olivine-Carbonate Unit and its Expression in and Around the NE Syrtis Landing Site (15 min)*
- 10:15 am M. S. Bramble, J. F. Mustard, and C. H. Kremer  
*Geological Continuity Between the Midway and NE Syrtis Candidate Landing Sites for the Mars 2020 Rover Mission (15 min)*
- 10:30 am D. P. Quinn  
*Sedimentary Units Accessible in the NE Syrtis Extended Mission Area and Recent Finding on the History of Surface Water in the Broader Region (15 min)*
- 10:45 am B. L. Ehlmann  
*Mapping the Decadal Survey Drivers for Sample Return to Geologic Units Accessible in the Primary and Extended Missions from NE Syrtis and Midway (15 min)*
- 11:00 am T. C. Onstott, B. L. Ehlmann, and H. Sapers, J. Marlow, M. Ivarsson, A. Neubeck, D. Nisson, R. Harris, Z. Garvin, P. Niles and M. Coleman  
*How Mars 2020 Could Look for Life in the Noachian Stratigraphy at NE Syrtis or Midway (15 min)*
- 11:15 am Discussion (15 min)
- 11:30-12:30 Lunch**

**12:30 pm NE Syrtis and Midway II: Operations Scenarios**

12:30 pm Mars 2020 Landing Site Working Group  
*Operations Scenarios (60 min)*

1:30 pm Discussion (*45 min*)

**2:15 pm Jezero Crater I: Science Considerations**

2:15 pm N. Mangold, G. Dromart, F. Salese, V. Ansan, and M. Massé  
*Constraints on the duration of fluvial and lacustrine activity at Jezero crater (15 min)*

2:30 pm K. L. Lynch, J. J. Wray, K. A. Rey, and R. J. Bond  
*Habitability and Preservation Potential of the Bottomset Deposits in Jezero Crater (15 min)*

2:45 pm T. A. Goudge, D. Mohrig, B. T. Cardenas, C. M. Hughes, and C. I. Fassett  
*Examining the Record of Fluvial Activity on Early Mars: Extended Mission Targets at Channel Deposit Outcrops of the Jezero Delta (15 min)*

3:00 pm K. M. Kinch and S. Shahrzad  
*The Dark-Toned, Mafic Floor Unit in Jezero Crater: Morphology, Cratering Statistics, and Formation Hypotheses (15 min)*

3:15 pm B. Horgan, R. Anderson, M. Rice, E. Amador, and G. Dromart  
*The Mineralogy of Jezero Crater: Implications for Fluvio-Lacustrine History and Biosignature Preservation (15 min)*

3:30 pm A. Brown, T. Goudge, and C. Viviano  
*Exploring the Olivine-Carbonate Association in the Jezero Crater Region, Possible Serpentinization and its Astrobiological Potential (15 min)*

3:45 pm J. D. Tarnas, J. F. Mustard, H. Lin, E. S. Amador, T. A. Goudge, M. S. Bramble, and X. Zhang  
*Application of Dynamic Aperture Factor Analysis/Target Transformation for Mineral Detection: Presence of Opaline Silica in Jezero Crater and the Surrounding NE Syrtis Region (15 min)*

4:00 pm Discussion (*15 min*)

**4:15 pm      Jezero Crater II: Operations Scenarios**

4:15 pm      Mars 2020 Landing Site Working Group  
*Operations Scenarios (60 min)*

5:15 pm      Discussion (*45 min*)

6:00 pm      End of Day 2

**Day 3/October 18, 2018**

8:30 am      Mars 2020 Landing Site Working Group  
*Extended Mission Traverse Between Jezero and Midway (45 min)*

9:15 am      Discussion (*45 min*)

10:00 am     Summary Discussions and Assessment (*90 min*)

**11:30-12:30   Lunch**

12:30 pm     Community Assessment of Final Candidate Landing Sites (*120 min*)

**2:30 pm      End of Workshop**