Mars 2020/MSR Sample Depot Science Community Workshop

First Announcement

September 28th and 30th 8am-12pm PDT / 11am-3pm EDT / 16:00-20:00 CEST

Workshop Summary Statement of Purpose

A depot of samples acquired by the Perseverance Rover in Jezero Crater needs to be established in the near future for risk management and other strategic reasons along the Jezero Delta Front. The goal of this workshop is to inform and solicit input from the science community on the potential for the samples in this proposed depot to sufficiently satisfy Mars Sample Return science objectives and thus constitute a scientifically return-worthy (SRW) sample set.

Workshop Information

As the Perseverance rover explores the Jezero Delta Front and continues to enhance its on-board sample collection, NASA and ESA are further advancing their planning for the retrieval and transportation of the samples to Earth.

Mission risk managers have determined that the probability of success is maximized if the collected samples are divided into two subsets, with “success” defined as the delivery of one of those two groups of samples to Earth.

The strategy is based upon Perseverance forming an initial depot within Jezero Crater within the rover’s qualified lifetime (1.5 Mars years), using one member of each of the paired samples it has collected. The second of each of the paired samples would then be retained on board, and this group of on-board samples would be augmented by additional future samples, potentially over multiple years (depending on Perseverance’s future state of health).

However, this strategy depends on each of the two sample groups being independently scientifically return-worthy (SRW); we will not know in advance which of the two sample sets would be returned, although the goal would be to return the second sample collection which should include the same lithologies as the first collection, but could also include additional samples from inside and outside Jezero Crater.

Note that the second sample set will be by definition superior in a scientific sense to the first (for example it will have a larger number, and greater diversity, of samples), and we can anticipate that there would be a strong incentive to retrieve it, if it is possible to do so.

The timing, location, and constituent cache of the first sample depot to be placed on the martian surface are currently under consideration – and feedback from the scientific community is being sought. A location referred to as Three Forks (along the western Jezero delta front) has been identified as a high-potential site for the placement of the first sample depot from both a Mars 2020 (M2020) and Mars Sample Return (MSR) Program perspective due to the favorable

terrain, the proximity to the planned M2020 traverse, and the number and diversity of samples that will have been collected at the time of the first depot formation.

Logistics

The MSR Campaign Science Group (MCSG) is the primary organizer of this meeting. This workshop will be held virtually from **8am-12pm PDT / 11am-3pm EDT / 16:00-20:00 CEST on Wednesday, September 28th and Friday, September 30th**, with the intervening Thursday being an "off" day to allow the participants to consider and develop their thoughts and feedback.

Further information on the agenda, preparatory materials, and virtual connection information will be provided in the next announcement. The science community is an important stakeholder in the decisions about the formation of the first depot, and we encourage broad participation in this discussion.