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Call for Candidate Landing Sites Call for Candidate Landing Sites Call for Candidate Landing Sites  
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## Call for Imaging of Candidate Landing Sites for the 2020 Mars Rover Mission

Dear Colleagues:

In response to the recent release of the Mars 2020 mission Announcement of Opportunity, we are soliciting imaging targets for candidate landing sites for the Mars 2020 rover mission. Candidate landing sites should be proposed based on their potential to satisfy the objectives of the 2020 mission as detailed in the recent mission Science Definition Team (SDT) report (*Mustard et al.*, 2013). This call relates to targets for new candidate landing sites as well as additional targets for candidate landing sites proposed to prior calls (e.g., Future Landing Sites, 2018 Joint Rover, JPL Critical Data Products V, VI, and VII). Targets for sites satisfying the requirements listed below will be provided to the Mars Reconnaissance Orbiter (MRO) and Odyssey missions for imaging.

The Mars 2020 rover would use the successful, as-applied Mars Science Laboratory (MSL) Entry, Descent, and Landing (EDL) system to reach the surface of Mars. Hence, the constraints imposed by this EDL system on the MSL site selection effort are broadly similar to those for the 2020 mission (e.g., a 25 km by 20 km landing ellipse, access to latitudes between 30<sup>0</sup>N and 30<sup>0</sup>S, details on all constraints can be found in *Grant et al.*, 2011 and *Golombek et al.*, 2012). An important difference, however, relates to an allowable elevation for the landing site of +0.5 km (with respect to the MOLA geoid) due to the higher atmospheric density expected at the season the 2020 rover arrives at Mars.

The SDT report (see *Mustard et al.*, 2013) also describes several possible enhanced EDL capabilities that could be included in 2020 and might grant access to somewhat smaller landing ellipses and/or ellipses characterized by increased topography relative to what was acceptable for the MSL EDL system (as flown). These capabilities include: Range Trigger and Terrain Relative Navigation (TRN). Proposers are urged to review these capabilities in *Mustard et al.* (2013), but Range Trigger could enable a smaller ellipse on order of 18 km by 14 km and TRN could enable some hazards up to ~300 m across to be avoided within the ellipse. Proposers should consider whether the addition of one or more would potentially enhance or enable consideration of their candidate site.

It is expected that all candidate sites for the 2020 mission will be vetted by the science community at a first workshop tentatively scheduled for the week of May 12-16, 2014, in the Washington, D.C. area. Proposed targets should be chosen that will help strengthen the science rationale of the sites as well as assist in evaluating the nature and distribution of potential hazards to landing that can inform the desire for any enhanced EDL capability.

## **How to Participate:**

Persons wishing to propose a candidate site should complete the accompanying abstract template, which provides further details on the science objectives of the 2020 mission, engineering constraints on landing sites, possible enhancements to EDL, planetary protection constraints, and the information needed to identify a landing site and define the requested images. Proposers will need to provide a short summary statement related to the science rationale and provide a detailed map indicating the *prioritized* location of desired images (e.g., the exact position and outline of desired HiRISE, CTX and/or CRISM images). Proposers should also indicate whether their site likely requires or could be enhanced by additional specific EDL capabilities (e.g., access to a site might be enabled by Range Trigger and/or TRN or a site might become land-on with inclusion of Range Trigger and/or TRN).

Candidate landing sites should be submitted to both Matt Golombek (mgolombek@jpl.nasa.gov) and John Grant (grantj@si.edu) by November 15, 2013.

Submitted candidate sites will be reviewed for completeness and broad relevance before being approved for imaging by orbital assets. As a result of orbit tracks and competing targets, it may not be possible to obtain a new image(s) of every site submitted before the first workshop. Nevertheless, submitting image requests sooner provides a better chance of acquiring the images.

## **Looking Ahead to the First 2020 Landing Site Workshop:**

The purpose of the first 2020 Landing Site Workshop will be to: 1) begin to identify and evaluate potential landing sites best suited to achieving science objectives of the 2020 Rover Mission within the constraints imposed by engineering requirements, planetary protection requirements, and the necessity of ensuring a safe landing; and 2) provide input to NASA and the 2020 Project at JPL on the relative importance of including any enhanced EDL capabilities on the mission. The desired product of this workshop is: 1) a list of all known sites that meet the threshold criteria; 2) for those sites, an assessment of what landing capability is required (four choices: MSL-only, MSL + Range Trigger, MSL + Range Trigger + Terrain Relative Navigation, unknown or TBD); and 3) for each category of landing capability, a ranking of the sites using the qualifying geological criteria. At the end of this workshop we should have a good idea of a) how many sites exist in each category, b) how much “better” are the sites that require landing enhancements, and c) insight to where we need to invest additional energy in site characterization.

A NASA-appointed Landing Site Steering Committee will use the results of the first workshop as the basis for establishing a list of potential landing sites for study. Community consensus with respect to high priority sites will also be solicited. It is expected that candidate sites will be ranked (high, medium, low priority) based on presentations made at the workshop and that these rankings will be used to guide imaging

priorities of the sites after the workshop. The goal will be to build up robust data sets while orbital assets are still operating for as many high priority sites as possible, thereby enabling comprehensive discussion of relative science merits at subsequent workshops.

Regards,

John Grant and Matt Golombek, Co-Chairs,  
Mars Landing Site Steering Committee

## **References Cited:**

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