



IMEWG Position Statement on Lower Cost Mars Missions

As part of an overall strategy for future Mars exploration, the International Mars Exploration Working Group (IMEWG) recognizes the value of lower cost* missions. Lower cost missions will allow for a high cadence of missions which will in turn enable a breadth of investigations and provide access to Mars for a wider range of nations. It will diversify the exploration of Mars by facilitating more frequent data return and technology demonstrations. Lower cost missions will also play a role in preparation for human exploration.

The rapid development of CubeSat and SmallSat capabilities promises to radically reduce the cost of Mars exploration. Miniaturization of spacecraft instruments and avionics, coupled with increased communication infrastructure at Mars and reduced costs for delivery of spacecraft to Mars, will enable more frequent, lower cost orbital and surface missions.

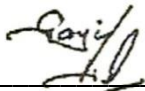
In support of this vision, IMEWG endorses the following recommendations:

- IMEWG will serve as a forum to foster collaboration amongst member agencies, identifying capabilities, shared interests, and long-term goals and opportunities for interagency partnerships that advance lower cost mission concepts for Mars.
- IMEWG encourages its member agencies to assess opportunities for secondary small spacecraft and/or instruments to be carried on any of their primary Mars-bound missions, as well as to develop capabilities for delivering multiple spacecraft. IMEWG will maintain a catalog of planned Mars launch opportunities by member agencies, and IMEWG member agencies will be regularly requested to provide indications of any opportunities and plans for accommodating secondary small spacecraft on planned primary Mars missions where applicable. In addition, IMEWG member agencies will be regularly requested to make known lower-cost spacecraft or instrument developments that could be accommodated on such missions.
- IMEWG advocates the following strategies in two high-priority mission-enabling areas of interest to all:
 1. Development of lower cost transportation systems with standard interfaces that can deliver multiple spacecraft to their intended operational orbits or entry trajectories, reducing the propulsion system requirements and costs of the individual spacecraft.
 2. Development of a robust Mars telecommunications relay network that also supports positioning, navigation and timing (PNT) services for Mars orbiters and landed vehicles (landers, rovers, aerobots). In support of that goal, IMEWG encourages member agencies to consider inclusion of a relay payload on each Mars orbiter, offering interoperable telecommunication relay services to Mars users.

*"Lower cost" encompasses Mars mission concepts with a typical total mission costs in the range of ~\$100M-\$300M.

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Signed on behalf of the IMEWG membership by



Sanjay Vijendran
IMEWG Chair

2023/01/13

Date



Richard M. Davis
IMEWG Secretariat

2023/01/13

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