

17th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND  
DEVELOPMENT (D3)Systems and Infrastructures to Implement Sustainable Space Development and Settlement - Technologies  
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NASA, United StatesENTRY, DESCENT AND LANDING (EDL) TECHNOLOGY INVESTMENTS WITHIN NASA'S  
SPACE TECHNOLOGY MISSION DIRECTORATE (STMD)**Abstract**

NASA's Space Technology Mission Directorate (STMD) has several investments in Entry, Descent and Landing (EDL) technologies, across its various programs. These investments span low-Technology Readiness Level (TRL) concepts through flight demonstrations. This presentation will give a top-level view of the various investments, how they relate to the Space Policy Directives and NASA's future mission plans. STMD investments in EDL technologies are focused on those in the mid-TRL range (3-6), which are managed within the Game-Changing Development (GCD) Program. The portfolio in GCD contains projects with varied objectives, from computational modeling improvements to instrumenting the heatshield of Mars 2020. These include: Safe and Precise Landing Integrated Capabilities Evolution (SPLICE), Entry Systems Modeling (ESM), the Descent Systems Study (DSS), and Mars Science Laboratory Entry, Descent and Landing Instrumentation 2 (MEDLI2). A brief overview of the objectives, major accomplishments, and maturity of each of these projects will be given. The STMD's programs in the lower TRL range include NASA Innovative Advanced Concepts (NIAC), Small Business and Innovative Research (SBIR), and Space Technology Research Grants (STRG). The presentation will describe efforts to increase the number and quality of EDL-related solicitations and investments in these "pipeline-feeding" programs. These programs engage universities, future employees, and small businesses in meaningful activities that will keep the EDL state-of-the-art moving forward. On the other end of the TRL spectrum are STMD's Small Satellite Program, Launch Opportunities Program, and the Technology Demonstration Missions (TDM). Within the TDM program is the Low Earth Orbit Flight Test of an Inflatable Decelerator (LOFTID) project, which will test the biggest heatshield ever flown. Small satellites and suborbital rockets are two additional avenues for implementing EDL activities to flight test and demonstrate promising capabilities. In recent years, STMD has supported a regular cadence of opportunities for commercial entities to partner with NASA centers or to mature technologies on their own, through the Announcement of Collaborative Opportunities (ACO) and Tipping Point solicitations. The EDL portfolio has been an enormous benefactor of these awards, in everything from thermal protection system (TPS) materials development to flight testing of precision landing sensors. The Space Technology Mission Directorate's EDL portfolio contains a number of building blocks to enable NASA and its partners to accomplish more challenging future exploration missions.