

Opportunity Taken: The Value of Diverse Career Experience

Dr. Robert D. Braun
Alvin Seiff Memorial Lecture

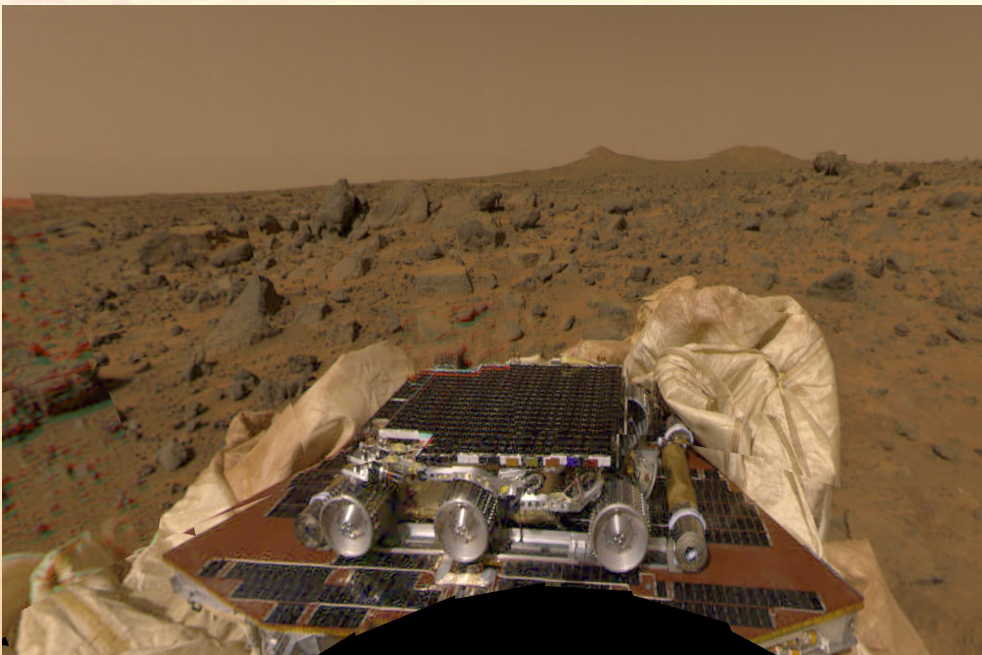
June 18, 2012
9th International Planetary Probe Workshop

Diverse Experience Blessings*

- Student
- Aerospace technologist and systems engineer
- Project, program and line manager
- Educator
- Policy maker

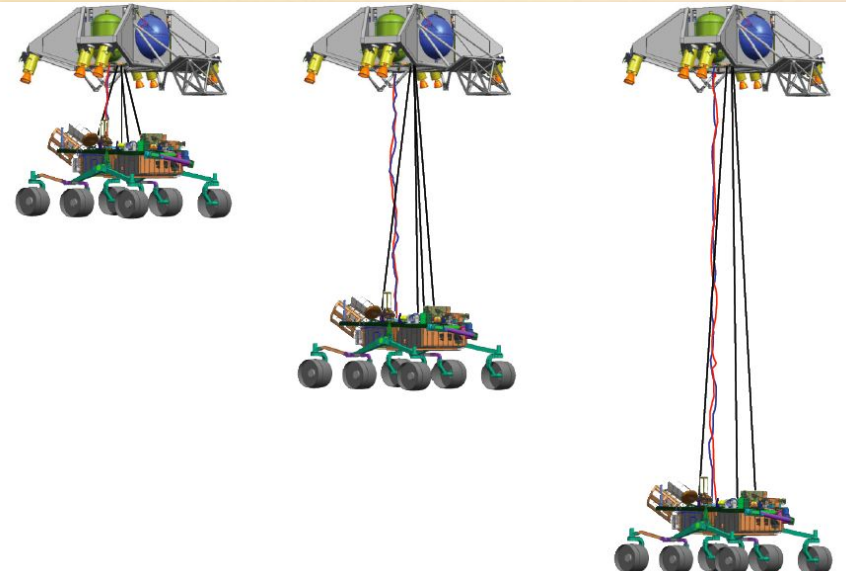
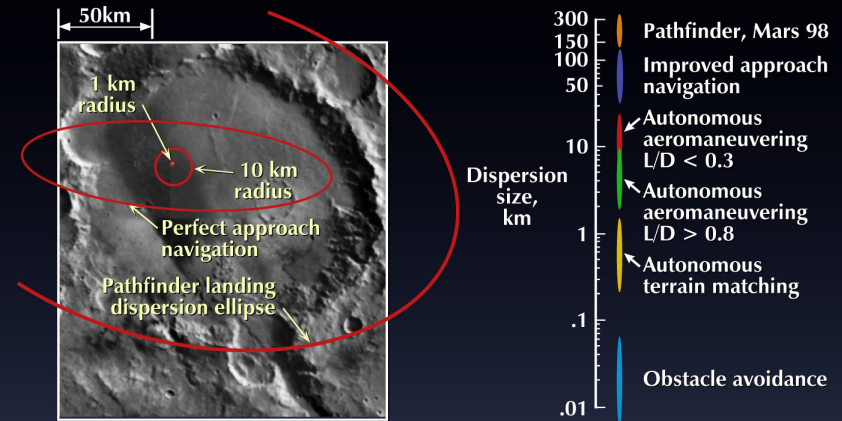
*Continuously mentored

Innovation Lives Here



Through passion and dedicated effort, the EDL community has developed proven solutions to seemingly insurmountable challenges.

Landing Footprint Improvement Through Precision Landing Technology



Phenolic Impregnated Carbon Ablator (PICA)

Stardust



Orion MDU



MSL



Dragon

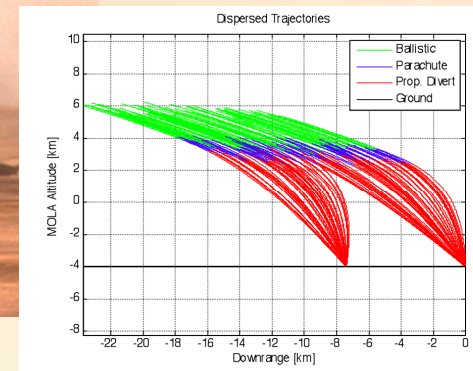
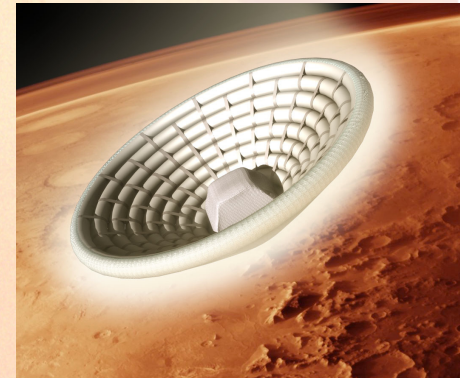
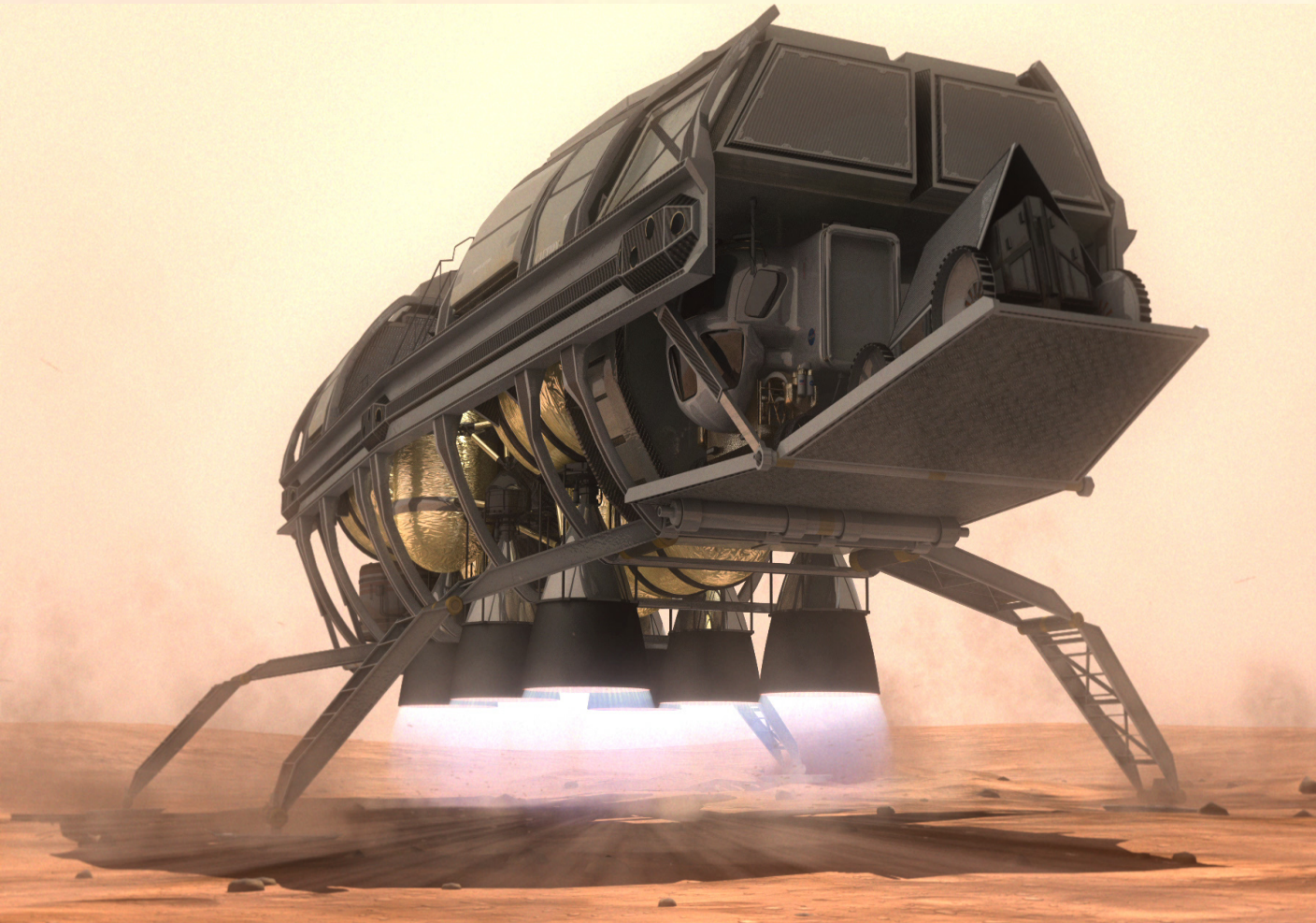


PICA-Flex



- Invented in 1997, 0.8 m uni-piece heatshield enabled Stardust 1200 W/cm², 12.7 km/s Earth return
- Technology investment continued for possible use on Orion
- Tiled, 4.5 m heatshield developed for MSL, when thermal issue was discovered with the baseline SLA TPS post CDR. Flight in August 2012.
- Tiled, 3.6 m PICAx heatshield for Dragon flight proven
- PICA-flex invented in 2009 for potential heavy mass Mars missions
 - Incorporates phenolic into flexible carbon felt rather than rigid carbon substrate
 - Arcjet and laser testing shows PICA-flex to be a viable ablator (up to 400 W/cm²)
 - Broad and diverse range of applications

What Does the Future Hold?



Take the Opportunity

- Technology advances are required for NASA's future missions
- Technology advancement requires risk taking
- Innovative solutions often come from diverse experiences and the mindset that failure is an option.
- Hard work is required to demonstrate technical feasibility
- Capitalize on lessons learned and the community experience
- Create your opportunity
- Work passionately towards bold challenges

