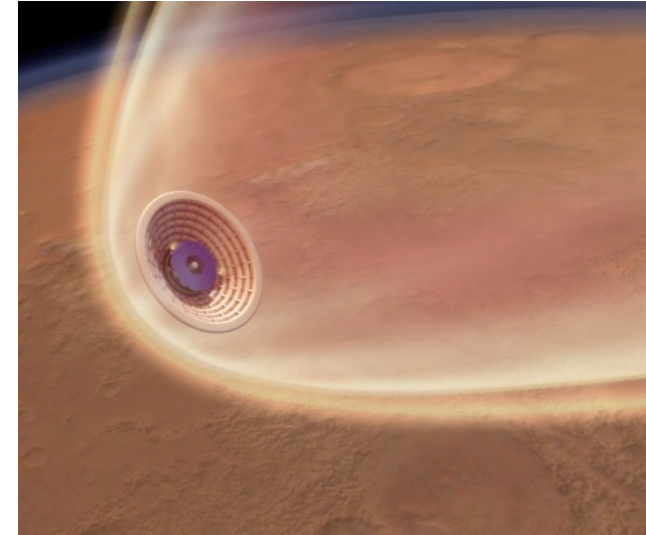
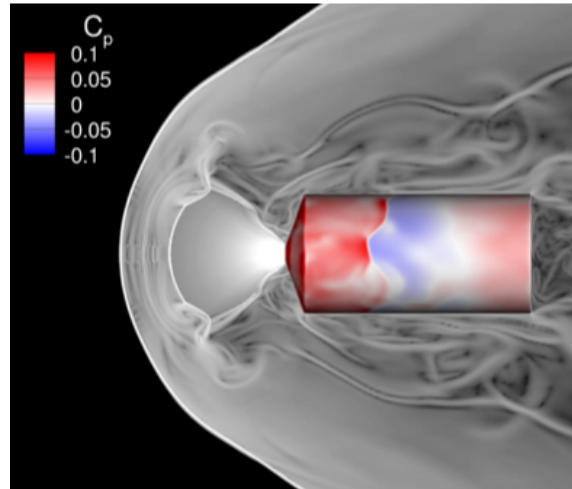
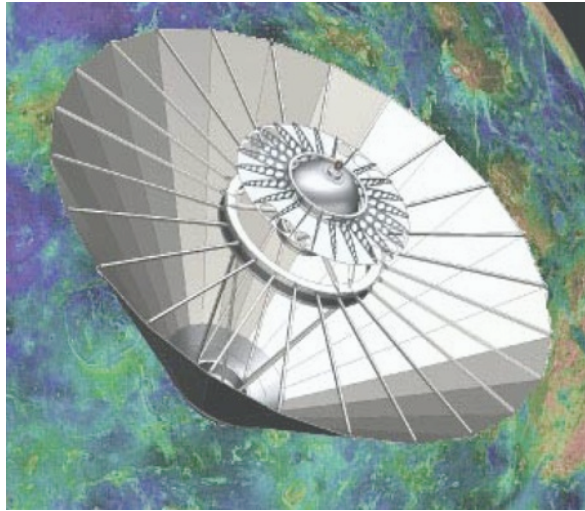


Game Changing Development Program

Briefing for International Planetary Probe Workshop

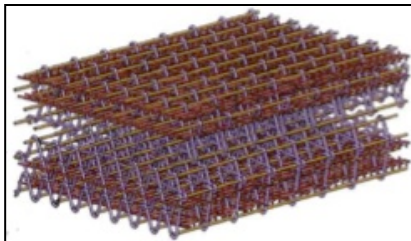


June 22, 2012

Neil Cheatwood

Aaron Morris

NASA Game Changing Development – Program Office
Entry, Descent, and Landing



Agenda



- **GCD Mission**
- **Technology Development Process**
- **Streamlined Documentation and Reporting**
- **Examples of current projects**
- **Examples of collaboration**
- **What the future holds**

NASA Game Changing Development



- **NASA OCT created a new program office this Fiscal Year, which is responsible for the development of innovative, disruptive technologies.**
 - Transformational Innovations
 - Disruptive Technology
 - Revolutionary Advance in Technology (not Evolutionary)
 - Create Technological Surprise (Borrowed from DARPA)
- **The GCD office focuses on mid-Technology Readiness Levels.**
 - TRL 3-5/6
 - Not early concept development
 - Transitions to Technology Demonstration Missions



Process for Engaging NASA GCD



- **There are three methods to engage NASA GCD for a new technology project**

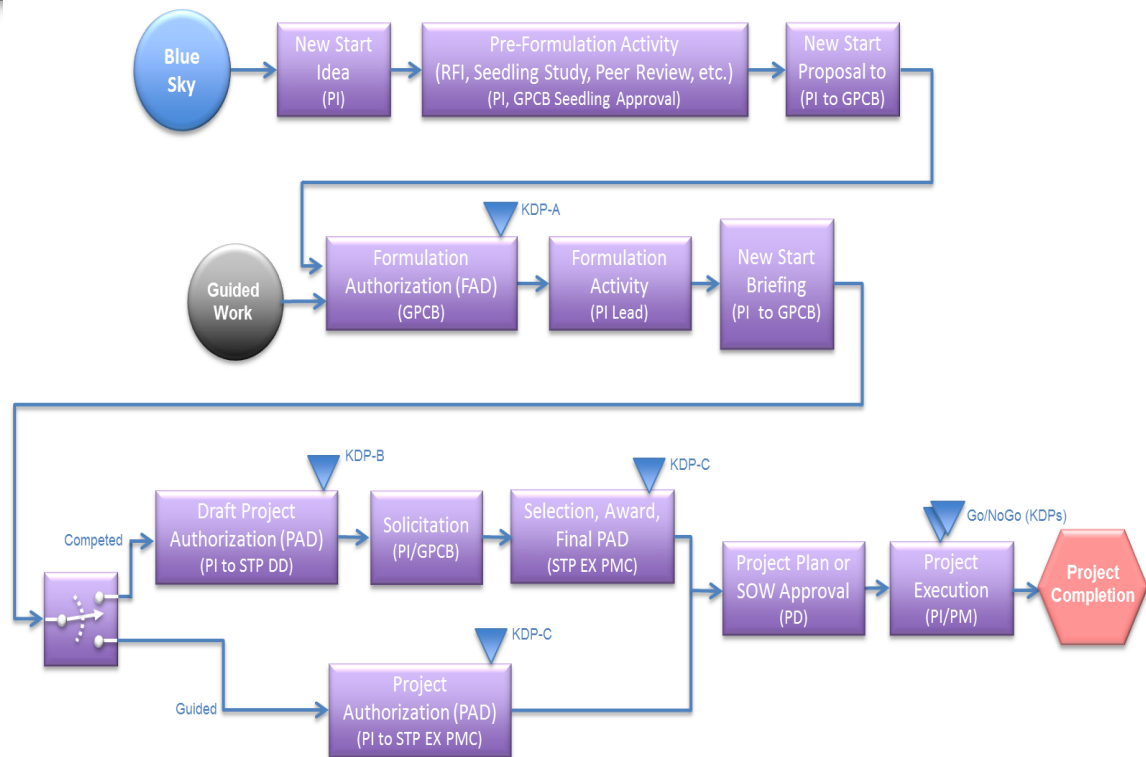
- Apply to BAA and NRA announcements

- Current announcements closed March 26th. An EDL focused appendix will be written for the next release of announcements later this year

- Guided Activities that support current NASA missions

- Engage the Agency PI for government led New Start ideas

- RFI's, Workshops, and Collaborations



Streamlined Reporting and Documentation



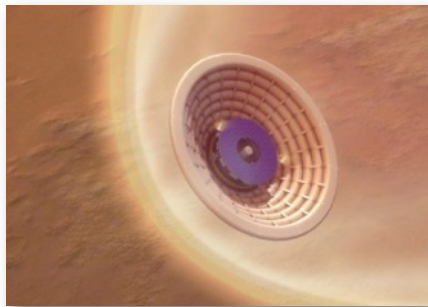
- **Projects are two year duration or less!!**
- **Project Reporting must be tailored on a case by case basis**
- **General guidelines for mandatory reporting are as follows**

Report	Content	From - To
Weekly Update	Project status including accomplishment and issues.	PI – PD/PE
PM Monthly	Programmatic, technical, cost, schedule status	PM – Program
Tech Authority Monthly	Technical, cost, schedule status	Project CE or Tech Lead – GCD CE, CSO
Monthly Risk Review	Project risk status	PM – GCD Risk Review Board
Annual Mid-Term Review	Detailed technical, cost, schedule, and risk annual report. Projections of future cost and schedule performance. TRL re-assessment. Review will serve as a GO/NO GO decision point and inform GCD Program Review	PI – Program, OCT
Annual Project Review	Detailed technical, cost, schedule, and risk annual report. Projections of future cost and schedule performance. TRL re-assessment. Review will serve as a Go/No Go decision point and inform GCD Program Review	PM/PI – Program, OCT

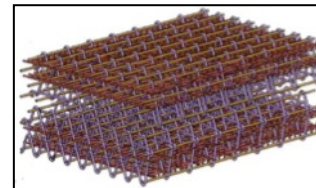
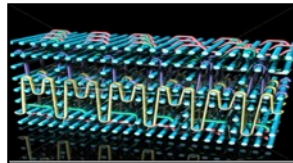
NASA Game Changing Development



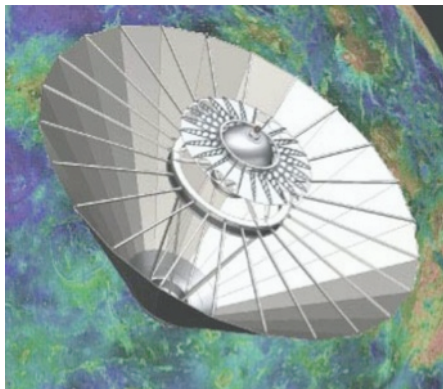
- **Entry, Descent, and Landing** is a popular theme within GCD.
 - Current EDL projects shown below



HIAD



Woven TPS



ADEPT



Conformal TPS



EDL Hypersonics

Methods of Transition and Collaboration

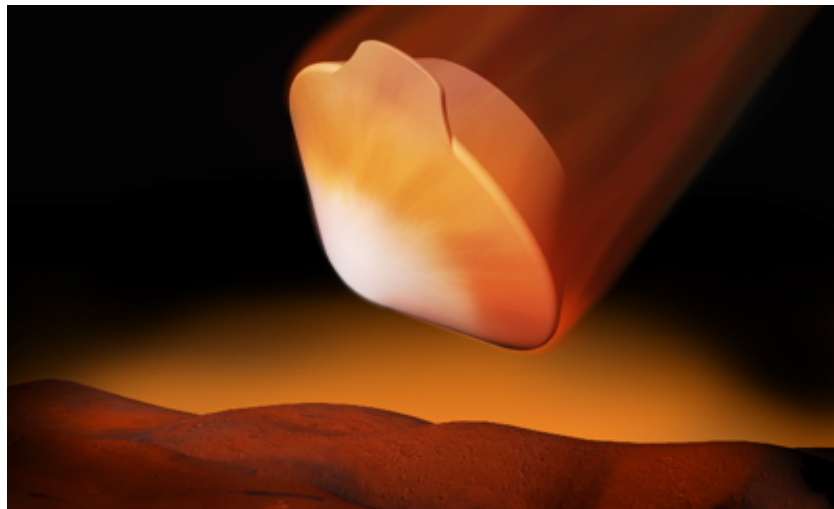


- **It is important to foster technology that is directly applicable to current NASA missions. A strong desire to collaborate between groups and NASA centers is present.**
 - Current plan to cooperate with Orion program and Woven-TPS for compression pads
 - Discussions ongoing regarding collaboration between HEART mission and Orion parachutes
 - Desire to put innovative new EDL instrumentation on test flights

Prominent Ideas (not currently funded)

- **Examples of interesting technology**

- Inflatable/deployable development
- Advancements in TPS
- Trim tabs
- Supersonic Retro-Propulsion
- Smart parachute (automated disreef, replacing metallic components with textiles, advanced materials)
- Landing systems
- EDL Instrumentation (wireless pressure sensors, advanced imaging and photogrammetrics)
- Test Techniques
- Precision Landing



Call to Engage with GCD PI



- Ultimately, this presentation is not to brief current technology development projects, but to serve as an introduction to current GCD technology investments and present a call to the community to engage with NASA Game Changing EDL Leadership.
- Neil Cheatwood
F.Mcneil.Cheatwood@NASA.gov
- Aaron Morris
Aaron.L.Morris@NASA.gov

Questions?

