



# Upcoming Workshop: Planetary Drilling

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# Why a workshop?

- Instrument development programs receive lots of proposals for sample acquisition devices: drills, corers, *etc.*
- Many mission applications for these devices have been discussed in various venues and to varying degrees of detail.
- However, there is no focused, strategic guidance on which applications — and therefore technologies — are highest priority.
- Nor is there overview of which applications have been examined in hardware and the Technology Readiness Level (TRL) of that hardware.

**As the manager of an instrument development program (ASTID), I am flying blind when I recommend a sample acquisition device for development funding.**



# What's the workshop about?

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- Dr. Brian Glass (ARC) and I are in the process of organizing an invitation-only Workshop on Planetary Drilling to be held in the Spring of 2013 (hopefully at GSFC).
- The purpose of the workshop will be to:
  - ◆ survey the current state of the art and;
  - ◆ determine for each high-priority application what technology has been demonstrated and what areas of investment are needed.
- Organizing principle will be a hierarchical framework of application considerations
  - ◆ Have asked PAGs to help prioritize applications within this framework.



# Workshop Format

- 2.5-3 days long
- 30-40 invited participants, all practitioners or domain experts
  - ◆ Looking outside US and into terrestrial drilling industries.
- 1-3 introductory talks to set the scene
  - ◆ Lightning talks (3', 1 slide) to allow each participant to tell the group what she does
- Highly discussion-focused; not a mini-symposium.
- Break-out groups will be formed to discuss focused questions and report back to the whole group.
  - ◆ Each of these break-out groups will be reorganized for each set of discussions



# Outcomes

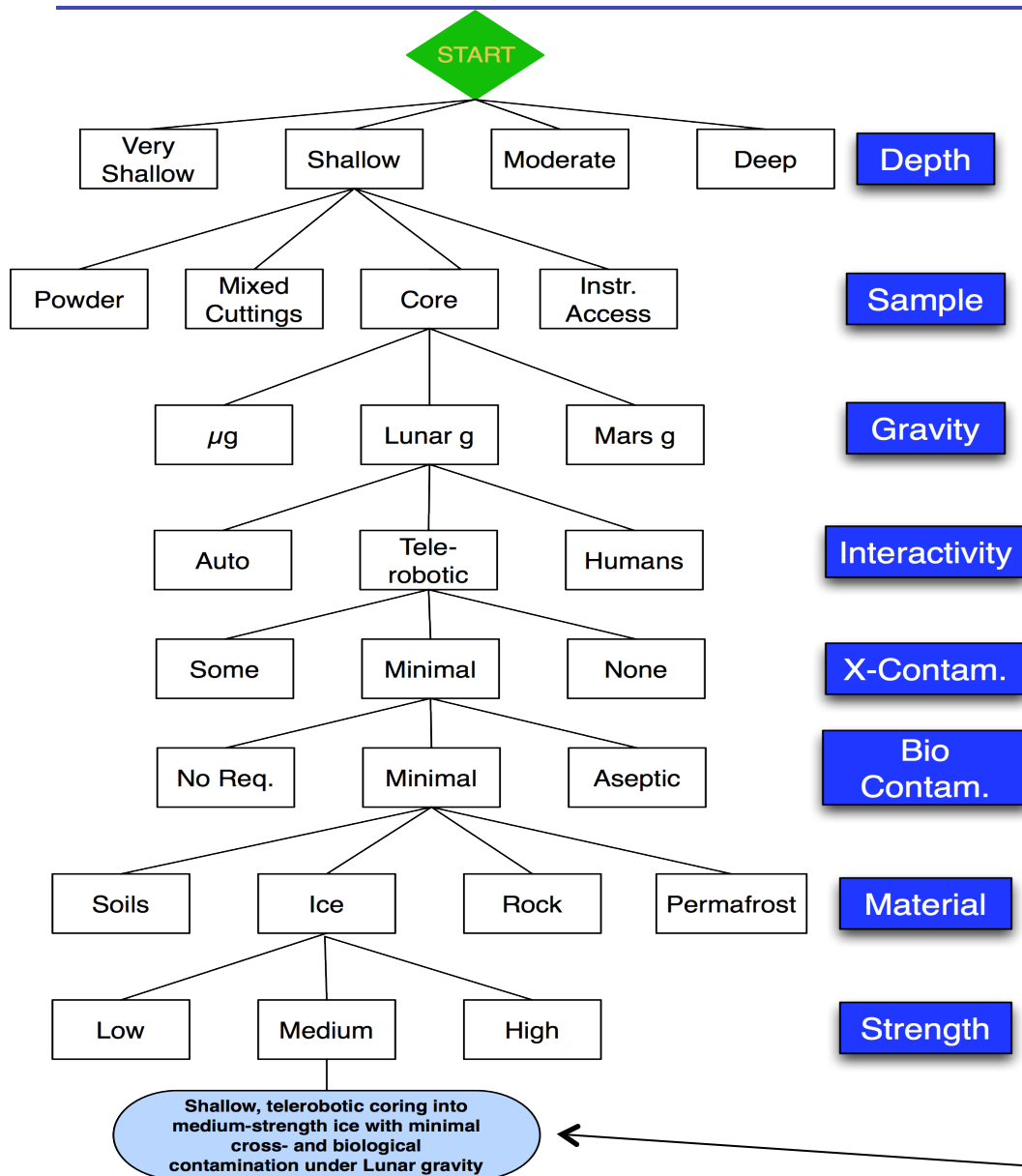
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- Refined hierarchical framework of application considerations.
- Survey of currently demonstrated technologies.
- Analysis of existing technology gaps.
- Report to be published in some form within 6 months.



# First Draft of Framework

<b>Consideration 1: Continuous Drill Depth</b>	Very Shallow (<20cm) Shallow (20cm -3m) Moderate (3-5m) Deep (>5m)
<b>Consideration 2: Required Sample Type</b>	Powder Mixed Cuttings Core Down-hole Measurements Only
<b>Consideration 3: Gravity</b>	Microgravity Low Gravity (e.g., Moon) Medium Gravity (e.g., Mars)
<b>Consideration 4: Degree of Human Interactivity</b>	Autonomous Tele-robotic Real-time, Human-in-the-Loop
<b>Consideration 5: Physical Cleanliness</b>	Cross-Contamination Tolerated Minimal Cross-Contamination No Cross-Contamination
<b>Consideration 6: Biological Cleanliness</b>	No Requirement Minimal Contamination Tolerated Aseptic
<b>Consideration 7: Material to be Drilled</b>	Minimally consolidated soil/fines Ice Rock Ice-indurated Regolith
<b>Consideration 8: Strength of Material</b>	Low Medium High



An application



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**ANY QUESTIONS?**