

# Context for the Workshop

- President Bush announced a new vision for the U.S. space exploration program (Bush plan in bold):
- **Undertake lunar exploration activities to enable sustained human and robotic exploration of Mars and more distant destinations in the solar system**
  - For Mars, the plan notes: **Conduct human expeditions to Mars after acquiring adequate knowledge about the planet using robotic missions and *after successfully demonstrating sustained human exploration missions to the Moon***
  - “Sustained” implies use of *in situ* resources

## Context (continued)

- **Starting no later than 2008, initiate a series of robotic missions to the Moon to prepare for and support future human exploration activities**
  - This is an important part of this workshop
  - Emphasis is on planning for human return
  - Our discussions will feed into deliberations by the Objectives/Requirements Definition Team defining the 2008 orbital mission

## Context (continued)

- **Conduct the first extended human expedition to the lunar surface as early as 2015, but no later than the year 2020**
  - Must plan human activities before 2015-2020
  - What will they do, besides maintain their base?
    - Field studies; experiments using rovers
    - Other science (e.g., astronomy, life science)
    - Resource utilization experiments

## Context (continued)

- **Use lunar exploration activities to further science, and to develop and test new approaches, technologies, and systems, including use of lunar and other space resources, to support sustained human space exploration to Mars and other destinations**
  - Science a part of this effort (A commission was set up to, among other things, “examine...a science research agenda to be conducted on the Moon”)
  - Resource exploration and utilization central to it
  - “Sustained” implies that ISRU is essential

# Context: A Note About Planning for Mars

- Goals for Mars exploration:
  - Determine if Life Ever Arose on Mars
  - Understand the Processes and History of Climate on Mars
  - Determine the Evolution of the Surface and Interior of Mars
  - Prepare for Human Exploration
- Goals are equal in priority, but implementation has favored the first three. We should avoid that in lunar exploration, while not ignoring science goals

# Workshop Goals

- Determine what we need to know to make human missions to the Moon effective in advancing the goal of human exploration of solar system
- “Effective” means:
  - Develop the capability to live and work on another planetary body
  - Develop methods to explore for and use lunar resources
  - Conduct technology and ISRU experiments
  - Do substantive scientific research
  - Gather data needed for an effective human presence on the Moon
- Provide information to ORDT meeting on Wed.

# Workshop Objectives

- Review current data sets
- Determine what future measurements are needed
  - Resource assessment
  - Surface geotechnical properties
  - Geographic properties (topography, geodetic control, location of permanently shadowed areas in polar regions, etc.)
- Determine quality and priority of measurements needed
  - Precision, accuracy, spatial resolution
  - Order in which data should be collected
- Establish priorities for data collection

# Working Groups

- Mission Operations (Ben Bussey, Hess Room)
- Assessment of Resources (Jeff Taylor, Berkner D)
- Resource and Regolith Processing (Larry Taylor, Mike Duke)
- Goals of the subgroups:
  - Identify information lacking
  - Suggest investigations/measurements that need to be done— emphasis is on the measurements, not on how to make them
  - Determine requirements of those measurements (precision, spatial resolution, etc.)
  - Prioritize the investigations and measurements
  - Draft sub-group reports (powerpoint, making use of notes pages)
  - Audience for report: Codes S, T, U, and others involved in implementing the program