Objectives for Human Missions to NEOs

PLANETARY DEFENSE
Presented by: Lindley Johnson
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## Magnitude of Findings

<table>
<thead>
<tr>
<th>Theme</th>
<th>Number of Objectives</th>
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<tbody>
<tr>
<td>Demonstrate Deep Space Capabilities</td>
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<td>Scientific Research</td>
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<td>Planetary Defense</td>
<td>30</td>
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<td>Other</td>
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- Overarching observations
Deep Space Capabilities Theme: Key Observations

- Objectives
  - Objective 1
  - Objective 2
  - Objective 3

- Activities
  - Activity 1
  - Activity 2
  - Activity 3

- Target Characteristics
  - Characteristic 3
  - Characteristic 2
  - Characteristic 3
Scientific Research Theme: Key Observations

- Objectives
  - Objective 1
  - Objective 2
  - Objective 3
- Activities
  - Activity 1
  - Activity 2
  - Activity 3
- Target Characteristics
  - Characteristic 3
  - Characteristic 2
  - Characteristic 3
Planetary Defense Theme: Key Observations

- Objectives
  - Characterize properties of an NEO
  - Determine effectiveness of different deflection techniques
  - Examine various surface attachment techniques
  - Verification of remote characterization (i.e., learn ground truth)
  - Sample return
  - Simulate a multi-national planetary defense campaign
  - Planning operation and coordination of large deep space missions
  - Public buy-in for planetary defense
  - Involve international community
  - Verify autonomous proximity operations

- Activities
  - Collect sample returns
  - Observe and examine result of various deflection techniques
  - Test terminal phase guidance and control
  - Operate avatars to explore parts of the NEO
  - Implanting seismic sensors and stimulators
  - Measure and examine the NEO environment
  - Drilling to determine characteristics
  - Observe response to laser and other focus techniques

- Target Characteristics
  - Survey to get complete target selection catalog
  - Targets that are potential impact hazards (i.e., smaller objects)
  - Need queue of targets over course of several years
  - Choose targets with fairly simple characteristics (i.e., shapes, etc.)
  - More challenging dynamics for follow on mission (ex., longer duration requires S.E.P. which enables greater target selection)
Backup
Parking Lot

• Optional chart
Possible Breakout Discussions for Tomorrow

• Optional Chart