

Apophis Mission Design Competition

July 5 Telecon Summary

Team:

Thomas Coffee

Wilfried Hofstetter

Ryan McLinko

Chase Million

Reviewer / advisor:

Paul Wooster

Major Points (1)

- **Tasks for the next weeks:**

- **1. Trajectories to Apophis**

- ◆ Calculate trajectories from the Earth to Apophis for mission opportunities between today and 2029
- ◆ Provide C3 (Earth departure and Apophis arrival) and time of flight information in diagrams and tables
- ◆ This task is a prerequisite for mission design
- ◆ Tom has taken the lead on this and generated initial data sets

- **2. Enumeration and assessment of mission architectures**

- ◆ Generate and describe a set of operational architectures to achieve the objectives set in the competition guidelines
- ◆ Carry out preliminary quantitative assessment of spacecraft and payload masses based on results from task 1
- ◆ Define metrics (beyond payload mass) for the evaluation and selection of these mission architectures
- ◆ Wilfried will take a lead on this and will be supported by Ryan

- **3. Review of methods and sensors for trajectory determination**

- ◆ Review algorithms and sensors for determining: spacecraft attitude, s/c position, s/c velocity, distances between spacecraft and planetary body, etc.
- ◆ Characterize the different methods with regard to their accuracy, power/mass/volume requirements, technology readiness, etc. to facilitate evaluation
- ◆ Chase will take a lead on this

Major Points (2)

- **Future tasks:**
 - Task 4: evaluate mission architectures and down-select to one preferred architecture
 - Task 5: carry out conceptual spacecraft and mission design for preferred architecture
 - Task 6: write report and send in (by August 31, 2007)
- **Rough schedule**
 - Tasks 1-3: finish in the next two weeks (by Thursday, July 19)
 - Task 4: finish by Thursday, July 26, should be coupled with review
 - Task 5: finish by August 17, should also be coupled with review
 - Task 6: finish by August 24
 - This should give us sufficient slack to tie up loose ends and do iterations
 - Paul will be available as reviewer
- **Next steps**
 - Tentative plan for telecon next Thursday, July 12, 2 pm
 - Telecon details will be confirmed and arranged by Wilfried