How to Plan for High-Profile Missions

John Klineberg, Moderator;
Rick Howard, NASA (ret.); Ralph McNutt, APL;
Charles Elachi, JPL; Bill Gail, GWC

High-Profile Missions
What are they?

- **Potter Stewart** (1915 –1985) Associate Justice of United States Supreme Court, in his opinion in the *Jacobellis vs. Ohio* (1964) obcenity case, wrote that pornography was hard to define, but "I know it when I see it."
- We also know when a mission is "High Profile."
- **Analog – Poker's "All In"**

  In no-limit games in poker, a player may go all in, that is, bet his entire stack, at any point during a betting round. He is out of the game if he loses.

High-Profile Missions
Definition of “Flagship”

- Charlie Kennel reminded us at a recent SSB XCOM Meeting that a “flagship” is the vessel used by the commanding officer of a group of naval ships, characteristically a flag officer, flying a special flag.
- Used generally, it is the lead ship in a fleet of vessels, typically the first, largest, fastest, most heavily armed, or in terms of media coverage, the best known.
- Over the years the term "flagship" has been used as a metaphor by various industries such as broadcasting, automobiles, education, and retailing to refer to their highest profile or most expensive products and outlets.

High-Profile Missions Terminology

- The recent inclusion of human space flight missions (Apollo, Space Shuttle and International Space Station) in the Agency's flagship study may lead to confusion.
- NASA should reconsider the definition of "flagships" and at least limit it to science missions, or preferably drop the term entirely.
- The term "High-Profile" - too vague
- "Strategic" – somewhat better
- Could consider "All-In" missions

“All-In” Missions Characteristics

- Are “sold” with difficulty over a long period of time.
- Have lengthy schedules that span several Administrations, Congresses and changes in NASA leadership.
- Contain multiple, very challenging, advanced developments for instruments, spacecraft and flight control systems.
- Usually involve more than one NASA Center and often one or more international partners.
- Have large budgets that can impact not just the Division, but the entire Science Mission Directorate and, at times, the broader NASA agenda as well.
- Tend to be periodically threatened with cancellation.
- Have the appearance of “betting the Agency” on the mission, which leads to a high degree of visibility and attention by many groups external to NASA.

"All-In" Missions
Some Examples & Possible Questions

- **HST SM-1**: "You went to considerable effort to launch a large telescope on the Space Shuttle and then found out it didn't work. If you can't fix HST, we should re-examine our decision to do astronomy from space."
- **MSL**: "You launched and landed a mobile platform with very sophisticated on-board instruments. If you don't find something really exciting this time, we should wait until we send humans there before we try a sample return."
- **JWST**: "You sacrificed most other astrophysics missions for a decade to launch this follow-on to Hubble. If JWST doesn't return the results expected, we should question whether NASA can deliver on such a large project."

“All-In” Missions
Potential Management Requirements

- Extensive trade-space exploration (science, performance, cost, risk) during pre-phase A.
- Selection of design point with large performance margins.
- Control of NASA science appetite during project initiation and payload definition.
- Identification and retirement of all major development risks during early mission formulation.
- Careful consideration of when to involve contractors with respect to critical mission and design decisions.
- Selection of project manager with relevant experience in dealing with major aerospace contractors.
- Involvement of Center Director in documented and well understood responsibility for mission management.