The Good Old Days

- First Discovery round in 1991 called for 10-page concept papers and 5 minute presentations at a meeting in San Juan Capistrano
- 89 concepts were submitted
- 11 concepts were selected for further study and given $100K each
- Out of this came the Lunar Prospector and Stardust missions
- Under this system, Step 1 proposals were about science, Step 2 proposals were about implementation

Comparing Proposal Cycles

- 1991: 10-page concept study
- 1996: Step 1 proposal: 46 pages for complete science, mission, spacecraft, management and cost description.
  - Actual proposal: 71 pages (13 scientists)
- 2006: Step 1 proposal: 66 pages for complete science, mission, spacecraft, management and cost description.
  - Actual proposal: 186 pages (21 scientists)
- Much of the growth is attributed to (unfunded) increased NASA requirements, request for details, appendices, etc.
  - e.g. EPO, SDB, DAP, participating scientists, telecom details, planetary protection, international agreements, etc.

Solutions

- Fund DAP and PS from the Discovery and New Frontiers Programs through Headquarters
- Leave out many of the requested Appendices until Step 2
- Leave out excessive technical details (e.g., telecom) until Step 2
- Have proposals allocate funds for EPO but leave description of EPO programs to Step 2 or even phase B
- Have proposals acknowledge SDB but leave details until phase B
- Weight Science higher in Step 1 evaluation

Take Launch Vehicle Costs Out of the AO

- Early Discovery cycles did not include launch vehicle cost
- Launch vehicle costs appear to rise far faster than inflation
- Launch vehicle costs sometimes change midway through the proposal writing cycle
- Solution: Assign a mid-level launch vehicle as GFE
  e.g. Atlas 531
- Proposers required to pay deltas ± from that vehicle to version they are requesting
- Proposers are given "credit" for using smaller vehicles
  i.e. Added to their cap

Get Real About Inflation

- Federal government typically under-reports true inflation rate (bought a tank of gas lately?)
- Typical aerospace inflation rate is higher than consumer price index, ~4.5 % in early 2000's when CPI was ~3.0 %
- New Frontiers cap was $ 700 M in FY'03$
- Decadal Survey recommended missions barely fit inside that cap
- Inflating to FY'09$ using the 4.5% rate gives $ 910 M
- If NF is 2 × (Discovery/Scout) then cap should be $ 950 M + inflation since FY'06
- Current CPI inflation rate is 7.4% for past 12 months (Los Angeles Times, 2/27/08). So even higher cap is needed.

Get Real About Funding Profiles

- 2004 Discovery AO had a profile with 60% of all money in the last two years before launch, typically years 3 and 4 in a normal 4-year mission development cycle
- Maximum spending typically occurs in years 2 and 3 when you are buying major hardware items
- Result in 2004 was that only 1 proposal, a cheap reflight of the failed ConTour mission, was rated Category 1

Proposal Reviewing

- Educate reviewers about the page limits in the AO
- More than half of all review comments can be summarized as:

"You didn't write enough about my specialty: __fill in the blank__."

- Another favorite reviewer comment:

"You didn't use the magic buzzword I was looking for."

- Educate reviewers as to the technical detail level expected in a Step 1 proposal
- Some reviewers treat Step 1 proposals as PDR or even CDR level reviews

Proposal Reviewing (continued)

- Educate reviewers that NASA Centers and major industry partners (both of which have been building s/c for decades) know how to do basic functions like quality assurance and fault protection without spending pages describing it