Hosted payload opportunities: What are some of the issues and steps to be taken from awareness of an opportunity to final agreement to host a payload?

From the PI perspective:
- Resource allocation – mass/volume/power/data budgets, and margin, need to be known in advance: crucial for determining if/how much development, hence time/money, is needed. Similarly for orbit, thermal parameters, target launch date, etc.
- Funding availability/timeline – competitive peer review takes time: critical for a "rapid response" program. Fast schedule may increase costs (even for "ready" instruments).
- Risk tolerance – can reviews be streamlined to compress schedule? What level of testing and/or assurances will be required, both by agency (to maximize likelihood of science success) & by provider (to mitigate mission risk) ?

Host platform concerns: What are the most common requirements, concerns, and interface characteristics of hosted platforms?

From the PI perspective… (in addition to the points from prior slide…)
- Simplicity is key for rapid response & low cost
  - The more standardized (even across platforms), the better!
  - The closer to COTS (e.g., RS422 rather than SpaceWire), the better, as this makes design/development more accessible, i.e., faster & cheaper (and implementable by a broader range of institutions)
- Interface specs (ICDs) should be determined ahead of time as much as possible, but delicate balance b/w flexibility (to be more accommodating) & rigor (to have firm goal, not get into weeds)
- Data – the closer to "bent pipe," the less work all around
  - Specify packet wrapper, but minimize processing
  - Define uplink availability/restrictions, & latencies (down *and* up), as far ahead as possible (for software & ops development/planning)

Program Design: If you were designing a hosted payload program, what aspects should be focussed on and what are the major obstacles (with solution ideas if possible)?

- Providers: should specify as much as possible ahead of time, & should adopt (& publish!) as much standardization as possible
  - Easier to "plug & play" = faster/cheaper to build & fly the payload
  - More flexible & risk tolerant = broader array of optimal payloads
  - Data handling should be as "hands off" as possible, cheaper for all!
- Agencies: should try to reduce PI hurdles as much as possible
  - Rapid peer review, or modified two-step process (review & store ahead of opportunity; programmatically direct upon appropriate opportunity)
  - Or: review, fund & (partially?) build instruments ahead, then match to opportunities later (modified/expanded Flight Opportunities Program)
  - Streamline development review (PDR, CDR, etc.) process, optimize risk tolerance, negotiate interface & testing standards ahead
  - Ensure delivery schedule is appropriate for required development

Program Design: How can the program be designed to maximize diversity of participation?

Depends strongly on risk tolerance, but structured mentorship programs would provide training/experience to underrepresented institutions (e.g., community & non-resident colleges; minority-serving institutions; R1s w/o flight experience) while mitigating risk:
- High tolerance: "learner" institute leads design, development, operations under guidance from "expert" institute
- Low tolerance: "expert" institute leads efforts with participation and dedicated training for "learner" institute
- Approach can be integrated w/ review process
  - Agency can match mentors/mentees, before or after proposal process
  - Well-suited to 2-step process (funded instrument development first, then funded flight opportunity)