1. Goal

Here is what NASA wants to see in proposals for flight opportunities. This information was shared at a NASA Tech Grant Webinar held on 1 February 2023. The webinar was recorded and will be publicly available from NASA.

2. Attention

NASA wants to quickly advance technology. Are we ready to take advantage of what NASA has to offer? There are multiple programs that are risk tolerant and target a technology readiness level (TRL) that we can produce.

3. Need

We design, document, build, and test open source digital radio work that benefits the terrestrial and space Amateur Radio Services. Suborbital and orbital flights are available to us if we can prove ourselves worthy of the investment.

4. Satisfaction

4.1. Cost Objections

We have sufficient funding to propose our work.

4.2. Time Objections

We have sufficient human resources to propose the work but will need to recruit additional human resources above and beyond our current technical staff in order to ensure delivery by the fast deadlines in TechFlights and most of the other proposal categories.

5. Visualization

The two major design patterns defined in the workshop were:
    1) Fly - Fix - Fly
    2) Build - Fly - Repeat

NASA supports both of these approaches.

The types of flights available fall into the following categories.
1) Ground
2) Suborbital (parabolic, high altitude balloon, and rockets)
3) Orbital (International Space Station and spacecraft)

Current Open Solicitations include:

Space Technology Mission Directorate (STMD) Opportunities
2023 NASA SBIR/STTR Phase I
Proposals due: March 13, 2023 by 5:00pm ET

Others were mentioned in the workshop, but they are listed as invitation-only on the website with most deadlines in the past. For example, the $750,000 TechFlights program:

Technology Advancement Utilizing Suborbital and Orbital Flight Opportunities "TechFlights"

Preliminary proposal period closed
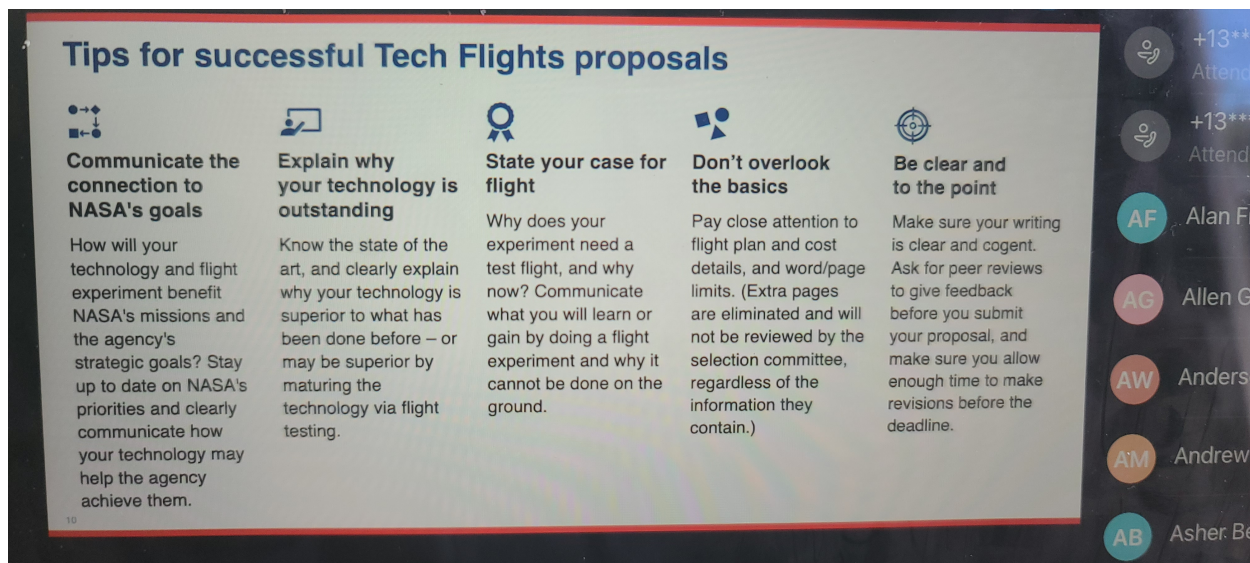Full proposals (by invitation only) due: September 29, 2022
Selection target date is February 2023
Award target date is March 2023

TechRise was mentioned as well, but all deadlines for that student program are in the past.

The workshop leaders emphasized multiple times that there is much more flexibility than we may have assumed concerning these programs and opportunities. They said to contact NASA early and often about ideas and to not be afraid to apply. This message was repeated throughout the hour-long workshop.

The bulk of the workshop was spent on defining the attributes of a successful proposal.

Tips for successful Tech Flights proposals

Communicate the connection to NASA's goals

How will your technology and flight experiment benefit NASA's missions and the agency's strategic goals? Stay up to date on NASA's priorities and clearly communicate how your technology may help the agency achieve them.

Explain why your technology is outstanding

Know the state of the art, and clearly explain why your technology is superior to what has been done before – or may be superior by maturing the technology via flight testing.

State your case for flight

Why does your experiment need a test flight, and why now? Communicate what you will learn or gain by doing a flight experiment and why it cannot be done on the ground.

Don't overlook the basics

Pay close attention to flight plan and cost details, and word/page limits. (Extra pages are eliminated and will not be reviewed by the selection committee, regardless of the information they contain.)

Be clear and to the point

Make sure your writing is clear and cogent. Ask for peer reviews to give feedback before you submit your proposal, and make sure you allow enough time to make revisions before the deadline.

All of these attributes were emphasized repeatedly.

Align your goals to NASA. Explain why you are outstanding. Clearly state your case for flight. Be specific in the budget. Get as much peer review as possible. Why is our work a good investment?

While the emphasis is on new technology, and trying that technology quickly, they also want to see proposals on cheaper ways to do things. Attack the size, weight, and power (SWaP). Attack the cost. What are other people doing with that same technology? Can you show a better way to implement it? Where are we unique? Why take a chance on us?

Why can't we do a particular thing on the ground or in simulation? What specific things need to be verified in the specific environment on a suborbital or orbital flight? Objective criteria and repeatability are important when you state your case.

Use the Proposal Handbook. It can be found at https://www.nasa.gov/sites/default/files/atoms/files/2021_ed._nasa_guidebook_for_proposers.pdf

1) Align with NASA Goals
    2) Make sure your budget adds up
    3) Leverage previous flight experience. Don't have any? That's ok! Partner with someone that does. This can and will eat up a lot of funds, but will get you moving forward.
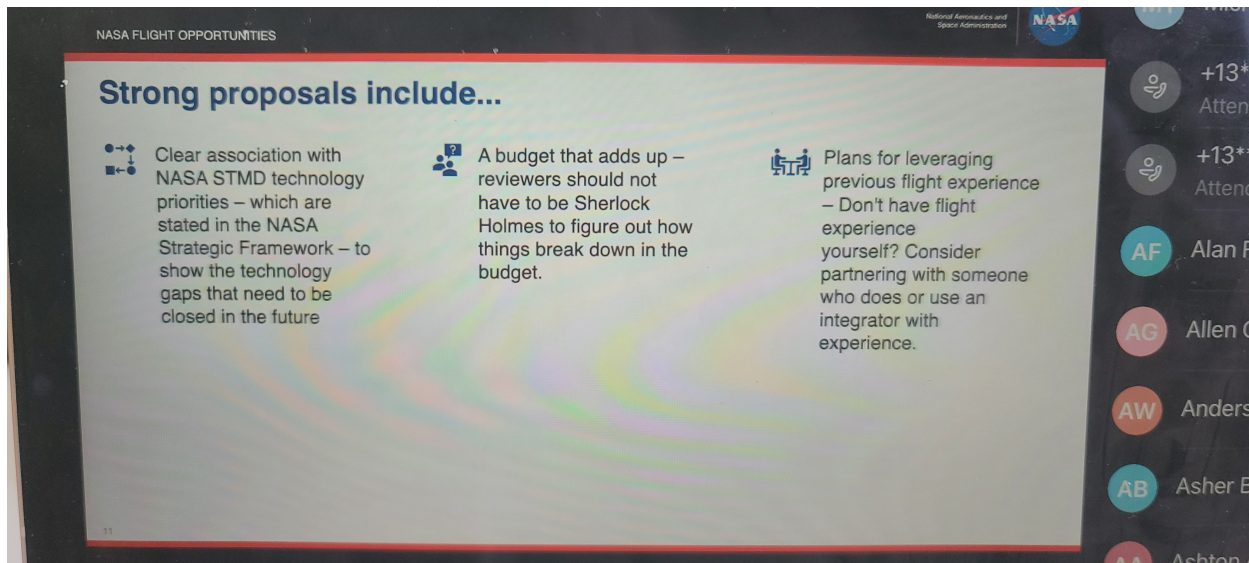
Be ready with Letters of Research Support or Letters of Resource Support.

TechFlights uses DAPR, or dual anonymous peer review. Be aware of how to communicate within the proposal to comply with this methodology. It's worth it to improve equity and accessibility, especially for organizations like ORI.

Q&A was good. People asked how to find integrators, and that advice is of interest to us. In the Tech Portfolio section, especially in past technology lists of awardees, a lot of good information can be found. Go to conferences where the people are and try and make contacts. Think broadly.

Review the Q&A sessions from previous solicitations. Look at the program fact sheets from previous programs. Monitor NSPIRES (this is the tool for calls and solicitations) and read the newsletter. Get your colleagues to review the work.

Peer review is necessary part of being ready for a proposal.

There are meetups on the 1st Wednesday of the Month as part of their community outreach. March won't have one, because NASA will be in Colorado at an event. It sounds like the outreach will be done there.

Technology Readiness Levels (TRL) were discussed.

TRL	As Described in Workshop

1	A paper has been written about it. This is whiteboard level design.
4	Bench level tests have happened. Minimum level for consideration for flights in many programs, but not the minimum level for funding. For example, many SBIRs are TRL 1-3.
9	Has heritage, is essentially in production.

TechFlights can take a project from TRL 4 to 6, but this is a guideline and not a strict definition. There's flexibility here and a desire to work with innovators on what their project needs in order to move forward in technology readiness level.

Q&A: Question about moon projects was shorted to ground pretty fast. Moon missions do not show up in any of the current solicitations, and the panel did not encourage this particular direction.

Deep space did not come up, but our technology does serve well for deep space.

Contact information and resources on the web can be found at https://www.nasa.gov/directorates/spacetech/flightopportunities/index.html

6. Action

1) Identify projects to propose
    2) Draft proposal(s)
    3) Communicate with NASA as directed in this workshop
    4) Revise proposal as advised
    5) Submit