

# **Sounding Rocket Working Group**

National Aeronautics and Space Administration

Meeting of March 10-11, 2026

## **Findings**

### **1. Sustaining NASA’s Sounding Rocket Capabilities During Uncertain Times**

*Summary:* The SRWG applauds the efforts of the SRPO in working to maintain the core program in light of recent budgetary uncertainties. This uncertainty has impacted the launch schedule, available ranges, new mission starts, and the ability to maintain expertise at Wallops (see next finding). As is well-established, the sounding rocket program provides foundational pillars which support NASA’s overall mission: 1) rapid access to space, 2) training for scientists and engineers who subsequently lead future missions, and 3) rapid maturation of science and technology, essential for motivating and enabling future missions. These fit squarely into the theme of “increasing the rate of scientific discovery and technology advancement” as expressed by Administrator Isaacman [1]. The SRWG hopes that the current capabilities of the sounding rocket program can be maintained, despite the current budget uncertainties.

*Background:* Sounding rockets in pursuit of science, research, and technology development have existed since well before NASA was constituted in 1958. The program has raised generations of scientists and engineers who have gone on to lead many of NASA’s orbital missions. For example, a recent study [2] traced the leadership and principal technologies for the last 12 Astrophysics Explorer missions to suborbital programs (sounding rockets, balloons, or both). The same trends are true within Heliophysics research (Solar and Geospace). Indeed, the program has discovered whole new fields of science, including the entirety of x-ray and EUV astrophysics, which contribute significantly to NASA’s mission and our understanding of the universe. The program is singular in its ability to rapidly deploy new technologies, validate science ideas, and chase unique events such as solar eclipses and nearby supernovae as they occur. The program can launch missions from all over the world using existing resources and experienced mission teams on extremely rapid timescales.

Unfortunately, the success of the program has not come without challenges. Over the years, there have been suggestions by those unfamiliar with sounding rockets to shrink or re-shape the program. Such efforts have been consistently followed by a “re-discovery” phase where a substantial effort from the community re-acquaints all parties with the unique capabilities and essential role the program plays within NASA. Currently, Administrator Isaacman has expressed NASA’s commitment to pursuing science and missions on a much faster cadence. The sounding rocket program is designed to do exactly that: rapid and essential training for scientists and engineers, rapid science and technology maturation, and rapid progression from idea to launch to results.

The SRWG hopes that the Sounding Rocket Program and its experienced mission teams can be maintained, enabling a robust launch cadence, the availability of unique launch ranges, its commitment to specialized science-driven campaigns, and the selection of new missions to do extraordinary science and research.

- [1] Isaacman, J., “Workforce Directive: Recognize, Reward, Inspire”, January 14, 2026.
- [2] Miles, D. M., “Great observatories maturation: a review of NASA astrophysics development through suborbital rocket and balloon programs”, *Journal Astronomical Telescopes, Instruments, and Systems (JATIS)*, 11 (4) (2025).

## **2. Maintaining Technical Expertise in Times of Budget Uncertainty**

*Summary.* The SRWG was alarmed to learn of recent, significant reductions in staff (both civil servant and contractors) with respect to the sounding rocket program at Wallops and the impact of these departures on maintaining the technical expertise necessary to keep the sounding rocket program viable and robust. Our understanding is that some of these departures were due to recent early retirement incentives and/or the uncertainty regarding the future of the program’s budget. The SRWG hopes the program will rebuild and fill these positions, particularly since the new NASA Administrator, Jared Isaacman, has stated on numerous occasions that NASA must restore core competency. To our dismay, we were informed that, at the present time, the SRPO cannot hire civil servant replacements and NSROC cannot replace departing personnel within the confines of the current budget. We encourage the SRPO to make every effort to restore these vacancies.

*Background.* The recent, significant reductions in staff (both civil servant and contractors) with respect to the sounding rocket program have alarmed the SRWG due to the impact of these departures on maintaining the required technical expertise at Wallops to keep the sounding rocket program viable and robust. At our March meeting, we learned that there are 35% fewer SRPO civil servants compared to the start of 2025 and 33% fewer NSROC personnel since the start of NSROC IV (Oct. 2023). Our understanding is that some of these departures were due to personnel who resigned, in part, because of the general uncertainty regarding the future of the program’s budget. Keeping the necessary technical expertise at NSROC is absolutely vital for the continued success of the sounding rocket program. Many aspects of sounding missions require highly specialized expertise that is not readily replaced, including flight performance and flight safety analysis, ground safety, vehicle systems, guidance, navigation, and control, and familiarity with deployment systems and science payloads. Preventing the erosion of this expertise, which is critically important to maintain the program, represents the principal concern of the SRWG.

## **3. Availability of Flight Termination Systems Threatens Approved Flight Schedule**

*Summary:* The Sounding Rocket Working Group continues to be greatly concerned about the availability of a viable flight termination system (FTS), which is a prerequisite for launches from White Sands Missile Range (WSMR) and is impacting the schedule of a number of approved sounding rocket flights. The working group appreciates the detailed report provided by the Sounding Rocket Program Office at the last meeting. Although we remain quite concerned, we strongly support the prioritization, creative approach, and sustained determination the program is bringing to address this problem.

*Background:* Multiple science missions are currently under threat due to FTS availability concerns. The manifest at WSMR was shifted to the right last year by the long wait for the new order of FTS paddles, and this year it is being impacted again. The cascading delays affect not only launch schedules but also the scientific productivity of PI teams and the training pipeline for

the next generation of space scientists. This outsized impact to science is why the SRPO has made FTS a top priority, for which the SRWG heartedly concurs.

The incoming lot of paddle FTS would be sufficient to support up to 15 flights, but their availability for launches depends on the outcome of ongoing lot acceptance testing and waiver efforts. Additional paddle FTS are on order, subject to the same uncertainties. Three alternate FTS units are on order from the vendor, with delivery anticipated in June 2026, which would enable up to three WSMR launches in the second half of the year. RFQ is out for more alternate FTS. Development of the planned replacement system, the Versatile Linear Shaped Charge (VLSC), is ongoing but has experienced a setback due to an accident at a vendor facility. Multiple creative alternatives are also under investigation. Across the board, challenges include low vendor interest (sounding rockets are a small customer), the extensive approval process (which is necessary since human safety is the driving consideration), and the strain on engineering staff who must balance FTS development efforts against other ongoing mission support demands. Launches from PFRR and possibly WFF may also be viable alternatives for some missions. Reliable water recovery would make WFF an attractive alternative. The Subtec-10 launch will be an important demonstration of this capability.

The long-term outlook is positive, with plans for a large number of VLSC units and 10-year storage lifetime and another order of alternate FTS ordnance. Given the state of development and the lengthy approval process, the final resolution is likely a few years out. It is possible that one of the other alternatives being investigated may help to relieve pressure in the interim. The committee encourages SRPO to maintain parallel development paths and to ensure that staffing and budget constraints do not further delay the resolution of this critical issue.

The SRWG is encouraged by the energetic effort by the SRPO that is being undertaken, on multiple fronts, to solve this problem. Though the impacts are serious and ongoing, it would have been much worse without the sustained and determined attention of NSROC and the Sounding Rocket Program Office. We commend the engineers and leadership for their resourcefulness and their willingness to think outside the box.

#### **4. Extending the Poker Flat Launch Season Through May**

*Summary.* The Sounding Rocket Working Group recommends that the Poker Flat Research Range (PFRR), in coordination with NASA Environmental and relevant regulatory agencies, pursue a standing authorization for sounding rocket launches during the month of May. This would remove a recurring source of uncertainty in manifest planning and support the ongoing need to fly missions from Poker Flat later in the Spring.

*Background.* The current Environmental Impact Statement (EIS) for Poker Flat Research Range (PFRR), established over a decade ago, restricts the launch season to end on April 30 each year. Beginning June 1, more rigid restrictions related to wildfire hazards effectively preclude launches. The April 30 cutoff is tied primarily to agreements negotiated with the U.S. Fish and Wildlife Service (USFWS) for the Yukon Flats and Arctic National Wildlife Refuges, which govern impacts and recovery operations on refuge lands. While there are some differences between the individual refuge agreements, USFWS has more broadly indicated that launches outside the October 1 through April 30 window should not have been included in any agreement. This presents a challenge for any mission requiring a May launch window.

At present, launches during May require submission of a Record of Environmental Consideration (REC) on a case-by-case basis, with approval depending on the specific timing, impact areas, and motor/payload characteristics of each mission. For example, in order to make the schedule, we had to integrate, ship, and travel the FOXSI-5 mission team “at risk”, not knowing if the REC had final approval for its May 1-15 launch window.

There are several characteristics of a May launch window from Poker that would benefit certain types of investigations. This option is particularly attractive for payloads requiring recovery on land because:

- (1) Poker Flat has a large area of available land-based down-range flight corridors
- (2) Flights along these corridors typically do not require a flight termination system
- (3) Warmer weather and the lack of snow cover in the month of May greatly simplifies recovery operations, relative to the currently approved October 1 – April 3 launch period. (We acknowledge that there is significantly reduced darkness in May, so this period may not be suitable for many auroral physics missions. However, in addition to solar investigations, there are many missions that do not require darkness.

The ongoing Flight Termination System (FTS) shortage has increased pressure to move some recoverable missions from White Sands to Poker Flat, making access to a May launch window all the more important. This pressure is likely to continue for the next few years as the FTS situation is resolved.

Requiring a new REC for each mission that falls in May introduces planning uncertainty for both PIs and range staff. It also places repeated administrative burdens on PFRR, NASA Environmental, and the wildlife refuge agencies. A standing authorization for May launches, if achievable, would simplify manifest planning and provide SRPO with greater scheduling flexibility during a period when that flexibility is especially needed.

The committee suggests that the PFRR and NASA Environmental continue exploring practical approaches to enable May launches, such as designing launch profiles that keep impact areas outside USFWS-managed lands or that confine impacts to areas that are consistent and acceptable to USFWS. An update to the existing EIS, which is over a decade old, may also be worth considering as a longer-term path. We also recognize that PFRR may have valid reasons to approach this incrementally rather than seeking a broad exemption all at once.

The committee recognizes that extending launches into May requires careful engagement with USFWS, which has expressed concerns about operations outside the October 1 through April 30 window. If the pending FOXSI-5 REC is approved, the resulting launch profile could serve as a reusable template for future May missions, reducing the need for repeated case-by-case review. PFRR's annual stakeholder meeting, currently planned for June 2026, may provide a natural forum to advance these discussions. We appreciate the efforts already underway to accommodate missions such as FOXSI-5 during the May window and encourage a path toward enabling the month of May to be a routine part of the launch calendar.

## **5. Maintaining the Development of Small Mesospheric Rockets**

*Summary.* The SRWG learned at the March meeting that the development of a sustained capability to fly small mesospheric payloads on a routine basis is now on “pause” given that the SR Technology Manager, who was leading this effort, has recently left NASA. We strongly encourage the SRPO to keep the mesospheric rocket/payload development “viable” insofar as resources permit, particularly since there is increasing interest in space weather and lightning research in the lowest altitudes of the earth-space interface. Furthermore, the development of a low-cost payload utilizing miniaturized technology recently developed for ejectable Swarm payloads makes this an opportune time to pursue this initiative.

*Background.* NASA’s sounding rocket program has traditionally included small launch vehicles, such as the Viper Dart and SuperLoki, that were capable of carrying simple payloads to altitudes of approximately 100 km that were utilized for mesospheric studies (50-100 km altitude), particularly in cases where a series of rockets were flown as part of a dedicated salvo. During the last 20 years or so, this capability subsequently underwent new developments with respect to the Mosquito vehicle and development of a custom avionics package, although progress was somewhat inconsistent. As noted in our finding of December, 2017, the SRWG has been pleased that the development of a sustained capability to fly small, mesospheric payloads on a routine basis is back on the Sounding Rocket Technology Roadmap and is being pursued at Wallops.

At our most recent meeting, however, the SRWG was very concerned to learn that the development of the mesospheric rocket capability is currently on pause because the Sounding Rocket Technology Manager, who was leading this effort, has left NASA. Although we understand that there is currently high turnover in available personnel, we encourage the SRPO to keep the development of the mesospheric rocket viable insofar as resources permit. This is particularly germane at the present time since the mesosphere and upper atmosphere/lower ionosphere (50-150 km altitude) are receiving renewed interest with respect to a number of space weather and lightning research goals and sounding rockets are the only means to gather direct measurements in this region. Furthermore, the development of a low-cost payload utilizing miniaturized sub-systems recently developed for ejectable sub-payloads such as Swarm, makes this a particularly opportune time to pursue this activity.

## **6. Loss of Telemetry Data Access in the Science Operations Center at Poker Flat**

*Summary.* The SRWG recognizes the excellent telemetry (TM) engineering support provided by NSROC and the flexibility and expertise shown in adapting systems for each science team and launch range. During the February 2026 launch campaign, however, which included multiple missions, access to telemetry data within the Science Operations Center (SOC) at Poker Flat Research Range (PFRR) was unavailable. This represents a loss of a previously established program capability during launch campaigns. Without TM data in the SOC, the science experiment team is required to separate, often resulting in graduate students and experiment engineers relocating to the TM Building during campaign operations. This arrangement can limit direct science team communication and reduce opportunities for graduate student engagement. The SRWG encourages the SRPO operations manager and NSROC telemetry engineers to collaborate with PFRR range personnel to restore this capability and, critically, to ensure that the configuration knowledge and documentation necessary to maintain it are formally captured and

transferred for all launch ranges so that future campaign teams can access TM data in the Science Operations Center.

*Background.* The Science Operations Center at PFRR has, in recent history, served as the hub for payload scientists and student researchers during sounding rocket launch campaigns, providing a co-located environment where instrument monitoring, real-time science assessment, and team coordination could occur simultaneously. A key element of this configuration was access to live experiment TM data in the room. During the February 2026 PFRR campaign, despite extensive efforts to set it up, TM data was ultimately unavailable in the SOC. Consequently, graduate students and experiment engineers, whose participation in field campaigns is valuable and part of their scientific training, were displaced to the TM Building. This separation removes students from the mentorship environment of the Science Building, isolating them from the principal investigators and instrument teams. Simultaneously, scientists in the SOC are left with less information about their instrument status, an inconvenience during time-critical launch activities.

The SRWG notes that campaigns with multiple missions require the telemetry team to repeatedly and rapidly reconfigure communication to the SOC, often multiple times a night as countdown procedures and prime windows switch between missions. If there are multiple missions in a campaign window, the added challenge of switching between TM configurations needs to be recognized and planned for. The TM issues experienced during the February 2026 PFRR campaign came as a surprise and may reflect a lapse in configuration management and institutional knowledge transfer as TM data was accessible in the SOC previously. The SRWG encourages the NSROC and PFRR range management to prioritize this issue, and to ensure that the system configuration, network architecture, and procedures are fully documented and preserved for future campaigns. Further, the SRWG suggests documentation and procedures be verified or created for all launch ranges to ensure TM data distribution to the science team location during launch campaigns.

## **7. Optimizing Interagency Cooperation for Sounding Rocket Missions**

*Summary.* Sounding rocket missions often include simultaneous observations from auxiliary ground-based instruments (e.g., ionospheric radars, telescopes) that are provided by other government agencies, such as NSF, NRL, and AFRL. The working group notes that an improved process to establish the necessary “Inter-agency” agreements to facilitate such simultaneous, independent measurements is needed. Such inter-agency leveraging of resources is called out in the recent Heliophysics Decadal Survey and we suggest the Sounding Rocket program might provide a pathfinder for establishing optimum ways to accomplish this.

*Background.* Many suborbital studies, particularly for geophysics sounding rockets, include multi-platform observations that combine ground-based and sounding-rocket measurements to achieve mission success. These additional observations are typically provided simultaneously from existing large facilities such as NSF owned and operated ionospheric radars.

There is no existing clear path for establishing support for using these auxiliary resources, beyond including a co-I from the agency providing the ground observatory (which is not always feasible). In the current environment of limited science resources, facilities are often financially strained and cannot provide unfunded support for sounding rocket missions, which is different from previous years. A recent example was the winter 2026 Poker auroral campaign, where missions were

designed to include dedicated PFISR operations. While a PFISR scientist was indeed a co-I, the missions were proposed and selected assuming that PFISR operations would be funded from general NSF-PFISR support, which had been true in the past for this particular facility. However, severe financial constraints at NSF recently put this plan at risk. Although ultimately NSF funding was supplied, it required last-minute advocacy from the rocket program.

An additional hurdle is that interagency agreements (IAA) have recently become very difficult to establish from a bureaucratic standpoint between NASA and the other government agencies. This is particularly true since the requisite office that deals with such agreements at NASA HQ is no longer supported at the required levels.

The many aspects of the inter-agency challenges described above include various permutations at different levels. The cognizant members of the sounding rocket working group believe that a process by which sounding rocket missions might leverage observations from existing facilities provided by other government agencies requires review and improvement. Heterogenous multi-platform science is an ever-increasing aspect of cutting-edge science questions and research and we believe this situation will only become more important moving forward. Given the recent Heliophysics Decadal Survey priorities highlighting the importance of leveraging inter-agency resources at all levels, we would be happy to help brainstorm mechanisms in which these interagency partnerships to support sounding rocket missions might be more easily formalized. In this manner, the sounding rocket program might be a pathfinder for processing interagency activities and agreements that might benefit larger programs as well.

## **8. Concerns about the Aging Infrastructure at Wallops**

*Summary.* The burst pipe in F-10 at Wallops during this past winter has elevated concerns regarding the state of the older infrastructure and unique equipment at Wallops. Maintaining key buildings and equipment at the Wallops Flight Facility is important as they comprise the foundation of NASA's unique means for carrying out the innovative design, fabrication, and testing of sounding rocket payloads.

*Background.* The SRWG learned that a burst pipe this past winter in Building F-10 resulted in around \$150K worth of damage to Electrical Engineering offices and "Ground Stations 2 and 3." Fortunately, the damage to the equipment was not as high as originally feared. Nevertheless, this event has underscored the need to maintain critical infrastructure at Wallops, especially in areas such as F-10 where there are significant risks to high-value NASA and experimenter assets. It would be beneficial to have at least a top-level assessment of the overall infrastructure status of key buildings and equipment including the level of risks their deterioration might pose to the overall sounding rocket mission. It is important that these assets be maintained to enable NASA to continue to carry out its unique capability to innovatively design, fabricate, and test sounding rocket payloads.

## **9. Appreciation for the Steadfast Support for NASA's Sounding Rocket Program from the Sounding Rocket Program Office and NASA HQ**

Given the current uncertain times at NASA as the agency reviews its flight programs and requisite funding, the Sounding Rocket Working Group wishes to express its strong appreciation to our program leaders at the Wallops Flight Facility and at NASA HQ for their steadfast efforts to maintain a viable Sounding Rocket program at NASA. The importance of the program has been recognized at all levels, including prestigious reviews of the National Academy of Sciences, and continues to be manifest in excellent scientific and space weather research, instrument development, and education and training of engineers and scientists. The program remains enormously popular within the growing community of principal investigators and their parent organizations across the nation. Accordingly, this user community, represented by the Sounding Rocket Working Group, is abundantly grateful to our leaders at NASA HQ and at the Wallops Flight Facility, for maintaining NASA's Sounding Rocket program as one of the most effective and truly unique flight programs within NASA's arsenal of research platforms.

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