

Inside this issue:

Summer Picnic	pg. 3
July Krimgold Launch	pg. 4
Apollo Contest	pg. 5
Blue & Gray Demo	pg. 8
The Antares Legacy	pg. 9
August Goddard Launch	pg. 11
August Krimgold Launch	pg. 13
Goddard Championship Series	pg. 15



ZOG-43

The official publication of NARHAMS

July / August 2023



ZOG-43

Volume 45 Number 4
July/August 2023

Official Newsletter of NARHAMS model rocket club
Editor: Alex Mankevich
Associate Editor: Thomas Henderson

ZOG-43 is dedicated to model rocketeers of all ages, abilities, and interest. We are committed to providing current information about NARHAMS' activities, updates on model and real world rocketry, and to provide educational material, as well as, entertaining information.

ZOG-43 is published bimonthly and is available to all paid up members of NARHAMS. Club membership is open to all, dues are 10 cents per week. The content of ZOG-43 is copyrighted. Free and unlimited reproduction is granted with the proper credit to the author and/or ZOG-43.

If you have any questions about ZOG-43, NARHAMS, subscriptions, or if you have any comment(s), correspondence, or if you'd like to submit an article, send them to:

ZOG-43
4023 Forest Valley Road
Parkville, MD. 21234
Email us at: zog43editor@yahoo.com

About NARHAMS:

The National Association of Rocketry Headquarters Astro Modeling Section, or NARHAMS, serves Baltimore, the state of Maryland., Washington, DC and the surrounding Metropolitan areas. The club is a section (#139) of the National Association of Rocketry (NAR). We are the oldest continuously active model rocket club in the United States, first established as a high school club in 1963, changing our name to NARHAMS when chartered as a NAR section in 1965. NARHAMS is the only seven (7) time winner of the NAR "Section of the Year" award (1997, 1998, 1999, 2001, 2004, 2006, and 2007).

NARHAMS members regularly fly their model rockets at NASA's Goddard Space Flight Center in Greenbelt, MD. and at Krimgold Park near Woodbine, MD. NARHAMS welcomes all to our monthly meetings and launches.

For details, dates and directions to our club, meetings and launches, go to: <http://narhams.org>

From the Editor:

This is another "catch up" issue which covers the events of the 2023 summer months. This was a busy time with NARHAMS participating in several outreach events.

You'll regret missing our Fourth of July picnic after you view the photos of all the fun we had. We have photos of both the July and August Krimgold Park sport launches. We present a report on the August Goddard Launch.

We report on two major outreaches that happened this summer. The 2023 Apollo Contest is a feature of this issue, with lots of photos and details. The other huge outreach was the Blue and Gray RC Demonstration Launch held near Gettysburg, PA.

You Editor offers his views on the end of the run of Antares 230+ rockets launching from the Mid-Atlantic Regional Spaceport located on Wallops Island, VA.

This issue has turned out to be an "eye candy" publication thanks to the many excellent photos submitted by several NARHAMS members. See their names listed below.

Contributing to this issue:

Reporters:

Brian Beard, Edward Jackson, Alex Mankevich

Photographers:

Eric and Thomas Henderson, Sally Cook, Michael Cochran, Brian Beard, Ole Ed Pearson, Alex Mankevich

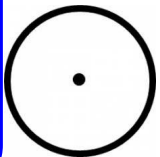
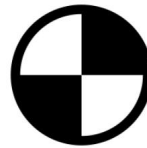


Image Credits for Covers

Front Cover: Dmitre Avramov (left) and Stoil Avramov (right) prepare their Radio Controlled Glider Models at the Blue and Gray Aircraft Demonstration event near Gettysburg, PA. Photo Credit: Eric and Thomas Henderson.

Back Cover: A view of the flying field at Blue and Gray Aircraft Demonstration as Brian Beard launches Thomas Henderson's Purple Major on a C11. Photo Credit: Eric and Thomas Henderson.

ZOG ROYAL COURT (NARHAMS OFFICERS)

ZOG (President) Ed Jackson

VICE ZOG (VicePresident) Alan Williams

COLLECTOR OF THE ROYAL TAXES
(Treasurer) Sarah Jackson

KEEPER OF THE HOLY WORDS
(Secretary) Brian Beard

COURT JESTER
(Section Advisor) Jim Miers



NARHAMS Annual Summer Picnic - July 01, 2023



Fabrice Derullieux came through as the grillmeister for the picnic. Fabrice shared some background information – he hadn't fired up his grills in several years. Not to worry, he and his grilling technique were marvelous.



Sarah and Ed Jackson partake of the summer picnic in their own separate ways. Ed prepares for the upcoming business meeting while Sarah has the right attitude by enjoying the dining and camaraderie.



Phoebe, the Welsh Pembroke Corgi was in charge of the picnic's decorum and fraternization. Her other responsibility was to dispatch any food that had fallen to the floor. By all accounts Phoebe exceeded expectations.

NARHAMS hosts two occasions in which we do a Pot-Luck theme at our monthly meetings. They are the Independence Day picnic in July and the Holiday Party in December.



Ole Ed Pearson tried his best to put on a brave face. Ed was due to fly out to Texas the following day to attend the World Spacemodeling Championships. The temperature down that-a-way had been 100 plus for several weeks. We guess that Ed was content to give up Maryland's 99 degrees heat.

Reported by: Alex Mankevich

The Carroll County Dept. of Recreation and Parks granted NARHAMS a launch permit at Krimgold Park for the July sport launch. The launch window had shifted to earlier in the day, so the launch was held from 8 AM to 12 Noon on July 15th. We were assigned to Field #5.

Fabrice Derullieux, Thomas Henderson, Natalie Shafer, Brian Beard, Ole Ed Pearson and Alex Mankevich were some of the members launching their rockets. Ed Jackson served as the firing officer.

Thanks to the earlier start time, we were able to get off the field before it got too hot. The heat eventually got into the low to mid 90s. A few members went from the Krimgold launch down to the Goddard Visitor Center to set up the launch range for the Apollo Contest which was to be held the following day.



Thomas Henderson's Moon Ghost rocket shoots out flame and smoke. Photo credit: Eric & Thomas Henderson.



Alex Mankevich's twin-engine model lifts off. Photo credit: Eric & Thomas Henderson.



Natalie Shafer carefully rolls up the long and colorful streamer from her modified Sky Writer rocket. Someone said she finished early August. Photo credit: Ole Ed Pearson.



2023 Apollo Contest

Reported by: Ed Jackson and Alex Mankevich

This year was the resumption of the Apollo Contest since its COVID-imposed hiatus. The last contest we conducted was in 2019 for the 50th anniversary of the Apollo 11 moon landing. We had purchased commemorative items to be given out to the more than 100 contestants for the 50th, but we still had some items left over which we are able to distribute at this year's contest.

Ed Jackson was the Contest Director. He oversaw the logistics and planning for this event and assigned the range duties to the volunteers. Ed also did the ordering and gathering of the trophies and prizes. Sarah Jackson did the data entry for the contest results.

The new presence of the Orbits Interweave kinetic sculpture forced a re-location and change of diameter of the traditional "moon circle". The 100 feet circle was offset towards the sidewalk which is used for Safety Check-in during the Sunday Goddard Launches. The new FAA-imposed gross mass limit for the models meant that traditional March Through History demonstration could not be conducted as usual with its heavier models.

We had a total of 19 volunteers on hand to manage the contest. Among the NARHAMSters braving the rain and heat were Brian Beard, Michael Cochran, Sally Cook, DJ Emmanuel, Bill Handy, Thomas Henderson, Ed Jackson, Sarah Jackson, Brett Jurd, Alex Mankevich, Ole Ed Pearson, Daniel Solomon, and Mandy Solomon. This team was augmented by five high school interns acquiring community service hours at the Goddard Visitor Center. They were Alix, Arnav, Minerva, Francesca, and Amarhi. They helped load the two launch racks and ran the contest cards to data reduction.

The contest registration was managed by Sally Cook, Sarah Jackson, and Mandy Solomon. The registration station was situated near the front door of the Visitor Center. The contestants utilized the Visitor Center auditorium to prepare their models. Daniel Solomon, Michael Cochran, and Ole Ed assisted with building and preps.



Contestants register with Sally Cook (top right), Sarah Jackson (middle right) and Mandy Solomon (bottom right). Photo credit: Ole Ed Pearson.



High School Interns from left: Alix, Arnav, Minerva, Francesca, and Amarhi. They helped load the two launch racks and ran cards to data reduction. Photo credit: Ole Ed Pearson.

The contest range had the "big tent" set up for launch control. Launch Officer James Miers and RSO/Narrator Ed Jackson were assigned to this station. Michael Cochran and Brett Jurd assisted the contestants at the launch racks and attended to the igniter wire misfires. The safety check and rail assignments were conducted under a second tent. Thomas Henderson and Alex Mankevich started off the check-in for the day. Daniel Solomon and DJ Emmanuel provided general assistance throughout the event.

We began with an introduction of the purpose of the contest followed by a review of the contest rules. An opening ceremony which included a playing of the National Anthem wrapped up the preliminaries. Rain showers leading up to the start of the contest made the day steamy as we got into the afternoon.

The Apollo Contest is essentially a spot landing event. An American flag served as the target. Bill Handy and Brian Beard did measurements to see who came closest to the moon's flag. Mid-way through the contest, Thomas Henderson spelled Brian. This year a Measurement Canopy was erected in the general vicinity of the target flag. After setting up their models for flight, the contestants adjourned to this station and awaited their launches and distance measurements.

The Contest Director decided to permit a second flight for all contestants after the initial results indicated that only a few rockets had landed inside the 100 feet diameter circle. This gracious accommodation slowed the pace of the launch, but permitted more contestants to stay competitive. Unfortunately, this created havoc for our Scorekeeper and for the Check-In volunteers.

Ed Jackson later officiated at the Awards Ceremonies. He announced the start of a new on-going streamer duration contest. Ed then got on to the prime feature of the Awards Ceremony – the announcement of the adult and junior winners. We awarded trophies and prizes to the top five contestants for each of the two divisions.

NARHAMS is thankful to the Maryland Space Business Roundtable (MSBR) which for years has granted funding to help finance this contest.

2023 Apollo Contest Continued

A collage of images of the contest recorded by Michael Cochran, Brian Beard and Ole Ed Pearson.



2023 Apollo Contest Continued

Junior Division Winners:

1. Luc Hutson 1.32 m
2. Nathan Jackson 4.46 m
3. Avish Arya 11.39 m
4. Bennett Rice 12.88 m
5. Edward Hanley 14.70 m

Adult Division Winners:

1. Josh Widzer 1.81 m
2. Ed Pearson 2.79 m
3. David Hanley 5.86 m
4. Thomas Henderson 9.66 m
5. Joanna Karpinski 11.65 m



The winning junior contestants show off their hardware. Photo credit: Michael Cochran.



The winning adult contestants. Some people may recognize Ole Ed Pearson and Thomas Henderson in the middle. Photo credit: Michael Cochran.

**NARHAMS member
Michael Cochran
designed and printed
the signage and
posters used for the
Apollo Contests.**



The Blue & Gray Model Aircraft Squadron Demo Launch Gettysburg, PA.

Reported by: Brian Beard - NARHAMS Event Manager

The demo launch for the Blue and Gray Model Aircraft Squadron took place on Saturday 12-August as planned. In attendance were Kevin Johnson (who brought launch system #2 with him) Brian Beard, Thomas and Eric Henderson, and Stoil and Dmitre Avramov.

The weather at the RC club's Gettysburg, PA flying field was hot with a mild breeze out of the southwest. We launched a wide variety of rockets with 1/2A through F motors. Stoil flew his RCBG twice and we had 17 other launches in total. We had one failure to deploy and one stuck on the launch rail but everything else flew well.

We did lose a few rockets in the adjacent soy bean field (which was waist high) but the club promised to notify us if they are ever found. We had a good crowd and there were lots of questions. As you would expect, many of these modelers had flown model rockets when they were younger but didn't continue with the hobby. We may see some of them at our Krimgold launches.



Brian Beard launches Kevin's Johnson's Valkryie rocket on an E16 motor. Photo credit: Thomas and Eric Henderson.

The NARHAMS Demo Team members are no slouches when it comes to operating Radio Controlled Rocket Gliders.

Stoil Avramov placed first in the senior division R/C Rocket Glider event at the World Spacemodeling Championships held Texas in 2023.

Kevin Johnson was part of a 3-member team that placed third in the R/C Rocket Glider Team division at the World Spacemodeling Championships held in Liptovsky, Mikulas, Slovakia in 2012.



The NARHAMS display with the members (left to right) Thomas Henderson, Brian Beard and Kevin Johnson. Photo credit: Thomas and Eric Henderson.

In Requiem:

Brian lost three rockets on demo day. We say a tearful farewell to his Big Bertha, Spectra and Tuna rockets. The waist-high soy bean field adjacent to the flying field swallowed them whole, never to be seen again.

The Antares Legacy

Reported by: Alex Mankevich

The Antares run of International Space Station resupply missions from the Mid-Atlantic Regional Spaceport (MARS) ended on August 1, 2023, as the final Antares 230+ rocket arced over the horizon and into history. This was the NG-19 mission and it was the sixteenth successful orbital launch in seventeen launch attempts. Only the OA-3 mission in October 2014 failed to reach orbit. The NG-19 mission closed out ten years of Antares launches all of which launched from MARS pad 0A.

The Antares launch campaign began on April 21, 2013 with the launch of a demonstration mission dubbed the Antares A-One mission. The ORB-1 mission launched on January 09, 2014, was the first commercial resupply mission. The launches eventually settled into a twice-yearly cadence with a spring launch in the February to April timeframe and a fall launch in the October to November timeframe. An unofficial tally counts twelve daylight launches and six nighttime launches. The Antares lifted off from Wallops Island during all months except March, June and December.

The Antares rocket itself underwent a series of upgrades from the initial Antares 110 version which used two Aerojet AJ26 engines (refurbished NK-33 Soviet era engines). The AJ26 engines were replaced by two Russian RD-181 engines following the catastrophic OA-3 launch. The first flight using the RD-181 engines was on October 17, 2016, which inaugurated the Antares 230 version. Structural enhancements culminated in November 2019 and the Antares was upgraded again, this time to be dubbed the Antares 230+ version. These series of upgrades ultimately provided a greater mass to orbit capability for the Antares rocket. The NG-19 flight of the Antares 230+ rocket lofted over 8,200 pounds of cargo to the International Space Station.

Saying goodbye to a rocket family has been in vogue recently. A host of Atlas V versions saw their last flight by the end of 2022. LauncherOne, which was manufactured by Virgin Orbit, made its final flight on January 9, 2023. Ariane 5 flew for the last time on July 5, 2023. Only one more flight, tentatively set for March 2024, remains before ULA retires the Delta IV Heavy.



The twin RD-181 engines on the Antares first stage lit up the twilight sky at lift off of the NG-19 mission to resupply the International Space Station. Photo credit: Alex Mankevich.

The Antares rocket became the signature launch vehicle for orbital launches from MARS. The Minotaur family of rockets is also capable of orbital launches, but Minotaur launches from Wallops Island are infrequent. The Antares launches doubled the total of eight launches of Minotaur rockets from MARS pad 0B.

A report issued by the Wallops Flight Facility in 2022 stated that rocketry activity at Wallops Island had an economic impact of \$1.37 billion and 6,092 jobs are attributed to the operation of the space port. The Antares launches had brought thousands of launch

spectators to viewing locations throughout the Chincoteague and Accomack County, Virginia areas. The NASA Wallops Flight Facility Visitor Center has estimated that up to three thousand people had attended its facility for a single Antares launch. Local businesses had benefited from serving both the launch spectators and the personnel assigned to the Antares launch operations. Anyone who has sat in their car as they slowly crawl along Virginia state route 175 following an Antares launch will attest to the popularity of experiencing an Antares launch.

Granted, a twice-yearly launch cadence is not the ideal basis upon which to grow and expand a dedicated base of rocket launch supporters, not to mention a local food and lodging industry dedicated to servicing the supporters. A short turnaround time between Antares launches was in the order of 15 to 20 weeks and a longer turnaround was in the order of 35 to 40 weeks. In between the launches, the launch pads remained empty. The MARS launch pads are located on restricted Wallops Flight Facility property, meaning that a vacationing family cannot simply drive up to a launch pad for a nice, long, leisurely, hands-on, up-close look. A "up-close" look at MARS launch pad is actually from a distance of about 2 miles. Binoculars and telephoto lenses are necessary to see any detail of the structures. The rockets and their payloads are assembled and integrated inside secure facilities located within restricted areas. One cannot simply knock on the door and ask to be let inside to see the rockets being assembled. So, during the hiatus between launches, the rocket garden at the NASA Wallops Flight Facility Visitor Center becomes the only viable site at which to get rocketry experience.

Continued on next page.

The Antares Legacy - Continued

In the spirit of full disclosure, the “final” Antares label is somewhat misleading. Strictly speaking, the NG-19 launch is the final Antares rocket launching with Russian-built engines and a Ukrainian-built first stage booster. The Antares series of rocket is slated to continue on with the debut of the all-American built Antares 330 rocket. Northrop Grumman had partnered with Firefly Aerospace to construct an upgraded Antares 330 version that will fly on seven of Firefly’s Miranda engines in the first stage. The first stage will be constructed using Firefly’s composites technology. This new stage will help to increase the Antares mass to orbit capability. The cluster of seven engines also opens up the possibility in the future of recovering the first stage. The projected inaugural launch date of the new Antares 330 has recently slipped from 2024 to the summer 2025. In the meantime, Northrop Grumman will honor its contract for International Space Station cargo resupply missions by launching its Cygnus spacecraft on SpaceX’s Falcon 9 rockets out of Florida.

We now have to come to grips with the fact that orbital launches from Wallops Island will now realistically come down to a single launch provider. Rocket Lab’s Electron rocket started service at MARS during January 2023, and to date have launched two orbital missions from Launch Complex 2. Press releases issued by Rocket Lab state that their Launch Complex 2 is designed to support up to 12 missions per year, however six launches per year are more likely. The Electron stands about 59 feet in length and is not quite four feet in diameter thus making it significantly smaller than the Antares rocket. While the Electron is harder to see when it is poised on the launch pad, the roar of its nine Rutherford engines as it hastily lifts off the launch pad is quite satisfying. Rocket Lab is also building a medium lift rocket called the Neutron, which may get to launch in late 2024.



Some photographers get creative in order to gain some advantage for getting just the right view or angle for their Antares launch images. This dude used his Wrangler to get an elevated platform above the throng of other launch photographers. Photo credit: Alex Mankevich.



Several people set up tripods along a narrow dock in the hopes of capturing the perfect picture of an Antares rocket launch. Photo credit: Alex Mankevich.



The Virginia Welcome Center got into the Antares launch action by providing handouts detailing launch viewing sites. They also provided “Rocket Fuel” to jump start the launch viewing experience. Photo credit: Alex Mankevich.

Reported by: Alex Mankevich

Goddard in the Good Ole Summertime

The First Sunday Goddard Launches take place (weather permitting) every month of the year. Naturally, this means that some launches will take place during the hottest months of the year, and others will take place during the coldest months of the year. Meteorological data and anecdotal memories point to June, July and August as the hottest three months in which to conduct a Goddard launch. A sentimental outlook is to say that these are the lazy-hazy-crazy days of summer. But, for those intrepid souls who brave the hot and muggy summer launches at Goddard, there is no poetry to be found in the mind-melting and flesh-searing conditions of being outdoors during summer's early afternoon hours. So, it is with much relief that we come to realize that concluding the August Goddard launch means that the worst of the summer heat and humidity should be past.

We had a good turnout of volunteers and modelers for this launch, despite it being a vacation month and the weather forecast warning of yet another hot and muggy afternoon. Julie Saba and Shirley Ramos reported that they had tallied 308 visitors. NARHAMS was assisted by six high school volunteers. Daniel Solomon's friend Rohil Cheepala also joined us as a launch range volunteer for the afternoon.



A crepuscular ray is an atmospheric phenomenon caused when the sun is set behind an irregularly shaped cloud. Photo credit: Sally Cook.

Our regular crew of Ed Jackson (firing officer), Sarah Jackson (check-in), Ole Ed Pearson (build assist and photography), Thomas Henderson (pad assistant), Mike Cochran (igniter wire maestro), Brian Beard (check-in) and Alex Mankevich (jack of all trades) kept the launch range operational and safe for the long line of modelers awaiting their turn. DJ Emmanuel was kept quite busy retrieving the numerous rockets that went over the Visitor Center property fence line.

We debuted a new 12-volt battery that we had purchased to partner with our existing battery. The additional battery assures that we have sufficient electrical "oomph" to run both the launch rack and the PA system. Of course, having been proactive with providing the necessary amperage, we then experienced a failure in the inverter that converts the batteries' DC current to the AC current required by the PA amplifier. So, we had kind of a "win some" / "lose some" situation at launch control.

The Potomac Conference Pathfinders Club brought out about 20 flyers for the August launch. Ed Jackson reported that we had 79 launches. The front desk ladies reported that they had awarded 37 first time flyer certificates. These are all good numbers considering the miserable weather conditions and August traditionally being a vacation month.



A Flying Colors model lifts off from the rack. Photo credit: Sally Cook.



A family watches as an Estes Crossfire descends. Photo credit: Ole Ed Pearson.

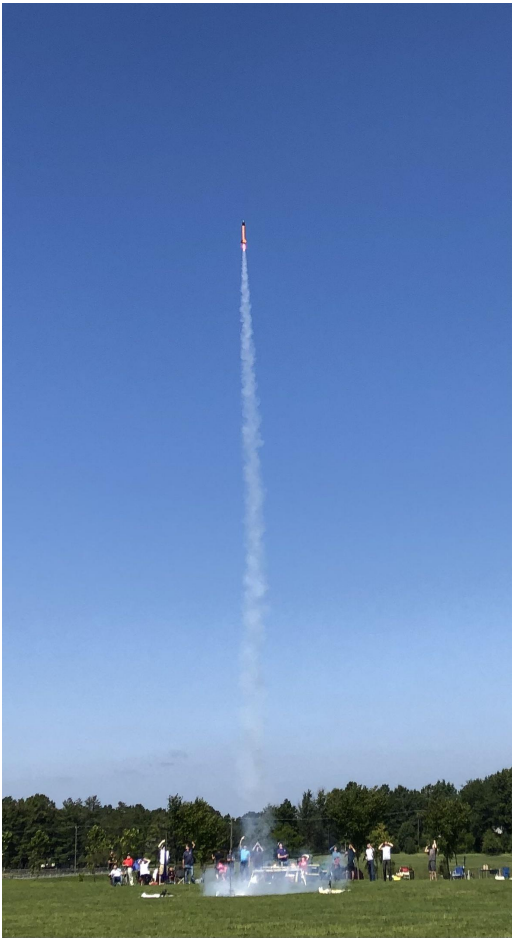


NASA High School volunteers (left to right) Matthew, Nicole, Seriah and Zoe, who assisted during the August Goddard launch. Photo credit: Ole Ed Pearson.

August Goddard Launch By the Numbers:

Total Rockets Launched:	79
Adults in Attendance:	191
Youths in Attendance:	117
Total Visitors at VC:	308
First Time Flyer Certificates:	37

Krimgold Sport Launch Report August 2023



A view from afar of Daniel Solomon's LOC-IV on a G77 Redline motor ascending from the launch rack. Photo credit: Ole Ed Pearson.



Alan Williams brought two novelty models—a flying saucer (right) and a modified Tasmanian Devil which he's inspecting. Photo credit: Ole Ed Pearson.



Jim Baird sets up his Patriot model on the launch rack. Photo credit: Ole Ed Pearson.

Brandon Fureigh of Cub Scout Pack 1967:

"Thank you again for allowing our Cub Scouts the opportunity to join the launch this Saturday. We have eleven Scouts and ten parents signed up to attend. We asked the Scouts to purchase the Estes Alpha III rocket and I purchased two sizes of engines....C6-5 and C6-3."



A satisfying smoke trail is seen from this rocket. Photo credit: Ole Ed Pearson.

The launch hours for the September through December 2023 sport launches at Krimgold Park will be from 9:00 am to 3:00 pm. The range will be set up on Field #3.

Krimgold Sport Launch Report- Continued



Alan Williams watches the launch of Brian Beard's kitbash two-stager. Photo credit: Eric and Thomas Henderson.



Alex Mankevich poses with his Super Neon XL. Photo credit: Eric and Thomas Henderson.



Jim Miers's rocket takes off on a Cesaroni Blue Streak F motor. Photo credit: Eric and Thomas Henderson.



A panorama view of the Krimgold Park launch range on Field #4. Photo credit: Eric and Thomas Henderson.



Goddard Championship Series



What: A year-long opportunity (contest) to show the longest flight duration of a model rocket using a 1/2 A6-2 model rocket motor and a streamer recovery device.

When: Year-Long Leaderboard. Season starts on the First Sunday of August to the First Sunday of July. The Goddard Championship Series winners are to be announced during the Goddard Contest on the third Sunday of July.

For: This event is open to the public and intended as an introduction to the National Association of Rocketry style of NRC competition. No NAR membership and no participation fee are required.

Where: All flights are done during the Goddard Rocket Launch on the first Sunday of every month at the NASA Goddard Visitor Center in Greenbelt, MD.

Event: 1/2 A Streamer Duration using a 18mm diameter motor (1/2 A6-2).

Registration: Contestants can register on any First Sunday launch for the Season at 12:30 pm before the normal Launch.

Awards: First, second and third for Junior and Senior divisions will be awarded a trophy.

Why: NARHAMS feels that competition is a great catalyst for rocketeers to improve their understanding of rocketry and increase their skills. We also hope this contest serves as a gateway for the contestant to explore rocketry competition further.

Rules and other information:

1) Each contestant or team must have their own rocket. No sharing of rockets is allowed (unless they are flying as a team). It is OK for a contestant to use more than one rocket.

[Additional Resources on Steamer Duration event are available at:](https://www.nar.org/contest-flying/competition-guide/duration-events/streamer-duration/)

<https://www.nar.org/contest-flying/competition-guide/duration-events/streamer-duration/>

Rules and other information - continued:

2) Rocket criteria: (A Wizard or Viking is a good model)

- a) Max Weight: 2.1 oz. (Maximum weight for a 1/2 A motor)
- b) Length: Between 10 in. and 24 in.
- c) Motor: 18mm diameter
- d) Fins: At least three (3) fins, with a length of at least 1.2 inches (measured from root to tip).
- e) Recovery: A single streamer with a loose end.
- f) The rocket must have the contestant's or team's name on the rocket in permanent ink.

3) Event Details: 1/2 A6-2 Streamer Duration - The rocket is timed from first movement to when the rocket stops its descent, hangs on an obstruction or goes out of sight. The rocket must stay in one piece including the motor.

- a) The rocket is disqualified if:
 - i) The flight is considered unsafe by the Range Safety Officer (RSO)
 - ii) The rocket comes down in more than one piece
 - iii) The motor is something other than an Estes 1/2 A6-2
 - iv) The rocket is found to be shared among multiple contestants

4) Timing will be performed by the Goddard Range Crew. The RSO has final say in determining a qualified flight.

5) The rocket must pass a pre-flight safety check and the contestant must alert the check-in officer that it is a contest flight.

6) Contestants 15 years or younger will fly in the Junior Division, contestants 16 years and older will fly in the Senior Division. Teams fly in the Division of the oldest member.

7) Rockets must fly during the normal Goddard First Sunday launch. This is a Leaderboard style event where the best score across the entire year determines the winner(s).

8) Registration for the Championship must be done before the launch. A 15 minutes contest orientation will be done prior to each launch.

9) Up to two (2) flights per Goddard Sunday launch will be allowed per contestant.

10) A contest flight card will be used to track all flights for that year and kept with the Check-In Station.

11) The contest champion will be determined by the longest single flight. Multiple flights are NOT cumulative, but will increase the flyer's chance for a longer flight and increase their understanding of the contest.

12) Decisions of the Contest Director, or RSO if the Contest Director is not on the field, are final.

Keep us posted:

Tell us about your rocketry projects, builds, favorite flights, outreaches and certifications.

Of course, send us your photos of the NARHAMS events.

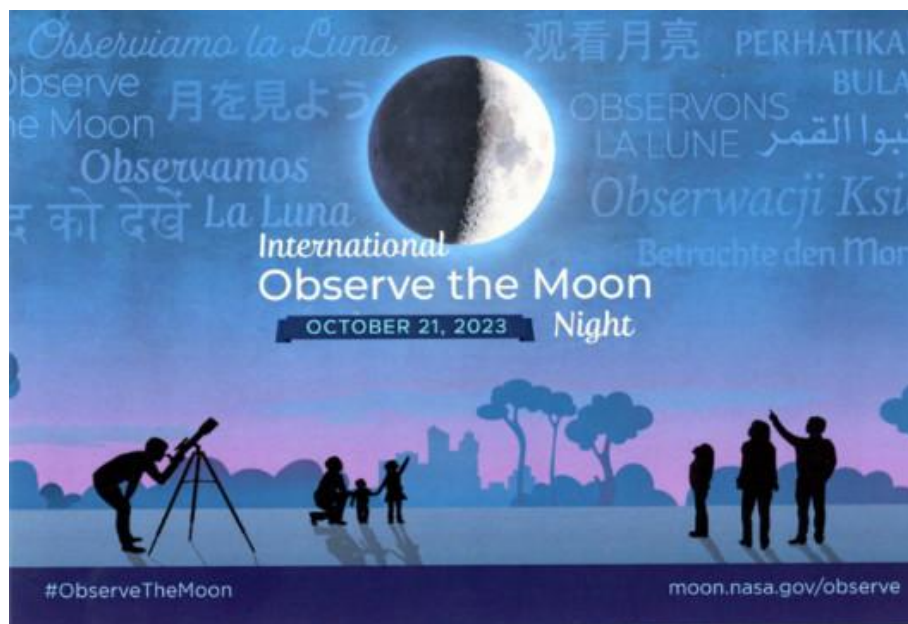
Email the ZOG-43 editor: zog43editor@yahoo.com

narhams@groups.io



NARHAMS uses Groups.io to update its members regarding its activities, meeting and launches. Notifications of launch cancellations or postponements will be announced in this group.

If you are already a member of narhams@groups.io, Log In to access the group. To start your membership in this group, go to <https://groups.io/g/narhams/join> and provide your email address. Then follow the instructions on the webpage.



NARHAMS Club Merchandise

<https://www.cafepress.com/narhams>



NARHAMS has an online store for club merchandise. No more waiting for a group buy to get neat stuff for yourself. Show your pride in your club membership.

There is a huge variety of items. Shirts, hoodies, hats and more!

End your loved ones' gift shopping dilemma. Point them towards the CafePress link whenever you have an upcoming birthday, anniversary or holiday.

