



SPORT ROCKETRY

TARC 2018 COVERAGE

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2018 TEAM A



Stine Range flightline ready to launch.
Photo by Glenn Feveryear.

by Trip Barber, NAR 4322, NAR TARC Manager

AMERICA

ROCKETRY CHALLENGE





Creekview High School of Canton, Ga.—TARC Champions.
Photo by Glenn Feveryear.

It is hard to believe that the Team America Rocketry Challenge (TARC) program, the NAR's premier STEM (science, technology, engineering, and math) program for young people, and the largest rocket competition in the world, is still going on and going strong after sixteen years. It has endured and succeeded because it works; the membership of the NAR and America's aerospace companies both see it delivering clear value in motivating young people to become aerospace professionals and to be rocketeers.

TARC is a key element of the NAR's foundation for the future; the young peo-



Festus (Mo.) High School - 2nd Place.
Photo by Glenn Feveryear.



3rd Place Russellville (Ala.) Schools.
Photo by Glenn Feveryear.

ple who go through it and learn to appreciate rocketry are our best hope for our next generation of adult NAR members. And they are joining the NAR; our membership is steadily increasing and much of the growth is in the TARC student age group. The U.S. aerospace industry counts on TARC to motivate students to enter the aerospace professions and become the next generation of their engineers, and they regularly see examples of this happening. That is why 25 aerospace companies provide the hundreds of thousands of dollars of sponsorship grants through AIA that cover 80 percent of the cost of running the TARC program.

Co-sponsored by the NAR and the

Aerospace Industries Association (AIA), the industry's trade association in Washington, D.C., TARC has enrolled 11,360 teams of middle and high school students (nearly 70,000 young people) over its history. 801 teams (made up of 4,600 students) entered the TARC 2018 program, the largest number of student team members since the program's first year. This year's teams come from 46 states plus the District of Columbia.

TARC is a "challenge" program where student teams are given a specific set of flight mission performance objectives and design constraints and then have to go through the design-build-test aerospace engineering process to meet these with their own original model rocket design. Teams are encouraged to use NAR volunteer adult "mentors" to teach them



**Harmony Science Academy
of Houston, Texas.**

Photo by Alex Mankevich.

rocketry skills and to use NAR sections to provide launch support. This nation-wide volunteer support is critical to the success of the program. As their part of the partnership, AIA provides the full-time professional staff support that handles day-to-day administration of the TARC program such as public relations, registration, and score recording plus the financial sponsorship support from AIA member companies that makes the whole program possible. This year an energetic young space enthusiast, Jeremy Davis, picked up the reins of TARC Manager for AIA.

Behind every successful TARC team there are one or more dedicated adults

supporting that success. These adults may be teachers, NAR mentors, or parents. There are many inspirational stories of their dedication, and we ask teams to submit nominations for their teachers or team mentors so that we can recognize this important dimension of TARC's success. We publicly recognize one teacher and one mentor each year at the Finals as representatives of all of these unsung heroes of TARC. This year we called out Rick Rudloff as the teacher and Mark Hansen as the mentor. See the accompanying text boxes on pages 46 and 50 for their inspiring stories.

The TARC 2018 Challenge

The precision-performance challenge presented to teams in the TARC 2018 program was to take two raw eggs to an altitude of 800 feet (as determined by one of the three models of PerfectFlite electronic altimeters that are permitted for use in



TARC scoring) and return them to earth safely and unbroken within 41 to 43 seconds after liftoff. Each foot that the flight was off the altitude target or second it was off the duration range costs the team points, and the low score wins. This year the teams had to recover the whole rocket, with all parts of it remaining connected together, by parachute. Rockets had to weigh no more than 650 grams at liftoff, use no more than 80 N-sec of rocket motor total impulse, and be at least 65 centimeters in length. This year, as in 2017, rockets had to use two different diameters of body tube in their structure, but for 2018 we reversed the order: the lower one containing the motor now had to be the larger of the two (no less than 64 mm in diameter, basically BT-80) and the upper one containing the eggs had to be smaller, no more than 57 mm (BT-70).

Out of the 801 teams that registered for TARC 2018, 509 of them (64%) conducted one or more official locally NAR-observed qualification flight attempts by the April 2 deadline. When their submitted scores were tabulated, a combined best-two-of-

The rocket of the Newark (Ca.) Memorial High School team lifts off.
Photo by Alex Mankevich.



three flight score of 35.56 or lower was required this year to make the cut to get one of the 100 score-based Finals invitations. One additional team that flew two good qualification flights but did not make the Finals score cut was invited based on winning a judged competition for the “Best Rocketry Outreach Program” that many teams also entered. These teams, coming from 28 states plus the District of Columbia, had to raise the travel funds to attend the Finals and commit to attending within two weeks of their invitation, or yield their spot to one of the 20 alternates. This year we used no alternates; every team found a way to raise the money to come to the Finals.

At the Finals, the top ten finishing teams split a prize pool of \$100,000 and there are additional cash prizes totaling \$5,500 for other types of recognition and activities, listed in the results box. In addition to these cash prizes, the winning TARC team gets a free trip to the Farnborough (England) International Air Show (this year’s winners) or International Paris Air Show (next year’s) courtesy of Raytheon Company

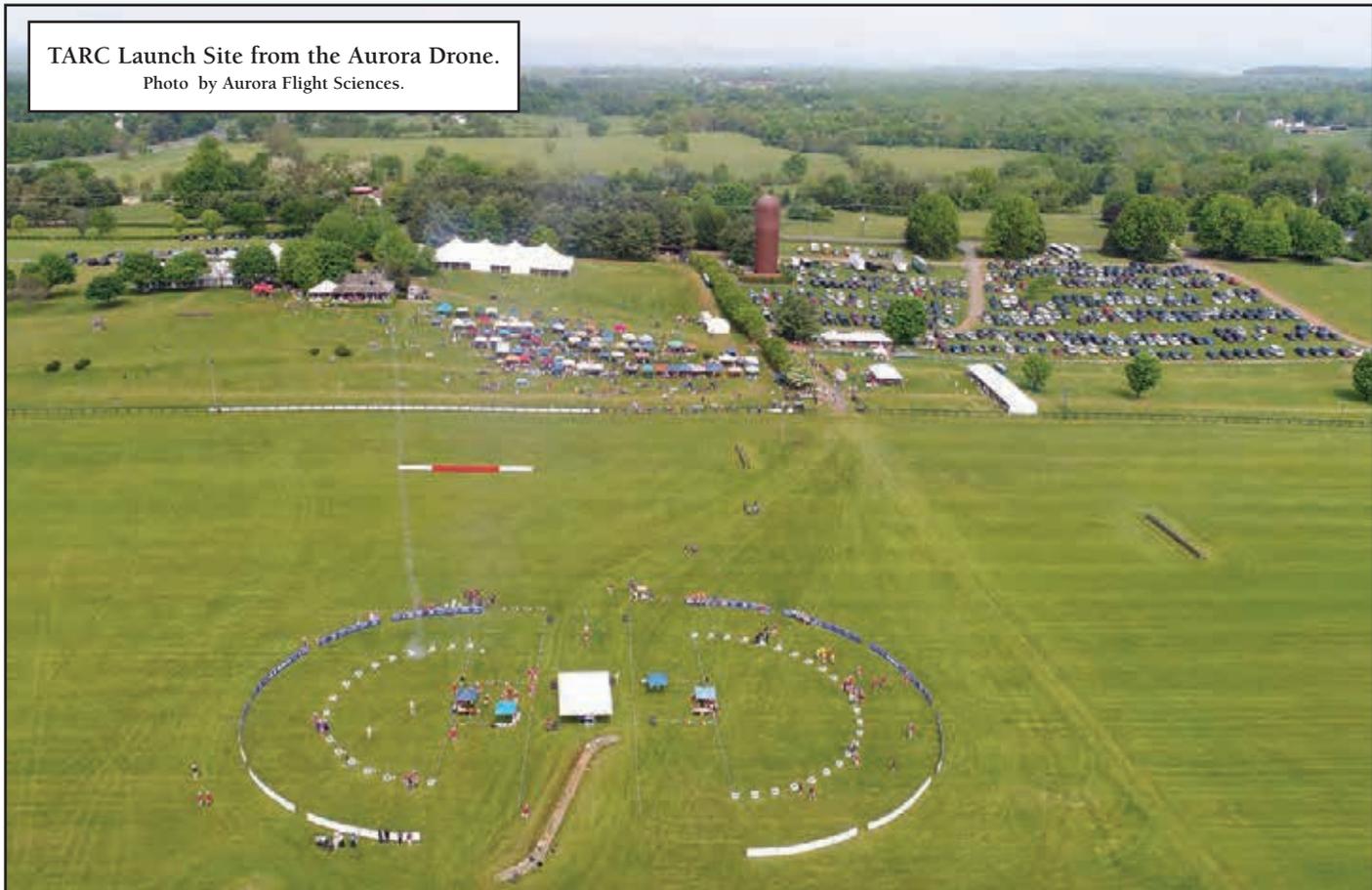
The TARC Finals

TARC Finals weekend, May 11-13, began on Friday morning with an opportunity for student teams to participate in an AIA-organized event called “Rockets on the Hill.” Over 550 attendees—students, parents, mentors, aerospace and defense industry representatives, and Congressional staff—gathered for this at the Senate Kennedy Caucus Room at the U.S. Capitol. The students exhibited their rocket projects and listened to astronauts and industry leaders congratulate them for their accomplishments, then many of them went off for individual team visits with their home state members of Congress. That afternoon, Aurora Flight Sciences—a company founded and run by long-time NAR leader Dr. John Langford (whose family recently purchased Estes Industries)—hosted TARC team members for a tour of their engineering facilities and developmental aircraft followed by a BBQ dinner.

Meanwhile on Friday, 40 NAR volunteers who had come a day early were hard at work all day out at the scenic Great Meadow flying site in The Plains, Virginia, setting up the large amount of equipment, banners, and signs needed to support the next day’s flying. The NAR volunteers who run the TARC Finals travel at their own expense and work from dawn to dark with-

TARC Launch Site from the Aurora Drone.

Photo by Aurora Flight Sciences.



out flying any rockets of their own, just to support the students who participate in the Finals. This is truly NAR "paying forward" volunteerism at its best, and it is why TARC continues to happen.

Friday evening's pre-flight briefing for the student teams filled the school auditorium in Manassas, Virginia, where it is held each year. The program is largely comprised of the NAR and AIA TARC managers briefing details of how the next day's operations will be conducted, but the speaker who always holds the students' attention most is Howard Bernstein, a Washington, D.C., TV meteorologist who each year provides

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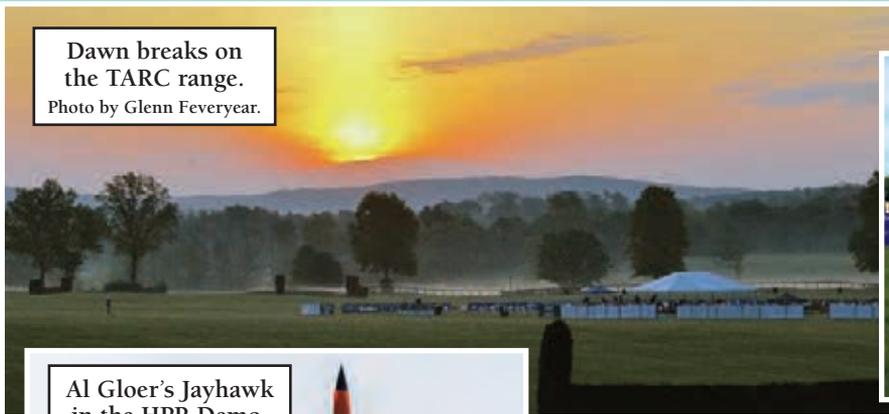
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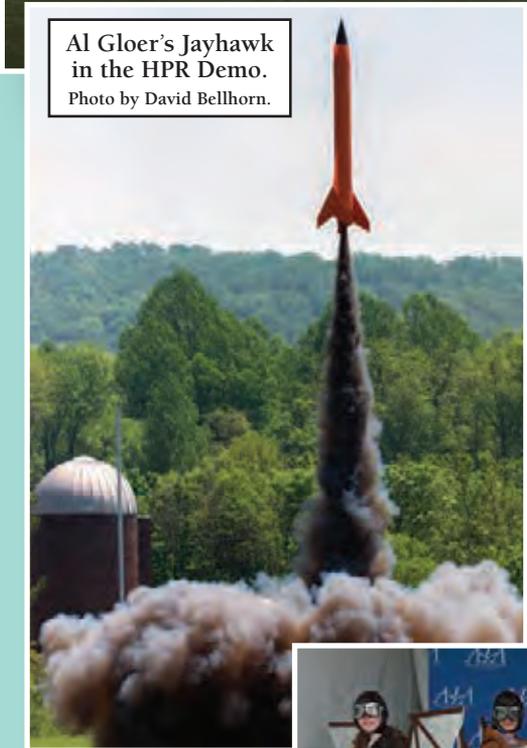
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Dawn breaks on the TARC range.
Photo by Glenn Feveryear.



East Fairmont (W.Va.) Middle School.
Photo by Glenn Feveryear.



Al Gloer's Jayhawk in the HPR Demo.
Photo by David Bellhorn.



Bernard Cawley does return on the rocket of Frog Pond Academy from Sherman, Texas.
Photo by Glenn Feveryear.



Best Dressed Team, Nazareth High School of Philadelphia.
Photo by Glenn Feveryear.



Galileo STEM Academy, from Eagle, Idaho.
Photo by Neil Michels.



John Langford RSOs a launch.
Photo by Glenn Feveryear.

Millington (Mich.)
High School Team 2.
Photo by Neil Michels.



Animas High School team from Durango, Colo.
Photo by Glenn Feveryear.



Most Creative in
Rocket-Building Contest.
Photo by Arno Tilles.



Knights STEM Association
from Vancouver, Wash.
Photo by Alex Mankevich.

ETA High School
of San Antonio, Texas.
Photo by Alan Williams.



Whitney Young Magnet
High School team
from Chicago, Ill.
Photo by Tom Pastrick.





Ivan Galysh issues eggs.
Photo by Glenn Feveryear.

other with 18, that loaded and launched these flights sequentially in 45-60 minute "rounds." One range was run by former NAR Presidents Ted Cochran and Mark Bundick and the other by U.S. International Spacemodeling Team manager John Langford and Tom Lyon. First competition flight lift-off was at 8:15 AM, and over the next four hours all the teams made their first flights in five rounds. 92 of the 102 teams had fully qualified flights, a bit lower than the 2017 success rate mostly due to egg damage from having two eggs at risk rather than just the single egg of 2017. The 42 top-performing teams from the first rounds of flights were identified by 1:00 PM and were given the opportunity to

a detailed (and very accurate) estimate of the next day's weather conditions. Last year the weather had been a real concern due to forecasts of rain, which fortunately came through early and let us fly with a late start. This year Howard's weather forecast was for near-perfect flying conditions with a little wind by the end of the day, and that is what we got on Saturday when the full 115-person NAR volunteer range crew and the 600 students who made up the TARC teams, plus hundreds of supporters, came together on the scenic flying field starting at 6:30 AM.

At the Finals each student team is pre-assigned days in advance a specific launch pad and a "launch window" time slot within which they must make their first flight. There were two fully-staffed NAR launch ranges, one with 24 pads and the



Doug Pratt checks in Oakton (Va.) High.
Photo by Glenn Feveryear.

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U.S. Internats team member Herb Vinyard recruiting new team members.
Photo by Glenn Feveryear.

TARC 2018 Finals Special Awards

Award	Team Name	City	State
Building Contest Team Awards (\$500 each)			
Best Rocket Craftsmanship	Animas High School	Durango	CO
Best Rocket Creativity	Kealakehe High School	Lailua-Kona	HI
Best Balsa Glider Performance	Covenant Christian High School	Indianapolis	IN
Team Achievement Awards (\$500 each)			
Best Outreach	Nazareth Academy High School	Philadelphia	PA
Best Dressed	Nazareth Academy High School	Philadelphia	PA
Best TARC Rocket Craftsmanship	Presidio ISD	Presidio	TX
Spirit of TARC	Galileo STEM Academy (Team 2)	Eagle	ID
Most Innovative Mission Approach	The Vanguard School	Colorado Springs	CO
Best Engineering Design Notebook	King County 4H	Bellevue	WA
Presentation Competition Team Awards			
1st Place (\$500)	Deford Dazzlers 4H	Cass City	MI
2nd Place (\$300)	Frog Pond Academy	Sherman	TX
3rd Place (\$200)	Explorer Post 1010 (Team 2)	Rockville	MD
Individual Achievement Awards			
Outstanding Teacher	Mark Hansen, Deford Dazzlers 4H	Cass City	MI
Outstanding Mentor	Rick Rudloff, Maharishi School	Fairfield	IA



Outstanding Teacher Award being presented to Rick Rudloff.
Photo by Glenn Feveryear.

Outstanding Teacher

Rick Rudloff—The Maharishi School, Fairfield, Iowa

We are nominating Mr. Rick Rudloff for the Outstanding TARC Teacher award because of his efforts going above and beyond what is expected of teachers and, in the process of doing so, becoming one of our closest friends.

Fundraising is a critical aspect of rocketry and fundamental to the success of the team. This year our school has had the privilege of sending a total of three teams to TARC finals as well as a NASA SL team, and although spirits are running high, the total cost for sending these teams off is running even higher. In order to raise enough money to support all four teams, Mr. Rudloff has dedicated hundreds of hours of personal time baking. In the early morning, he is usually in the kitchen making cinnamon rolls, cookie dough, and freshly baked pizzas. You can find him there again almost every evening, working hard to make enough biscotti to sell in the next day's bake sale. In addition Mr. Rudloff spent over 200 hours during his summer vacation writing grant requests to many companies. In total, he has helped all of our rocket teams raise more than \$15,000.

Many integral parts of our rockets are printed with our 3D printer, and without Mr. Rudloff's assistance and guidance this wouldn't be possible. The many hours that he puts in teaching us 3D design with 123D Design and Fusion 360, and troubleshooting and operating the 3D printer have been a critical part of our team's success. He has also spent a significant amount of time walking team members through the basics of rocket design on OpenRocket and RockSim. Whenever there's sun outside and optimal wind speed, Mr. Rudloff is ready with his car to take us to the launch site to test launch our rockets; weekdays, weekends, breaks, and holidays as well. He helps us set up the launch pad, teaches us to assemble the motors, calculate and adjust launch angle, calculate parachute size and rocket mass, and he stays until we are satisfied with our launch results. He's also helped recover rockets from trees in the most creative of methods.

Teachers are key to the success of the TARC program, putting in countless hours to ensure the success of their students and teams. Throughout our TARC journey, our coach, teacher, and friend has been there for us. His dedication, commitment, and care has touched us deeply, and we commend him for his efforts going above and beyond his duty as a teacher.

make a second flight—to a flight goal that was 25 feet higher in altitude and one second more in duration than the first flight, based on a coin toss at Friday evening's contestant briefing. Top places were then decided based on the sum of the two flight scores, with the lowest score winning.

When the results of second flights were recorded, the winner of TARC 2018 was Creekview High School from Canton, Georgia, who had a two-flight score of 21.2. Creekview has had a TARC program for many years, and (with a different team of students) had also won TARC 2014. The program has been run over this period by a teacher (Tim Smyrl) who himself competed as a student in TARC's early years. Close

Continued on page 50.

The TARC 2019 Challenge

- Participation is now open to 6th graders in addition to the previous 7th through 12th.
- Altitude goal is 856 feet (Apollo 11 landed at 8:56 AM), duration window 43-46 seconds.
- Three "astronaut" eggs for payload, eggs plus altimeter in their "capsule" must recover separately from the rest of the rocket on two or more parachutes that are within 2 inches of being the same diameter.
- Cash prize at the Finals for the rocket that most closely resembles the Apollo 11 Saturn 5 in shape and/or paint pattern; all rockets at Finals must have paint or other decorative finish on any external part that is made of wood or paper.
- Total impulse limit 80 N-sec, liftoff weight limit 650 gm, minimum air-frame length 650 mm, single stage.
- Any number of teams can be entered from a school by the December 1, 2018, registration deadline but only the top two will be eligible to be invited to the Finals.
- The altitude and duration targets for second flights at the Finals (only) will be slightly different from the first-flight targets: + 25 feet and + 1 second, with the decision of whether these are higher or lower to be based on the flip of a coin at the pre-flight team briefing on the evening of May 10.
- Finals are May 18, 2019; qualification flight deadline is April 8, 2019

TARC range in operation.
Photo by Glenn Feveryear.



TARC 2018 Flight Results

Place	Team Name	City	State	Rocket Length ¹	Rocket Weight ²	Motor	Flight 1 Score	Flight 2 Score	Total Score	Student Prize ³
1	Creekview High School	Canton	GA	87	486	F39-9	8.92	12.28	21.20	\$20,000
2	Festus High School	Festus	MO	70	480	F39-9	23.76	2.00	25.76	\$15,000
3	Russellville City Schools (Team 3)	Russellville	AL	65	375	F39-6	16.00	10.00	26.00	\$12,500
4	Minster Journeyman's Club (Team 1)	Minster	OH	71	374	F42-8	6.00	23.92	29.92	\$10,000
5	Plantation High School (Team 1)	Plantation	FL	80	606	F26	23.56	8.00	31.56	\$7,500
6	Richards R-V Middle School	West Plains	MO	77	445	F39-6	20.00	24.64	44.64	\$5,000
7	Maharishi School (Team 3)	Fairfield	IA	73	474	F39-6	31.40	14.40	45.80	\$5,000
8	The Lawrenceville School	Lawrenceville	NJ	77	454	F39-6	23.56	23.00	46.56	\$5,000
9	The Green Vale School (Team 1)	Old Brookville	NY	91	551	F42-8	20.60	29.04	49.64	\$5,000
10	Maharishi School (Team 1)	Fairfield	IA	75	405	E28-2	11.20	40.28	51.48	\$5,000

Notes: 1. Rocket length in cm.
2. Rocket weight in grams for the first flight.
3. Schools of the winning teams also received \$1,000 awards.



TARC is Worth It Even When You Don't Make the Finals

by Jacob Nathan

Joining a club or being a part of a team is one of the best things an incoming freshman can do once they arrive in a new high school. I weighed my options and did exactly that, killing two birds with one stone when I joined the TARC team and rocketry club at my school, University School, in Hunting Valley, Ohio. During our first club meeting, I curiously found my way into the woodshop among the intimidating power tools and tables piled high with projects among which I found a group of older guys standing around with our coach. I approached the coach, Jim Seibyl, and asked him what I could do. He directed me to an upperclassman who gave me the dull assignment of epoxying fins onto the booster sections of three of our rockets. At the time, I was not even allowed to mix the adhesive myself. While this menial task seemed quite ridiculous to me at the time, I took it seriously because I wanted to learn as much as I could as quickly as possible, though in retrospect, I can appreciate why I started off slowly due to the incredible complexity and skill involved in building rockets.

Once we had our rockets for the chal-

lenge built, we began test flights. My fellow freshman on the TARC team, my friend Isaac, and I were able to progress almost as quickly as we wanted as we gobbled up information and learned the ropes of launch days and test flights as rapidly as we could. Thursdays were club meetings and I will admit that while these are my favorite part of the week, they can be ridiculously stressful during the fall and during the TARC season. In these meetings we planned launches, discussed motors, and invented far-out ideas for weighting the rockets. By October, we began test flights on the athletic fields behind the school.

By November, we were building our own Level 1 projects as our coach informed us of the NAR and Tripoli and how we could work on our own projects in addition to the tiered certifications of the use of high power motors. Isaac and I each purchased an Estes Sahara kit to build as first high-powered rockets. We began building them during our free periods and eagerly awaited the launch day once they were completed.

Building my first high-powered rocket was a great experience, starting with picking it out from the Estes website, and finishing with the final coat of bright red spray paint. The most difficult part was definitely learning how to mix epoxy. As I've progressed to designing and building my own rockets, I've developed a real appreciation for precut fin slots, as cutting my own slots in my scratch builds has become the bane of my existence. I have discovered that a very satisfying part of the build process is finishing and painting my rockets. This, of course, is only second to seeing your creation on the pad and watching it punch a hole in the sky.

As we progressed through the season, our team bonded over jokes about each other, bagels, and crazy ideas for insane projects, and this is what makes the team. Being a part of a TARC team for the first time, especially as a freshman, is a great experience because of the teamwork and camaraderie, but most importantly, the rocketry and the science and design behind our final rockets. Through catos and misfires as well as cold and blustery launches, our team was greatly disappointed as we unfortunately did not make the finals. Despite the fact it was merely the school's second year registering for the competition, we had very high expectations. Still, we were leaps and bounds more successful than the team of the previous year, as we were able to get all three of our qualifying flights off the launchpad and safely recovered, while

the previous year's team did not recover any flights. We placed somewhere in the middle of the nation in terms of our team score, which was 91, though some of our launches came out around 30!

My appreciation for TARC stems from the fact that it is a team activity that calls for cooperation as well as a genuine passion for hard work and a certain mental resilience. It's this mindset and these characteristics that make a good rocketeer. Evidently, many of our TARC team members express these same characteristics and as I have noticed, exemplify them. A rocketeer must be skilled in sciences such as physics, engineering, and meteorology, as well as in problem solving.

Joining the rocketry team at University School was somewhat daunting thanks to the fact that many of the guys on my team have very impressive projects. Our coach just got his Level 3 this year. Two juniors have what is called a Strnad Fellowship, which is a program in which students are funded to conduct research and build a project. The young men are building a dual-stage carbon fiber rocket that will be launched in Blackrock, Nevada, as they are attempting to reach 50,000 feet. However, starting as the "stupid freshman" who was only allowed to hold a booster section while a teammate affixed fins to the rocket,

I have been able to come quite a long way due to the help and support of my teammates, to the point at which I have my Lev-



el 1 certification and am working on my third project currently.

The other freshman on the team, my friend Isaac, has come a long way as well. He has a Level 1 attempt under his belt as

well as several fun launches and endless TARC tests. These outings have led Isaac and myself to a level of experience we would not have otherwise gained. Again, I cannot emphasize enough that we owe our success to the support of our teammates. The seven members of our team took us to a successful season, considering that it was merely our second year registering for TARC.

Next year, as cliché as it may sound, we are going to totally nail the TARC competition. Of course, we are going to put in all the hard work necessary and likely acquire some new "stupid freshmen" as well. It is young people like me who will keep this hobby alive. Whatever the challenge is going to be, we are going to absolutely kill it. Get ready to be reading "University School" off the list of the top 100 schools next April!

I'd like to leave readers with this thought: rocketry is one of the best extracurricular activities one can join and I recommend all of you to spread word of this great pastime to your peers and friends so the hobby can only grow. TARC, NAR competitions, and the NASA Student Launch Initiative are the best ways to facilitate its growth and schools all over the country should participate.



behind Creekview in second place was Festus (Missouri) High School, last year's TARC winners, with a score of 25.76. This is the closest TARC has ever come to having the same school win in two consecutive years. Third place went to Russellville (Alabama) City Schools, who scored 26.0; a team of different students from Russellville had won TARC 2015. The top three teams got significant prizes in scholarship funds paid by AIA for their future post-secondary education (shared equally among team members): \$20,000 for 1st place, \$15,000 for 2nd place, and \$12,500 for 3rd. All of the other teams that finished in the top ten got \$5,000 for the students and all ten got \$1,000 for their sponsoring school or organization.



A TARC team captures their flight on their phones.
Photo by Glenn Feveryear.



Deford Dazzlers 4H from Michigan, winners of the Presentation Competition.
Photo by Arno Tilles.

The Creekview team then moved on to the world stage as the U.S. team in the International Rocketry Challenge at the Farnborough (England) International Airshow, traveling to England as the guests of Raytheon Company to fly against the teams that won the TARC-equivalent rocketry events in England, France, and Japan.

The Road Ahead

Each year the challenge for the next year's TARC program is disclosed at the Finals award ceremony. The TARC 2019 challenge is described in the accompanying text box on page 46; the detailed rules and registration materials are available on the event website (www.rocketcontest.org) and registration opens on September 1, 2018. The theme for TARC 2019 will be commemoration of the 50th anniversary of Apollo 11, the first manned landing on the moon. It is also an important year for our AIA partners as they celebrate their 100th anniversary.

TARC continues to succeed each year because of the dedication of NAR volunteers nation-wide who serve as local "mentor" advisors and coaches for student teams; who volunteer as official flight observers for teams' qualification flights; who run NAR section ranges supporting teams' flying; and who come to the Finals to be part of the NAR range crew. If you'd like to be added to the list of the NAR members who do any of these, please let me know at ahbarber@alum.mit.edu. TARC is the best example in the hobby and in the NAR of what we call paying forward to build and inspire the next generation of NAR members and U.S. aerospace professionals. Thank you to all those in the NAR who support it.

Outstanding Mentor:

Mark Hansen—Deford Dazzlers 4H, Cass City, Michigan

We would like to nominate Mr. Mark Hansen for the Outstanding NAR Mentor award. Mr. Hansen has been mentoring rocket teams since 2009. He has taken teams to the Team America Rocketry Challenge Finals seven times, placing in the top 10 multiple times, and winning first place in the Presentation Competition multiple times. Additionally, he has led a team through a successful season in the NASA Student Launch program. Under his direction, the Deford Dazzlers have achieved "Legacy Team" status with AIA and NAR.

Mr. Hansen has accomplished all of this remarkable work as an unpaid volunteer with untrained assistants. In many years of competing, the team has had to fundraise the entire cost of the season and the cost of travel, because they don't have the benefit of corporate sponsorship or school sponsorship. Mr. Hansen, unlike many others who support TARC teams, is not employed by a school, so none of his prep time or mentoring hours are compensated.

Both his accomplishments and his dedication are commendable, but we are recommending Mr. Hansen for further reasons. Simply put, this man inspires young people. He connects with each member of his team on a personal level. He has earned their trust, their love, and their respect. He demonstrates what it means to be a scientist and a teacher. The world would be a better place if there were more human beings like Mark Hansen, who is "outstanding" in every sense of the word.

Start your rockets! Opening
demo at TARC 2018.

Photo by Glenn Feveryear.



High Power Rocketry Display
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The Creekview High School team represented the U.S. at the International Rocketry Challenge. AIA photo.

INTERNATIONAL ROCKETRY

The 2018 International Rocketry Challenge flyoff was held Friday, July 20, on the tarmac and in front of a huge international aerospace industry crowd at the Farnborough Airshow in England, the largest air show in the world in 2018. In a close competition, the United States team from Creekview High School (made up of Brayden Dodge, Kennedy Hugo, Aiden McChesney, and Warren Teachworth) narrowly defeated the French team from Lycee Sud Medoc. The U.S. team led the field in the presentation contest, followed closely by the team from Omiya High School in Japan. The United Kingdom also had a team participating from Tonbridge School.

The flights from all four teams were competitive, but Team France with a flight of 801 feet and time of 38.22 seconds was almost 3 points behind Team USA, who put up a flight of 797 feet and 39.49 seconds. Creekview's impressive victory kept the United States first at the International Challenge for a fourth year in a row. Special thanks go to Raytheon Company for sponsoring the travel and all expenses for the Creekview team to represent the United States.

Photos courtesy of the Aerospace Industries Association and Raytheon.



INTERNATIONAL ROCKETRY CHALLENGE



The Creekview team readying their rocket.
AIA photo.

U.S. TARC Team Wins International Fly-off at Farnborough Air Show



The U.S. flight.
AIA photos.