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National Association of Rocketry Educator's Newsletter

December 2014

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In this Issue

The New NAR Teacher's Certification Program

NAR has been training teachers how to fly rockets for decades. Now there will be a program to standardize the training to get teachers and rocketeers working together in a more official way. At the beginning of next year we will engage the "NAR Rocket Teacher Certification Program" that will train teachers to build and fly. The "narTcert" process is that a teacher will build and launch a simple model with a NAR member or section and receive formal recognition to be a 'rocket science teacher.' NAR will certify anyone who is a professional classroom or home school teacher, informal educator with a youth organization, or whoever will 'teach or train STEM using model rocketry.' The study material is all online and the teacher has no time limit to complete the process. This a major offering by NAR and readers of this newsletter are the first to hear about it. As the next year begins and narTcert launches there will be more information here on how to participate and a link to get you started. It will be a very happy new year for rocketry education.

Aim high!

Vince Huegele
NAR Education Chairman

2015 Team America Rocketry Challenge (TARC) is underway

TARC is the world's largest rocket contest and is co-sponsored by the Aerospace Industries Association (AIA) and the National Association of Rocketry in partnership with AAPT, DoD, NASA, and AIA member companies. **Registration is open until December 12, 2014.**

The first twelve Team America Rocketry Challenges, held in 2003 through 2014, were the largest model rocket contests ever held. Co-sponsored by the NAR and the Aerospace Industries Association (AIA), the eight events together attracted 8,260 high-

school teams made up of a total of over 65,000 students from all 50 states. These students had a serious interest in learning about aerospace design and engineering through model rocketry. The top 100 teams each year came to a final fly-off competition in mid May near Washington, DC, to compete for $60,000 in prizes and a free trip to either the Paris or the Farnborough air show in Europe. These teams were selected based on the scores reported from qualification flights that they conducted locally throughout the US.

Team America Rocketry Challenge 2015's target flight duration of 46-48 seconds is measured from the moment of rocket liftoff until the part of the rocket with the egg payload lands. The target flight altitude of 800 feet is measured by an onboard electronic altimeter. The top 100 teams from among all those who have entered will meet in a final fly-off competition on May 9, 2015 at Great Meadow, The Plains, VA. These top 100 teams will be selected based on the sum of duration and altitude scores reported from two local qualification flights that they conduct in front of an NAR Senior (adult) member observer at their choice of time up until the flight deadline of March 30, 2015.

NAR Support for Team America

The NAR asks all of its Senior (adult) members and its Sections to take an active role in supporting TARC. This event offers a tremendously rewarding opportunity to teach rocketry skills to bright and enthusiastic young people and to "pay forward" to a new generation of rocketeers for the support we once received from others when we were starting out in the hobby. Please use the attached publicity handout to get the word out about TARC. Details of the duties of a mentor or flight observer are available in our Mentor Guide.

Mentors are adult (age 21 and above) members of the NAR who volunteer to serve as technical advisors and instructors or coaches to TARC teams. The role of the mentor is to get teams over the initial learning hump of mastering basic rocketry skills; they are not allowed to help teams with their final contest designs. Mentors may also serve as "qualification flight observers."

TARC team members can obtain a current list of NAR Mentor volunteers.

If you want to volunteer as a NAR Mentor, contact NAR TARC Manager Trip Barber.

Qualification flight observers are adult members of the NAR who watch a team's official "qualification flight" attempt at a mutually convenient time and place sometime before March 30, 2015. The observer verifies that the flight is conducted within event rules and that the egg payload is uncracked after flight, serves as one of the two stopwatch-equipped timers for the flight, and then records the flight duration and altimeter-reported altitude post-flight. He or she signs the official flight-report form, which is then sent in to the AIA. Qualification flight observers are under no obligation to also serve as a mentor to a team, although they may do so. Observers must be impartial; they cannot be related to any member of the team they observe, be employed by the team's school, or be a member of the team's sponsoring non-profit organization. Impartial adults may join the NAR (online if desired) simply for the purpose of being an observer, if a team is not otherwise able to locate an NAR adult member.

NAR Sections help by listing all of their launches on the NAR "Launch Windows" web page and by providing free access to these launches and use of Section or personal launch equipment for any TARC team that needs to do a test or qualification flight.

Only certain NAR-certified model rocket motors of total impulse class "F" and below

are approved for flight use in TARC 2015. They are enumerated in this list.

NAR Site Owner Insurance

TARC teams needing "site owner insurance" (insurance which protects the owner of the land used for a rocket launch) in order to gain access to a flying site for their local test and qualification flights may get this through the NAR, just like NAR Sections (clubs) can do. This insurance is available only for actual landowners (including schools and school boards), not for school officials who are concerned about personal liability. It is available for $15, but only to teams whose teacher supervisor is a member of the NAR, and have at least three student team members who are members of the NAR. You can apply for site insurance using this printable form.

Key dates to remember are:

Feb. 1 - Complete first test flight (recommended)
Mar 1 - First TARC qualification flight recommended (teams this year can have three official qualification flight attempts as long as one of them is on or before this date)
Mar. 15 - Complete first official flight attempt
March 30 - Submit qualification form to AIA
Apr. 3 - Top 100 team selected
May 9 - National Finals at Great Meadow in The Plains, VA

The NAR website provides further information. Also, there is a superb new teacher resource posted on the TARC website. NAR member (and middle school teacher) Tom Sarradet built a complete STEM curriculum for middle school students based on using TARC, and posted it on this page.

Trip Barber
NAR 4322 L3
TARC Manager

NAR Scholarship Program and Robert L. Cannon Award

Did you know that if you are NAR member between the ages of 17 and 22 attending college or a vocational school that you may be eligible to receive a scholarship?

Are you a teacher or educator who uses model rocketry in the classroom? You are welcome to apply for a $500 grant to use in your program.

In 2001, the NAR's scholarship and Robert L. Cannon educational awards were inaugurated at NARAM. Three NAR members received scholarships and two educators received Cannon award grants. For 2002, there were five Cannon awards and five scholarships presented to recipients. In 2003, there were four scholarships awarded to NAR members and three Cannon award winners. Over the years the number of award winners have grown. This year we will award ten $1000 scholarships, and ten Cannon $500 grants.

The deadline for applying for the Scholarships and the Cannon Award in 2015 will be June 1st.

Both of these programs are ongoing. See http://www.nar.org/cannon.html for details on how to apply. If you have questions concerning either program, please contact **Joyce Guzik,** via email: jguzik@mindspring.com**.** Awards are announced at the annual meet (NARAM). You do not have to be present to receive an award.

AIAA Foundation Scholarships

Founded in 1996, the AIAA Foundation is a nonprofit, tax-exempt educational organization committed to providing financial support to educational programs. By devoting resources to the education of both practicing and future aerospace professionals, and by recognizing professional achievement, we are influencing the future of the aerospace profession.

The AIAA Foundation offers a wealth of resources to support educators at both the university level and K-12: scholarships, classroom grants, design competitions, and student conferences. This financial assistance allows educators and students to build scientific literacy and advance the arts and sciences of aerospace.

To help support promising future aerospace professionals, the AIAA Foundation annually awards financial aid to undergraduate and graduate students in science or engineering programs related to aerospace. Our goal is to help attract top science and engineering students to aerospace fields ... to provide high-visibility recognition of these students and their work ... to furnish financial assistance to aerospace students ... and to assure the availability of the talented professionals the aerospace industry will need in the years ahead.

The AIAA Foundation's undergraduate scholarship program offers scholarships to college sophomores, juniors, and seniors each year, and recipients can apply to renew their scholarship annually until they graduate.

Through its annual graduate scholarship program, the AIAA Foundation presents awards to graduate students doing excellent research in the air and space sciences.

Undergraduate and Graduate scholarship applications may be submitted online (applications are accepted from October through January[**this year's deadline is January 31 2015**]).

Basic Criteria for Undergraduate and Graduate scholarships:

- Must be an AIAA Member
- Must be a full-time student
- 3.3 Grade Point Average (or equivalent)
- Must be studying a topic related to an AIAA Technical Committee

For the second year a $20,000 scholarship paid in $5,000 increments over four years will be available to all seniors participating in TARC. The scholarship honors Brendan M. Kutler, who suddenly and unexpectedly died in his sleep on December 29, 2009, at the age of seventeen. Former AmSafe CEO, Mr. Terry Lyons remarked on the scholarship: "We are establishing this scholarship in honor of Brendan Kutler, who, along with his teammates from Harvard Westlake School in Los Angeles, competed in TARC in 2008, reaching the Finals and placing 13th in the nation overall. Rocketry was just one of Brendan's many diverse interests. It is in this spirit and in his honor and memory that we have established this scholarship. In an era where more often than not we hear about what is wrong with our upcoming generation, Brendan was a shining example of what is good in so many of today's young people. Through this scholarship, we hope to identify other young men and women with similar traits, values and aspirations and to help them, through education, to make a positive impact as tomorrow's leaders."

Alan Shepard Technology in Education Award

The Space Foundation, in conjunction with the Astronauts Memorial Foundation (AMF) and the National Aeronautics and Space Administration (NASA) annually presents the Alan Shepard Technology in Education Award to recognize outstanding contributions to creative and innovative use of technology in education by K-12 educators or district-level education personnel.

The award, which is named after Mercury Astronaut Alan Shepard, honors an educator who has demonstrated a commitment to inspiring students' interest in science, technology, engineering and math (STEM). The Alan Shepard Technology in Education Award is presented annually at the Space Symposium at the opening ceremony at the Broadmoor Hotel in Colorado Springs, Colo.

Educators who have demonstrated a commitment to inspiring students' interest in science, technology, engineering and math (STEM) may apply now now to receive the 2015 Alan Shepard Technology in Education Award.

Submissions for the award must be mailed and postmarked no later than **Feb. 3**, 2015. The winner will be announced in March 2015.

RESOURCES

NASA

Education Materials Finder
NASA's Education Materials Finder will help teachers locate resources that can be used in the classroom. Users may search by keywords, grade level, product type and subject. With hundreds of publications and Web sites indexed, the finder is the best way to locate NASA educational resources. (http://search.nasa.gov/search/edFilterSearch.jsp?empty=true)

Civil Air Patrol

Aerospace Library
Dedicated to promoting and sharing Aviation, Air Force, CAP & NASA History, the folks at the Civil Air Patrol have put together a fantastic library of rocketry resources! Check it out... (http://www.scribd.com/collections/3819081/MODEL-ROCKETRY)!

American Institute of Aeronautics and Astronautics (AIAA)

Offering answers...
The AIAA has created an online venture called "**Ask Polaris**" (http://www.askpolaris.org/) to enlighten students, parents and especially guidance counselors of the possibilities and prospects of aerospace engineering

National Association of Rocketry (NAR) offers Teachers and Youth Group Leaders Resources

The NAR offers Free Resource downloads (http://www.nar.org/educational-resources/) produced by members who have helped teachers and youth group leaders like yourself all over the United States.

Rocketry School Supplies Provided by Donors

As teachers, you know your students' needs best. Donorschoose.org is available to provide an avenue for public school teachers to submit project requests for the specific materials their students need to learn. As their name implies, donors choose which projects to support. Once a project is funded, they deliver the materials directly to the school. In return, teachers submit photos of the project in use and thank-you notes from students, which are then sent to the project's donors.

To learn more about our program and how to be a successful DonorsChoose.org teacher see http://www.donorschoose.org/teacherindex.html.

INSPIRING OTHERS:

Students Team Up for Rocket-Making Challenge
by Grace Burch Buffalo, NY

Excited students, teachers and parents all look toward the sky in anticipation on a cold October day. A bright blotch of color appears, and cheers and applause erupt heralding a successful launch. Students run across the field, racing with the descending object to where it will land. They wonder: Is the egg intact? How high did it go? What was the time?

This scene was replayed many times at East Aurora High School during the Moog Regional Rocketry Challenge, a model rocket competition for students in grades seven through 12. With 91 participants, the competition was a rather large spectacle. Moog, a worldwide engineering company located in Elma, sponsored the event.

Why would anyone sponsor a model rocketry competition? The Moog Regional Rocketry Challenge is held to assist students in the Team America Rocketry Challenge (TARC). It's an international model rocket competition where teams across the globe design, build and fly model rockets in an attempt to reach a perfect height, time, and safely land an egg. The top 100 teams in the United States qualify for nationals in Washington.

The TARC teams in Western New York were busy building their rockets, which were ready to fly on that cold Sunday afternoon. The Moog Regional Rocketry Challenge provided these teams with a chance to test their rockets in a local competition.

In TARC, the scoring works differently than at other competitions. The perfect score is a zero. For every foot over or under the height limit, one point will be added. Every second over or under the time limit will result in four points being added. One raw egg must launch in the rocket and return safely and uncracked. A cracked egg results in disqualification. For this year's TARC Competition, the rocket must fly to 800 feet in 46 to 48 seconds. The rocket must come down in two pieces with similar parachutes. The competition requirements change every year.

There were a total of 13 teams at the Moog Regional Rocketry Challenge from area schools such as City Honors, East Aurora and Orchard Park. Each team had built a unique and individual model rocket using programming software and performed various test runs over several months.

These students learn quite a lot throughout the experience. Model rocketry programs are used to design the rockets, giving students a chance to work with

programming simulations and computer modeling. Also, students get a hands-on perspective in the process of building the rockets under the assistance of their mentors.

Project Lead the Way (PLTW) expands to 3,400 K-12 schools

Project Lead The Way (PLTW) prepares students to be the most innovative and productive leaders in Science, Technology, Engineering, and Mathematics (STEM) and to make meaningful, pioneering contributions to our world. PLTW works with new schools and school districts to make sure that implementation of our rigorous curriculum is as smooth and streamlined as possible. The information packets for our Engineering and Biomedical Sciences classes guide educators through the PLTW process. They contain course descriptions, sign-up information, and other tips to make PLTW a success at your school.

Estes

Reach For The Stars National Winners

Contestants in the seventh annual competition had to build and launch a solid-fuel powered rocket at an event held in their area by schools, YMCAs, Scouts, Challenger Learning Centers and other youth groups. The closest average landing (by parachute) to a target after two launches was declared the winner, with the local winner's results entered into the national Competition. **The annual competition runs continuously and is open to ages 10 to 18.**

Author Homer Hickam and the original Rocket Boys have kicked off the eighth annual Reach for the Stars -- National Rocket Competition at the October Sky Festival in Beckley, West Virginia. Competitions are already being held across the country, and local competitions can be held anytime throughout the year with a deadline at the end of June. For more details about the competition go to TheRocketman.net.

Great American Classroom Makeover

Enter the Great American School Spectacular for your chance to win up to $10,000 for your school. Must be accomplished by December 20th!

4-H

2014 4-H National Youth Science Day Huge Success!

October 8th was a big day for 4-H as the seventh annual 4-H National Youth Science Day (NYSD) was in full effect. Youth around the world geared up for the 2014 National Science Experiment, Rockets to the Rescue. Thousands of students built and launched rockets in this aerospace lesson. See those participating at http://www.4-h.org/4-h-national-youth-science-day/science-experiments-projects/plan-science-day-event/event-map/. Hopefully many of these kids will want to further explore STEM subjects with rocketry. 4-H is a partner with NAR and supports TARC with many teams.

Engineering and Technology

The work of scientists and engineers impacts our daily life on so many levels, but sometimes it's hard to isolate just how those professionals contribute to programs we watch on television or items we see in stores. 4-H uses its Filmmaking Studio and Workshop and Robotics programs to help youth understand just how important an interest in science, engineering and mathematics is to advancing our society's access to new technology. The

programs provide a unique opportunity to interact with the community through volunteer activities and avenues for the club to engage new mentors who are local industry experts.

This Month in History:

65 Years Ago

December 2, 1949: The United States Air Force first fired the Aerobee research rocket (RTV-A-1a) at Holoman Air Force Base.

55 Years Ago

December 10, 1959: U.S. Ambassador Lodge presented a resolution to the Assembly of the United Nations (U.N.) recommending that an international conference on the peaceful uses of outer space be convened within the next year or two. Two days later, the United Nations created a permanent 24-nation committee for this purpose.

45 Years Ago

December 17, 1969: The U.S. Air Force closed its 22-year investigation into sightings of unidentified flying objects (UFOs), otherwise known as Project Blue Book.

40 Years Ago

Dec 2, 1974: NASA's Pioneer 11 spacecraft flew by Jupiter, passing 26,725 miles above Jupiter's cloud top. The spacecraft returned dramatic images of Jupiter's famous Great Red Spot and determined the mass of Jupiter's moon, Callisto.

30 Years Ago

December 27, 1984: Members of the ANSMET (Antarctic Search for Meteorites) Project discovered meteorite ALH 84001 in the Allen Hills region of Antarctica. ALH 84001 is the famous Mars meteorite that sparked excitement in 1996 about past life on Mars.

25 Years Ago

December 26, 1989: A U.S. patent was awarded for the invention and construction method for the Miniature Traveling Wave Tube (TWT). This technology allowed satellites to carry a greater number of messages in a particular radio frequency signal, and resulted in commercial television applications.

15 Years Ago

December 18, 1999: NASA launched Terra, a weather satellite project undertaken jointly with Japan and Canada, on an Atlas rocket from Vandenberg Air Force Base. The 4,864 kg spacecraft was part of an international program and was intended to enable new research into the ways that Earth's lands, oceans, air, ice, and life function as a total system.

5 Years Ago

December 14, 2009: NASA will launch the Wide-field Infrared Survey Explorer (WISE) aboard the Delta II 7320 rocket from Vandenberg Air Force Base between 6:10 - 6:23 a.m. PST. This mission will survey the entire sky in the mid-infrared range, producing over a million images from which hundreds of millions of astronomical objects will be cataloged using far greater sensitivity than any previous mission or program. 47 Years Ago

Manufacturers

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'Tis the Season

Looking for some great reference material for your classes? How about history of sounding rockets? Or technical report? Take a look at the NARTS website https://blastzone.com/nar/narts/!

If your are searching for unusual shapes for your next rocket project, check out New Way Space Models http://newwayspacemodels.com/ .

Need a different payload for your next science project? Why not a video camera!?! Look at what BoosterVision has to offer http://www.boostervision.com/boostervision/default.asp.

Still can't find a unique item? Stop by ARG Rockets http://www.tataryn.org/argrockets/ and take a look at their offerings!

Looking for all-round opportunities? From easy to complex, there is a challenge waiting for you at JonRocket.com, Aerospace Speciality Products, Rocketarium, Fliskits, Estes, Quest, or Odd'l Rockets.

Quick Links...

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