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# National Association of Rocketry Educator's Newsletter

June 2014

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More Space for Aerospace

As the sun stretches out the summer days, it's a good time to relax from school; but, take a look at what NAR has already planned for the fall! We have been busy working with two national youth groups to expand educational rocketry activities. NAR has just signed a Memorandum of Understanding (MOU) with the Civil Air Patrol that will bring their squadrons together with our rocket clubs. CAP has always taught its cadets rocketry; but, now the two organizations are better connected to be more effective. Check out their fantastic [model rocketry educators guide!](#)

Another NAR partner, 4-H, has announced they are offering aerospace training in two events. They are having a 4-H National [Youth Summit Series](#) and the first program is Aerospace Engineering this September. They are also featuring aerospace for their [National Science Youth Day](#) this year and it will involve a special mission with a rocket.

Many of our subscribers are part of informal education and will be involved with these groups; but, you and your school can participate with these organizations as well as give your students an opportunity for even more STEM exposure. Find the CAP squadron nearest to you by going to <http://www.gocivilairpatrol.com/>. Look for a neighborhood 4-H group at <http://www.4-h.org/get-involved/find-4-h-clubs-camps-programs/>. But, most importantly, know your [local NAR section](#); because, for us, summer is launch time!

Aim high!
Vince Huegele
NAR Education Chairman



2014 Team America Rocketry Challenge (TARC)

The TARC <http://www.rocketcontest.org/> is the world's largest rocket contest, sponsored by the Aerospace Industries Association (AIA) and the National Association of Rocketry in partnership with AAPT, DoD, NASA, and AIA member companies.

TARC 2014 is completed and the winners have been named. Congratulations to Creekview High School from Canton, GA for finishing in first place at the TARC 2014 Finals on May 10. In addition to their cash prize of \$10,500 (plus \$1,000 for their school), the team will be traveling to London in July as the guests of the Raytheon Company to fly against the winners of the TARC-equivalent event in the UK, France, and Japan at the Farnborough Air Show, which will be the biggest aerospace show and exhibition in the world in 2014. The results of the TARC 2014 Finals are attached, including flight data. A big thank-you to Chris Kidwell who has done all results management since the beginning of TARC, and who gets me the digital results within hours of the end of the Finals.

Congratulations as well to the other top 10 teams who shared the rest of the \$60,000 overall cash prize pool plus the other special awards, and to all the teams who flew well enough in local qualification flights to come to the TARC 2014 Finals. Any TARC team that made it to the Finals represented a highly successful combined effort of students, teachers, parents, and NAR mentors that can be proud of their achievements. Any team that completed a TARC 2014 qualification flight met all the educational and NAR outreach goals of the TARC program, even if they did not come to the Finals.

712 teams (representing over 5000 students) entered TARC 2014 from 48 states, 413 teams made at least one qualification flight attempt, and the 103 teams that came to the Finals represented 25 states plus the US Virgin Islands. AIA at the national media level, and our NAR volunteers at the local media and word-of-mouth level, are doing a great job recruiting for TARC. I have attached a [TARC publicity handout](#) for your use in continuing this recruiting for TARC 2015.

We had some challenges from weather this year at the Finals and as a result were only able to get in one round of second flights (the 24 minimum specified in the TARC 2014 rules) rather than the two rounds that we had hoped for. I know that some students (actually all of us) were disappointed that we could not get all 42 into the air, and there was also a whole lot of disappointment about being unable to do the high power demonstration. But due to the exceptional skill and efficiency of the whole NAR range crew, particularly the check-in/returns crew led by Jonathan Rains, we were able to finish 103 first flights (plus 4 reflights) and 24 second flights before the rains came at 2:30. That was a great demonstration of teamwork, and I thank the NAR range crew for making this happen. They delivered exactly what we promised to some of the best young people in America, and did it safely and with a smile despite the weather challenges.

When we offer a national program that offers hands-on mentoring at the local level by expert volunteers (that's our NAR TARC Mentors) and culminates with a highly-organized, professionally-run Finals event (thanks to the 102-person NAR range crew that made this happen), we can truly make a difference, and we are. Thank you for what each of you contributed to TARC 2014. This is "paying forward" on a scale that would have made Harry Stine proud, and in a way that is perfectly aligned with one of the most important missions of the NAR -- educational outreach.

This year we released [the rules for the next year's TARC challenge](#) at the end of the

awards ceremony. Key elements of the challenge are:

- Payload is one egg (any orientation, but note the revised weight range for eggs, matching what eggs actually weigh these days)
- Altitude goal is 800 feet, duration goal is 46-48 seconds for all qualification flights and for the first flight at the Finals; but at the Finals (only) those teams that earn a second flight must aim for a different goal on the second flight: 775 feet and 45-47 seconds
- Weight and power limits, and altimeters, are the same, but there is a new limit - a minimum length requirement of 650 millimeters
- The part of the rocket containing the egg and altimeter must separate from the rest of the rocket and must return by parachute (any size), the rest of the rocket can use any safe recovery system
- There is no longer a limit on the number of teams that a school or youth group may enter, but only the three best-scoring teams from any single organization will be eligible to be invited to the Finals. Team supervisors can adjust membership of these three teams before the Finals (within the maximum limit of ten per team) to include students from other teams from their school that scored better than the national Finals cutoff score but were not in the top three from that school.
- Selection for the Finals will continue to be based on the sum of the best two of up to three qualification flight reports submitted by a team by March 30, but there will be no bonus point award for doing one early

In the absence of a high school program for NASA Student Launch this year, NAR has teamed with [Small Satellites for Secondary Schools \(S4\)](#) to offer the opportunity to participate in a different program focused on the development of scientific payloads.

The top 25 TARC teams are eligible to apply, and the top five teams will receive a free S4 hardware set and a free flight to 5000 feet at Black Rock during [ARLISS \(A Rocket Launch for International Student Satellites\)](#) in 2015, donated by the National Association of Rocketry.

This is a long-standing, successful program, and offers a new perspective on rocketry to advanced TARC teams.

Thank you for what you are doing to build the future of America's aerospace workforce and NAR through your support of the Team America Rocketry Challenge. I look forward to continuing our success with your help in TARC 2015.

[Trip Barber](#)

NAR 4322 L3

NAR 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. Currently, we award 10 \$1000 NAR scholarships and 10 \$500 Cannon winners per year.

Deadlines for the NAR scholarship and the Cannon award in 2014 will be June 1st. Awards are announced at the annual meet (NARAM). You do not have to be present to receive an award.

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.

Interested in a Fellowship this Summer?

Industry Initiatives for Science and Math Education (IISME), founded in 1985, seeks to transform teaching and learning through industry-education partnerships. IISME exists to address the critical need for a strong, highly skilled workforce in math, science and technological fields. IISME recruits sponsors in California from Alameda, Contra Costa, Marin, Sacramento, San Francisco, San Mateo, Santa Clara, and Santa Cruz Counties. The majority of Fellowships are offered in the Palo Alto, Sunnyvale, Santa Clara and San Jose Area.

This industry-education partnership focuses on teachers as the primary agents for effecting meaningful change in mathematics and science education. IISME provides teachers with experiences and tools they need to adapt their practices and change their schools so that all students are prepared to be lifelong learners, responsible citizens and productive employees. <http://www.iisme.org/>



Air Force Association Educator Grants

The Air Force Association believes that one of the most significant means to affect student learning is to fund grants to meet the unmet and unfunded educational needs of students. Each school year, the Association awards grants of up to \$250 to worthy projects that significantly influence student learning.

View [Grant Guidelines](#) and Official [Grant Rules](#).

To apply: [Register](#) (Be sure to write down your username and password)
Returning participants: [Log-in](#) (Using your existing username and password)
Grant applications must be completed and submitted online - hardcopy or faxed applications will not be considered.

Important Dates for the 2014 Educator Grant:

- July 1, 2013 - grant submission period opens
- November 28, 2013 - grant submission period closes
- January 2014 - grant winners are announced

The grant process is competitive in nature. A committee comprised of outside experts in the field of aerospace education will review all qualified grant applications and make recommendations on funding. Based upon the funding available, the Association will choose to invest in projects that best serve our nation's students and support the mission of the Air Force Association.

The Educator Grant program promotes aerospace education activities in classrooms from kindergarten through twelfth grades. The program encourages development of

innovative aerospace activities within the prescribed curriculum. Questions regarding the Educator Grant program should be directed to the program manager via e-mail at field@afa.org.

INSPIRING OTHERS

Museum of Flight-Seattle, Washington

3, 2, 1, Blast-Off! The Museum of Flight in Seattle, Washington is launching STEM with Model Rocketry

Energize your math and science curriculum! This workshop introduces how model rocketry can be used to teach STEM concepts in the classroom.

Participants will learn about the history of model rocketry and the National Association of Rocketry's role in establishing it as a safe and educational hobby. Each participant will build a basic model rocket kit and learn how to successfully lead a class in a model rocket build and launch.

Other activities include samples of STEM lessons that use model rockets and how to begin a model rocketry program at their school. There will be a special presentation on starting a model rocketry club and participating in the Team America Rocketry Challenge. We then travel to a nearby launch area to fly the rockets and learn how to collect data to use in STEM lessons. (WA State clock hours available at no charge).

Date: Saturday, August 9, 2014
Time: 8:00 am - 4:00 pm
Audience: Educators teaching students in grades 6 - 12
Location: Museum of Flight, Seattle
Fee: Free
Clock Hours: Seven for free

Registration: dsmith@museumofflight.org or 206-764-1384
Questions: mkwong@museumofflight.org or 206-768-7216

The North Carolina School of Science and Mathematics

The North Carolina School of Science and Math Summer [Accelerator Program](#) extends to a global audience our 30 years of experience offering innovative courses and opportunities to talented high school students.

The Accelerator program offers unique, high-level courses in an innovative format that incorporates both residential, hands-on learning and online education. This summer, explore aerospace engineering by designing and launching your own rocket. Analyze the connection between music and math and compose your own work in Music of the World and the Math Behind It. Uncover the secrets of the dead and real-world excavation methodology in Death and Burial Around the World.

Highly skilled faculty focus their talents on building upon the strengths of high-achieving students in advanced science and math topics in the classroom. Student Life Instructors offer a valuable resource and help provide a safe and enjoyable residential experience for students out of the classroom. NCSSM crafts unique college-level academic experiences, as a constituent and flagship high school of the University of North Carolina system, in a setting designed specifically for high school students.

Explore complex topics, collaborate with peers from around the globe, and get

hands-on experience that will kick start college readiness and career interests this summer.

Innovation Now

How about a daily 90 second radio program that features highlights in aeronautics and aeronautics technology, science, history, innovations, research, and inventions from the aerospace industry? Try this one out! www.innovationnow.us



Civil Air Patrol

Collectively, we can have a remarkable impact on a partnering national organization. Take the time to contact a [local Civil Air Patrol squadron](#) near you and Pay Forward! You can find a local squadron by entering your zip code or city and state in the online unit locator found on the [home page](#). Each of these squadrons would welcome your insights and camaraderie! Additionally, the Civil Air Patrol has an Advanced Rocketry Program (and Guide) for those folks who enjoy High Power Rocketry as well as Mid and Low Power...It's a great opportunity to share experiences and Pay Forward!



4-H

National Youth Summit on Aerospace Engineering

It isn't rocket science...or maybe it is!

Expanding on the partnership with 4-H, NAR members are invited to bring teams of young people to the nation's capitol and experience building, experimenting, designing, and collaborating in the field of Aerospace Engineering from September 24-28, 2014. Test your ability to solve practical issues through hands-on engineering learning experiences. National 4-H Council and National 4-H Youth Conference Center are partnering with industry professionals to provide this unique opportunity.

This Summit is open to any high school student in grades 9-12 as of September 2014. Participate as a team (as few as two and as many as 10) with at least one adult mentor/chaperon. Youth interested in participating should contact an adult to register and accompany them at the event. **Registration is now open** for adult chaperons and mentors to [register their youth team](#).

Rocketry School Enrichment and After School Enrichment Programs

help students meet Pennsylvania Academic Standards in science. 4-H project books are available for Delaware County, Pennsylvania classroom teachers, home school families, and after school clubs to use with students.

Estes

Student STEM Competition Offers \$100,000 Awards

The Siemens Foundation has opened its annual [Competition in Math, Science & Technology](#), with this year's program offering scholarships ranging from \$1,000 to \$100,000. Administered by the [College Board](#), the competition calls on high school students to submit original research in technology, science, or math, either as individuals or in teams. Regional competitions will be held at six United States universities in November, with finalists competing in Washington, DC, in December.

The application period for the awards is open now. Applications are due Sept. 30. Additional details can be found on the [Siemens Competition in Math, Science & Technology site](#).

Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring

Established by the White House in 1995, this Presidential award recognizes U.S. citizens, permanent residents and organizations that have demonstrated excellence in mentoring individuals from groups that are underrepresented in science, technology, engineering, and mathematics (STEM) education and workforce. These STEM groups include women, people with disabilities, underrepresented racial and ethnic minorities, individuals from low socio-economic backgrounds and geographic regions like urban and rural areas. The [PAESMEM program](#) is administered by the [National Science Foundation \(NSF\)](#) on behalf of the [White House Office of Science and Technology Policy](#).

Promote STEM with Reach For The Stars - National Rocket Competition

There is still time to get your kids into the Reach for the Stars - National Rocket Competition. The deadline for entering is August 31st, which gives museums, schools, scouts and youth groups enough time to get their supplies and run a local event. This year's Competition was kicked off by famed author Homer Hickam in Coalwood, West Virginia at the October Sky Festival - with the original "Rocket Boys" giving the countdown.

Special pricing makes the Competition very affordable. In most cases the cost of the rocket kit, supplies for two launches, achievement certificate and Competition registration is less than the list price of the rocket kit alone. A step-by-step video and on-line help, supplied free with order, are available to guide you. The Competition is for ages 10 to adult, with three levels determined by age. Time and supplies are limited, so get started now! More information is at [TheRocketman.net](#).

The National Aerospace Training and Research (NASTAR) Center

Located about 50 minutes by car from the city of Philadelphia, NASTAR is offering teacher development programs at **no cost to teachers** through its non-profit NASTAR Foundation. [NASTAR's teacher programming](#) emphasis is on fun, experience-based learning that provides teachers with practical tools and activities that they can apply in a classroom environment. Teachers can experience a 3-G suborbital spaceflight simulation in the NASTAR Center centrifuge, ascend to 8,000 feet in the altitude chamber, or learn how airplanes are controlled while piloting the GAT II simulator. The NASTAR Center has added two new teacher professional development programs: "The Atmosphere and Weather" and "Exploring the Solar System" for this summer.

The NASTAR Center is an approved provider of Act 48 continuing education hours by the Pennsylvania Department of Education. Each program is worth 8 hours of continuing education.

Programs are offered at **no cost to teachers**. If you are coming from out of town, they have arranged a meal/room package at a special rate at an area hotel. For enrollment information, contact Greg Kennedy at (215) 355-9100, X 1512, or via email at gkennedy@nastarcenter.com. A program list and registration packet may also be downloaded from the NASTAR Center website, nastarcenter.com.



Rocket Science 101

Here is a website where you can learn about the basic parts of a real launch vehicle, how they are configured, and how they work together to launch a NASA spacecraft. Rocketry Science 101 would be great for students who want to build a virtual rocket. National Coalition for Aviation and Space Education

Embry-Riddle Aeronautical University is partnering with the Aerospace States Association in support of the [Real World Design Challenge](#) (RWDC), an annual high school competition aimed at increasing the science, technology, engineering and mathematics (STEM) workforce.

Embry-Riddle will award up to seven \$50,000 scholarships - \$12,500 annually per student - to winners of the national competition who attend the university, and its professors will serve as mentors to high school teams and as judges in future national-level challenges.

The agreement, starting with the competition in 2014, expands Embry-Riddle's continuing efforts to encourage young people to pursue technical careers.

Embry-Riddle is the only university formal partner in the competition in which teams of high school students and their teachers try to solve an engineering challenge faced by industry, one in aviation and one in ground transportation. Students first compete in a state-level Governor's Cup and then each state's best team competes in the national finals in Washington DC.

"Through this partnership we plan on making the Real World Design Challenge opportunity available to all secondary students in the United States. Embry-Riddle is critical in helping us achieve this goal," said Ralph K. Coppola, founder of Real World Design Challenge and president of RKC International. "Embry-Riddle's expertise in aviation will better help us prepare students for careers in this critical area."

"Having been a national blue ribbon judge since the first Real World Design Challenge, I know that these students are awesome. With guidance from teachers and mentors, they take an actual design issue from concept to an engineering solution," said Bob Mansfield, executive director of the Center for Aviation and Aerospace Leadership at Embry-Riddle. "This sponsorship gives hundreds of high school students who want to be in the aerospace industry a chance to participate in the RWDC, learn about our exceptional university and have access to our faculty as mentors."

Strickler Award Nomination

If you know an outstanding organization or individual who has illustrated noteworthy achievement and contributions to aviation or space education, or perhaps an accomplished educator who deserves to be inducted into the Crown Circle, we invite you to nominate one or more of these special candidates for NCASE's Dr. Mervin K. Strickler Jr. Aerospace Education Leadership Award.

Please take this opportunity to identify a person or organization deserving of one of these special recognitions. Nominations must be emailed or postmarked no later than July 15, 2014 for the Strickler Award.

Nomination forms for each award are now available at: [NCASE](#)

RESOURCES



NASA Makes Finding Teaching Materials Easy

NASA's Education Materials Finder will help you 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 a great way to [locate NASA educational resources](#).

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.



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

[Free resource downloads](#) produced by members who have helped teachers and youth group leaders like yourself all over the United States.

Space History



Forty-nine years ago this month, Astronaut Edward H. White II became the first American to perform what in NASA parlance is referred to as an Extra Vehicular Activity (EVA). In everyday terms; a space walk.

White, Mission Commander James A. McDivitt and their Gemini IV spacecraft were launched into low Earth orbit by a two-stage Titan II launch vehicle from LC-19 at Cape Canaveral Air Force Station, Florida. The mission clock started at 15:15:59 UTC on Thursday, 03 June 1965.

On the third orbit, less than five hours after launch, White opened the Gemini IV starboard hatch. He stood in his seat and mounted a camera to capture his historic space stroll. He then cast-off from Gemini IV and became a human satellite.

White was tethered to Gemini IV via a 15-foot umbilical that provided oxygen and communications to his EVA suit. A gold-plated visor on his helmet protected his eyes from the searing glare of the sun. The space-walking astronaut was also outfitted with a hand-held maneuvering unit that used compressed oxygen to power its small thrusters. And, like any good tourist, he also took along a camera.

Ed White had the time of his all-too-brief life in the 22 minutes that he walked in space. The sight of the earth, the spacecraft, the sun, the vastness of space, the freedom of movement all combined to make him exclaim at one point, "I feel like a million dollars!"

Presently, it was time to get back into the spacecraft. But, couldn't he just stay outside a little longer? NASA Mission Control and Commander McDivitt were firm. It was time to get back in; now! He grudgingly complied with the request/order, plaintively saying: "It's the saddest moment of my life!"

As Ed White got back into his seat, he and McDivitt struggled to lock the starboard hatch. Both men were exhausted, but ebullient as they mused about the successful completion of America's first space walk.

Gemini IV would eventually orbit the Earth 62 times before splashing-down in the Atlantic Ocean at 17:12:11 GMT on Sunday, 07 June 1965. The 4-day mission was another milestone in America's quest for the moon.

The mission was over and yet Ed White was still a little tired. But then, that was really quite easy to understand. In the time that he was working outside the spacecraft,

Gemini IV had traveled almost a third of the way around the Earth.

Now, that's a long walk!

Manufacturers

Looking for a large scale rocket to display in the classroom or a mid/high power highlight for your demonstration launches? Check out [Lower Hudson Valley's](#) collection or the [Ultimate Paper Rocket Guide](#) site. How about something in 1/12...Check out Mike Bauer's selection of Stomp Rockets at [Alaska Paper Model Rockets](#) or drop him an email at paperstomprockets@yahoo.com. These make fantastic displays or compressed air powered rockets! Looking for something smaller? Need a more traditional building project? Cast your glance toward [Fliskit's](#) large assortment of MicroMaxx kits...From scale, futuristic, to oddroc, you won't be disappointed. Need something in between these sizes? Try [Rocketarium's](#) unique line of scale, futuristic, and oddroc kits!



Quick Links...

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- [Our Website](#)
- [NAR Teacher Resources](#)
- [Find a Local Club](#)
- [Model Rocket Safety Code](#)

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