



NASA Aeronautics

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Monthly STEM Newsletter

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Join the 4th annual Dream with Us design challenge for students in grades 6-12. Dream of new innovations for the future of aviation and get inspired for your future career in aeronautics today!
Credit: NASA / Andrew Carlsen

October 2025

For some of you Aeronauts, the leaves are changing, and we have a great new change for the 4th annual Dream with Us Design Challenge, now including our partners at the FAA! Read on to find all the details for the new challenge and let show us their designs for the future of aviation. And with the X-59 getting so close to its first flight, this month's edition will feature the science of sound to share NASA resources about ways to teach about sound how sound and the good work the Quesst team is doing to quiet those sounds. Check out the Aeronautics Crew Highlight featuring Kate McMurtry, NASA's Aeronautics Deputy Director of our Integrated Aviation Systems Program. There are newly open STEM Opportunities to challenge student skills and webinars to gain more knowledge about aeronautics, engineering, and to get students inspired for a career in aviation. This is your last chance to sign up for Flight Log to send names with us on the X-59, so work fast! Read on to learn more so you don't miss an opportunity to engage with NASA Aeronautics.

Our team also sends out a supersonic thank you to Holly Gutierrez for her amazing work here in aeronautics—she will be missed here at NASA and no doubt by all of you. If you need to see more of something or have a new idea for upcoming newsletters, let us know! Do you know someone else who needs this monthly update? Share the good news. Not subscribed yourself? [Sign up for our monthly STEM newsletter](#) today! Have questions or want to be removed from the list? Send an email to april.a.lanotte@nasa.gov.

The Science of Sound

October 2025

With the Quesst Mission's quiet supersonic research aircraft, the X-59 flying soon, we are excited to share the Science of Sound edition this month. As you may remember from last month's edition, supersonic flight was banned by the Federal Aviation Administration (FAA) in the United States over 50 years ago due to concerns about sonic booms causing disruption to human and animal life. Rules about flying supersonic over land may change, but the boom still remains...until now! The Quesst team is dedicated to minimizing the noise made by supersonic flight, and the X-59 will prove this new technology. This edition is your guide to learning about sound and how NASA is working to quiet those sounds to fly more quietly.

What is sound? Sound waves are longitudinal waves that travel through a medium like air or water. This form of energy is created when molecules vibrate. Many different sounds are created due to an endless variety of materials that can vibrate and ways those vibrations can travel. This can be difficult to explain to younger learners (or older ones as well!). Try the [Seeing Sound activity](#) to see waveforms move with the vibrations of music or noise created by clapping or singing.

The Seeing Sound activity is a great way to help students visualize sound waves but what does it mean to measure them? Check out the [Speed of Sound activity](#), where students use tuning forks and simple materials to measure the length of sound waves.

Tie these fun sound activities to our work here at NASA with the Quesst mission. Why does a supersonic aircraft make so much noise when flying, do you ask? Aircraft moving faster than the speed of sound, or Mach 1, push

surrounding air away quickly with a strong force. This creates a shockwave cone of pressurized air moving downward to the ground. The sudden change in pressure creates the sound we know as the sonic boom. Learn more with the [60 Second Science - Sonic Booms](#) video.

NASA Aeronautics has so many resources to learn about the science of sound. Use the [Quesst Supersonic STEM Toolkit](#) to find sound activities, videos, and even a Schlieren imagery cross-stitch project. The Quesst mission also has a great resource, "[What's the science of sound?](#)" to help explain the physics of soundwaves, how they're measured, their speed, how sonic booms form, and how Quesst is on a mission to quiet those sounds. Try some of our [Aeronautics @ Home](#) activities for more engagement with sound, including: [Nutty Balloon Noise Maker](#) and [Tongue Depressor Harmonica](#).

Don't stop there! The [Aeronautics STEM webpage](#) has more activities and the [Learn With NASA YouTube channel](#) has engaging videos to watch. The [Quesst Mission page](#) shares so many ways to learn more about the X-59 and quiet supersonic research. Get inspired for a career in aerospace and STEM when you start exploring all of this and more. Happy learning!

Aeronautics Crew Highlight

Kate McMurtry, NASA Aeronautics Deputy Director, Integrated Aviation Systems Program



Kate McMurtry has served this country throughout her career starting with her service in the Airforce, then making her way to support the missions of the [NASA Aeronautics Integrated Aviation Systems Program \(IASP\)](#). Read on to learn about her expertise in aviation and her joy of flying both for work and for fun.

"I am the deputy director for ARMD's Integrated Aviation Systems Program. The program focuses on validating concepts and technologies in flight to foster industry adoption, U.S. competitiveness, and overall faster and more efficient air travel for the public.

My path to NASA was forged by leaning into my interests and new experiences. In high school my interests included science, military service, and a college education. Nearing graduation, the U.S. Air Force offered me a college scholarship if I pursued a chemical engineering degree and commissioned as an officer upon graduation. Given that it bridged all my interests, I gladly accepted the offer. Upon college graduation I became a second lieutenant started my active-duty career. I requested to be stationed at Edwards Air Force Base in California for two reasons – the west coast would afford a new experience and Edwards was a place of amazing firsts in aviation.

At Edwards I served as a developmental engineer performing integration and flight test of defense systems for the warfighter. During this time, I noticed NASA Armstrong Flight Research Center (at the time called Dryden Flight Research Center) was co-located on the base and learned of their flight research focus. From early childhood, NASA was a dream of mine to be a part of, but I hadn't seen a path until that moment. So, when my military commitment was nearing its end, I applied to NASA Armstrong and was thrilled to be offered to join. My NASA career has been and continues to be incredibly rewarding. I started as an operations engineer supporting the integration and flight research of supersonic technologies and concepts. Years later I shifted into management and became the chief of the operations engineering branch responsible for the airworthiness of flight vehicles

throughout maintenance and project lifecycles. I pursued new experiences through a detail in the Office of the Center Chief Engineer and another as Deputy Director of Safety & Mission Assurance. As throughout my career, my perspective and skills continue to be sharpened by the expertise and mentorship of the mechanics, technicians, engineers, test-pilots, and leaders I have worked with, and I have been blessed with a variety of memorable experiences to date. Among my favorites is any time I served as a mission controller during a research flight because it marked months or even years of teamwork toward the aeronautics mission of bringing a technology, concept, or idea to flight. One of my favorite sounds continues to be that of an F-15 or F-18 engine spooling up.

A career in flight research inspired me to acquire a private pilot license. I now have single-engine land and single-engine sea ratings, and I recently acquired a tailwheel endorsement. My husband (also a pilot) and I enjoy flying together, whether local to southern California or to national parks across the U.S. Looking forward, I continue to lean into my interests and new experiences and look forward to the growth and lasting memories NASA will afford me next."

NASA Opportunities

Fly with NASA's X-59! NASA Aeronautics Flight Log

Get ready to fly with the Quesst Mission's quiet supersonic research aircraft, the X-59. Taxi tests, the last step before approval for first flight, are being completed now! Don't miss your chance to fly your name with the X-59, hand carried by NASA's lead pilot Nils Larsen. Head to [NASA](#)



[Aeronautics Flight Log](#) to log back in or create a new account and sign up for the X-59 First

Flight Series. Sign up on your own or as a group and check out all the activities and videos to learn more about aeronautics, the X-59, the crew, and more! Earn endorsement stamps when you complete activities. Start building your virtual flight log today. We can't wait to fly with you!

Get the Facts at Aero 101!

Join NASA's Dave Berger and our workforce development team for the monthly NASA Aeronautics 101 session to talk about a NEW topic and all-things-aviation. Learn about NASA Aeronautics projects and missions to bring conceptual engineering, career pathways, and more to your future in aviation. Meet the team on the fourth Wednesday of each month on Microsoft Teams. The next session is on **October 22nd at 6pm ET/ 3pm PT**. Use the information below to join the conversation with Dave, the STEM team, and other NASA experts. If you register in [NASA STEM Gateway](#) to let us know you're coming, you'll receive a copy of the presentation at the end of the session. We look forward to seeing you!

Join us October 22nd!

Meeting ID: 252 856 825 018

Passcode: Hc3md7wh

Meet the Experts! NASA University Leadership Initiative (ULI)

Join NASA ULI and the University of California, Berkeley on the last Thursday of each month for a technical seminar with the Center for Air Transportation Resilience (CATRes). Get firsthand knowledge about ULI's CATRes from UC Berkeley and NASA experts. Learn more about the monthly seminar when you visit the [UC Berkeley CATRes website](#). The next session is **October 30th at 2pm CT/ 11am PT**. Register on Zoom at <https://umich.zoom.us/meeting/register/Atxj>

[TNagRG-CZKvPDECKBA#/registration](#) to join the conversation!

Challenge NOW OPEN! NASA TechRise



Middle and High School students, have you ever thought of

flying a suborbital spaceship or a high-altitude balloon? Get a team together to develop an experiment to fly in one of those vehicles and propose your idea to NASA experts. Selected projects will receive a grant to engineer and test their project to show NASA their skills. Head to the [NASA TechRise Student Challenge webpage](#) to get more information and submit your proposal by **November 3rd, 2025**.

Screening OPENS Oct 6th! NASA Artifacts

The NASA Artifacts office is now accepting educator applications for the next round of screening for requests to have real NASA items from missions, projects, and programs for your classroom or school. These items include astronaut training clothing, shuttle tiles, and more. Now's the time to get your genuine NASA artifact! The screening period for applications will be open from **October 6 – November 4, 2025**. Get your application in early! Check out the [NASA Artifacts webpage](#) to learn more.

OPEN for Registration! Gateways to Blue Skies



The 2026 Gateways to Blue Skies post-secondary challenge is OPEN for registration! The theme this year is RepAir: Advancing Aircraft Maintenance

challenging college to improve efficiency, safety, and/or costs to maintaining aircrafts. Visit the [Gateways to Blue Skies Competition webpage](#) to get more details and submit your notification of intent by **November 4th, 2025**, to

be considered for the final presentation to NASA experts.

Middle & High School Students, Join the Challenge! Dream with Us design Challenge



The 2025-2026 Dream with Us Design Challenge is now underway! This

year NASA and the FAA challenges participants to *Integrate UAS into the Agriculture Industry*. The challenge will look a little different this year with a more focused task for students in grades 9-12. When you head to the Dream with Us webpage, choose the middle school module or the high school module to join the challenge that matches your grade level. **Middle School** student teams must submit their entire project by **December 31st, 2025**. For **High School** student teams, registration closes **November 21st, 2025** and notebooks must be submitted by **January 23, 2026**. Check out the [Dream with Us design challenge webpage](#) for all the details. We are excited to see what students design for the agricultural industry!

Summer Positions Now Available! NASA



Internships

Explore the [NASA Centers and Facilities](#) around the country and near you to spend the summer with NASA experts! Check out the [NASA Internship webpage](#) to find in-person opportunities in a variety of career fields for students and educators. Applications are due **February 27th, 2026**, so get your application in early and don't wait to start earning and learning with NASA. Students 16 years and older are eligible to apply, and educators too!

More Opportunities! Are you interested in other STEM and career connections with NASA? Log in

or create a new account to join [NASA's STEM Gateway](#) to find opportunities that interest you. Check out [NASA Engages](#) to submit a request to connect NASA experts with the community sharing NASA missions and content inspiring students to pursue a career in Aeronautics!

Did you know?

October is National Book Month! Use this month to focus on the importance of reading and literacy. Grab a book and curl up on the couch to get lost in a good story. Need some suggestions? NASA Aeronautics has an entire library of great e-books about the history, people, and science of aviation to get anyone inspired for a future career in aerospace. Use your tablet or computer to check out the [NASA Aeronautics e-book collection](#). NASA has books for all ages including the [Aeronautics Leveled Readers](#) and the [Aeronautics for Littles](#) for young learners that include activities and videos. Learn more about NASA people, missions, programs, and projects when you explore the [NASA e-book library](#).

October 20th is International Air Traffic Controllers Day. On this day, celebrate the people who keep us safe in the air and on the ground. Their dedication to aircraft maintenance is paramount in keeping the airspace safe for everyone and everything. NASA Aeronautics has a great program for students called Smart Skies: LineUp with Math, which teaches the basics of air traffic control using critical thinking skills and the mathematical relationship between distance, rate of speed, and time. When you're done with [LineUp with Math](#), explore the [Smart Skies webpage](#) to play and learn more about air traffic, effects of weather on aviation, airports and infrastructure, Aeronautics careers, and more!

Links to our Aeronautics STEM Resources:

[Aeronautics STEM Page](#): (all ages) This link takes you to a wide variety of educator resources, Aeronautics@Home, ebooks, National Academies Reports, webinars, lithographs and mini posters, the NASA Aeronautics Research Institute, and more.

[Aeronautics@Home](#): (K-12) This web page contains aeronautics-based activities, videos, games, and more that can be completed at home, in the classroom, or in any number of settings. Topic areas include: "Build It!" "Make It!" "Explore It!" "Watch It!" "Solve It!" "Color It!" "Read It!" "Craft It!" and "En Español".

[Aeronautics Innovations Challenges](#): Keeping up with our many design challenges and opportunities for both post-secondary and K-12 can be tough. In response, we created a "one-stop shop" to pull them all together in one location.

[Flight Log Experience](#): (K-12, post-secondary, general public) Sign up to send your name with NASA Aeronautics on X-planes, UAS flights, and more as you build your virtual NASA flight log. Earn virtual endorsement stamps and mission patches and access aeronautics STEM activities and resources. Educators can sign up their entire class.

[Museum and Informal Education Alliance](#): (Informal Educators and Museums) Not in a classroom? Looking for informal education materials? Join NASA's Museum and Informal Education Alliance, where you have access to NASA resources—including aeronautics—for your program, organization, museum, science center, or library. Find out about events happening near you and in the virtual world, and let the MIE Alliance help you build your programs! Access to guest speakers, the latest announcements about grant programs, and an active community network allow you to connect with other like-minded people in a supportive, engaging, and aerospace-focused neighborhood.

[NASA Aeronautics for Educators Facebook Page](#): (K-12, post-secondary) Join our NASA Aeronautics for Educators Facebook page, where the latest aeronautics updates, professional development opportunities, lessons and ideas are freely shared.

[NASA Connects](#): (K-12, post-secondary) NASA Connects is a network of educators who come together to collaborate, share NASA resources, and create personal collections of materials that can then be shared with others. Members can join groups tailored to their specific interests.

[NASA Express Sign-Up](#): (K-12, post-secondary) Have you signed up for NASA's NASA EXPRESS weekly newsletter? This newsletter contains the latest information for educators (K-12 and post-secondary) about new resources, design challenges, internships, and workshops. It is THE go-to for the latest STEM news.

[Space to Learn](#): (K-12, post-secondary, educators, general public) Need more resources from a variety of contents? NASA has a page full of learning resources from all projects and programs at NASA.

National Aeronautics and Space Administration

Headquarters
300 E. Street, SW
Washington, DC 20546

www.nasa.gov/aeroresearch