



NASA Aeronautics

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Monthly STEM Newsletter

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NASA's X-59 quiet supersonic research aircraft sits on the ramp at Lockheed Martin Skunk Works in Palmdale, California during sunrise, shortly after completion of painting. Credit: NASA

September 2025

The school year has swept in at supersonic speeds, Aeronauts, and in alignment with that, we have an X-59 Special Edition to share with you! NASA's supersonic research aircraft, the X-59, is passing all tests and getting ready for first flight. We are so close to seeing what all the X-59 can do and we have some great opportunities to share with you! Don't miss this month's Aeronautics Crew Highlight, David Richwine, one of the engineers who has been working on the X-59 and the whole mission. The Quesst mission has been working with Lockheed Martin's Skunk Works to make sure X-59 is in tip-top shape ready for the big day. Be sure to check out the STEM Opportunities section for all the deadlines coming up this month. If you haven't already signed up with NASA Aeronautics Flight Log, get your account set up today—you are running out of time to sign yourself and your students up for the X-59 first flight series! Earn special endorsement codes and mission patches when you complete X-59 activities and watch our YouTube shorts, *59 seconds on NASA's X-59*. Read on to learn more.

Do 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 or holly.o.gutierrez@nasa.gov.

All About the X-59

September 2025

NASA's X-59 is getting ready to fly faster than the speed of sound but with a quieter boom which we've nicknamed a "sonic thump." The X-59 is a quiet supersonic research aircraft built with the help of Lockheed Martin's Skunk Works in Palmdale, California.

In 1973 supersonic flight was banned over land by the Federal Aviation Administration (FAA) in the United States since sonic booms were causing disruption to human and animal life. While there are plans to lift that ban, the Quesst team is still dedicated to minimizing the disruption from supersonic flight by reducing noise from the sonic boom to ensure communities and animals are less affected.

About the aircraft: the X-59 is a single pilot, 99.7-foot-long, 29.5-foot-wide aircraft powered by a single engine, designed to fly as fast as Mach 1.4 (925 mph) at a height of 55,000 feet above sea level.

To design the X-59, scientists, engineers, and technologists first used scaled models to gain insight into the aircraft's abilities. Computational fluid dynamics, a type of computer modeling, helped the team understand the flow of sound-generating molecules around the aircraft. Schlieren photography was used to show how the pressure waves pushed those molecules out of the way and will be used during the actual aircraft's flight tests. Each model was put to the test in NASA wind tunnels to decide which design achieved the best results in quieting the noise produced by supersonic flight. Learn more about the science behind the mission on the [Quesst Mission webpage](#).

At NASA, all missions are completed by a team of dedicated people and the Quesst mission is

no exception. From across the country, teams from the Ames Research Center, the Armstrong Flight Research Center, the Glenn Research Center, and the Langley Research Center came together with Lockheed Martin's Skunk Works to create an experimental aircraft designed to quiet the sonic boom to a sonic thump. NASA's [The Quiet Crew videos](#) showcase some of the people that work behind the scenes to ensure the X-59 is ready to safely fly in the air.

Watch NASA's new shorts series, [59 Seconds on NASA's X-59](#) to hear Nils Larson, the lead test pilot, talk about different parts of the X-59 and how she is designed to fly. There are 7 episodes talking about the Engine Run, Life Support Gear, and Aluminum Bird Testing, to name a few. Learn about the science behind the X-59 through engaging activities created by the NASA STEM team. Use the [Quesst Supersonic STEM Toolkit](#) filled with activities and videos about sound and supersonic flight to inspire learners of all ages. Use the [Design Your Own X-Plane activity](#) to explore different types of research aircraft.

X-59 First Flight is on the Horizon! Time is running out to sign up for the NASA Aeronautics Flight Log

Have you watched the NASA shorts series, "[59 Seconds on NASA's X-59](#)" with Nils Larson? After the videos, find special endorsement codes in the video description to enter into your Flight Log. Don't have a [NASA Aeronautics Flight Log](#) account yet? Sign up today on your



own or as a group to send your name flying with the X-59 First Flight Series.

After you sign up and enter your special codes into your flight log, check out all the activities and videos to learn more about aeronautics, the X-59, the crew, and more! Earn more endorsement stamps when you complete activities. Earn mission patches when you complete a whole series of activities. We can't wait for you to fly with us. Don't miss out on the fun, so sign up today!

Aeronautics Crew Highlights

David Richwine, NASA Aeronautics Deputy Project Manager for Technology



David Richwine serves as the Quesst Mission Integration Lead and Low Boom Flight Demonstrator (LBFD) Deputy Project Manager for Technology, coordinating technical requirements and capabilities across the mission.

Experience

David has worked in aeronautics research for a combined 40 years at both the Langley Research Center in Hampton, Virginia, and Dryden Flight

Research Center (now Armstrong Flight Research Center) in Edwards, California. During his 17 years at Dryden, he worked on several research projects including the F-18 High Alpha Research Vehicle and F-15B Aeronautics Research Testbed. He also served as Dryden's Project Manager for the Defense Advanced Research Projects Agency's Quiet Supersonic Platform program and F-5E flight test.

After moving to Langley in 2003, David served in several positions supporting NASA's supersonics research. In 2012, Richwine was the planning lead and then managed the low-boom flight demonstrator concept studies which ultimately evolved into the X-59 aircraft's preliminary design.

Education

David received his bachelor's degree in mechanical engineering from the University of Virginia in Charlottesville, Virginia, and earned his master's degree in engineering administration from George Washington University in Washington, D.C.

NASA Opportunities

Annual Student Challenge! New theme! Join the Dream with Us Design Challenge

Opening Sept. 26th, 2025. Middle and high school teams--join the Dream with Us Design Challenge. For 2025, we are challenging participants with **Aviation in Agriculture**. This year we have ramped up our high school challenge, collaborating with the FAA and Embry Riddle to give participants a more rigorous challenge. Head over to the [Dream with Us design challenge webpage](#) and choose the middle school or high school module (note that teams with mixed grade level participants will enter the challenge that aligns with the oldest team member). Check out the

site for more challenge details and upcoming information sessions. We are excited to see what students dream up for the agricultural industry!

Deadline This WEEK! University Days at Glenn



University Days is right around the corner! Register by **September 5th, 2025** for this virtual event especially for graduate and undergraduate students. Participate in a live workshop, get details about NASA internships, and engage in a Q&A with current and former interns, and NASA Glenn experts. Visit the [University Days at Glenn webpage](#) for more details.

High School Students:

Get Your Applications in TODAY! NASA Glenn High School Capstone Projects

Algae and aviation?? That's right! Don't miss the chance to study algae with NASA Aeronautics. NASA scientists at the Glenn Research Center are researching harmful algal blooms using uncrewed aerial vehicles (UAVs) equipped with remote sensors. This is an incredible opportunity for students in grades 9-12. Get your application in today to get a chance to work closely with NASA experts. The [Glenn High School Capstones webpage](#) has all the information and [NASA STEM Gateway](#) is the place to apply before the deadline on **September 19th, 2025**.

Calling all Texas 11th Graders! High School Aerospace Scholars



Texas High School Juniors, don't miss this opportunity to engage with NASA's Johnson Space Center in Houston, Texas. The High School Aerospace Scholars program is open now, but

the deadline is coming up soon! Gain skills in coding, CAD, and engineering to fuel a future career in aerospace. Visit the [High School Aerospace Scholars website](#) for more information and learn how to apply by **September 24th, 2025**.

Get the 411 at Aero 101! NASA Aeronautics 101

Dave Berger is hosting another monthly NASA Aeronautics 101 session to talk about a NEW topic and all things Aeronautics. Gain insight on NASA projects and missions to bring conceptual engineering, career pathways, and more to your students. Join us on the fourth Wednesday of each month via Teams. The next session is on **September 24th at 6pm ET/ 3pm PT**. It's easy to join-- use the information below to join the conversation. 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 September 24th!](#)

Meeting ID: 252 856 825 018

Passcode: Hc3md7wh

Apply Today! GoAero



GoAero is looking for aeronautics innovators to create a UAV (uncrewed aerial vehicle) to help first responders battle emergencies. Create an autonomous vehicle that is fast and safe to deploy in emergency situations. Visit the [GoAero competition page](#) to get all the info. Submit your project by **September 30th, 2025** to show NASA how you can help save lives!

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?

September 9th is International Sudoku Day! Sudoku is a 9x9 grid with numbers in each row and column. The goal is to fill up each 3x3 sub grid with the numbers 1-9 without repeating numbers in any row or column. Sudoku puzzles are a game of logic using pattern recognition and problem-solving skills to complete the puzzle. The NASA Aeronautics team created an [X-plane Sudoku puzzle](#) that will have you flying! Check out other logic puzzles like the

[Aeronautics Cryptograms](#), [Aeronautics Hidden Words](#), and the [X-59 Crossword Puzzle](#) to exercise your brain muscles.

September 15th is World Engineer's Day. Engineers use science and mathematics to design, test, build, and maintain structures and machines like airplanes and spacecraft. At NASA there are many engineers who have dedicated their careers to improve the future of aviation and put humans in space. NASA Aeronautics honors those engineers everyday for working tirelessly to ensure the future of aviation is safe, efficient, and accessible to all. Get inspired for a future career as an engineer with some of the NASA Aeronautics STEM activities such as [Design Your Own X-Plane](#), [Make an Aeolipile \(Hero Engine\)](#) with recycled materials, or [Power It Up](#) when you make your own battery with pennies. Explore more engineering activities on the [Aeronautics STEM webpage](#) and build something today!

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.

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