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**HAPPY
LABOR DAY**

Labor Day: From Protest to National Holiday

The first Monday in September was declared a national holiday, named Labor Day in 1894. It is an annual celebration of the social and economic achievements of American workers.

The roots of Labor Day grew out of violent clashes between labor and police during the Haymarket Riot in 1886. At that time, working conditions in the country's factories, railroads, mills, and mines were grim. Employees, including children, were often required to work 12 or more hours a day, six days a week, in crowded, poorly ventilated spaces. Thousands of workers in Chicago took to the streets to demand eight-hours a day, five days every week. It was America's first true nationwide strike and a major milestone for the labor movement.

<https://www.flickr.com/photos/chicagocrimescenes/7199922974>



This memorial statue visible in the photo was erected at the spot where Samuel Fielden was speaking when riot broke out. Located on North Des Plaines Street between Randolph Street and Couch Place

Labor Day: From Protest to National Holiday

Only the United States and Canada observe Labor Day, the reason comes from the above complex history. This distinguishes them from the rest of the world, where Workers' Day typically coincides with May Day, observed on May 1

This is one of the most important histories for the world. One reason is that we take much of it for granted, not just in the way of employment and labor rights but our entire legal system and the legacies of labor and conflict.

Now Labor Day in the United States is not only a time for barbecues, travel, shopping, and family gatherings, but also a day to honor the struggles of past generations who fought for workers' rights and better conditions. It commemorates the labor movement's efforts, such as securing the eight-hour workday, safer workplaces, and fair wages, that shaped the protections and benefits workers enjoy today. While many people spend the long weekend relaxing or celebrating the end of summer, Labor Day also carries the deeper meaning of remembering those who stood up for justice and dignity in the workplace.



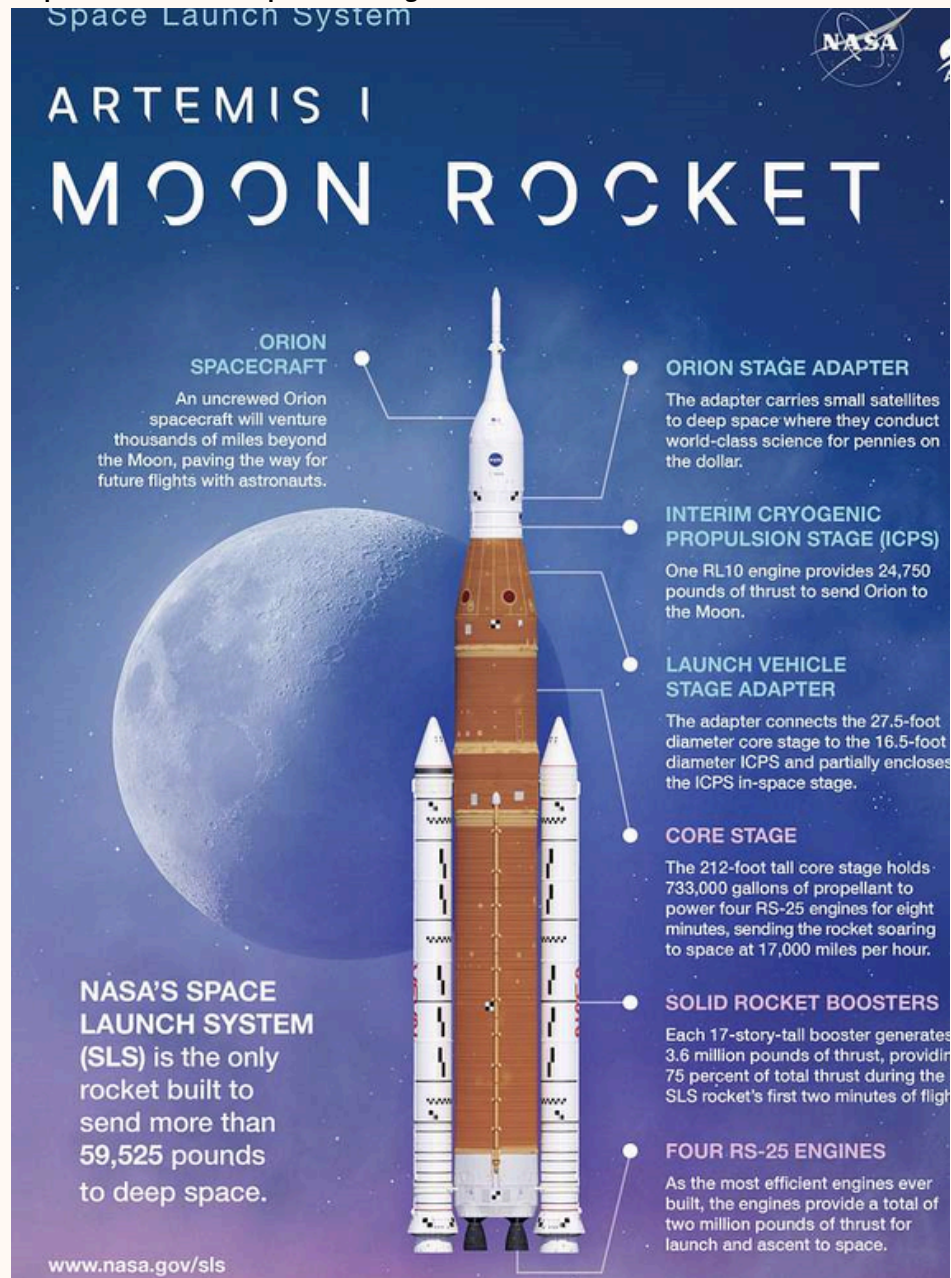
The Artemis Generation: Humanity's Return to the Moon

As a high school student of this generation, I had imagined humans left their footprints on the moon half a century ago. However, since the Apollo Program, humans have not made any new big progress, it seems we are farther away from the Moon. Now NASA's Artemis Program will start a new chapter in space exploration. It will not only plant flags and take photos, but also build a sustainable lunar base, so humans can use it as a stepping stone to explore farther space.

The Artemis I project began in November 2022, it was only an essential test flight without astronauts on it. NASA used this test to prove the new powerful rocket was safe before astronauts could ride it. The Orion spacecraft was launched for a 25-day mission that circled the Moon. Its most important challenge was reentrancing the earth while it flew through Earth's atmosphere at 25,000 miles per hour. Its heat shield had to withstand temperatures of nearly 5,000°F. The shield will protect astronauts and survive in missions.

The right picture shows space launch system which includes from top to bottom: Orion spacecraft, Orion stage adapter, interim cryogenic propulsion stage, launch vehicle stage adapter, core stage, solid rocket boosters, four RS-25 engines.

<https://www.flickr.com/photos/chicagocrimescenes/7199922974>

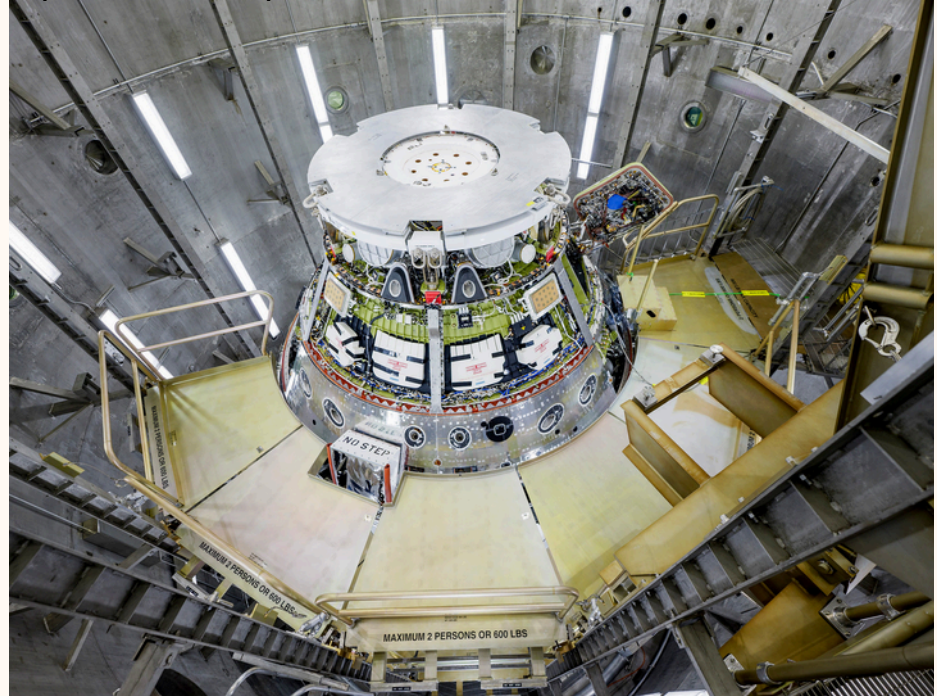


NASA planned the Artemis II project and will launch a new spacecraft with four astronauts on board in 2026. The mission will take 10 days to fly around the Moon, but will not land. Artemis II will be used to test Orion's life-support, communication, and navigation systems with a human crew in the harsh environment of deep space.

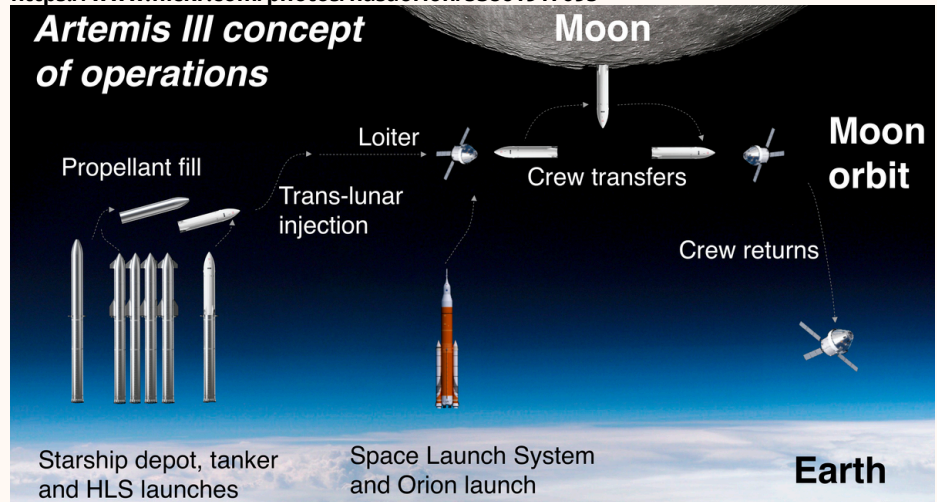
Artemis III will be the most exciting mission. Two astronauts are expected to land near the Moon's south pole where it has never before been visited by humans. Scientists believe there are vast quantities of frozen water under this place. Water ice is a game-changer because it can provide drinking water, breathable air, and even be broken down into hydrogen and oxygen for rocket fuel. This could make it possible to build a long-term lunar base. The astronauts will spend about a week exploring, deploying new scientific instruments, and using new, more flexible spacesuits to study the geology of this unique region.

Artemis is not only a series of science missions for our high school students of this generation, it is also an invitation to ask us to pursue studies in science, technology, engineering, and math (STEM). The Apollo Program inspired millions fifty years ago, and now Artemis carries that same powerful spirit to inspire us. It's not just about future astronauts; it requires engineers, coders, biologists, and creative thinkers to solve thousands of complex problems. That is why our generation is often called the Artemis Generation.

<https://www.flickr.com/photos/nasaorion/53861917095>



<https://www.flickr.com/photos/nasaorion/53861917095>



Unforgettable Meal at Zuzu in Napa

In the summer, during our family trip to Napa, we stumbled upon Zuzu, a cozy Spanish restaurant in the heart of downtown. The moment we stepped in, we were enveloped by a warm atmosphere: wooden tables, soft lighting, and colorful artwork. We felt casual, bustling, and absolutely perfect for a family sharing a good meal together.



The food is what truly made our evening. We ordered a variety of plates to share, here are several delicacies we still want to taste again:



Zuzu Bacalao:

We started with this incredible salted cod spread. It was so creamy and savory, blended perfectly with herbs and olive oil. Paired with the toasted bread, it was the perfect introduction to Zuzu's flavors.

Flat Iron Steak:

This dish was a masterpiece. The steak was unbelievably juicy and tender with a perfectly charred crust, topped with fresh herbs. It was a simple yet stunning dish that paired wonderfully with a local red wine.

**Paella del Día:**

As the centerpiece of our table, the paella did not disappoint. Made with authentic Bomba rice, it had absorbed all the rich flavors of the seafood broth and was generously topped with fresh clams and other seafood.

**Queso Frito:**

This was a favorite for the whole family. The pan-fried Manchego cheese was crispy on the outside and wonderfully gooey on the inside. The roasted poblano and guajillo sauce it came with provided a bold, delicious balance of creaminess and spice.



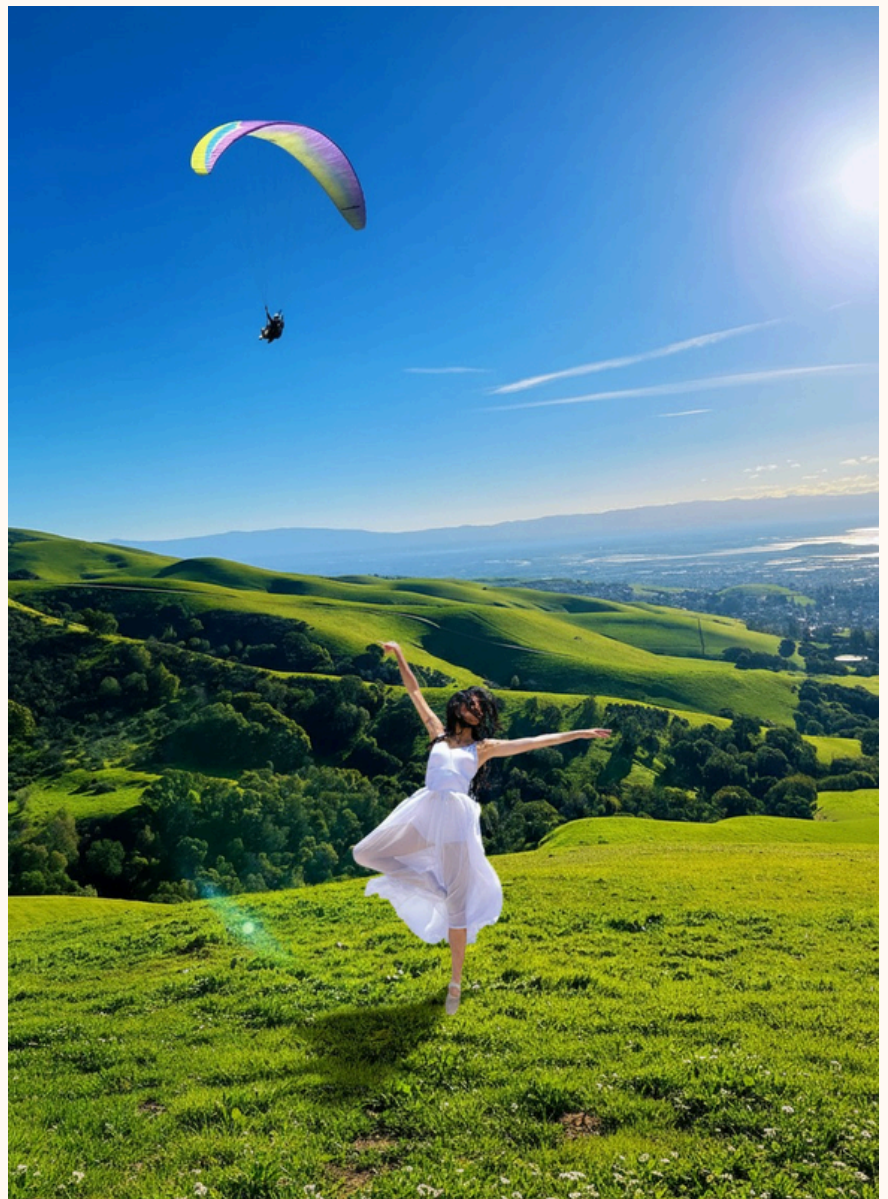
Our family enjoyed an unforgettable dinner at Zuzu during this Napa trip. If you're planning a trip to Napa, we highly recommend you taste the above food.

A First Look at Google's Gemini 2.5 Flash Image Model

Recently, a new model was just released in Google's AI Studio: the Gemini 2.5 Flash Image preview. This model, possibly the mysterious project named "nano banana", has special image generation and editing capabilities. In particular, it is good at multi-image referencing and precise object control, combined with a uniquely practical "Snap-to-Recipe" feature, shows that artificial intelligence has made huge step forward.

Powerful multi-image reference and fusion

Unlike traditional text-to-image or image-to-image processes of other AIs, one of the most striking features of the Gemini 2.5 Flash Image model is the ability to use multiple images as references, then It can pick specific elements from these references images and seamlessly fuse together based on user instructions. This powerful capability marks a significant advancement in AI image generation.



Example:

Author: Zhiyu Wen

To help the AI better understand commands, users can assign labels to different reference images. Here's an example from my test:

Image A: a photo with green grass

Image B: a photo with a soaring parachute

Image C: a photo with dancing girl

By giving the model an instruction, it successfully picked three elements and fused into a new picture: placing the person from Image C onto the grassy field in Image A, and positioning the soaring parachute from Image B in the background of Image A.



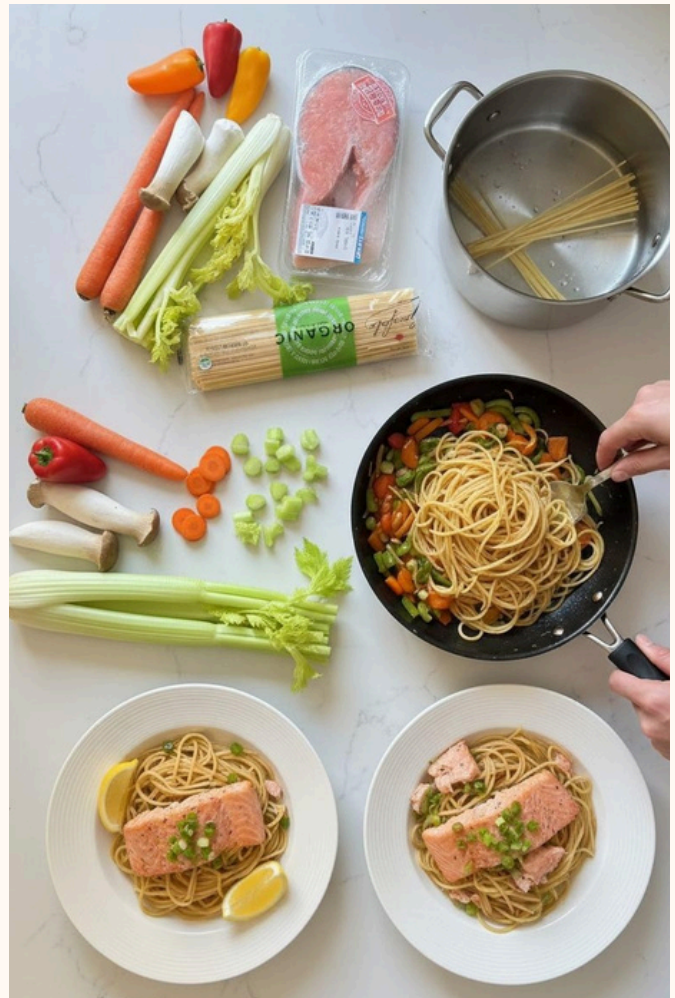
<https://www.pexels.com/photo/woman-dancing-in-white-dress-20187457/>



This special creative ability greatly broadens the boundaries of artistic expression, allowing users to act like directors free select the best “actors” from different photos and film into one target image.

Your Smart Cooking Assistant

This model has another ability to generate personalized recipes from a single photograph. The process is extremely simple: just take a picture of the ingredients in your fridge, and its advanced technology will instantly and accurately identify everything. Then, Gemini 2.5 Flash acts as your personal chef, recommending a variety of dishes based on what you have, from quick home-style meals to exotic cuisine. This intelligence not only sparks culinary inspiration but also turns limited ingredients into delicious meals, effectively preventing food waste. More importantly, every recipe has a complete cooking guide. It provides gram-accurate ingredient lists, clear step-by-step instructions, detailed nutritional analysis, and practical tips to help you effortlessly balance health and flavor



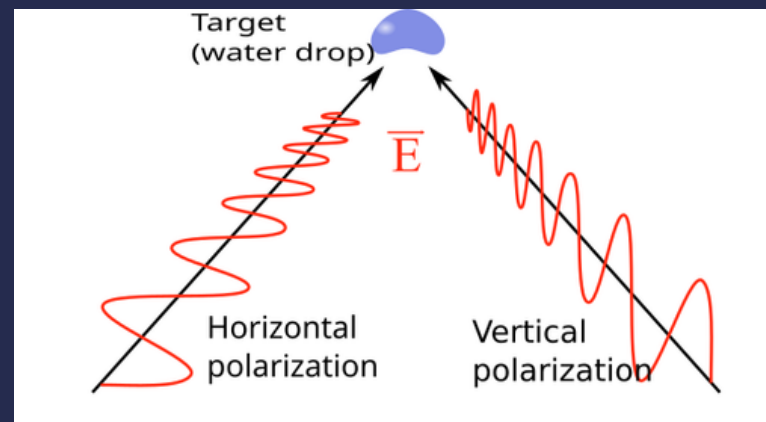
SEEING THE STORM: THE POWER OF NEXRAD PART II

Dual Polarization Upgrade

The original WSR-88D primarily transmitted and received radio waves in a single horizontal plane. This made it challenging to distinguish between types of precipitation or non-weather phenomena. The Dual Polarization upgrade was fully implemented by 2013.

The radar now transmits and receives pulses in both horizontal and vertical directions. By comparing the characteristics (intensity, phase, and correlation) of the horizontal and vertical echoes, the radar can infer the hydrometeors' shape, size, and orientation (water or ice particles).

https://www.wikiwand.com/en/articles/Weather_radar#/media/File:Radar-polarisation_en.svg



Portable & Mobile Doppler Radars

Despite the broad coverage of the NEXRAD network, researchers quickly realized its limitations in capturing the fine-scale, rapidly evolving details of severe storms like tornadoes and downbursts. These phenomena often occur at scales too small and fast. This critical gap led to the development of portable and mobile Doppler radars in the 1990s. The Center for Severe Weather Research (CSWR) helped lead the way in storm research with its well-known Doppler on Wheels (DOW) radar trucks, which collect detailed data on tornadoes and other severe weather right where it happens.

<https://picryl.com/media/a-portable-doppler-radar-provides-weather-surveillance-e0f386>



These systems are smaller, often mounted on trucks or trailers. Their construction allows them to be rapidly transported and deployed. Many use higher frequency X-band radar for greater portability and resolution at short ranges.

The primary advantage is mobility. Researchers can position these radars within proximity to a storm. This enables them to capture incredibly detailed data on wind fields and the precise structure of tornado vortices. While it cannot provide wide-ranging surveillance, the unique data collected by mobile radars is crucial for scientific understanding, improving forecasting models and early warnings, and benefiting everyone. They also provide critical hyperlocal data during high-impact events such as hurricane landfall or localized snowfall.

<https://www.flickr.com/photos/7890429@N03/5173307152>



Future Phased Array Weather Radar

Even with dual polarization and a mobile setup, the mechanical characteristics of the WSR-88D NEXRAD system still present limitations. The physically rotating dish means a full scan of the atmosphere takes several minutes. For rapidly evolving severe weather, a delay of even a minute can be critical. Furthermore, the large, heavy moving parts always cause mechanical failures and require significant maintenance.

Phased Array Weather Radar is the future of weather tracking. It's now being tested in projects like NOAA's National Weather Radar Testbed. This new radar doesn't rely on slow-moving mechanical parts. Instead, it scans the sky electronically, making it much faster and more efficient. Phased Array Radar could solve major problems with older radar systems and better cover significant areas and fast-changing storms.

<https://itoldya420.getarchive.net/amp/media/the-cobra-dane-radar-is-a-single-faced-ground-based-ebc2b2>



- **How it is made and how it works**

- Unlike NEXRAD's single moving dish, a Phased Array Weather Radar consists of a stationary, flat panel composed of thousands of tiny, individual transmitting and receiving elements. It has no significant moving parts but relies on precision electronics.

- **Phased Array**

- The core innovation of the Phased Array Radar is the ability to steer the radar beam without any physical movement. By precisely controlling the phase of the radio waves emitted from each element, the radar can instantaneously beam its beam to any desired point in the sky.

- **Display**

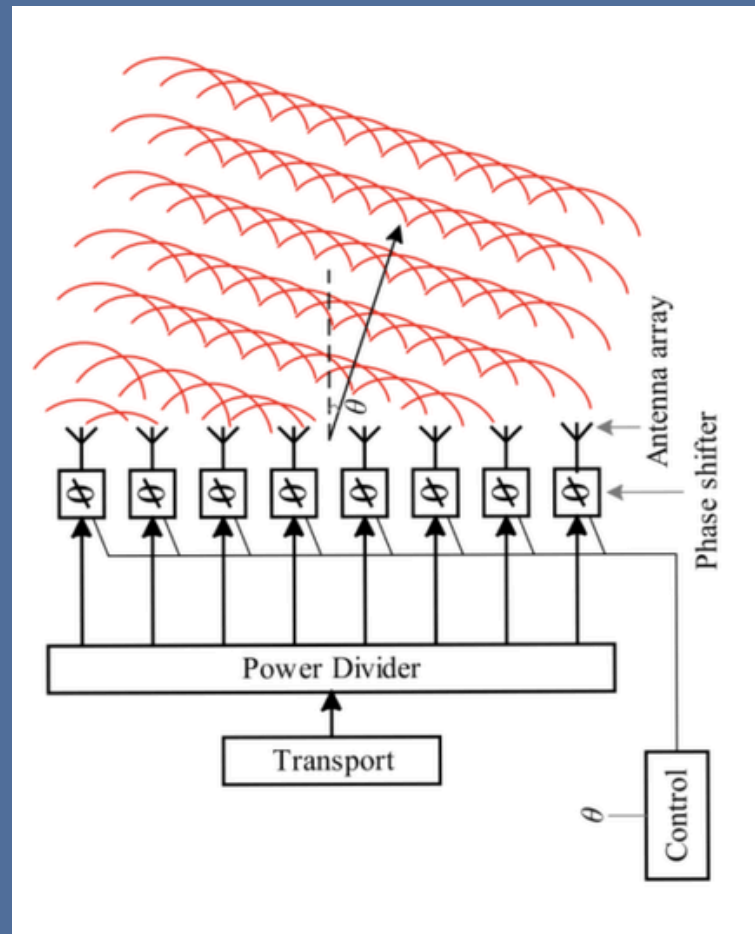
- The most impact on visual display is the sheer speed. Instead of a new 3D scan every two to six minutes, forecasters could see a new, complete, high-resolution picture of a storm every 30 to 60 seconds, or even more frequently. This new technology turns radar images from separate still photos into a smooth, real-time animation of what's happening in the atmosphere.

- **Benefits to people**

- Phased Array Radar significantly increased warning lead times, more accurate alerts, better detection of hail, and three-dimensional real-time monitoring of the atmosphere. Forecasts will be able to monitor the development of severe storms minute by minute, making more confident and life-saving decisions. The phased array radar network is expected to replace the current NEXRAD system

Conclusion

The journey of weather radar, from the foundation of the NEXRAD network to close-range insights provided by the DOW, and on to the speed and adaptivity of Phased Array Weather Radar, is a powerful example of continuous innovation.



<https://easy-peasy.ai/ai-image-generator/images/raw-natures-fury-unpredictable-storm-over-abandoned-barn>





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