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# Introducing Apple Vision Pro: Apple's first spatial computer



Introducing the era of spatial computing with Apple Vision Pro.



CUPERTINO, CALIFORNIA — Apple today unveiled [Apple Vision Pro](#), a revolutionary spatial computer that seamlessly blends digital content with the physical world, while allowing users to stay present and connected to others. Vision Pro creates an infinite canvas for apps that scales beyond the boundaries of a traditional display and introduces a fully three-dimensional user interface controlled by the most natural and intuitive inputs possible — a user's eyes, hands, and voice. Featuring visionOS, the world's first spatial operating system, Vision Pro lets users interact with digital content in a way that feels like it is physically present in their space. The breakthrough design of Vision Pro features an ultra-high-resolution display system that packs 23 million pixels across two displays, and custom Apple silicon in a unique dual-chip design to ensure every experience feels like it's taking place in front of the user's eyes in real time.



Built on the foundation of macOS, iOS, and iPadOS, visionOS is the world's first spatial operating system ↓ that blends digital content with the physical world.

"Today marks the beginning of a new era for computing," said Tim Cook, Apple's CEO. "Just as the Mac introduced us to personal computing, and iPhone introduced us to mobile computing, Apple Vision Pro introduces us to spatial computing. Built upon decades of Apple innovation, Vision Pro is years ahead and unlike anything created before — with a revolutionary new input system and thousands of groundbreaking innovations. It unlocks incredible experiences for our users and exciting new opportunities for our developers."

"Creating our first spatial computer required invention across nearly every facet of the system," said Mike Rockwell, Apple's vice president of the Technology Development Group. "Through a tight integration of hardware and software, we designed a standalone spatial computer in a compact wearable form factor that is the most advanced personal electronics device ever."



Apple Vision Pro utilizes the most advanced materials possible for incredible performance, mobility, and wearability. ↓

## Extraordinary New Experiences

Apple Vision Pro brings a new dimension to powerful, personal computing by changing the way users interact with their favorite apps, capture and relive memories, enjoy stunning TV shows and movies, and connect with others in FaceTime.

**An infinite canvas for apps at work and at home:** visionOS features a three-dimensional interface that frees apps from the boundaries of a display so they can appear side by side at any scale. Apple Vision Pro enables users to be even more productive, with infinite screen real estate, access to their favorite apps, and all-new ways to multitask. And with support for Magic Keyboard and Magic Trackpad, users can set up the perfect workspace or bring the powerful capabilities of their Mac into Vision Pro wirelessly, creating an enormous, private, and portable 4K display with incredibly crisp text.



With visionOS, apps can fill the space around users, be moved anywhere, and scale to the perfect size.  
They even react to lighting and cast shadows.



**Engaging entertainment experiences:** With two ultra-high-resolution displays, Apple Vision Pro can transform any space into a personal movie theater with a screen that feels 100 feet wide and an advanced Spatial Audio system. Users can watch movies and TV shows, or enjoy stunning three-dimensional movies. Apple Immersive Video offers 180-degree high-resolution recordings with Spatial Audio, and users can access an exciting lineup of immersive videos that transport them to entirely new places.

Spatial computing makes new types of games possible with titles that can span a spectrum of immersion and bring gamers into all-new worlds. Users can also play over 100 Apple Arcade games on a screen as large as they want, with incredible immersive audio and support for popular game controllers.



Users can transform any space into their own personal movie theater with a screen that feels 100 feet wide. (Viewers can stream *Foundation* on Apple TV+ with a subscription.)



**Immersive Environments:** With Environments, a user's world can grow beyond the dimensions of a physical room with dynamic, beautiful landscapes that can help them focus or reduce clutter in busy spaces. A twist of the Digital Crown lets a user control how present or immersed they are in an environment.



Immersive Environments allow users to grow their world beyond the dimensions of a physical room with dynamic, beautiful landscapes.



**Memories come alive:** Featuring Apple's first three-dimensional camera, Apple Vision Pro lets users capture, relive, and immerse themselves in favorite memories with Spatial Audio. Every spatial photo and video transports users back to a moment in time, like a celebration with friends or a special family gathering. Users can access their entire photo library on iCloud, and view their photos and videos at a life-size scale with brilliant color and spectacular detail. Every Panorama shot on iPhone expands and wraps around the user, creating the sensation they are standing right where it was taken.



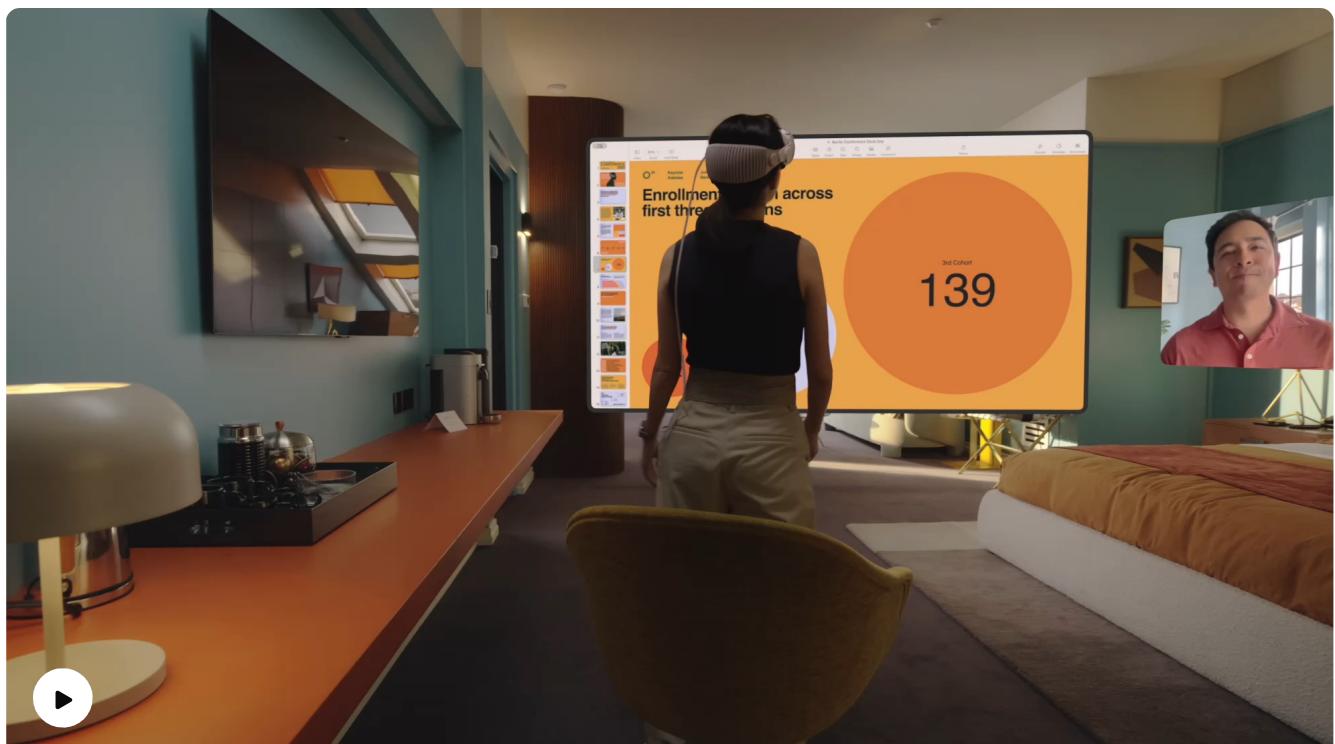
Spatial photos and videos transport users back to a special moment in time.



Stunning panorama photos shot on iPhone expand and wrap around the user, creating the sensation they are standing right where it was taken.

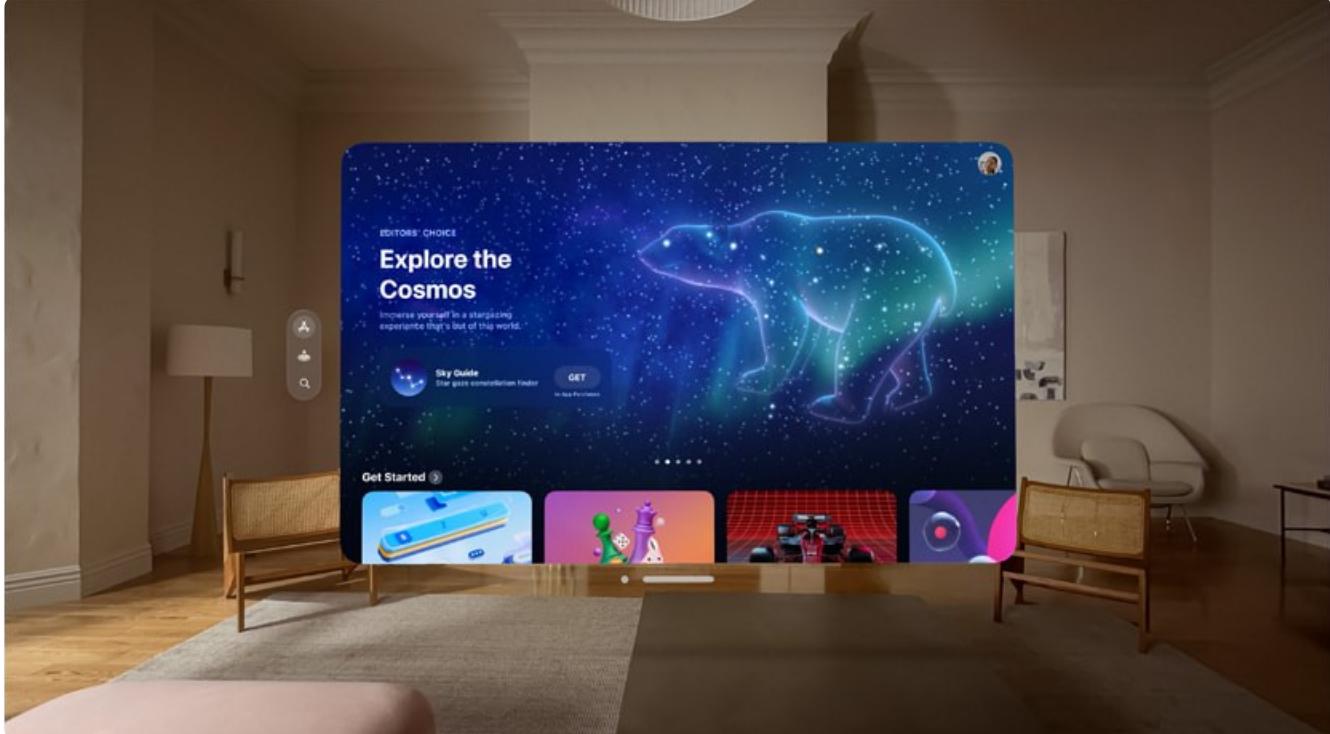


**FaceTime becomes spatial:** With Apple Vision Pro, FaceTime calls take advantage of the room around the user, with everyone on the call reflected in life-size tiles, as well as Spatial Audio, so it sounds as if participants are speaking right from where they are positioned. Users wearing Vision Pro during a FaceTime call are reflected as a Persona — a digital representation of themselves created using Apple's most advanced machine learning techniques — which reflects face and hand movements in real time. Users can do things together like watch a movie, browse photos, or collaborate on a presentation.



FaceTime on Apple Vision Pro makes it easy to connect and collaborate. Video tiles are life-size, and Spatial Audio makes it sound as if participants are speaking right from where they are positioned. 

**Even more app experiences:** Apple Vision Pro has an all-new App Store where users can discover apps and content from developers, and access hundreds of thousands of familiar iPhone and iPad apps that run great and automatically work with the new input system for Vision Pro. Apple's developer community can go even further and take advantage of the powerful and unique capabilities of Vision Pro and visionOS to design brand-new app experiences, and reimagine existing ones for spatial computing.



visionOS introduces an all-new platform for developers to create amazing app experiences. And with the App Store on Apple Vision Pro, it's easy for users to discover new apps or access hundreds of thousands of familiar iPhone and iPad apps at a larger-than-life scale.



## A Revolutionary Operating System and User Interface

Built on the foundation of decades of engineering innovation in macOS, iOS, and iPadOS, visionOS was designed from the ground up to support the low-latency requirements of spatial computing. The result is a revolutionary operating system that delivers powerful spatial experiences that can take advantage of the space around the user, unlocking new opportunities at work and at home.

visionOS features a brand-new three-dimensional interface that makes digital content look and feel present in a user's physical world. By responding dynamically to natural light and casting shadows, it helps the user understand scale and distance. To enable user navigation and interaction with spatial content, Apple Vision Pro introduces an entirely new input system controlled by a person's eyes, hands, and voice. Users can browse through apps by simply looking at them, tapping their fingers to select, flicking their wrist to scroll, or using voice to dictate.



The revolutionary visionOS features a brand-new three-dimensional interface that users can magically control with their eyes, hands, and voice. ↓

Apple Vision Pro also features EyeSight, an extraordinary innovation that helps users stay connected with those around them. When a person approaches someone wearing Vision Pro, the device feels transparent — letting the user see them while also displaying the user's eyes. When a user is immersed in an environment or using an app, EyeSight gives visual cues to others about what the user is focused on.



Even when fully immersed, EyeSight allows users to stay connected to those around them while wearing Apple Vision Pro. ↓

## Breakthrough Design

Apple Vision Pro builds on Apple innovation and experience designing high-performance products like Mac, iPhone, and wearables like Apple Watch, culminating in the most advanced personal electronics device ever. To achieve ambitious goals for performance, mobility, and wearability, Apple utilized the most advanced materials possible.

Apple Vision Pro has an astonishing amount of technology in a compact design. A singular piece of three-dimensionally formed and laminated glass is polished to create an optical surface that acts as a lens for the wide array of cameras and sensors needed to blend the physical world with digital content. The glass flows into the custom aluminum alloy frame that gently curves around the user's face, while the modular system allows for a tailored fit to accommodate a wide range of people. The Light Seal is made of a soft textile, and comes in a range of shapes and sizes, flexing to conform to a user's face for a precise fit. Flexible straps ensure audio remains close to the user's ears, while a Head Band — available in multiple sizes — is three-dimensionally knitted as a single piece to provide cushioning, breathability, and stretch.<sup>1</sup> The band is secured with a simple mechanism, making it easy to change to another size or style of band.



From left to right: The glass of Apple Vision Pro flows seamlessly into the custom aluminum alloy frame, gently curving around the user's face, while a modular system of parts — including the Light Seal and Head Band — allows for a tailored fit.





Apple Vision Pro is designed to sustain high-performance workloads and is capable of running for two hours on a single charge. ↓

## Unrivaled Innovation in Hardware

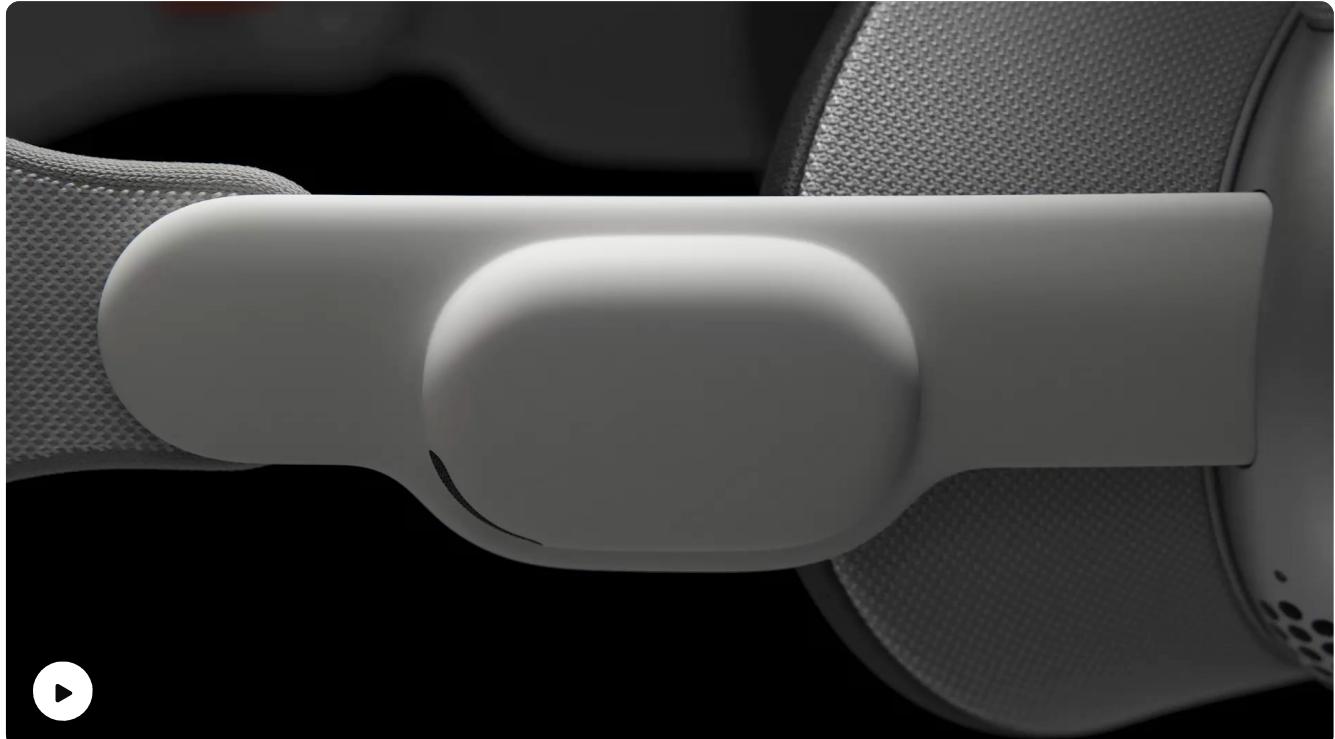
Apple Vision Pro is designed to deliver phenomenal compute performance in a compact wearable form factor. Featuring a breakthrough ultra-high-resolution display system built on top of an Apple silicon chip, Vision Pro uses micro-OLED technology to pack 23 million pixels into two displays, each the size of a postage stamp, with wide color and high dynamic range. This technological breakthrough, combined with custom catadioptric lenses that enable incredible sharpness and clarity, delivers jaw-dropping experiences. Users with vision correction needs will use ZEISS Optical Inserts to ensure visual fidelity and eye tracking accuracy.<sup>2</sup>



Apple Vision Pro features an ultra-high-resolution display system that packs 23 million pixels across two displays — more than a 4K TV for each eye — and the brand-new R1 chip, for a virtually lag-free, real-time view of the world.



An advanced Spatial Audio system is core to the Apple Vision Pro experience, creating the feeling that sounds are coming from the environment around the user and matching the sound to the space. Two individually amplified drivers inside each audio pod deliver Personalized Spatial Audio based on the user's own head and ear geometry.<sup>3</sup>



Featuring the most advanced Spatial Audio system ever, Apple Vision Pro creates the feeling that sounds are coming from the environment around the user. Dual-driver audio pods positioned next to each ear deliver personalized sound and adapt to the environment.



In addition to creating a breakthrough display and advanced audio experiences, the high-performance eye tracking system in Apple Vision Pro uses high-speed cameras and a ring of LEDs that project invisible light patterns onto the user's eyes for responsive, intuitive input.

These groundbreaking innovations are powered by Apple silicon in a unique dual-chip design. M2 delivers unparalleled standalone performance, while the brand-new R1 chip processes input from 12 cameras, five sensors, and six microphones to ensure that content feels like it is appearing right in front of the user's eyes, in real time. R1 streams new images to the displays within 12 milliseconds — 8x faster than the blink of an eye. Apple Vision Pro is designed for all-day use when plugged in, and up to two hours of use with its external, high-performance battery.



The groundbreaking innovations in Apple Vision Pro unlock magical new experiences at work and at home.



## Industry-Leading Privacy and Security

Apple Vision Pro is built on a strong foundation of privacy and security, and keeps users in control of their data.

Optic ID is a new secure authentication system that analyzes a user's iris under various invisible LED light exposures, and then compares it to the enrolled Optic ID data that is protected by the Secure Enclave to instantly unlock Apple Vision Pro. A user's Optic ID data is fully encrypted, is not accessible to apps, and never leaves their device, meaning it is not stored on Apple servers.

Where a user looks stays private while navigating Apple Vision Pro, and eye tracking information is not shared with Apple, third-party apps, or websites. Additionally, data from the camera and other sensors is processed at the system level, so individual apps do not need to see a user's surroundings to enable spatial experiences. EyeSight also includes a visual indicator that makes it clear to others when a user is capturing a spatial photo or video.

### Pricing and Availability

Apple Vision Pro starts at **\$3,499** (U.S.), and will be available early next year on [apple.com](https://apple.com) and at Apple Store locations in the U.S., with more countries coming later next year. Customers will be able to learn about, experience, and personalize their fit for Vision Pro at Apple Store locations. For more information about Vision Pro, visit [apple.com/apple-vision-pro](https://apple.com/apple-vision-pro).

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Apple revolutionized personal technology with the introduction of the Macintosh in 1984. Today, Apple leads the world in innovation with iPhone, iPad, Mac, Apple Watch, and Apple TV. Apple's five software platforms — iOS, iPadOS, macOS, watchOS, and tvOS — provide seamless experiences across all Apple devices and empower people with breakthrough services including the App Store, Apple Music, Apple Pay, and iCloud. Apple's more than 100,000 employees are dedicated to making the best products on earth, and to leaving the world better than we found it.

1. Accessories are sold separately.
2. ZEISS Optical Inserts are sold separately.
3. Personalized Spatial Audio requires an iPhone with a TrueDepth camera to create a personal profile.

This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

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