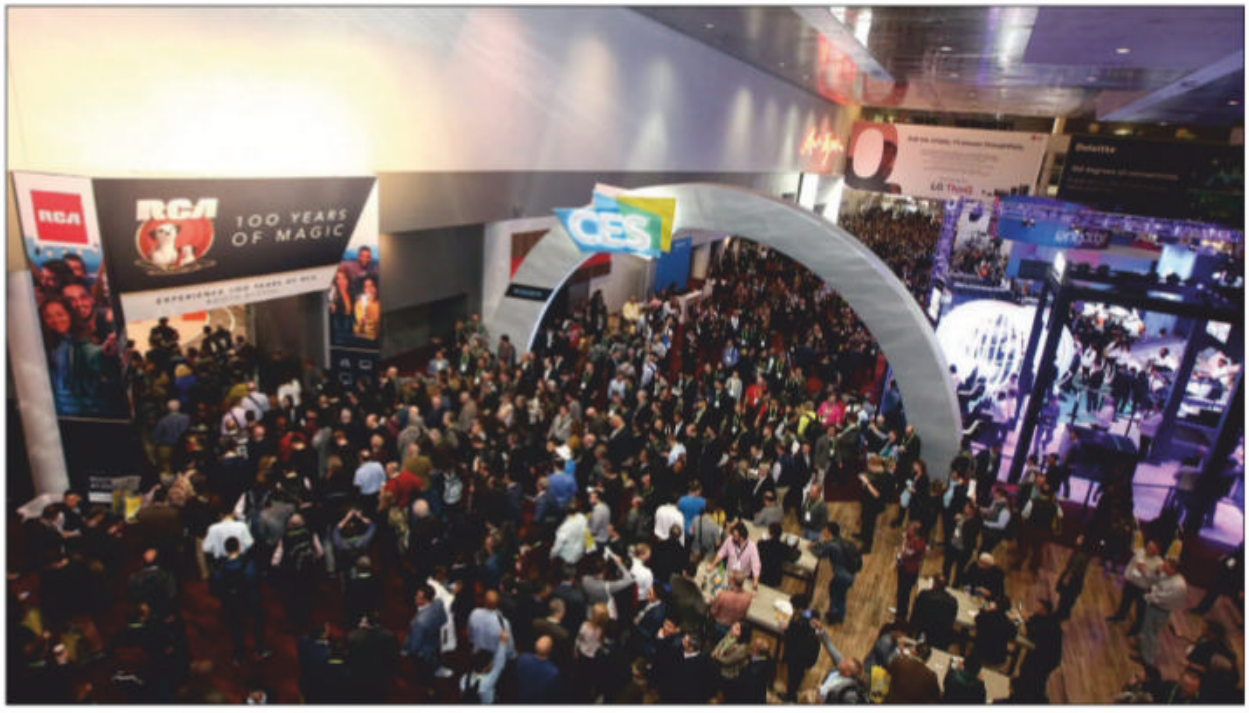
Best of CES 2019

The coolest PCs, PC components, and PC spectacles we saw at this year's event. TECH ADVISOR STAFF



Put aside all misconceptions that CES is a smart home show, a home entertainment show, or even a car stereo show. CES is a computer show, and we've got the battle scars to prove it. Our intrepid reporters immersed themselves in all the laptops, chips, components, accessories, and outright PC monstrosities they could find. Here are our favourites.

Nvidia GeForce RTX 2060

Nvidia groin-kicked cost-conscious gamers when it introduced its GeForce RTX 2070, RTX 2080 and

RTX 2080 Ti at far higher prices than their older counterparts. Even worse, there was no ray trace-ready option for mid-range gamers. Well, it appears Nvidia heard the howls of anger and decided to introduce the RTX 2060, the first card capable of hybrid ray tracing at an almost reasonable £329 from **fave.co/2AYDD7m**. Our colleagues at PCWorld were able to review the RTX 2060 before its grand CES unveiling, and gave it 4.5 out of 5 stars – see **fave.co/2TfBGuk**. Then, bam, the card was just about everywhere at CES seemingly moments after Nvidia announced it.

Thanks to driver and game improvements since the original RTX Turing launch, the card can run hybrid ray-traced games at decent frame rates. Of course, this doesn't allay fears of a dearth of ray tracing-enabled games, but the good news is the RTX 2060 is about as fast as a GeForce GTX 1070 Ti, which still fetches £419 from **fave.co/2Wb8Kpb**.

Nvidia GeForce RTX for laptops

GeForce RTX is too hot, and too power-hungry for laptops, they said. Well 'they' were wrong. Nvidia proved all the naysayers to be, well, nay, by not just introducing GeForce RTX GPUs in laptops, but by introducing 40 different designs that have its newest mobile GPU. While there are still questions about how well mobile RTX performs, you can't dispute that 40 wins is quite an accomplishment. We saw dozens of laptops running the new GPU, and running hybrid ray tracing at that. The last hurdle, of course, will be pricing. But in talks with multiple hardware partners, we learned that the price increase tied to the GPU alone is

small (though, other components drive up laptop costs, and those could make RTX laptops quite pricey). Even if you're a hater, you have to respect that Nvidia pulled off a hell of a feat, and as much as some people would want to dismiss it, hybrid ray tracing isn't going away.

Acer Swift 7 (2019)

Acer's Swift 7 already held the crown for the thinnest, lightest mainstream laptop around, but the Acer Swift 7 (2019) lightens it to 890g. That's simply insane.

If that's all that Acer accomplished with the latest Swift 7, that would probably be enough to win a Best of CES award. But Acer didn't stop there. No, it also sliced the display bezels down to just 2.57mm, enough so that the screen almost appears to cover the entire display.



Acer Swift 7 (2019)

There's more. Acer's Swift 7 (2018) lacked a clickable touchpad, a serious deficiency that the Swift 7 has rectified in the 2019 version (also known as model SF714-52T). Add to that a new Intel 'Whiskey Lake' processor and Thunderbolt 3 ports. We're incredibly eager to get our hands on a new Swift 7 for final testing. It looks like it will be as fun to use as it is to look at.

Acer Predator Triton 900

When Acer first revealed the Predator Triton 900 concept in 2018, the crazy, swivel-display gaming laptop was hidden under glass – because that's how you show off hardware that's so audacious, it may never reach the production line. But at CES 2019, the



Acer Predator Triton 900

Predator Triton 900 suddenly became very, very real with a projected release date of March this year. Sure, it'll cost you €4,199 (around £3,640), but that's the buy-in if you want to play in laptop crazytown.

Eighth-gen Intel Core i7? Check. Mobile RTX 2080? Yes, it includes Nvidia's just-announced GPU. Props to Acer for including top-shelf, ray-trace-ready silicon. But what really earns this Predator one of our Best of CES awards is the 17in 4K G-Sync display – it swivels on what Acer calls an "Ezel Aero Hinge", affording incredible positioning flexibility, from laptop mode to tablet mode to impress-your-most-jaded-friends mode. Sure, the Triton 900 is something of a parlour trick, and we still need to test the machine, but this one scores off the charts for CES wow factor.

AMD 3rd generation Ryzen

The rumbling you hear? That's AMD's 3rd gen Ryzen freight train coming down the CPU tracks, straight at Intel. Don't believe us? At CES 2019, the company showed off an 8-core Ryzen standing toe-to-toe with Intel's 'best gaming CPU', the Core i9-9900K. Even more impressive: AMD leapfrogged Intel straight to a 7nm process.

While most take that to mean a 3rd gen Ryzen will equal a Core i9-9900K, it should really be seen as an indication of the minimum performance that might come from the chip. But that's what happens when a company releases the first 7nm x86 consumer CPU, and the competition is on its third retread of a 14nm process. While no one yet knows all the details, it's entirely possible the demo chip could materialize as

a 3rd gen Ryzen 5. So buckle up, nerds, and prepare for months of speculation as the hype train roars down the tracks.

MSI GS75 Stealth

We've come a long way, baby. Just two years ago, a 17in gaming laptop almost needed a wheelbarrow to move around. But MSI's GS75 Stealth will shock you at just how little it weighs: 2.25kg. That's basically not much heavier than most 15in laptops. Thanks to narrow bezels, it has a footprint not much bigger than most 15in gaming laptops, too. And the GS75 Stealth doesn't compromise on the specs either. With its 17.3in, 144Hz Full-HD screen, 8th gen Core i7, and GeForce RTX 2070 Max-Q GPU, you can have your gaming and take it with you, too. Eight hours of battery life won't set any records, but for a gaming laptop it's pretty good.

MSI GS75 Stealth



Alienware Area-51m

Not everyone is comfortable taking a small, dainty gaming laptop to the café . Sometimes you have to go big, and nothing says big like Alienware's new Area-51m, a truly in-your-face gaming laptop if there ever was one. It's got a newly revealed Alienware design language, but you might be more impressed by the parts inside it: a socketed and upgradeable desktop Core i9-9900K and a GeForce RTX 2080. But the real reason we're so jazzed by the Area-51m is what Alienware is prepping to deliver to enthusiasts: upgradeable graphics.

The problem with gaming laptops is that once their graphics cards get stale, there's really nothing you can do except buy a new laptop. But Alienware says it designed a proprietary graphics module for the Area-51m, and it fully expects that when a new



Alienware Area-51m

graphics chip comes out, you can either swap it out yourself or have a service rep visit and do it for you. This is basically the Holy Grail of laptop features. For our hands-on, go to **page 35**.

Corsair Capellix LED technology

The horse probably didn't think of much of the first Model T that passed it on the road, but Corsair's new Capellix tech has that same game-changing potential – for RGB LEDs. You may scoff, sure. You may think new LED tech isn't as significant as a new CPU, GPU or SSD. But we'd bet that RGB LEDs can help sell a gaming computer more than a new graphics card, at least to the average person.

Capellix shrinks the size of LEDs by 90 per cent while also increasing efficiency by 60 per cent and upping brightness by 40 per cent. You can basically fit



Corsair's Capellix LED technology

132 Capellix LEDs on a postage stamp, while a normal SMD LED used in today's PCs would maybe fit 10.

The upshot? Capellix could deliver incredibly bright and power-efficient LEDs in places never before seen in a gaming PC. And, yup, it's the razzle-dazzle that's wins most of the time.

Creative Super X-Fi Theatre and Air

Just as we were coming down from the high of using Creative Lab's impressive Super X-Fi dongle, the company dropped two more Super X-fi products at CES 2019, and they're just as impressive. Please meet the Super X-Fi Theatre and the Super X-Fi Air.

The Air is a Bluetooth headset that features Super X-Fi built directly inside. Creative calls Super X-Fi



Creative Super X-Fi Theatre and Air

"headphone holography", and it's probably not the wrong phrase to use. It works by mapping out the shape of your head with a phone camera, and then with the aid of special-sauce algorithms, it creates a virtual surround-sound system using just normal headphones. In our testing of the Super X-Fi USB dongle, we can tell you it works. And it works damned well.

Even cooler: Super X-Fi Theatre takes it to the next level by letting you hook up anywhere from one to eight low-latency headphones for communal movie watching. Each, of course, features that same Super X-Fi audio magic.

Royole FlexPai

The FlexPai (£1,209 from **fave.co/2R3pZVO**) makes a very compelling argument for folding phablets – in a vivid, tangible, 'it's working right now' kind of way. The phone folds over itself into a chunky slab that's far thicker than the spec sheet's claim of 7.6mm, but unfolds into a full 7.8in screen running a custom version of Android 9. Even better, you can run Android apps in multi-window in both its folded phone configuration or in the unfolded tablet.

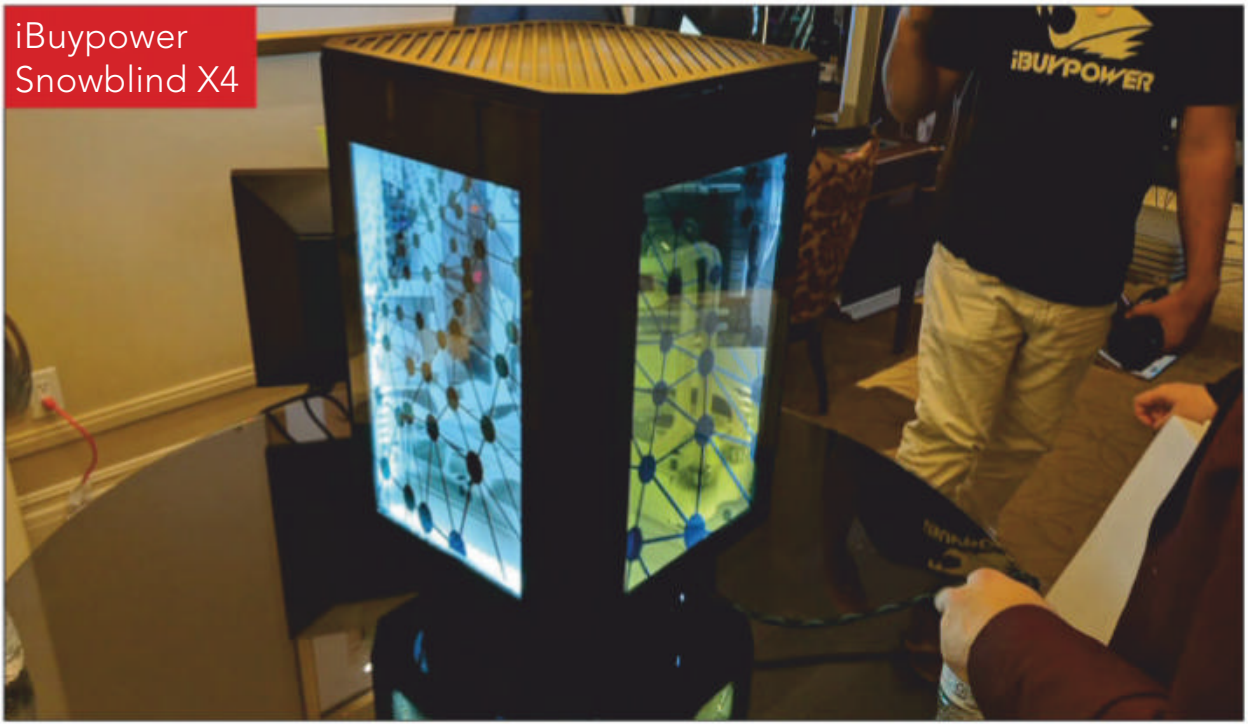
A smartphone when you need it, a tablet when you want. If nothing else, the FlexPai is a fantastic concept that we'll use as a comparison point if and when Samsung rolls out its own folding phone. For our hands-on, go to **page 65**.

iBuypower Snowblind X4

CES isn't just a trade show for new products. It's also the show where PC vendors dig deep to create

crazy, over-the-top project PCs to catch the attention of the press and net one of those snazzy 'best of' buttons. Well, after seeing dozens of crazy computers – including one with a Nintendo Switch built inside – the winner of 'America's Got Crazy PC' contest is easily iBuypower's Snowblind X4.

Not only does it feature four crazy Snowblind doors with motion colour graphics, the entire PC rotates like one of those rotating restaurants at the top of a hotel. What's really impressive, though, is that iBuypower has come up with a way to pass not just power from the base, but also data and video. The company tells us it used a hub similar to those used in windmills. Honestly, we don't care. We just know that when we want to see the right side of our liquid-cooled graphics card, we don't want to get up move – we want the PC to move for us.



iBuypower Snowblind X4

6 important CES reveals

The PC showed up strong at CES 2019, reveals BRAD CHACOS



The PC's been enjoying a resurgence over the past few years, and judging by what we witnessed at CES, the pedal will remain planted firmly to the metal in 2019. AMD, Intel, and Nvidia all hosted blockbuster keynotes brimming with big announcements. Monitors evolved beyond being simple 27in rectangles. Gaming laptops embraced innovation in wildly different ways. And there's a lot of gear coming that's just plain badass.

These are the big CES hardware reveals and trends that PC enthusiasts need to know about. Buckle up,

and be sure to hit those links if you want deeper details about any of these topics.

1. Nvidia

Unsurprisingly, the company continued its real-time ray tracing push, bringing the technology to the masses by announcing mobile RTX GPUs that appeared in almost every new gaming laptop at the show.

Nvidia also pushed its cutting-edge tech towards the mainstream with the GeForce RTX 2060 (£329 from **fave.co/2AYDD7m**), a powerful graphics card that excels at both 1440p and 1080p gaming and comes packed with the dedicated RT and tensor core hardware needed for real-time ray tracing and AI-enhanced Deep Learning Super Sampling. The RTX 2060 hit the streets on 15 January, and we absolutely love it even though it costs slightly more than its predecessor.



Nvidia GeForce RTX 2060

Then came the shocker.

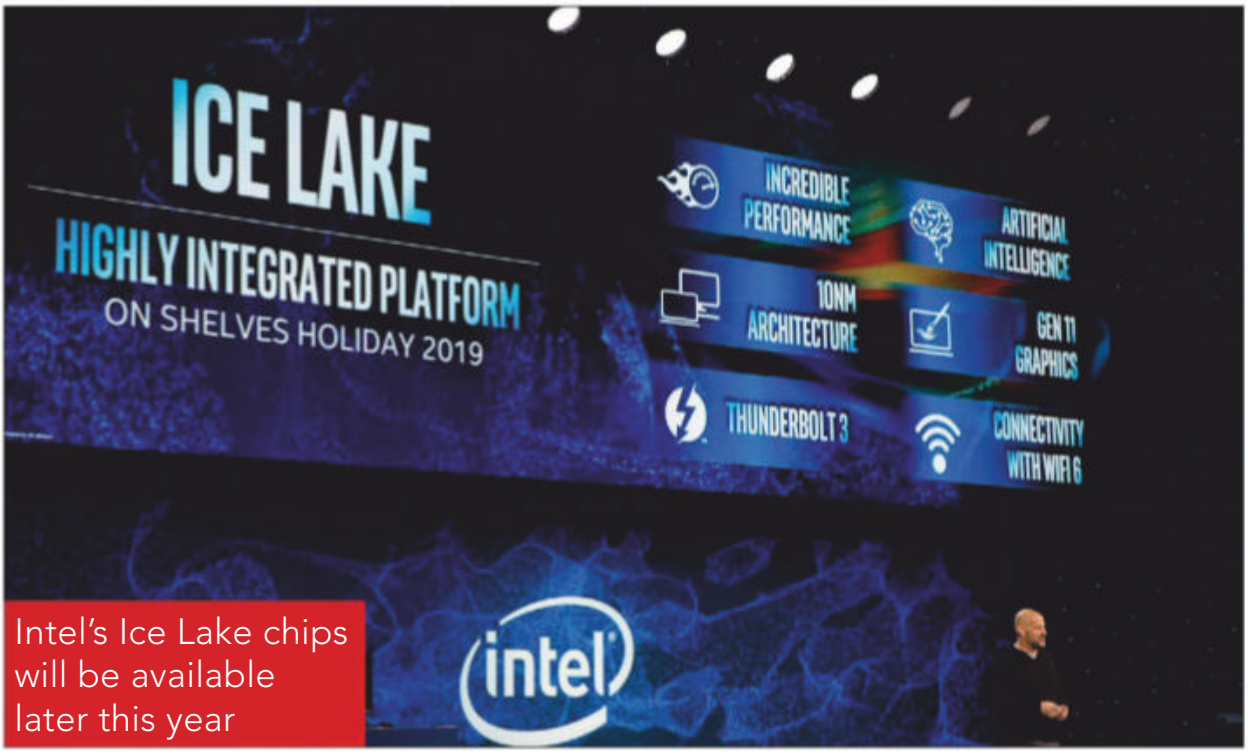
Nvidia's GeForce graphics cards will receive a driver update this month that allows them to tap into the variable refresh rate capabilities of VESA Adaptive Sync monitors – otherwise known as AMD FreeSync. Until now, GeForce GPUs only worked with Nvidia's rival G-Sync monitors, which require special hardware and thus cost much more money. But that hardware and Nvidia's oversight also gives G-Sync monitors a higher level of quality control; of the 400-plus FreeSync monitors Nvidia tested, only 12 met the requirements to earn a 'G-Sync compatible' certification and have variable refresh rates automatically enabled by the new driver.

On the plus side, you'll be able to manually enable variable refresh rates on non-certified monitors via the Nvidia Control Panel. On the minus side, things can sometimes get ugly if you do, from unwanted blurring to full-on 'blinking' effects.

2. Intel

In December, Intel showed journalists its new 10nm 'Sunny Cove' CPU architecture. At CES, the company revealed the processors that will use it, formally unveiling Ice Lake chips that also integrate Thunderbolt 3 and next-gen Wi-Fi capabilities. Speeds, feeds, and other concrete product details weren't disclosed though, as the chips are scheduled for a holiday 2019 launch. Intel also announced new processors for the current 9th-gen line-up to hold us over until then.

Then things got interesting. Intel's 'Lakefield' chips will stack four Atom CPUs atop an undisclosed



Intel's Ice Lake chips will be available later this year

Sunny Cove processor, using the 'Foveros' stacking technology the company revealed during its December Architecture day. Stacking chips lets Intel squeeze out more performance without increasing the overall die space – a boon for thin-and-light laptops.

Speaking of thin-and-light laptops, Intel also revealed Project Athena, an industry-wide push to make a new generation of longer-lasting and much more responsive notebooks, backed by computer makers including Acer, Asus, Dell, HP, Lenovo, Microsoft, Samsung, Sharp, and Google. Yes, Google – Chromebooks are part of the push.

3. AMD

AMD's keynote might have been last, but it certainly wasn't least, as the company announced the world's first



AMD president and CEO Lisa Su unveils the Radeon VII

7nm desktop CPUs and GPUs, giving it a technological edge over Nvidia and Intel – for now, at least.

First up: Radeon VII, which uses a supercharged version of the Radeon Vega GPU built on 7nm. AMD equipped the GPU with a whopping 16GB of super-fast High Bandwidth Memory. The company says the Radeon VII will deliver a great 4K gaming experience and trade blows with Nvidia's GeForce RTX 2080 in both performance and price. (Nvidia's CEO already dissed the Radeon VII, calling it "underwhelming" and "lousy".) We'll be able to confirm that performance ourselves soon, as the Radeon VII will launch on 7 February, at a cost of $699 (around £540). Sadly, AMD didn't provide any updates on its next-gen 'Navi' architecture expected to release later this year.

AMD also offered a preview of its 3rd-generation Ryzen CPUs, although details were light. CEO Lisa Su said it "will absolutely set the bar for performance and power efficiency", and in a head-to-head live comparison against Intel's flagship Core i9-9900K onstage, a similarly equipped 8-core, 16-thread 3rd-gen Ryzen chip scored 2,057 points in Cinebench, topping the 9900K's 2,040 points – and with a significantly lower power draw. Impressive stuff. The new Ryzen CPUs will also be the first mainstream processors to support PCI-E 4.0. Look for the chips to launch sometime in the middle of the year. But maybe not with that 8-core chip as its standard bearer. In a candid, wide-ranging interview with a small round table of reporters after the keynote, Su strongly hinted that 3rd-gen Ryzen could hit 16 cores. Yes, please.

4. Wild laptop innovation

Computer makers are already putting all of the new hardware from AMD, Intel, and Nvidia to good use, too. Sure, we saw the expected updates to tried-and-true laptops like the Dell XPS 13 and Lenovo's ThinkPad X1. And they look great. But more interestingly, there were a bunch of outright wild notebooks at CES 2019.

The new HP Omen 15 offers a screaming-fast 240Hz display unheard of in laptops. The MSI GS75 Stealth manages to squeeze a top-end Core i7 and Nvidia's RTX 2080 Max-Q into a notebook that's just 2.25kg, while Gigabyte's Aero 15 uses Microsoft-powered machine learning to compare your workload against its own database of applications, then optimize battery life accordingly. Clever.



Gigabyte's Aero 15 is expected to include top-of-the-line hardware, but what's most interesting will be its software controls

The Asus ROG Mothership is basically a gaming-ready Surface Pro rival with a detachable keyboard and the most fearsome hardware possible. (See **page 41** for our hands-on.) Acer's Predator Triton 900 pairs its formidable firepower with a 17in, 4K display that swivels on its hinge, so the screen faces outward. And the Alienware Area-51m completely revamps the Alienware aesthetic while simultaneously offering desktop-grade hardware and a laundry list of options and upgradable parts, complete with handy markers on

the bottom panel that explain how to swap those parts out. (See **page 35** for hands-on.)

At CES 2019, laptop makers started truly thinking outside the box to make their products stand out from the crowd and cater to the surging crowd of PC gamers.

5. Magnificent monitors

Nvidia embracing FreeSync alone is a huge shift and a major milestone for PC gamers. But at CES all sorts of monitors stole the spotlight by bucking convention.

The most notable display remains tied to Nvidia. The stunning HP Omen X 65 Emperium will be the first Nvidia 'Big Format Gaming Display' to hit the streets with a gargantuan 65in 4K HDR panel, an ultra-fast 144Hz refresh rate, and G-Sync. It also comes with Nvidia Shield functionality built in, as well as a soundbar custom-tuned to avoid disrupting the display. And did I mention it's 65 inches? Not to be outdone, Dell announced a 55in 4K Alienware monitor outfitted with a luscious OLED display for deep blacks and fantastic colour reproduction. It's fast, too, at 120Hz. And seemingly every major PC maker jumped on-board ultra-ultrawide or ultra-big monitors, from Asus to even Lenovo. (We weren't expecting Lenovo to announce ultrawide gaming displays.) Samsung showed off a new iteration of its ultra-ultrawide monitor that started the trend, in addition to one that can be pushed back to sit perfectly flat against the wall.

6. Razer HyperSense

Razer wants to bring immersion to your peripherals too, using a technology sorely underutilized on PCs: haptic

feedback. Razer HyperSense builds on the success of the company's impressive Nari Ultimate headset (£199 from **fave.co/2R6pbzk**) by integrating rumble controls into all of your peripherals – from keyboard to mouse to chair to headset.

In Razer's example, your keyboard's wrist rest could vibrate to simulate movement on your left, while your mouse could rumble to simulate right-side movement and the kickback of a gun. Your chair could physically let you know when something happens behind you, whereas your headset could provide full situational haptic feedback, as it already does with the Nari Ultimate. And HyperSense achieves it all by simply



reading the low-frequency range of your audio, so game developers don't need to work to support the technology.

It's an incredibly nifty idea that shows just how much more immersive PC gaming can be compared to consoles. But will it ever be more than just an idea? That's the question. While game developers don't need to implement HyperSense, hardware makers do, and it remains to be seen if Razer's rivals will jump on the idea. At CES, Razer said the Subpac chair and Lofelt's mouse and wrist rest prototypes support the technology. Fingers crossed we'll see more about HyperSense soon.