

# TOP MOMENTS OF INTEL'S 50<sup>TH</sup> YEAR



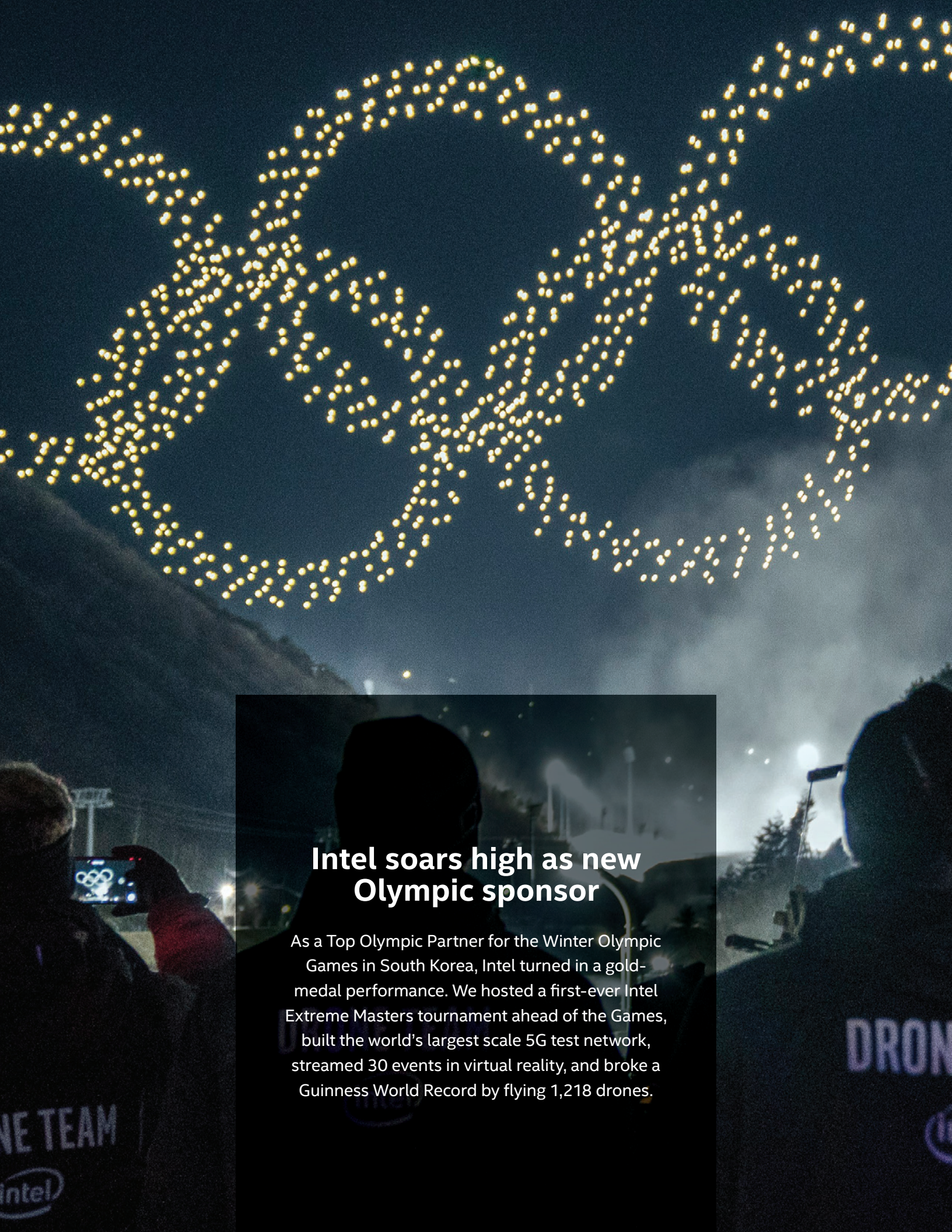




**IN 2018, INTEL ACHIEVED  
THE 50-YEAR MILESTONE,  
A HUGE ACCOMPLISHMENT  
THAT MOST COMPANIES  
NEVER ACHIEVE.**

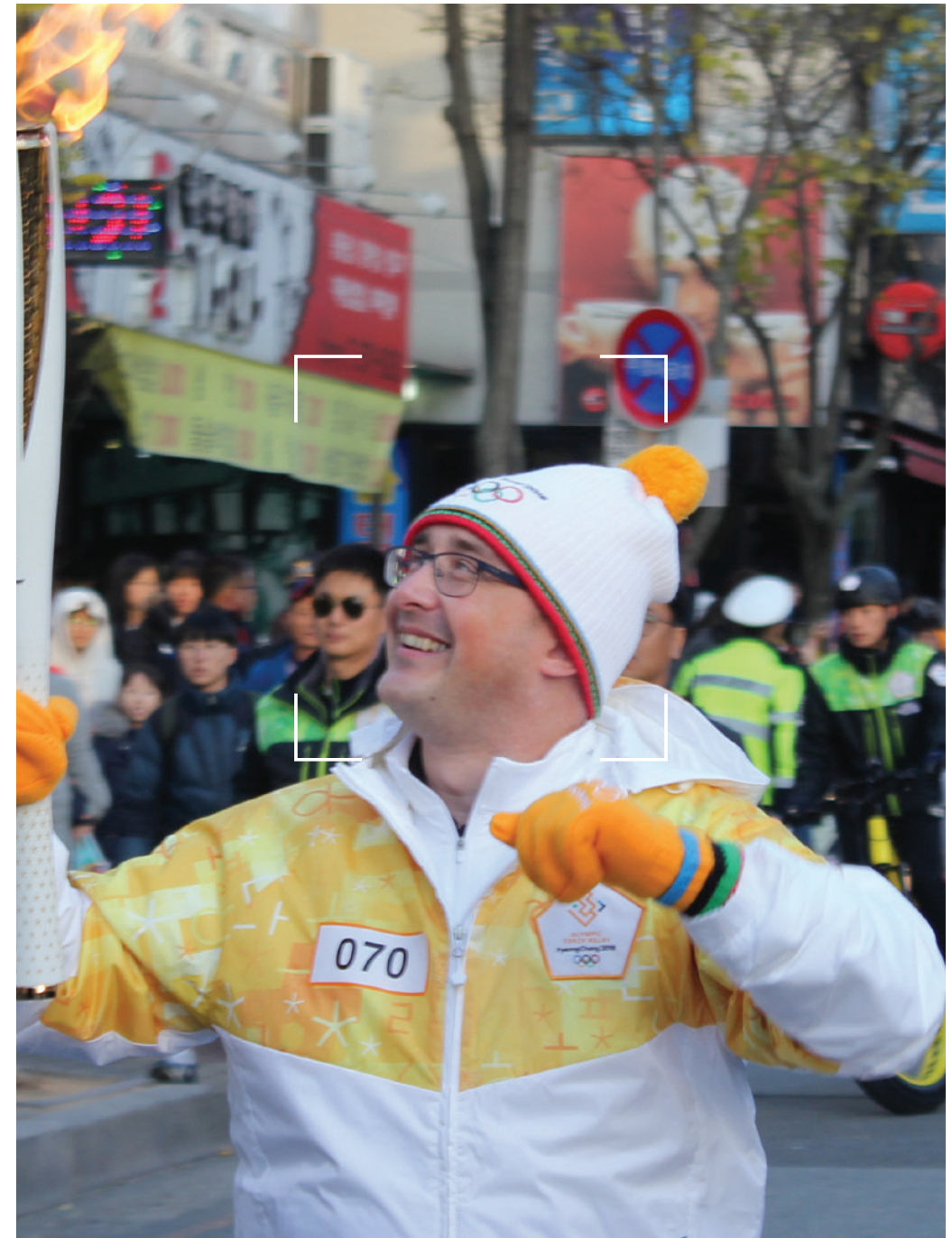
**AS THE YEAR ENDS,  
INTEL'S 100,000  
EMPLOYEES LOOK BACK  
AT 2018 WITH PRIDE. BUT  
OUR FOCUS IS FIRMLY FIXED  
ON BUILDING A SMARTER,  
MORE CONNECTED FUTURE  
FOR OUR COMMUNITIES  
AND THE WORLD.**






## Intel soars high as new Olympic sponsor

As a Top Olympic Partner for the Winter Olympic Games in South Korea, Intel turned in a gold-medal performance. We hosted a first-ever Intel Extreme Masters tournament ahead of the Games, built the world's largest scale 5G test network, streamed 30 events in virtual reality, and broke a Guinness World Record by flying 1,218 drones.



Thirteen Intel employees and five company leaders ran parts of the three-month, 2,018-kilometer (1,254-mile) Olympic torch relay.





## The need for speed

The ski slopes of Alpensia, the Gangneung ice arena, and the Bokwong snow park were three of 10 Winter Olympic Games venues in South Korea that featured high-speed 5G links — all powered by Intel Mobile Trial Platforms. They delivered a whopping 3,800TB of network capacity, powering incredible experiences that provided a glimpse to how people around the world watch sports.



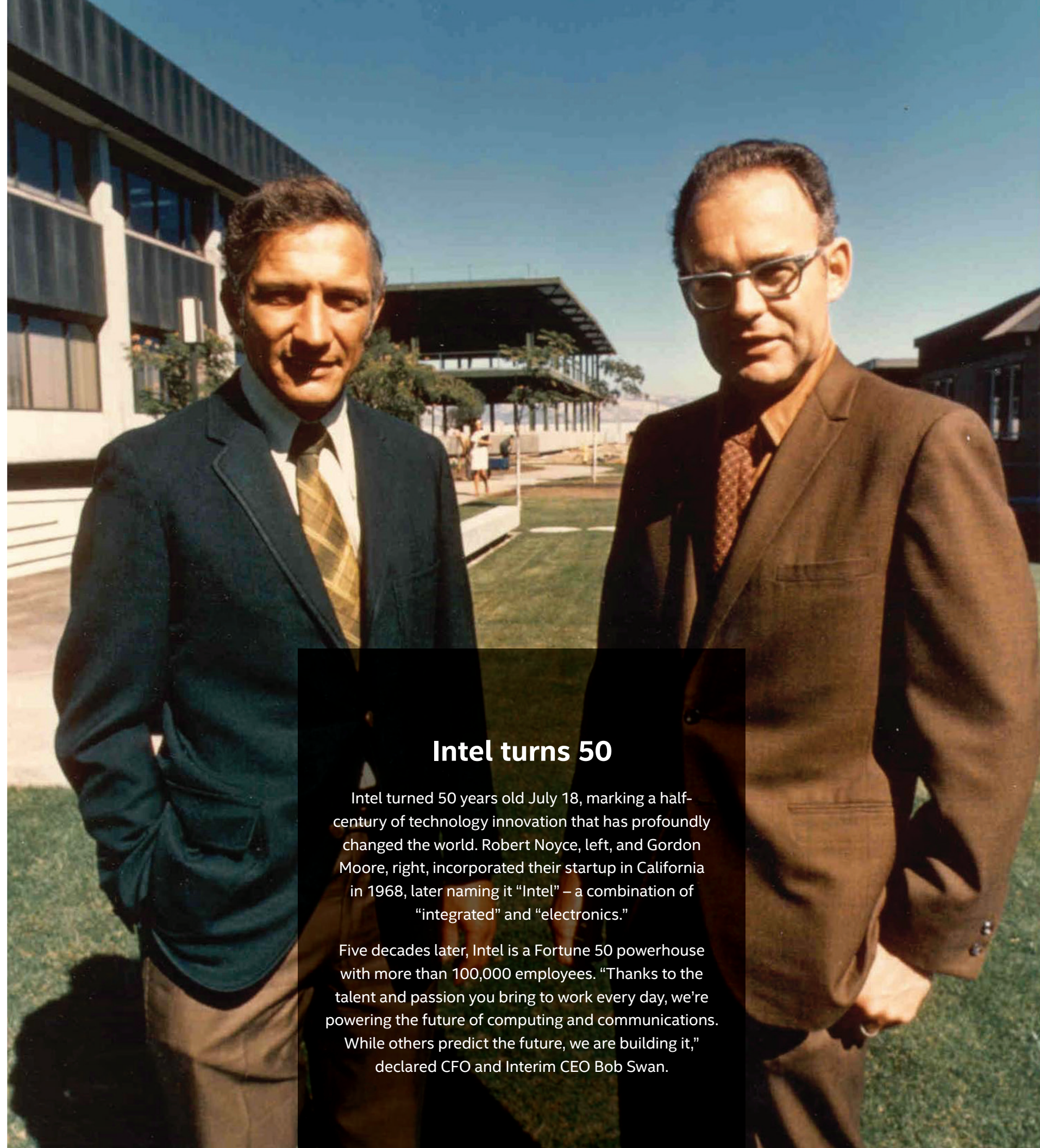
## Paving the path to 5G

More than 60 5G trials in 20 countries around the world in 2018 helped pave the path toward a 5G-powered future. Intel showcased 5G use cases, including 4K broadcasts from the U.S. Open golf tournament, a 5G-connected bus in Japan, and a fast-paced eSports tournament in Australia. We also made the world's first 5G-compliant live data call in August from our Santa Clara 5G lab to Ericsson's lab in Sweden, which VP Asha Keddy called “an important step in ensuring our commercial platforms are field-ready for deployment in 2019.”





*Intel's first 106 employees, including co-founders Robert Noyce (front left) and Gordon Moore (front right) and their first hire, Andy Grove (second row, far right) gather in front of Intel's first building, in Mountain View, Calif.*



## Intel turns 50

Intel turned 50 years old July 18, marking a half-century of technology innovation that has profoundly changed the world. Robert Noyce, left, and Gordon Moore, right, incorporated their startup in California in 1968, later naming it "Intel" – a combination of "integrated" and "electronics."

Five decades later, Intel is a Fortune 50 powerhouse with more than 100,000 employees. "Thanks to the talent and passion you bring to work every day, we're powering the future of computing and communications. While others predict the future, we are building it," declared CFO and Interim CEO Bob Swan.

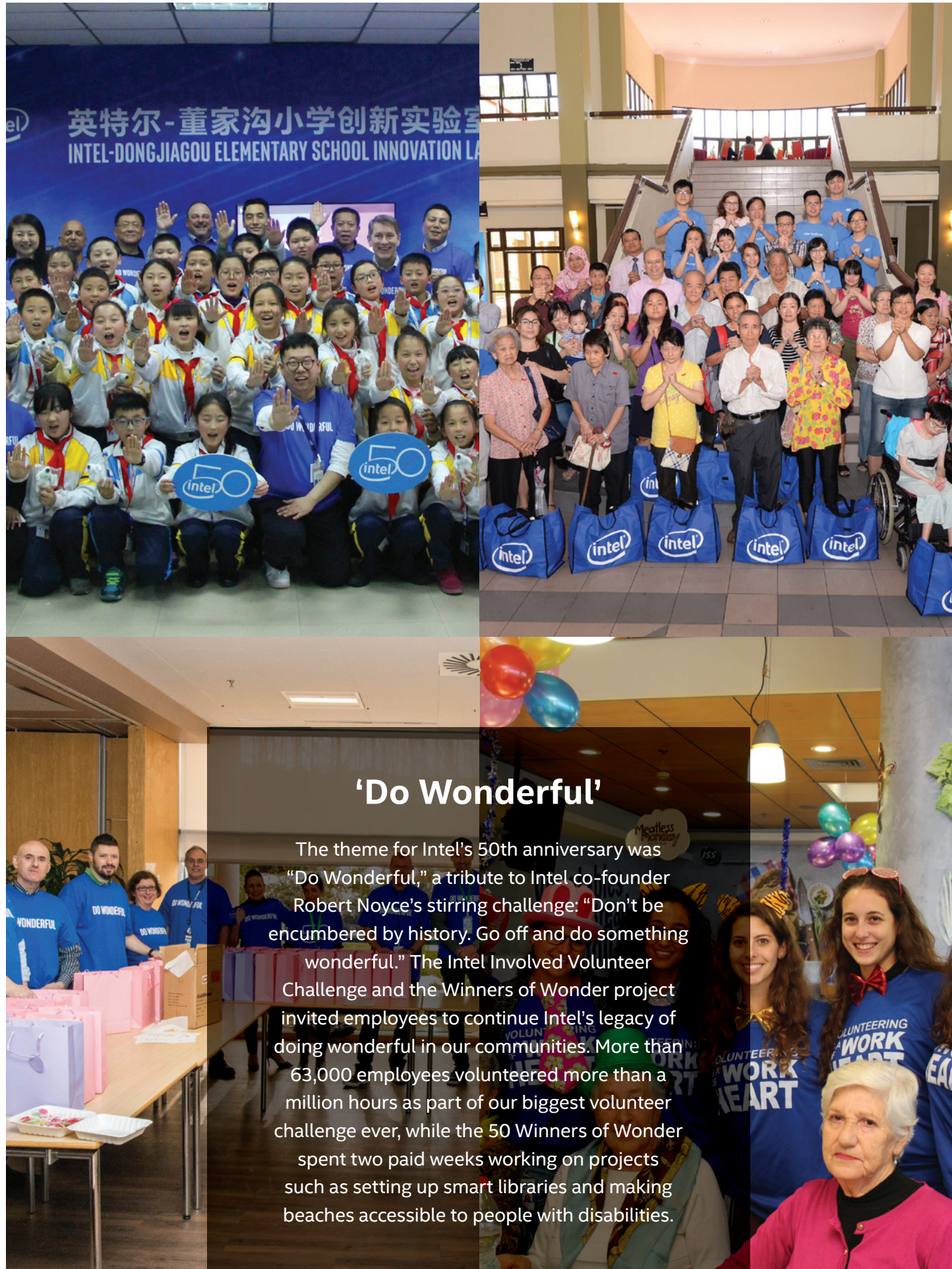




**Employees celebrate  
our 50th worldwide**







## 'Do Wonderful'

The theme for Intel's 50th anniversary was "Do Wonderful," a tribute to Intel co-founder Robert Noyce's stirring challenge: "Don't be encumbered by history. Go off and do something wonderful." The Intel Involved Volunteer Challenge and the Winners of Wonder project invited employees to continue Intel's legacy of doing wonderful in our communities. More than 63,000 employees volunteered more than a million hours as part of our biggest volunteer challenge ever, while the 50 Winners of Wonder spent two paid weeks working on projects such as setting up smart libraries and making beaches accessible to people with disabilities.



## PC innovation at Computex

A powerful 28-core desktop processor. A limited edition Core i7-8086K. Laptops with a 1W panel for extra-long battery life. These were among the disclosures at Computex Taiwan, Asia's largest IT tradeshow — and proof that Intel intends to power the cloud and billions of connected devices.



## 8086K marks 40 years of x86

On June 8, 1978, Intel released the revolutionary 8086 microprocessor that would mark the beginning of the x86 architecture, the foundation for processor design through today and beyond. To celebrate the 40th anniversary, Intel created the limited edition Core i7-8086K and held an international sweepstakes for 8,086 processors, which amassed over 3 million entries within 24 hours.







## Our data-centric opportunity

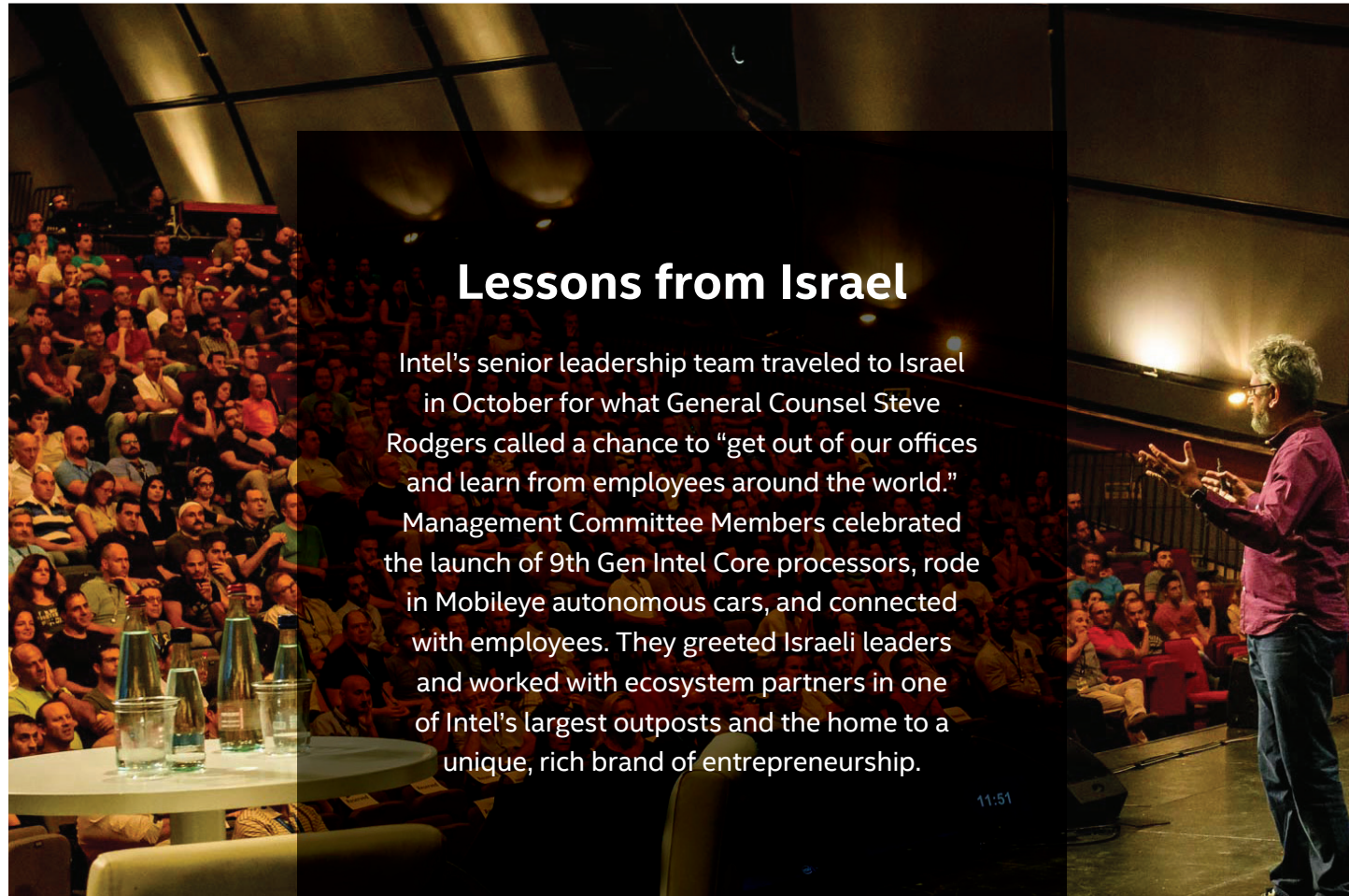
“Data is defining the future of our industry — and the future of Intel,” Data Center Group leader Navin Shenoy told analysts and press at the company’s Data-Centric Innovation Summit in August. Shenoy predicted the total addressable data-centric silicon market would breach \$200 billion by 2022, calling it “the biggest opportunity in our company’s history.” That estimate included not only the data center itself, but also memory, the internet of things, automated driving, and FPGAs.



## Expanding the AI domain

Intel’s long-term bet on artificial intelligence grew in strength and scope. The company unleashed new hardware (like the Neural Compute Stick 2, Myriad X VPU, and Intel Vision Accelerator Design Products), software (nGraph, OpenVINO both open-sourced), and research — like the kind AIPG’s YinYin Liu (pictured) announced in May. And in a sign of momentum, Navin Shenoy revealed for the first time that Intel sold more than \$1 billion in Intel Xeon processors for AI in 2017.










## Staying ahead of the black hats

As technology evolves, so do the sophistication of cybersecurity threats. In the wake of the Spectre and Meltdown vulnerabilities, Intel created a new business unit — Intel Product Assurance and Security — to help centralize Intel's security expertise and innovation and help design Intel products with security top of mind. Intel partnered across the industry in this work, and new Intel chips featuring additional security features started to be baked into the hardware level soon after.



## Getting 10nm back on track

An explosion of data and the need to process, store, analyze and share it spurred strong demand for Intel chips — and, in some cases, tight supplies. Intel, in a letter to customers, announced an additional \$1 billion investment in 14nm plants worldwide. And he informed customers that we expect to be on track to reach volume production on delayed 10nm products in 2019: “You can expect us to stay close, listen, partner and keep you informed.”



A photograph of Bob Swan, a middle-aged man with short brown hair, wearing a light blue button-down shirt. He is standing at a podium, gesturing with his hands as if speaking. A small microphone is clipped to his shirt. The background is a dark blue wall with a horizontal wooden panel.

## Bob Swan takes the helm

The Intel board of directors named Chief Financial Officer Bob Swan our company's interim CEO on June 21. This followed the resignation of CEO Brian Krzanich. While serving as interim CEO, Bob continued in his role as CFO — a job he told employees he greatly enjoyed — during the Intel board's search, both inside and outside the company, for Intel's next chief executive.

A close-up photograph of a hand holding a small, thin, white SSD module. The module has a gold-colored connector on one end. The background is dark with many out-of-focus green lights, creating a bokeh effect.

## A year of records

2018 was a year of bests and firsts, from Wall Street to Guinness World Records. Our Q3 revenue of \$19.2 billion marked the best quarter in Intel history, as we looked to make 2018 revenues our highest ever. Our products broke records, from our Core i9-9900K CPU, called by tech reviewers the fastest gaming processor ever, to the world's densest SSD (pictured) to Intel Xeon Scalable processors that set 95 performance world records. Finally, we flew a world-record 1,218 drones for the Olympic Winter Games — then set another Guinness record just five months later, when 2,018 drones hovered in the night sky over Folsom for our 50th anniversary.





## **Saving endangered tigers with AI**

Forest degradation and poaching continued to threaten the habitats of critically endangered Amur tigers in China, and the work to protect these animals is time- and labor-intensive. Intel shared expert help and the full suite of our artificial intelligence portfolio — from Movidius-powered smart cameras to extensive data center tech — to help conservationists at the World Wildlife Fund precisely identify and track individual tigers, and monitor total population, pack sizes, and the distances they roam to hunt.



## **Intel meets U.S. diversity goal — two years early**

In 2015, Intel announced a bold goal and a \$300 million investment to support it: to increase our representation of women and underrepresented minorities by 2020. This year — two years early — we met that milestone; our U.S. workforce now reflects the diversity of the available U.S. skilled labor market. CFO and interim CEO Bob Swan and Chief Diversity and Inclusion Officer Barbara Whye told employees, “We should be proud, but not satisfied. We’re not done yet. In fact, we’re just getting started.”





## Creating new sports experiences

Intel True VR was a star player this year at the Winter Olympic Games in South Korea and the NBA All-Star Weekend in Los Angeles. Intel True View technology — which captures players in volumetric 3D, letting viewers see the action from a near-infinite number of angles — joined the lineup for standout performances at the NCAA's March Madness tournament and National Football League, Major League Baseball, Professional Golfers' Association of America, and La Liga soccer events.



## Hands-on tech for students

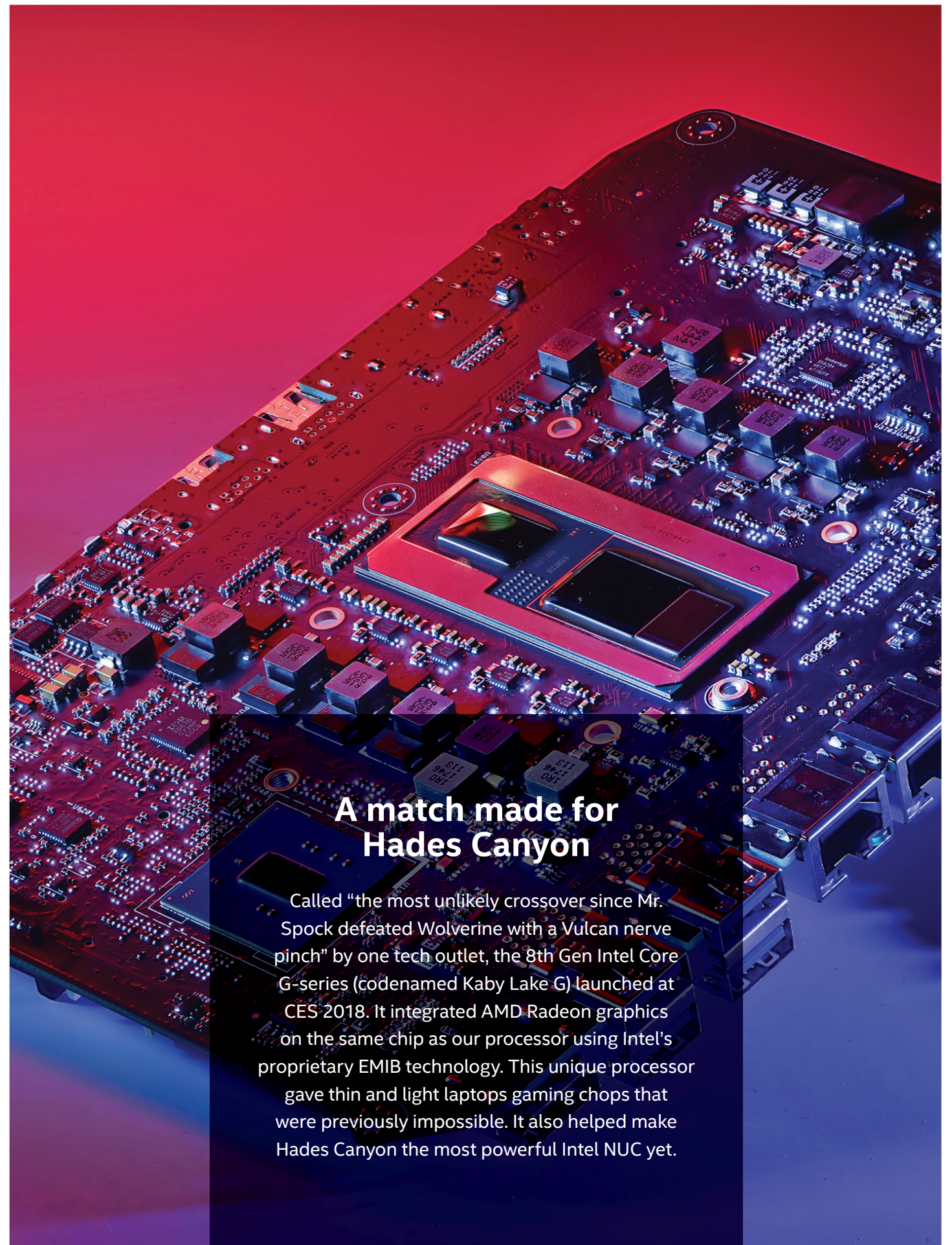
Students experienced Intel technology up close and personal when the Tech Learning Lab truck hit the road. The custom-built mobile container truck was outfitted with virtual reality demo stations, powerful PCs, augmented reality and internet of things smart whiteboards, while the Intel Employee Service Corps hosted hands-on workshops featuring artificial intelligence, coding and robotics. The truck visited six schools serving underserved and tech-focused students from New York to California.





## Acquisitions speed chips to market

In the wake of our two biggest-ever acquisitions — Altera in 2015 for \$16.7 billion and Mobileye in 2017 for \$15.3 billion — Intel's 2018 mergers and acquisitions bolstered existing businesses. The Programmable Solutions Group acquired custom chipmaker eASIC to expand its portfolio with structured ASICs, and the Silicon Engineering Group's acquisition of NetSpeed Systems brought in system-on-chip design tools and interconnect fabric intellectual property. Sundari Mitra, NetSpeed Systems co-founder and CEO, is shown with SEG's Jim Keller.



## A match made for Hades Canyon

Called "the most unlikely crossover since Mr. Spock defeated Wolverine with a Vulcan nerve pinch" by one tech outlet, the 8th Gen Intel Core G-series (codenamed Kaby Lake G) launched at CES 2018. It integrated AMD Radeon graphics on the same chip as our processor using Intel's proprietary EMIB technology. This unique processor gave thin and light laptops gaming chops that were previously impossible. It also helped make Hades Canyon the most powerful Intel NUC yet.





## How we ship our tech

Intel's supply chain starts in its fabs around the world. It ends – for European customers – at Intel's 145,000-square-foot Amsterdam warehouse, where thousands of CPUs, servers, solid state drives, and drones exit its doors every 25 seconds. It's the last stop in a supply chain that juggles 16,000 suppliers in 100 countries, while managing over 8,000 products.



## Big sharks, big ships, big search

Intel-powered AI came to the forefront, helping animate the giant shark in "The Meg," powering autonomous ships from Rolls Royce, bringing FPGA-based smarts to Microsoft's Bing search and Azure cloud, and running Taboola's content recommendation engine. That's on top of new partnerships with Baidu, Novartis, Tencent, and the upcoming Tokyo 2020 Summer Olympics.



# AIDC

## Intel AI DevCon 2018

### New AI DevCon events a hit

“Our commitment is to give you the most complete toolbox to realize your AI vision,” Artificial Intelligence Products Group leader Naveen Rao told a sold-out crowd of developers at Intel AI DevCon, our company’s first conference devoted to them. The San Francisco event was repeated in Bangalore, India, and Beijing, showcasing our products and progress in AI and putting Intel top AI talent in touch with thousands of developers.



### Autonomous fleet hits the street

Intel and Mobileye’s autonomous test fleet drove on real roads, gathered data, and served as test cars for our self-driving technology. In May, Intel invited journalists to Mobileye’s headquarters in Jerusalem to experience how well the test cars handle Israeli traffic. “If you can drive in Jerusalem, you can drive (almost) anywhere,” noted Mobileye leader Amnon Shashua.





## Mobileye's MaaS appeal

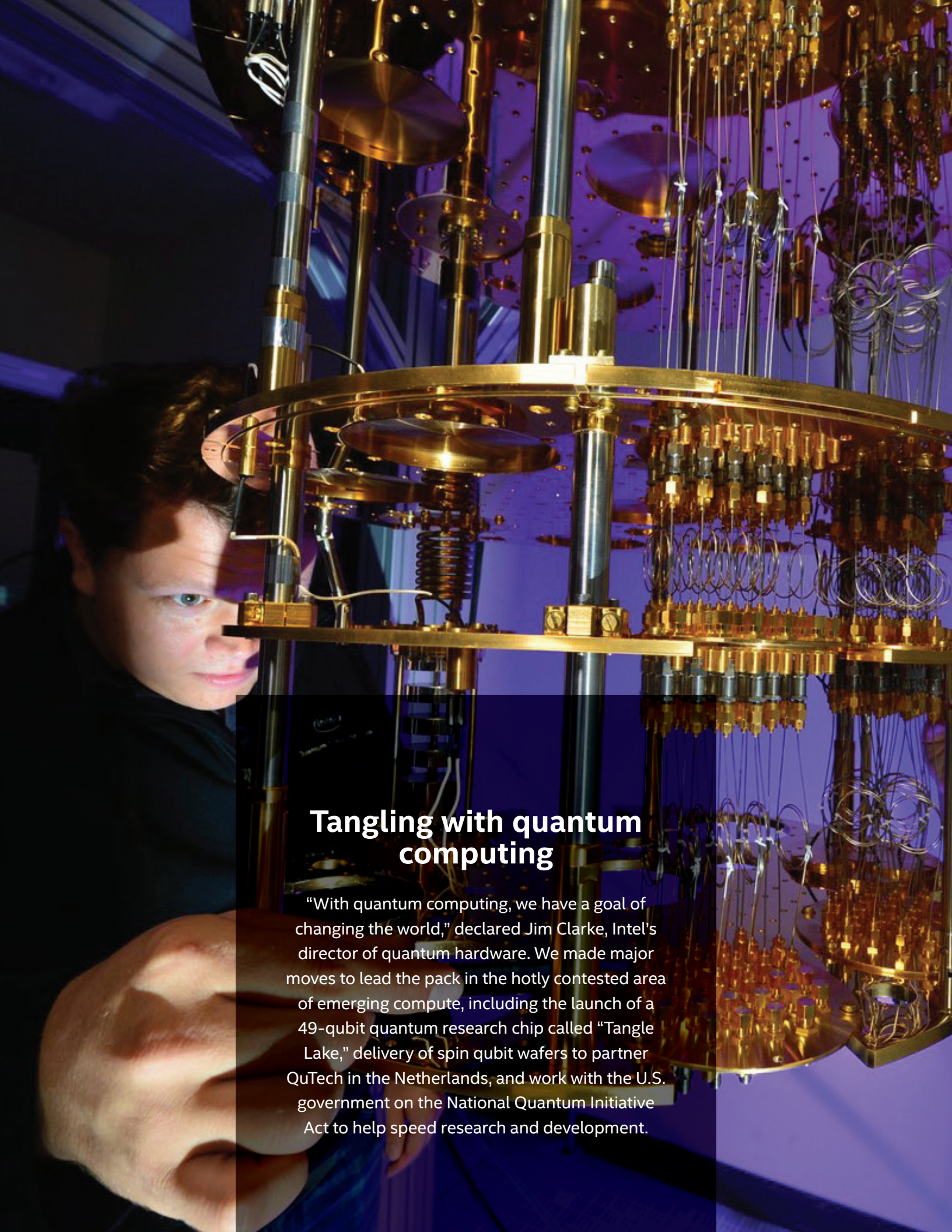
Mobileye announced a joint venture with Volkswagen Group and Israeli auto importer Champion Motors to commercialize Mobility-as-a-Service and put self-driving MaaS electric vehicles on roads in Israel in 2019. October's non-pilot commercial program announcement was among the first of its kind in the ride-sharing industry.



## RSS gains traction

Responsibility-Sensitive Safety, a Mobileye-defined model for autonomous vehicles, gained considerable traction in 2018 from industry partners. In July, China internet giant Baidu chose to integrate RSS into Apollo Pilot, Baidu's self-driving technology developed for multiple Chinese OEMs. The state of Arizona in August formed the Institute for Automated Mobility, with Intel as a founding partner. Intel will offer institute members RSS as a starting point for building their solutions.





## Tangling with quantum computing

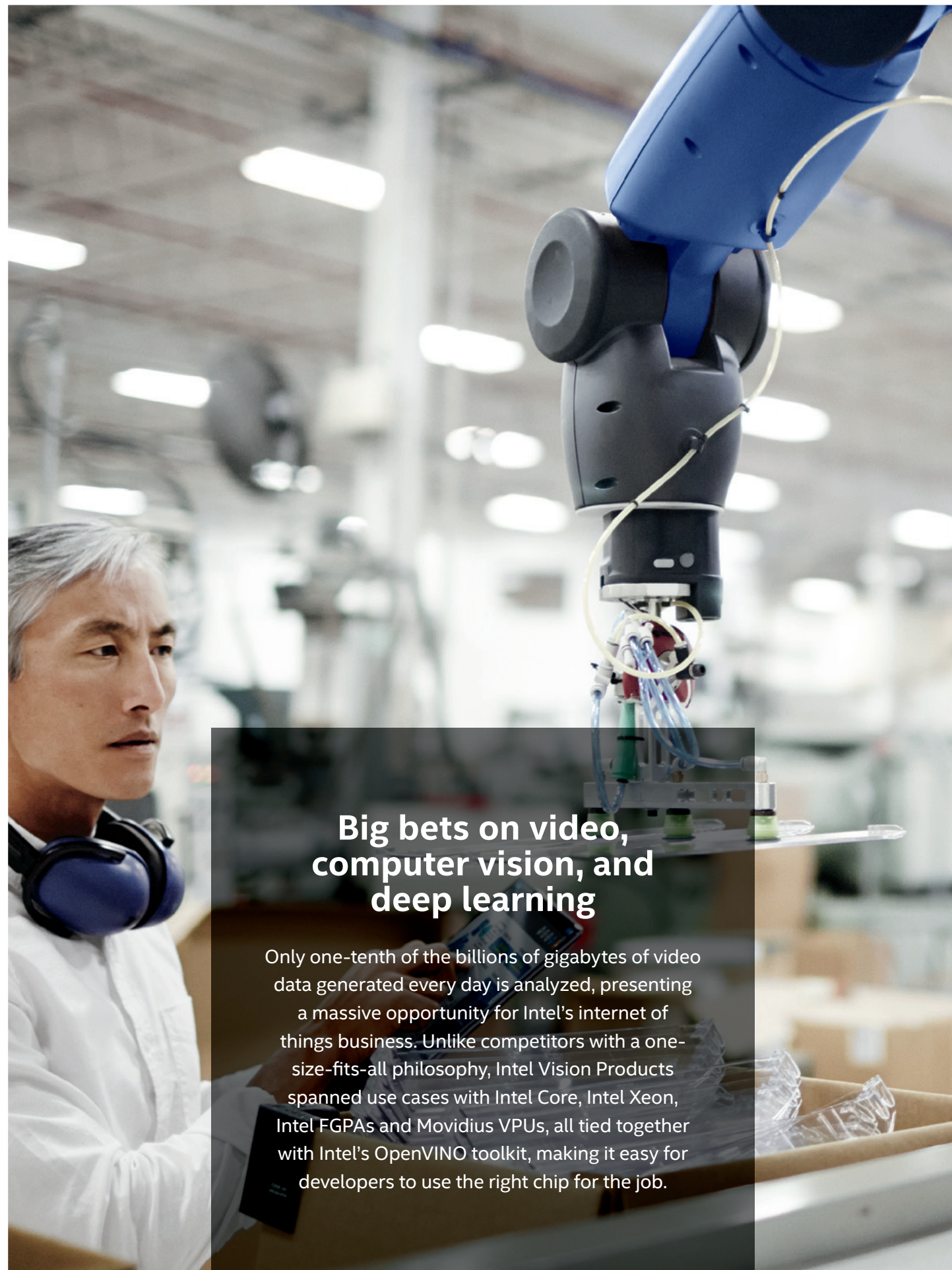
"With quantum computing, we have a goal of changing the world," declared Jim Clarke, Intel's director of quantum hardware. We made major moves to lead the pack in the hotly contested area of emerging compute, including the launch of a 49-qubit quantum research chip called "Tangle Lake," delivery of spin qubit wafers to partner QuTech in the Netherlands, and work with the U.S. government on the National Quantum Initiative Act to help speed research and development.



## Mimicking the brain in silicon

Joining quantum computing as another focus area for emerging compute is neuromorphic computing, led by Intel Labs' Mike Davies. He called it "a complete rethinking of computer architecture" that aims to "understand the operation of the brain and copy it on silicon." The team unveiled "Loihi," the first-of-its-kind self-learning chip, and created the Intel Neuromorphic Research Community to advance the test chip.





## Big bets on video, computer vision, and deep learning

Only one-tenth of the billions of gigabytes of video data generated every day is analyzed, presenting a massive opportunity for Intel's internet of things business. Unlike competitors with a one-size-fits-all philosophy, Intel Vision Products spanned use cases with Intel Core, Intel Xeon, Intel FPGAs and Movidius VPUs, all tied together with Intel's OpenVINO toolkit, making it easy for developers to use the right chip for the job.



## Accelerating the future

Intel FPGAs (field programmable gate arrays) helped accelerate applications from the edge to the network to the cloud. In April, we launched the Intel Stratix 10 FPGA. In July, Intel acquired eASIC to expand our programmable solutions portfolio and in September unveiled the Intel Arria 10 GX Programmable Acceleration Cards to offer developers a robust platform to deploy FPGA-based accelerated workloads.





Intel® XMM™ 7560

## One momentous modem

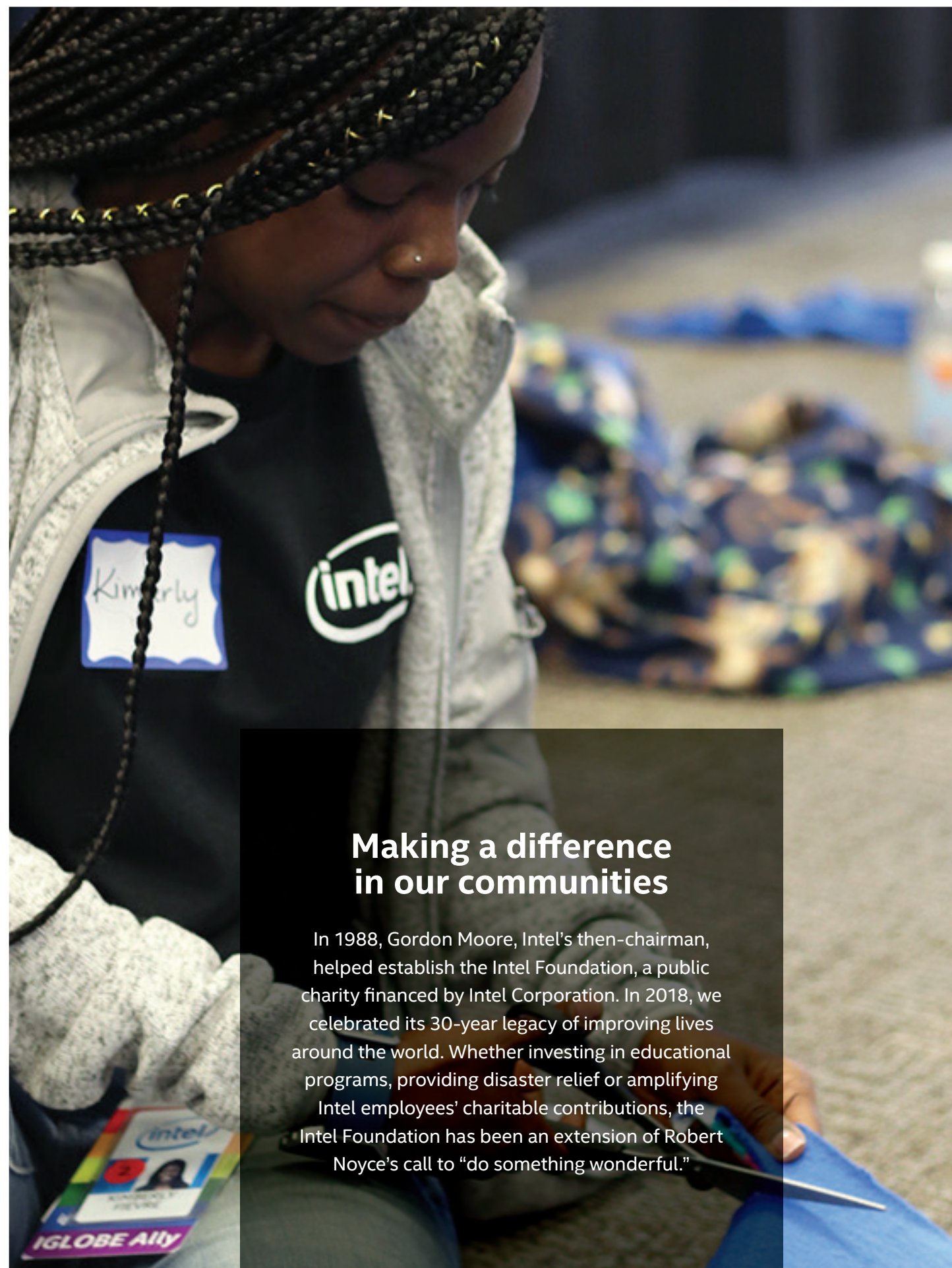
Achieving some big firsts in a single modem product — gigabit speed, CDMA wireless, Intel fabrication and packaging, integrated global satellite navigation, and multi-SIM capability — made it “the most humongous project we’ve ever done,” said an engineering lead of the Intel XMM 7560 modem effort. The cross-Intel team overcame a number of setbacks to deliver the ultimate cellular modem win.



## Memory breakthrough

Roughly half a year ahead of its official launch, Navin Shenoy in August handed Google's Bart Sano the first production modules of Intel Optane DC Persistent Memory, which will bring 3D XPoint memory to server DIMM slots alongside “Cascade Lake” in early 2019. Customers and partners hungered for the disruptive technology, which already set new performance records and capacity benchmarks for in-memory databases, virtual machines, system restarts, storage throughput, and more.





## Making a difference in our communities

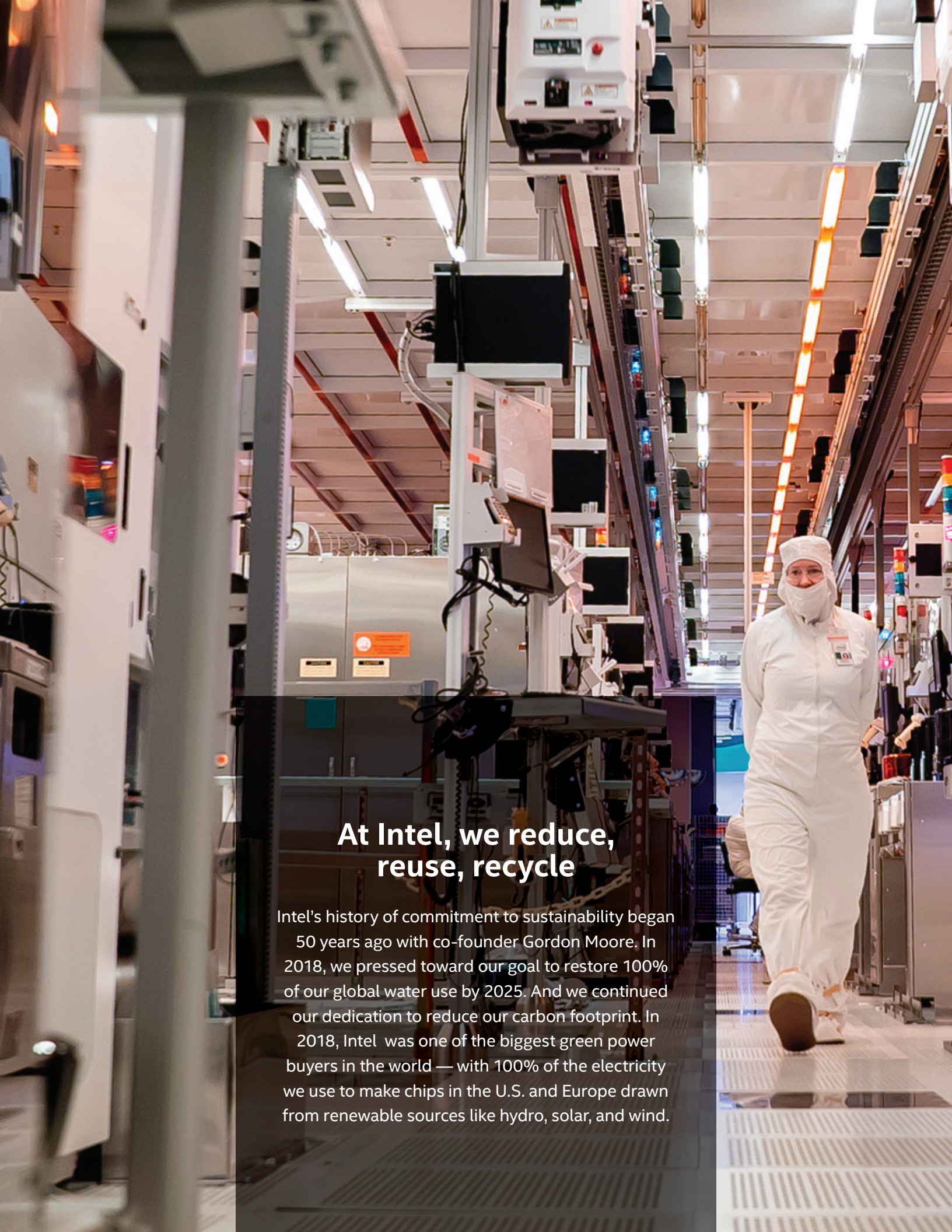
In 1988, Gordon Moore, Intel's then-chairman, helped establish the Intel Foundation, a public charity financed by Intel Corporation. In 2018, we celebrated its 30-year legacy of improving lives around the world. Whether investing in educational programs, providing disaster relief or amplifying Intel employees' charitable contributions, the Intel Foundation has been an extension of Robert Noyce's call to "do something wonderful."



## Restoring the Great Wall of China

Intel drones, data and AI helped to restore the Great Wall of China in partnership with the China Foundation for Cultural Heritage Conservation and Wuhan University. Historically, surveys of the Wall were performed by hand, often with a tape measure. This year, images captured by Intel Falcon 8+ drones enabled teams to survey a section of the wall in just three days, work that used to take a month. The project will continue with Intel Xeon-powered servers helping construct a 3D model to analyze the data and assess materials needed to preserve the wall and its legacy.





## At Intel, we reduce, reuse, recycle

Intel's history of commitment to sustainability began 50 years ago with co-founder Gordon Moore. In 2018, we pressed toward our goal to restore 100% of our global water use by 2025. And we continued our dedication to reduce our carbon footprint. In 2018, Intel was one of the biggest green power buyers in the world — with 100% of the electricity we use to make chips in the U.S. and Europe drawn from renewable sources like hydro, solar, and wind.



## The 'heartbeat of Intel'

Manufacturing Day on Oct. 5 celebrated the thousands of technology and manufacturing employees who Technology and Manufacturing Group co-leader Ann Kelleher called the "heartbeat of Intel." A few weeks later, Murthy Renduchintala, who leads the Technology, Systems Architecture & Client Group, announced the restructuring of TMG into three groups: Technology Development, Manufacturing and Operations, and Global Supply Chain.



时尚健康 × intel

启动暨沙龙

**Technology to help reduce breast cancer**

In China, medical imaging company HYHY Medical Technology and a popular health magazine partnered to reduce breast cancer by boosting the accuracy of diagnoses. An all-Intel Xeon array weaves artificial intelligence into medical imaging systems, speeding the detection of cancer cells. Intel teams will partner with customers across the country to scale AI-based medical scanning systems into more Chinese hospitals next year.

**Happy 20th anniversary, Intel India**

All across India, Intel employees celebrated their site's 20th anniversary with special events, including a walkathon and a social initiative contest that saw 20 Intel employees each receive \$21,000 in stipends to pursue volunteer projects. CFO and Interim CEO Bob Swan capped off the festivities by inaugurating SRR4, the site's new 620,000-square-foot research and development facility. Noted Swan: "Intel India over the last 20 years has had a significant impact on Intel as a company and in turn on the technologies that we deploy around the world."





## Architecting a new path

At the “Architecture Day” event held in December for press at Robert Noyce’s former Los Altos estate, Intel tech leaders demonstrated a broad range of 10nm-based systems set to launch in the coming year and unveiled long-term plans and new technologies aimed for an expansive set of computing workloads. “Foveros” 3D packaging technology, for instance, will enable the integration of logic chips on top of one another. It will arrive in products next year.



## More space for manufacturing

In December, Intel announced that it has started planning for multiyear expansion projects at manufacturing sites in Oregon, Ireland, and Israel. This follows the opening of Intel’s first 3D NAND memory fab in Dalian, China, where the team set an Intel record of just nine months to build and install factory tools.



