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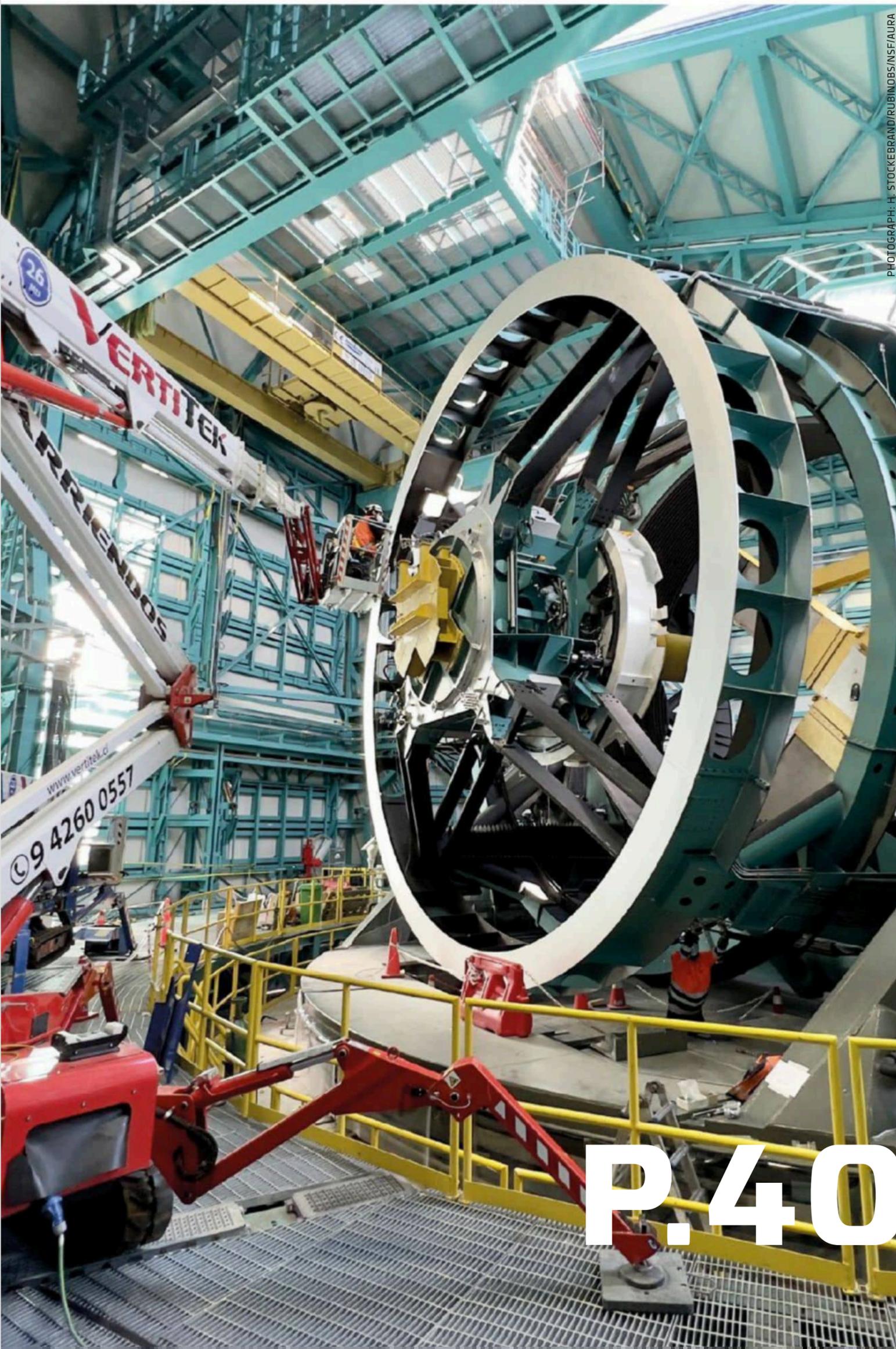

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A SAGA OF 8 WORLD RECORDS, BORN IN ITALIAN GENIUS, MADE IN SWISS EXCELLENCE



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ROMA 1884



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NASA and MBRSC partner to further exploration of the Moon.

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PHOTOGRAPH: STEVE RUSSELL

WIRED

MIDDLE EAST

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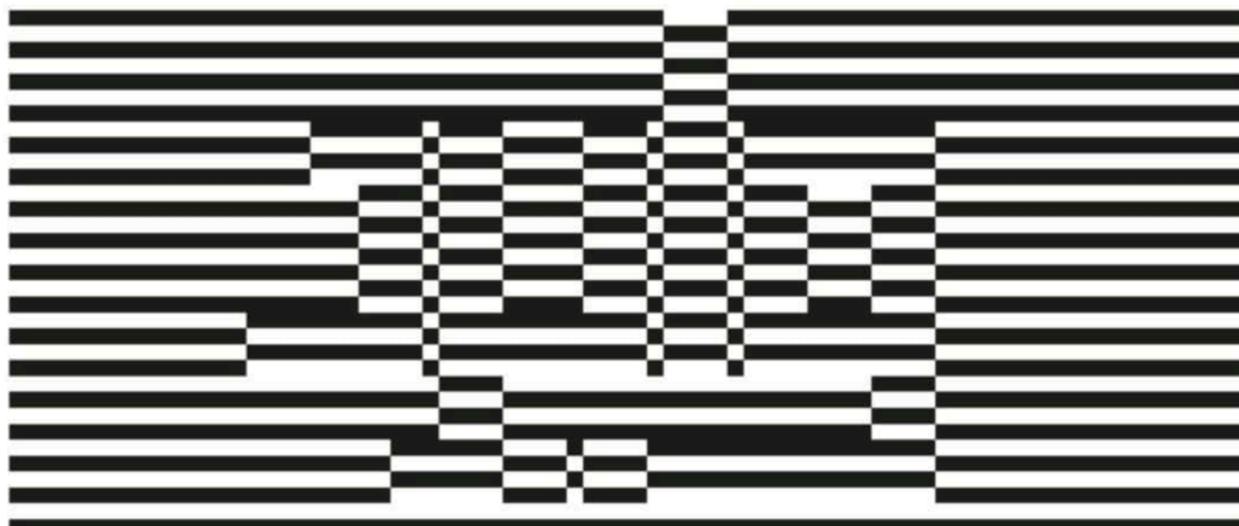
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Disrupt Disrupt Disrupt

EDITOR'S LETTER

كلمة رئيس التحرير

Not long ago, the word “disruptive” was always used in a negative context – an apt descriptor of rebellious youth, disturbers of the peace and people who simply didn’t fit the mold. In a way, these ideas are still true.

The disruptors of today are young minds that hope to change the way the world works – shaping a new approach to the present world, rather than contorting

to fit into yesterday’s standard. Disruption, a term reclaimed by our unruly innovators, has become a global status quo.

The Middle East has, in the past few years, entered into its own renaissance of disruption. Visionary thinkers and the inspired few, backed by eager investors and government mandates, have seized the golden opportunity to reshape the region.

Arabs are innovating on a regional, global and interstellar role – Emirati Sultan Al Neyadi’s historic spacewalk was just the start of the nation’s collaboration with NASA. Closer to home, founders like Emon Shakoor empower Saudi women to build their own businesses, and leaders of industry including Alat’s Amit Midha aim to turn the region into a global business hub.

They’ve already left an impact. At LEAP and DeepFest this year in Riyadh, the sentence I heard the most often was: “This is my first time at LEAP.” It’s not just small talk – this is an important indication that the world is paying more attention to Saudi Arabia as a tech and business hub.

With hundreds of hands shaken, dozens of interviews and many panels attended, we’ve created our list of Disruptors changing the face of Saudi Arabia. From rocket engineering to entertainment, technology and esports, our disruptors are making major moves to build the future of the Kingdom.

On that note, the second-most common phrase I heard at LEAP was: “Saudi Arabia is not how I imagined it would be.” Peruse our list of Disruptors and you’ll see exactly why that is – old stereotypes about the Kingdom are rapidly shattering as it opens its doors to the world.

CARLA SERTIN
Senior Editor



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FIND YOUR WORLD





ATOM TOD: Illuminating Palestinian heroes through Lego portraits

An American artist is championing the cause of Palestinian heroes through his Lego art.

Bottled water contains up to 100 times more plastic than we thought

A study exposes shocking levels of plastic particles in bottled water, prompting health concerns.



When a Greenlandic startup decides to ship Arctic ice to Dubai

Shipping "the world's purist ice" sparked outrage on the startup's social media.

Story of a fake CEO: The actor behind a \$1.3 billion crypto scam

An actor, uninterested in crypto, ended up becoming the face of a \$1.3 billion crypto scam.

When will the metaverse have its "Wordpress moment"?

User-friendly tools hold the key to the mainstream adoption of the metaverse.



TRENDING STORIES

البيان ALBAYAN

// TOMORROW TODAY:
WHAT'S ON THE WIRED RADAR



The gateway to the Moon

NASA and the UAE's MBRSC partner on a vital project
to further our exploration of the solar system.

By Nadine Kahil



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The gateway to the Moon

NASA and the UAE's MBRSC partner on a vital project to further our exploration of the solar system.

By Nadine Kahil

NASA and the UAE are collaborating on the development of the multinational Lunar Gateway, a space station that's set to dramatically enhance our ability to explore the Moon and further afield. NASA has tasked the UAE with developing a vital airlock system on the platform. Here, we speak to His Excellency, Salem Humaid AlMarri, Director General, Mohammed Bin Rashid Space Centre (MBRSC) about what this means for the UAE's space ambitions.

Built by international partners and commercial companies, the Lunar Gateway (Gateway) will serve as mankind's first space station dedicated to the Moon. The station will form a major component of NASA's deep space exploration efforts in the coming years and is a vital part of the upcoming Artemis missions that aim to return to the Moon and begin our journey to Mars. The space station will eventually become a multi-purpose system orbiting the Moon and providing support to lunar missions.

"MBRSC's role in the Lunar Gateway project is a landmark endeavor for the UAE and the region. The UAE's involvement is through the development and operation of the Emirates Airlock, which is an access point between the lunar space station's pressurized cabin and the vacuum outside. Additionally, we will also

HE Salem Humaid Al Marri,
Director General of MBRSC,
at the space center.

be sending an Emirati astronaut on a mission to the Moon. This collaboration not only places the UAE at the forefront of space exploration but also underlines our commitment to contributing significantly to global space research," says HE AlMarri.

This move further solidifies the partnership between NASA and its international partners, including the UAE. According to HE AlMarri, this work with NASA will help to "contribute to lunar research and exploration, furthering our understanding of space".

The airlock is a vital part of the station, as it must allow astronauts to safely disembark from the Lunar Gateway to perform spacewalks as they install and retrieve physical payloads for scientific missions, "Our contribution will be integral in facilitating a sustainable human presence on the lunar surface and supporting scientific experiments and explorations," says HE AlMarri.

According to HE AlMarri, the project will showcase cutting edge technologies developed within the UAE, "These advancements not only contribute to the Lunar Gateway project but also enhance our national space technology capabilities," he says. The project is important for the UAE, it's both a test of the country's capabilities, and a public display of ambition. "By taking part in this project, we will be at the forefront of the most ambitious and extensive program for Moon and space exploration to date. It's a clear testament to our unwavering commitment to becoming a leading nation in global space endeavors. We will also be among the countries to send an astronaut to the Moon, marking a historic milestone in our space journey."

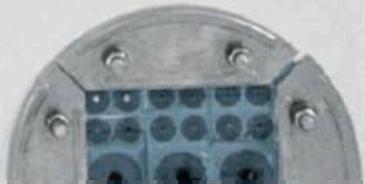
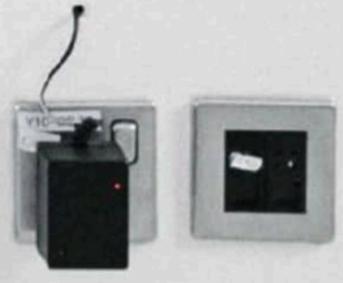
"إن من شأن مشاركتنا في هذا المشروع أن تضعنا في طليعة الدول التي تبنت أحد أكثر البرامج طموحاً وشموليةً لاستكشاف القمر والفضاء حتى الآن."

"By taking part in this project, we will be at the forefront of the most ambitious and extensive program for Moon and space exploration to date."



Acceptance Criteria Ranges

Room #	Room Name	Temperature °C	Humidity %	Microbial Load	ISO Class	Flow Rate
1	Control Room	18-22	30-60	100-1000	1,000,000	20,000
2	Control Room	18-22	30-60	100-1000	1,000,000	20,000
3	Control Room	18-22	30-60	100-1000	1,000,000	20,000
4	Control Room	18-22	30-60	100-1000	1,000,000	20,000

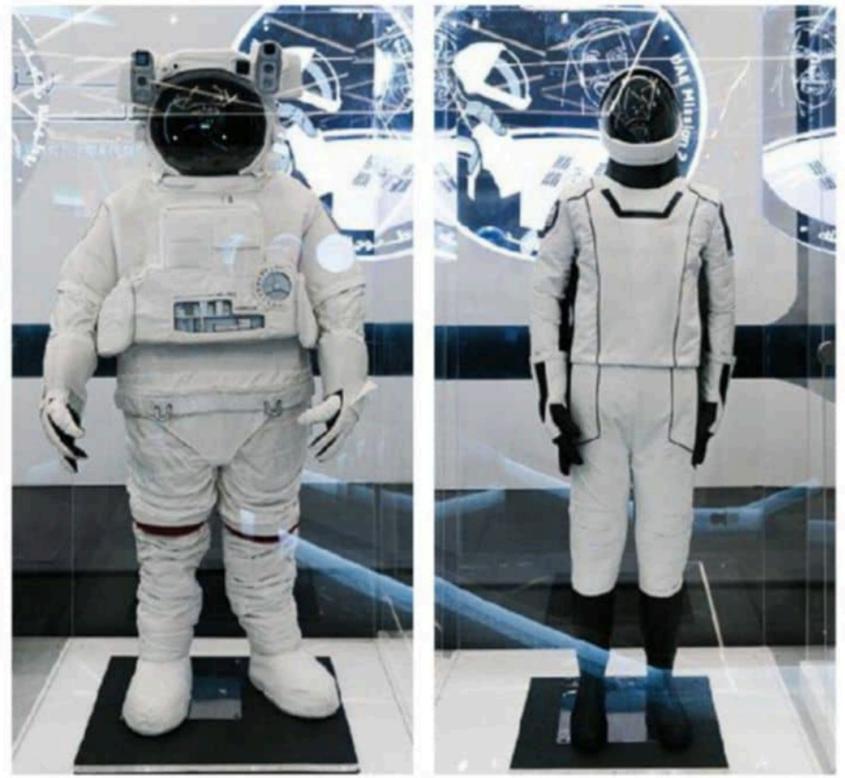


As HE AlMarri says, taking part in the project will also guarantee the UAE a spot on a future Artemis mission, allowing one of their astronauts to travel to the Moon aboard the missions that kicked off last year with Artemis I. HE AlMarri highlighted the spirit of cooperation between NASA and the UAE, saying, “We have a long-standing partnership with NASA and have worked on multiple missions together over the years, including the longest Arab space mission undertaken by Sultan AlNeyadi last year.” Speaking of the Gateway collaboration, he says, “For the UAE, it’s a significant leap in our space exploration journey, elevating our status in the international space community. For NASA, our unique geographical and technological contributions offer new perspectives and capabilities in lunar exploration.”

The Lunar Gateway’s design and mission are remarkable. Designed to be built in a rectilinear halo orbit around the Moon, the station is intended to support landings on the Moon’s south polar region. The landings are part of future Artemis missions and NASA and their partners’ attempts to create a long term presence on our nearest neighbor. AlMarri stressed that, while there are bound to be challenges in the construction of such an ambitious project, he was confident that the international partners would overcome any issues through meticulous planning.

“نسعى من خلال مشاركتنا إلى إلهام الشباب الإماراتي عبر استعراض ما حققته دولة الإمارات من تقدم في تكنولوجيا الفضاء.”

“Through our participation we aim to inspire the Emirati youth by showcasing the UAE’s advancements in space technology.”

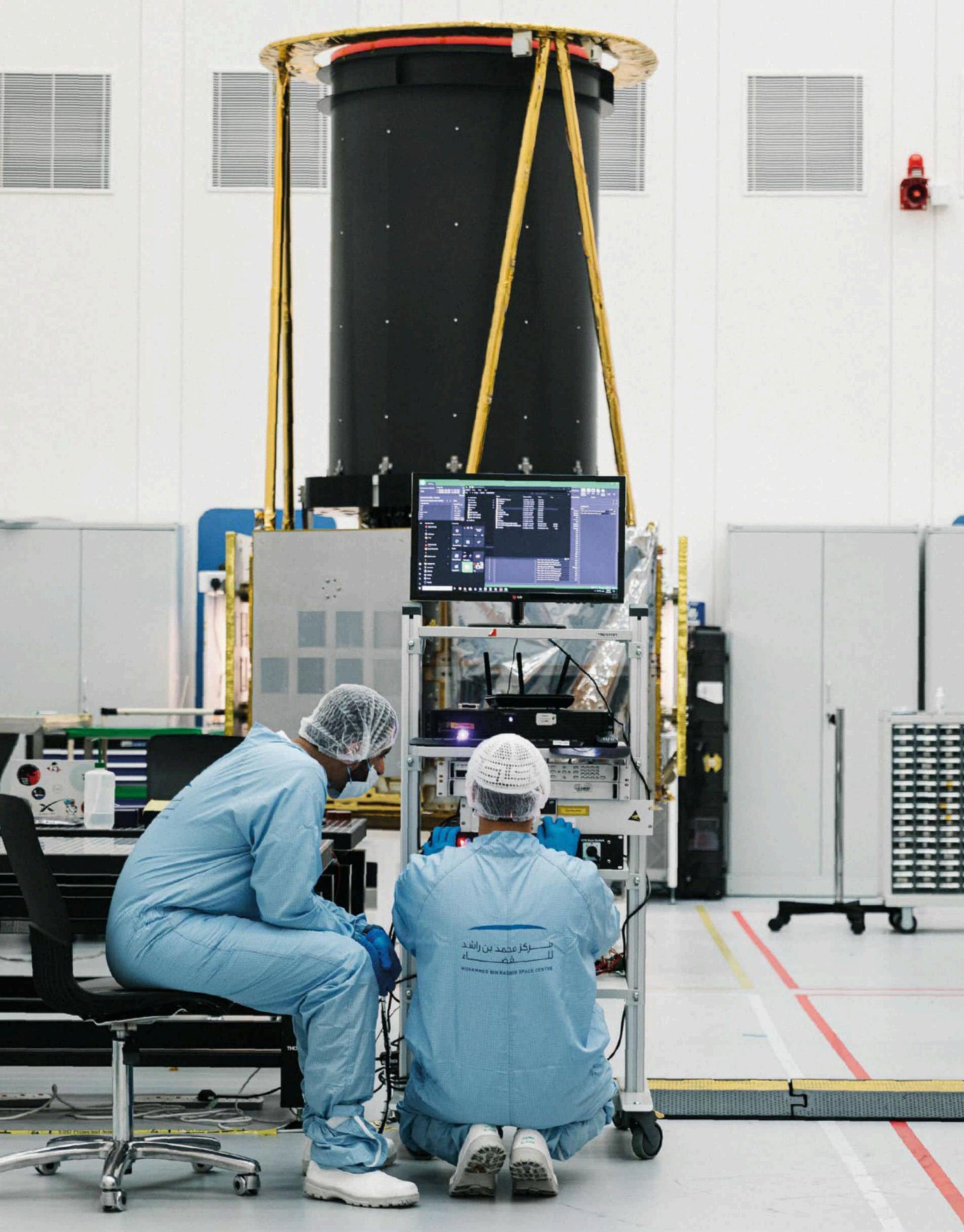


Top images: Space suits worn by Sultan AlNeyadi on his latest ISS mission to the Moon and while walking on the Moon. Right image: MBZ-Sat, the regions’s most powerful imaging satellite under work.

There are no public dates for the project, but AlMarri spoke of a phased approach, “starting with the design and development of the Emirates Airlock, followed by rigorous testing, and culminating in its integration into the Gateway station. These phases are strategically planned to align with the overall timelines of the Lunar Gateway project, which will be updated in the coming weeks.”

It’s hoped that the project can be positioned as a source of pride, and a way to engage Emirati youth the idea of space exploration, “Through our participation we aim to inspire the Emirati youth by showcasing the UAE’s advancements in space technology,” says HE AlMarri. “We plan to engage them through educational programs, internships, and collaborative projects, fostering a new generation of space scientists and engineers.”

A fantastic opportunity to advance the UAE’s capabilities, a project that shines the light on the nation’s capacity for the development of space and a means by which to secure an Emirati astronaut traveling to the Moon? It all sounds too good to be true. When you then add in the data the UAE will gain through the collaboration and the potential to influence a new generation of space engineers and astronauts, the UAE’s participation in the Lunar Gateway project is a dream come true. 🇦🇪



How we will exist in a rapidly heating world where resources are depleting? It's a question that keeps many of us awake at night. And while many of us are, so far, largely unscathed, it is our responsibility to leave the world a better place for the generations that follow. This idea, and the seemingly endless possibilities presented by AI, mean that maybe, just maybe, there's something to be done.

During the recent 54th edition of the World Economic Forum, held at Davos, Switzerland, the issue of making short term gains while losing sight of the bigger picture was a theme up for debate. While even those at the cutting edge of innovation hesitate to delve into the deeper details of just exactly how AI will come to our rescue in face of the climate crisis, certain broad strokes were laid out. The idea is that AI can help with measuring and reducing the emissions of any given institution by using its power to discover technologies that help reduce carbon production. It could also help to build technologies that anticipate climate disasters through the advanced processing of data, which in turn helps to mitigate the damage done. It can also develop contingency plans.

A local example is the Masdar City of Abu Dhabi. Funded by the government of Abu Dhabi and built by Masdar, a subsidiary of the state-owned Mubadala Investment Company, Masdar City is a model eco urban development. Equipped with state of the art technologies, the cluster of high-performing buildings is viewed as a laboratory to understand real-time resource needs and how to optimise these efficiently. "I think people want to live a life where they can have a positive impact on the environment and to be able to create places where where that can happen, where you can find community, where you can find areas that can positively impact your health," says Steve Severance, director of growth of Masdar City about resources and how people will live in the future. As with all the world's great cities of yesterday and today, Masdar City has two universities on site—Mohamed bin Zayed University of Artificial Intelligence, Technology Innovation Institute (TII) as well as the research entity Advanced Technology

Sunny with a chance of AI

AI will increasingly help us to face the challenge of climate change.

By Rujuta Vaidya

Research Council (ATRC). These operate as think tanks and knowledge centers dedicated to the cause of improving urban development as well as developing technology-based solutions to imagine a better future.

Given that one of the most concerning, and largest, sources of carbon emissions in the world comes from the production of electricity and transport, Masdar City has created a command and control center to study the consumption patterns of energy used in its buildings and is in the early stages of working with AI to pinpoint anomalies and make significant changes that are aligned towards sustainability. Masdar City also encourages the use of public transport such as electric public buses, low-carbon personal transport and the autonomous NAVYA shuttle. A metro line is in development. Last year, The Masdar City Free Zone introduced a new licensing package encouraging AI-based start ups and businesses to accelerate the region's AI growth.

Responsible data management has a crucial role to play in the larger scenario, however, data centers themselves use large amounts of elec-

“تُشكّل انبعاثات الكربون الصادرة عن إنتاج الكهرباء والنقل أحد أبرز مصادر الانبعاثات وأكثرها إثارة للقلق على مستوى العالم.”

“One of the most concerning and large sources of carbon emissions in the world comes from the production of electricity and transport.”



tricity, contributing to 0.1 percent–0.2 percent of global green house gas emissions. It is up to policy makers to utilize the information available and share it while ensuring affordable technology access to all for in order to spur increased global cooperation. It is early days when it comes to AI's role in reversing climate. In the future, besides mitigation, AI will perform a significant role in adaptation and resilience, which could translate to projective modelling for large-scale natural disasters, responding to crises and building resilient infrastructure. According to BCG's Accelerating Climate Action with AI report, the UNHCR, the United Nations refugee agency, has worked with Omdena, a global crowdsourced community of AI experts, to help mobilise risk-prone residents of Somalia who are frequently displaced due to natural disasters. Elements of the food

system, such as agriculture, fisheries and irrigation can benefit from predictive modelling and deepened data analysis by way of accurate estimates provided by AI.

The larger, troubling questions about AI relate to the biases that can be fed into these systems. By providing a wide range of data sets, regional discrepancies in information can be avoided. Solutions, once identified, can be further developed by the public sector. Steve Severance spoke about the larger vision for model cities like Masdar City which are shaped by the vision of leaders like Sheikh Mohammed bin Zayed, who recently said, "In 50 years, when we might have the last barrel of oil, the question is: When it is shipped abroad, will we be sad?" If we are investing today in the right sectors, I can tell you we will celebrate at that moment." ■

Sustainable games

The UAE's Estidama Craft is a remarkable new Minecraft experience that aims to teach youth about sustainability.

By Nadine Kahil

In its never-ending efforts to combat climate change, Year of Sustainability continues to light the touch paper on a green revolution among the younger generation. That's the idea behind the launch of Estidama Craft, a vibrant, immersive experience, a game, designed to captivate today's digital natives and instill lasting eco-conscious habits.

Rooted in the wisdom of our forebears, Estidama Craft offers educators and parents a treasure trove of guided lesson plans, blending your typical Minecraft-style play with purpose. Inspired by our ancestors' reverence for the earth, Year of Sustainability seeks to cultivate a generation of stewards committed to preserving our planet's legacy. With five meticulously crafted lesson plans, Estidama Craft unveils the intricate tapestry of sustaina-



bility, from composting to confronting environmental crises like desertification and habitat loss. Through interactive gameplay, players unlock insights into responsible consumption and climate action, charting a course toward a greener future.

Year of Sustainability worked alongside Blockworks, a design studio and consultancy working with Minecraft, to create an immersive experience through a specialized Minecraft World inspired by the UAE's habitats and landscapes. Through innovative approaches to game development, and by leveraging the existing Minecraft platform, Year of Sustainability

is hoping to plant the seeds of sustainability deep within the hearts of UAE's youth, fostering a profound connection to our land. The UAE's natural beauty can be seen in the very fabric of the game, hopefully inspiring a collective journey toward environmental stewardship and renewal. The idea is that every pixel and line of code helps to champion a future where playfulness and sustainability converge for generations to come. The game is available on Minecraft Education and Minecraft Marketplace and has been downloaded over 100,000 times, despite not being officially launched.

“Through Estidama Craft, we wanted to create a game that's already adaptable

for kids and dear to their hearts whilst being a fun, immersive, and educational experience about sustainability that catalyses sustainable behavioral change – particularly in the UAE's context,” says Ayesha Bin Haider, Design Lead - Estidama Craft. “The game is based on a ‘Complete the Monument’ style of gameplay. The Minecraft World – Estidama Craft – is open for players to explore, visiting different regions in any order they wish. Each region is based on a UAE-inspired biome or habitat, and contains two main activities or minigames. Once this task is completed, it provides players with key information about the environmental, sustainability



and climate issues facing that region.”

The second task is open-ended and creative in nature. Players are asked to put the knowledge they’ve acquired into action through demonstrating responses and actions aimed at addressing sustainability challenges. Upon completing a task, secret areas, special items and other rewards can be accessed to keep gameplay rewarding. All this is set inside a huge world with plenty of areas to explore beyond the challenges and tasks.

Players progress through customized levels within the Minecraft world where they’ll learn about ideas such

as composting, reducing food waste, energy resources and responsible consumption, environmental conservation and endangered species and climate change. “Through various obstacles in the game, players use problem-solving and innovative strategies to advance through the levels of the game. Our objective with Estidama Craft is to increase knowledge and awareness of creatures, lands and endangered habitats in the UAE, showcase the natural beauty of the UAE’s landscape and enhance players’ storytelling and problem-solving skills through innovative challenges,” says Bin Haider.

With over 100,000 downloads already, there’s clearly great interest in the project, but Year of Sustainability has even greater plans. The team is looking to engage with the UAE’s educational authorities to see if the game can be brought into the nation’s curriculum and, through a Minecraft Toolkit downloadable by educational entities and schools, Bin Haider hopes to “bridge the gap between eSports organizations, streamers, and educational institutions”.

“In addition, once participants complete Estidama Craft, we are planning to give rewards with exclusive access to real-world workshops on mate-



rials and sustainable production. We are also going to be announcing our Estidama Craft merchandise soon, ranging from toys to t-shirts. We have also planned several engagements around Estidama Craft in the coming year, with the Year of Sustainability officially extended into 2024,” she says.

Perhaps the thing that most sets Estidama Craft apart from other Minecraft environments is how the team was able to bring the physical world into the digital, “A really cool element of Estidama Craft is that we were able to create a sort of virtual manifestation of our physical work at the Year of Sustainability. One of our projects – Material Lab – aimed to promote sustainable production and design in the UAE, where we worked with innovative artists and designers to experiment with material inno-

vation and sustainable materials,” says, Bin Haider. “We incorporated Material Lab into the game to enable players to imagine themselves as pioneers in the UAE, offering a legacy for them to look up to for sustainable local production and design. The Material Lab project appears in the free build area, with their materials to be used as special blocks for building.”

The result is that when players step into the game, they can experience a range of products that Material Lab has helped to support. In the mountains biome players will find a special Leukeather block. “Nuhayr Zein is an

architect, designer, and entrepreneur who creates culturally relevant designs inspired by the natural context. Nuhayr’s Leaukeather, contemporary mandos (traditional Emirati storage chests to keep valuables), and carpets, made under the Fatima Bint Mohamed Bin Zayed Initiative [which was] founded with an aim to empower underprivileged communities and women, by providing them with sustainable employment and critical social service, are displayed as pieces in the game’s interior space,” says Bin Haider.

Further examples of real-world impact in the digital environment are a special block made of SandtoGlass, a real-world, innovative project focused on creating glass from local desert sand by enhancing silica content through a process inspired by SLS 3D printing, which can be found in the Mountain Biome, and a block from the Coastal Biome called the Liminal Series, “Developed by Hala Al-Ani the series harnesses the captivating power of salt crystallization processes to craft objects and furniture, and seamlessly blends science with design, creating visually compelling and functional creations,” says Bin Haider. The City Biome is home to a block called Datecrete, named after the real Datecrete, the first date pit-based cementitious material, with no trace of concrete or resin. Finally, there’s the Tibra block, named after architect and designer Reema Almheiri’s creations which “weave sustainability, UAE heritage, and culture into a harmonious blend of contemporary aesthetics and tradition through bio-materiality and regenerative design,” says Bin Haider.

This incredible creation is a testament to Year of Sustainability’s love of education and the environment and there’s sure to be a bright future ahead. Estidama Craft can be downloaded all over the world and is safe to play with parental guidance. Furthermore, the addition of lesson plans and guides for kids make this a truly global educational initiative and a celebration of the UAE’s natural beauty. 🌍



Estidama Craft, launched by Year of Sustainability, features unique design elements created specifically for the game. inspired by the UAE’s landscape and biodiversity.



A doctor on every street

CarePods leverage AI and advanced technologies to create a self-service doctor's office accessible to all.

By **Louis Parks**

Forward CarePods, the world's first AI-powered doctor's offices, are set to reshape the landscape of healthcare delivery. The self-serve pods, driven by cutting-edge technology, are designed to empower individuals, putting them in control of their health journeys.

As healthcare costs continue to soar, and access to quality care remains elusive for many, American company Forward might just have the answer. With the goal of revolutionizing healthcare by leveraging technology,

Forward CarePods offer a blend of advanced diagnostics, personalized health plans, and a premium in-person experience, all readily accessible for all, at least that's the plan.

Adrian Aoun, San Francisco-based founder of Forward, envisions a future where healthcare is not just a service but a fundamental right, "Forward was created to solve the existential problems in healthcare by using technology to scale care to the people of the world," he says.

Aoun, like many tech entrepreneurs, an ex-Googler. He sold his first AI related startup to the company in 2013 and then spent time in the company's AI division before becoming director of special projects for Google cofounder Larry Page. It's safe to say that he's got a track record.

CarePods, equipped with state of the art medical equipment and powered by proprietary AI, offer immersive experiences tailored to individual health needs. Upon stepping into a CarePod, members unlock a personalized gateway to a diverse range of Health Apps, designed to address current health issues and prevent future ones. Through the CarePod, members can enjoy on-demand access to services and tests including disease detection, biometric body scans, blood testing, and more. The system is supported by Forward's vertically integrated, direct-to-consumer healthcare system, comprising 19 locations nationwide and a team of over 100 primary care clinicians. CarePods are being installed in malls, gyms, and offices starting in the San Francisco Bay Area, New York, Chicago, and Philadelphia, and Forward plans to more than double its footprint in 2024.



The system is straightforward; users visit the CarePods and are tested, thereby giving the system a wide range of information about their health. This data is then securely transmitted to Forward's platform, through which the user is monitored thanks to regular visits to the CarePod and a fresh supply of data. The system allows for continuous progress monitoring, identifying disease risks, and providing in-depth evaluations using sensors, laboratory tests, and vital sign measurements, according to Aoun and this data can be accessed at any time through the Forward app. The convergence of CarePods with Health Apps provides members with an empowering self-serve healthcare experience, ensuring personalized, convenient, and comprehensive healthcare services.

"Health Apps help you address a wide range of disease areas - some are single-use, like COVID-19 testing and others are longer term plans including programs for diabetes, heart health, weight management, and mental health," says Aoun, "The blend [of Health Apps and CarePods] prioritizes preventative healthcare, allowing for early detection of potential health concerns, therefore mitigating risks and ensuring more timely and effective treatment when required. Members can conveniently access this experience through the CarePod on-demand or via the Forward mobile app, without the need to book an appointment."

"Forward CarePods are AI-powered and self-serve. They create immersive experiences, putting you in the driver's seat of your health," says Aoun. The Health Apps, accessible both in CarePods and through the Forward mobile app, cover various disease areas, from

diabetes and hypertension to mental health and advanced cancer screening.

Forward's recent announcement that it has secured \$100 million in growth capital underscores the confidence the company's blue-chip investors and AI luminaries have in Forward. With backing from industry giants like Eric Schmidt, John Giannandrea, and Demis Hassabis, Forward is poised to scale its revolutionary healthcare model nationwide.

The hope is that CarePods present not just a solution to rising healthcare costs and accessibility issues; but that they represent a fundamental shift in the way healthcare is perceived and delivered. By leveraging technology to bridge the gap between

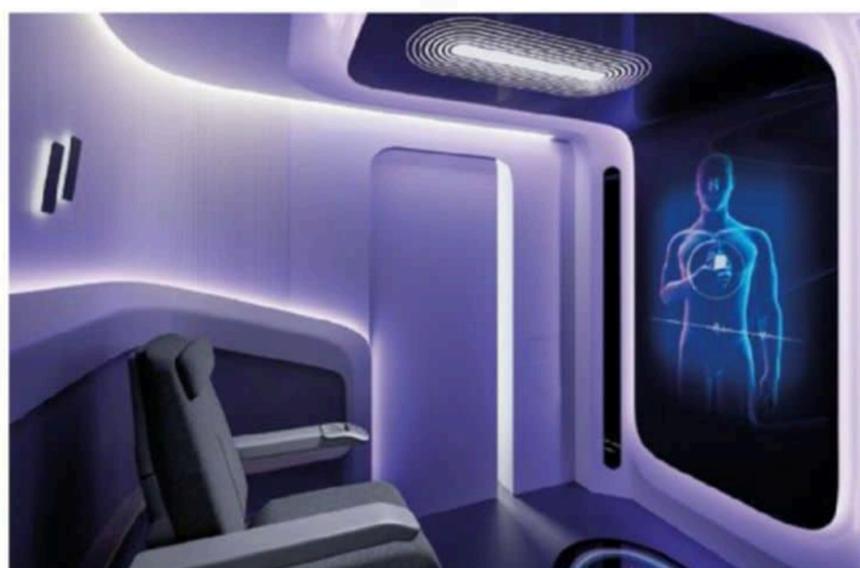
patients and providers, Forward is paving the way for a future where quality healthcare is accessible to all, regardless of location or socioeconomic status.

As Aoun emphasizes, "CarePods were designed to address the three fundamental challenges of healthcare: cost, accessibility, and quality." By making healthcare more affordable, accessible, and efficient, Forward CarePods stand at the forefront of a transformative journey towards a healthier and happier society.

Forward's AI-powered CarePods embody the promise of technological innovation in healthcare, offering a glimpse into a future where personalized, high-quality care is not a dream, but a reality for all. ■



Adrian Aoun, Founder of Forward CarePods.



CarePod, the world's first AI-powered doctor's office.

Faster, higher, stronger – together

A look back at some Olympically memorable moments in sports history.

By Farah Al Toukhi Illustration: Juan Vallejos

776BC

The 1st Olympic Games

While their origins are shrouded in myth and lost to time, the legends say that the Olympic Games were started in Olympia, Greece, by Hercules. Legend has it that the games were held in honor of Zeus after Hercules completed his Twelve Labors. To this day, the Games are held every 'Olympiad' — every four years — in keeping with the ancient tradition. In his attempts to suppress pagan rituals, the Roman Emperor Theodosius I abolished the Games in 393 AD.

1900

Changing the Game

The Paris Olympics allowed female athletes to compete in various sports, including sailing and tennis. Swiss sailor Countess Hélène de Pourtales became the first woman to compete and win a gold medal in sailing, while British tennis player Charlotte Cooper became the first female individual Olympic champion.

Every four years, the world's attention is captivated by a series of events measuring the physical and mental limits of human potential. In the spirit of friendly competition and physical excellence, the Olympic Games bring together athletes from all around the globe to compete for national pride and commemorative discs made of various metals. The athletes push themselves to the brink of exhaustion and

beyond, striving for the chance to etch their name into history. The history of the Games dates back to ancient myth and continues to have a long-standing tradition of showcasing the best that sports (and entertainment) have to offer. As we await the 2024 Olympic Games in Paris, let's take a look back at some of the historical moments that make the Olympic Games the epitome of international competition and unity.

PIERRE DE COUBERTIN



1896

Olympic Revivals

The 2024 Olympics will be held in Paris for the first time this century after being held in France in 1900 and 1924. The French capital is also home to the modern Olympiad's origins. In 1892, Baron Pierre de Coubertin proposed the idea of reviving the ancient Olympic Games, leading to the establishment of the International Olympic Committee in Paris in 1894. The first modern Olympics were held in Athens in 1896, marking the beginning of a new era for the Games under the patronage of the IOC.

1928

Middle Eastern Gold

An Egyptian weightlifter accomplished a historic win at 1928's Games, marking a first for the Middle East. El Sayed Nosseir made history by becoming the first athlete from the Middle East to win a gold medal. Nosseir not only made Olympic history, he also broke a world record by lifting 355 KG in Amsterdam that year.



1936

Victorious Legacies

The Berlin Games, the world's first televised sporting event at the time, featured Jesse Owens, an African-American track and field athlete, winning four gold medals. Despite the Nazi regime's intention to showcase Aryan supremacy, Owens' victories became a symbol of triumph over racism and discrimination.



1980 & 1984

Wartime Boycotts

The 1984 Los Angeles Olympics were a significant event due to global political unrest, with the US boycotting the 1980 Moscow Olympics in protest of the Soviet invasion of Afghanistan. The Soviet Union boycotted the Los Angeles Olympics, leading to punitive bans on participation. Still, the LA Games were considered the most financially successful in Olympic history, with a surplus of \$225 million.



1992

The Dream Team

Before 1986, the Olympic Games were exclusively for amateur athletes, relying on private sponsorships. In 1986, the IOC allowed professional players to participate, allowing for public sponsorships. This led to iconic sports moments like the "Dream Team" in basketball, featuring NBA superstars like Michael Jordan, Magic Johnson, and Larry Bird, who won gold in 1992.



2016

First Time Continents

The XXXI Olympiad took place in Rio de Janeiro, Brazil, marking the first Olympic Games in South America. Nine new venues were built, and golf and rugby sevens were reintroduced. Farida Osman became the first Egyptian female swimmer to win an Olympic medal, winning bronze in the women's 50-meter butterfly.



2020

Pandemic Postponement

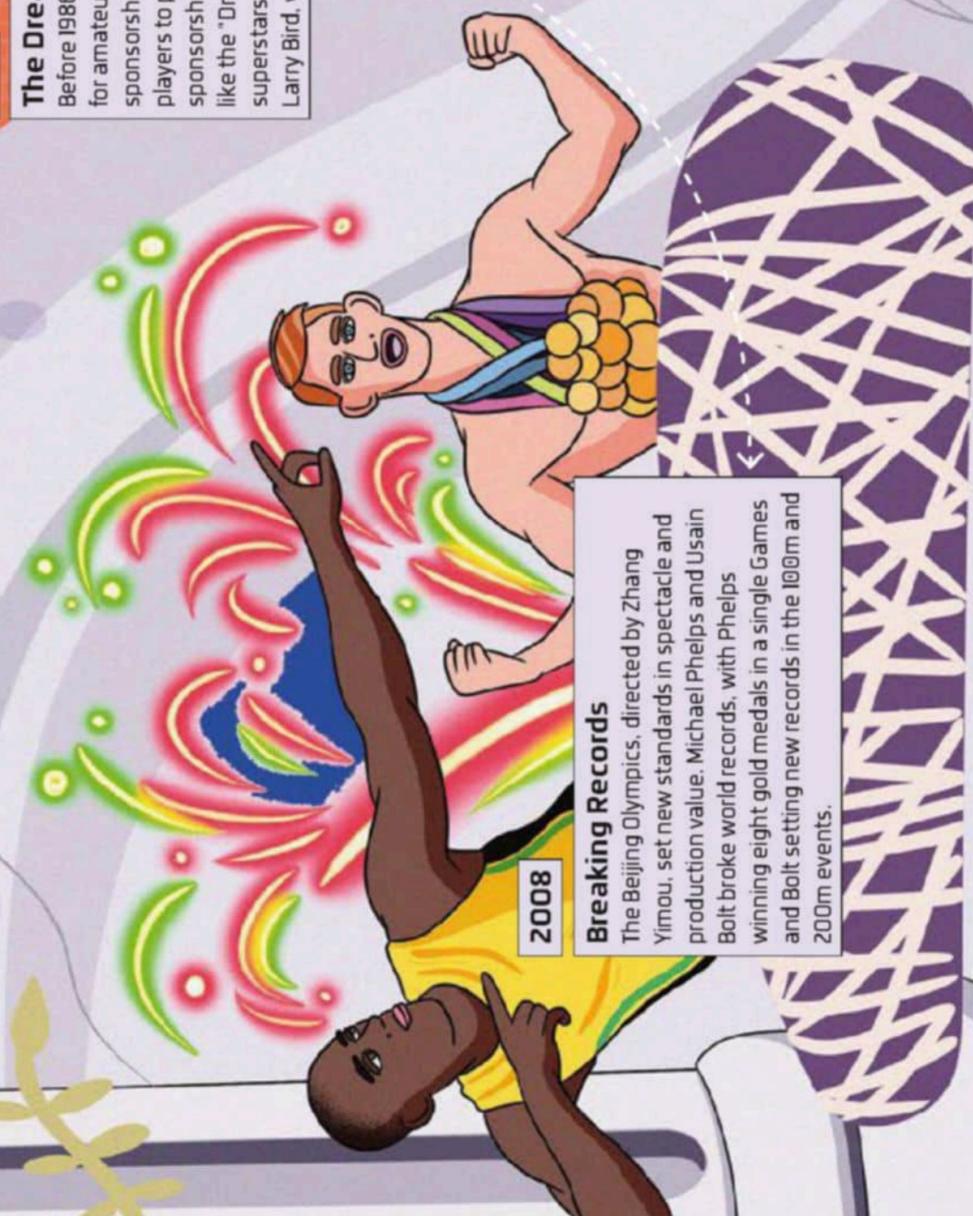
Amid a public health crisis, the 2020 Olympic Games saw an unprecedented decision by the International Olympic Committee. The first Olympics to ever be postponed eventually took place in 2021 in Tokyo, Japan, with strict COVID-19 countermeasures in place to ensure the safety of athletes and spectators. Spectators were not allowed in most venues, creating a unique atmosphere for the athletes to compete in.



2008

Breaking Records

The Beijing Olympics, directed by Zhang Yimou, set new standards in spectacle and production value. Michael Phelps and Usain Bolt broke world records, with Phelps winning eight gold medals in a single Games and Bolt setting new records in the 100m and 200m events.



Solar surge

As the Arabian Peninsula embraces solar energy like never before, the search for more efficient solar panels is heating up.

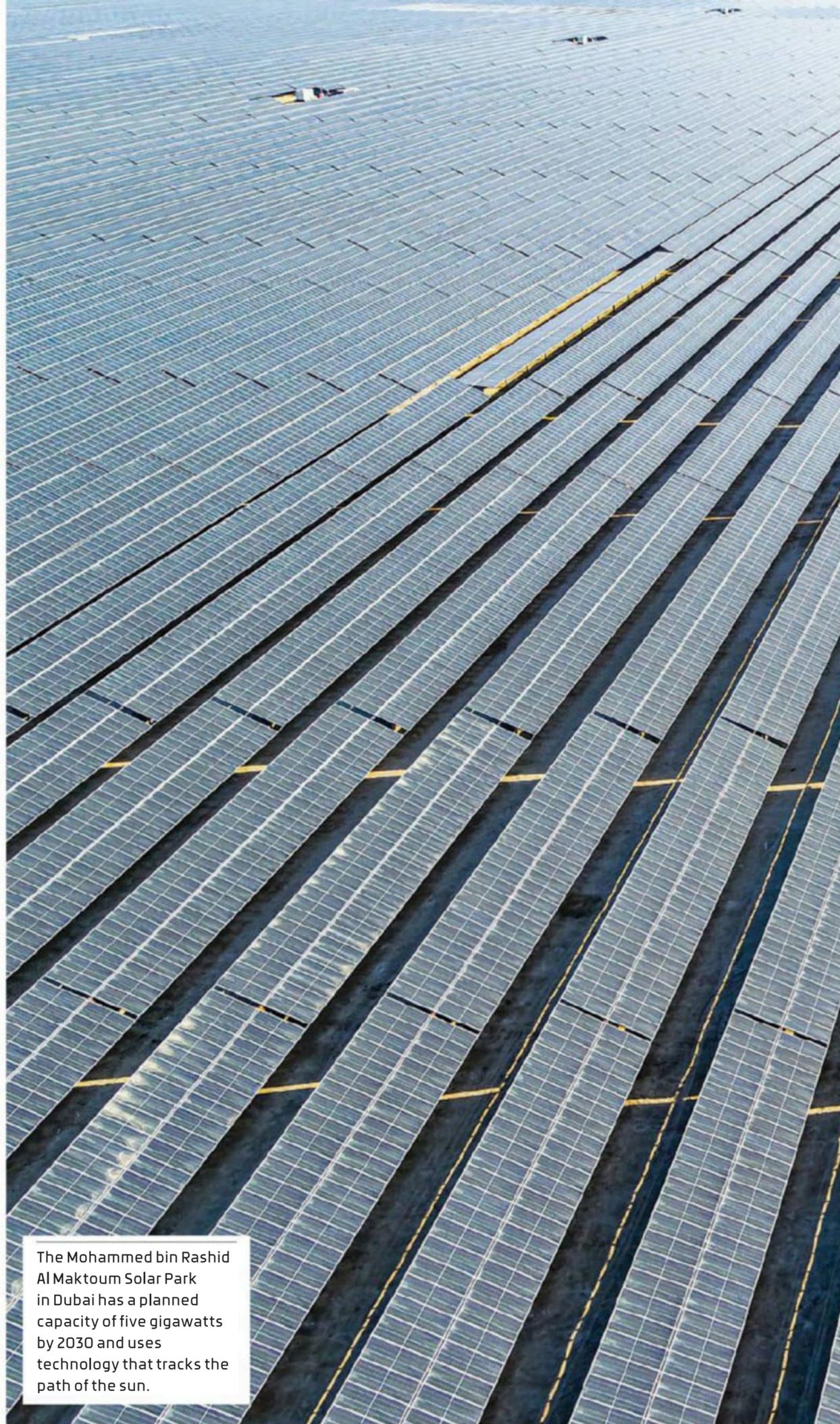
By Iain Akerman

“It’s like any other system,” says Ibraheem Almansouri, director of engineering at Masdar. “There are physical limitations. At the end of the day, we are capturing sunlight, or the photons that come from the sun. So there is a limitation in terms of the quality of material that can absorb the light. Some of the light might be reflected, some might be absorbed, and some might be transmitted. This is why, for commercially available products, the efficiency varies from 15 to 22 percent.”

For the uninitiated, the revelation that solar panels do not convert all the sunlight that hits them into energy may come as a shock. Technological advances and significant investment may mean solar power is abundant and cost effective, but that doesn’t mean it is anywhere near as efficient as desired.

The vast majority of solar parks across the Arabian Peninsula use monocrystalline solar panels, a type of photovoltaic panel known for its cost effectiveness and durability. Made from monocrystalline solar cells, the panels convert, on average, about 20 percent of sunlight into energy. They are, says Almansouri, a bankable technology with a proven track record. Most of Masdar’s projects use such panels, although it also utilizes polycrystalline, including for phase three of the Mohammed bin Rashid Al Maktoum Solar Park in Dubai.

Passivated emitter and rear cell (PERC) technology can be used to enhance the efficiency of monocrystalline and polycrystalline solar panels, although this is slowly being superseded by an advanced solar cell tech-



The Mohammed bin Rashid Al Maktoum Solar Park in Dubai has a planned capacity of five gigawatts by 2030 and uses technology that tracks the path of the sun.

nology called tunnel oxide passivated contact (TOPCon). The latter addresses some of the limitations of traditional solar cells by introducing a thin layer of silicon oxide between the silicon wafer and a highly doped silicon layer. In both cases, the technologies are an attempt to increase efficiency.

“We find that most new solar plants that are being commissioned or planned are predominantly TOPCon technology,” says Georges Badawi, a director in the

energy, resources and sustainability practice at Strategy&. “TOPCon harvests more energy per unit area due to reduced losses resulting from the type of solar wafer it uses. It is roughly five percent more efficient and also has a lower degradation, effectively meaning its lifetime is longer.” Such new commissions include Saudi Arabia’s Al Shuaibah, the world’s largest single-site solar power plant. Announced in February last year, the project is expected to begin opera-



“ندرك أن الطاقة الشمسية تنطوي على فرص هائلة على الصعيد العالمي؛ إذ ارتفع توليد الطاقة الشمسية بنسبة ٢٤ في المئة خلال عام ٢٠٢٣، ما يجعلها المصدر الأسرع نمواً للكهرباء على مدى ١٨ عامًا متتالية.”

“We know that solar has tremendous potential globally. Solar generation rose by 24 percent in 2023, making it the fastest growing electricity source for 18 years in a row.”

tions in 2025 and will have a generation capacity of 2.6 gigawatts.

The search for greater efficiency, however, continues. Heterojunction technology (HJT), which combines two different types of semiconductor material, has shown promise, but it is perovskites that have grabbed the world’s attention. Perovskites are a relatively new family of semiconductor materials that, when combined with traditional solar cells, consistently break

world records for efficiency.

“Sunlight consists of a wide range of wavelengths,” says Joel Jean, the CEO and co-founder of Swift Solar, a US-based startup specializing in high performance solar technology. “A solar cell can absorb and convert light to electricity efficiently over a narrow range of wavelengths, but shorter wavelengths like blue light are converted inefficiently while longer wavelengths aren’t absorbed at all. This is a funda-

mental tradeoff. We are working on a new multi-junction or tandem cell technology that combines two or more cells, each converting a narrower part of the spectrum, which gives you a higher overall efficiency.”

Perovskite tandem solar cells may be in the early stages of development but they are creating ripples of excitement. In April last year, Saudi Arabia’s King Abdullah University of Science and Technology produced a perovskite tandem solar cell with an efficiency rate

great potential in a laboratory setting, it has not yet transitioned into mainstream commercial success. Why? Well, perovskites are sensitive to moisture, heat, and UV light, which is problematic for a solar product. Questions related to durability and the scalability of production also remain. “Perovskite tandems can reduce the cost of solar electricity, but the technology is still in its infancy,” admits Jean. “Tandems are neither mature enough nor produced at a large-enough scale to be adopted

four solar projects in Saudi Arabia with a combined capacity of 3.7 gigawatts, uses technology that tracks the path of the sun to maximize the output of the Mohammed bin Rashid Al Maktoum Solar Park. It also uses bifacial technology to capture reflected light.

“We are always looking at new technologies that could be deployed, but we pay a lot of attention to the durability of that new technology and whether it has a sufficient track record to deploy at a utility scale,” says Alman-



Swift Solar’s perovskite tandem solar cells, which have the potential to greatly increase the efficiency of solar panels.

of 33.2 percent. In November, the Chinese firm Longi set a new world record of 33.9 percent. According to UK-based Oxford PV, the technology has a theoretical maximum efficiency of over 43 percent.

“Perovskites work well in tandem cells because they can be tuned to absorb different parts of the solar spectrum,” explains Jean. “They can be combined with silicon – the main material used in solar cells today – or with other solar cell materials to boost conversion efficiencies from the low to mid-20s to above 30 percent, which is a big step. Perovskites also absorb light well, which means you need less material – and less cost.”

Although the technology has shown

widely by most solar customers today.”

Such uncertainties mean perovskite tandem solar cells are unlikely to be rolled out across the region anytime soon. “Investments in large-scale solar farms are quite extensive and it is advised to use an established and commercialized technology when building them,” says Badawi. “Additionally, having a robust and reliable supply chain is important to reduce supply risks especially as so many new projects are being launched across the region.”

That’s not to say new technologies aren’t being embraced. Masdar, which in February qualified to compete for

souri. “The focus in the region is on expanding and optimizing existing solar panel technology to meet renewable energy targets.

“In order to meet the climate goals, we must rapidly build the energy system of tomorrow, and solar energy has a critical role to play in that,” adds Almansouri. “We know that solar has tremendous potential globally. Solar generation rose by 24 percent in 2023, making it the fastest growing electricity source for 18 years in a row. And some studies suggest it could be the dominant power source by 2050, but this will require continuous investment, innovation, and policy support.” ■

Riyadh Air: A year of excellence

Celebrating one year on the road to revolutionizing air travel in Saudi Arabia.

When it comes to the airline industry and travel, Riyadh Air has emerged as a force of change over the past year. From its inaugural flight on the 12th of March 2023, the airline has embarked on an extraordinary journey to redefine air travel not just in Saudi Arabia, but globally.

Under the leadership of CEO Tony Douglas, Riyadh Air aimed not just to fly, but to soar above and beyond conventional standards, "2023 was a monumental year for Riyadh Air and we're immensely proud of the progress we've made in the last 12 months as we celebrate our first anniversary - but we're only just getting started. This year is set to be an even bigger one for us and we can't wait to reveal more as we continue to accelerate towards our maiden flight in 2025, as we become the most forward-thinking carrier in the skies. I would like to thank our partners, stakeholders and team for supporting us in our vision to disrupt the aviation industry and delivering an airline experience like no other," he said.

It has indeed been a remarkable year, Riyadh Air set the stage for a grand entrance into the aviation industry from day one. Under the patronage of His Royal Highness Prince Mohammed bin Salman bin Abdulaziz Al Saud, the Crown Prince, Prime Minister, and Chairman of the Public Investment Fund (PIF), Riyadh Air placed an order for Boeing 787-9 Dreamliners, showcasing its intent to shake up air travel. The partnership with Boeing wasn't just about airplanes; it was a statement of Riyadh Air's commitment to sustainability, reliability, and hospitality.

Riyadh Air's logos and marketing campaigns were themselves statements. From the lavender-inspired livery over Riyadh to the meticulously crafted design showcased at the Paris

and Dubai Airshows, Riyadh Air's dual-livery designs embrace contemporary styles in order to reflect Saudi Arabia's warm hospitality and future-focused vision, and were designed to captivate hearts and minds around the globe, a theme the airline keeps coming back to.

Collaboration has been at the heart of Riyadh Air's strategy since it was founded. From signing landmark agreements with Saudia and Turkish Airlines to forging a pioneering partnership with Lucid Motors, Riyadh Air paved the way for a new era of cooperation in the aviation industry. These strategic alliances weren't just about expanding routes or sharing resources; they were designed to shape the future of sustainable transportation and driving innovation across sectors.

In its quest for excellence, Riyadh Air didn't shy away from embracing cutting-edge technologies. From partnerships with

industry giants like IBM, Microsoft, and Oracle to unlocking digital leadership in aviation sustainability, Riyadh Air set the stage for a digital transformation in the skies. These technological advances are intended to do nothing less than redefine the very essence of contemporary air travel.

Beyond the sky, Riyadh Air spread its wings into cultural and sporting arenas. With partnerships with leading Spanish football club Atlético de Madrid and debuts at industry events like the World Travel Market London, the airline positioned itself not just as a company, but as a cultural ambassador, fostering connections and collaborations across borders.

As Riyadh Air celebrates its first anniversary, it is not only celebrating the passing of an eventful year, it's heralding an exciting future. With its sights set on the skies and beyond, Riyadh Air continues to soar, shaping the future of aviation one flight at a time.



For Gastón Paladini, pork is a family affair. In 1923, his great grandfather Don Juan Paladini moved from Italy to Santa Fe, Argentina, where he started putting a South American twist on classic Italian sausage recipes. Eventually, the company Don Juan started became one of Argentina's largest meat producers. To this day, it still bears the family name: Paladini.

But in 2020, Gastón started having the kind of heretical thoughts that would have made his ancestors blush. What if you could capture the essence of pork—that meaty, umami sweetness—and put it in a plant? Paladini's imagination ran wild with thoughts of a soybean that dripped blood: A chimera that packed all the flavor of pig meat into a seedling.

Today, Paladini is the CEO of Moolec Science: a molecular farming firm that uses crops to grow animal proteins. The idea is to turn plants into tiny, field-based factories that can produce high-value proteins and other molecules

that might be used to supplement existing products, or provide a meaty heft to plant-based food. "This is the real thing. These are real meat-protein molecules," says Paladini.

Growing meat-flavored plants

With shoppers finding animal-free alternatives to be an underwhelming eat, molecular farming could be the key to giving bland food products a much-needed meaty twist.

By **Matt Reynolds** Illustration **Joe Taylor**



In June 2023, Moolec revealed that it had inserted genes from pigs into soy plants in order to make soybeans that expressed porcine proteins. The experiments were carried out at the company's greenhouses in Wisconsin. In some of the soybeans, over a quarter of the soluble proteins were identified as pig. It's not quite the bleeding soybean that he first imagined, but Paladini was still impressed with just how much pig protein his soybeans seemed to produce. The beans have a pinky hue and a meaty taste, he says, though the company is still awaiting a full analysis of their nutritional qualities. In 2024, Paladini hopes to take the soybeans to outdoor field trials in Wisconsin.

Plant-based meat companies might be particularly interested in animal proteins grown this way. In the US, sales of plant-based products are flat-lining amid signs that consumers are



“أؤمن شخصياً بأن صناعة اللحوم النباتية قد تباطأت بسبب ارتفاع كلفتها وعدم تحسين طعمها ونكهتها لإرضاء مختلف الأذواق.”

“I personally believe the plant-based industry has slowed down because the cost and taste and flavor are good—but not good enough.”

the only area that Paladini has his eye on. In fact, he’s more interested in the trillion-dollar global market for meat. It’s an uncomfortable truth that many meat products contain a surprisingly small fraction of flesh. In the UK, for example, sausages only need to contain 42 percent pork to qualify for the label “pork sausages.” The rest is flavorings and filler—which often includes protein from soybean. Mixing in a meatier-tasting soybean could improve these products while keeping their costs down, says Paladini, who cofounded Moolec after a career in marketing. Moolec, which is a

spin-out from the biotech firm Bioceres Crop Solutions, is also working on pea plants that contain beef proteins and safflowers modified to produce one of the main enzymes that helps milk coagulate into solid blocks of cheese.

One of the reasons Moolec is concentrating on soy and pea is because there are already huge markets for these commodities. Rather than introduce people to an entirely new ingredient, Paladini is hoping that they’ll be more responsive to a slightly tweaked version of a crop that they’re already familiar with. However, because the plants that Moolec is working on contain genetic material from at least two different species, they will fall foul of rules in the UK and the EU that tightly regulate genetically modified organisms (GMOs). Paladini hopes this will be less of a problem in Argentina and the US, where Moolec also has offices, and where regulators have a much more relaxed stance towards genetically-modified foods. “Sooner or later, I think we need to embrace science,” he says. 🍷

underwhelmed by these animal-free offerings. As confidence wavers, an increasing number of startups are hoping to create the killer ingredient that can help plant-based sausages and burgers rival their fleshy counterparts. Australian startup Nourish uses genetically-engineered yeast to produce animal-like fats, while UK-based Hoxton Farms grows fat from actual animal cells in bioreactors.

“I personally believe that the plant-based industry has slowed down because the cost, taste, and flavor are good—but not good enough,” says Paladini. “Plant-based companies still need to improve flavor and texture and get down cost.”

Improving plant-based meat isn’t

Fake it to make it: Four food startups aiming to make the cut

Nourish Ingredients

Without the tasty, glistening ooze of animal fat, a plant-based burger is just a dry puck of disappointment. Australian startup Nourish Ingredients is trying to identify the most delicious animal-free fats and grow them using yeast cells to deliver a satisfying savory sizzle for plant-based meats.

Hoxton Farms

But why settle for plant-based fats? In London, Hoxton Farms is growing real pork fat with surprisingly little help from pigs. Starting with a sample of stem cells, the entire growing process takes place in a bioreactor, which nurtures the cells until they’re ready to be harvested.

Impossible Foods

In 2016, Impossible Foods surprised the world with a plant-based burger that bled thanks to heme—an oxygen-carrying molecule that gives blood its red color. Founder Patrick Brown genetically-engineered yeast cells to produce a heme molecule usually found in the roots of soy plants.

Paleo

Finding the meatiest molecules might require a trip back in time. Belgian startup Paleo has experimented with replicating heme produced by mammoths—which, in case you forgot, are extinct. The company says it can also produce heme proteins identical to those in chicken, pork, lamb, and tuna.

Communicating the future

CEO Ahmed Al-Anqari's vision for Salam and Saudi Arabia's digital transformation.



Ahmed Al-Anqari,
CEO of Salam.

In the dynamic landscape of information technology and telecommunications, few companies stand out as prominently as Saudi's Salam and their CEO Engineer Ahmed Al-Anqari. Al-Anqari's leadership is not only steering Salam towards new horizons of digital innovation but it also aligning it closely with the Kingdom's ambitious Vision 2030.

Salam stands at the forefront of Saudi Arabia's telecommunications sector, delivering cutting-edge ICT solutions. This includes advanced services in broadband, connectivity, cloud computing, managed services, security, satellite, and internet services catering to diverse sectors such as government, business, wholesale, and consumers. The company seeks to empower businesses by enhancing their digital capacity, integration, and security and to play a pivotal role in bringing their community towards a robust digital future.

Adapting to digital demands, over the company's lifetime Salam has evolved from a business-centric communications provider to a comprehensive digital and telecommunications powerhouse, catering to both individuals and enterprises. Al-Anqari highlights this journey as a reflection of Salam's adaptability and commitment to meeting the evolving needs of customers, "This shift is not just a change in our product line; it's a reflection of our adaptability and our commitment to serving the evolving needs of our customers and the market," he says.

Saudi Arabia's Vision 2030 is a transformative blueprint for the nation's future, and Salam is playing a critical role in this transformation. "We are investing in next-generation broadband, cloud computing, and cybersecurity, contributing to the nation's digital infrastructure. Our strategy is to be a catalyst in the Kingdom's digital transformation, enabling a smarter, more secure, and interconnected society," says Al-Anqari, highlighting the need and determination to

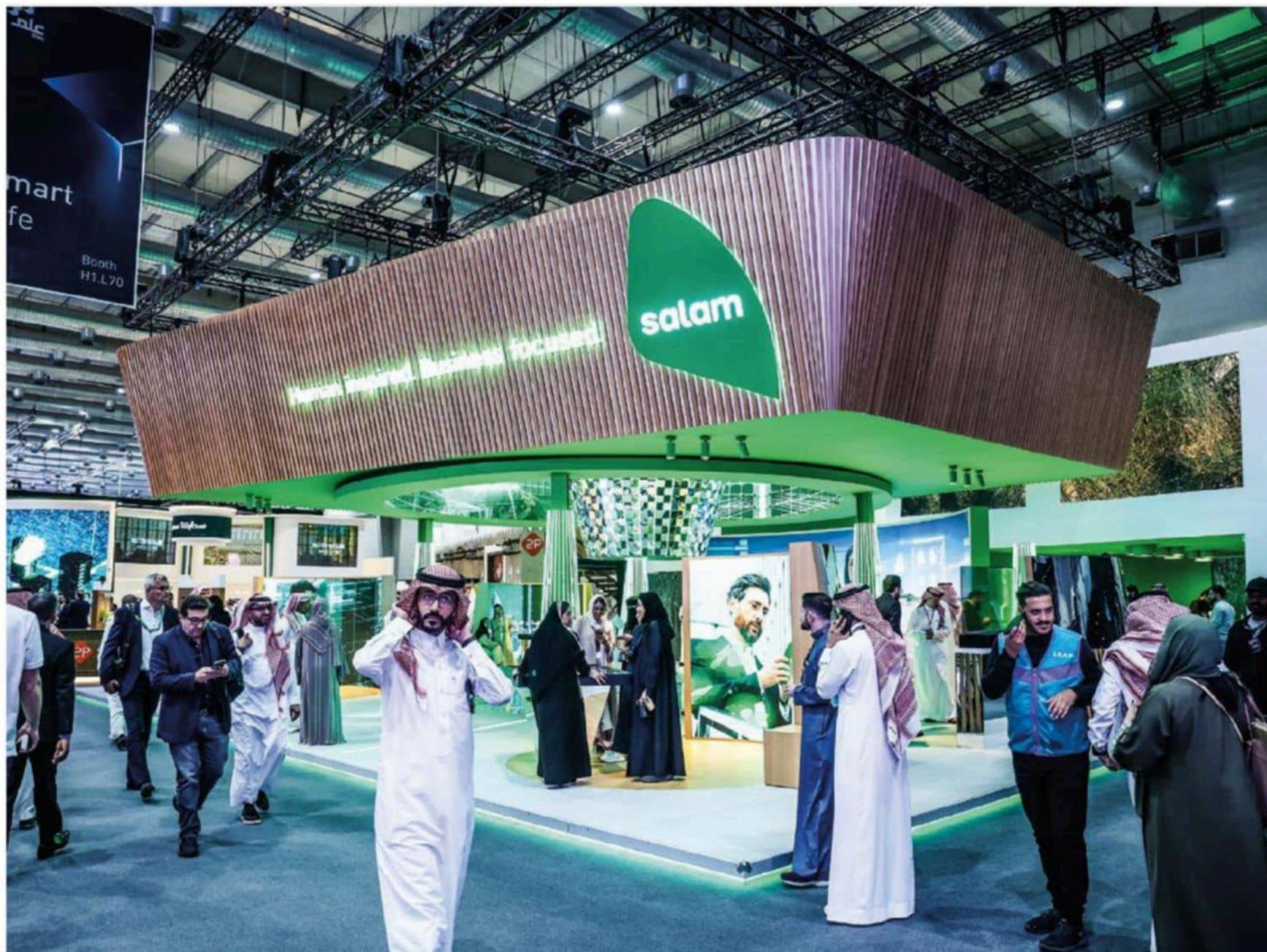
drive the Kingdom forward in the digital age.

Salam is a leader in the Kingdom's digital transformation, "First, by expanding our infrastructure to include state-of-the-art fiber optic networks, reaching over 700,000 homes with high-speed internet. Second, through our strategic partnerships, we're introducing innovative services that anticipate future needs, from AI-driven solutions to secure cloud services," says Al-Anqari. The idea is to set trends, not to follow them.

In a sector where innovation is relentless, Salam stays ahead by embracing emerging technologies such as 5G networks and AI, says Al-Anqari. "Innovation is at our core," he notes, "Our approach involves heavy investment in R&D, fostering a culture of innovation within our teams, and forming strategic partnerships with global tech leaders." This proactive stance ensures that Salam is not just keeping pace, but is actively shaping the industry's future.

The launch of Salam Mobile marks a significant step in the company's journey, offering unmatched call and video quality, it's especially beneficial to businesses and individuals reliant on high-quality communication, "While it's designed for a broad





user base, its high-quality service particularly benefits businesses and individuals who rely on crystal-clear communication and robust internet service," Al-Anqari says, highlighting the service's appeal.

Salam's involvement in key national projects, such as the construction of the National Broadband Network, underlines its role as a digital enabler and the support the company is offering to Saudi's burgeoning cities. "These projects are not just about technology; they're about facilitating new ways of living, working, and engaging with the world, thus directly contributing to the Kingdom's economic diversification and digital transformation goals," says Al-Anqari, emphasizing Salam's contribution to the Kingdom's digital landscape.

Looking ahead, Salam views AI and other emerging technologies as vital to the sector's future. Al-Anqari is enthusiastic about the possibilities these technologies offer, from enhancing services to creating new growth opportunities. "At Salam, we're excited about the possibilities these technologies bring, from smart city

solutions to AI-driven customer service. We see these as tools to enhance our offerings, improve efficiency, and create new opportunities for growth and innovation," says Al-Anqari, highlighting the company's aim to benefit not just their customers, but society at large.

As Salam continues to evolve, Al-Anqari's message is one of commitment and optimism. "We are committed to driving innovation, enhancing our services, and playing a pivotal role in Saudi Arabia's digital future. For our customers and stakeholders, the future is bright, with Salam as a trusted

partner in their digital journey. Together, we'll explore new possibilities, embrace new technologies, and build a connected, digital Kingdom," he says, promising a bright future with Salam at the forefront of Saudi Arabia's digital journey.

Eng. Ahmed Al-Anqari's leadership at Salam is not just about business and growth, but about a deep-seated commitment to innovation, societal transformation, and aligning with Saudi Arabia's vision for a digital future. Salam, under Al-Anqari's stewardship, is set to be a central figure in this exciting new chapter of the Kingdom's history.

"At Salam, we're excited about the possibilities these technologies bring, from smart city solutions to AI-driven customer service."

TECHNOLOGY

IDEAS

SCIENCE

CULTURE

BUSINESS

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SEE-THROUGH

// FROM PHONES TO DRONES, THIS
TECH WILL CHANGE YOUR LIFE



The see-through future of gear

The trend of making gadgets transparent is back but at a whole new level compared to its predecessor—the Y2K transparent plastic aesthetic.

By Yunqi Li



↓ **TRANSPARENT KEYBOARD**
LOFREE 1% Transparent Mechanical Keyboard

This see-through mechanical keyboard comes with transparent keycaps, switches, and chassis, and offers seven white LED backlit effects. Weighing 812g, the keyboard is processed by pad printing and UV coating. This makes the characters on the keycaps non-fading while the keys won't harvest fingerprint marks. The hollow structure of the keycaps allows room for personalization with its DIY Keycap Set. This set has six transparent space keys with glue accessories for keycap customization. With three hours of charging time, the keyboard can last for up to 60 hours. Of course, the typing sound is also loud and for those who are into mechanical keyboards.

→ **TRANSPARENT WATCH**
Hublot Square Bang Unico
Sapphire 42mm

Transparent cases reveal the exquisite internal designs of mechanical watches. There are many transparent watches in the market, but only this 42mm watch is made from lab-grown sapphire, developed by Hublot's Metallurgy and Materials laboratory. From the case and bezel to its anti-reflective crystal and dial, the watch is as transparent as a block of ice, revealing Hublot's unique "in-house" Unico movement. This automatic chronograph system consists of 354 components and has a power reserve of 72 hours. It also boasts water resistance to 50m or 5 ATM.



→ **TRANSPARENT SPEAKER**
Transparent

With an iconic Nordic style, the Swedish brand Transparent have introduced a see-through speaker with a modular design. Made with tempered glass, it looks much lighter than it is, weighing in at 11 kg. While many have argued that this is merely a statement piece and that it cannot offer good audio quality, this sleek speaker boasts a high-quality sound that has a nice bump at the low-end as well as crispy highs. The settings can also be cranked up with the bass and treble dials. This speaker is the largest model from Transparent, measuring 33.3cm in height, 43.1cm in width, and 11.8cm in depth, and comes in three colors: black, white and red.

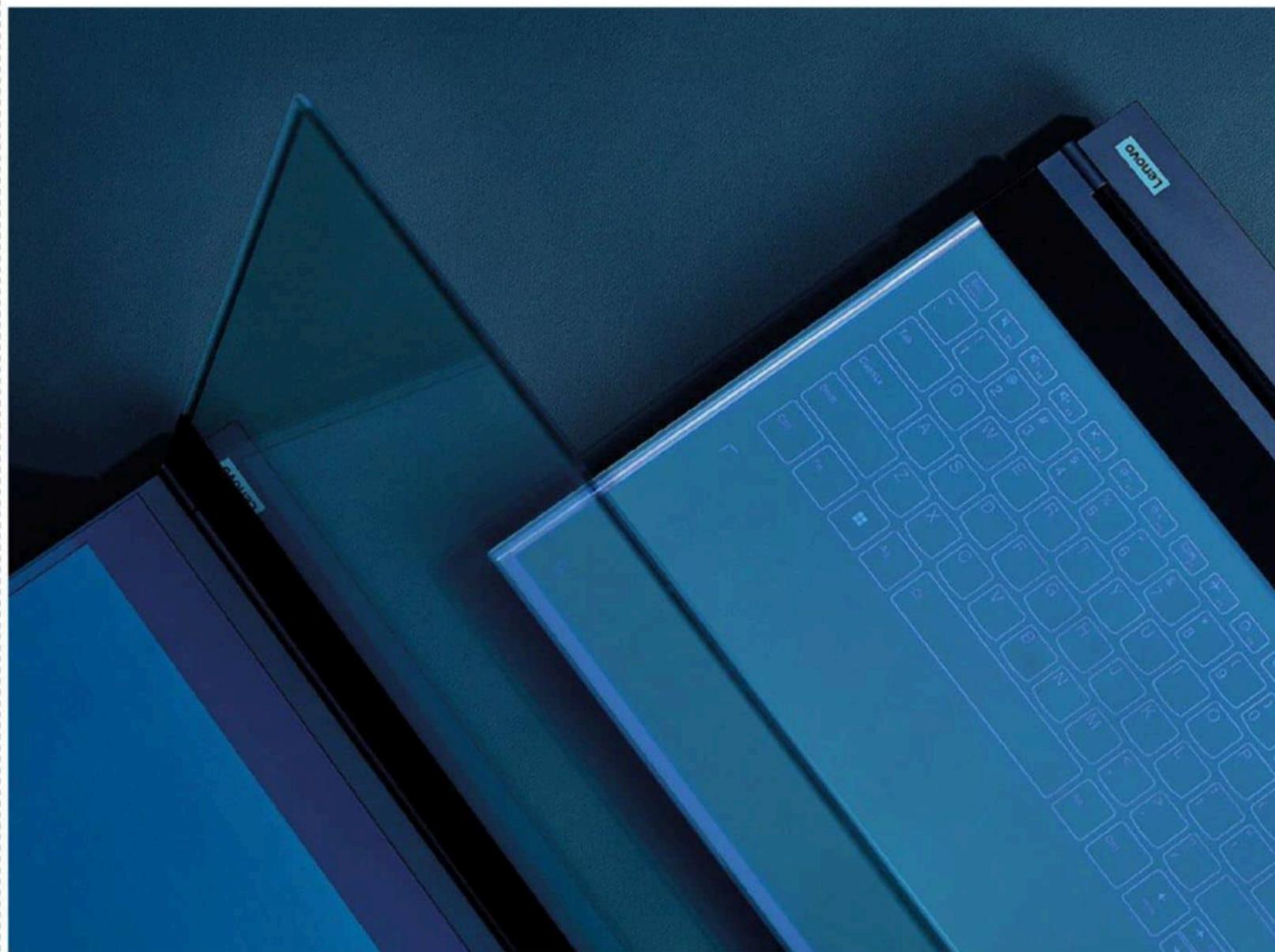


→ **TRANSPARENT TV**
LG Signature OLED T

This is not the first transparent TV the world has seen, and it certainly won't be the last. However, as LG claims, the Signature OLED T is the world's first wireless and transparent TV, featuring a 77-inch 4K display. The best thing about a transparent and wireless TV is that it can be placed in the center of the room without blocking light or your view. But to get a full OLED experience with vibrant color, the built-in contrast screen is still needed. It receives video and audio from LG's Zero Connect Box, which can be placed as far as nine meters away from the TV.

→ **TRANSPARENT LAPTOP**
Lenovo ThinkBook Transparent Display Laptop

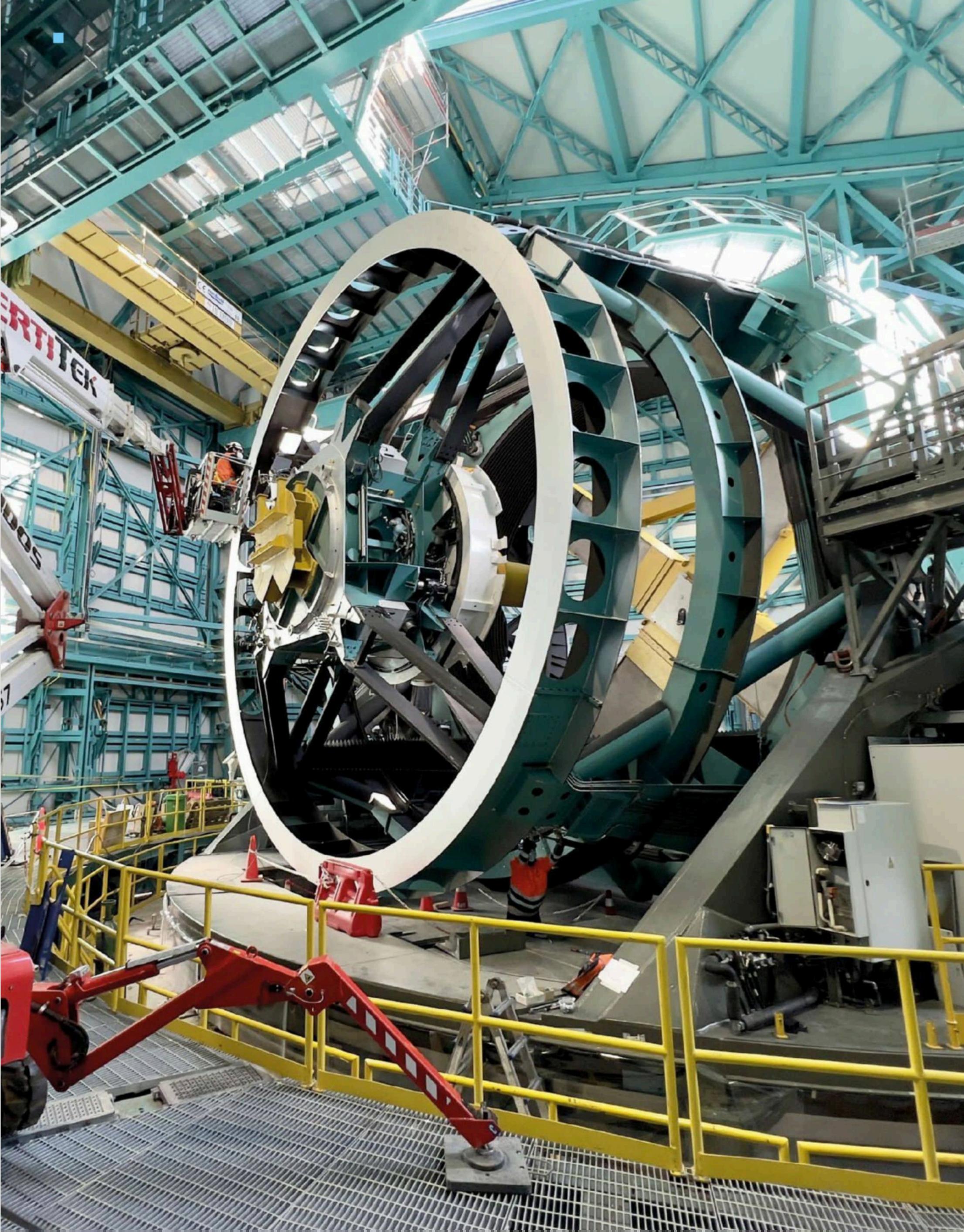
Lenovo has taken the Mobile World Congress (MWC24) cake with its transparent laptop concept. Dubbed Project Crystal, this bezel-free concept notebook comes with a 17.3-inch Micro-LED transparent display. It's at 55 percent transparency when its pixels are set to black and turned off. Its rear-facing camera is powered by generative artificial intelligence (AI) and augmented reality (AR) software to enable real-time interactions with objects behind the device. The base is also designed to work as a drawing tablet. One of the concepts that Lenovo showed off in a demo was of an architect being able to sketch a building on location without taking his eye off the screen to check the environment.





↑ **TRANSPARENT EARBUDS**
BEATS Studio BUDS

This pair of earbuds not only has a cool transparent look but it also boasts the usual great sound quality from Beats. Each earbud comes with a custom two-layer transducer that flexes to deliver cleaner bass and ultra-low distortion to boost powerful and balanced sound. It features three acoustic vents that help improve audio precision while relieving pressure for a more comfortable fit. It's equipped with Active Noise Cancelling (ANC) and Transparency mode. There are four ear tip options and the listening time goes up to 36 hours with the charging case. 🎧



Eye on the universe

On a mountain in Chile, the largest digital camera ever meets an astronomically fast telescope.

By Jonathan O'Callaghan



The telescope can pivot to a new section of the sky every five seconds, a task that would take other scopes minutes to do.



The camera is being constructed at the SLAC National Accelerator Laboratory in California. Here, engineers install one of the optical system's three fused-silica lenses.

What would you do with the world's biggest camera? Probe the very structure of the universe? That's what, later this year, scientists at the Vera C. Rubin Observatory in Chile will finally get to do. The observatory, named for the late astronomer and dark-matter pioneer, is under construction at the 9,000-foot peak of Cerro Pachón in the Andes. It will house the largest digital camera in history, a telescope with a massive 8.4-meter-wide mirror, and a fast-pivoting mount to peer into the universe as never before.

"The major strength of this technology is to see faint objects and the dynamic universe—things that are changing," says Sandrine Thomas, deputy director of construction at the observatory. "That gives us a lot of information about the beginning

of the universe, galaxies, and objects in our own solar system." The facility is set to be completed toward the end of next year, when it will take what Thomas calls its "first photons" of the universe. In 2025, it will begin its primary mission, a decade-long survey of the southern sky.

The camera has nearly 200 image sensors, which will combine to create 3.2-gigapixel snapshots of the heavens. It will take 700 pictures a night, totaling some 20 terabytes. To do this, the mount is designed to move quickly, switching between targets in just five seconds, instead of the min-

utes required by other telescopes.

Such a fast-moving telescope, coupled with such a powerful camera, gives the scientists at the observatory an unparalleled ability to study the universe. Over the decade, the telescope is expected to document some 40 billion cosmic objects, including billions of galaxies. This will enable astronomers to learn more about dark matter, the mysterious, invisible substance that accounts for 85 percent of all matter in the universe but that can only be observed indirectly, by how it



The observatory is located on a mountain in Chile's Atacama Desert, where the thin atmosphere means fewer obstructions for incoming light.



Engineers work on the image sensors under strict clean-room conditions.



On the next page: The camera focuses light from the telescope at the image sensors, which are cooled to a chilly -100 degrees Celsius by a cryostat to eliminate noise.

distorts the appearance of galaxies.

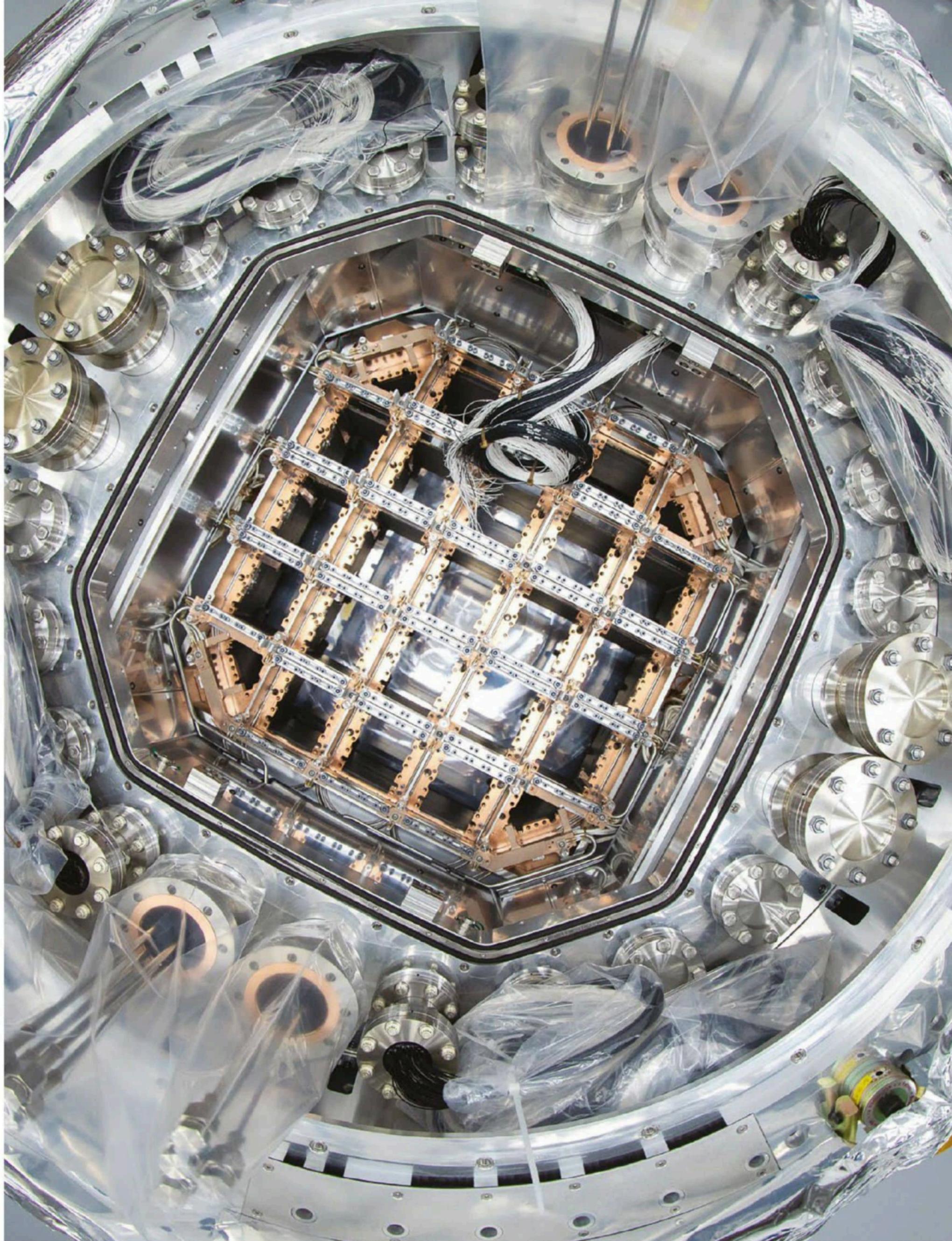
Astronomers like Rachel Mandelbaum at Carnegie Mellon University will use the galactic images to study an effect called weak gravitational lensing, where massive objects “distort spacetime and change the paths that light rays would have taken,” she says. “Dark matter doesn’t interact with light, but it has a gravitational effect, so weak lensing is a great way to map out the distribution of dark matter in the universe.”

The telescope is particularly suited to this technique because of its unusually wide field of view—each image the equivalent of seven full moons across. With this, much more than just the distribution of dark matter is on offer. The telescope will capture millions of asteroids, many undiscovered, and perhaps confirm the existence of the so-called Planet Nine, which is theorized to be

orbiting at the edge of the solar system.

When construction is complete, it will have taken nearly a decade. “It’s extremely exciting, and stressful at the same time,” Thomas says, “because we want to make sure that it all works.” Just don’t forget to remove the lens cap. 📷





Unlocking futures

Talal Al-Ajmi and Development Holding are changing lives across Kuwait and beyond.

Talal Al-Ajmi, CEO of Development Holding, and his company oversee the growth and success of a series of businesses across a wide range of sectors, from trading platforms to grocery stores and more. Dedicated to supporting entrepreneurs and founders, Al-Ajmi and Development Holding strive to find, and invest in, the story within each business.

Al-Ajmi's entrepreneurial spirit ignited at a tender age and was marked by a shrewd business sense. "I was passionate about being an entrepreneur from a very young age – I used to make good deals at a young age, selling some toys to friends and neighbors," he says. His transition from a university education in IT to business leadership was a natural evolution, fueled by an insatiable hunger for knowledge and a keen understanding of algorithms pivotal in trading and stock markets. "I have always believed that a good background in education can pave a solid path towards success," he says.

Trading and investment became inseparable facets of Al-Ajmi's life during his university days. "Trading and investment for me are interlinked in many ways, when I was first introduced to trading I said to myself that this is where I belong – the passion behind it all came when I was a student at university," he says. A chance encounter with a trading ad sparked a flame that burns fiercely to this day. Educating himself relentlessly on market intricacies, he found his calling in the dynamic world of investments.

VI Markets, a subsidiary of Development Holding is perhaps the perfect manifestation of Al-Ajmi's love of trading. The company is revolutionizing online trading in Kuwait and the Middle East with its technology-driven services. Partnering with UK-based One Financial Markets, VI Markets represents a comprehensive trading platform for forex and CFDs. With a decade of success behind it, the company is internationally recognized.

Their offerings include a wide range of instruments, including major and exotic

currency pairs, and innovative copy trading technology, allowing clients to replicate successful traders' strategies. VI Markets is also a licensee of the One Connect Copy Trading app, fostering global trading communities. All this allows traders to connect with others, discuss strategies and more and traders can even directly copy the trades of another trader.

But, VI Markets is just one of Development Holding's success stories. The group includes a range of companies across various industries. VI Markets, Canteen a grocery store in Kuwait, and 20 grams, a specialty coffee company, stand as shining examples of DH's prowess in fostering growth and innovation. "We weave together the art of insight and the science of strategy to empower growth and shape destinies," says Al-Ajmi.

According to Al-Ajmi, at Development Holding, passion converges with entrepreneurship, fostering a culture of transparency and teamwork. The company's ethos centers on relentless pursuit of excellence, driving it to navigate the ever-evolving business landscape with resilience and social responsibility.

"We envision ourselves as the driving force behind transformative growth, forging a legacy of remarkable success stories and redefining what's possible. VI Markets 14 years ago was a humble company with a huge vision becoming globally recognized as one of the leading brokerage firms in the Middle East and MENA region. Today VI Markets is strategically aligned with Axi – a global online broker," he says. "Canteen is another success story – DH invested in it when it was only one branch, today it has become one of the leading convenient stores located in more than 11 branches across Kuwaiti petrol stations, which increased the market value to more than 20 million KWD."

Managing diverse profiles within Development Holding poses unique challenges,

yet the company thrives on identifying hidden gems and undiscovered treasures. "Our investment philosophy is rooted in a deep appreciation for the power of human potential and the transformative impact of visionary ideas. We seek out opportunities that are more than just financial prospects," says Al-Ajmi. Through meticulous research and conviction, Development Holding brings life to visionary ideas, investing not just in financial prospects but in companies with the potential to redefine industries.

Al-Ajmi and his team believe in the art of storytelling, where every investment is a chapter in a grand narrative of growth. By curating portfolios that blend financial acumen with industry expertise, Development Holding becomes entwined in the stories of entrepreneurs, turning ideas into reality. "We immerse ourselves in the stories behind the investments, understanding the motivations, aspirations, and challenges faced by the entrepreneurs we support. With each investment, we become co-authors of a story, partnering with our clients to turn their dreams into reality," he says.

Alongside their commitment to financial growth, Development Holding, under Al-Ajmi's stewardship, champions sustainable development through education. Investing in research and development, leveraging artificial intelligence, and fostering a culture of continuous learning, while VI Markets empowers clients with the tools and knowledge to navigate the complex world of trading. "We value intellectual curiosity and foster an environment that nurtures personal and professional advancement," he says.

In the story of regional entrepreneurship, Al-Ajmi emerges not just as a leader, but as a visionary, weaving together the threads of innovation, growth, and empowerment to craft extraordinary narratives in business. Development Holding is set to change lives.

"We envision ourselves as the driving force behind transformative growth, forging a legacy of remarkable success stories and redefining what's possible."



CEO of Development
Holding, Talal Al Ajmi.

MOBILE REVOLUTION

How phones have transformed over time.

Research **Nadia Méndez & Jennifer George**



- 25cm height
- 1.1 kg weight
- 10 hrs charge

1983

DYNATAC 8000X

The first commercially available handheld mobile phone manufactured by Motorola. A full charge took roughly 10 hours, and it offered 30 minutes of talk time.

The first ever phone call was made by an underdog.

- Height: 23cm (open)
- Weight: 350g

2G mobile phone systems introduced text messaging and media content access on mobile devices.

1989

MICROTAC 9800X

A cellular phone first manufactured as an analog version. Introduced a new "flip" design, where the "mouthpiece" folded over the keypad.



1990



- Height: 19.5cm
- Width: 6cm
- Weight: 500g

1992

NOKIA 1011

The first mobile phone that could be used anywhere in the world. Featured a monochrome LCD and an extendable antenna. The memory could hold 99 phone numbers.

The first ever text message was sent. Neil Papworth, a test engineer for Sema Group, sent the first text message to a mobile phone. The message simply read "Merry Christmas."

1993

SIMON PERSONAL COMMUNICATOR

In addition to placing and receiving cellular calls, the touchscreen-equipped Simon could send and receive faxes and emails.



- Height: 9.4cm
- Width: 5.5cm
- Weight: 88g

1996

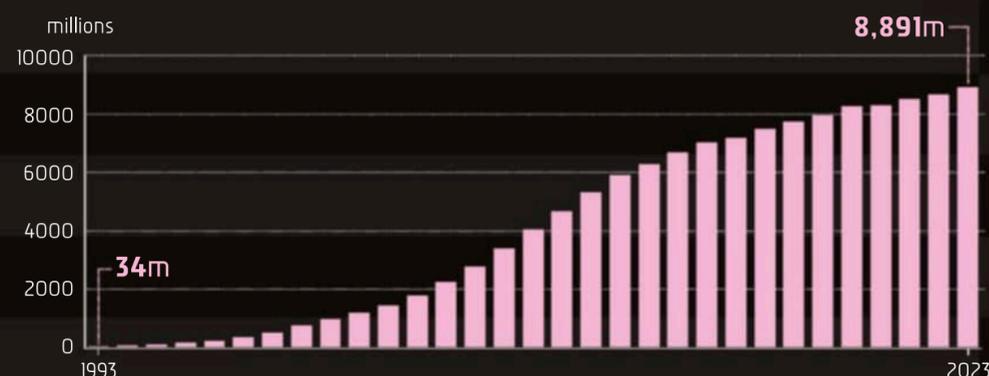
MOTOROLA STARTAC

The successor to the MicroTAC. It had the ability to receive SMS text messages, although only the later digital models had the capability to send messages.



- Height: 20cm
- Width: 6.4cm
- Weight: 510g

NUMBER OF MOBILE [CELLULAR] SUBSCRIPTIONS WORLDWIDE FROM 1993 TO 2023



*Statista

LEXICON OF THE SMARTPHONE

Smartphone

is a mobile device that combines the functionality of a traditional mobile phone with advanced computing capabilities. It typically has a touchscreen interface, allowing users to access a wide range of applications and services, such as web browsing, email, and social media, as well as multimedia playback and streaming.

Android

Mobile operating system based on a modified version of the Linux kernel and other open-source software, designed primarily for touchscreen mobile devices such as smartphones and tablets. Its most widely used version is primarily developed by Google.

More than half a century ago, the makers of the first mobile phone prototype envisioned a world where “when you’re born, you would be assigned a phone number. If you didn’t answer the phone, you would die.” Though the present technological landscape does not look apocalyptic, nearly 7.1 billion people worldwide own a mobile phone. Mobile users, as young as 12 years old,

scour the world’s app stores for yet more entertaining and ‘useful’ apps with which to waste more time on hand held devices. In a matter of 50 years, humans have gone from carrying electronic bricks to folding over a touchscreen device to perform the same basic function. The mobile phone revolutionized communications, but also altered the way we interact as a civilization.



- Height: 14.1cm
- Width: 4.8cm
- Weight: 152g

1996

NOKIA 8110

Nicknamed ‘the banana’ due to its curved profile. It attracted a lot of attention from consumers due to the fact that it was so easy to use; one of the very first ‘slider’ phones,

An altered version was featured in the first ‘Matrix’ film.

In 1997, the Nokia 6110 included a built-in version of the basic arcade game “Snake,” which many consider the first mobile app.



- Height: 12.38cm
- Width: 5.05cm
- Weight: 151g

1999

NOKIA 3210

One of the most popular and successful mobiles ever produced, inspired by the Casio G-Shock and Sony Walkman designs. The first mass market phone with an internal antenna.



1997
SIEMENS S10

The world’s first mobile phone with a color display. It also came with several basic apps such as an alarm, a phone book and even a voice note recorder.

- Height: 14.7cm
- Width: 4.6cm
- Weight: 185g

3G is the third generation of wireless mobile telecommunications technology, offering faster data transfer, and better voice quality.

2000

SHARP J-SH04

A Japanese brand that influenced mobile phones forever; this was the very first mobile phone to feature an integrated digital camera [only 0.11 megapixels.]



2001

- Height: 9.8cm
- Width: 2.2cm
- Weight: 111g

iOS

Is a mobile operating system developed by Apple Inc. exclusively for its mobile devices. It was unveiled in January 2007 for the first-generation iPhone. The mobile OS supports input through direct manipulation and responds to various user gestures, such as pinching, tapping and swiping. The iOS developer kit provides tools that allow for iOS app development.

App

Is a software designed to run on a mobile device like a phone, tablet, or watch. Apple’s App Store has contributed significantly to the tech industry and society in general. The new apps and games changed the way we communicate, work, eat, and play. Other platforms like Google Play and Amazon App Store have made apps more accessible.

WHY ARE SMARTPHONES GETTING BIGGER WHEN THEY COULD BE SMALLER?

In recent years, smartphones have only gotten bigger. One reason for this strange turn of events is the camera. Capturing high-definition images requires bigger sensors and more than one camera to create depth in images as seen by the naked eye. Similarly, like any device, the smartphone gets hotter when used for hours on end. To prevent overheating in traditional phones, heat sinks or liquid cooling technology were utilized. Most modern smartphones resort to passive cooling, which requires a larger surface area to allow the heat from the processor to dissipate efficiently.



2001

Introduction of the iPod, a series of portable media players and multi-purpose mobile devices designed and marketed by Apple Inc.

2002

BLACKBERRY 5810

The first BlackBerry device to have integrated mobile phone capability, albeit requiring a headset to make and receive calls as it had no built-in microphone or speaker.



- Height: 11.7cm
- Width: 7.9cm
- Weight: 133g

- Height: 10cm
- Width: 4.6cm
- Weight: 99g

2005

SONY ERICSSON W800

The first Walkman phone. This phone was, one of the first models to prioritise its creative features (games, video, camera, ringtones, etc.) over the basic features of a mobile phone, such as calling and texting.



2007

IPHONE

Launch of first Apple's iPhone, whilst this wasn't the first touchscreen phone, they eliminated most physical hardware buttons. A 3-in-1 device, which for the first time combined an iPod music player, an Internet communication device and a traditional phone.



- Height: 11.5cm
- Width: 6.1cm
- Weight: 135g

Launch of the mobile operating system iOS.

2009

2008

Launch of the mobile operating system Android.

The App Store was launched with 500 apps.

Release of the widely-popular instant messaging network Whatsapp.

Release of 4g technology.

Instagram made its App Store debut on October 6th, 2010 and gained 25,000 users on its first day.

2010

SAMSUNG GALAXY S

The Galaxy S line has been one of Apple's biggest and most consistent competitors over the last ten years. This was the first device of the third Android smartphone series produced by Samsung.



- Height: 12.24cm
- Width: 6.42cm
- Weight: 119g

IPHONE DESIGN EVOLUTION

Each year, Apple makes the phone bigger and faster, refining the product without changing the basic form factor.



Why hasn't the iPhone's basic form factor changed significantly since the iPhone 12?

Apple's original design philosophy was rooted in minimalism. Apple's sleek devices reflect the idea that "design is how it works, not how it looks."

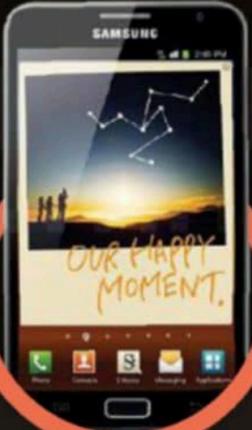
MOBILE PHONES SIZE

A comparison of the sizes of mobile devices from different models released over the years.



2007

2023



- Height: 14.69 cm
- Width: 8.3cm
- Weight: 178g

2011

SAMSUNG GALAXY NOTE N7000

Launch of the 'phablet' (phone/tablet). With a screen size of 13.462m, something that was pretty unheard of at this time, it had a huge impact on the future of mobile phones.



- Height: 16.8 cm
- Width: 7.86cm
- Weight: 234g

2023

NOKIA XR21

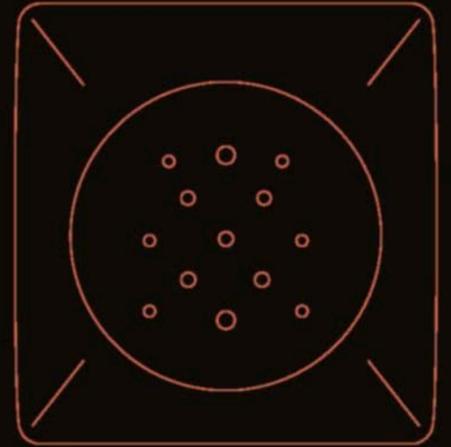
Was a rugged 5G smart-phone that was the first product to be assembled on HMD Global's new European-based assembly line in Hungary. Built to last and designed with sustainability in mind.



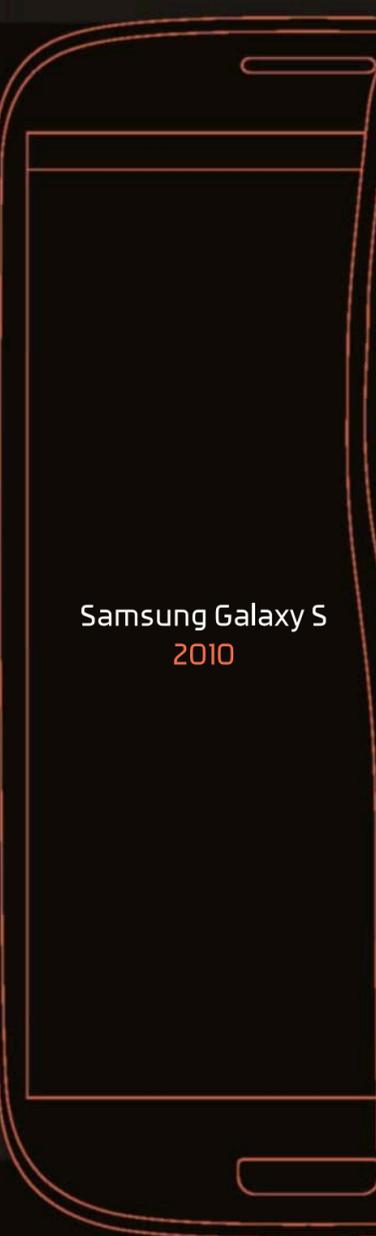
2015
IPHONE 6S AND 6S PLUS

While the iPhone has changed a lot since its inception, the foundation laid at the start was a solid one that ensured success for years to come.

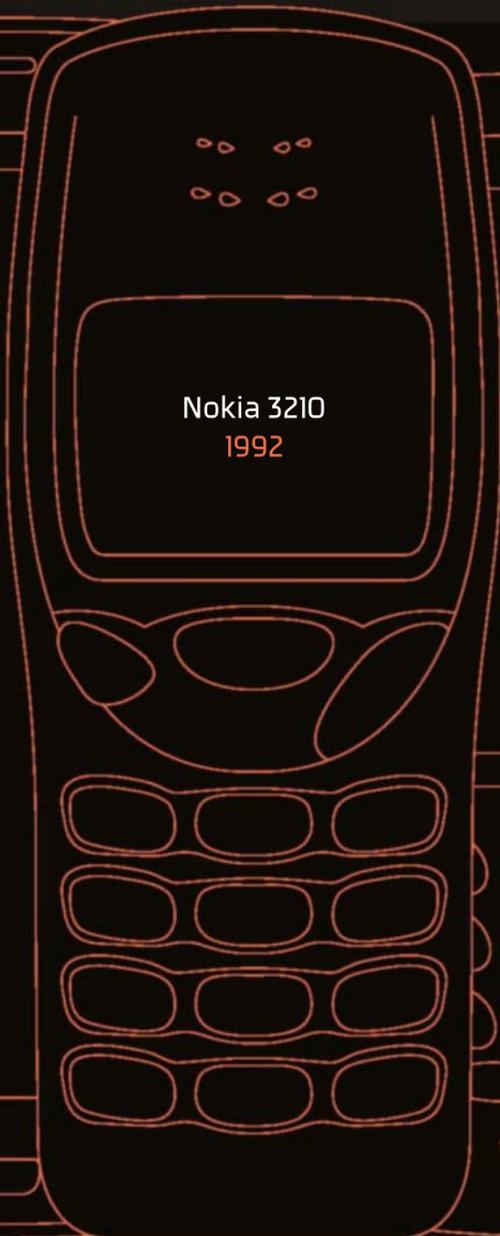
- Height: 15.8cm
- Width: 7.79cm
- Weight: 192g



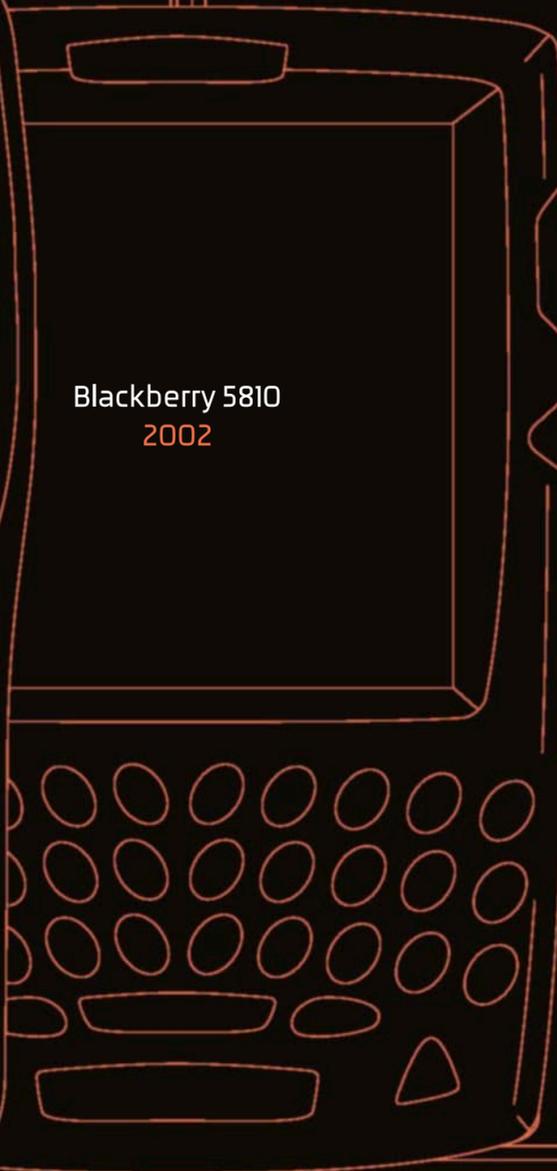
DynaTAC 8000X
1983



Samsung Galaxy S
2010



Nokia 3210
1992



BlackBerry 5810
2002



iPhone 15 Pro Max
2023



A transformative era

The BMW iX2 redefines electric luxury in the compact segment.

By Nadine Kahil

THE EDIT



The automobile industry is in a transformative era, with electric vehicles (EVs) the vanguard of a sustainable revolution. BMW, a name synonymous with innovation, has once again raised the bar with the introduction of the BMW iX2. This vehicle is not just an addition to the EV market; it is a sign of BMW's commitment to sustainable mobility combined with luxurious driving experiences.

The BMW iX2 emerges as the electric variant of the second-generation BMW X2, which pioneered the concept of a Sports Activity Coupé (SAC) in the premium compact segment. The new BMW X2 has undergone a significant evolution in design and technology, offering a larger, more expressive exterior and advanced automated driving and parking systems. The iX2 takes these advancements further by adding an all-electric heart to the dynamic SAC.

The iX2 strikes an imposing figure

with its larger dimensions and distinct coupé silhouette. Measuring 4,554 millimeters in length, 1,845 millimeters in width, and 1,590 millimeters in height, it boasts a robust and athletic stance. The design philosophy is unmistakably BMW – from the signature kidney grille, now available with Iconic Glow contour lighting, to the dynamic lines and surfaces that scream performance.

Inside, the BMW iX2 offers a sanctuary of high-end materials and cutting-edge technology. The curved display, floating armrest, and ambient lighting create an atmosphere of modern luxury. The choice of upholstery, including the Veganza perforated variant and Vernasca leather, alongside features like massage seats, elevates the comfort to a new level. The cabin's layout, blending aesthetic appeal with functionality, reflects BMW's mastery of interior design.

Under the hood, the iX2 xDrive30





packs a punch with its 2.0-liter four-cylinder engine, delivering a thrilling drive that's true to BMW's sporty DNA. The X2 M35i xDrive sprints to 100 km/h (62 mph) from a standstill in 5.4 seconds, meaning that it delivers impressive performance. It's M-specific chassis tuning teams up with the BMW xDrive intelligent all-wheel drive system to deliver impressive performance in a wide range of environments. Its adaptive M suspension enhances both agility and long distance comfort. For those looking for the full experience, M Compound brakes are available as an option.

The BMW iX2 comes equipped with state-of-the-art driver assistance systems, ensuring safety and comfort. Features like the front collision warning system, cruise control with brake function, and parking assistance highlight BMW's focus on creating a safe driving environment. Going even deeper, BMW offers a wide range of options, including a Steering and Lane Control Assistant, Active Cruise Control with Stop & Go function, Active Navigation, an exit warning function and the BMW Head-Up Display, as well as the Surround View, Remote 3D View, BMW Drive Recorder and Remote Theft Recorder functions. This is a car with safety and usability at its core.

The vehicle's infotainment system, based on the BMW Operating System 9, offers a seamless and intuitive user experience. The BMW Curved Display and Intelligent Personal Assistant are geared for touch and voice commands, making interaction with the car's systems more natural and engaging.

The iX2 is not just a SAC, it's a statement on sustainable luxury. BMW's commitment to the rise of electric vehicles is evident in every aspect of the iX2, from its resource-preserving production to the potential for recycling at the end of its lifecycle.

The BMW iX2 combines the excitement and performance BMW is known for with the efficiency and green credentials of electric power. This is BMW's vision of the future, now. 

impresses with two integrated drive units delivering a combined output of 230 kW/313 hp. The vehicle boasts a top speed of 180 km/h and can sprint from 0 to 100 km/h in just 5.6 seconds. Its high-voltage battery offers a commendable range of 417 – 449 kilometers in the WLTP cycle, marking a significant achievement in EV technology.

The iX2 sets new standards in charging efficiency with its Max Performance Charging software. The Connected Home Charging Package offers solar-optimized charging, making it not just a vehicle but a part of a sustainable lifestyle. Adaptive recuperation and the MAX RANGE function are key features that enhance the car's range and efficiency, showcasing BMW's commitment to pioneering electric mobility solutions.

For those craving more power, the X2 M35i xDrive model is an attractive proposition. This performance model

iX2's aesthetic appeal, reflects BMW's mastery of interior design.





A2RL - A stellar success in AI-powered motorsport

Yas Marina Circuit witnesses a triumph of AI in racing and youth empowerment.



Stephane Timpano,
CEO at ASPIRE.

On April 27, the Yas Marina Circuit in Abu Dhabi hosted a historic event in motorsport and technology. The inaugural AI-powered race of the Abu Dhabi Autonomous Racing League (A2RL) marked a pivotal moment in the integration of artificial intelligence into motorsports. ASPIRE, the program management arm of Abu Dhabi's Advanced Technology Research Council (ATRC), achieved a groundbreaking success, combining high-speed racing with cutting-edge AI technology.

The A2RL Yas Marina Circuit event is part of a new race series where eight teams from North America, Europe, the UAE, and Asia, compete for a US \$2.25 million prize. All the teams were racing a SF23 car, specially modified for A2RL. All of the eight cars were exactly the same, the only differences between them came from the code created by the teams. The SF23 car is the fastest open-wheel car in the world, apart from those driven in Formula 1 and the goal of the A2RL series is to demonstrate the rapid advancements in autonomous technology, emphasizing its potential in enhancing road safety.

"While it may look fairly similar from a distance, the modifications done to the SF23 racecars used in A2RL are extensive. All race cars in A2RL use a drive-by-wire system that replicates human inputs. This system employs actuators for the steering, braking, and gear shifting, eliminating the need for a physical driver. These actuators are all controlled by the onboard computer," says Stephane Timpano, CEO at ASPIRE, "The



next major modification is the vast array of sensor technologies that will allow the machine learning algorithms to 'see' and develop situational awareness – including radar, lidar, cameras, and GPS.”

AI was a core component for the vehicles, “AI is the only way that the vehicles can be controlled on track. The development of the algorithms that will interpret data and make 'decisions' on the track while racing is entirely up to the teams, beyond the basic functionality that we will provide. The software itself is comprised of various modules that will be used to understand what the vehicle is doing and what it should do next,” Timpano says.

The challenges the teams had to overcome were myriad, according to Timpano, “When you think about all the intuition and minuscule actions and decisions that drivers make instinctively, there is a lot for these systems to understand and work with. That includes tactile feedback from the environment like grip levels, g loads, and suspension movement to give the AI a complete picture of its dynamic situation. Perhaps most important of all is the planning module, which allows the racecar to prioritize objectives and strategize during the race. As you can imagine, it is extremely complex,” he said.

One of the overall goals of the event was to highlight how far AI-assisted driving and electronic driver assistance has come and how far it might go. Tested and refined in an extreme environment, there's no doubt that electronic systems are becoming incredibly reliable, “Many drivers are showing a lack of enthusiasm towards ADAS 3 components such as Lane Assist, which they find disconcerting. The competitive environment of motorsport can demonstrate the reliability and safety of these systems thus enhancing consumer confidence and de-risking OEM investment,” said Timpano.

Alongside the Super Formula cars ran the final event of a STEM program that aimed to spark of love of engineering and coding in the next generation. A2RL STEM Program attracted students from across the UAE and an international team, offering a hands-on

experience in programming autonomous scale racecars. With top speeds of 100 km/h, these cars are more than mere models and are packed with technological marvels. The partnership with YAS In Schools and Autonomia Labs facilitated a comprehensive understanding of advanced technology, in line with ASPIRE's goal of nurturing future innovators.

173 students participated in the A2RL STEM Program displaying their skills in preliminary challenges, culminating in a spectacular race day at the A2RL Fan Zone. These bright minds, from 18 different institutions, showcased their ability to develop systems for controlling the one-eighth-scale electric racecars, capable of accelerating up to 1.6 G. As April 27 approached, selected teams gathered in Abu Dhabi for a final showdown. Their programming skills and strategic thinking were tested in a qualification phase, leading up to the main event, where autonomous Super Formula racecars reached speeds of up to 270 km/h. The event exemplified the peak of AI capabilities in racing.

“To meet the challenges of humanity's future, we must inspire, nurture, and invest in, the next generation of STEM talent. We have been thrilled with the engagement and excitement of students in response to our A2RL STEM Program. It is an exhilarating and practical way to teach, learn, and discover some of the fundamental technologies behind autonomous vehicles and the fast-paced world of motorsport,” said Timpano.

The April event at Yas Marina Circuit will be remembered as a landmark in autonomous racing. It signified a leap towards a future where technology and human potential merge, creating innovative possibilities. A2RL has established itself as a source of technological innovation, education, and the spirit of youth. Alongside highlighting the potential of AI in high end motorsport, the initiative is also doing its part in paving the way for the next generation of scientists, engineers, and racing enthusiasts. The success of this event not only celebrated the achievements of the present, but also set the stage for a more technologically advanced and exciting future in the world of motorsport and beyond.





**47 LIT GIFTS FOR ALL
THE ENTHUSIASTS,
CONNOISSEURS, AND
FANATICS IN YOUR CIRCLE.**

Contributing product
reviewers:

Boone Ashworth,
Michael Calore,
Julian Chokkattu,
Nena Farrell,
Scott Gilbertson,
Simon Hill,
Matt Kamen,
Christopher Null,
Adrienne So,
Louryn Strampe,
Ryan Waniata, and
Jeremy White.

Photo assistant:
Taka Mark Kasuya

Photographs by
Joseph Shin



KEEP YOUR HEAD

This helmet's understated good looks belie its advanced construction, light weight, and comfort. The elastic chin strap keeps it reassuringly secure on even the most oddly shaped noggin. A hidden vent above the sun visor lets the breeze cool your forehead, and all the pads can be removed and washed when they get funky. The Sidestreet gets an added safety boost from the MIPS system, industry-standard tech that reduces the brain-damaging effects of rotational forces experienced during a nasty crash. **Cannondale Sidestreet | \$115**

Future Society puts a historical spin on traditional perfumery. The company sequences DNA samples of extinct flowers, then isolates the genes that produce scent molecules. Those genes are bioengineered into yeast cells, which pump out scents that the company's perfumers blend with other botanicals. This fragrance is built around *Hibiscadelphus wilderianus*, a Hawaiian flower that grew on the slope of Maui's Haleakala volcano until 1912. Now you can wear the citrusy, rose-ish scent of yesteryear to all tomorrow's parties.

Future Society Solar Canopy | \$98

OLD FACTORY SCIENCE



You might know LifeStraw as the company that makes a portable water filtration system you carry in your backpack on hiking trips. Now, the same technology that lets you safely sip from backcountry streams without catching giardia is available for your kitchen counter. This 56-ounce glass pitcher uses two filters—a membrane microfilter and an activated carbon filter—to remove parasites, bacteria, microplastics, PFAS, and other contaminants from your drinking water. The micro-filter (\$25) cleans about 40 gallons of water, so you replace it every two months; the carbon filter (\$17) should last a year.

LifeStraw Home 7-Cup Glass | \$65

LIQUID ASSET



RECORD COLLECTOR

The makers of the legendary OP-1 synthesizer are back with more audio ingenuity. **Teenage Engineering's TP-7** is a gorgeous way to tape an interview, record samples, and capture late-night notes-to-self. Outfitted with 128 GB of storage and three 3.5-mm jacks that work as inputs or outputs, this field recorder is ready to roll tape whenever you are. The dedicated buttons to start and stop recordings are easily reached while holding it in one hand, as is the rocker on the side to fast-forward and rewind. The disc in the center mimics an analog tape reel, slowly spinning as it records; thumb it to manually scrub through a clip, or press and hold to pause playback. A companion mobile app transcribes recorded interviews and backs up your sounds to the cloud. **Teenage Engineering TP-7 Field Recorder | \$1,499**





BLESSED BE THE FRUIT

The Raspberry Pi debuted a decade ago as a tiny computing platform for tinkerers and hobbyists. Now the 4-inch circuit board has grown powerful enough to serve as a household's primary computer. The Pi 5 is twice as fast as the previous model, with a new 2.4-GHz CPU, a more efficient GPU, and an updated power management controller, all made with custom silicon developed by Raspberry's in-house engineers. There's support for dual 4K displays this time, too. Users pushing their Pi hard 24/7 will want to spend an extra \$5 on the Active Cooler module, which mounts directly to the main board and manages the heat with a fan and heat sink array.

Raspberry Pi 5 | \$60



WHISKY DRINK

The perfect gift for a true tea person, this three-piece kit contains all the makings of a killer cup of matcha. The tin is filled with ceremonial-grade Japanese green tea that's been milled into a fine powder. Firebelly's matcha is excellent—rich with grassy flavors and a sweet finish. The 30-gram stash makes about 20 cups. Use the battery-powered Aerolatte whisk to froth up the matcha in hot water and to whip oat milk to make a latte. The 13-ounce bowl has high sides to prevent splashes during prep.

Firebelly Matcha Essentials Kit | \$70



ROLL MODEL

The Osaka-based Toyo Steel Company is known for its brightly colored and decoratively stamped steel toolboxes and utility boxes. The company's wheeled cart is just as useful—and covetable. The bottom two trays are each about 24 by 12 inches, and 6 inches deep. Fill them with crafting supplies, Legos, or your arsenal of household cleaning products. Or load up the shallow top tray with WFH essentials and use the 33-inch-tall cart as a desk caddy. Toyo's products are sturdy enough to easily last a few lifetimes, so don't be surprised when everyone starts asking whether this thing will be included in your will.

Toyo Utility Cart | \$250

Chunky acetate-framed sunglasses dress up any outfit with a dash of timeless style, but they're usually pretty heavy and tend to slide around when you start to move and get sweaty. Article One's patented frame resin is made from hexetate, which is lighter and more durable than acetate while retaining a cool and luxurious feel. Rubber pads on the nose and behind the ears keep the frames on your face while biking, paddling, and hiking. Don't worry—you can still pull them down your nose to peer over the top just as skeptically as a lead actor in a 1980s teen movie. The UV-blocking, anti-glare lenses come in seven polarized and nonpolarized tints.

Article One Avalon | \$199

PEEP SHOW



If your listening habits are as mercurial as your taste in music, consider the new wireless speakers from Danish audio wizards Bang & Olufsen. The Beolab 8s can be set to narrowly fire sound waves directly to your favorite chair when you're alone or to widely disperse audio in a room full of guests. Or, if you want to keep the sound pristine while you move between the chaise, ottoman, and bar cart, open B&O's mobile app on your iPhone and the speakers will reposition the sweet spot to your location. Onboard microphones monitor playback, and the speakers self-adjust to tighten up any flabbiness. Yes, they're expensive, but each unit puts 300 watts of power behind three drivers, and the whole setup—from the glass touch-control panel on top to the brushed metal bodies and optional wood grilles—looks and feels scrumptiously luxe. Plus, the speakers can stream from any service you can name and will make vintage analog gear sound born-again.

Bang & Olufsen Beolab 8 | \$5,498 and up per pair

LISTEN HERE



The initials in this knife's name stand for "particle separation device," which reflects designer Jim Hammond's belief that the knife is so durable and versatile it can be used to cut nearly anything. Nice peace of mind, that. This second iteration of the P.S.D. is a minimal knife with a 3-inch stainless steel drop-point blade and a 4-inch fiberglass composite handle. A flipper tab on the back lets you flick it open with one hand (after some practice), and a liner lock makes sure the thing doesn't close up on you while you're dismantling Amazon boxes, opening a bag of cat litter, or slicing bananas for your oatmeal.

CRKT P.S.D. II | \$75

FINAL CUT



EYE WITNESS

The Go 3 is a tiny action camera that's able to shoot stabilized 2.7K video while clipped to your shirt, magnetically mounted to your helmet, or dangling around your neck like a pendant. The pill-like camera gets even more capable when you snap it into its Action Pod, a larger housing with both a battery pack and a 2.2-inch articulated touchscreen. Vloggers and action sports nuts will appreciate the dual microphones' wind suppression features, and stargazers will love the time-lapse mode for capturing hours-long scenes. Crop clips in the companion mobile app to fit a standard frame, a square, or (sigh) vertical formats.

Insta360 Go 3 | \$380

OUTSIDE IN



The most surprising thing about Meta's latest headset is that it doesn't just do virtual reality. Much like Apple's forthcoming Vision Pro face computer, the Quest 3 allows some of the real world to creep in. A six-camera array on the outside of the goggles pipes in a view of the wearer's surroundings, allowing the headset to offer mixed-reality experiences that play out on carpets, tabletops, and ceilings. The pair of included hand controllers and an array of integrated speakers for 3D audio effects complete the untethered immersion. There are more than 500 games and experiences available now, with Meta promising more reality-blurring titles next year.

Meta Quest 3 | \$499

Specialized's Globe Haul ST is the company's first light cargo ebike and the first affordable, reliable car substitute from a major road bike manufacturer. The Haul fits riders of many heights, from under 5 feet to well over 6. The powerful 700-watt rear hub motor relies on an IPX7-rated battery to provide natural-feeling pedal assistance beyond the advertised range of 60 miles. The 20-inch multi-terrain wheels are stable on paved and unpaved roads, even when the bike is loaded to its 419-pound capacity. There's no suspension, which can make the ride bumpy if you're carrying a lot, and it uses a greasy chain instead of a clean belt drive. However, unlike direct-to-consumer bike companies, Specialized has a large network of shops that can do repairs. **Specialized Haul ST | \$2,800 and up**

CARRION



اختيارات الممر



PILLOW TALK

Bookend your slumber with the innovative tech inside this bedside clock. It uses a two-phase alarm to rouse you: a gentle 30-second alarm is followed nine minutes later by a more invigorating jingle that serves as your official wake-up call. At bedtime, you can choose one of the 100-plus included soothing soundscapes, or you can activate Loftie's built-in Magic Story Maker, which combines ChatGPT and ElevenLabs' voice AI to craft personalized bedtime stories. Drift off to fanciful tales about a seaside vacation or a snowy train ride with your best friend, secret crush, or favorite Dostoevsky character. While the soundbaths and nature sounds are free, the AI features require a \$5 monthly subscription. **Loftie Clock | \$149**

STAND BY ME



Knot is a Japanese watchmaker founded in 2014, recent enough to still be a brand-new name in the world of horology. The company's timepieces are beautifully designed yet surprisingly affordable. If you stop by Knot's store in Harajuku, Tokyo, you'll find a large table displaying a dizzying array of watch faces—including automatic, quartz, and solar models—and a plethora of straps in different designs and materials. Mix and match to achieve your perfect style. For those of us who can't make it to Japan, Knot replicates this customizable experience on its web store. **Knot Timepieces | \$165 and up**

SET YOUR WATCH



Protect your laptop while giving your mobile office an ergonomic boost with this vegan leather sleeve-stand hybrid. It keeps the computer wrapped in a scratchproof and water-resistant shell that has a zippered pocket for your cables and dongles. When you sit down to work, the sleeve origamis into a multiuse stand, propping up your laptop at a 15-degree angle that's perfect for typing or a 25-degree angle that lifts your webcam closer to eye level for video-conferencing. The smaller sleeve fits most laptops up to 15 inches; the 16-inch version (\$70) is a better fit for beefier machines like Apple's new 16-inch MacBook Pro. **Moft Laptop Carry Sleeve | \$60**

The fastest path to improving your photos and videos is to upgrade your lighting setup, and this retro-licious 20-watt lamp is an easy and inexpensive option. Adjust the brightness and the color temperature of the LED—which puts out light from a warm, mellow 2,700K to a daylight-like 6,500K—using the two knobs on top, or in the companion mobile app. It runs for an hour per charge, and at just 1 pound it can be comfortably held or mounted on a tripod. Each light comes with a set of gels and barn doors to control the color and direction of your illuminating brilliance.

Hobolite Mini | \$299

اختيارات الممر





ULTIMATE WEARABLE

San Francisco artist Windy Chien is renowned for her pieces of fabric art crafted from knots. She has written an instructional knot-tying book (*The Year of Knots*) and her twisty, tightly tied work was featured in *Wired*. Chien has collaborated with California studio Cast to create a jewelry line featuring her “circuit board” designs, with 14K gold and sterling silver standing in for silicon and solder. There are rings, earrings, and pendants in the collection, but we love this cuff, a gender-neutral bracelet with a magnetic clasp that signals the wearer is totally wired.

Cast x Windy Chien The Circuit Cuff | \$2,950

Sort of a cross between pesto and salsa verde, zhug (also called sahwaiq or mabooj) is a vegan, gluten-free Yemeni hot sauce that zings up any savory dish. Blank Slate's version is a spicy and herby sauce of jalapeño peppers, parsley, cilantro, garlic, lemon juice, and olive oil, all heavily dosed with cumin and cardamom. It's a perfect spread for avocado toast, or dolloped on top of a bowl of hummus. You can even use it to marinate fish and tofu. We're surprised zhug isn't as well known as its cousins like Arabic shatta and Indian coriander chutney, but it's a condiment every foodie should cozy up to.

Blank Slate Zhug | \$11

HIT THE SAUCE



Monoprice sells oodles of work-from-home gear—cables, keyboards, mice, USB drives, headphones, wireless routers—and prices it all affordably. The company's desk lamp is capable and practical, with five color temperature settings and six brightness levels to match your room's ambient lighting, and a timer to automatically turn it off. Plus, it has a cute trick up its sleeve. There's a wireless charger in the base to keep your phone topped up during the workday. A USB-A port on the back supplies juice to your non-wireless gadgets or things that are just too big to balance on the charging pad. The lamp's hinges are limber enough that you can pack the whole thing flat to save space. **Workstream by Monoprice WFH Aluminum Multimode LED Desk Lamp | \$31**

BRIGHT AND ARTICULATED



Microsoft's new hybrid laptop is a do-it-all machine for "I need everything" creative types with a spendy budget and a distaste for macOS. The design revolves around its innovative hinge. Use the Surface like a standard laptop, or pull the bottom edge of the screen forward into an arrangement called Stage Mode, which covers the keyboard but leaves the trackpad available. Pull the screen more to lay it down flat in the tablet-style Studio Mode. If you want to use the Surface Slim Pen 2 instead of a finger to interact with the gorgeous 14.4-inch touchscreen, you'll sadly need to drop another \$130, as the accessory isn't included. **Microsoft Surface Laptop Studio 2 | \$2,000 and up**



HUSH NOW



Bose monopolized the high-end noise-canceling headphone market for years. Then Apple, Sony, and everyone else swooped in with premium offerings that sounded, looked, and felt amazing. Now Bose is back in the luxe game. The QuietComfort Ultras offer three noise-canceling modes for immersive listening, quiet study time, and maintaining awareness of your surroundings. A new spatial audio feature creates the impression that the music is being performed slightly in front of you instead of piped straight into each ear hole. [Take note: It reduces the battery's play time of 24 hours to a paltry 18.] With metal arms and lightweight plastic covered in soft vegan leather, they fold down easily for travel.

Bose QuietComfort Ultra Headphones | \$429

You don't need a machine with dual copper boilers to make a great cup of espresso. Hell, you don't even need electricity. A little elbow grease is all that's required. The Superkop is a manual espresso maker: Put ground coffee into a standard portafilter, nestle the polycarbonate cup on top, fill it with hot water, slip that assembly into the machine, and get pumping. Unlike on most manual machines, you don't have to pull down with the strength of Hercules to reach the 9 to 11 bars of pressure required to make a shot. The Superkop uses a ratcheting mechanism to keep the pressure constant as you raise and lower the pump arm. Six modest pulls earn you a delicious coffee. No buttons, no app, no nonsense.

Superkop Espresso Machine | \$800



BIKE OF ALL TRADES

Those oddball "bike people" have several rides, one for each type of terrain. One bike is really all anyone needs, and we recommend this Surly. The Preamble is technically a gravel bike, which means its double-butted steel frame and fatter 35-mm tires can handle unpaved paths and sketchy backroad shoulders just as well as pavement. But since the frame can accept luggage racks, fenders, and water bottles, the Preamble also makes a spry commuter and a capable tourer. Whatever your planned route, it'll happily gobble it up. The Preamble comes set up with disc brakes and an 8-speed drivetrain. Choose between a flat handlebar or curvy drop bars. **Surly Preamble | \$899 and up**

PULL TO REFRESH

COURTESY OF TOYO STEEL, BANG & OLUFSEN, META, SPECIALIZED BICYCLES, LOFTIE, MOFT, TEENAGE ENGINEERING, ARLO, DOONA, OFFBITS, FAIRPHONE, NATIVE INSTRUMENTS, BMW, BROOKS RUNNING, FREEDOM GAMES, SURLY BIKES, ORION PICTURES AND GETTY IMAGES



These are the Platonic ideal of jeans: Stretchy, ready for anything, huge pockets. Made from a blend of cotton, durable Cordura, and springy elastane, Ripton's jeans are super comfortable during bike rides, long hikes, and road trips. The reinforced knees make them ideal for toiling in the garden or garage till sundown. With a nipped-in waist and adjustable cuffs, they're surprisingly flattering for a casual night out. The mesh-lined front pockets are cavernous, but our favorite feature is the zippered pocket on the left leg, just where your fingers end. It is the perfect place to stash your phone, lip balm, or a pocket knife. **Ripton Women's Hiker Jean | \$116**

PERFECT PAIR



اختيارات المرء



S U C T I O N P U P

Many of the leading robovacs—Roombas, Deebots, and the like—use cameras to see where they're going and avoid obstacles. But letting a camera-equipped bot surveil your hallways is a gamble, exposing you to privacy breaches by hackers. The smarter way to automate your sweeping is with a lidar-equipped robovac like this one. It uses lasers to learn the lay of the land, then plans a path to efficiently suck crumbs and pet hair from your floors and carpet. When its three-hour run time is spent, it heads to its dock to empty its payload in a 4-liter dust bag and recharge.

Tapo RV30C Plus | \$289



There's something about a heavy pen. Your thoughts carry more weight, your words land with extra gravity. OK, not always, but a sturdy metal pen just feels so satisfying to write with. James Brand's Burwell pen has a 1.2-ounce stainless steel body with a machined grip and a pleasingly angular pocket clip next to the spring-loaded clicker. It uses Parker-style G2 ballpoint cartridges, so your options for cheap refills are many. Choose between black, silver, and rose gold. **James Brand Burwell | \$69**

C L I C K B A I T



When you think of who makes quality wireless earbuds, Technics may not be on your list. But the legacy hi-fi brand has been working hard to change that, and the EAH-AZ80 are the culmination of that journey. These buds offer great noise canceling, sparkling sound, seven hours of playtime per charge, and excellent comfort, with a quiver of ear tips to help them fit nearly everyone. They can pair to three devices at once, setting them apart from rivals like AirPods Pro when it comes to multitasking across a phone, tablet, and computer. Their relatively high price pushes the envelope a bit, but these buds prove Technics deserves to be a part of the conversation. **Technics EAH-AZ80 | \$300**

H E Y B U D S , L E T ' S P A R T Y !



The P-Cap by Parapack will win your heart with a clever design: The whole hat, brim and all, folds up into a triangular parcel that fits in your palm or pocket. When the hat's unfurled, its any-size adjustability is managed by a cinch string in the front, and when it's folded, that same string can be clipped onto a carabiner or laced onto a backpack D-ring. With an SPF-50 ripstop nylon body and foam visor, it weighs only 1 ounce, so you no longer have an excuse for not packing a hat. **Parapack P-Cap | \$40**

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WILL THERE BE A WINNER



// WHERE TECHNOLOGY
AND LIFE INTERSECT

Racing towards destiny

The inspirational journey of rising UAE motorsport star,
Rashid Al Dhaheri. ▶

By Louis Parks



“أفتخرُ بتمثيل دولة الإمارات العربية المتحدة والعالم العربي، وأطمح لتقديم صورة مشرّفة يقتدي بها الآخرون لبلوغ أحلامهم بكل عزيمة وإصرار.”

“Representing the UAE and the Arab region with pride, I aim to inspire others to pursue their dreams with unwavering determination.”

Hailing from the United Arab Emirates, a young Rashid Al Dhaheri first fell in love with the world of motorsport when watching the Abu Dhabi Formula 1 Grand Prix. At the age of just three, Al Dhaheri was entranced by the roar of the engines, the surges and gasps of the crowd and the sights and sounds of F1 cars tearing around the track as he spent time hovering around the Ferrari box. Little did he know that that moment, a lot of skill, and his newfound passion would propel him to become one of the most promising names in motorsport.

Al Dhaheri's first karting experience, his first true motorsport experience, was in the UAE at the start of 2013. That

summer, he headed to Italy for a training program and he participated in a race at the Al Ain Raceway that same year. It was the opening round of the 2013-2014 UAE Championship. He would finish second.

Fast forward to the present and Al Dhaheri has not only participated in prestigious events like the Macao International Kart Grand Prix, but he's also left an indelible mark as the youngest winner of an F4 race at Sepang International Circuit in 2023 before winning his first Formula 4 victory on home soil just recently. From securing podium finishes to setting records, his journey in motorsport has been nothing short of remarkable. Currently racing with



Italian team PREMA in his second year in Formula 4, Al Dhaheri is gearing up to compete in both the Italian Formula 4 Championship and the Euro4 Championship in 2024.

For Al Dhaheri, motorsport wasn't just a hobby—it was his destiny. Remembering his first experience with the sport, that incredible visit to the Abu Dhabi Formula 1 Grand Prix, he's clearly still very much enraptured with racing, "That was the moment I fell in love with racing—the speed, the roar of the engines, and the camaraderie within the teams. It was then I knew racing was my calling. Starting with go-karting, I cherished the challenge

of finding the limit, feeling the rush of speed, and the thrill of moving up through the racing categories," he says.

From bustling karting tracks to the prestigious arenas of Formula 4, Al Dhaheri's progress to date has been extraordinary. But, all this has come with challenges, "Juggling school, missing out on birthdays, and adapting to a hectic travel schedule for championships were part of my journey. Moving my training to Italy to compete at a higher level was a significant step, made possible only by the incredible support of my family. The experience of living alone in Italy during COVID-19, away from my family, was challenging,

especially at the age of 12, but it taught me resilience and fueled my ambition to succeed in karting," he says. At the age of just 14 he was invited to participate in the "19th Supercorso Federale" of the Italian Motorsport Federation.

These are the experiences of an incredibly talented driver, however, there was another, less obvious challenge Al Dhaheri faced. He was the first Emirati F4 racer, nobody had done it before. All of this was unknown and furthermore, "Without any motorsports background in my family, we were starting from zero," he recalls, "Facing skepticism at a young age was tough, but it taught us to trust our instincts."

Despite the odds, Al Dhaheri's talent shone brightly, earning him accolades and recognition on the global stage. "Being part of the Ferrari Driver Academy World Finals at just 14 was a life-changing experience," he reflects. Ferrari afforded him the opportunity to learn from the very best in the industry as young talent competed for a place in their Driver Academy, an initiative that aims to find the very best young drivers from around the world. Al Dhaheri was the first Arab driver to make it to the Scouting World Finals.

In 2023, Al Dhaheri's meteoric rise continued as he secured podium finishes and etched his name in the annals of motorsport history, winning a historic race at the Sepang International Circuit. He would also succeed in Macau and Italy. "Winning in Sepang, along with securing podiums in Macau and Italy, has truly been a milestone," Al Dhaheri remarks. Ever modest, he goes on to say, "These achievements are a testament to my team's hard work and the right direction we're headed in."

But it would get even better, still only 15, he clinched his first victory in

the Formula 4 category on home soil during the UAE F4 Championship in early February. This landmark achievement makes him the only Emirati on the grid to secure a victory in the 2024 season.

That day, Al Dhaheri's team, PREMA backed by Yas Heat, commenced with two test sessions aimed at race simulation and optimizing the car's performance for the qualifying rounds. Despite encountering heavy rains in Abu Dhabi, their meticulous preparations paid off. In the first race, Al Dhaheri exhibited his skills by making strategic moves, ultimately securing an impressive second-place finish. The second race saw him start from the 11th position due to the reverse grid rule, yet he adeptly navigated the challenging conditions brought on by the rain, crossing the finish line in sixth place.

The pinnacle of the weekend for Al Dhaheri unfolded in the third race, where he confronted the added pressure of commencing from pole position amidst fluctuating weather conditions. Undeterred, he emerged triumphant, clinching his inaugural F4 victory on home turf.



Rashid Al Dhaheri all geared up.

Following his win, his sights are set on distant horizons, saying, "My goal for the upcoming season is to leverage my partnership with PREMA to further my development and achieve new heights in my racing career". It certainly is a remarkable rise over such a short period of time, Al Dhaheri seems to have the world at his feet.

But amidst the thrill of victory and the pursuit of excellence, the young man remains grounded, mindful of the impact his journey has on aspiring racers across the UAE. "Winning the F4 race here at home was unbelievable," he says. "This win means so much to me, not just because it's a big achievement, but because it happened at Yas Marina Circuit, the place that made me fall in love with racing 12 years ago."

Al-Dhaheri's journey serves as inspiration for the youth of the UAE, reminding them that with dedication and perseverance, dreams can become reality. Elite motorsport is still a very new thing in the region, but as Al Dhaheri's story shows, anything is possible with talent and grit. "It's important to consistently strive for excellence, despite the challenges and setbacks," he says. "Representing the UAE and the Arab region with pride, I aim to inspire others to pursue their dreams with unwavering determination."

As Rashid Al Dhaheri continues to carve his legacy in the world of motorsport, his story stands as a testament to the power of passion, perseverance, and the pursuit of dreams. In every twist of the track and every turn of the wheel, he reminds us, and the youth of the UAE, that greatness lies within reach for those who dare to chase it. 🏁

Pit stop action as the team executes a lightning-fast tire change.





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CHAIMAA HOLDING



F. AL DIVER

The skin I'm in

Young girls are putting their health at risk in pursuit of perfection.

By Menna Shanab

The beauty industry, once a domain predominantly frequented by adults, is witnessing a seismic shift as tweens and teenagers increasingly make their presence felt in stores like Sephora and Ulta Beauty. This demographic, armed with social media savvy and an appetite for the latest beauty trends, has sparked a debate—among both teen and adult beauty shoppers. Social media platforms such as TikTok and Instagram are awash with posts showcasing the chaos unfolding in full force within these stores, from ransacked product displays to interactions where young shoppers are depicted as being inconsiderate to both fellow customers and store employees.

This influx of teen and pre-teen consumers into beauty stores is not just about the numbers; it's about the types of products they're purchasing. Items containing ingredients like retinol, harsh exfoliating acids, or advanced moisturizers, toners, and serums designed to minimize the effects of aging—products traditionally targeted at a demographic decidedly older than the youth currently flocking to beauty counters.

Tweens are also among the biggest consumers of social media, which serves as a constant stream of beauty and skincare influences. Brands pay influencers to promote their products, and social media algorithms take it a step further, bombarding users with personalized recommendations based on their searches. It's no surprise then, that beauty is a top category for influencer marketing on platforms like YouTube, TikTok, and Instagram, with countless individuals pushing products and claiming to demystify skincare and make beauty attainable.

Combine two factors: The young person's natural desire for social approval and the constant exposure to unrealistic beauty standards on social

media, and you have a recipe for potential trouble. From Lebanon, Nadine Younes, with her background as a beauty and youth consultant, including a Master's from Harvard School of Business and over 17 years of experience collaborating with international labs, provides a critical perspective: "Young people are seeking validation from others. Their inspiration comes from influencers on platforms like TikTok, who may not have any expertise in skincare. This trend can be attributed to the use of filters, online bullying, and the constant barrage of unrealistic beauty standards promoted on social media. From embracing freckles to lip fillers, fake tans, and contouring, these unrealistic ideals can be overwhelming for young people."

Younes voices a critical concern regarding what she calls the "massacres" caused by young consumers in beauty stores. "We're witnessing a frenzy that's not just overwhelming the stores but also impacting the skin health of these young consumers," Younes explains. "I have seen young people's skincare trends change over the years," she states. "Every two months, there is a new skincare trend on social media, then the whole





wave changes.” This rapid evolution, according to Younes, pushes teens towards products that may not suit their young skin, such as retinol and AHA (alpha hydroxy acids), often inspired by what they see online rather than what their skin truly needs.

Today’s generation seems to have a deeper and potentially more enduring connection with the world of beauty. Modern trends, like the pursuit of “glass skin”, often push unrealistic and demanding ideals, requiring a constant investment in an array of products. This linguistic shift from “beauty products” to “skincare” further fuels the notion that not actively maintaining your skin is neglectful.

“We are raising a generation of children that are easily bored and overstimulated, always looking for the next thing,” she reflects. Her advice to Sephora and other retailers is to involve dermatologists in vetting products and to introduce age indications for items to guide young consumers toward appropriate choices. “The only thing I would like Sephora to do is to get a real dermatologist to check

the items and put an age range for the products. This is a must," she insists, arguing against the use of retinoids and harsh acids for young skin.

In the digital age, skincare routines and trends among teenagers are inarguably shaped by what they see online. Lama Aqeel, 17, from Saudi Arabia says, "the most common ingredients I hear about through social media are hyaluronic acid, retinol, and salicylic acid," - This influence is further exemplified by the insights from a young woman in Jordan, 18, who actively incorporates retinol and vitamin C into her skincare routine, aiming to harness their collagen-boosting benefits.

The phenomenon extends beyond mere ingredients to innovative uses of an alarming number of products and homemade remedies, as highlighted by emerging TikTok trends. From utilizing La Roche Posay's cicaplast face cream as a mask, to the decorative yet functional pimple patches and natural solutions like boiled flax seeds for a botox effect, social media has unleashed a wave of creativity in skincare.

While teenagers are enthusiastic about embracing the latest skincare trends, the use of some potent ingredients might require a more nuanced approach. Nadine Younes highlights the importance of considering age-appropriate products: "Young people are not necessarily the best candidates for retinoids or harsh acids. Salicylic acid is a great option for them. There's also no significant benefit for teens to apply hyaluronic acid directly to their skin,

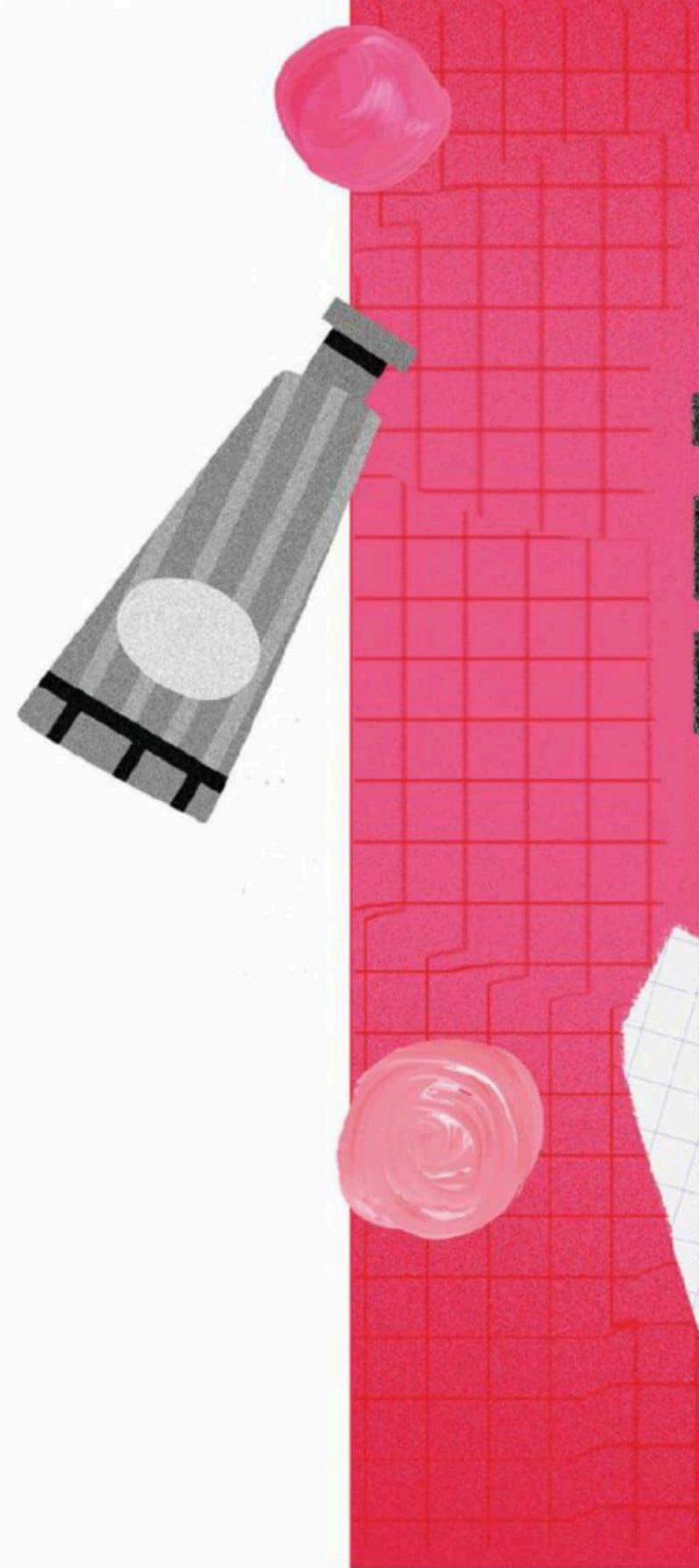
as their young skin naturally produces sufficient amounts."

Salicylic acid remains a well-regarded choice for its effectiveness in treating acne, a prevalent concern among teenagers. However, dermatologist Dr. Elie Maalouf offers a different perspective on retinoids: "While teenage skin naturally excels at cell turnover, incorporating certain retinoids like tretinoin can actually be beneficial for treating acne breakouts under professional guidance. It's important to note that while tretinoin is a retinoid, it won't offer anti-aging benefits for teens since their skin cell turnover is already high."

Dr. Maalouf highlights the misuse of products designed for adult skin concerns like cell renewal and sun damage repair, "It's important to understand that products meant for adults are not 'better' - they're stronger because mature skin needs more maintenance and care, which is why they have higher concentration of actives that address mature skin cycles."

Think of it like this: Teenagers have a natural glow and resilience, so they may not need such a heavy-duty approach. There are gentler, more appropriate ways to keep their skin healthy and looking its best.

Dr. Maalouf also cautions against the overuse of moisturizing creams containing hyaluronic acid and collagen for young skin: "Teens often fall into the trap of thinking more moisture is always better, but research suggests



otherwise. A 2020 study published in the International Journal of Trichology found that excessive hyaluronic acid in some moisturizers can disrupt the skin barrier function in young skin, potentially leading to increased breakouts. Similarly, collagen applied topically has limited effectiveness as it struggles to penetrate the deeper layers of the skin."

Razan Galal, 17, and Mariam Mahfouz, 18, both from Egypt, also emphasize the influence of social media while advocating for wise product selection. Galal emphasizes the aim to minimize acne exposure and protect skin from premature aging, mentioning, "CeraVe cleanser and The Ordinary and moisturizing with Bepanthen... for acne I use Starville acne-prone skin cream."

"في عصر رقمي، يتعلم المراهقون آخر صيحات الجمال وروتين العناية بالبشرة حصراً من خلال ما يرونه عبر الإنترنت."

"In the digital age, skincare routines and trends among teenagers are inarguably shaped by what they see online."



Mahfouz views skincare as a form of self-care and habit-building, steering clear of ingredients like retinol, based on her preferences and social media trends. Meanwhile, Serena from Lebanon highlights the peer influence on her skincare decisions, stating, “My friend recommended that I use glycolic acid for hyperpigmentation.”

These conversations also reveal a commendable awareness among teenagers about the importance of sunscreen in their skincare routines. Lama Aqeel’s mention of using “moisturizer and sunscreen in the morning” and Razan Galal’s inclusion of “Bepanthen” (a brand known for its healing and protective products, including those that can be used to soothe skin after

sun exposure) in her routine highlight a growing understanding of the critical role of sun protection in skin health. This awareness is particularly important given the environmental factors and the increased risk of skin damage due to UV exposure.

Furthermore, the discussion about sunscreen not only illustrates the teenagers’ commitment to protecting their skin from sun damage, but also reflects a broader trend towards health-conscious skincare. As Younes points out, “the trend is now moving toward clean, chemical-free, even environmentally friendly product packaging.” The emphasis on sunscreen, alongside the cautious use of heavy ingredients, signifies a shift towards more

informed, preventative skincare practices among young consumers.

Teens are navigating the ever-shifting landscape of skincare information. While social media offers a constant stream of trends and inspiration, established experts like Nadine Younes and Dr. Maalouf provide a crucial counterpoint, emphasizing safety, simplicity, and the importance of understanding your unique skin. This collective journey, marked by experimentation, learning, and adaptation, highlights the evolving relationship between teenagers, skincare, and the digital platforms that influence their choices. ■

The cosmos at work

An illuminating peek into the celestial work of astrologers.

By Farah Al-Toukhi

During an excursion in Tokyo, I was encouraged to use a unique gacha machine that would disperse a paper fortune upon being fed a coin. I turned the dial and received my prediction, entombed in a plastic capsule. The crisp, emerald paper declared I would have ‘Excellent Luck’ and that my hard work would guarantee my ‘big wishes’. I have degrees in biology and journalism and a generally cynical disposition. I am a skeptic through and through, but I still keep that paper in my wallet, fearing that leaving it behind might withhold the luck I secretly believed it brought (it also came with a coupon for a pizza bar).

This type of routine, mild superstition is perhaps what fuels millennia of human belief in luck and fate, despite our rational minds (and science) telling us that we shouldn’t buy into it. It is a small tether in an unpredictable world, guided by years of ancient and modern practice.

- My sun is in Virgo. My Venus is in Cancer.

- My first card drawn is ‘The Tower’.
- My coffee grounds are oriented in ominous swirls.

Whether it be astrology, tarot cards, or coffee ground readings (tea leaves for some), the human desire to find meaning in randomness is a powerful force that continues to shape our beliefs and actions, and sometimes, our professions. For as long as uncertainty has existed, some claim to have a special connection with unseen forces

that govern our lives, offering guidance and insight to those seeking answers. The more questions that come up, the more empowered these practices become, sitting comfortably in the zeitgeist of society.

Allied Market Research estimated that the global astrology industry was valued at \$12.8 billion in 2021, up considerably from \$2.2 billion in 2018. By 2031, it’s expected to rise to \$22.8 billion. A mutable field, it seems to adapt to the times. As technology advances and societal norms shift, astrology has found new ways to reach and resonate with a wider audience, maintaining its relevance and popularity.

May El Masry, a Cairene and professional tarot reader, found a home for her business on social media, despite having very early beginnings in her practice. “I am a natural clairvoyant, and I was born with this gift,” says El Masry. “Of course, that was scary for me as a kid, but later, I mastered this talent.”

El Masry, who has degrees revolving around radio and television, uses tarot cards and runes as her divination tools of choice, which she uses to perform readings for clients both in person and online. It is important for her to adhere to a strict code of ethics, for example, she will

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not provide readings on health or give bad news. “My readings address positivity,” El Masry insists. “This doesn’t mean I hide information, but since manifestation powers are important in readings, I love to grasp the opportunity to empower and never to spread fear and bad omens.”

It is interesting to observe that, in this craft, what you give is what you get. Terms like “manifestation” and “energy” are commonplace in astrological practices, both heavily implying the existence of preconceptions that could feed these readings. “Tarot is empowering rather than fatalistic,” El Masry states. This ego-affirming stance might support the popularity of this industry. A quick skim of El Masry’s positive online reviews indicates that her clients seek her guidance with particular (and common) problems.

–My ex texted me today, just like you predicted.

–They got the investment in January, exactly like you said.

–You were right! He never got divorced.

This suggests that people turn to astrology and tarot for reassurance and validation, rather than simply seeking solutions to their problems. The positive feedback loop created by accurate readings may contribute to the continued belief in these practices.

El Masry started practicing professionally in 2019, after only performing readings for friends and family. She is careful to describe her craft more like meteorology: While a weatherperson can predict a chance of rain, they can’t predict if you’ll stay indoors during a

storm. “All divination tools are used to read energy and paths,” El Masry warns. “Astrology is used to forecast events in relation to the positions of planets. Free will must prevail. Therefore, divination tools are used to highlight, warn, and guide.”

El Masry is the epitome of a modern, urban seer. When she is not spending time with family, friends, and pets, she cleanses muddled auras and reads thoroughly shuffled tarot cards for her clients. She diligently promotes her services through social media, a venue where modern astrology and divination thrive and where practitioners can

1 in 3 people would blame Mercury in Retrograde for something going wrong in their lives.

Millennials are less religious but nearly 1 in 6 of them believe in some ‘new-age’ spirituality.





Tarot cards are just one of many tools of divination.

operate within their preferred levels of privacy and security within their own communities.

In Middle Eastern societies, it is important to consider both the prevalence of divination practices and their rejection by regional religions. In Islam, for example, the study of celestial bodies is not prohibited, but using them to predict the future is. “There is no debate about how Islam views divination and forms of magic; however, many practices of divination root themselves in Islamic teachings,” says Lamiaa Soliman, a cultural anthropologist who finds it difficult to even remember the different horoscopes. “One very obvious example is asking for blessings from sheiks and saints.” While the ‘evil eye’ will be swiftly and commonly protected against by Islamic

talismans, ideas that involve divination are considered borderline blasphemous. Astrology exists in a delicate and temperamental societal balance.

While Soliman never engages in astrology herself, she understands its cultural significance. “Today, astrology is more common among many who are interested in understanding characters and characteristic traits through horoscopes.” Soliman also suggests that the study of celestial bodies is a long-honored profession in the Middle East, one that predates the Islamic faith. “The science of astronomy evolved in pre-Islamic times. [This evolved into] the knowledge and theories of astrology between modern-day Iran and India, which were also transferred through the Silk Roads.”

Participation in these practices can range from a pastime to becoming an expert. Some individuals may simply read their horoscope for fun, while others may consult professional astrologers for guidance in important life decisions. For some, even a casual interaction can be a gateway to a new career path.

Sohayla El Fakahany, a social research consultant for the American University of Beirut, has experienced the full spectrum of engagement with divination. “I used to ask my friends’ parents for a coffee ground reading or visit a woman in Sinai for a palm reading,” says El Fakahany. “I started as a skeptic, developed an interest, became a client, and then grew to become a practitioner myself. Although I started my fieldwork with the failed intention of detaching myself

from the experiences and the field, after the first few field visits, I realized that fully immersing myself in the experiences of the discipline became a priority in conducting my fieldwork.”

During her academic career, El Fakahany earned a Master’s degree in social anthropology with a focus on the anthropology of magic, rituals, and religion. Both the subject matter, and her immersion in it, earned her some criticism. Bearing in mind that there is a substantial number of people who both seek and practice these rituals who are considered well-educated, El Fakahany’s research was however repeatedly deemed ‘ignorant’, particularly implying that her research, and those who participate in astrology or divination, cast aside religion to do so.

“This resonated with me because I came across some practitioners and clients who appeared traditionally religious. This made their ‘practice’ of it more relatable to the general public, which, by their own logic, ironically undermines them and questions their faith,” she says.

As both an academic and practitioner, El Fakahany frequently struggles with Middle Eastern societies’ hypocrisy on this particular topic. She finds that practices that are deemed traditional (like tasseography and palm reading) tend to be perceived and dealt with as tricks or games or as trivial, while those that are considered, albeit incorrectly, as modernized methods (like tarot cards and meditation) are more tolerated and are less criticized. “That being said,” El Fakahany adds pessimistically, “Religious exclusivists will view most of these practices as charlatanistic and heathenize their seekers and practitioners, regardless.”

Believe in Astrology

37%

Women

20%

Men

Believe their horoscopes to be accurate

62%

Gen Z

63%

Millenials

Skepticism is standard practice when it comes to any form of divination or spiritual exploration. Ultimately, the value of these practices lies in the personal meaning and insight they provide to those who engage with them. Disbelief alone doesn’t seem to be slowing the industry down. Interest in alternative spiritual practices continues to grow, with more people seeking guidance and connection through these methods, and even the most fervent skeptic can be driven by curiosity.

Mai El Masry easily dismisses critics of her field, saying, “I am very confident about my gift and practice. If they are afraid, I can’t connect to them.”

The increasing popularity of alternative spiritual practices suggests a significant shift towards seeking deeper meaning and connections. Its endurance is an anthropological marvel that highlights the evolving nature of humans’ constant search for cosmic understanding. However, skepticism should not be relinquished easily. It is important to approach these practices with a critical mind. The unending search for extramundane guidance should not be hindered by unquestioning belief (even if it does come with a coupon for a pizza bar). 

Advances in DNA testing have transformed the field of genealogy, providing ancestral insights that were unimaginable just a few decades ago. And yet genealogy companies continue to paint people from the Levant and the Arabian Peninsula in broad, generic brushstrokes or have removed them entirely from their ethnicity estimates. Where we see a rich tapestry of ethnicities and religions, they too often see homogenous groups devoid of diversity.

Despite a network of over 25 million people, Ancestry, the world's largest provider of consumer DNA testing, still struggles to provide detailed and accurate ancestral information for individuals from the Arab world. AncestryDNA tests loosely classify someone from Lebanon as being from the Levant, Egypt, or the Arabian Peninsula, although their communities may include regions such as Mount Lebanon or the Beirut, Damascus, and the Sidon Triangle. The company's 'West Asia' features 36 regions and communities, yet Palestine only appears as a secondary community, not as a region. Jordan doesn't appear at all. The degree of detail available for Syria is also extremely limited. "It's like a constant attempt to erase my identity," says Dalia Abuzeid, a Dubai-based Palestinian film producer. Her original AncestryDNA ethnicity estimate said she was 97 percent Palestinian. Several updates later, she is now from the Levant

(54 percent), the Arabian Peninsula (23 percent), and Egypt (18 percent). The only reference to Palestine comes from her communities, which classify her as coming from Southern Lebanon and Northern Israel/Palestine. "The inclusion of Israel in my analysis, aside from the fact that it is ridiculous, specifically because Israel did not exist prior to 1948, insults me," says Abuzeid, whose family are from Yafa and Nablus. "It is my claim to the land, it is proof of my heritage, and yet something that should be so factual so obviously carries bias."

MyHeritage has gone a step further and wiped Palestine from the map entirely. The Tel Aviv-based company categorizes a person's DNA according to 2,114 geographic regions and 42 ethnicities, none of which include Palestine. For the Levant and the Arabian Peninsula, there are only two possible ethnicities – Middle Eastern and Yemenite Jewish. If you're from Lebanon, you are most likely to be categorized as Middle Eastern, West Asian, or North African, which are so generic they render the test all but worthless. Egypt, Syria, Iran, Iraq, and Yemen do not have enough data to show those countries' ethnicities at all.

In the past, 23andMe has also been criticized for casting Palestinians as 'genetically stateless'. Such accusations stemmed from the fact that both Israel and Palestine were absent from the company's test results. Instead, Pales-

tinians were assigned ill-defined ancestries such as Western Asian and North African or Arab, Egyptian and Levantine. They still are, but now that broad ancestry is complemented by more granular results and the assigning of specific genetic groups. These include the Highlands of Palestine and the Southern Coastal Plain, the Lower Galilee, and Greater Ramallah.

In March, the company added 26 genetic groups to the Levant as part of an update that also improved the DNA results for indigenous people of South America. In Lebanon, the Qadisha Valley and Northern Mount Lebanon, Zahlé and the Southern Beqaa Valley Uplands, and the Central Lebanon Coast were added, as well as the Southern Beqaa Valley Lowlands and Southern Lebanon. In Syria and Jordan, Wadi al-Nasara and Homs, Greater Damascus and the Orontes River Valley, and the North-



Where's the Middle East?

DNA testing companies have a blind spot, and it's a little suspect.

By Iain Akerman



western Jordanian Highlands were added. The update also included the addition of 11 Sephardic and Mizrahi Jewish genetic groups, with the latter including ancient Jewish communities in Algeria, Egypt, Iran, Iraq, Lebanon, Morocco, Syria, and Yemen.

Producing such a detailed update required extensive research, says Sam Ancona Esselmann, a senior product scientist at 23andMe. First, consenting customers whose grandparents were born in the Levant and have Levantine genetic ancestry were selected. A technique called genetic clustering was then used to identify potential groups of individuals who share higher levels of DNA with each other than they do with others in the analysis. These 26 genetic groups became the company's reference, enabling it to compare customers' DNA to the DNA of individuals within these groups. The groups were then labelled

according to the self-reported information provided by those individuals. "We know the history of this region is sensitive, and that different people can understand the population and political history of this region in different ways," says Esselmann. "Our product scientists extensively researched the population and political history of this region and consulted with external experts, including prominent population geneticists with specific expertise in the Levant region, to make sure we were appropriately representing genetic ancestry from this region without bias or agenda."

Establishing someone's genetic ancestry is far from easy. National borders do not necessarily reflect historical populations, especially in the Arab world or in formerly colonized countries, and different populations can share genetic markers. The complexities of human history,

including migration, war, and trade, complicate matters further, making it hard to ascertain a person's ancestry. There are also issues of bias (political or social) and underrepresentation, with biomedical research (historically at least) disproportionately focusing on participants of European descent.

More importantly, DNA tests do not tell you where your ancestors came from, only where DNA like yours can be found today. The inference being that your ancestors came from those places, too. As such, DNA ancestry tests are little more than probabilities or estimates of your connection to various regions.

AncestryDNA, for example, compares an individual's DNA to a reference panel made up of DNA from groups of people with deep roots in a particular region. It does this by looking at 1,001 sections of that person's DNA and assigning each section to the ethnicity region it

looks most like. These results provide the percentages an individual sees in their ethnicity estimates. The company also uses its genetic communities technology to identify groups that share relatively recent ancestors from the same region or culture.

The size of a reference panel differs from company to company. For France, AncestryDNA has 5,305 samples, while there are 9,559 for Indigenous Cuba. The Levant has only 271 samples and the Arabian Peninsula has 208. Others, including 23andMe, do not share exact sample sizes. In all cases, an assumption is being made that a reference panel serves as a proxy for a historical population. The accuracy of the ethnicity estimates these panels help to provide is heavily dependent on their diversity and representation, but not necessarily on their size. “The accuracy or precision of the results is not always correlated with the number of samples in a reference panel,” explains Barry Starr, a senior science writer at Nucleus Genomics.

“The number of samples needed for a reference panel is primarily determined by two interconnected factors: the uniqueness of the group’s DNA and the size of the region of the world to which you are trying to assign it. Some people (for example, the indigenous peoples of Australia or Ashkenazi Jewish people) have unique DNA fingerprints, largely because they have been isolated from other populations, either geographically or socially. Because these DNA differences are so specific, one can create a reference sequence for these groups with very few samples. You need many more samples if there has been a lot of contact between groups or you are trying to narrow regions down more.”

Starr cites the border between Germany and France as an example. Because the border was fluid for the best part of 1,000 years, it is very difficult to assign someone to Germany or France. Similarly, the Cuba DNA region represents the indigenous people of Cuba. But because of Cuba’s history (migration, wars, colonization, revolutions et cetera), most of the indigenous Cuban DNA exists in very small sections of the genomes of many of the people who live in that country. A large sample size is therefore needed to tease these out.

“The other significant factor in reference panel size is the number of customers with deep family roots from a specific region,” adds Starr, who states that his opinions are his own and do not represent the views of his

employer. “Most of the samples in a reference panel, particularly when there are large numbers of samples, come from the customers. Ideally, people included in the reference panel can trace all four of their grandparents to a specific region of interest. For this, you need lots of customers. The issue is you end up with a chicken and egg problem. To get customers, you want to offer the most precise regions possible. But to provide the most precise regions possible, you need customers. This is a complex problem that companies offering ancestry testing have not yet solved.”

One region where precision is largely absent is the Gulf. Regardless of whether you are Emirati, Saudi, or Omani, an AncestryDNA ethnicity estimate will, in all likelihood, assign you the embarrassingly broad Arabian Peninsula. The only community associated with that region is Iraq, which isn’t even part of the peninsula. Even this vagueness is better than MyHeritage’s Middle Eastern, which reeks of colonial invention and bias.

The most detailed ancestry composition for the Arabian Peninsula is provided by 23andMe, which not only identifies someone as Peninsula Arab, but breaks it down into regions. These include the Eastern Province of Saudi Arabia, Abu Dhabi in the UAE, and Taizz Governorate in Yemen. Even then, there are limitations. Known ancestry in Yemen, for example, does not guarantee a match to that country. Such a match depends on the number of refer-

“ليس من السهل إطلاقاً تحديد النسب الجيني لشخص ما؛ فالحدود الوطنية لا تعكس بالضرورة سگان المنطقة عبر التاريخ، لا سيما في العالم العربي أو الدول المستعمرة سابقاً.”

“Establishing someone’s genetic ancestry is far from easy. National borders do not necessarily reflect historical populations, especially in the Arab world or in formerly colonized countries.”



ence individuals from that country and how genetically distinctive they are. “I am not an expert on the population history of the Arabian Peninsula but the genetics are almost certainly complicated because of a long history of migration and nomadism,” says Starr. “To see ethnicity regions in DNA, you need populations that are relatively isolated for a period of time. If a part of the world does not have that, then it is very difficult to disentangle larger groups into smaller ones. Not impossible, but difficult enough that, again, it comes down to the number of DNA samples. And in some cases, even with a large number of samples, a region can just not be broken down further.”

As genetic databases expand and increase in diversity, and as companies such as Ancestry and 23andMe refine their algorithms and methodologies, the granularity and accuracy of their ethnicity estimates and ancestry compositions will improve. This is especially true for people from the Arabian Peninsula and the Levant, who have historically played second fiddle to those of European descent. “It is always our goal to accurately and fully represent the diversity of global populations, in order that our customers can see themselves and their family story represented in their DNA test results,” says Aaron Wolf, senior population geneticist at Ancestry. “Continuing to increase the number and the specificity of our ethnicity regions and DNA communities is one approach we have to do this.”



Up close and personal

The Close-up Photographer of the Year award celebrates the best micro and macro photography in the world.

By **Nadine Kahil**

Discover the incredible world of the Close-up Photographer of the Year (CUPOTY) competition, where every snapshot reveals the mesmerizing wonders of nature up close and personal. Established in 2018 by Tracy and Dan Calder, CUPOTY celebrates the art of close-up, macro, and micro photography. It's not just about capturing images; it's about delving into the intricate details of our natural world. Macro photography zooms in on larger subjects, while micro photography unveils the beauty of the minuscule, requiring a lens beyond the ordinary.

Picture nearly 12,000 entries from 67 countries igniting the competition's fifth edition, evaluated by a panel of 23 esteemed professionals. Categories span from Animals to Human Made, showcasing the diverse tapestry of life.

Hungarian photographer Csaba Daróczy clinched the title of Close-up Photographer of Year with his awe-inspiring shot of a Eurasian nuthatch in flight, captured from within a hollowed-out tree stump.

Tracy Calder reflects, "Thanks to these creative and original pictures, I now know that tadpoles can eat birds, ants fire acid like water pistols, and bees sometimes hold each other's legs while they sleep." Each image tells a story, revealing the extraordinary in the ordinary.

Join us in celebrating the breathtaking artistry of CUPOTY, where every click of a camera shutter unravels the magic of nature's finest details.

CARNAGE

Photographer:

Artur Tomaszek

Category:

Butterflies & Dragonflies

Finalist

Artur Tomaszek took this image in April last year, in Hong Kong. Here we see a spotted orbweaver spider (*Neoscona* sp.) consuming its much larger blue marsh hawk dragonfly (*Orthetrum glaucum*) prey in a clear display of nature's awesome power.





PANDERCETES SP. SQUARED

Photographer:

Peter Grob

Category:

Animals Finalist

A large huntsman spider (Panderbetes sp.) feeds on a smaller huntsman spider feeding on prey in Kebun Che Mah, Kuala Lumpur, Malaysia. 'I was observing a large huntsman spider on a tree when it suddenly leapt and caught a moving subject next to it. Upon closer inspection, I realized that a smaller huntsman spider had caught its own prey and while feeding on it, it had attracted the attention of the larger spider,' says Grob.

**PREPARING THE
TRANSFORMATION**

Photographer:

Juan J Gonzalez Ahumada

Category:

**Butterflies & Dragonflies
Finalist**

A caterpillar hangs from a wire fence and begins to form its cocoon. Taken in spring, in Ojén, Málaga, Spain. Police official Juan J Gonzalez Ahumada took this stunning photo of a caterpillar preparing to create its cocoon. The caterpillar hangs from the twists of a wired fence as it gets ready for a new stage of existence.







**WOOD ANTS FIRING ACID
SECRETION**

Photographer:

René Krekels

Category:

Insects 1st Place

Wood ants defend their community by spraying acid, taken in July, in Malden, the Netherlands. 'I had been studying the lifestyle of wood ants in the Netherlands for work when I noticed the defending ants of a very large ant's nest seemed eager to scare me off by spraying acid towards me. Luckily it wasn't that destructive, and it provided me with a great opportunity to photograph them defending the nest,' says Krekels.



SPIDER IN THE FRAME

Photographer:

Yuan Minghui

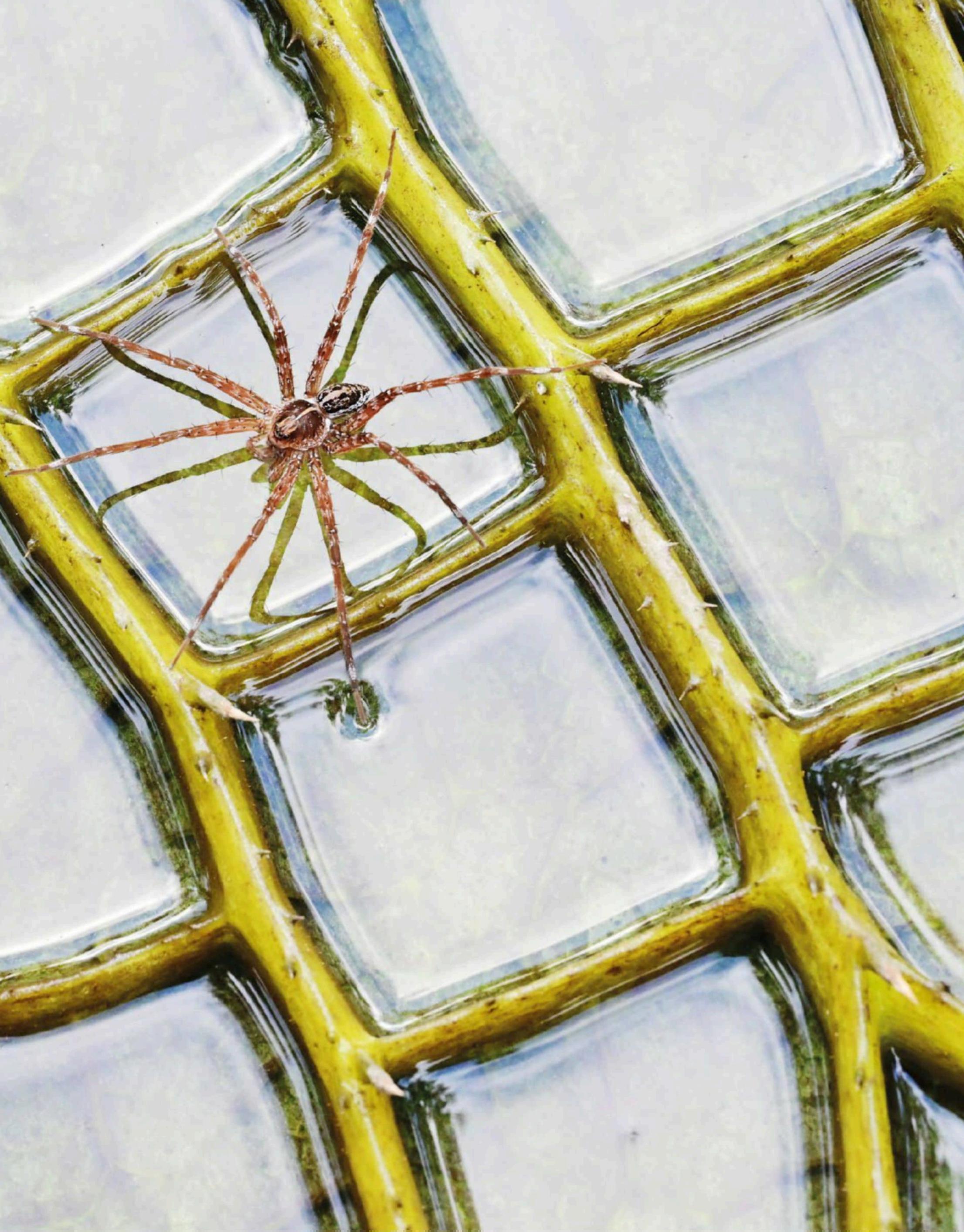
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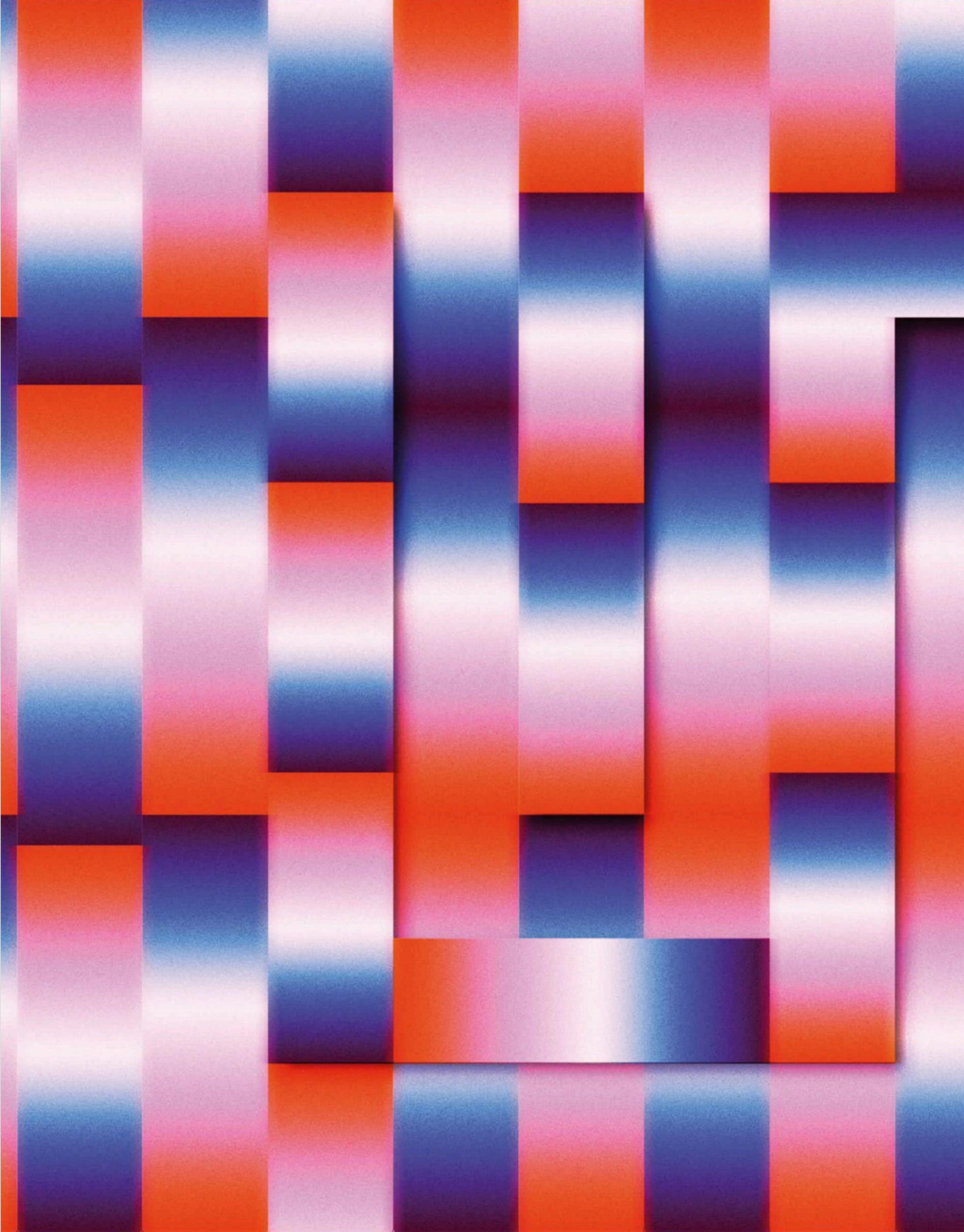
Animals Finalist

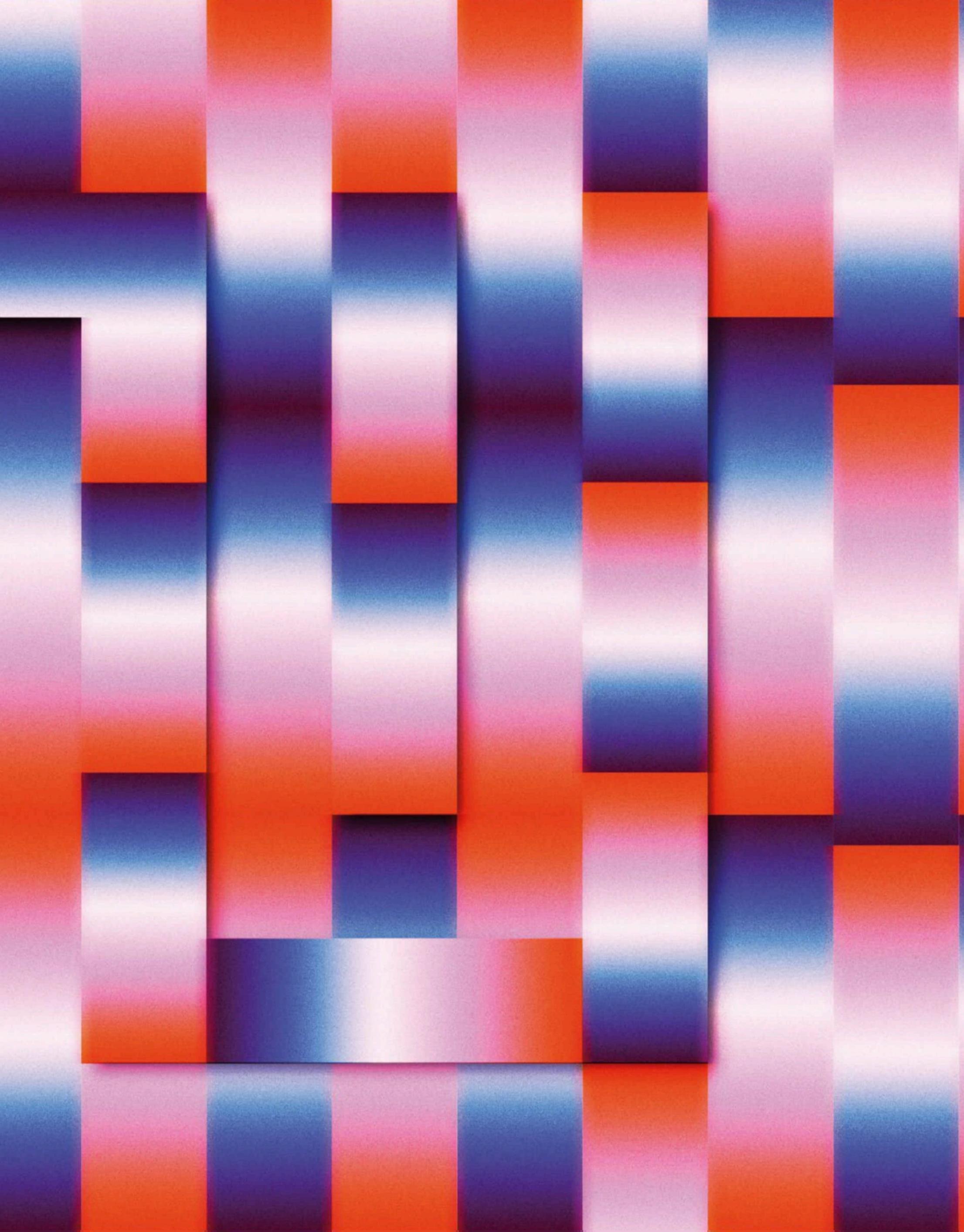
A water wolf spider walks across a giant water lily.

Taken in summer, in the Tropical Botanical Garden in Xishuangbanna, China. "I found a water wolf spider on the back of one of the giant leaves.

The veins of the leaf formed some delightful shapes, while also holding the water in each frame to form tiny mirrors," says Minghui. 📷







STARTUP GROUP

By

CARLA SERTIN

NADINE KAHIL

YUNQI LI

Illustration

NADIA MÉNDEZ

Meet the people jumpstarting Saudi Arabia's
age of innovation.



SAUDI ARABIA STANDS as a beacon of transformative change in the Middle East, propelled by a cohort of visionary disruptors. Among them, Ammat Al Sabban's revolutionary product, Seven, redefines norms, while Amit Midha leads the nation's transition from an oil-dependent economy to a technological powerhouse. Mishaal Alshemimry's unwavering passion advocates for proactive preparation for future job markets, seamlessly complementing Saleh Al Tunaib's lead-

ership in robotics and system software integration. These individuals represent the forefront of Saudi Arabia's innovative landscape, each contributing a unique perspective and skill set to the nation's evolution. It's important to note that these are just some of the many figures driving Saudi Arabia's transformation. Together, they embody Saudi Arabia's proactive approach to addressing global challenges, harnessing innovation and adaptability to redefine traditional

narratives and propel the nation towards a future shaped by technological advancement and economic diversification. Their collective efforts not only position Saudi Arabia as a regional leader, but also inspire a new generation of innovators to contribute to the nation's ongoing transformation. In embracing disruption, Saudi Arabia emerges as a dynamic hub of creativity and progress, paving the way for a brighter and more inclusive future for all.

Ammar Al-Sabban

Associate Director of Entertainment Product, SEVEN

In the world of entertainment, the fusion of technology and creativity is reshaping how stories are told and experiences are crafted. Ammar Al-Sabban, a veteran in the realm of entertainment and media, stands at the forefront of this transformative wave. As the Associate Director of Entertainment Production at Saudi Entertainment Ventures | SEVEN (SEVEN), Al-Sabban is helping to redefine the narrative of AI in entertainment.

“Today, we delve into the realm of technology, particularly AI, in entertainment and media,” Al-Sabban shared while speaking at LEAP. Amidst concerns about AI displacing creative roles, Al-Sabban emphasizes its role as a powerful ally. “I’ve been using AI as a screenplay writer and entertainer for over a year. It enhances creativity; it doesn’t replace it. So think about it just like the internet or Google search. I mean, I’m old enough to remember going to a library and checking out books and researching

and now you just Google it, and you can get the information. So it’s the same I mean, Google did not replace research. I don’t think AI will replace art.”

For Al-Sabban, AI is not merely a tool; it’s a catalyst for innovation. “Using AI as a writer breaks the ice, combats writer’s block. It streamlines the creative process,” he explains. With AI’s ability to learn and adapt, it becomes a symbiotic partner, amplifying creative output and efficiency, “Whoever knows how to utilize that tool and to make their lives and their work better,” will succeed, he says.

However, we’re all aware that skepticism looms over AI’s integration into creative domains. Al-Sabban addresses this apprehension with clear pragmatism. “We’re always fearing whatever we don’t know. And, and that’s why I really jumped on the opportunity to use it and get to learn how to use it. It just shaves a lot of time off of, you know, some tedious work that you need to do. And again, if you don’t know, you’re going to fear it. You’re going to be afraid of it. You’re going to be skeptical about it. But once you use it, I mean, I can’t. I can’t imagine people when they invented the car, they were like No, no, no, we’re going to stick with horses and bicycles and stuff. It’s the same thing,” he asserts. Drawing parallels to past technological advancements, he underscores the inevitability of change and the need to adapt, “I

“I’VE BEEN USING AI AS A SCREENPLAY WRITER AND ENTERTAINER FOR OVER A YEAR. IT ENHANCES CREATIVITY; IT DOESN’T REPLACE IT.”

mean, we’re smart enough and I think, we need to just to get up with the times and honestly there’s nothing to be to be scared of.”

Looking ahead, Al-Sabban envisions a limitless horizon for AI in entertainment. From creating prototypes to animating characters, the possibilities are boundless. “AI streamlines prototyping, expedites concept validation. It’s a gateway to innovation,” he remarks. Yet, he remains grounded in the importance of ethical considerations amidst technological advancement, “The possibilities, I think, are endless. I think what’s good about it for us currently is using it to create prototypes, or let’s say pilots, if I want to create like a prototype comic book to sell it to somebody, it’s a great selling tool because I can do it myself. But then you can’t copyright it because whatever AI creates, you’re not able to by law, to copyright it. I think from this aspect, it’s great for us not to waste any time or resources, get the idea out, get a proof of concept and then go from there.”

In Al-Sabban’s worldview, technology is not a threat but an opportunity. “Embrace where we’re going and be careful with it,” he advises. As entertainment evolves, embracing AI is not just about staying relevant; it’s about shaping the future. Ammar Al-Sabban’s narrative emerges as a testament to the transformative power of AI—an ode to the harmony between artistry and innovation, where the human spirit thrives in synergy with technology.

Ammar Al-Sabban surrounded by the different characters he has played.



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Amit Midha

CEO, Alat

Serving as the CEO of Saudi's Public Investment Fund (PIF) company Alat, Amit Midha stands out as a visionary business leader with a proven track record of spearheading businesses across diverse global markets, including China, the US, India, and Singapore.

Midha was the President of the Asia Pacific and Japan (APJ) region and the Global Digital Cities business during

his tenure at Dell Technologies. Now at the helm of Alat, his ambition is to significantly elevate the technological landscape in the Kingdom, aiming to boost its capacity for generating lucrative investment prospects. "It's pretty exciting to be leading a world-class team with great strategies and commitment from the Kingdom," says Midha. "We want to play a significant transforma-

tive role in building a global industrial hub here in Saudi Arabia."

Saudi Arabia is committed to transforming itself from an oil-dependent economy to a powerhouse of technology. This commitment is evidenced by Alat's mission to reshape the electronics and advanced industrial sectors globally by establishing a robust manufacturing nucleus within Saudi Arabia. "We are partnering with SoftBank to build a robotics factory here that will start producing this year," says Midha. The partnership will reportedly pour US\$150 million into establishing a fully automated manufacturing and engineering hub in Riyadh. "We're partnering with Tahakom here and Dahua Technology in China to create an intelligent city," he says. Alat and Dahua Technology are planning to invest US\$200 million to make security and surveillance products.





trialist

Alat also announced a Memorandum of Understanding (MOU) at LEAP 2024 to partner with the King Abdullah Center for Industrial Science and Technology. The partnership aims to boost local talents in the semiconductor ecosystem, laying the foundations for designing and manufacturing semiconductors. “Some global leaders are saying the world is going to run out of energy before it gets to the AI era,” says Midha. “Energy is the key to everything you want to do. And clearly, that’s our advantage. Every day we have one trillion-plus kilowatt-hours of energy generated from the sun here.” Alat is harnessing the power of solar, wind, and green hydrogen clean energy sources. “We will create green zones to run our carbon-neutral data centers and we can manufacture silicon carbide in a way that no one else can,” says Midha.

Midha expresses a fervent desire to employ technology as a transformative force across industries. By integrating advanced AI and adhering to Industry 4.0 principles, Alat believes that manufacturing practices should prioritize sustainability and efficiency across the board. “This is not only using clean energy but applying sustainability measures to all our operations, infrastructure, logistics and supply chains, with sustainability at the core of everything we do,” Midha adds.

Looking ahead, Midha is confident that

Alat will pave the way for sustainable growth and technological advancement in the Kingdom. “By the end of this year, our factory with SoftBank will be ready to go and the next generation will be exported to the world for production and services.” Midha also shares that several new partnerships will be announced between now and then. A training program designed to empower Saudi talents is also in the pipeline. Overall, Alat aims to create 39,000 direct jobs in Saudi Arabia and achieve a direct non-oil gross domestic product contribution of \$9.3 billion by 2030.

“THERE ARE NOT MANY PLACES WHERE YOU CAN MAKE THINGS HAPPEN WITH THE CONFIDENCE AND BOLDNESS THAT SAUDI OFFERS.”

The

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Mishaal Ashemimry

Founder, Mishaal Aerospace

Mishaal Aerospace's goal is to send small satellites into orbit with cost-effective space access vehicles known as the M-Rocket Series.

Mishaal Ashemimry's story is one of unwavering passion and perseverance. From a young age, she felt a powerful connection to the cosmos upon being amazed by the stars in the desert sky. This early encounter sparked a relentless pursuit of knowledge, leading her to excel in aerospace engineering and mathematics.

"A calling is just within you, no matter how hard you try to suppress it, you cannot. It will always win over you. And with space, that's how it really was for me. I think one of the truest forms of love is the passion to know and to have that curiosity to figure out. It depends on what you believe in life and so forth, but you are connected to the universe somehow. And I think this was the universe's way of saying, hey, I'm here and you're part of me," she says.

Ashemimry embarked on an academic journey that took her to Florida Tech and eventually landed her a coveted position at NASA. "NASA wanted to do research on nuclear thermal rockets, which is a type of rocket you would use to send humans to Mars. I was really interested in it, so I applied and got accepted to be the graduate research assistant for it. I had to design a nuclear thermal rocket for a Mars mission and to mitigate all the issues faced by the NERVA Rover program. I absolutely loved it. It was a lot of research and the beauty of it is, I wrote all the codes, so I had to do predic-



tive analysis and modeling of the rocket engine. That was a lot of fun," she says.

Later, her time at Raytheon Missiles & Defense proved to be a valuable learning experience, allowing her to gain practical engineering expertise, "I learned a lot and I loved it because it involved engineering, predictive analysis and coding that helps in predicting the behavior of the rocket. And then I got to do something called stage separation analysis, which is very critical and happens in a very short period. So here, you're talking about milliseconds here that you're worried about. I enjoyed it," she says. Eventually, Ashemimry took matters into her own hands and founded Mishaal Aerospace with a vision to provide launch services for small satellites.

Ashemimry's dedication and expertise were recognized when she was

appointed Vice-President of Diversity Initiatives at the International Astronautical Federation, "I recognize while we have made great strides in the transformation of the space sector, we still have much more work to do. Given that entry into the space sector requires large investments or commitments that must involve governments, we can infer that geographical representation might be constrained by a lack of support or funding and competing social and economic priorities," she says.

Beyond her professional accomplishments, Ashemimry is passionate about inspiring the next generation of space explorers. She actively uses social media to bridge the information gap for Arabic audiences and encourage young people to pursue careers in STEM fields, "What I often see lacking is long term thinking. If they don't see an immediate job in the field, they are not interested in it. I want them to understand, you don't prepare yourself for a job of today, you prepare yourself for the job of tomorrow," she says. Her ultimate dream? To one day walk on the Moon or Mars, contributing to humanity's quest for knowledge and expansion into the cosmos.

"YOU DON'T PREPARE YOURSELF FOR A JOB OF TODAY, YOU PREPARE YOURSELF FOR THE JOB OF TOMORROW."

Emon Shakoor

Founder and CEO, Blossom Accelerator

Emon Shakoor's journey is a unique blend of scientific inquiry and entrepreneurial spirit. Though she began her career as a neuroscience researcher, her passion for empowering others has led her to become a prominent figure in Saudi Arabia's burgeoning startup ecosystem.

Shakoor's interest in the human brain initially led her to pursue a degree in Cognitive Science at UC San Diego. However, her desire to make a tangible impact on the world drew her towards the world of startups. "During my time studying and living out in California, I cultivated a community of tech entrepreneurs, of developers, of creatives, and would often attend hackathons and tech crunches and Startup Weekends and just really got immersed. And I ended up starting out a company in California amidst my day job in neuroscience research. And I basically just caught the entrepreneurship bug. Soon thereafter, I realized there was a tremendous gap in the Saudi and MENA startup ecosystem. Obviously, this was back in 2016. And I knew that there were a lot of family offices, obviously, in Saudi Arabia, we have no shortage of, of wealth," she says. This shift led her to establish Blossom Accelerator, the first female-focused and tech-inclusive startup accelerator in Saudi Arabia.

Blossom Accelerator is more than just an investment firm; it's a springboard for innovation. Shakoor recognizes the immense potential within the Saudi market, particularly among

women entrepreneurs, "We're known as the region's first and leading tech inclusion accelerator and ecosystem builder. And what that means is that we offer all kinds of entrepreneurship programs and services. So we actually partner, both B2B and B2G with a number of different companies and Saudi ministries and entities, and essentially together put on accelerators, venture studios, hackathons incubators, online educational entrepreneurship, platforms, and all of it is to not only cultivate an ecosystem."

The accelerator's approach is multifaceted. It offers mentorship from experienced industry leaders, workshops on essential skills like fundraising and marketing, and access to a network of potential investors. This comprehensive support system empowers female founders to navigate the often challenging startup landscape.

Beyond Blossom Accelerator, Shakoor is actively involved in the Saudi Arabian tech scene. She serves as a Venture Partner at the Oryx Fund, by Hambro Perks, a leading international investment firm, "Nearly half of our investments are out of KSA. And we primarily focus on FinTech, logistics, health tech, and we're early stage investors. So we also invest anywhere from pre seed to pre Series A, you'll find that

the majority of my work between blossom and Oryx is actually quite complimentary."

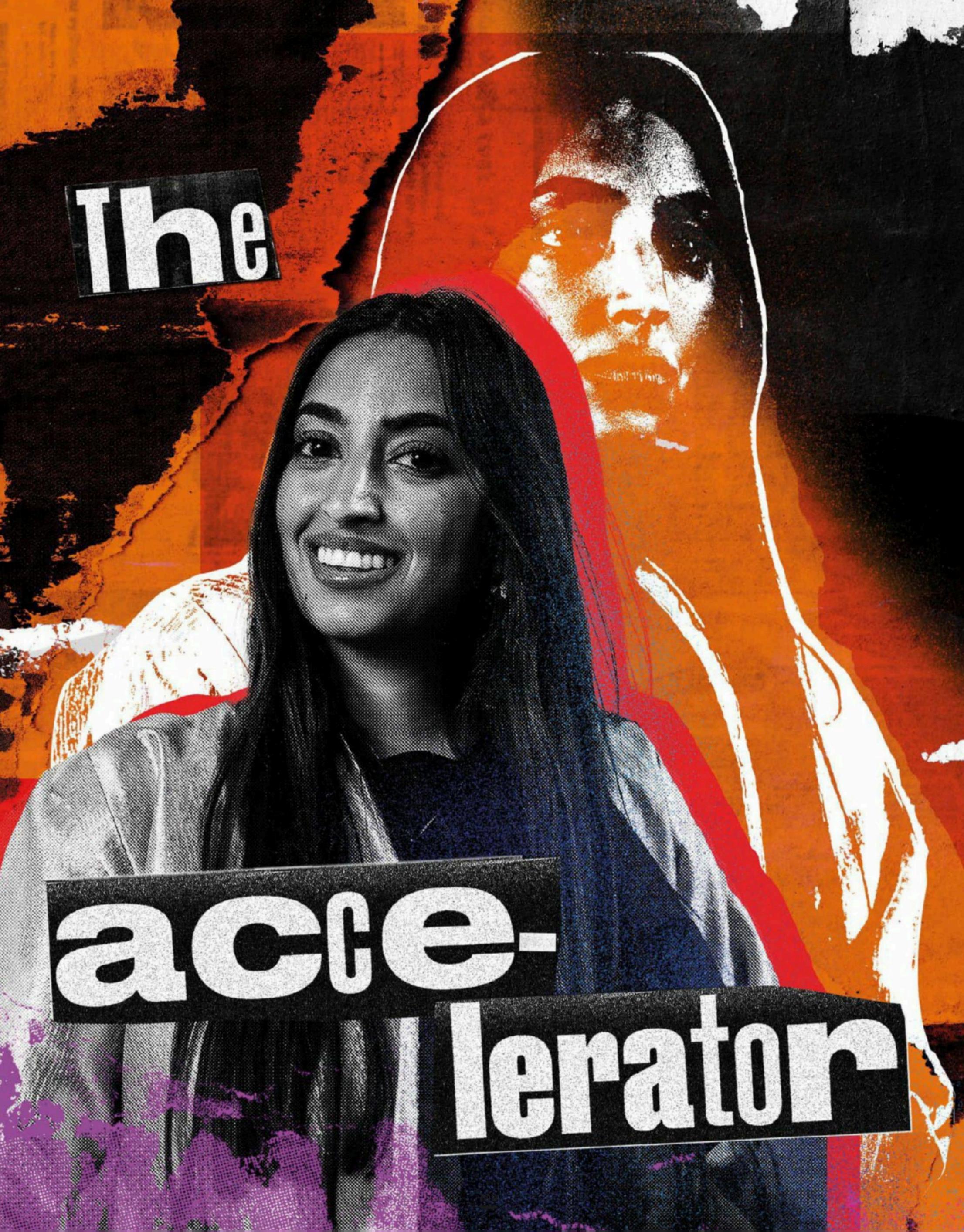
She also uses her platform to advocate for inclusivity and diversity within the tech industry. Shakoor's voice is a powerful one, inspiring not just female founders but all aspiring entrepreneurs in Saudi Arabia and beyond, "We've shifted away from a narrative of just woman empowerment and really a larger narrative of diversity and inclusivity. And as today, over 40 percent of the workforce are women, we're talking about a different Saudi Arabia than that of 2017. We also have come to focus on different sectors and different stages of companies as the ecosystem has evolved as well, where we primarily used to only focus on pre-seed and seed, we now also work with startups and scale ups, and also companies across sectors that are in cybersecurity or in the space or in the ESG and climate tech sectors."

Emon Shakoor's career demonstrates what can be achieved if you follow your passion. Shakoor's true calling lies in empowering others to unlock their potential and bring their visions to life. Through Blossom Accelerator, she nurtures a generation of Saudi entrepreneurs, fostering a vibrant and inclusive tech ecosystem for the future.

"WE'RE KNOWN AS THE REGION'S FIRST AND LEADING TECH INCLUSION ACCELERATOR AND ECOSYSTEM BUILDER."

The

accelerator



Saleh Al Tunaib

CEO, Raha Holding

Logistics is an area ripe for disruption, and Saleh Al Tunaib, Co-founder and CEO of Raha Holding Ltd, knows it. Leading a company that spans three diverse sectors—e-groceries, e-commerce 3PL, and integrated automation systems— Al Tunaib is working to revolutionize MENA’s retail landscape.

Under the Raha umbrella, btr.tech is perhaps the most exciting company in the region’s retail space right now. Leveraging the power of automation to address key challenges such as labor shortages, productivity demands, supply chain disruptions, and the surge in e-commerce, btr.tech creates custom solutions to meet the needs of clients of all sizes.

“We’re btr.tech, a robotics integrator and operator, we’re the first of its kind in the MENA region,” says al Tunaib.

“Today, Saudi Arabia is growing, and the demand on logistics are is growing as fast as it is. We’re here to assist clients to grasp the potential of the market and be able to automate their warehouses and logistic needs as soon as possible.”

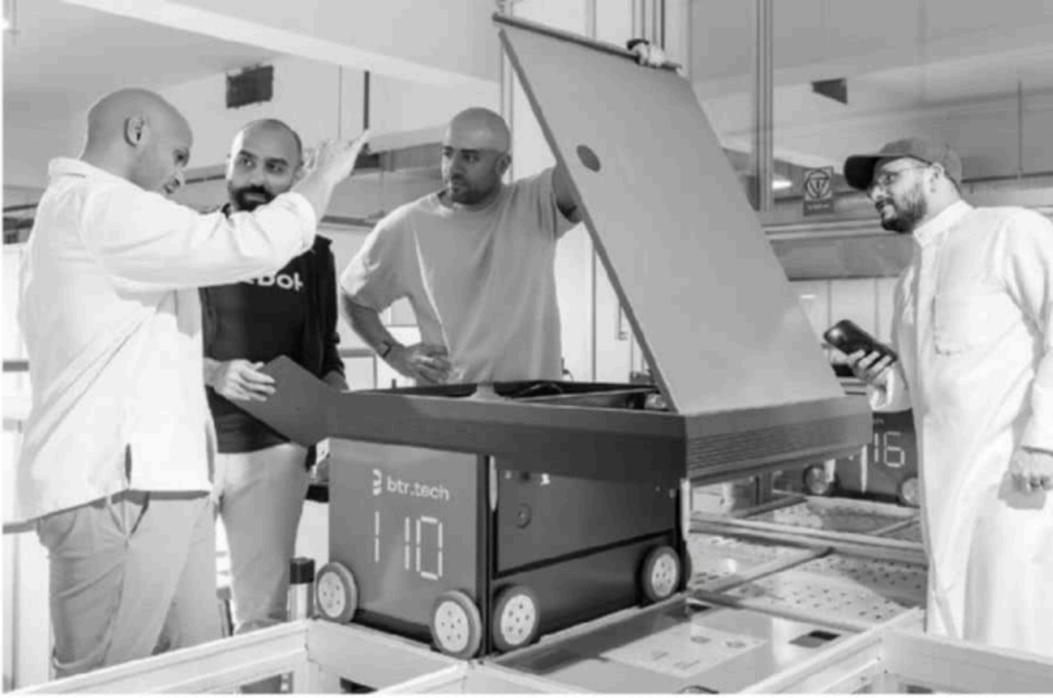
btr.tech, isn’t just a seller of robots; they’re a full-service integrator, offering a range of solutions designed to automate and streamline the burgeoning logistics sector in Saudi Arabia. The company represents a series of robot manufacturers “from Asia and Europe, and in the Middle East” and as a result, can offer a range of services, “We look into their warehouses and the requirements they have,” says al Tunaib. “We

offer them the best solution that fits their warehousing and logistic requirements. And in addition, we have a full software solution that adds to the and serves the client’s needs, from a simple warehouse management system to a last mile solution, we are able to, in essence, give the client a turnkey solution.” In a market where efficiency is paramount, btr.tech recognizes that for many companies, automation isn’t a luxury, but a necessity.

But btr.tech isn’t simply a provider of cutting-edge hardware. They possess a deeper understanding – the wisdom that comes from hands-on experience; they’ve gone all the way, building and

“TODAY WE’RE POSITIONED AS THE TOP ROBOTICS AND SYSTEM SOFTWARE INTEGRATOR OF THE REGION, HELPING CLIENTS IN VARIOUS INDUSTRIES AND SECTORS.”





Team at btr.tech working to make automation available to everyone.

operating their own automated warehouses. This operational expertise separates btr.tech from the pack. They aren't just selling machines, they're selling an ongoing service, a partnership built on a deep understanding of the intricate workflows that make warehouses function, "Understanding operations is a big difference between selling hardware and selling hardware with the knowledge of operating it. With operations, we are able to give our clients the full security and understanding that we know their business, we know how to operate it,

and we'll get them to where they want to get to come," he says.

Al Tunaib is a man bubbling with gratitude for the support btr.tech has received. The backing of private venture capitalists has been instrumental in their success. These investments have allowed the company to act as a bridge, fostering connections between international robotics manufacturers and the specific needs of the Saudi market. Al Tunaib and his team speak the language, figuratively and literally, they understand the cultural nuances,

and most importantly, they are there for the long haul. btr.tech doesn't just sell and implement; they maintain and support their clients throughout their automation journey, ensuring a smooth transition and a maximized return on investment.

btr.tech's vision extends beyond the borders of Saudi Arabia. They see immense potential for growth across the entire GCC region, "Today we're positioned as the top robotics and system software integrator of the region, helping clients in various industries and sectors to be able to automate their warehouses and logistics needs. In addition to that, we are we actually have our entire team is in as in house, so we are able to give full development solutions and maintenance solutions and deployment solutions. And that's a huge addition and added value that it can be transferred to the client," Al Tunaib says.



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Craig Levine

Co-CEO, ESL FACEIT

While not from this region, Craig Levine, Co-CEO of ESL FACEIT alongside Niccolo Maisto, will undoubtedly leave a mark on the Middle East. The company sits at the forefront of the gaming industry and is owned by none other than the PIF's Savvy Games Group.

"There's a lot that's been happening here within Saudi Arabia around video games and esports," says Levine. "We're excited to be a big part of that." It's a clear indication of the group's optimism despite turbulence in the global gaming landscape.

"What it's gone through over the last two years really has been this moment of consolidation in the industry," he observes. "We're incredibly excited about the future. We see that the underlying KPIs of viewership and attendance and players on our products are all rising at an all-time highs, and we've taken advantage now of this climate and been able to say how do we create stakeholder alignment with different people in the industry, whether that's publishers, whether that's teams, how do we all come together in a sustainable way to create the lay the foundation of growth that's going to be needed to continue to fuel this generational fan-

dom for the years to come," he says.

As the eSports ecosystem evolves, Levine emphasizes the paramount importance of putting players and fans at the heart of innovation. "How do we keep players and fans at the center of what we do?" he asks, mindful of shifting consumer habits and generational dynamics shaping the eSports landscape, "We're really trying to be thoughtful and listen together with that and think about how do we deliver that for us? So, there's a lot of work that we've been doing across things like our Dream Hack festivals to think how do we create this next generation, millennials have their comic cons and their Pax events? What's that next live event experience for this new generation of Gen Z and ultimately, Gen Alpha?"

However, challenges loom on the horizon. Fragmentation and passive engagement pose formidable obstacles, according to Levine, they demand innovative solutions to unlock new revenue streams and foster community cohesion. "This two-way interactivity is now

"THIS TWO-WAY INTERACTIVITY IS NOW CREATING THE NEED AND THE OPPORTUNITY TO INNOVATE ON THE BUSINESS MODEL OF FANDOM."

creating the need and the opportunity to innovate on the business model of fandom," Levine remarks, eyes fixed on the horizon of digital transformation.

In the heart of the Middle East, a new eSports frontier has emerged, captivating audiences and igniting passions across Saudi Arabia. "This is a young demographic; they have high disposable incomes," Levine remarks, nodding to the region's burgeoning gaming culture. From grassroots initiatives to international acclaim, the Middle East's eSports renaissance promises boundless growth and opportunity. "So, for as EFG we're excited to sort of be involved at the ground level here, to be able to think about how we serve those audiences, both to nurture the existing communities that are happening locally, as well as to bring them on to international stages. And we've seen that already happening in the eSports world recently at the Overwatch World Cup, the Saudi national team won their team, Falcons, has already been a world-renowned Rocket League team on the RLCS circuit, in Counter Strike, you're seeing it," he says.

Levine's parting words echoed with a sense of generational legacy and enduring potential. "This idea of fandom takes time. There's a lot that's been done to incubate this, but eSports is still in the very early years of where we're going to be in our history," he says, a testament to the enduring power of generational fandom and the limitless horizons of the eSports revolution.

In the ever-evolving tapestry of eSports in the Middle East, Craig Levine and the ESL FACEIT group stand as pioneers, quite where they and we are headed is yet to be seen.

Saudi Arabia team compete in the FIFAE Nations Cup 2023 in Riyadh, Saudi Arabia.





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Amin Al Zarouni

CEO, BEDU

A leading innovator in blockchain technologies in the UAE, Amin Al Zarouni is working to demonstrate the potential of Web3 at its crossroads with AI.

Al Zarouni and his company BEDU started with a heavy focus on building virtual worlds and immersive experiences. The company is most recently known for its milestone pro-

ject—Metaverse Project 2117—a virtual world that simulates the UAE’s planned Mars mission.

Despite the focus on the metaverse and Web3, BEDU has also closely followed the evolution of AI since its inception. “We shifted from being a Web3 company to becoming more of a venture studio model that focuses on the intersection between Web3 and

AI,” says Al Zarouni. He anticipates the intersection between AI and Web3 to happen in up to five years. “We’re going to witness plenty of use cases—from commerce, banking, and healthcare to real estate and education.”

To speed up the arrival of that intersection, BEDU is at the forefront of initiating projects leveraging the power of the two. “We are working on an interesting real-world asset tokenization platform utilizing AI and blockchain technology. It will make real estate investment affordable to everyone,” Al Zarouni says. According to a quick study by BEDU, over 60 percent of the UAE population has never invested in real estate. The main reasons are the hefty entry cost in real estate investment and the high risk of entering into real estate.



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With tokenization, individuals can invest in real estate through small amounts, thereby reducing the barriers to entry. BEDU envisions a platform where real estate developers can tokenize off-plan projects, making them accessible for investment. And by doing so, the liquidity in real estate is also increased. “If I’m an investor and I own several real estate assets, I can liquidate a small portion of it if I need cash. And as a result, I bring more investors into the market.”

“That is where we see the intersection between the AI and Web3,” Al Zarouni points out. “AI can play a major role in recommendations, streamlining the process verification process and KYC (Know Your Customer) process.”

This ambitious project inevitably

“WE ARE WORKING ON AN INTERESTING REAL-WORLD ASSET TOKENIZATION PLATFORM UTILIZING AI AND BLOCKCHAIN TECHNOLOGY.”

ventures into an uncharted area in the region due to the lack of regulations. Nevertheless, BEDU is working closely with the government of the UAE and forging partnerships with stakeholders.

With a strong presence in the UAE, BEDU has managed to develop a strong relationship with both the government and the private sector across the spectrum of the UAE market. “One of our advantages is that we collaborate and

partner with the regulators so we can build a product that is very relevant to them.” This way, the product and the regulation go hand in hand and can be adjusted to meet the policies.

Looking ahead, BEDU aims to elevate its regional influence to the global stage by creating platforms that integrate emerging technologies with adaptable models applicable across various sectors and industries.

Christian Bauer

CFO and CCO, Volocopter

Christian Bauer isn't just a businessman; he's part of a visionary team redefining how we move with cities. With over 15 years navigating the mobility sector, Bauer has honed his expertise to propel Volocopter, a German company, to the forefront of electric air mobility. As the company's Chief Financial and Commercial Officer, Bauer channels his expertise towards a singular goal: making Urban Air Mobility (UAM) a reality across the globe, starting with the Middle East.

Bauer's vision isn't confined to whiteboards and planning documents. He's actively shaping the future of urban transportation. Volocopter's brainchild – electric air taxis nicknamed “Volocitys” – are poised to transform cityscapes. Imagine a world of electric air taxis that soar through city skies, connecting airports to downtown areas and facilitating emergency rescue missions.

This year marks a pivotal moment in Bauer's vision. “We will start now this year fully commercial with a two seater, but we will very soon improve our performance so we will go to a five seater in the next two to three years, ready to cater for more payload, longer ranges also when better technology allows, and then eventually with an aircraft that can fly up to 200 kilometers and connect cities. So you will see as you have seen on the electric car, side a develop-



Volocopter: Shaping the future of urban transportation.

ment of those aircrafts and designs in the future, which we'll look up to the lead on,” he says.

Bauer's commitment extends beyond technological innovation. He recognizes the importance of collaboration. The joint venture with NEOM, a futuristic city under construction in Saudi Arabia, exemplifies this philosophy, “NEOM is a new city with a new transportation system, the Volocopter can play a vital role. And in that respect, NEOM also became an investor in Volocopter and also a partner,” he says. Their collaboration saw the maiden flight of a Volocopter prototype last year, marking a significant milestone in the development of UAM in the region.

However, NEOM isn't the only city on Bauer's radar. He sees immense potential in Saudi Arabia's growing cities,

“When I see the vibe of the Kingdom, the hunger for new technology, the growth in the cities also around Riyadh, and the traffic problems that are there. I think it's a great place for us to initiate our products and services,” he says.

Sustainability is another cornerstone of Bauer's vision. He understands that the future of transportation hinges on environmental responsibility and Volocopter's electric air taxis represent a significant shift – CO₂-neutral flights that leave a minimal footprint compared to traditional aviation.

Bauer plans to launch operations during the 2024 Olympics. With certification underway through the European Aviation Safety Agency, Paris and Rome are set to witness the first commercial operations of Volocopter's air taxis if all goes to plan. This isn't just a business milestone; it's a powerful symbol of the viability and sustainability of UAM.

The efforts undertaken by Bauer and the rest of the Volocopter team revolve around envisaging a solution to a pressing environmental and urban problem – the polluting nature of transport. Leveraging new technologies to create a faster, less polluting solution, Volocopter is at once helping the planet and improving the lives of its users.

“NEOM IS A NEW CITY WITH A NEW TRANSPORTATION SYSTEM, THE VOLOCOPTER CAN PLAY A VITAL ROLE.”

The



**WILLIAMS
SPORTS
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Mudassir Sheikha

CEO, Careem

During LEAP 2024, Mudassir Sheikha, CEO and Co-founder of Careem, delivered a talk titled Driving the Future of Mobility, where he discussed a wide range of topics.

Simply put, Sheikha was at LEAP 2024 to orchestrate a transformation – a shift in how people across the region perceive Careem. “We started as a ride-hailing service,” Sheikha declared, “but that’s just the first chapter in our story. We’re transforming into an everything app, your digital butler for everyday life.”

The “everything app”, or “super app”

concept is a game-changer. Imagine a single platform where you can order groceries with a tap, book a rental car for a weekend getaway with a swipe, pay your bills with a click, and even schedule laundry pickup with a voice command – all within the familiar, user-friendly Careem interface. “So that includes things like food delivery, grocery delivery payments, bill payments, laundry, cleaning, rental cars, you name it, and that transformation has been proven to some extent in a few cities in the Gulf. And it is time now for us to

expand that concept to the rest of the region and transform what was previously seen as the ride-hailing service to what is now everything app that will simplify your daily life,” he says.

However, Saudi Arabia, a crucial market for Careem, presents unique challenges. Cultural sensitivities and local preferences need to be woven into the fabric of the app. “As we bring other services to Saudi, we have to recognize that Saudi is quite different from many of the other countries that we operate in. So it’s never about let’s bring it technology that’s working somewhere and expect it to work on day one. You have to bring the technology, you have to understand the preferences, the lifestyles that people have here and adapt the technology to make it work,” he says. During Careem’s early days in Saudi Arabia, features like women-friendly car options and responsibility-inspiring titles like “captain” for drivers were crucial for building trust and a loyal

“YOU HAVE TO UNDERSTAND THE PREFERENCES, THE LIFESTYLES THAT PEOPLE HAVE AND ADAPT THE TECHNOLOGY TO MAKE IT WORK.”



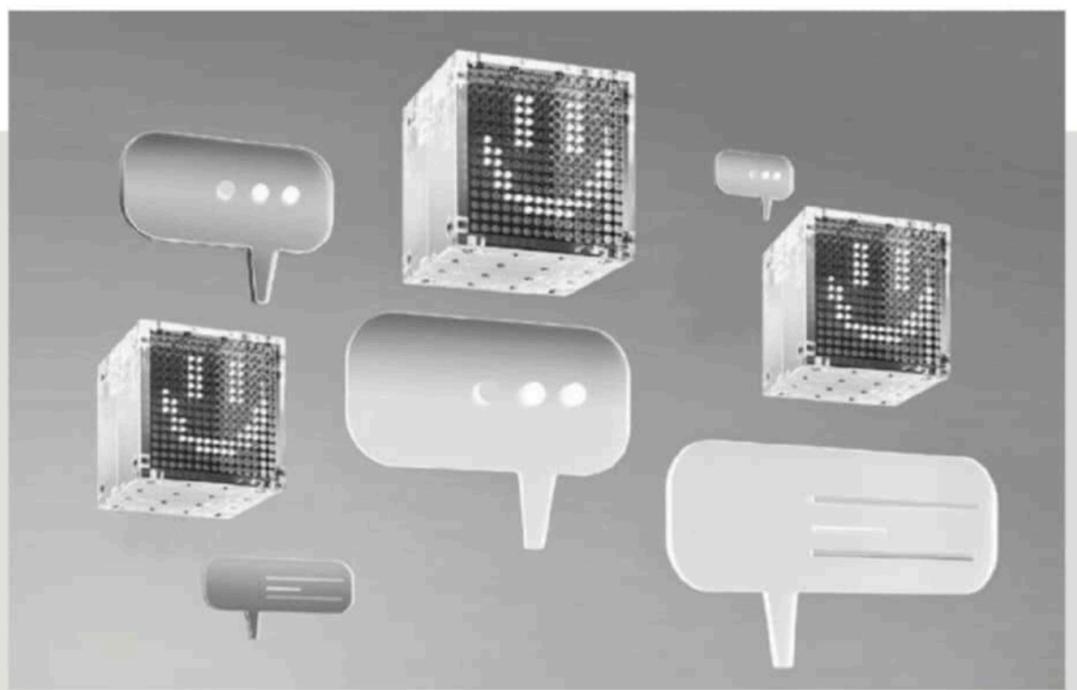
user base. This localized approach will be essential for the everything app's success, too.

Sheikha envisions an app that seamlessly integrates a wide range of services, eliminating the need for juggling multiple apps and the endless cycle of creating accounts and remembering passwords. "The whole idea of the everything app is that for things that you need to do in your daily life, you should not have to rely on 20 different apps, 20 different logins, 20 apps where you have to give your location, your payment information and so forth. You just do it once," he says. Imagine food delivery recommendations based on your recent grocery purchases, or laundry services automatically triggered after a long overseas business trip. The possibilities are as vast and diverse as the region Careem serves.

The ultimate goal? To transcend convenience and step into the realm of predictive intelligence. By harnessing user

data across different services, Careem aspires to anticipate your needs and proactively surface relevant options within the app. "This," Sheikha declares is, "the Holy Grail, what we are calling personalization, with the information that we collect on our customers, to the usage of so many services that use a Careem, we should be able to predict and give you access to all the services new and existing in the app."

LEAP 2024 was something of a platform for Careem's vision. The company is no longer about getting a ride from point A to point B. It's about simplifying your life, one tap at a time. Whether you're navigating the bustling streets of Riyadh or exploring the ancient medina of Rabat, Careem wants to be your one-stop shop for everything you need to get through your day – and maybe even predict what you'll need tomorrow.



mobili- zer

Dr. Yaser Al-Onaizan

CEO, SDAIA and NCAI

After more than two decades of studying and working in the US, Dr. Yaser Al-Onaizan returned to Saudi Arabia and now serves as the CEO of the National Center for Artificial Intelligence (NCAI), a sub-entity of the Saudi Data and Artificial Intelligence Authority (SDAIA) that drives research, development, and implementation of AI solutions across the Kingdom.

While the US and China are leading development in AI, Dr. Al-Onaizan points out that the Middle East has immense potential in this space. “We have the right ingredients to be successful in this space,” he says. “It’s much easier to catch up now than it used to be because of all the work done to democratize AI. We are adapting [to AI] quickly in the Middle East and Saudi particularly.”

An industry veteran himself, Dr. Al-Onaizan received an MS and PhD in Computer Science from the University of Southern California and an MBA from Columbia University. He has over 20 years of experience in R&D from IBM and AWS. Before serving as the CEO at the NCAI, he was the deputy CEO at the center, leading a team of scientists and engineers to develop AI solutions of national importance.

Saudi Arabia’s success in digital services paves the way for AI integration, he says, empowering the Kingdom to leverage data and drive innovation across sectors.

Under Dr. Al-Onaizan’s leadership, NCAI is geared up for the global AI revolution. “Our primary focus is to address sector-specific challenges,” he

says. The Center leverages AI expertise, for instance, in computer vision technology, to enhance diagnostic processes. Meanwhile, as the Kingdom hosts several mega projects that are building the cities of the future and the Center also incorporates AI technologies when exploring smart city solutions.

Furthermore, the Center’s endeavors extend to crafting solutions tailored to the unique language and cultural landscape of Saudi Arabia. Its focus on language modeling for Arabic is evidenced by SauTech, a speech-to-text system that encompasses a diverse range of Arabic dialects. It is poised to fuel the development of AI solutions across various sectors within the Kingdom and the Arab world.

Dr. Al-Onaizan’s confidence not only comes from the achievements at NCAI

but also from the Kingdom’s commitment to becoming a rising power in AI. “One of the advantages of Saudi Arabia is that we have a young population that is very tech-savvy,” he says. Contrary to the stereotypes that many believe, the percentage of female engineers in the field is very high in Saudi Arabia, according to Dr. Al-Onaizan. “I worked in tech companies in the US for a very long time. It was always a challenge to bring diversity to these companies. The target numbers always hover around 20 to 25 percent of the workforce,” he says. “When I came back to Saudi and joined the NCAI, women constituted more than half of the technical workforce.”

Apart from the abundance of local talent, investments are also rushing in. “Whether it’s in the development of AI solutions, or the manufacturing and assembly of chips and other processors that are necessary for the AI revolution, Saudi Arabia has become an extremely attractive market, especially from an investment perspective.” With a strategic vision and open-mindedness, Saudi Arabia is ready to take a share of the AI revolution cake. SDAIA and NCAI will be at the forefront to drive the Kingdom to advance in the AI space. ■



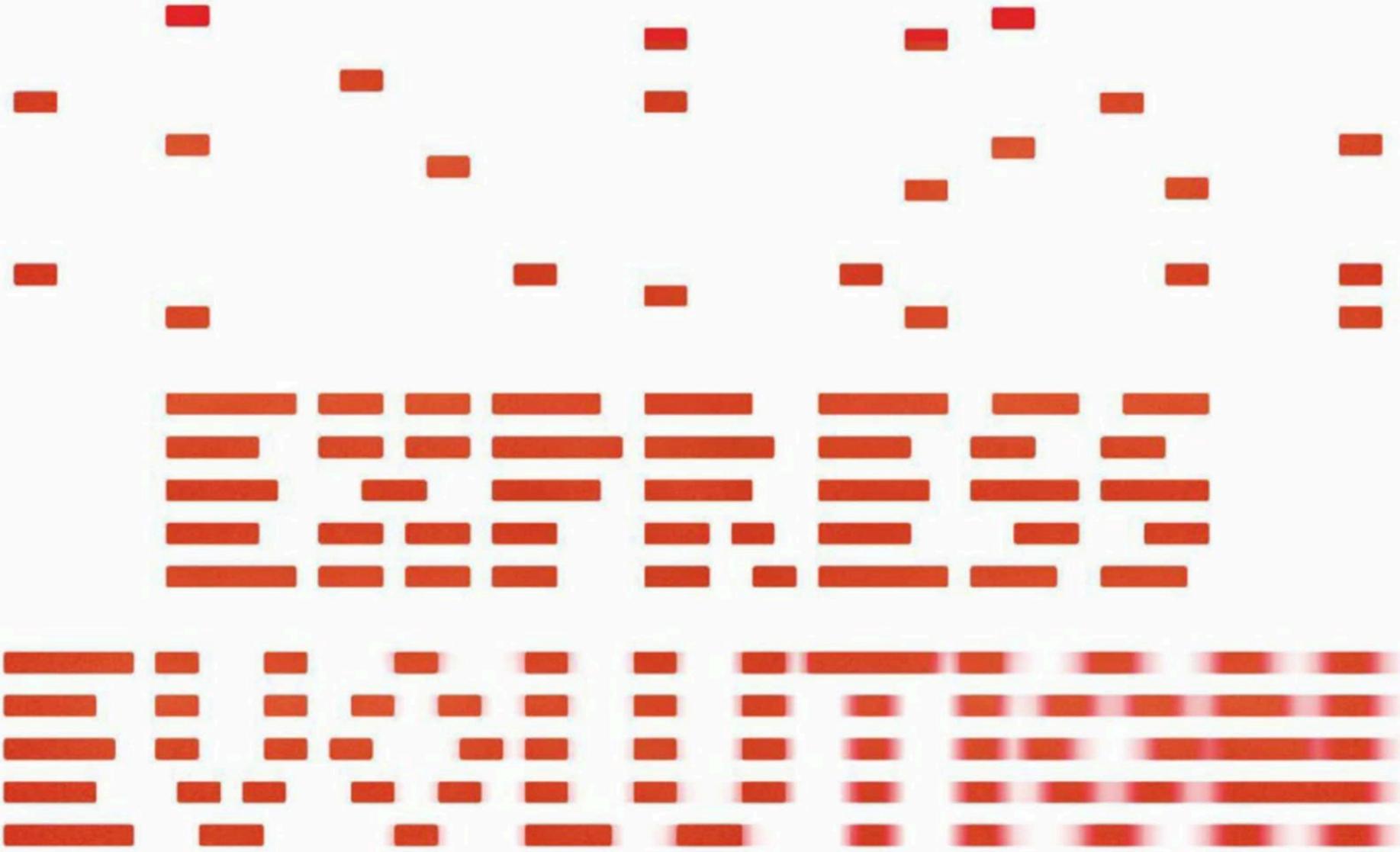
“ONE OF THE ADVANTAGES OF SAUDI ARABIA IS THAT WE HAVE A YOUNG POPULATION THAT IS VERY TECH-SAVVY.”

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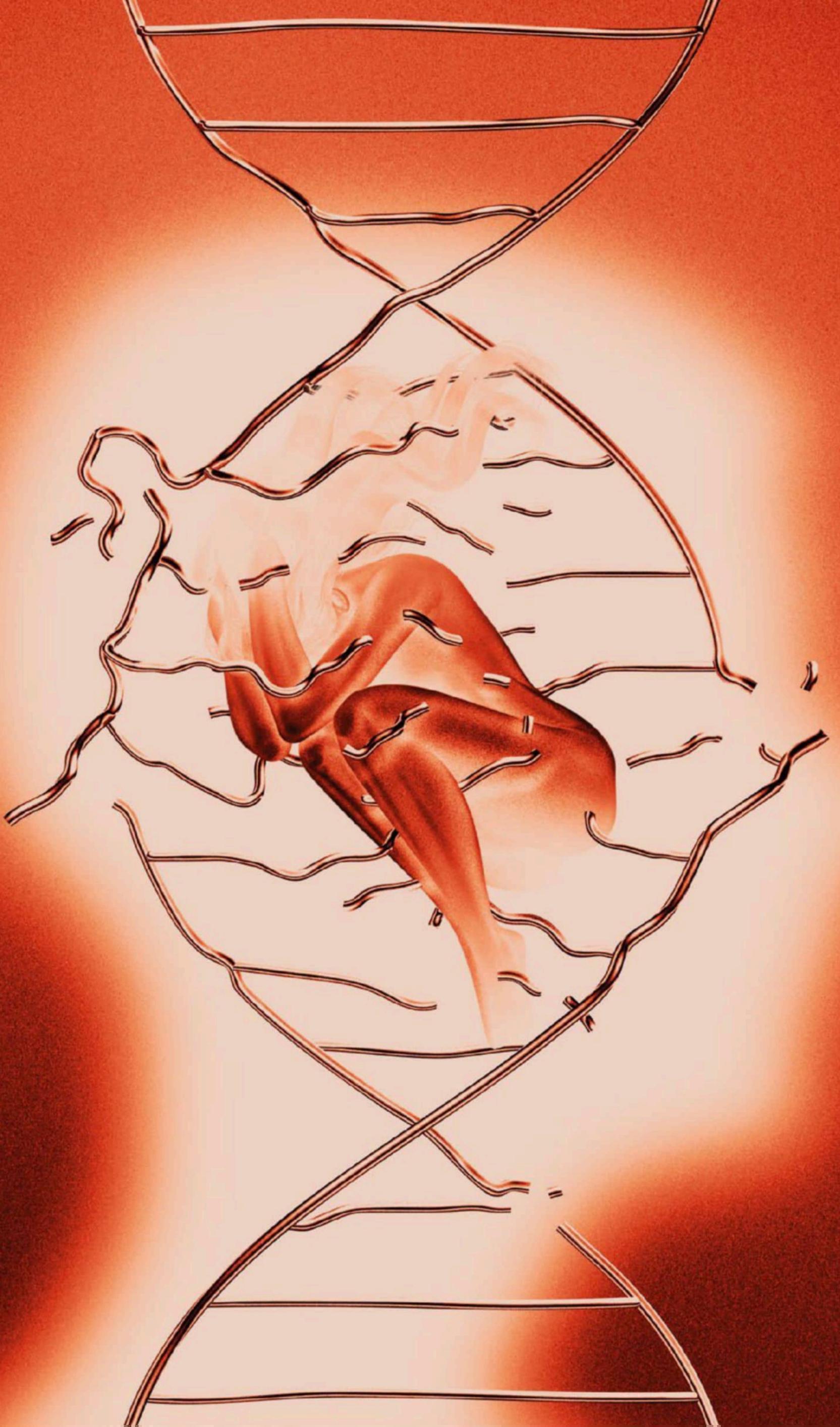
key to turning back time.

How the biology

of epigenetics might hold the

By Farah Al-Toukhi

Illustration Arafath Ibrahim



A STUDENT, WHOSE KNOWLEDGE OF SCIENCE WAS

limited to a 4th grade baking soda volcano, crosses the threshold into an introductory biology class. That student is simultaneously apprehensive and secretly giddy with anticipation at the prospect of finally getting to the 'Reproduction' chapter in their science textbook. But before this student can gawk at cross-section anatomical drawings of human genitalia, they must first learn the most fundamental lesson in biology: The laws of genetic inheritance.

Stripped of complex jargon, the concept follows some straightforward rules. Genes are the instructions that determine our traits, passed down from our parents. DNA is the instruction manual that holds all of these genes, organized into chromosomes. A variation of a gene is known as an allele; this determines how a trait is expressed. While it would be great to know exactly who you ought to blame for your male pattern baldness (it's actually both your parents), the study of genetic inheritance is of paramount importance to understanding, treating, and preventing certain genetic disorders that run in families, like heart disease and breast cancer.

It doesn't stop there. In domains such as medicine, agriculture, and conservation, understanding genetic inheritance is make-or-break for developing treatments, breeding programs, and conservation strategies. While they certainly have a bad reputation, we owe a great deal to genetically modified organisms. Harnessing genetic modification has allowed us to increase food production and reduce the need for harmful pesticides, essentially holding the key to improving food security and preventing

malnutrition. The next time you shun a product you suspect is rife with 'GMOs', remember that produce like bananas and cauliflower would not exist today had it not been for the genetic modifications of other plants. Additionally, genetically modified organisms have been used to produce important medications and vaccines, improving healthcare outcomes for many people around the world.

When contemplating this, it is important to consider the speed with which genetic changes can happen. In a lab setting, the 'genetic turnover' of something like the humble cauliflower can seem instantaneous by evolutionary standards. Artificial cross-breeding can immediately give rise to a new generation with a desired trait, a process that takes millions of years in the wild. In a normal evolutionary process, organisms will experience genetic variations in one of two ways: mutation or genetic recombination. These variations lead to changes in the DNA coding sequences, ultimately resulting in different physical traits or characteristics. By that logic, your genes are the result of generations of biological trial and error, and once inherited, the genomic fate of you and your progeny is sealed. You can only hope that an undesirable trait will skip a generation.

There are many instances where humanity may want that process to occur a little more swiftly. I personally have taken enough introductory biology classes to guarantee that a lesson in genetics almost inevitably prompts skepticism about a certain elusive concept pertaining to the subject. As if it were part of the curriculum, there will be a furrowed brow and a raised hand, demanding an answer to one very important question:

"Well, if I dye my hair red, will my child also have red hair?"

The choice of hair color or cosmetic procedure can vary from one inquisitive class to another, but the central query remains the same: Can an aesthetic change in appearance in one generation be passed down to the next? The short answer: No. Changing your hair color or getting rhinoplasty has no effect on the base genetic code. There are no changes being made to the alleles or their corresponding transferable traits. Hair dye, while sometimes regrettable, is not heritable.

While the logic is flawed, there is something to be taken away by humoring it. Could it be possible that certain external factors are so disruptive that they could effectively change the genetic activity within a generation? It turns out there could be.

READING INTO THINGS

Transgenerational epigenetic inheritance can occur when environmental factors impact gene expression without altering the underlying DNA sequence. Very simply, this means that experiences such as stress, diet, or exposure to toxins can potentially influence the traits passed down to future generations. As the prefix implies, ‘epi’ (outside of) genetic factors only bind themselves on top of DNA, changing the chromosomes and subsequent gene expression. The instruction manual for the genetic code stays the same, but now the instructions have marks and notes scribbled on them - they will be read differently. The heritable outcome is now something entirely new and can happen exponentially faster than traditional, run-of-the-mill evolution, but this is not necessarily a good thing.

Upon first impressions, it might be scary to hear that there are factors out there so potent that they could penetrate our genetic code and affect our offspring by way of genetic inheritance. It’s worth taking a look at the mechanism with which this occurs before we let the panic sink in (remember, your grandchildren are at stake).

Impacting gene expression epigenetically can happen by means of either DNA methylation or histone modification. DNA methylation involves the addition of a methyl group to the DNA molecule, thereby preventing the binding of transcription factors necessary for gene activation. Alternatively, histones are proteins around which DNA winds, protecting it from damage. Any ‘remodeling’ of histones changes their shape, in turn, changing how DNA forms around

them. These mechanisms affect how genes are turned ‘on’ or ‘off’ which virtually affects how they are read, how they behave, and how they are expressed. The transgenerational epigenetic change in question will depend on the mechanism that occurs, which depends on the environmental factor at play. Smoking can cause DNA methylation, while exposure to nickel causes histone remodeling.

While we may have often considered how our surrounding environment and lifestyle choices have a direct impact on our life qualities and spans, perhaps we don’t often think of how those factors might affect our children and grandchildren, on a genetic level. However, it should be considered that if these epigenetic changes are adapted at the speed of a singular generation, by an external factor that can be eliminated or treated, could it then be reversible?

STRESSED ENOUGH FOR THE WHOLE FAMILY

It may sound as simplistic as a public service announcement to declare stress to be bad for the body. Stress can mean a great deal of things, but a ‘stressor’ is generally any factor that represents a threat to an organism and evokes some sort of psychological or physiological response. In a study by Neil Schneiderman, Gail Ironson, and Scott D. Siegel from the University of Miami, after perceiving a stressor, there is ‘a cascade of changes in the nervous, cardiovascular, endocrine, and immune systems.’ The response to these stressors is described as generally adaptive for a short while. The body is then sent into a frenzy: stress hormones are released, energy is diverted to skeletal muscles and the brain, and the immune system is

now on high alert. This explains why humans might be more susceptible to upper respiratory infections during particularly stressful periods.

Our genetic code is equally susceptible to perceived stress. Some studies suggest that nearly 90 percent of individuals will experience a traumatic event in their lifetime, however, only around 20-30 percent of them will develop one of the most physiology-impairing mental health disorders: post-traumatic stress disorder.

In a 2021 study of the molecular biology of PTSD by Ghazi I. Al Jowf, Clara Snijders, Bart P. F. Rutten, Laurence de Nijs, and Lars M. T. Eijssen, it is suggested that there here was a heritability rate between five and 20 percent for five different PTSD markers. They found that, in preliminary research of transgenerational epigenetic research performed in animals, the epigenetic effects of trauma may be transmitted to multiple generations, by means of both histone modification and DNA methylation. The suspected heritable symptoms that were observed were inflammation, upregulation of olfactory function, and downregulation in immune system genes. This could give new, more literal, meaning to the term ‘intergenerational trauma’.

Similar research has been performed on the potential of transgenerational epigenetic inheritance in individuals affected by schizophrenia. In 2014, Dr. Schahram Akbarian found that “evidence from postmortem studies is in support of the hypothesis that early life experience may indeed leave a lasting epigenetic imprint in the human brain.” Remarkably, some abnormal neuronal expression and DNA methylation of the receptor that regulates genes controlling development, metabolism, and immune response were found in suicide victims who experienced childhood abuse, compared to those who did not.

“In a lab setting, the ‘genetic turnover’ of something like the humble cauliflower can seem instantaneous by evolutionary standards.”

“Experiences such as stress, diet, or exposure to toxins can potentially influence the traits passed down to future generations.”

It may seem grim, but looking at this research from a treatment standpoint is worthwhile. If we could develop an understanding of the exact heritable markers and the factors that cause them, perhaps developing treatment that specifically reverses the epigenetic changes that cause these expressions would also be within the reach of modern medicine. Some advancements have been made in this field already. In recent years, an anticonvulsant and mood-stabilizing agent known as valproic acid (VPA), has been shown to effectively regulate DNA methylation, and directly inhibit histone remodeling. However, not everyone is as optimistic about this potential.

“Personalized medicine for complex diseases is a long way off,” says Dr. Karen Lankford from the Yale School of Medicine. “We just do not have the model framework to interpret the effects of individual genetic variations on cell organ function in the context of all of the other genetic variations in the genome. The best we can do right now is to identify medications that will definitely not work for an individual.”

According to Dr. Lankford, the potential of epigenetic studies for the treatment of mental health disorders is lacking due to the field’s neglect in investigating mental well-being.

“The biggest research challenge to the entire field of mental health research is that the funding is pathetic compared to the social and economic costs of these conditions,” Dr. Lankford explains. “Especially since so much of the research requires recruiting human volunteers and using human tissue samples, both from living patients and family members and postmortem brain tissue from organ and tissue donors with known mental health histories. This is much more costly and time-consuming than research that can be done on rodents. Would I like to know

if the MSC-derived exosomes which appear to be therapeutically effective for reducing neuroinflammation and enhancing tissue repair for spinal cord injury and stroke might also be beneficial for reducing the severity of schizophrenia or bipolar symptoms? Sure, but there just is not the funding to do that kind of research.”

If treatment is still out of reach, then perhaps tapping into epigenetic research might help unlock new possibilities in prognosis instead. This year, researchers from the Josep Carreras Leukaemia Research Institute were successful in finding an epigenetic ‘fingerprint’ that is associated with a good clinical response to a demethylating drug in patients affected by a blood cancer called myelodysplastic syndrome. This research shows great promise in the development of rapid and relatively inexpensive biomarkers which could then be used to identify treatment plans for patients. Yet, there are barriers and challenges associated with standardizing and validating epigenetic biomarkers for clinical use.

“Despite the advantages of epigenetic biomarkers for diagnosis and clinical use, the predictive value of epigenetic signatures should be evaluated in prospective studies and with a larger cohort of patients to guarantee reproducibility, accuracy, and clinical utility,” explains Dr. Ignacio Campillo-Marcos, a postdoctoral researcher at the Josep Carreras Leukaemia Research Institute. “On the other hand, regarding promising new single-cell approaches, most are still nascent and present limitations, such as low throughput, limited coverage, and high costs to be implemented for clinical use.”

Despite these challenges, it seems that those who are working in research in epigenetic biology are still motivated. In the medical field, it is always

worth delving into any disorders’ potential to be reversed.

“The reversibility of epigenetic modifications, in contrast to the irreversibility of genetic changes have made the epigenetic machinery attractive for drug development. Current epigenetic drugs (also termed epidrugs) target enzymes that introduce, recognize, and remove epigenetic marks to DNA or core histones,” says Dr. Campillo-Marcos. “The collaboration between different research groups with different backgrounds, clinical institutions, and policymakers are crucial to interpret these findings and translate this basic and translational research into promising therapeutic strategies that increase the lifespan and enhance the quality of life of patients.”

LONG LIVE EPIGENETICS

While navigating research on the treatment of certain illnesses and disorders using epigenetic biomarkers, it becomes apparent that there is potential in looking at the science from a different perspective. If epigenetic biology is to be considered for its prospects of reversal, then maybe we can benefit from it the most in preventative care. This shift in focus could lead to groundbreaking advancements in personalized medicine and early intervention strategies. By harnessing the power of epigenetics for preventative care, we may be able to improve health outcomes and reduce the burden of disease on individuals and healthcare systems. With a greater emphasis on prevention rather than treatment, we could potentially identify individuals (and progeny) at risk for certain diseases and implement targeted interventions before symptoms even develop.

This proactive approach has the potential to revolutionize healthcare by promoting wellness and reducing healthcare costs associated with managing chronic conditions. Potentially, the answer to prevention can be found in addressing longevity.

The mechanisms involved in the epigenetics of aging remain the same. Environmental influences, such as diet, exercise, stress, and exposure to toxins,

can impact epigenetic changes and accelerate the aging process. Changes in DNA methylation patterns have been associated with aging, with global hypomethylation and site-specific hypermethylation being common features of aging cells. Histone modifications have been implicated in aging-related processes, including cellular senescence, apoptosis, and inflammation. So, how exactly does epigenetics interact with existing genetics in determining lifespan and longevity?

“Genetics are static, epigenetics are dynamic,” explained Max Unfried, a longevity scientist at the Center for Healthy Longevity at the National University of Singapore. “I think one example is sex and the germline, where upon fertilization, two aged organisms of the same species can create offspring, and the epigenetic state of the fertilized oocyte is reset to that of a youthful one. After the sperm enters the egg, both the sperm and the egg genomes undergo extensive epigenetic reprogramming. This includes the widespread erasure of DNA methylation marks, which is crucial for resetting the epigenetic state of the zygote. This reset allows the embryo to develop pluripotency, the ability to differentiate into any cell type, which is essential for the development of diverse tissues and organs.”

This process ensures that the offspring starts with a clean slate in terms of epigenetic marks, which is important for proper development. The reprogramming of epigenetic marks also helps prevent the inheritance of age-related changes from the parents to the offspring.

“Epigenetics is one piece in the puzzle of aging,” Unfried continues. “Other parts of biology also play a role. Epigenetics is currently a hot topic and holds a lot of promise that it has to live up to, and the ultimate assessment will be if epigenetic medicines make it into humans and extend health and lifespan or even are able to provide full body rejuvenation.

But the more we understand, the better interventions will become.”

Full-body rejuvenation almost seems like a science fiction trope, but with advancements in epigenetics and other areas of biology, it may become a reality in the future. As our understanding of this particular biology deepens, interventions aimed at rejuvenation may become more effective and accessible to the general population. The replacement of individual cells, tissues, and organs may become a common practice.

An important tool in this pursuit has been the aptly named epigenetic clock. Theoretically, this clock measures biological age based on changes in DNA methylation patterns, providing valuable insight into the aging process. This molecular method calculates the aging of blood and other tissues by tracking methylation. By comparing chronological age to the blood’s biological age, scientists can use the clock to predict each person’s life expectancy.

Even treatment-wise, the research is already fairly promising. In a study that took place between 1990 and 2018, scientists in Switzerland found that, while accelerated epigenetic aging can occur in untreated HIV infections, it is partially reversible with effective antiretroviral therapy (ART). Antiretroviral therapy can help slow down the premature aging experienced by those living with HIV.

There are, of course, limitations to this work. It seems that a main barrier to unlocking the promise of epigenetics, once again, is restrictions in research.

“Biology is very non-linear and noisy,” Unfried laments. “Using AI with these non-linearities can be identified if we have very large datasets with hundreds of thousands or millions of samples, ideally longitudinally. However, most epigenetic datasets are still rather small, with only five to twenty thousand available samples. Hence, more global data acquisition would help immensely.”

Nearly
90%
of individuals will
experience a traumatic
event in their lifetime



around
20%
will develop one of
the most physiology-
impairing mental
health disorders:
post-traumatic stress
disorder.

PTSD affects nearly
8%
of the world’s population
during their lifetime.

Smoking increased
the epigenetic age of
lung tissue by
4.3
years

EPIGEN – ETHICS

The question of why there are so many shortages and restrictions in this field must be considered. Epigenetics holds a great deal of potential for answering many questions pertaining to treatment, prevention, and the safeguarding of our genetic makeup. Why are scientists unable to get the resources they need to bolster their research?

The answer may lie in the ethical questions that loom over the study of epigenetics. Ethical concerns surrounding the manipulation of epigenetic markers and the potential consequences of altering gene expression could be hindering the availability of resources. As researchers navigate these complex ethical dilemmas, it may be challenging to secure the necessary funding and support for expanding epigenetic datasets. There are a great many privacy concerns to address when it comes to the storage, confidentiality, and use of human genome samples, which can also get quite complicated in legal terms. Additionally, a lot of epigenetic research relies on post-mortems and cadaver samples. In the United States, only an estimated 18,000 people donate their bodies to science per year. In the Middle East, there are no body donation programs for medical schools – cadavers are imported from abroad.

This lack of access to human samples can significantly hinder the progress of epigenetic research in certain regions. Additionally, cultural and religious beliefs in some countries may also pose challenges when it comes to obtaining human genome samples for research purposes.

Separately, the quest to develop personalized medication that is tailored to one's lifestyle might run the risk of stigmatization. In clinical epigenetics, inferring lifestyle adaptability and choices based on genetic markers can lead to a dilemma of discrimination: environmental exposure is not created equal. When it comes to reversing adverse epigenetic changes caused by lifestyle, diet, or stress, prescribing a "change" might not be as instantaneous, yet.

"Lifestyle interventions influence the epigenetic landscape and are available for everyone," says Unfried. "As with all medicines, they are expensive at the beginning, but prices drop – making them available to a broad population. This is less of a science and more of a health insurance issue. But as nations have a big interest in keeping their populations healthy from a socio-economic perspective, this will happen eventually."

Additionally, the lack of diversity in genetic databases can also impact the accuracy and effectiveness of personalized medicine for different populations. When considering offspring in this study, there might be a minor dilemma.

"There are increased ethical concerns with therapies that manipulate the genome or epigenetically modify gene expression, and they are exacerbated for children or individuals who might not be fully mentally competent to consent to such treatments," explains Dr. Lankford. "It is especially concerning that these treatments could have unanticipated effects on any future children since epigenetic changes can be passed on for at least two genera-

tions. This does not mean that such treatments should be ruled out."

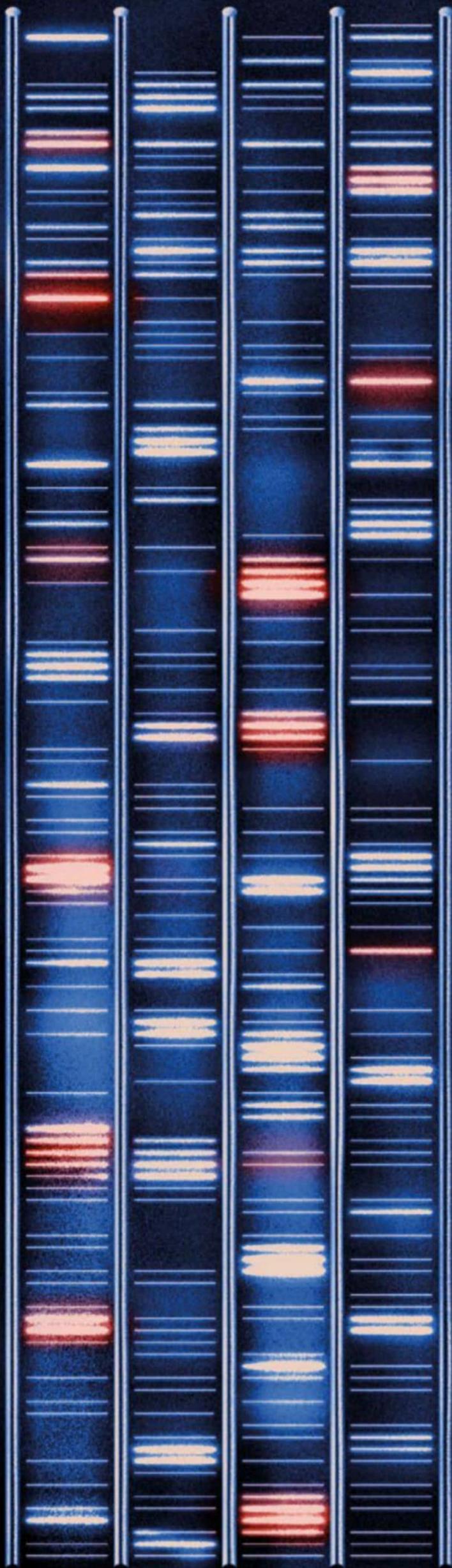
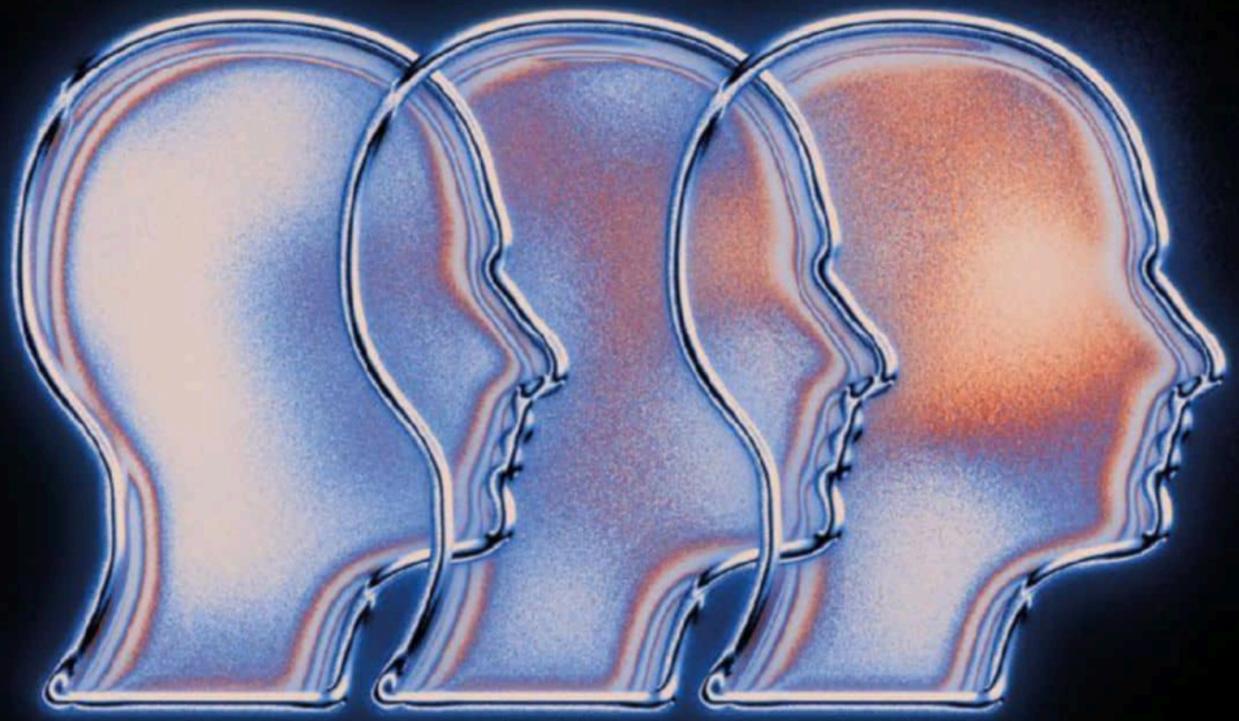
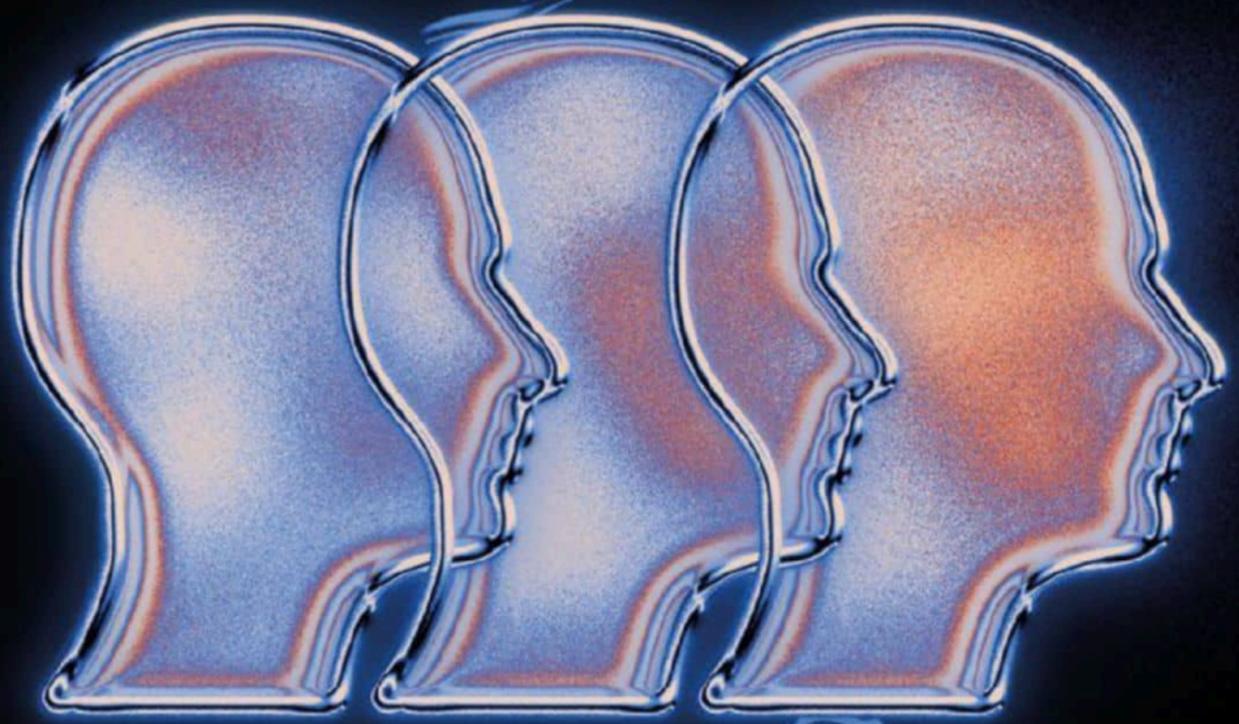
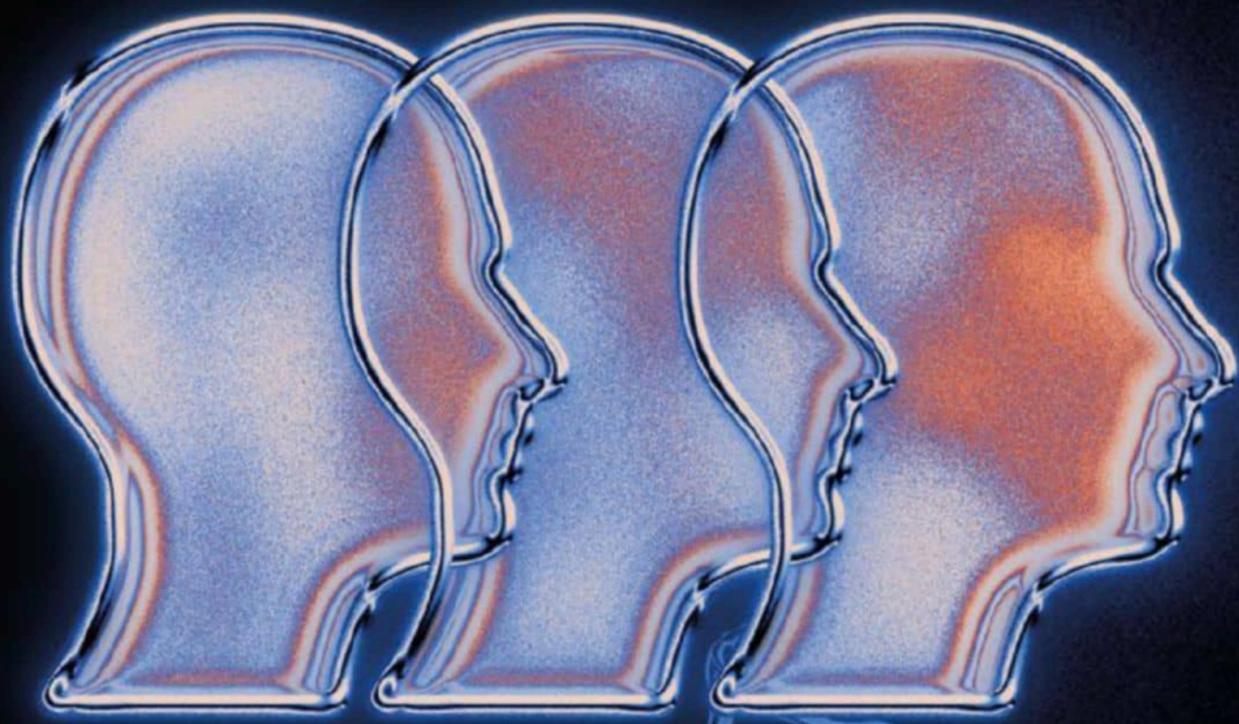
Alternatively, there are those who adhere to a very holistic view of the duty to science. "Given the potential of epigenetic interventions, it would be ethically questionable to not pursue epigenetic medicines, as it would mean more suffering through age-related diseases," says Unfried.

Unfried argues that the benefits of pursuing epigenetic medicines outweigh the potential risks, emphasizing the importance of advancing scientific knowledge and potentially alleviating age-related diseases. Ultimately, the ethical debate surrounding epigenetic treatments highlights the complex considerations involved in balancing scientific progress with potential consequences.

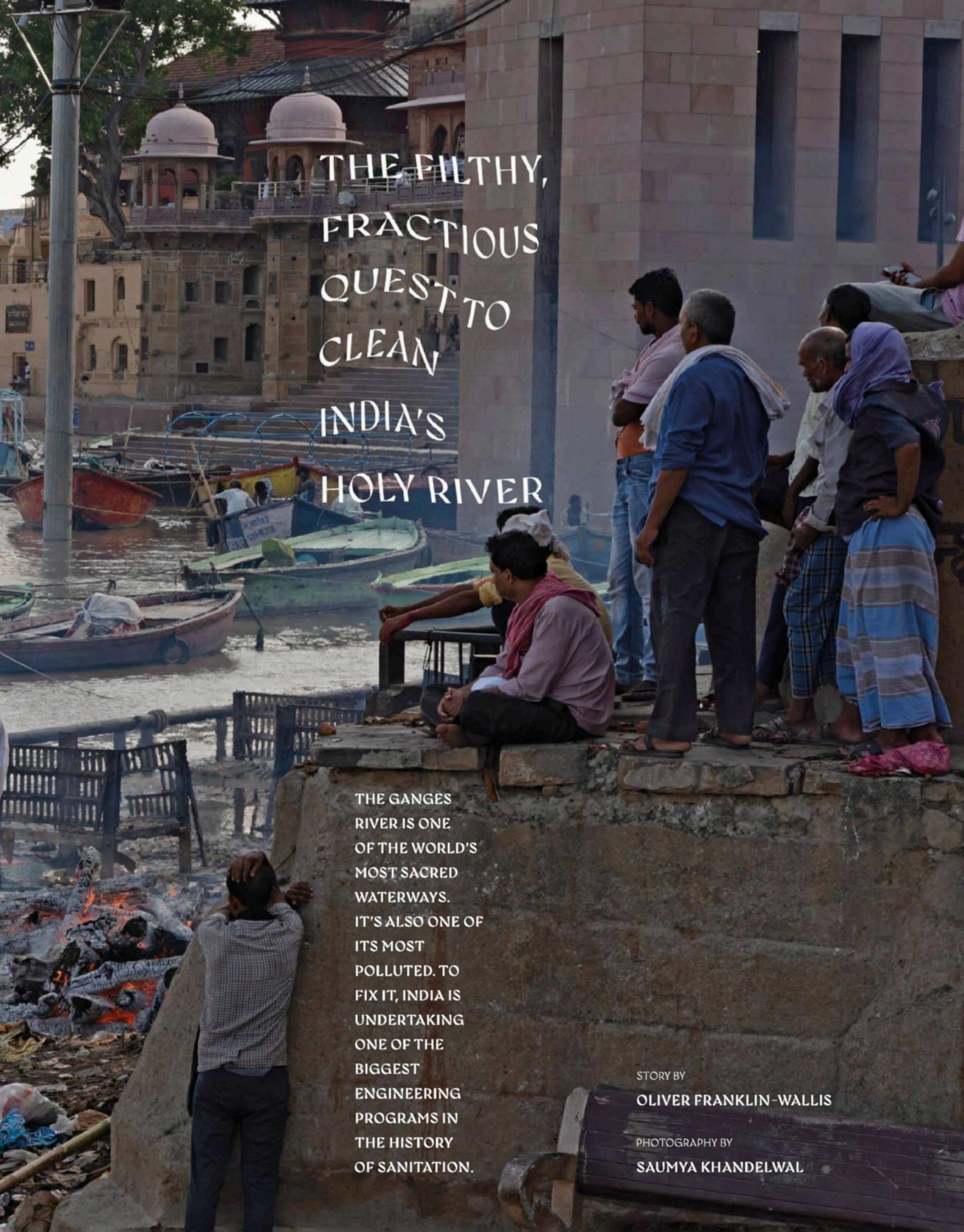
However, there is an elephant in the room that must be tackled when discussing epigenetics, and that is epigenetic determinism. Epigenetic determinism refers to the idea that our genes and environment completely determine our health outcomes, which can oversimplify the complex interactions involved in disease development. In rudimentary terms, it can be best described as 'genetic astrology'. This reductionist view fails to account for the multitude of factors that contribute to health and disease. It is important to recognize the role of epigenetics in shaping our health outcomes while also acknowledging the possibility of deterministic thinking.

Ultimately, while there is a lot of hope in the promise of epigenetics, we must wait for more clarity. The field is still evolving, and at the very least, it is crucial to approach the topic with an open mind and a willingness to explore the complexities involved. Perhaps in the future, they'll have more to discuss in Biology 101. ■

"If epigenetic biology is to be considered for its prospects of reversal, then maybe we can benefit from it the most in preventative care."







THE FILTHY,
FRACTIOUS
QUEST TO
CLEAN
INDIA'S
HOLY RIVER

THE GANGES RIVER IS ONE OF THE WORLD'S MOST SACRED WATERWAYS. IT'S ALSO ONE OF ITS MOST POLLUTED. TO FIX IT, INDIA IS UNDERTAKING ONE OF THE BIGGEST ENGINEERING PROGRAMS IN THE HISTORY OF SANITATION.

STORY BY
OLIVER FRANKLIN-WALLIS
PHOTOGRAPHY BY
SAUMYA KHANDELWAL



the morning, in Varanasi, the air on the banks of the Ganges fills with the scent of burning bodies. On the steps of the Manikarnika ghat—the holiest of the city’s stepped riverbanks, upon which Hindu dead are cremated—the fires are already lit, and mourners assemble by the hundred to accompany their loved ones at the end. Pyres of sandalwood (for the rich) and mangowood (for everyone else) are already burning; on one, a corpse wrapped in white is visible in the flames. Down at the river, where I’m watching from a boat, some families are engaged in the ceremonial washing of their dead, the corpses shrouded in white linen and decorated with flowers. A few meters away, a man from another family (usually, the honor is bestowed on the eldest son) wades into the water, casting in the ashes of an already cremated relative so that the Ganges might carry their spirit onwards to the next life or even moksha, the end of the rebirth cycle, and transcendence.

The funeral ceremonies, held against the backdrop of the ancient city, are undeniably beautiful; but the same can’t be said of the river itself. The water’s surface is flaked with ashes; ceremonial flowers linger in the eddies. Just downstream, a couple of men are diving for discarded jewelry. Not 50 meters upstream, another group, having finished their rites, are bathing in the filthy water. An older man, clad in white, finishes his bathing with a traditional blessing: He cups the fetid Ganges water in one hand and takes a sip.

The Ganges is one of the most densely populated river basins in the world, providing water for an estimated 600 million people. But to Hindus, it is more than a waterway: It is Ma Ganga, the mother river, formed—according to the sacred text, the Bhagavata Purana—when Lord Vishnu himself punctured a hole in the universe and divine water flooded into the world. Water from the Ganges is widely used in Hindu prayer and ceremony; you can buy plastic bottles of it from stalls all over the subcontinent—or order one on Amazon in the UK for as little as £3. And yet despite its sacred status, the Ganges is one of the most contaminated major rivers on Earth. The UN has called it “woefully polluted”. As India’s population has exploded—in April 2023, it overtook China to become the world’s most populous country—hundreds of millions of people have settled along the Ganges’ floodplain. India’s

sanitation system has struggled to keep up. The Ganges itself has become a dumping ground for countless pollutants: Toxic pesticides, industrial waste, plastic, and, more than anything, billions upon billions of liters of human effluent.

It’s March 2022, and I’ve come to India while reporting my book, *Wasteland*, about the global waste industry. And few issues in waste are more critical (yet less sexy) than sanitation. In the Global North, sewage is a problem that many of us assumed was more or less fixed in Victorian times. But access to clean water and adequate sanitation remains an urgent global issue. 1.7 billion people worldwide still do not have access to modern sanitation facilities. Every day, an estimated 494 million people without access to flushing toilets and closed sewers are forced to defecate in the open, in gutters, or in plastic bags. The World Health Organization estimates that one in ten people consumes wastewater (aka sewage) every year, either via unclean drinking water or contaminated food. In India, the result is that 37 million people are thought to be affected by water-borne illnesses, such as typhoid, dysentery, and hepatitis, every year. Worldwide, poor sanitation kills more children annually than AIDS, malaria, and measles combined.

Sanitation is one of those amenities that most of us in the Global North don’t think about until something goes wrong. In the UK, sewers have lately dominated news headlines for the wrong reasons: Many of Britain’s rivers and beaches are being polluted by sewage overflow and farming run-off. According to the UK’s Environment Agency, water companies discharged sewage into English rivers on 301,091 occasions in 2022, totaling more than 1.7 million hours; on Britain’s beaches, sewage is reportedly making swimmers sick. Britain’s sanitation woes have been caused by years of neglect: Systemic under-investment by profit-chasing ownership; austerity-starved and ineffectual regulation; and the ever-widening expansion of our concrete urban spaces, which divert water away from natural soaks like soil and wetlands and into our watercourses.

In India—like much of the Global South—the issue is the opposite: In most cases, the sewers were never there in the first place. In this respect, the Ganges’ pollution is a strange mark of success. When prime minister Narendra Modi was first elected in 2014, among the first things he did was launch the Clean India Campaign, a nationwide effort to install sanitation and modern waste facilities in a country that had previously lacked them.

Even those critical of Modi’s government—denounced for alleged Islamophobic policies and oppression of the press, among many other things—have to admit that the numbers since have been astonishing: Between 2014 and 2019, by one official estimate, India installed 110 million toilets, providing sanitation for an estimated half a billion people. Little more than a decade ago, India was known for having the highest rate of open defecation (that is, going to the toilet in the open) in the world. Thanks to this massive expansion of public and private toilets, that rate has reportedly plummeted. The issue is that with so many new toilets, the sewage needs to go somewhere.

In that sense, India is like many rapidly urbanizing countries in the Global South. But India is also unique, in that Hindu culture places rivers at the center of religious beliefs. And it’s for this reason the Modi government, alongside its Clean India Campaign, launched an expensive infrastructure plan to clean



ABOVE:
A family washes a statue of Krishna in the Ganges. They may also take a sip of the water, despite the sewage.



up the national river: The Namami Gange (“Obeisance to the Ganges”) program. It is by no means the first attempt. Previous governments have been launching “action plans” to clean the Ganges since at least the 1980s. But past efforts, beset by alleged corruption and mismanagement, rarely got far.

To date, the Namami Gange program has cost over 328 billion rupees (£3.1 billion) and promised the construction of more than 170 new sewage facilities and 5,211 km of sewer lines—enough to cross the Atlantic Ocean. It is a fascinating test case in the global effort to clean up our rivers and seas. After all, if you can’t clean a river sacred to hundreds of millions of people, what hope do the rest of us have?

The

offices of Jal Kal, Varanasi’s water board, are a traffic-clogged drive west from the cremation ghats and the old city, in one of Varanasi’s increasingly

busy commercial neighborhoods. When I arrive there is construction work and activity everywhere. In his air-conditioned office, Raghuvendra Kumar, Jal Kal’s general manager, explains that this is one of the challenges that the Namami Gange project has faced. “This city does not sleep,” Kumar explains.

Kumar, a neat man with a side parting, in a black leather jacket and surgical mask (when we speak, India is not long out of a Covid spike), has been at Jal Kal since 2018. “When I joined, the situation in the city was much worse, because the work was still in progress,” Kumar says. “Sewers were flowing everywhere. It flowed into the streets.”

Varanasi is among the oldest inhabited cities in the world. It is situated at the confluence of two rivers: The Varuna and Assi, both tributaries of the Ganges, which join the river course here. The city’s spiritual and tourist center, on the western bank of the river, is a warren of alleyways, many too narrow to move cars down, and often blocked by stray cows and market stalls. The city’s original trunk sewer (the main sewer, into which smaller pipes feed) was built by the British in the early 20th century, but local officials explain that the precursor can be traced back to the Mughal Empire.

Until a few years ago, much of the city’s sewage was released

untreated into the Ganges via public drains, or nullahs, which discharged along the same bank as the ghats, where people habitually bathe. Since 2016, the center of the city has seen the installation of several kilometers of new sewer lines, connecting pipes that once spewed straight into the river to a new intercepting sewer, which now carries much of the flow off to one of three new sewage treatment plants. Out of 23 known drains that previously carried raw sewage into the Ganges, Kumar says that 20 have been capped, with the rest in progress. Later, on the same boat that took me past the cremation sites, I see it myself: The city's most notorious drain, Sisamau, is now capped. Only a steady trickle remains.

In a city that has seen near-constant civic engineering work going on for the last two decades, the sewer project has not always been popular. ("Changing the mindset of the people is a very difficult task," Kumar says.) To improve uptake of the new waste regime, Jal Kal and the state's Pollution Control Board put out a series of local adverts; the city ran public announcements over loudspeakers from garbage collection vehicles, warning against open defecation and asking inhabitants not to pollute the river and new drains with garbage. "In the last three to five years, it has come into the habit of the citizens that we have to improve our lifestyle, we have to change our behavior," Kumar says. "And now it has become the habit of the people."

It's not the only change that has taken place in Varanasi. The temple flowers that once clogged the banks of the Ganges after cremations and religious festivals are now collected on the banks in marked bins and in the river using floating barriers; the remains are composted or collected by a local startup, Phool, which converts them into incense sticks. The city's wider green policies have helped cut pollution levels: Varanasi has passed laws banning certain plastics within the holy city, and launched a scheme mandating that more than 580 diesel-powered boats on the river be converted to run on compressed natural gas, reducing oil slicks on the water's surface. The city also set about "beautifying" the ghats, employing teams of workers to collect leftover waste for recycling, and artists to paint murals celebrating the Namami Gange campaign. And most importantly, 361 public toilets have been built, connected to the new sewers, to reduce the rate of open defecation.

Among the Namami Gange projects inaugurated by Modi himself are a new sewage treatment plant in Dinapur, to the northeast of the city, designed to process up to 140 million liters of effluent per day. Similarly, as the city has expanded, so by necessity has the sanitation system. The day after I visit Jal Kal, I am given a tour of a brand new sewage plant in Ramnagar, on the river's west bank, where the population is booming. On the road to the plant I'm surrounded by building works, formal and informal; at one point, we pass a group digging up bricks from a newly laid road, presumably for housing construction.

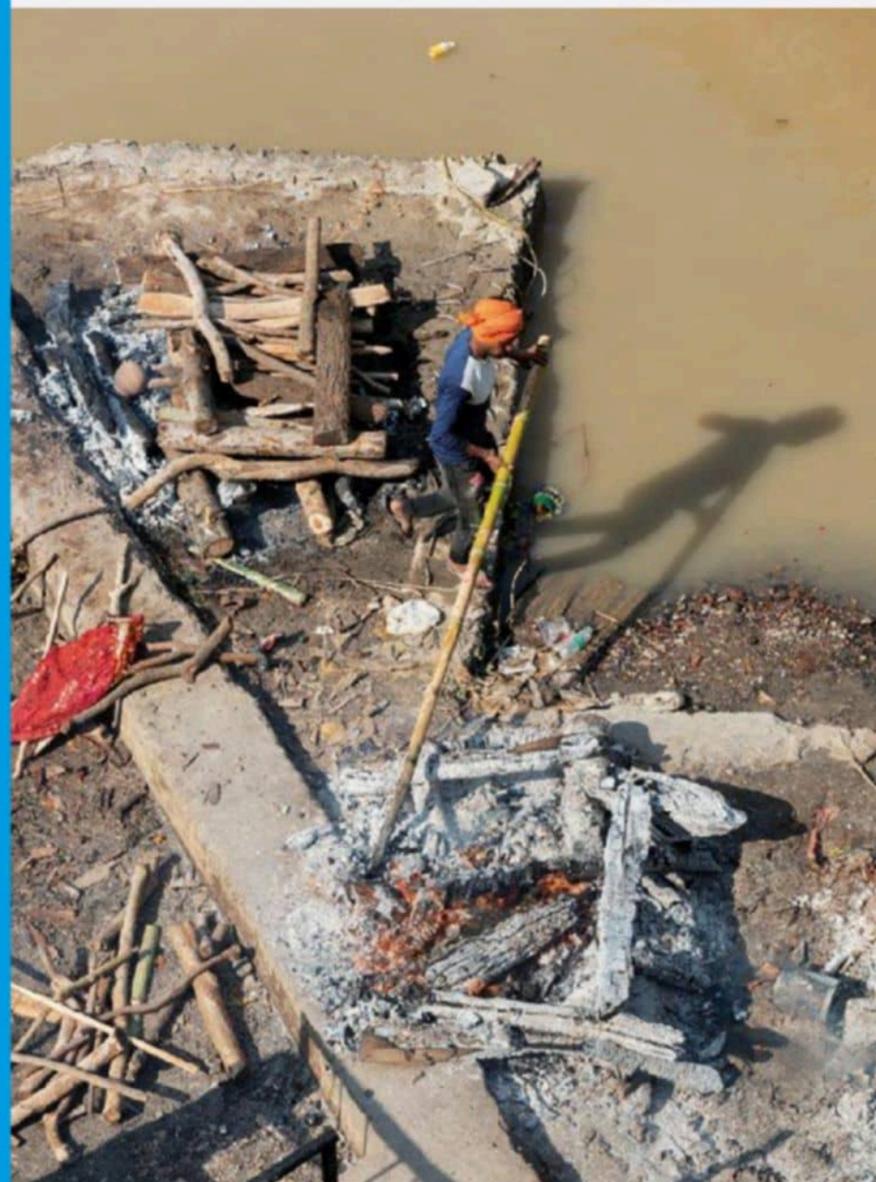
I'm met by Shashikari Shastri, an engineer in charge, who shows me around. The sewage treatment plant is a modern and pleasant place (at least, as pleasant as sewage works get), with pale green buildings and neat rows of trees in the flower beds.

Most sewage treatment plants work in a similar way. To grossly simplify: The bigger solids (i.e. feces) are screened

out in large, often open tanks, and those solids that remain are allowed to settle on the bottom of the tank or float to the surface, and are removed. The remaining water is then passed into a series of tanks and mixed with bacteria, which digest the leftover organic matter and kill off remaining pathogens. The ponds are aerated to encourage digestion. (The result tends to be bubbling lanes of sewage which, if you close your eyes, could sound like water fountains, were it not for the smell.) At this stage, any lingering solids are again settled out. Different technologies exist for third and even fourth steps to clean the water further—UV light, chlorination, etc.

The older sewage treatment plants in Varanasi work using an activated sludge technique, in which some of the solids removed during the settling process are reinjected as a kind of bacterial starter. Ramnagar, however, uses a modern A20 (anaerobic-anoxic) design, in which the effluent is passed through additional tanks to reduce dissolved nitrogen and phosphorus. "Our focus is to minimize eutrophication, because last year lots of algae and eutrophication was found [in the Ganges]," Shastri explains. Eutrophication is when a body of water becomes overly enriched with nutrients and minerals, leading to an explosion of algae, which can choke the river of aquatic life.

We arrive, eventually at the outlet pipe, a cascading series of tiled waterfalls at the river's



edge. By now, Shastri says, the treated water is far cleaner than when it arrives. This is measured using biological oxygen demand (BOD)—the amount of dissolved oxygen in the water that bacteria need to remove any unwanted organic matter, a proxy measure for how much waste is in the water. “The BOD at the inlet is 180 mg/liter,” Shastri explains. “At the outlet, it’s 5-10 mg/liter.” Down on the sand, children are playing. Another group is mining sand (illegally, most likely) for building materials.

The sewage treatment plant—like several that I visited along the Ganges reporting my book—is an impressive place, if small. (Despite asking, I was not permitted access to the city’s largest plant, in Dinapur, during my time there.) Still, I couldn’t help but feel that its miniscule size was woefully inadequate for the task in hand.

Size

is not the only issue. The rosy image of the Namami Gange campaign, painted by the city’s civil servants, does not always match the reality on the ground. While almost everyone I spoke to in Varanasi was positive about the effect of the campaign on the river and the city, it’s clear that despite the rapid pace of building, the Ganges is still far from clean.

One afternoon in Varanasi, my fellow reporter Rahul Singh and I walked over to the banks of the Assi river (or “Assi nullah [sewer]” as many people still colloquially refer to it). Despite the Namami Gange project’s efforts, the banks of the Assi were buried ankle-deep in plastic waste: Microsachets, bottles, packets, pots. I met one of the city’s waste pickers collecting PET bottles, which he can sell for 10 rupees (less than 10p) per kilogram. A little further upstream, floating barriers have been installed in the water to help catch the garbage; so much trash has built up on them that it has created reef-like islands mid-stream.

When the Assi reaches the Ganges, it passes through a pumping plant, designed to filter out solid rubbish before transferring the wastewater downstream to a sewage treatment plant. But when I visited, the pumping station was barely manned and operating at a fraction of its capacity. One of the metal screens for trapping garbage was broken; inside the facility, plastic and other waste trickled slowly off a conveyor belt and into sacks to be carted away for recycling or incineration. One of the staff (who I agreed could remain nameless) told me the plant extracts a tonne of plastic waste per day.

The creaking reality of some of the infrastructure goes against the government’s line on the Namami Gange campaign, which it tends to portray in rapturous, nationalistic tones. The real-

ity is that nearly 10 years after Modi first unveiled the project, the Ganges in Varanasi, and along much of its stretch, remains polluted.

According to the government-run Pollution Control Board’s own figures, in 2020, samples of the river water collected in Varanasi far exceeded India’s own recommended limits for fecal coliform and fecal streptococci bacteria—the latter exceeding the limit by more than 20-fold. The same was true when I visited the industrial city of Kanpur, known for its chromium and heavy metals pollution. It’s not just the Ganges, either: The Yamuna, in Delhi, registered fecal streptococci readings at 10,800 times the recommended limit. All across India, there are reports of rivers foaming with toxic waste or lakes catching fire.

This is the reality of a country like India, that is growing at such an astonishing rate: The risk for India’s civic planners is that by the time new infrastructure—sewage plants, waste facilities, roads—are built, the population is already greater than their capacity. (It is also, it should be said, not solely an Indian problem. Every major industrial country—from China in the last two decades, to the US and other Western countries several decades ago—has faced river pollution crises.) But the continued failure of the government’s schemes to clean the Ganges is a wedge issue for religious campaigners, to whom the issue of cleaning the Ganges is more than practical, or political. It’s moral.

One

evening in Varanasi, I head back to the ghats, to meet with one of the Namami Gange project’s most outspoken critics. Vishwambhar Nath Mishra is an intense man in his fifties, with white hair and a thick mustache. Mishra is a professor of electronics engineering at Banaras Hindu University, and also Mahant (high priest) of Varanasi’s Sankat Mochan Hanuman Temple, a position he inherited from his late father, Veer Bhadra Mishra. Mishra’s father was a lifelong campaigner for the Ganges, and back in the 1980s set up the Sankat Mochan Foundation, an NGO focused on protecting the river; when we meet, in a room near the foundation, there is a picture of the elder Mishra on the wall, smiling happily. When Mishra Sr died in 2013, Vishwambhar inherited the foundation, along with his religious duties.

For Mishra, that combination—of engineering, campaigning, and religion—gives him a unique perspective on the requirements of cleaning the Ganges. “The use of this river is entirely different from other river systems,” Mishra says. “People come from distant places and worship Ganga like their mother. A few [of those] people come and gently touch Ganga water and put it on their forehead. A few people come and take a religious bathe in the river. And a few take sips of Ganga water.” This sip is a sacred ritual part of the daily bath in the river taken by many devout Indians.

“Now, if people are sipping on the water, that means the quality has to be potable water quality, there has to be no compromise,” Mishra says. For him, it’s personal. As a religious leader, one person expected to sip Ganges water during their daily bath is Mishra himself.

Mishra’s weapon in the fight for the Ganges is a simple one:

BELOW:
A worker clears the still-smoldering remains of a funerary pyre to make room for the next ceremony.



Data. In 1993, the Sankat Mochan Foundation established one of the few independent labs to analyze the quality of the Ganges' water in Varanasi. "That's why they [the government] are scared," Mishra says. "We have a database that speaks the reality of how healthy the river is." Ever since, the foundation has been keeping track of the water—bacteria levels, oxygen demand—and has seen the river's health decline with India's growth.

According to Mishra and his fellow activists, the government's own figures when it comes to sewage in Varanasi don't add up. The largest sewage treatment plant, at Dinapur, has a stated processing capacity of 140 million liters a day (MLD). "Now as a matter of fact, I know that in [the Dinapur plant], they are able to carry only 60 MLD of sewage," Mishra says, growing more animated as he talks. "At Goitha, where the capacity is 120 MLD, a few months back when I asked those people, they are able to transport only 10-20 MLD of sewage. That's all. So as a scientific man, you can just calculate the efficiency." Similarly, Mishra claims that the government's assertions that drains are no longer discharging into the river is not true. "Five years ago we found 33 locations discharging [sewage] ... that has reduced to 15 or 16," he says. (The Uttar Pradesh Pollution Control Board did not respond to requests for comment.)

Whereas India's religious and environmental campaigners like Mishra hope to make the Ganges drinkable again, the Indian government has to date only declared an intent to make the Ganges in Varanasi a Class B river—fit for bathing only. Even by that standard, Mishra says, the project is failing. "We have scientific parameters that if Ganga is Class B River, then total fecal coliform count should be less than 500 per 100 ml," Mishra says. (Fecal coliform bacteria are a strong indicator of other pathogens being present.) Mishra shows me a ream of paper, upon which he has printed charts of the lab's water quality data at numerous locations, going back months. "Right now [in March 2022], where we are sitting at Tulshi ghat, the figure is 41,400 per 100 ml. At the end of [Varanasi], where a big channel is discharging, it is 51 million."

(While I could not independently confirm these numbers, even the Indian government's data shows that pathogen levels in the Ganges at Varanasi are many multiples higher than its safety targets.)

Back in 2014, before the launch of the Namami Gange program, Mishra sat with Modi to discuss his hopes to clean the Ganges. Mishra's foundation has since presented its own proposals for treatment projects, but has been ignored. The Pollution Control Board and state government dispute the foundation's data; Mishra, meanwhile, says that the government's figures, which are averages of samples taken from across the width of the river, do not reflect the reality experienced by bathers on the ghats, where sewers discharge into the Ganges and the water is slower. "They will never recognize our laboratory because they know that it will be a big trouble for them. But we have all the data since 1993."

Mishra also claims that commercial interests are preventing the government from taking even more decisive action to cut pollution. "Ganga happens to be a very fertile cow. So, everybody's milking in the name of Ganga," he says. (Allegations of corruption have plagued India's many Gan-

ges cleanup campaigns, although Mishra didn't share any specific evidence of corruption. India's Ministry of Jal Shakti, or water ministry, did not respond to WIRED's requests for comment.)

Most politicians and engineers in India, when asked, will tell you that a totally pure Ganges, of the sort that Mishra is aiming for, is almost certainly impossible. ("Religious people don't follow logic," SK Barman, a project manager for the state water company's Ganga Pollution Prevention Unit, told me. "We have to achieve salvation somehow. Moksha, moksha, moksha.") But in driving the conversation, it's also clear that without Mishra and the countless other environmental activists across India campaigning for the Ganges restoration, the issue would be worse.

A

year since I was last in Varanasi, it's clear that India's sanitation drive is still far from where the government's narrative would have the public believe. According to a public information request by the Indian news organization Down To Earth, in 2023, 71 percent of the Ganges' river monitoring stations were reporting "alarmingly high" levels of fecal coliform bacteria. Over 66 percent of drains in the state of Uttar Pradesh, where Varanasi sits, still empty into the Ganges and its tributaries.

There is no doubt that the Namami Gange project has made progress, and not just in the number of toilets installed and treatment plants made operational. Nearly every member of the public I spoke to in Varanasi, Kanpur, and in New Delhi confirmed that anecdotally, pollution issues are improving. It wasn't that long ago that dead bodies would be regularly found in the river, and sewage in the rainy season flowed up onto the ghats. Today, aquatic life is returning, such as the Ganges river dolphin.

And at 2022's state elections, Modi's BJP party remained in power—a significant sign ahead of 2024's presidential election. In March 2023, Modi's government confirmed Namami Gange Mission II, an additional £2.1 billion of expenditure on expanding the program and continuing to complete already commissioned infrastructure.

As for Mishra and the other activists advocating for a clean holy river, their campaign continues, no matter how unpopular it makes him with the government and Modi-leaning press. "I have heard, 'Why? Why don't you say the Ganga is clean?' Mishra says. "I cannot say that. We are totally committed to the Ganga, and we cannot mislead people. For me, the Ganga is the medium of my life."

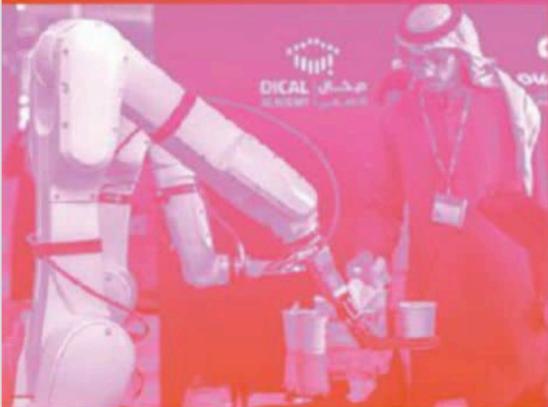
It's a holy mission, I say.

"It's a holy mission, and a scientific mission." ■

RIGHT:
The morning bathing ritual happens alongside funerary rites and the day-to-day business of the river—yet the sacred water is highly polluted.



LEAP



2024: A



GRAND

CELEBRATION





OF

GENERATIVE



AI

The Middle East's largest tech event concluded with unprecedented investments which will boost the region's digital dominance.



The third edition of Saudi Arabia's most-attended tech event continued to fuel ambitious innovators and their technology-enabled transformation. Building on over \$9 billion of deals signed during the 2023 event, LEAP 2024 concluded with record-breaking investments totaling \$13.4 billion. Over 1,800 trailblazers from around the world explored transformative innovations across seven laser-focused content tracks at the four-day event at the Riyadh Exhibition and Convention Center.

This year, LEAP focused intensively on Generative Artificial Intelligence (GenAI). In line with this focus, DeepFest returned on a grander scale in conjunction with LEAP and supported by the Saudi Data and Artificial Intelligence Authority (SDAIA). DeepFest welcomed over 120 companies and showcased government-led AI projects at the forefront of innovation. The wide-ranging events included a leadership conference, specialized track

sessions, training workshops, live demonstrations, innovation showcases, start-up pitch sessions, and an exhibition. The exhibition hosted leading global tech companies at the forefront of AI innovation.

The conference witnessed significant investment announcements centered around AI, e-sports and gaming. Amazon Web Services put in a \$5.3 billion investment to establish a high-capacity cloud zone while IBM announced a \$250 million investment in a software development center. ServiceNow also dropped a \$500 million investment to launch its first data hub in the region.

The National Development Fund, in collaboration with the Social Development Bank, launched two venture investment funds in the gaming and e-sports sectors, with a total value of \$120 million in collaboration with Mirak Financial and Impact Financial (Impact46) further bolstering Saudi Arabia's digital infrastructure and entrepreneurship ecosystem.

The far-reaching economic impact of Leap 2024 goes beyond direct investments. It is estimated that the event has infused around \$500 million into the local economy, uplifting various sectors, from aviation to hospitality, with hotel occupancy rates in Riyadh surging to 99 percent.

Meanwhile, one of the most exciting highlights at LEAP is the annual Rocket Fuel Startup Pitch Competition, with a total prize pool of \$1 million. The third edition of the competition was powered by Saudi Arabia's National Technology Development Programme (NTDP) in collaboration with the Kingdom's Ministry of Communications and Information Technology (MCIT) and the Misk Foundation. This year's Rocket Fuel Startup Pitch Competition saw four expert judges presenting awards across six categories with entrants selected from 90 international startups. American start-up Reme-D Inc. walked away with a prize fund of \$250,000 after winning the coveted LEAP Award.

IN NUMBERS

50,000
guests

215,000
visitors

1,800

international
and local entities
participated

25%

increase in
attendance compared
to the previous year

60%

increase in
investors compared
to the previous year

\$13.4

billion worth
of investment

Over **600** startups hosted

BUILDING NEW BUSINESSES AT A TURBULENT TIME

Focus on the opportunities brought forward by challenges, and don't stop investing.



The rise of disruptive technologies has reshaped the landscape for new business building. As consumer needs evolve alongside shifting tech trends, business leaders around the world are finding themselves in a turbulent environment. Can Kendi, senior partner at McKinsey points out that challenges bring opportunities. “So don't stop investing,” he says.

Shared at LEAP 2024, McKinsey's new annual New Business Building report shed light on the core factors leaders should look at as they navigate this new landscape. New business building refers to the creation of new revenue streams through new products, services, or businesses that require new capabilities and has become a critical priority for business leaders. “[Our report] found that 67 percent of the businesses are topping up the game if they make new business building one of the top three priorities on their agenda,” says Sonia Wedrychowicz, partner at McKinsey.

According to the report, over 50 percent of CEOs already consider business building one of their top three priorities. They have good reason

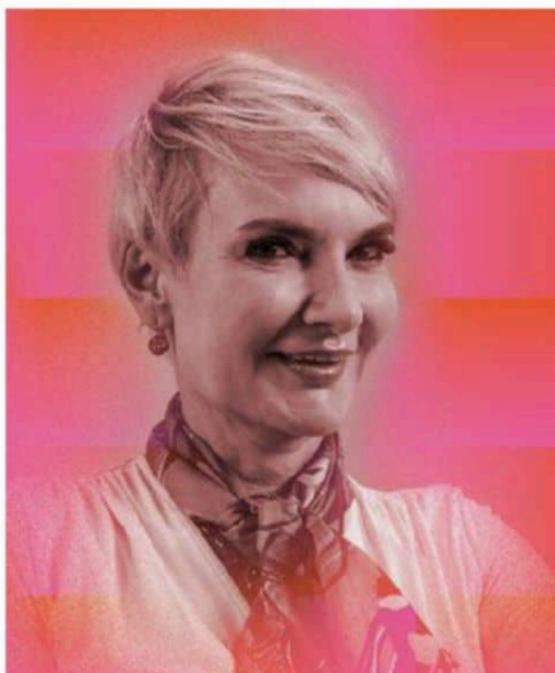
to do so because the firm also expects that business building alone will help generate 30 percent of revenues by 2028.

Speaking at a keynote at LEAP 2024, Kendi and Wedrychowicz highlighted the key factors in successful business building. Discipline stands out as a key factor in building efficient and sustainable businesses. “Digital business building hates chaos,” speaking to WIRED, Wedrychowicz points out that, “It loves process and discipline.” McKinsey's report found that businesses with formal mechanisms are 2.4 times more successful at new business building compared to those without. Experience is another key factor. The report defines an experienced expert builder as a business that launches three or more new businesses per year. Efficiency also plays a key role in successful business building. Around 40 percent of business builders are more likely to close an underperforming business than maintain it, the report says.

Elaborating on the three key factors, Kendi says that it's crucial to keep fresh blood in the business building team. “Do not try to create a new business with the same old management team,” he advises. “The new business should come with a new and agile mindset with more freedom.” Wedrychowicz adds that business builders should not neglect the importance of partnership on the technical side of business building. “Don't build it in-house if you can buy it,” she says. According to both Wedrychowicz and Kendi, building a product in-house, while feasible, is deemed to slow down the entire business building process due to structural issues that will inevitably occur along the way.

McKinsey's report also examined the areas that business builders are looking at. Data, analytics, and AI remain the most anticipated types of new businesses. The report also hints that 45 percent believe the advancement of Generative Artificial Intelligence (Gen AI) could increase their organization's investment in new business building over the next five years.

Left: **Can Kendi**, Senior Partner at McKinsey. Right: **Sonia Wedrychowicz**, Partner at McKinsey.





Dr. Christina Yan Zhang, CEO, The Metaverse Institute

The metaverse, the tech darling of 2022 more recently spurned in favor of AI, still holds a great deal of promise. Yet its quick rise to prominence brought questions for the public (what is the metaverse? Is it the same as the company Meta?), and for experts (how do we make sure hardware and software are on the same level?) alike.

Dr. Christina Yan Zhang of the Metaverse Institute looks at the biggest questions – how do we leverage metaverse to solve global challenges? Zhang has been at the forefront of researching applications of the metaverse and related technologies for over 15 years. The metaverse, in her eyes, is a convergence of new technologies including virtual reality, digital twins

and the internet, “coming together to form the next generation of the internet, which is more immersive, interactive and intuitive.”

Zhang highlighted some of her early work using platforms like Second Life to develop international education strategies. She also explored using digital twins to simulate and optimize construction, engineering and architecture projects. “This issue is, like any frontier technology, when you are a little bit too early like me, people don’t always understand what you’re talking about.”

Reflecting on the shift in interest from metaverse to AI, Zhang sees it as a positive. “Instead of saying that generative AI killed the metaverse, generative AI has become the most powerful building block of the metaverse.” She predicts that the next mainstream use for AI will

be text to 3D objects, avatars and environments – a boon to metaverse developers which would make the field far more accessible, allowing for unprecedented participation in building out virtual worlds.

Yet the metaverse shouldn’t be purely virtual, she asserts. It should be tied to the physical world using sensors and digital twins. Digital twins, a 3D, digital version of physical objects or locations, use sensors in the real world to transmit data and information digitally. Zhang says the future of the metaverse could include human digital twins.

One challenge she notes is the all-aboard mentality of both people and companies in the face of new technology – rather than questioning the best use for new technologies, it becomes applied in its most rudimentary form, often not reaping any rewards other than the completion of corporate box-ticking. “The challenge is, how do you identify the most effective use case of such frontier technology in a relatively short time?”

Zhang co-chairs a UN task group exploring how technologies can support smart, inclusive cities. Through the Metaverse Institute, she also advises organizations on identifying effective use cases that provide real-world benefits. Some focus areas include using digital twins at various scales from individuals to entire countries and planets.

Ensuring no one is left behind in the digital transformation is a major priority. Over a billion people lack reliable electricity access and billions more are not online. Zhang discussed how technologies may help address global digital divides and bring opportunities to underserved communities.

Public-private partnerships will be crucial to make progress on the UN’s Sustainable Development Goals by 2030. By championing collaborative approaches and using tech for good, emerging technologies can be harnessed to benefit all of humanity according to Zhang.

The future looks promising yet there is still much work to be done to bring this technology to its true potential.

COMBINING DIGITAL AND PHYSICAL

How do we bring the metaverse to its world-changing potential?

TRANSFORMING BUSINESS WITH GENAI



Providing clarity on AI's impact on workforce and business efficiencies is crucial amid the AI revolution.

Artificial intelligence was the hot topic at this year's LEAP. PwC Middle East, a key player in the Middle East's ongoing technological transformation, has set its sights on a particularly compelling frontier: Transforming businesses with generative AI (GenAI).

With the technology evolving at lightning speed and players in every industry trying to get in on the act, the AI space is getting crowded and somewhat chaotic, according to Ali Hosseini, Chief Technology Officer at PwC Middle East. Establishing its first AI Centre of Excellence in the city of Riyadh aimed at upskilling and scaling the AI capabilities of Saudi engineers and researchers, PwC believes that providing clarity on AI's impact on the workforce and business to its clients is the key to maximizing the potential of AI.

"The way I see the impact of AI is two-dimensional," says Hosseini, "One dimension is the workforce transformation, and the other is AI automation." AI tools like ChatGPT and Microsoft's Copilot have significantly increased the efficiency of employees across different industries by freeing them from some of the drudgery of office work, according to Hosseini. However, transforming the entire workforce with AI is not as easy as it sounds. Getting staff to understand what to adopt and how to adopt AI, requires both the understanding of the technology and the domain knowledge, he says. The current state of AI allows

for the democratization of knowledge, which empowers individuals, regardless of their technical background, to engage with and leverage the power of these intelligent machines. "I think, first of all, no one is an expert in GenAI. No matter what anyone tells you," says Moussa Beidas, Partner and Ideation Lead at PwC Middle East. "Every single second, every minute you open up your browser, you open up your phone, there's something new," he declares. "So everyone is learning at the same pace, which I think is a fantastic democratizer."

"The opportunities are massive," says Beidas when referring to AI's capability. "Every day people are finding new use cases of how GenAI can impact industries and people's lives." Highlighting the future potential of AI automation in financial services, Hosseini shares that "[To automate actions like] account opening, mortgage application, or insurance risk assessment, you would need a technology that combines the knowledge and the actionable solutions," he says. He points out that this is an evolution of AI from knowledge augmentation to action-oriented automation.

"When it comes to Gen AI, we want to make sure that we build capability at every level," Hosseini adds. PwC's long-term investment in AI and its deep, industry-spe-

cific knowledge allow it to combine technology and know-how to create customized solutions for its clients.

Positioning itself at the forefront of technological innovation, PwC is determined to remain a leading force in this exciting journey. As it embraces GenAI's revolutionary potential, it also aims to be the force of change for the region's future alongside this transformative technology.

Ali Hosseini,
Chief Technology Officer at PwC.





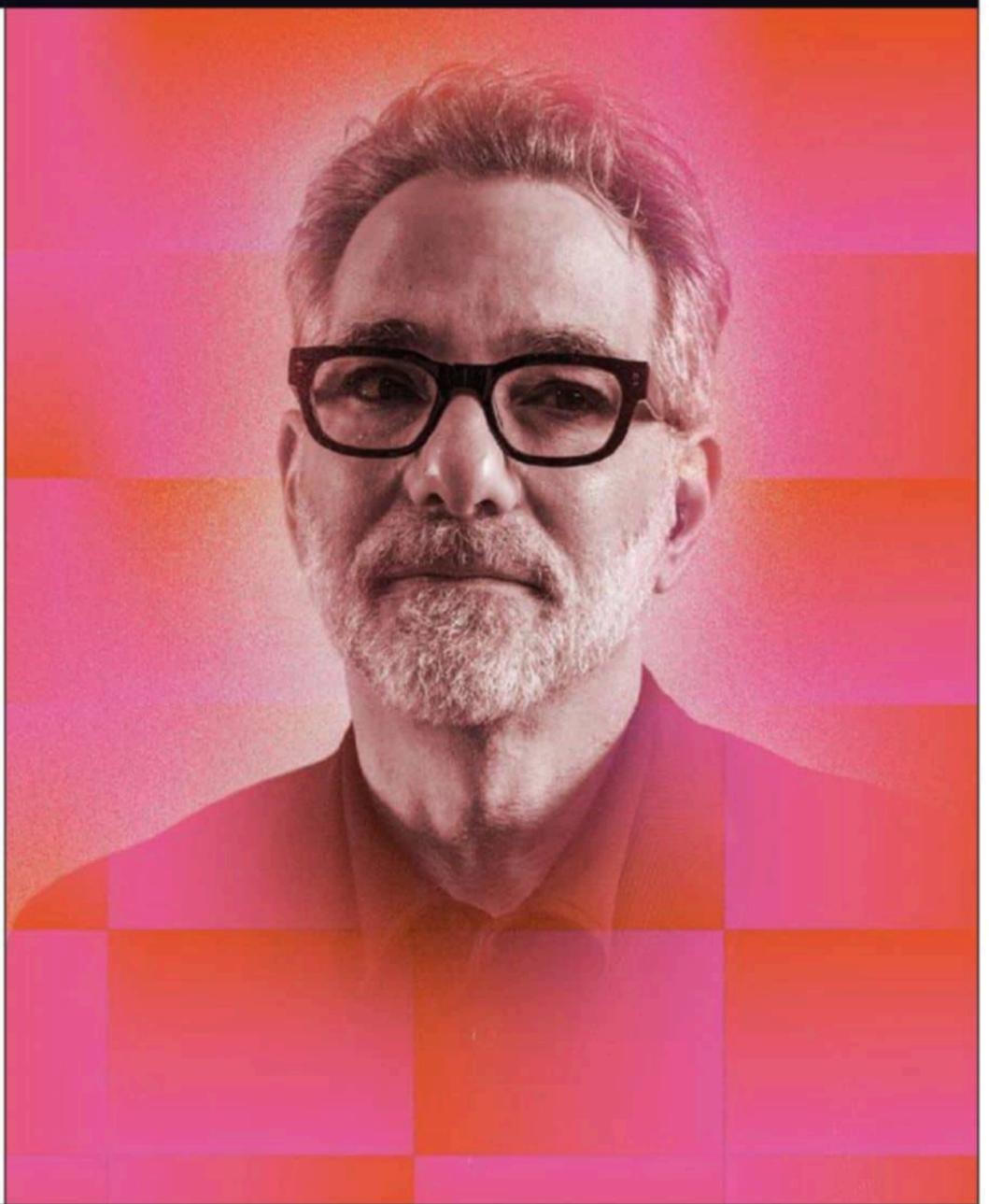
Amidst the hum of innovation and the buzz of anticipation at LEAP 2024, CEO of Qantm AI Seth Dobrin, shared his perspective on the evolving landscape of artificial intelligence and its profound implications for humanity.

Dobrin's upcoming book, *AI IQ for a Human-Focused Future*, stands as a testament to his dedication to demystifying AI and its transformative potential. "Over more than decade, I've been transforming companies through AI and data," Dobrin explains. "Tying business strategy to technology and human outcomes."

When it comes to AI's impact on human society, Dobrin emphasizes the imperative of fostering a value-based AI future, one that transcends technological advancement to prioritize human well-being and equity. "AI impacts humans," Dobrin asserts, "and when designing and implementing AI, we must consider its impact on individuals across diverse contexts and cultures. And so the companies need to understand that humans are using it, and others are impacted by it. And when they're designing and implementing the AI, they need to consider that. And they also need to consider the location of the person, you know, kind of where that person lives. Because there's different biases that exist in different parts of the world. There's different moral and ethical constructs. And we can't inflict Western ethos on the rest of the world," he says.

Taking it a step further, Dobrin offered up his take on a wide range of biases and how we have to be very careful in creating a more equitable system, "And so what you need to think

Seth Dobrin,
CEO, Qantm AI.



about is, okay, where do we control things like bias? Now, I think globally, we can agree that gender bias is the thing, and we want to control gender bias. Outside of gender bias, there are different constructs of bias around the world. So in the West, we look at black, brown, we look at race, we'll get ethnicity, we look at religion. And so while if you're considering western values baked into and regulated into pre-trained models, you're ignoring other biases, other bias constructs and inflicting your own on those parts of the world. And you're essentially in a new type of colonialism. It's technological colonialism on south of the equator. And so we're expanding the digital divide. And through these new gender of AI

tools, or pre-trained models, we're going to be expanding the digital divide if we don't be more inclusive, include these people in the training and development of these models, and even looking in the Middle East."

Finally, Dobrin shared his aspirations for the future of AI. He spoke passionately about empowering organizations to embrace AI strategies grounded in human-centric values, particularly in regions like the Middle East where technological innovation intersects with societal transformation. "It's about enabling organizations to chart a course aligned with their broader vision," Dobrin affirms, underscoring the pivotal role of AI in shaping our collective future.

UNDERSTANDING AI

Seth Dobrin, formerly IBM's first-ever Chief AI Officer, discusses the future of AI.



Yonah Welker,
serial technologist.



At LEAP 2024, Yonah Welker, a serial technologist, and a proponent of cross-cultural collaboration, shared his insights on the symbiotic relationship between technology and humanity, “Two years ago we started the global movement of AI for Humanity. And the main idea behind this movement was that no matter what type of algorithm or system I would love to build, we’d have people and humanity behind it, and it’s why it affects the data, the historical context behind it. The potential biases, positive or negative outcomes,” he says.

Welker’s journey traverses the divide between the western and eastern hemispheres, embodying the essence of a technology ambassador, “My personal focus is algorithms which focus on cogni-

tive, sensory and physical spectrum such as AI for dyslexia, cognitive impairments, autism, medical technologist education, and on one hand, I oversee portfolios in technology transfer in this field on behalf of the government on behalf of my personal projects. Also, I work on policies to better understand how to adopt these technologies.” His mission? To infuse every algorithm and system with the essence of human experience, transcending mere lines of code.

The idea is that it is the worker, the everyday man or woman who will be using AI technologies is better informed, and so Welker works with UNESCO and governments to foster AI education, “I work on policies to better understand how to adopt these technologies. It was not only the system, but the classroom, the teacher or nurse who will use these

technologies provide better understanding of literacy in capacities,” he says.

“I still believe that when we work together, then we respect the diversity behind the teams. We can create not only the human centered systems for hospitals, schools, workplaces, but actually solve bigger social challenges for more collaborative cooperation. at national and regional level. That’s my message,” he says.

In navigating the complexities of international collaboration, Welker confronts multifaceted challenges. He acknowledges the nuanced intersectionalities within data, emphasizing the imperative of gender-specific studies and the recognition of historically marginalized communities, “AI is just two lines of code. Everything that happens, whether positive or negative, is actually about society. An algorithm is just a reflection of society. For instance, when we build AI for autism, we discover cognitive impairments unique for girls. We need to conduct gender-specific studies to better understand the data in this area. For years, medical studies primarily focused on men, excluding women and disregarding intersectionality. When discussing cognitive spectrums, we often overlook comorbidities or underlying conditions, as well as how some specific conditions are unique to certain ethnicities, geographical locations, or communities that were historically excluded from access to hospitals and classrooms,” Welker says.

“Two years ago, when I first visited Riyadh and worked on the global AI Summit, the idea of human capacity was at the forefront. Two years ago, the Saudis signed the agreement and declaration of AI ethics with UNESCO. Now, through the Center of AI Ethics and Research here in Riyadh, we can see how it comes in parallel, not only with the EU and AI and digital services, but also actively working with our counterparts globally. We all agree that we should balance the facilitation of technology and the protection of people, because humanity is always behind the system,” he says.

MERGING HUMANITY AND TECHNOLOGY

How do we leverage technology, while respecting the human condition?

A YOUTUBER AND AN AI INTERVIEWER

The rise of deepfakes and AI-generated avatars is a cause for concern.



At this year's DeepFest, curious crowds saw Kwebbelkop, one of the world's biggest gaming YouTubers, getting interviewed by his own AI avatar.

With the recent increase in deepfakes and AI-generated avatars on our social media feeds and messaging threads, Aaron Jones, co-founder of Yepic AI, was keen to stress that "it's about the realism, to reach beyond novelty, to have an emotive connection, or to offer an experience that either excites and delights."

Jones was discussing the endless possibilities for, and the inspiration behind, creating and being turned into an AI avatar. Yepic AI had just completed a remarkable project – The creation of an AI interviewer that would talk with YouTube sensation Jordi van den Bussche, aka Kwebbelkop, "[It] came together in a remarkably fast time-frame—literally days. As a company that specializes in this type of technology, we just needed one photo and less than two minutes of Jordan's voice to create the clone."

The mind-bending interview between van den Bussche, and a digital avatar based on his YouTube persona, Kwebbelkop, touched on the differences in gamers across the world and whether van den Bussche would like to clone his loved ones. "It's fascinating to see how certain jokes or video games can be popular in one region but not in another.

These cultural nuances definitely make the gaming and streaming landscape diverse and unique across different locations," says van den Bussche. With regards to cloning a loved one, he agrees that it is "a little bit interesting and strange. But it can help people who have social anxiety or who are very lonely, even those with dementia," battle with their dwindling grasp on their memory.

Creating an avatar from scratch is not a cakewalk, despite the assumption that it is just "custom promptings and instructions" typed into an AI model. The backend heavy task "is literally millions and millions of frames of people talking in hundreds of languages that create huge datasets that are trained over a long period of time to give us a foundation model that enables us to generate videos like this on the fly in real-time with very little GPU," says Jones.

Jones even alluded to the possibility that "every single customer-facing knowledge job will be replaced by an avatar," stating that the most obvious and logistically viable use cases of these AI avatars would be in "customer service and airport kiosks." As the "smartest video model in the world," Yepic AI works tirelessly to ensure that "people can access the world through AI avatars without giving over their data sovereignty," according to Jones. That's a good thing, considering how widely he anticipates AI avatars to be used.

Yepic AI intends to launch their system, Jordi 2.0, on mainstream platforms soon after its inauguration on the LEAP main stage. The updated avatar is "dynamic and even more lifelike, trained on just a few minutes of video that also works in real-time. Running on an RTX 4080, which requires very little computation, Jones adds that the demo they are "working on right now will run on the new iPhone. So it's really an exciting time to be at the cutting edge of the new UI."

Overall, Yepic AI's goal is simple: to bring APIs (that support 84 percent of the world's internet) to LLMs in a personified way to create deeper connections. 🗺

Aaron Jones,
co-founder of Yepic AI.

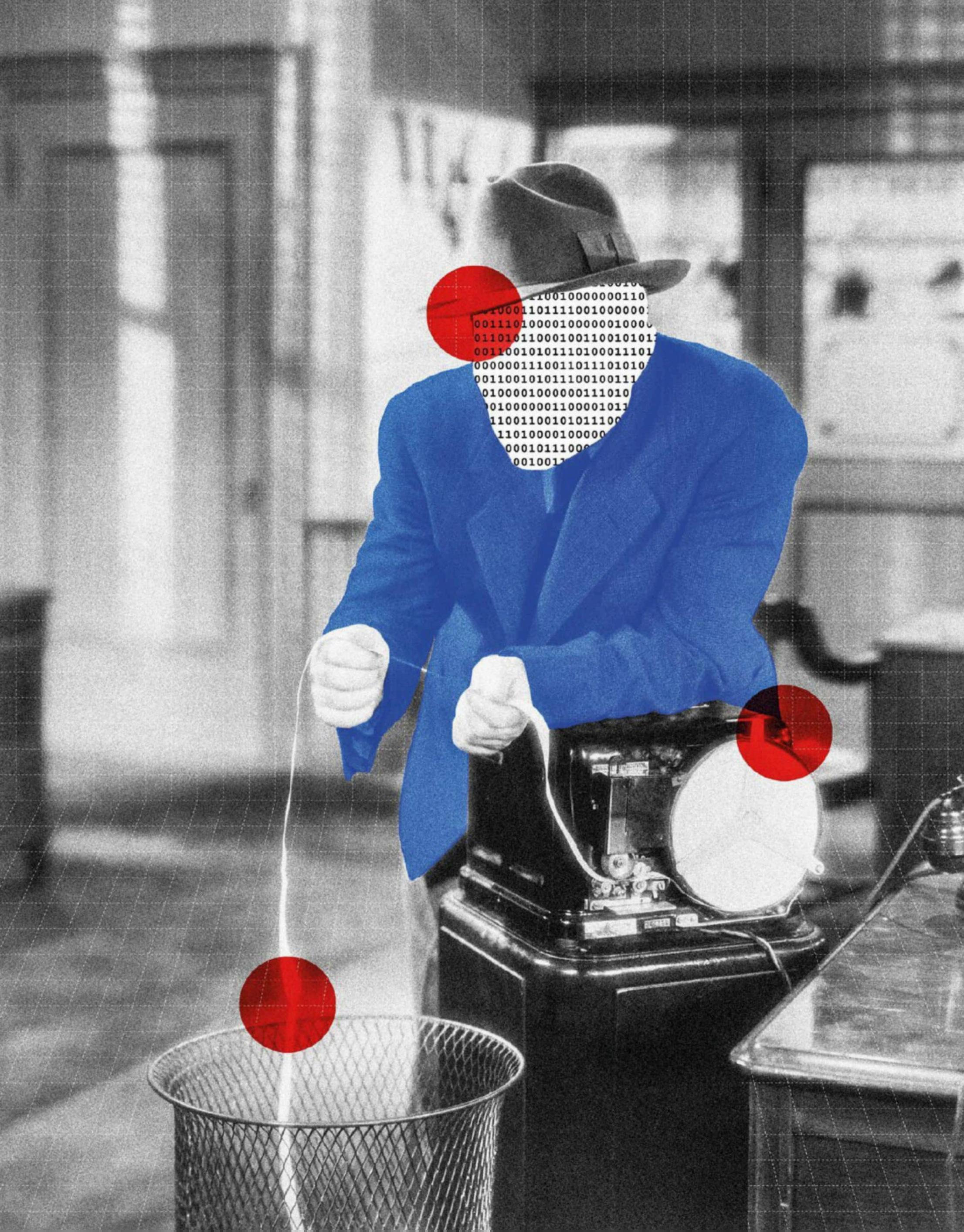


WALL STREET IS HIGH ON AI

Wall Street has always been talking about AI, but as the craze boils over, the anxiety of being replaced by AI kicks in.

By **Yunqi Li**

Illustration **Nadia Méndez**



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Ever since the name ChatGPT came to public attention,

productivity in the workforce has taken a great leap forward. Every industry in the world has rushed in to take a share of the artificial intelligence (AI) cake.

In 2023, a frequently cited study from the University of Florida hinted that a ChatGPT trading algorithm could deliver 500 percent returns in the stock market, outpacing conventional sentiment analysis models used by most hedge funds. Myriad AI-based trading tools soon appeared across the market.

Bloomberg News reported last year that at some of the most enthusiastic banks on Wall Street 40 percent of their job hires are for AI-related talents. These roles include data engineers, quantitative analysts, and ethics and governance roles, according to data from the consultancy firm Evident.

Evident's data showed that the biggest US bank, J.P. Morgan, listed 3,651 AI-related roles globally from February through April in 2023, almost double those of its closest rivals Citigroup and Deutsche Bank. Eigen Technologies, a research-driven AI company that helps firms including Goldman

Sachs and ING with AI, reported a five-fold jump in inquiries from banks in the first quarter of 2023 compared to the same period a year ago.

A report by Deloitte also shows that the top 14 global investment banks have been able to boost their front-office productivity by as much as 35 percent with generative AI. This could result in additional revenue of \$3.5 million per employee by 2026.

The AI craze on Wall Street is growing by the day and trading with AI seems to be the trend now.

Predictions in an unpredictable market

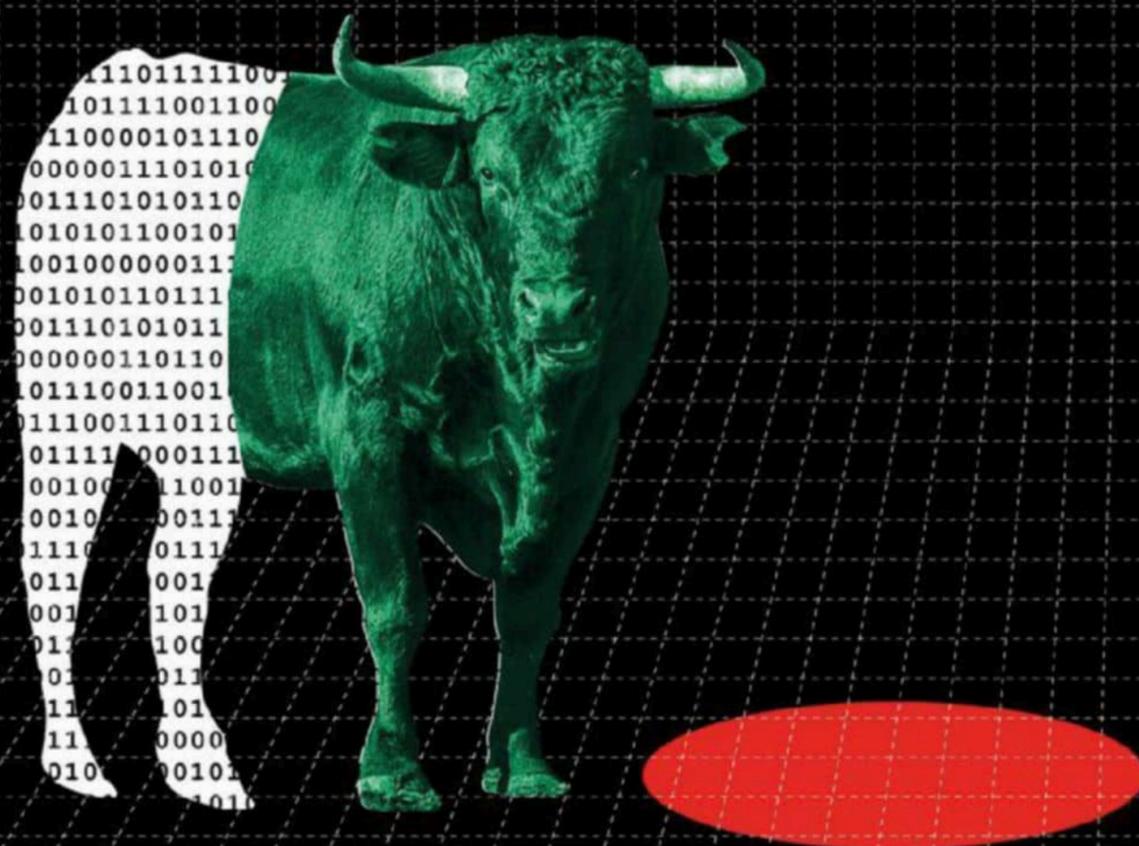
AI in the finance sector involves a wide range of models that go beyond generative AI like ChatGPT. The most prominent characteristic of AI is its ability to process a massive amount of data in a short period of time. In stock trading, analysts and traders often have to look for signals from an overwhelming sea of information. And AI can easily gather that information, from historical price trends to news and social media sentiments.

"Take investor sentiment, for example," says Shawn Edwards, Chief Technology Officer at Bloomberg. "One way to measure sentiment in the stock

market is to analyze news, research, and social media posts. The unstructured nature of textual information presents challenges that are comfortably addressed by machine learning techniques to increase confidence in text-based signals." Data science-empowered technologies enable real-time observations from sources like consumer credit card transactions, satellite images, shipping information, supply chain data, earning call transcripts, and other economic indicators.

Gathering information is only the first step, organizing and analyzing the data via complex algorithms are the key if AI is to make predictions. "When these observations are linked to traditional market information, never-before-seen relationships can be discovered, helping users make more informed decisions," Edwards adds.

The power to quickly extract useful information from massive amounts of data might make the stock market seem less volatile for AI than for humans. "The sudden unpredictable market might be abnormal for humans, but rarely [have] these moves not happened in history," says Dr. Rein Wu, the ex-Visa researcher who founded the AI-enabled prediction market PredX. "We can use historical patterns to match with current stock



patterns, including sudden moves, and project what happened next with a probability distribution.”

Natural Language Processing (NLP) and machine learning (ML) hold the key to this data—gathering, organizing, and analyzing process. Dr. Rein named Long Short-Term Memory (LSTM) as proof of a highly effective algorithm that is used in trading. It has an exceptional ability to capture and make good use of the data, he says, “Similarly, there are Random Forests, a commonly-used machine learning algorithm that combines predictions from multiple models, thereby providing robustness,” he adds.

Several models built on these algorithms, such as Recurrent Neural Networks, Gradient Boosting Machines, AdaBoost, Convolutional Neural Networks, Deep Q-Networks, and Deep Deterministic Policy Gradient, were used to predict stock prices and have proved to be quite effective, according to Dr. Rein.

Trading with AI

“AI has certainly helped make my trading better, bridging the gap where my biases have cost me some serious profits,” Dr. Rein says. Even for an experienced and knowledgeable investor like himself, human bias and sentiments inevitably “mar the trading experience and the bank balance,” he says. With AI, these undesirable elements can be easily removed. However, he also admits that human-monitored strategies are still crucial in trading.

As a company that has been building and deploying AI for more than 15 years, Bloomberg has received all sorts of feedback from its customers who have taken advantage of its AI solutions. The company has incorporated generative AI into its products and services, launching its large language model specifically for finance, BloombergGPT, and the AI-powered Earning Calls Summaries for its customers, researchers, and analysts.

Its earnings transcript summarization system can quickly decipher complex financial information, extract key insights, and produce summarized answers on topics like capital allocation, hiring plans, supply chain issues, and

more. Normalizing and enhancing data with AI enriches the extracted information, making it more accessible for those who need it. “Each day, Bloomberg processes millions of news articles, research documents, and social media posts, annotating them with metadata such as entity and topic identifiers, sentiment analysis, importance assessment, and salience ranking,” explains Edwards. NLP techniques help the company construct a knowledge graph encompassing companies, individuals, products, events, actions, and topics.

Meanwhile, BloombergGPT excels at answering conversational finance questions—a complex task that was previously done by human employees with rigorous numerical reasoning. “It requires an understanding of structured data and financial concepts, and

AI trading could also potentially lead to amplification of the market. Despite AI algorithms’ quick responses to market changes based on real-time data, they might also contribute to market volatility as they may all respond to the same market indicators simultaneously.

Some researchers have noticed that the effectiveness of algorithmic trading in the short term is heavily influenced by news more than other indicators. In a personal project, Hasan Mustafa Hosny, an Automation Engineer at the Swiss Stock Exchange experimented using the LSTM algorithm over a period of three weeks. “Intraday trading carries a high level of risk,” Hosny says. He also points out that the stock market is very unpredictable in the short term with breaking news kicking in, influencing the trend

“At some of the most enthusiastic banks on Wall Street 40 percent of their job hires are for AI-related talents.”

the need to relate follow-up questions to the turns in dialog about S&P 500 earnings reports that include text and at least one table with financial data,” says Gary Kazantsev, Head of Quant Technology Strategy at Bloomberg.

Apart from data gathering, extracting information, and conversational tasks, the use of AI in trading has also enabled traders to make better decisions by analyzing vast amounts of data quickly and accurately. It has enabled some traders to automate their trading strategies and take advantage of market opportunities 24/7 with High-Frequency Trading (HFT), a type of algorithmic trading that involves executing trades at very high speeds—sometimes even in fractions of a second.

However, one of the major limits of AI trading is its inability to predict black swan events and extreme market conditions. While AI models can be trained on historical data, they are not able to predict sudden market changes or unexpected events that can significantly affect the market.

and prices. “Plus there is a lot of price manipulation done by hedge funds and traders, so the price movements do not always tell the truth about the market, especially with AI and HFT affecting the price movements,” he adds. “In the short term, the sentiment of the market and news has a huge influence on the stock movement, and usually gives great results in return, even if they are not really based on facts or other data,” he concludes. To further study breaking news’ impact on ongoing trades, Hosny is creating a new algorithmic trading project that would run 24/7, scanning news from all over the world, with the algorithm designed to autonomously decide which securities to invest in based on the news.

Many industry experts arrive at the same conclusion, that the human factor is still crucial in trading as AI still has a lot of limitations. “I think that for the foreseeable future, humans will continue to play a significant role in the investment process, especially considering some of the constraints, such as

the finite amount of computing available,” Kazantsev says.

“AI’s performance is largely dependent on the quality of its training data,” adding to the limitations on AI, Hosny says. “The data we feed into the AI model is a crucial factor in determining its performance.” As for now, it’s more sensible to look at algorithmic trading as an analytical assistant that can monitor market trends. The task of deciphering market nuances still largely depends on human expertise.

Will we See an AI-Powered scandal?

AI is ubiquitous on Wall Street. Quantitative hedge funds and leading investment firms like BlackRock and J.P. Morgan are already using AI, with many following across the financial markets.

“AI’s performance is largely dependent on the quality of its training data. The data we feed into the AI model is a crucial factor in determining its performance.”

The SEC (US Securities and Exchange Commission) has also greenlit Nasdaq’s AI trading system, which utilizes reinforcement learning (RL) algorithms to make real-time adjustments. The threat of supercharged AI manipulation of the stock market seems to be lurking around the corner.

“Informed AI traders can collude and generate substantial profits by strategically manipulating low order flows, even without explicit coordination that violates antitrust regulations,” warned a research paper by finance professors Winston Wei Dou and Itay Goldstein from the Wharton School at the University of Pennsylvania. This might be done either through a “price-trigger mechanism” designed to penalize deviations in trading behavior or through the cultivation of uniform learning biases among algorithms, according to the paper.

“When these algorithms are programmed with the intention of influencing the market, they can enhance the ferocity of certain movements, causing

great market volatility,” says Dr. Rein. “There’s even a possibility that the algorithm uses market manipulation as an investment strategy.”

“As the adoption of traders’ AI accelerates, a balance must be maintained to ensure not just fairness but also to enhance trading proficiency and mitigate its impact on the entire financial system,” he adds.

Meanwhile, as many researchers point out, the quality of data could further complicate the matter. The available datasets in stock markets may be rife with errors and inconsistencies. Such inaccurate, incomplete, or biased data inevitably deteriorate the models, consequently offering deceptive insights and potentially leading to expensive trading judgments.

“Most institutions are taking a

very careful approach to using them, especially due to the non-public data they’re being used to analyze,” Kazantsev noticed. Adding to that are the current models’ other limitations, such as hallucinations, a lack of reasoning, and the inability to perform advanced mathematical tasks.

Regulators are also alert to the potential threat of AI in financial markets. Gary Gensler, the chair of SEC, recently warned against “the possibility of AI destabilizing the global financial market if big tech-based trading companies monopolize AI development and applications within the financial sector.”

Scrutiny is also coming from regulators around the globe. The European Union has already introduced the AI Act, while the United Nations has adopted the first global AI resolution. Dr. Rein points out that despite the absence of an overarching AI legal framework in the Middle East, “concerns regarding market manipulation, fairness of trading practices, and transparency in data

usage are raising some serious questions for regulators, who have begun to take notice.”

“However, it is important they strike a balance to accommodate advancements in technology while protecting the market,” he adds.

The AI transformation is unstoppable

Stock market trading is already undergoing a significant transformation amidst the AI revolution. “But it is just the beginning. As the technology advances, especially with artificial general intelligence (AGI) looking like a real possibility in the not-so-distant future, I believe it is going to get even crazier,” says Dr. Rein.

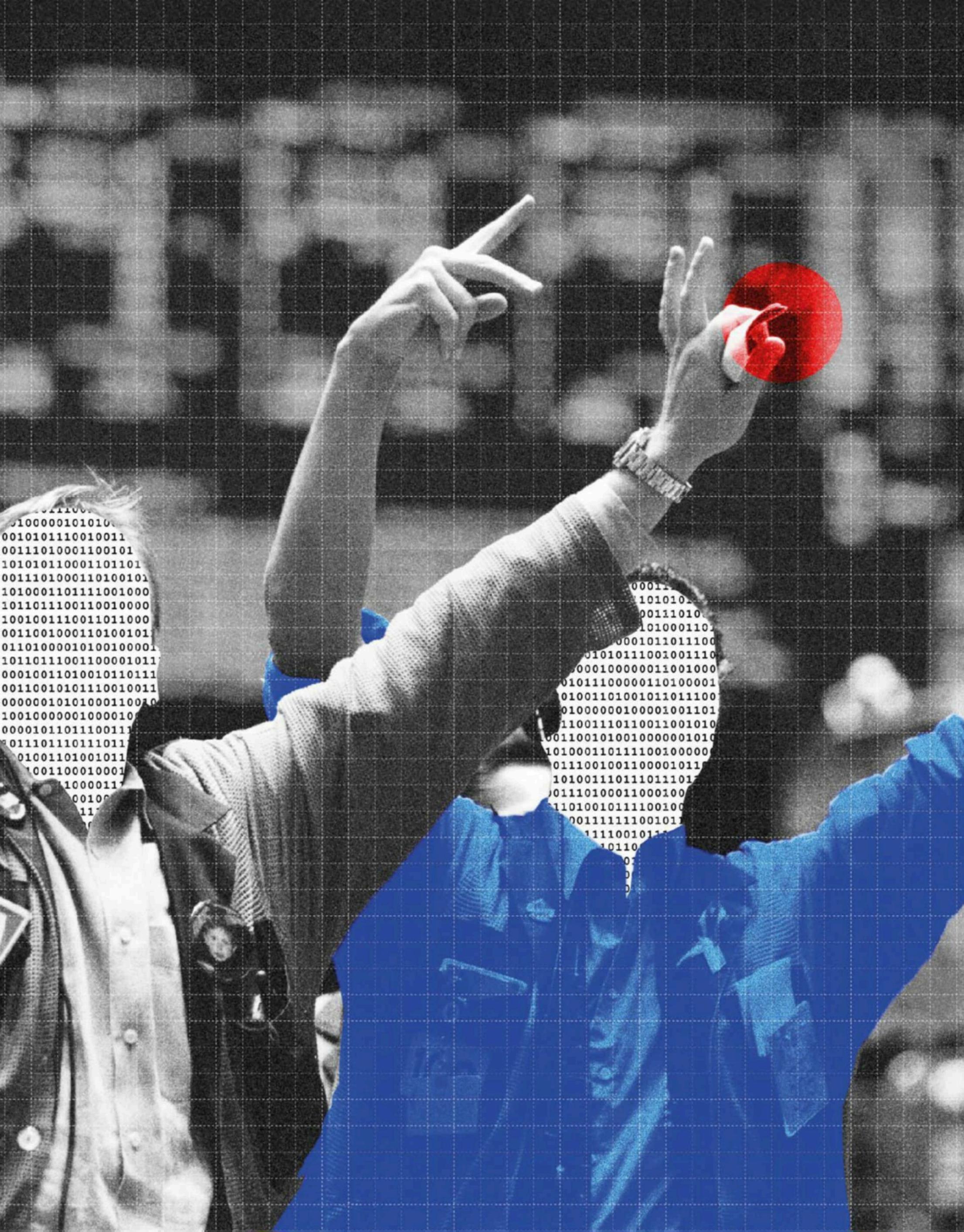
For starters, AI’s use in algorithmic trading will allow users to capitalize on miniscule price fluctuations that humans fail to process. AI would likely play a key role in risk management, reducing potential losses while providing more personalized investment strategies to amplify profits. Furthermore, market predictions and forecasting could be more accurate, which would enable humans to make better and more informed decisions.

“I think we can easily anticipate the industry rapidly exploring the capabilities and limitations of AI over the next year and focusing on key use cases to improve the efficiency of various automatable or augmentable workflows,” says Kazantsev. Some examples include reading and summarizing complex documents, improved search and analytics, and code generation.

Kazantsev also points out that the adoption of AI will speed up considerably when users are able to run a state-of-the-art LLM on their laptops. “This technology will then be incredibly transformative,” he says.

“I envision a day not too far in the future when one of these models could power a personalized assistant that remembers details about you and what you’re working on, and that can help you with complex tasks.”

As AI continues to disrupt Wall Street, it seems that human wisdom is the bridge between AI’s power and limitations and it will be some time before that can be removed from the equation. ■



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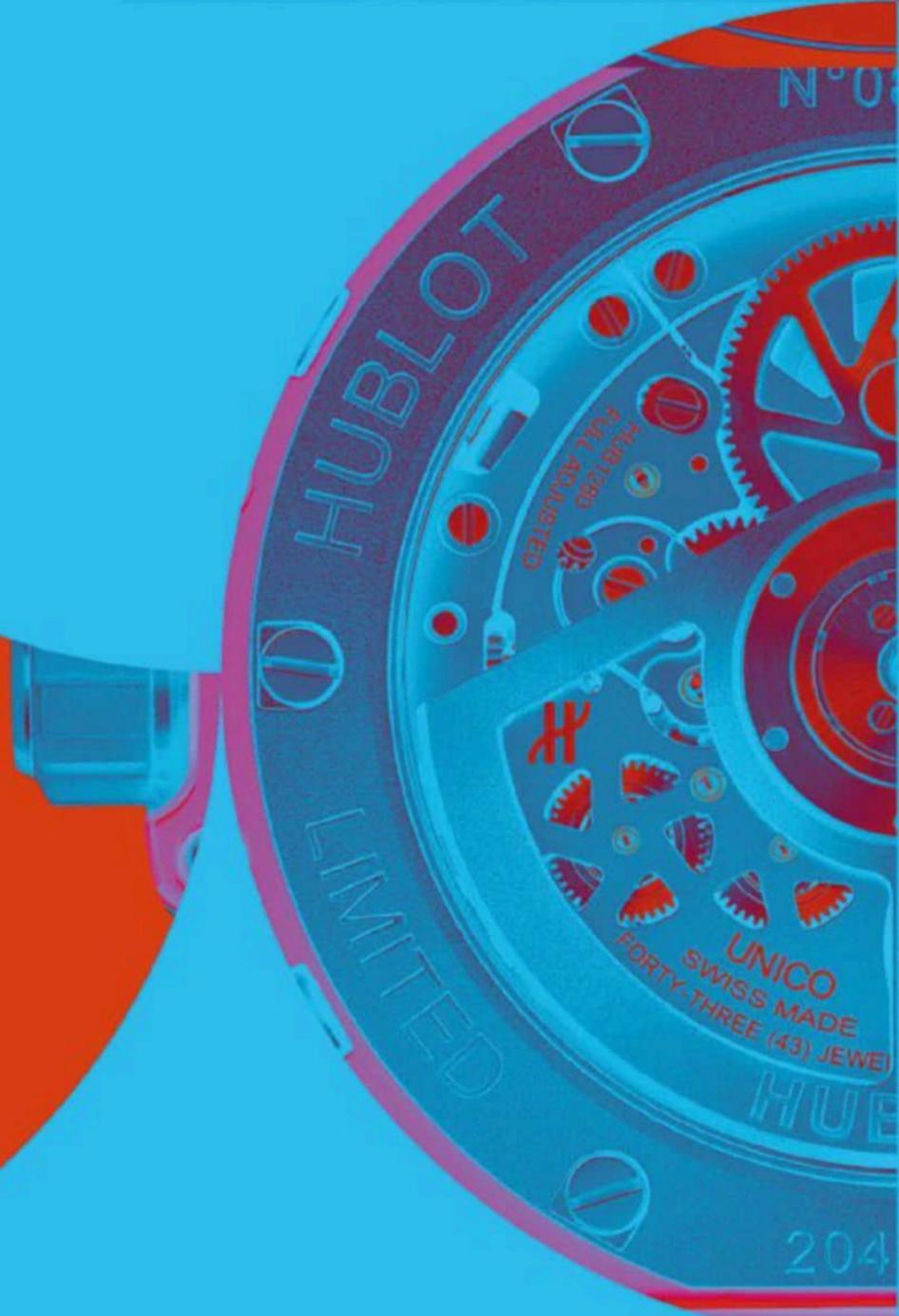


WIRED DESIRED

HAUTE HORLOGERIE

EXTRAORDINAIRE

Watches and Wonders through the eyes of WIRED Middle East.





Watch out!

Discover some of the finest examples of the watchmaker's craft from Watches and Wonders 2024.

By JEANNINE YAZBECK

This April, the Palexpo-Geneva opened its doors for the world's most anticipated watch fair. The annual rendez-vous at Watches and Wonders sets the time for the watchmaking world and brings together the biggest maisons from around the world. Setting the trends for the upcoming year, we saw a return to more classic and unisex proportions, the presence of bold colors and the use of interchangeable bracelets. Grand complications remain a focal point, while the use of métiers d'art showcases the intersection of watchmaking and decorative art.

↓Alpine Eagle 41 XP TT - Chopard

A contemporary sporty-chic collection with a pure design and sophisticated aesthetic, this year the Alpine Eagle series welcomes the Alpine Eagle 41 XP TT. The name of this new timepiece says it all: '41' referring to the diameter of the case; 'XP', for 'extra-plat' (ultra-thin), while 'TT' evokes the terms 'technical' and 'titanium' that are both strongly featured in the model's design. Providing full visibility across the entire intricate mechanical workings of the L.U.C Calibre 96.17-S, the 3.30-millimeter thick movement features subtly open worked components in an elegant play on contrasting materials and finishes, showcasing the finest expertise and innovation cultivated within the Chopard Manufacture.



↑Big Bang MP-11 Water Blue Sapphire - Hublot

The uniqueness of Hublot – a fully integrated Manufacture – lies in its technical excellence in terms of both the movement and its exterior”, says Ricardo Guadalupe, Hublot's CEO. The MP-11 is no exception, with its sculptural seven-baarrel movement and two-week power reserve. For 2024, Hublot added a new color: A radiant and translucent water blue. This new shade is based on a new chemical formula, a custom development, and an exclusive transparency index, yet it still boasts all the usual properties of sapphire: Brilliant, luminous, perfectly inalterable, and 100 percent resistant to knocks and scratches.

A CHALLENGING MACHINE

Fabrizio Buonamassa Stigliani of Bulgari talks to Wired about the complexities of watch design and the marvels he helps to create.

Despite their delicate appearance, fine details, elegance and the fact that we use them almost without thinking every day, watches are machines. Intricate, beautiful machines. Fabrizio Buonamassa Stigliani, a watch designer at Bulgari, understands this more than most – he spent the start of his career in the automotive industry, and has always relished embracing the roots of Italian design. “I definitely brought my love for mechanics and beauty into watchmaking,” he says. “In my opinion you also find the same “Italian-ness” and Italian approach or point of view in both industries,” he says.

Creating innovative designs is a fluid process at times, regardless of what you’re designing. Cars and watches have their own unique challenges, but the creative process often starts the same way, according to Stigliani. “An image, a feeling, a smell. I never really know – I am always inspired by many things, so it always depends,” he says.

“That’s how I start, and then I start drawing and sketching with ballpoint pens, fountain pens or on the iPad. Step-by-step, I start to imagine the product in my head, then I imagine the customer who wants to use and wear it. I see if it’s coherent with the brand and its image, and if through this product we can add value to the brand compared to what we already have. It’s hard to explain because it’s one of the most mysterious things in the world. You need something, and that’s why you try to find the idea,” he says.

While the process might be difficult to explain, the outcome is often exceptional – take the Octo Finissimo Ultra Cosc-Bulgari, for example. This stunning piece sets the bar in terms of high-end mechanical watchmaking. Setting a new record for its thinness, the timepiece has shaken up the world of watchmaking and proved that nothing is impossible.

Pushing all boundaries, this incredible machine is more than the world’s thinnest mechanical watch, it symbol-



Octo Finissimo
Tourbillon Automatic.



izes the ability to innovate and redefine the codes of Haute Horlogerie. At 1.70 mm thin, never has a mechanical watch this resistant to shocks been made so slim – thinner than a coin.

“The product that has a special place in my heart is the first Bulgari product when I arrived. The Serpenti Tubogas and Octo Finissimo, these two products totally changed the brand,” he says “It’s the opportunity to give the brand a shake and change the perception of the brand for watch collectors.”

Yet every watch has its challenges: “High end watches have a challenge in terms of stones and flexibility. The Octo Finissimo’s challenge is thickness [...] Every project is different,” Stigliani concludes.

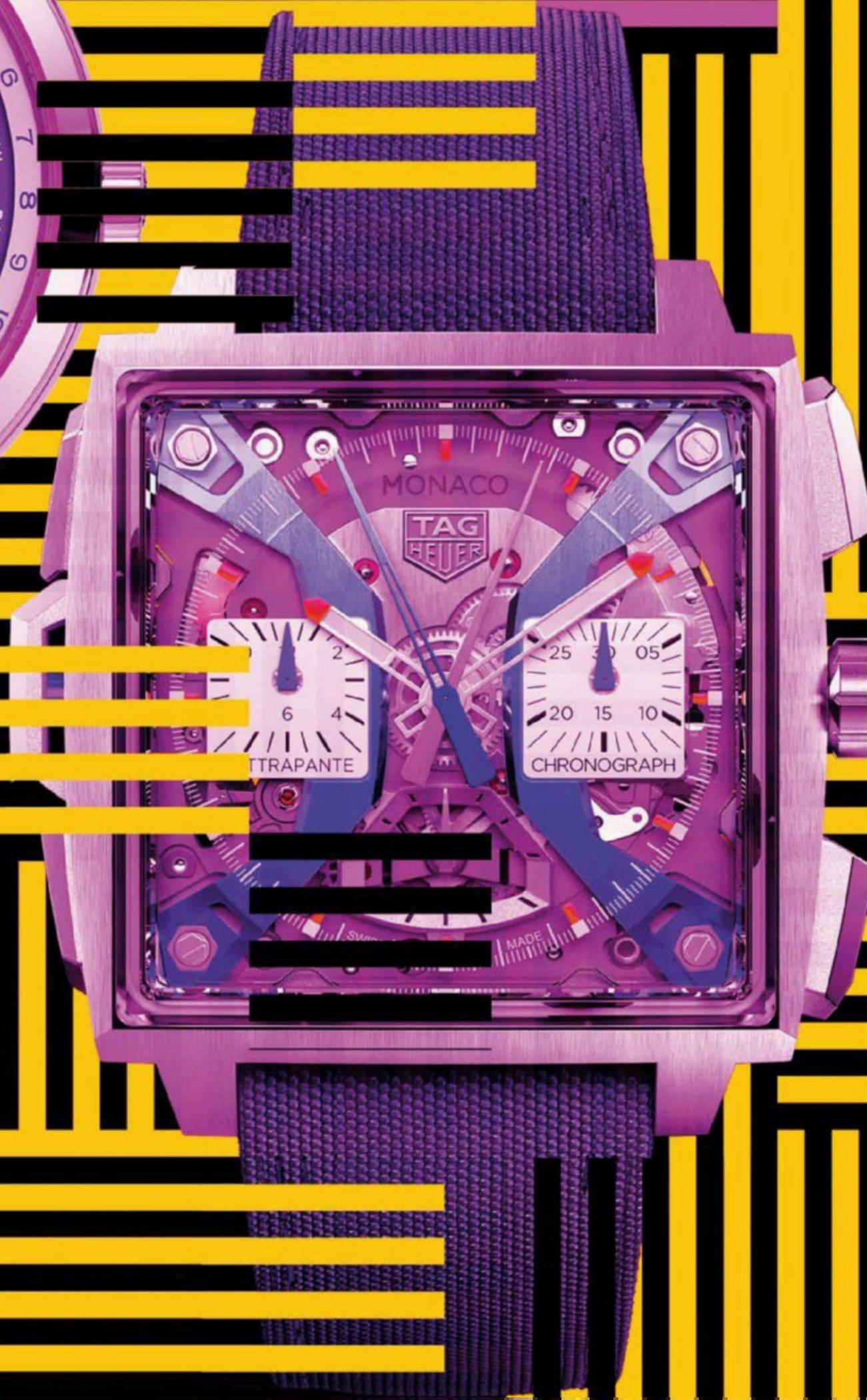


Octo Roma
Black.



Octo Finissimo
Automatique BVL 138
Sketch (rose gold).





↓ **World Time watch Reference 5330G-001 - Patek Philippe**

Patek Philippe's new generation of the World Time watch Reference 5330G-001 stands out for a patented world first: a date display synchronized with local time, a distinguishing feature and a new milestone in the history of the Patek Philippe. Launched as a limited edition at the Patek Philippe grand exhibition "Watch Art" held in Tokyo in June 2023, the Reference 5330 is now in the manufacture's regular collection. For this timepiece the manufacture developed a new movement, caliber 240 HU C, based on the caliber 240 HU ultra-thin self-winding movement that has fueled the World Time watches. A calfskin strap embossed with a denim motif, in blue gray with white hand-stitching, echoes the color of the dial. It is secured by a fold-over clasp in white gold.



↑ **TAG Heuer Monaco Split-Seconds Chronograph**

Celebrating 55 years of the Monaco collection, the TAG Heuer Monaco Split-Seconds Chronograph sets a new definition in the design. With a changed architecture and using light materials such as grade-5 titanium, the new timepiece weighs a mere 85 grams and achieves a singular appearance where sapphire crystal and transparency play a central role. At the heart of the TAG Heuer Monaco Split-Seconds Chronograph beats the new TH81-00 mechanical split-seconds chronograph caliber. Combining Swiss watchmaking craftsmanship with cutting-edge technology, the timepiece features a split-seconds function, also called a "rattrapante", a highly sophisticated and intricate mechanism that requires the most expert of watchmakers due to its complexity. Available in dynamic red and classic blue, the timepiece represents a noteworthy achievement in marrying tradition and innovation in the world of Haute Horlogerie d'Avant-Garde.



↓ **Santos de Cartier Dual Time - Cartier**

Featuring a mechanical movement with automatic winding combining two time zones, the Santos de Cartier Dual Time watch allows the wearer to track two different time zones at once without sacrificing reliability. Exuding elegance through its details, this steel version includes rhodium-finish sword-shaped luminescent hands, a seven-sided faceted crown and a grey counter showing a second adjustable time zone. Like all of Santos de Cartier collection, the timepiece embodies practicality in all its elements, including the bracelet. Offered in steel or leather, the bracelet can be interchanged using the patented QuickSwitch system, which seamlessly integrates into the case's architecture. Moreover, the metal bracelet can be adjusted to perfectly fit using tool-free SmartLink size adjustment system.



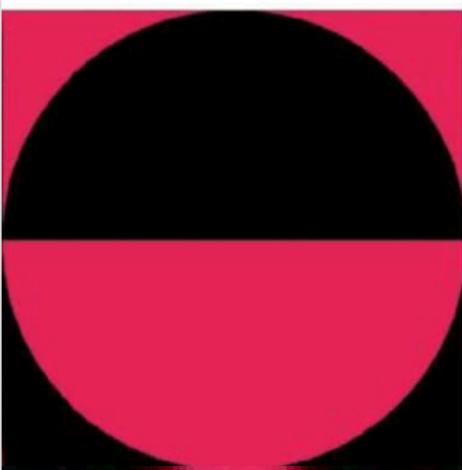
→ **Oyster Perpetual Rolex Deepsea - Rolex**

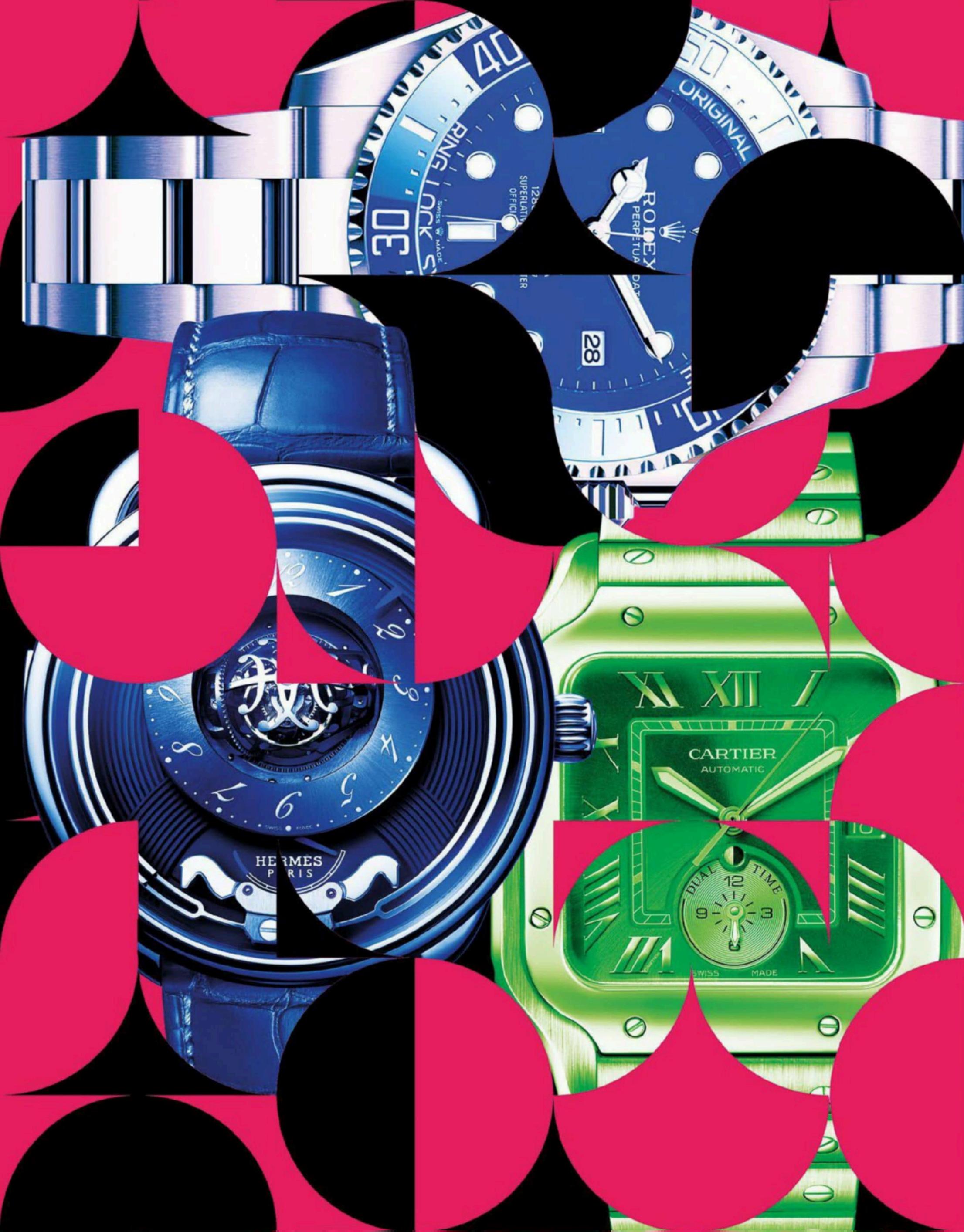
Engineered to dive into the ocean's depths, the new version of the Oyster Perpetual Rolex Deepsea in 18 ct yellow gold, features a blue ceramic Cerachrom bezel and a blue lacquer dial with the 'DEEPSEA' name in powdered yellow. This diver's watch includes a high-performance ceramic compression ring within the Ringlock system, enhancing its durability and waterproofness. It is equipped with the calibre 3235, a state-of-the-art movement, enabling the display of the date as well as the hours, minutes and seconds. The epitome of robustness and reliability, the 44 mm Oyster case of the Rolex Deepsea is guaranteed to be waterproof to a depth of 3,900 meters. The middle case is crafted from a solid block of 18 ct yellow gold. Its caseback, edged with fine fluting, is hermetically screwed down with a special tool that allows only Rolex watchmakers to access the movement. The Triplock winding crown, fitted with a triple waterproofing system, and protected by an integral crown guard, screws down securely against the case. All-in-all, the waterproof Oyster case provides optimal protection for the movement it houses.



↳ **Arceau Duc Attelé - Hermès**

A statement of harmony between the world of Haute Horlogerie and equestrian aesthetics, the new 43mm Arceau Duc Attelé features a central triple-axis tourbillon and the 'tuning-fork' minute repeater. This association is a first and is revealed at the heart of the watch. On the dial side, a sapphire dome tops the tourbillon and its triple mirror-polished titanium carriage shaped with interlacing double "H's", an echo to the ironwork adorning the lift in the original Parisian boutique at 24 Rue du Faubourg-Saint-Honoré. To enhance the visibility of this timepiece, claw-shaped hands appear around the rim of the chapter ring. Their blue hue complements the 48-hour power-reserve indicator appearing at the base of the dial. Hand-wound via the three o'clock crown, the Arceau Duc Attelé watch features the manufacture H1926 movement equipped with a high-frequency balance (5 Hz). The gears feature a cut-out design inspired by the wheels of the Duc Attelé: A canopy-top four-wheeled carriage drawn by two horses. 🐎









least 12 feet tall and encased in a sleek, wasp-like exoskeleton of porcelain white, sports a diminutive head.

The hotel itself presents as a white, modular structure, its parts seemingly snapped together right on the premises. As you enter through sliding glass doors, you're greeted by an anteroom adorned with countless bone-colored orchids.

Adjacent to this, a young female-looking android clad in a white tunic and bellhop cap, her black hair neatly side-parted, smiles. Nearby, there's an incongruous sight: A velociraptor, in bellhop attire, complete with a periwinkle bow tie and a cap, stands ready behind the check-in desk.

Stepping onto a marked floor mat, you're formally greeted by the velociraptor, which bows before inviting you to complete the check-in process via a touchscreen panel. After entering your details and receiving your room number, your attention is directed to a facial-recognition tower for keyless entry, a final step to authenticate your identity.

"Check-in is all finished," the process concludes. This interaction with robotic service at the hotel sparks a thoughtful examination of how human roles are shifting within the service sector, questioning the conventional importance of personal interaction and the growing reach of automation.

This strange setting began to take shape in the 1980s with the creation of

There's a certain genius in Japan's ability to balance the deep respect for tradition with an embrace of the future. So it comes as no surprise that on the shores of Nagasaki Prefecture, a large theme park dedicated to imperial Holland is the backdrop for the world's first hotel fully staffed by robots.

The name of the hotel, Henn-na, offers a playful double entendre that doesn't quite translate directly: On one hand, it means "Strange Hotel", and on the other, it echoes the Japanese word for "evolve". The name nods to a blend of novelty and the inevitable evolution in hospitality.

As you step into the hotel, you'll come across a towering robot sentinel, keeping watch just inside the door. This robot, at

Far left image: A humanoid robot replaces human staff at the check in counter. Left image: A view of the front of Henn Na Hotel in Ginza.

the Huis Ten Bosch in Nagasaki Prefecture. Described as a bold dream turned reality, the park stands as an ode to Japan's bubble-era ambitions, blending historical homage with savvy technological innovation.

At first glance, Huis Ten Bosch resembles a Dutch city, its sprawling, immaculate grounds dotted sporadically with tourists. Yet, its heart beats with a commitment to futuristic entertainment: Seismic adventures through historical floods, holographic concerts, digital interactive aquariums for children, 5-D experiences, and larger-than-life video games, all snapshots of a vision of tomorrow's fun.

Within this forward-looking paradise, the presence of robot porters, silently signposted, says a thing or two about the blend of tradition and innovation that defines not only the park, but also Japan's broader engagement with the future.

Back in the room, a laminated card positioned in front of the robot shows its name and provides guests with instructions about the time, weather, room temperature, and other services like lighting adjustments or setting a morning alarm. An illustration shows the guest how to soothe their robot friend into silence by gently rubbing its forehead.

Robo hotel

The hotel of the future is staffed by robots in the form of Japanese women, guards and velociraptors.

By Misbaah Mansuri



Left image: A small robot in each room controls lighting and other features by voice command; a robotic dinosaur replaces human staff at the check-in counter. Right: A robotic receptionist.



The room features a sleek control panel to easily switch off motion-sensing lights, meaning that the cluster of switches found in traditional hotel rooms is ditched for a design that simplifies guest interactions, amping up both convenience and efficiency.

When the lights are turned off, the only illumination comes from the subtle indigo glow of the motion detector embedded in the center of the ceiling. This faint light fills the room, creating an atmosphere akin to being enveloped in an odorless blue mist, further simplifying the environment and focusing on the essentials of guest comfort and

technological convenience aimed at redefining the traditional hospitality experience by integrating innovative solutions that prioritize ease of use and minimalistic design.

The robotic staff at the Henn-na Hotel are creations of Kokoro, a Tokyo-based company affiliated with Sanrio, the giant behind Hello Kitty. "Kokoro", translating to "heart", initially focused on crafting small entertainment robots and animatronic animals like pandas, tigers, and dinosaurs, which found their way into entertainment venues and museums. The company soon expanded into producing humanoid robots, including

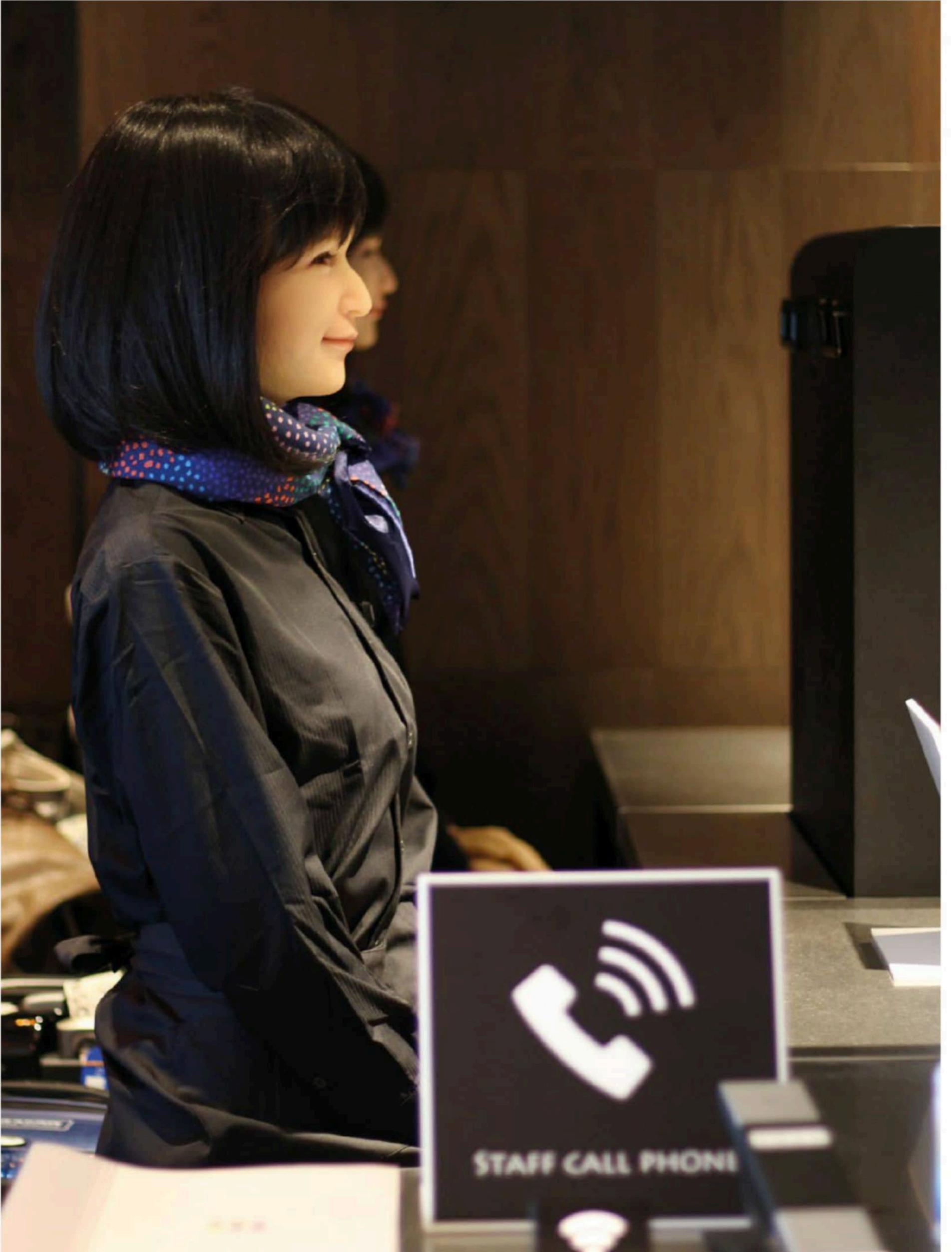
the Actroid series, which features the robot in the form of a Japanese woman that guests meet at check-in.

These Actroids, often deployed as interactive information booths, are designed for specific tasks rather than fulfilling broader roles. Kokoro's range includes unique models such as a professor, a "Beautiful Woman Robot," and even a dental patient robot, with some designed for research by leading figures like Hiroshi Ishiguro from Osaka University, whose work explores human-robot interaction.

The Actroid and velociraptor models serving at the Henn-na Hotel are tailored to the hospitality industry. The hotel's innovative approach to staffing was developed in collaboration with entities like HIS, the University of Tokyo, and Kajima Corp., and is aimed at enhancing efficiency and reducing labor costs without compromising the quality of the guest's experience.

Guidelines for the hotel's robot porters ensure a smooth interaction between guests and machines, focusing on safety and reliability in their service. Here, guests are reminded to keep follow closely, to avoid overloading the robots, and to understand the limit of their responsibilities.

Nagasaki's historical engagement with technology, from its pivotal role in introducing Western science to Japan to its industrial achievements and the tragic legacy of the atomic bomb, makes it a poignant location for the robot hotel. The city's complex relationship with technology, coupled with a commitment to peace and innovation makes it a fitting backdrop for the world's first robot hotel. 



The recent 2024 Richard Mille AlUla Desert Polo event was a resounding success, marking a significant milestone in AlUla's burgeoning sporting legacy. Over four exhilarating days, the event brought together international patrons, esteemed dignitaries, and top-tier athletes for an unforgettable experience at the AlFursan Equestrian Village.

AlUla, nestled 1,100 km northwest of Riyadh, stands as a testament to both natural wonder and human history. Encompassing a sprawling 22,561km², it boasts a diverse landscape featuring verdant oasis valleys, imposing sandstone mountains, and ancient cultural sites tracing back millennia to the times of the Lihyan and Nabataean kingdoms.

Among its treasures, Hegra emerges as a jewel, earning the distinction of being Saudi Arabia's inaugural UNESCO World Heritage Site. Spanning 52 hectares, this ancient city served as the primary southern stronghold of the Nabataean Kingdom.

Recent studies suggest Hegra's significance extended further, possibly as the

southernmost bastion of the Roman Empire following their conquest of the Nabataeans in 106 CE. Beyond Hegra, AlUla boasts the storied remnants of Dadan, the erstwhile capital of the Dadan and Lihyan Kingdoms. Completing AlUla's tapestry of antiquity is Jabal Ikmah, a sprawling open-air library adorned with hundreds of inscriptions, each a testament to the region's rich cultural and historical legacy.

After four days of competition watched by international patrons, royal dignitaries, and the world's best players, celebrity audiences and sports fans enjoyed a grandstand finish. Team Saudia emerged victorious, claiming the coveted Desert Polo trophy in a fiercely contested final against Richard Mille, winning 9-5. Led by Sayuu Dantana, Melissa Ganzi, and polo legend Adolfo Cambiaso, Team Saudia showcased their prowess on the field, captivating audiences and enthusiasts alike. The event culminated in a spectacular display of skill and sportsmanship, with teams from AlUla and Tamyra securing third and fourth place, respectively.

The 2024 Richard Mille AlUla Desert Polo was hailed as a 'magnificent' affair, offering a unique experience for all participants. From the electrifying matches to the cultural festivities, the event showcased the rich heritage and hospitality of AlUla, leaving an indelible impression on guests and spectators. "We're incredibly proud to have hosted the third edition of Richard Mille

AlUla Desert Polo – it was a brilliant occasion for everyone connected," said Ziad AlSuhaybani, Chief Sports Officer, Royal Commission for AlUla (RCU). "The on-field competition was magnificent and players, visitors, and media alike really enjoyed a unique experience – one exclusive to AlUla that can't be found elsewhere else on the international polo circuit."

Richard Mille's partnership with the AlUla Desert Polo is an underscoring of the brand's commitment to excellence in sports and events. With a storied history of collaborating with premier sporting tournaments worldwide, Richard Mille continues to elevate the profile of polo and equestrianism on the global stage. The brand's support has been instrumental in the success and growth of the AlUla Desert Polo, which doubled the number of teams playing this year to eight – AlUla, Richard Mille, Saudia, SAB, Bentley, Dadan, Kaybar and Tayma–, paving the way for future collaborations and milestones.

Looking forward, AlUla has plans to expand and enhance the tournament in the years to come and remains dedicated to fostering community engagement, promoting heritage sports, and showcasing its rich cultural heritage to the world. From the revamped AlUla Tour to the upcoming Custodian of the Two Holy Mosques Endurance Cup, AlUla continues to captivate audiences with its diverse array of events and experiences.

AlUla Moments serves as the

Raw talent and ancient beauty

The Richard Mille AlUla Desert Polo event was a roaring success in Saudi's stunning UNESCO World Heritage Site.

By **Nadine Kahil**





The event brought people together to celebrate sports and the stunning sights of AlUla.

epicenter of events in AlUla, offering a diverse calendar of festivals and celebrations throughout the year. From art and culture to wellness and equestrian activities, AlUla Moments celebrates the rich history and vibrant culture of AlUla, inviting visitors to explore its ancient wonders and hidden treasures.

Faisal Bin Dowees, CEO of the Saudi Polo Federation said of the event, “The tournament has been very well received by a local community whose historic ties with horsemanship and heritage sports date back thousands of years. Throughout this time, polo and equestrianism have remained

immensely popular and looking to the future, Richard Mille AlUla Desert Polo is sure to be a catalyst for inspiring up-and-coming generations to participate and compete.”

The 2024 Richard Mille AlUla Desert Polo event was a fantastic celebration of skill, teamwork and sporting excellence and a wonderful advertisement for AlUla. AlUla seems set to continue to offer remarkable experiences set within a stunning natural environment and collaborations with companies such as Richard Mille offer unique, international opportunities to put the region, and Saudi Arabia in the spotlight. 🏆

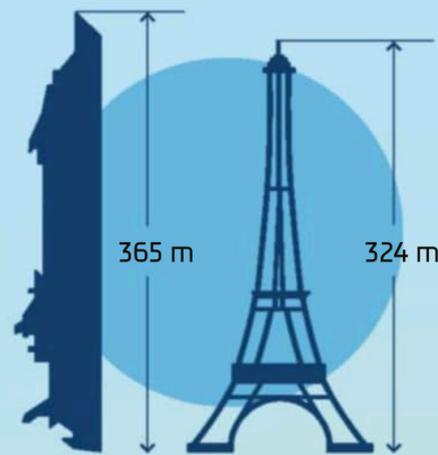


Green seas

How a sketch on a napkin revolutionized sustainable cruising.

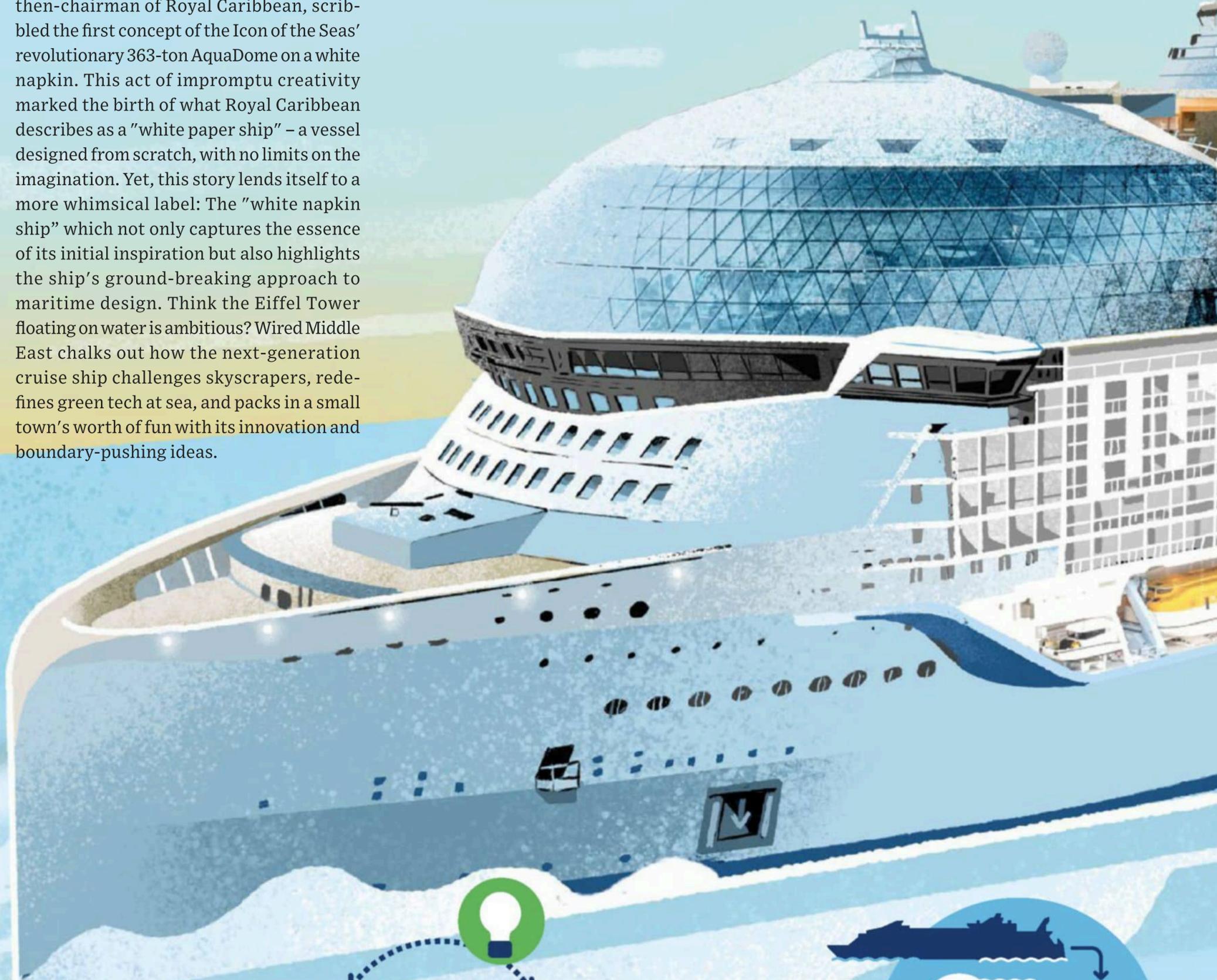
By Misbaah Mansuri Illustration Luis Vazquez

It was just another moment of spontaneous inspiration when Richard Fain, the then-chairman of Royal Caribbean, scribbled the first concept of the Icon of the Seas' revolutionary 363-ton AquaDome on a white napkin. This act of impromptu creativity marked the birth of what Royal Caribbean describes as a "white paper ship" – a vessel designed from scratch, with no limits on the imagination. Yet, this story lends itself to a more whimsical label: The "white napkin ship" which not only captures the essence of its initial inspiration but also highlights the ship's ground-breaking approach to maritime design. Think the Eiffel Tower floating on water is ambitious? Wired Middle East chalks out how the next-generation cruise ship challenges skyscrapers, redefines green tech at sea, and packs in a small town's worth of fun with its innovation and boundary-pushing ideas.



Scale and comparison

The Icon of the Seas measures 365 meters, surpassing the height of the Eiffel Tower laid on its side and approaching the original World Trade Center towers in height, which stood at 417 and 415 meters tall, not including antennae, making the ship comparable in size to some of the world's most recognizable landmarks.



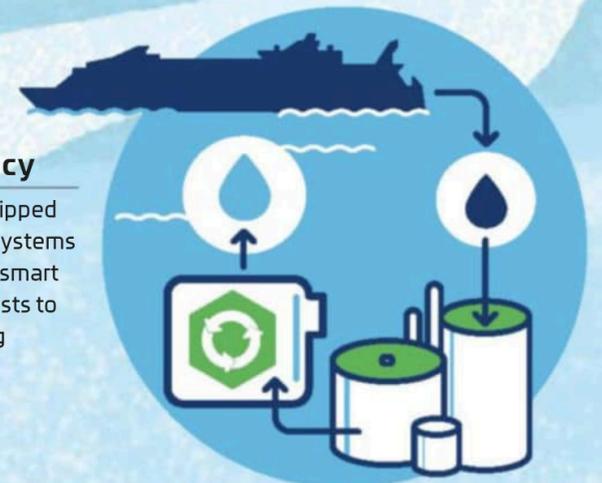
Waste management and water treatment

The ship features advanced waste management and water treatment systems, ensuring sustainable processing and the treatment of waste onboard.



Energy efficiency

Icon of the Seas is equipped with energy-efficient systems like LED lighting and a smart HVAC system that adjusts to occupancy, minimizing energy use.





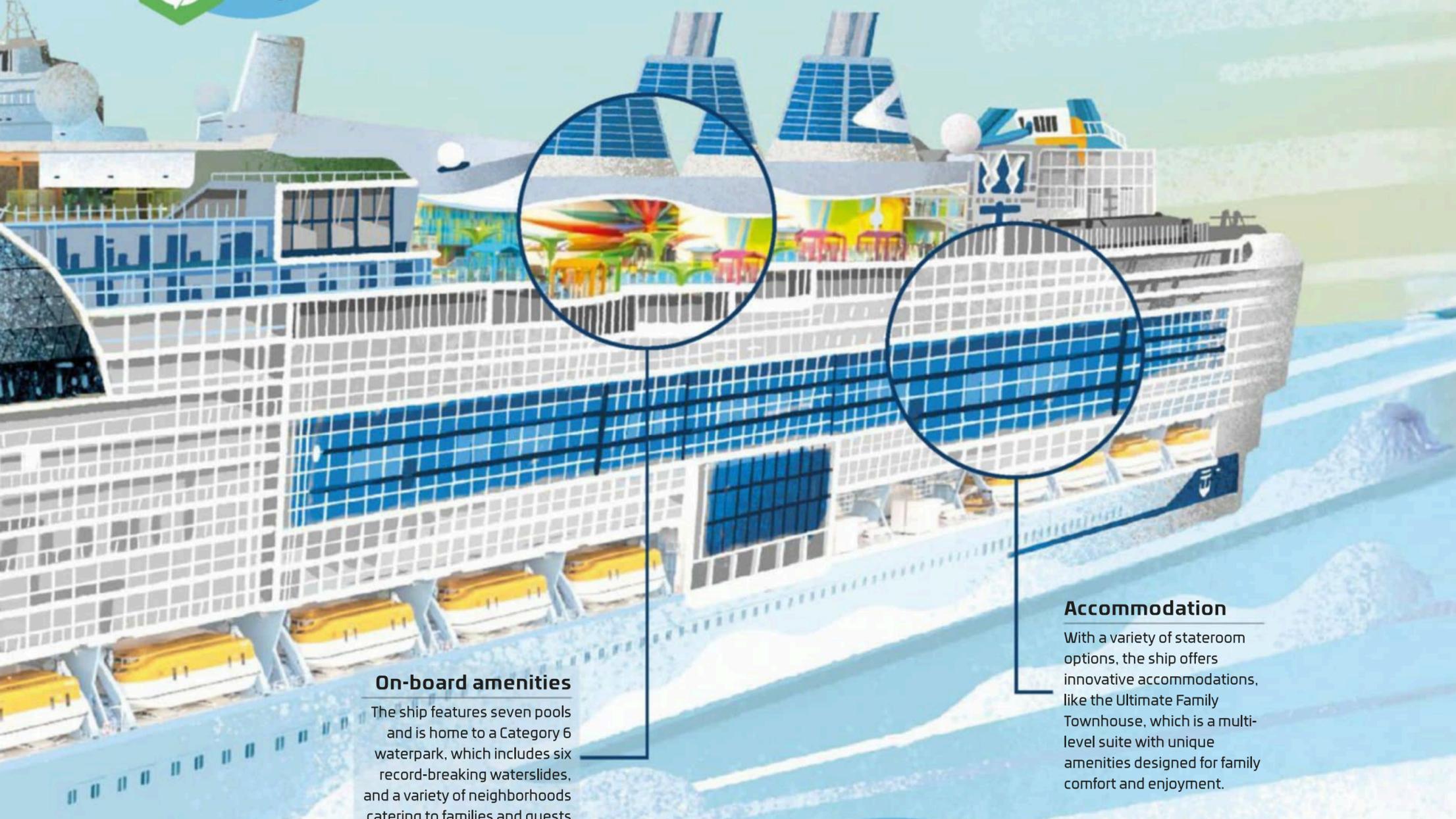
Eco-Friendly construction

During its construction, the Icon of the Seas employed eco-friendly materials, including low-emission paints and sustainably sourced woods.



Passenger capacity

It can host up to 7,600 passengers with a crew of 2,350, making it akin to a small town at sea. The ship contains 20 decks, seven pools, and claims the largest waterpark of any cruise ship.



On-board amenities

The ship features seven pools and is home to a Category 6 waterpark, which includes six record-breaking waterslides, and a variety of neighborhoods catering to families and guests of all ages.

Accommodation

With a variety of stateroom options, the ship offers innovative accommodations, like the Ultimate Family Townhouse, which is a multi-level suite with unique amenities designed for family comfort and enjoyment.

Sustainability and power

The vessel is powered by LNG, a cleaner alternative to traditional fuels, significantly reducing emissions. The ship also employs advanced waste heat recovery systems, utilizing shore power connectivity to eliminate emissions while docked.





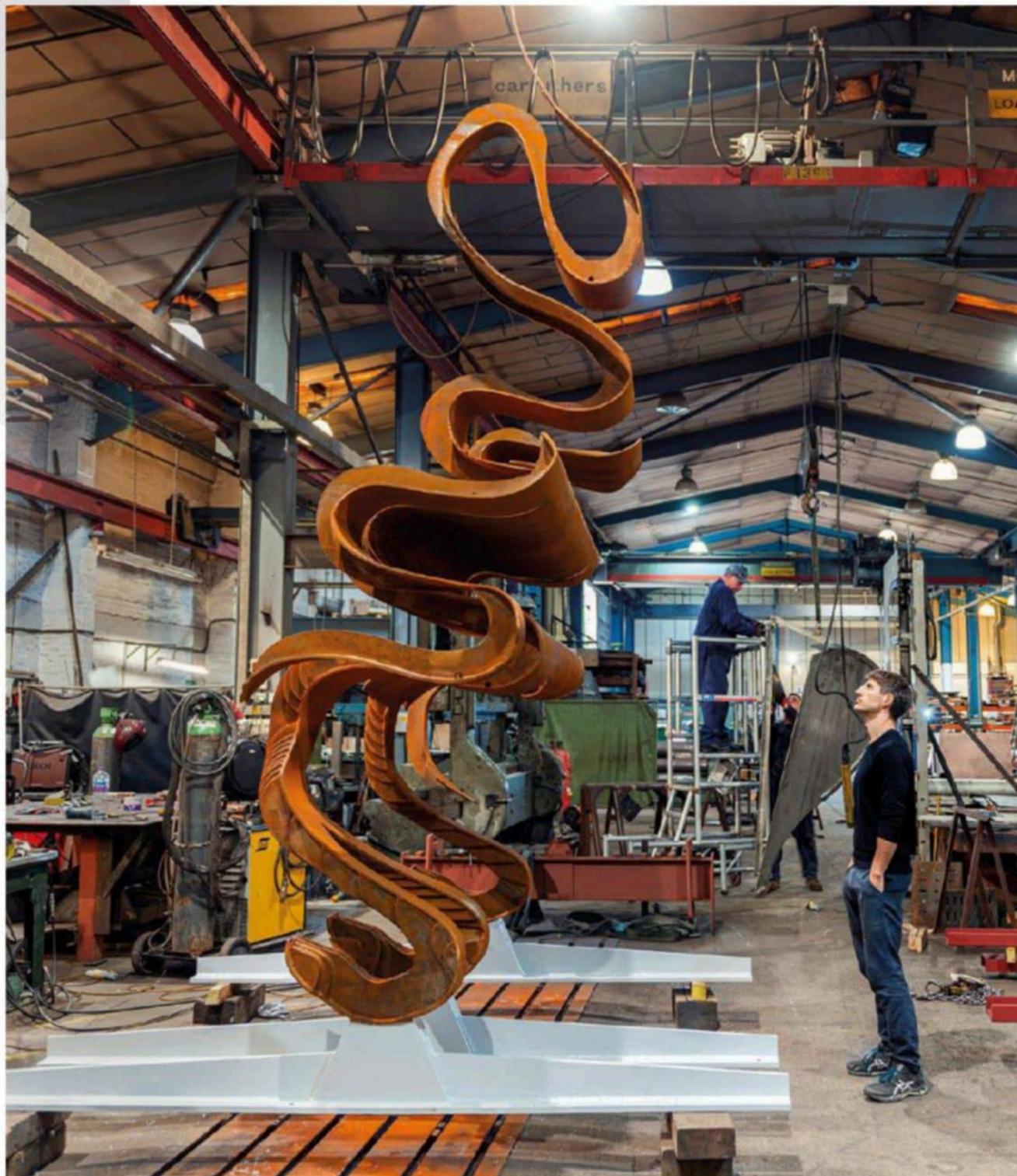
You can get a crash course in Nick Hornby's work over the course of an hour-long London walk. The artist has three permanent sculptures installed across the city, metal silhouettes that start off familiar but change with your vantage point. In St. James, his conquering equestrian, modeled on Richard I, becomes an amorphous squiggle as you circle; in Kensington, his take on Caspar David Friedrich's Wanderer turns abstract; and a bust of Nefertiti doubles as the Albert Memorial.

Raising questions about power and the role of the monument, the trio are a clever combo of craft and concept. But they're also feats of digital innovation. The equestrian, for example, started out as a digital model scripted in Python. It was then unrolled into individual components to be laser-cut from metal, then assembled by fabricators. "It was a lovely, seamless relationship between concept, digital processes and mechanical fabrications—165 pieces manipulated into the six-and-a-half-ton object," says Hornby, from his studio in north-west London. "But when people look at it, they don't see that at all."

Modern art is a matter of perspective

Nick Hornby's computer-modeled transforming sculptures bend both brains and artistic license.

By **Allyssia alleyne**



"I like to think that one of the distinctive features of my work is its ambition to capture the imagination of anyone, not limited to the art world; to try to address complicated ideas in plain English. Anyone will recognize the trope of the man on the horse, and will have a reaction to how I have manipulated it."

This kind of technical-conceptual wizardry is Hornby's calling card. Favoring the screen over the sketchpad, he uses 3D modeling as the foundation for abstract sculptures that reference the art-historical canon and challenge notions of authorship—contorted mashups of works by Hepworth, Brancusi, Rodin and more. One series of sculptures takes



“ما يميز أعمالي هو قدرتها على إثارة مخيلة الجميع وكسر القيود المفروضة على عالم الفن.”

“A distinct feature of my work is its ambition to capture the imagination of anyone, not limited to the art world.”

the profile of Michelangelo’s David and extrudes it to a single point, legible only from an angle.

He started young, creating life-size terracotta figures in school while his classmates labored over simpler pots. “But then I went to art school, and it was like, I didn’t want to do pastiches of Rodin. I wanted to be part of the future. I wanted to be innovative,” he says. “So I jumped on technology.”

At the Slade School of Fine Art in London, where he enrolled in the late 1990s, Hornby thrived in the new. There were forays into video; a semester at the Art Institute of Chicago, where he joined the artist-hacker collective Radical Software/Critical Artware; and musical experiments with MAX MSP, the object-oriented programming language employed by Radiohead in the early 2000s. But it was only after pursuing a Master’s in his thirties that his career took its current shape.

“I actually had quite a radical sea-change in my relationship to tech,” he says. “I got quite frustrated by people saying, ‘Wow, that’s really cool. How did you do it?’ because I find that question really boring. I’m much more interested in the question, ‘What does it mean?’” So, in the last decade, Hornby has eliminated “any form of human subjectivity,” he says. The wires and screens were obscured, the rough edges erased with laser precision. All the better to invite questions of substance rather than process.

But now Hornby feels his focus shifting again. “I thought that the reason I had been embracing this perfect digital realm was for rigorous conceptual questions around authorship. But when I turned 40, I came to realize that there was no visibility of me in my work at all. I’d eliminated myself,” he says. It’s something, on reflection, he ties in part to ambivalent feelings about his own identity. “I only realized 15 years later that I had been systematically erasing my subjectivity because I didn’t feel that my opinion—and who I really was—was valid, legitimate, or something that I was willing to reveal.”

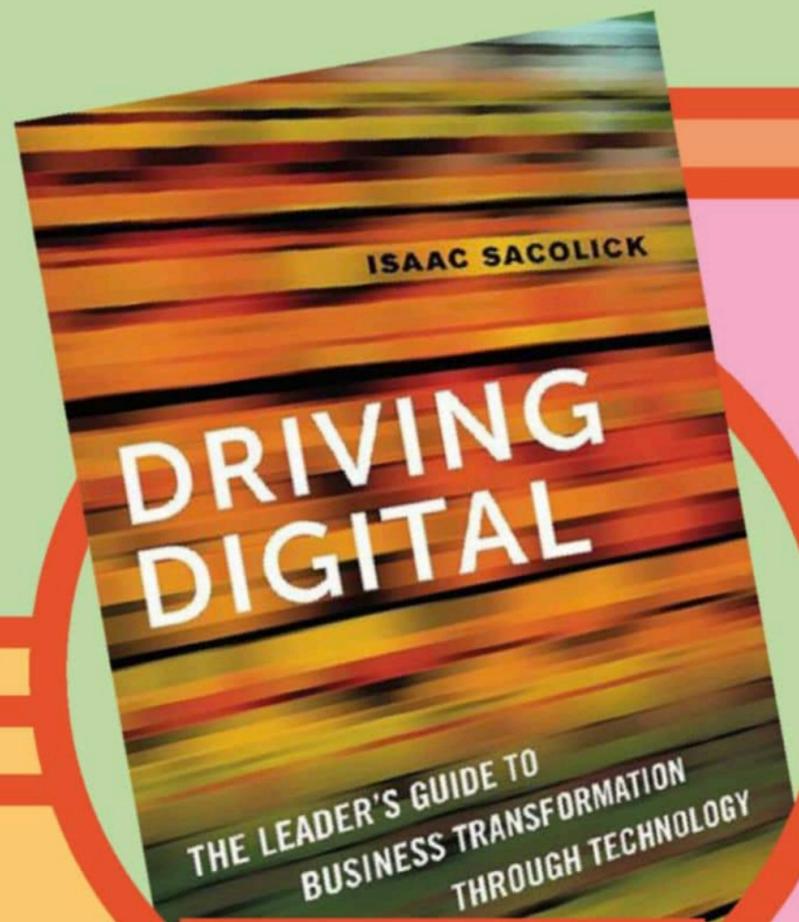
After a decade reckoning with the canon, he’s ready to insert himself into the work. A glimpse of this new stance comes through in a recent series of fiberglass sculptures wrapped in the liquefied photos of old friends using a technique called water transfer-printing. (He started the work in 2020, during a month in which he turned 40, and ended a long term relationship). Finally, after three years largely spent coordinating the creation of three colossal monuments, Hornby is eager to level up his hands-on technical skills.

“I’ve been so enmeshed in production, making things, realizing projects, that I haven’t had very much time to experiment and play,” Hornby says. Now, there’s time to get his parametric design and 3D-modeling skills up to scratch, to find new ways to combine his established processes (water transfer-printing on bronze?), and to investigate new tech on his radar. There have already been some experiments with generative AI, which Hornby finds “intoxically exciting, exhilarating, and terrifying.” “Watch this space,” he says. “I’m just at the beginning of my career.”



ما يجب عليكم قراءته

Books to sink your mind into.



Driving Digital: The Leader's Guide to Business Transformation Through Technology
Isaac Sacolick

Learn how to spearhead digital transformations successfully with insights from Isaac Sacolick. This guide helps navigate leaders through the complexities of digital enterprise, offering strategies for formulating plans, driving cultural change, and maximizing ROI. It's a roadmap for embracing digital disruption and propelling your business into the future.

Spoon-Fed

Why Almost Everything
We've Been Told
About Food is Wrong
Tim Spector



Spoon-Fed: Why Almost Everything We've Been Told About Food is Wrong

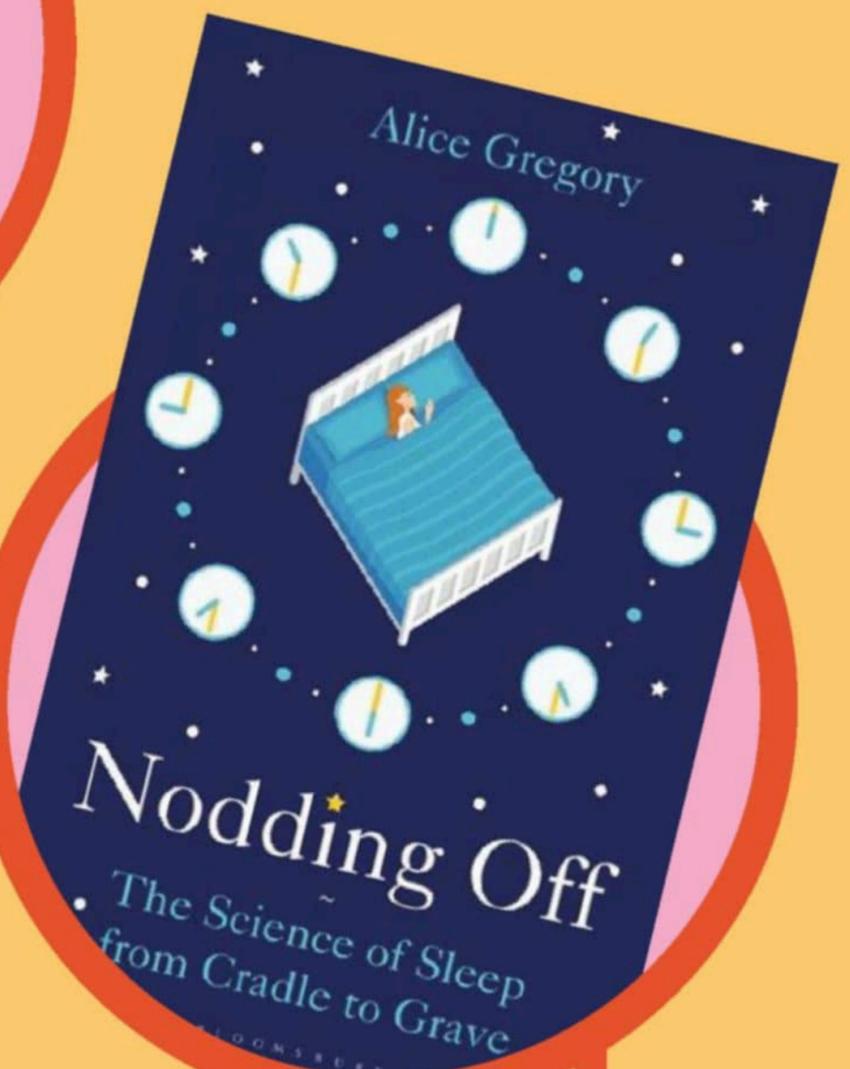
Professor Tim Spector

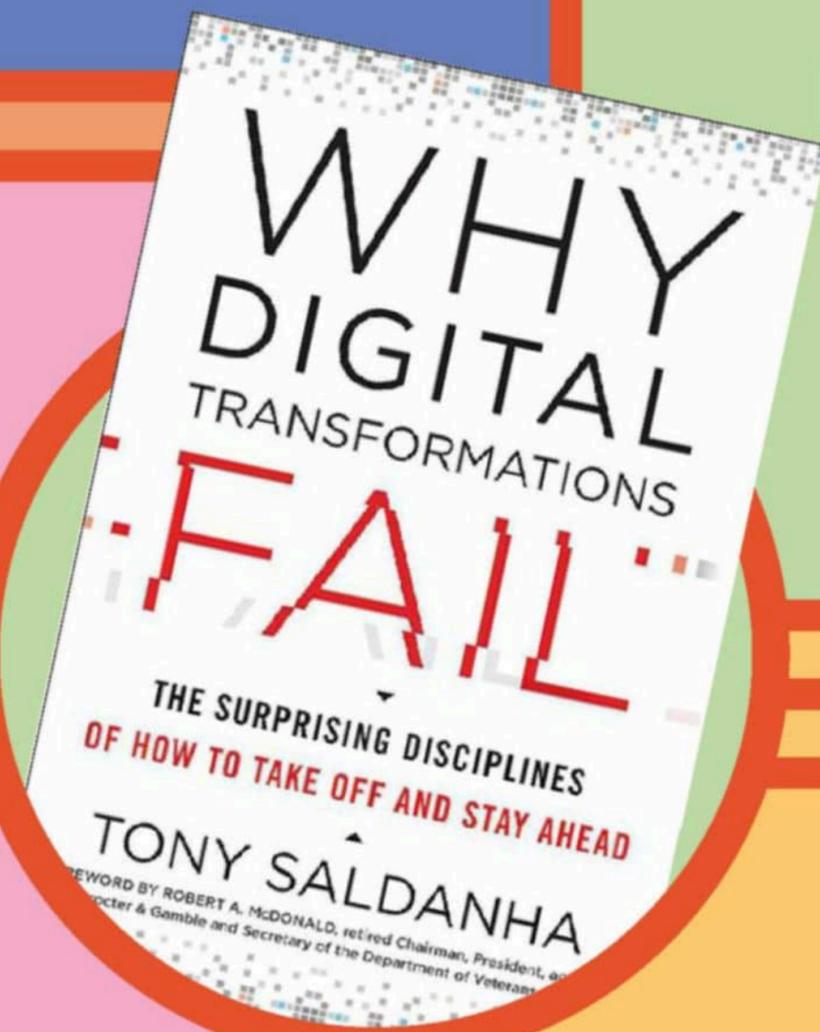
Professor Tim Spector challenges conventional wisdom about nutrition, debunking myths and highlighting the influence of the food industry on research. From vitamin C to diet drinks, he encourages readers to question beliefs and advocates for unbiased scientific inquiry in the field of nutrition.

SETTING THE RECORD STRAIGHT

Nodding off: The Science of Sleep from Cradle to Grave
Alice Gregory

Alice Gregory delves into the science of sleep, exploring its purpose, psychology, and barriers to quality rest. Drawing from research and personal anecdotes, Gregory offers insights into sleep disorders and potential remedies. It's a comprehensive guide to understanding and improving sleep habits at every stage of life.

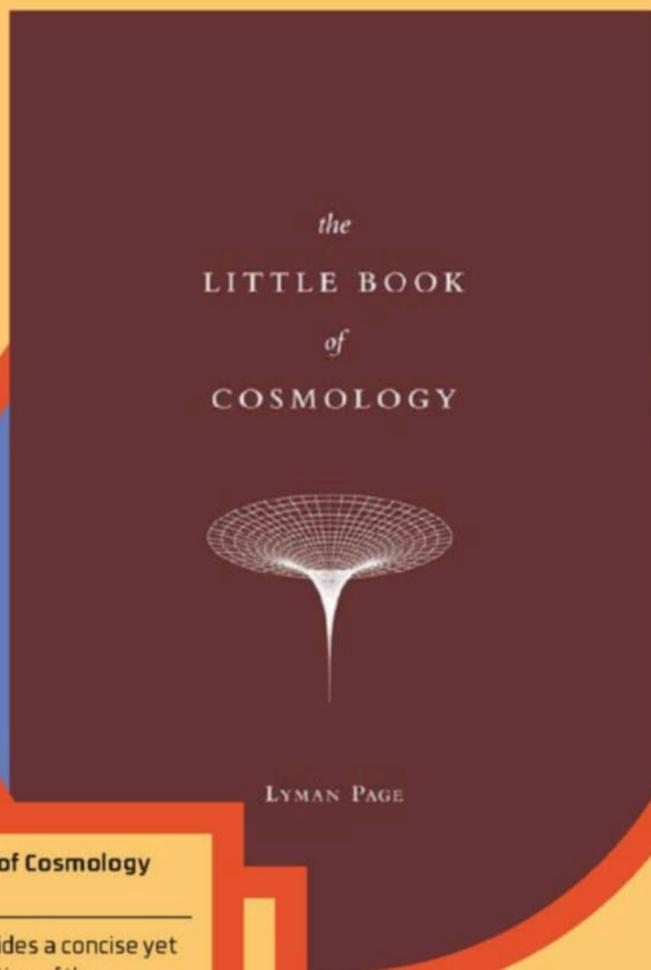




Why Digital Transformations Fail: The Surprising Disciplines of How to Take Off and Stay Ahead
Tony Saldanha

Tony Saldanha unveils the secrets to successful digital transformation, revealing a proven five-stage model. Drawing from extensive experience at Procter & Gamble, Saldanha demystifies the process, addressing common pitfalls while offering a disciplined approach to innovation.

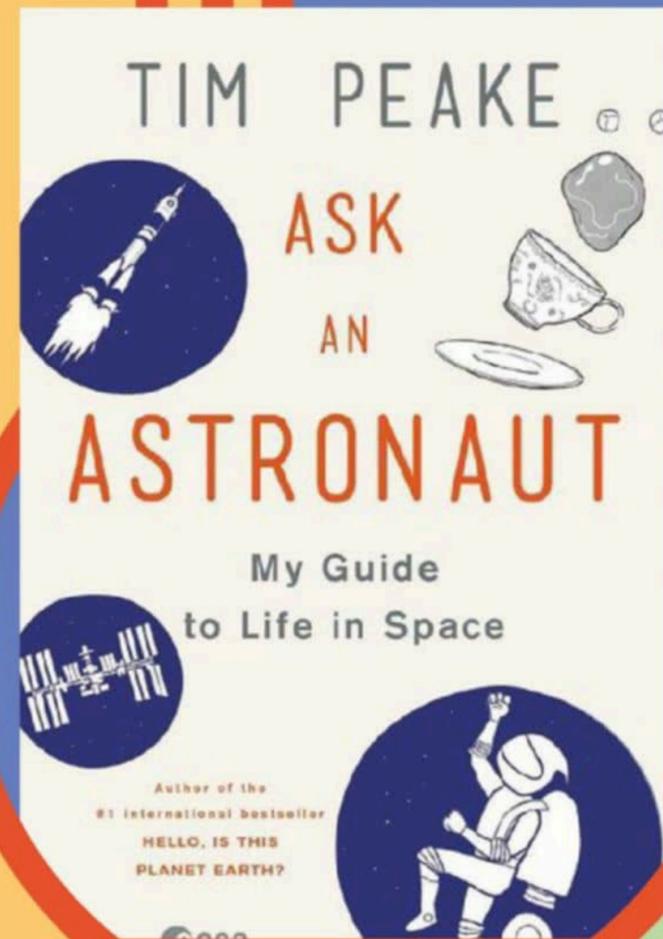
GOING DIGITAL



The Little Book of Cosmology
Lyman Page

Lyman Page provides a concise yet insightful exploration of the universe's mysteries, focusing on the cosmic microwave background and the composition of the universe. Accessible to readers with basic physics knowledge, this book offers a captivating overview of current cosmological understanding in a compact format.

UNDERSTANDING SPACE



Ask an Astronaut: My Guide to Life in Space
Tim Peake

Tim Peake takes readers on an extraordinary journey through space exploration, life on the ISS, and the challenges of re-entry. With engaging illustrations and a Q&A format, Peake demystifies space travel, making complex topics accessible to readers of all ages. It's an inspiring exploration of life beyond Earth's atmosphere.



SAMEERA MOUSSA

If you've ever gotten an X-ray, you might owe it to the efforts of an Egyptian scientist. Sameera Moussa (who was notably the first female Egyptian nuclear physicist) once famously said, "I'll make nuclear treatment as available and as cheap as Aspirin." Born in 1917, Moussa's groundbreaking work in nuclear physics was crucial to the advancement of medical imaging technology, making X-rays more accessible and affordable for patients. Not only did she pave the way for improved medical diagnostics, but she also inspired future generations of women to pursue careers in science and healthcare. Moussa's legacy is often overshadowed by her mysterious death. After receiving an invitation to dinner, her driver suddenly swerved the car off the road and jumped out as it plummeted off a cliff, killing Moussa under very suspicious circumstances in 1952, at the age of 35. 🏛️



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John Rawlings, May 15, 1954, Vogue

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