RECONNAISSANCE
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Holograms to Maintain Growth in 2023

Commercial holograms will maintain robust growth in 2023 despite the global challenges, says Dr Paul Dunn, chair of the International Hologram Manufacturers Association (IHMA).

Authentication and track and trace systems, which feature holograms, will continue to help to underpin international efforts by government and law enforcement agencies to bolster overt and covert protection strategies in the next 12 months, he said.

Dr Dunn sees fake COVID cards, documents and vaccines also remaining a big security threat in the months ahead, so government, law enforcement authorities and global supply chains must consistently review their anti-counterfeiting plans and investment in security resources.

He said: 'Counterfeiting is and will remain a massive global threat, continually placing governments, brands and the public at risk – and will continue to be tackled effectively to minimise the impact on society. Despite the economic, social and global supply chain challenges, we expect to see growth in 2023 with countries enhancing and bringing forward their anti-counterfeiting plans which feature holograms.

'These holograms will become even more integrated with other technologies to create intuitive brand engagement programmes while simultaneously, authentication through scanning a QR code on the label acts as a secondary product verification method. This provides a simple unified platform for brands to interact and engage with their customers.'

Dr Dunn also sees the hologram on labelling continuing to become part of a wider function to track a product throughout its life, and post-life, cycle in 2023. This combination of authentication and tracking will give brand owners complete visibility and control from sourcing raw materials through to recycling.

This year will also see continued growth in high security print applications as increasingly, holography origination capabilities are brought in-house. This cuts the innovation cycle and enables printers to get their technologies specified for new banknote work.

He also sees ID document producers similarly adopting hybrid optical technologies to protect against fraud: 'I expect the trend of using colour personalisation and optically variable image devices to protect the secondary portrait on ID and travel documents to continue through 2023 as the threat of portrait morphing becomes more common.'

Sustainability will also be one of the key themes of the next 12 months, with manufacturers developing strategies to cut carbon footprint as part of their corporate responsibility strategies. 'The IHMA will be leading efforts through its Sustainability Working Group to encourage best practice by sharing information and showcasing companywide initiatives,' he said.

The next 12 months mark the 30th anniversary of the foundation of the IHMA. Although itself impacted by the global challenges in recent years, Dr Dunn sees 2023 as a year for growth and development on the back of the organisation's re-brand. This features a new logo and website improvements with a focus to expand the opportunities for membership among converters and equipment suppliers, as well as producers.

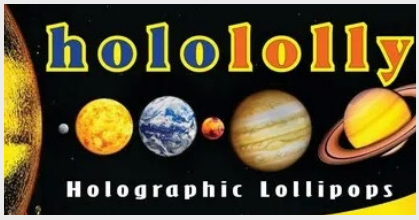
IHMA
International Hologram Manufacturers Association

Hololollly Launches Line of Edible Holographic Lollipops

Based in Stafford (UK), and distributed through a US facility, Hololollies are lollipop candies made with hologram technology. Each Hololollly candy is laser etched with stars, skulls or other images creating an illusion that seems to leap out at the viewer. The lollies are safe to eat, with no dyes, colourings, or additives in the holograms.

According to Hololollly, the makers of the holographic lollipops, the line of edible, holographic lollipops are as dazzling to look at as they are delicious to eat. Created with safe, cutting-edge laser etching technology, the holographic candies are the creation of holographer, Robson Bowman.

Using simple ingredients – including tooth friendly Isomalt which is favoured by dentists over regular sugar – the initial launch of Galaxy themed lollipops conjure the night-sky to showcase a starburst of diffractive space colours.



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Continued on page 3 >

Disney's Still Curious About Holograms

By Francis Tuffy, Editor

It shouldn't come as any surprise to anyone who has seen Disney movies such as 'Ralph Breaks the Internet[1]' or visited any of their theme parks that the corporation takes holograms – both physical and digital – very seriously. The love affair between Disney and holograms goes back more than 40 years and shows no sign of breaking up.

In his interview with Holography News® (HN April 2022), Chris Rich, CEO of WaveFront Technology Inc, attributed his fascination with holography to a holiday visit to a Disney theme park. 'I was on vacation at Walt Disney World's EPCOT centre in 1983 and saw a large-scale stereogram by Craig Newswanger (Advanced Dimensional Displays) and I knew right there I wanted to have a company involved in making holograms'.

Craig, who had worked in the 'Illusioneering' (to complement Imagineering) department of Walter Elias Disney (WED) Enterprises, went on to form Advanced Dimensional Displays with partner Chris Outwater, and then became director of optical engineering at Zebra Imaging.

Big is beautiful

Disney's use of holographic imaging is, I believe, linked to the magical and illusionary feel you get when viewing a hologram. In the corporation's mission to 'entertain, inform and inspire', holography provides a way to hold the viewer's attention with big, visual-field-filling light that begs the question, 'how to they do that'?

Research at Disney to make 'bigger' holograms continues in collaboration with the University of Cambridge (UK) (see HN April 2022). The work has resulted in a holobrick proof-of-concept, which can tile holograms together to form a large seamless 3D image.

This is the first time this technology has been demonstrated and opens the door for scalable holographic 3D displays. The results are reported in a paper titled 'Holobricks: modular coarse integral holographic displays' in the journal Light: Science & Applications[2].

The goal of the research is to generate both a large-size and wide-viewing-angle holographic display that uses a spatial light modulator (SLM) to present a holographic fringe pattern of sufficiently large space-bandwidth product (SBWP) – the product of fringe pitch and modulation area.

To put the task into perspective, for a 2D full HD display the information data rate is about three gigabits per second (Gb/s), whereas a 3D display of the same resolution would require a rate of three terabits per second (Tb/s), which is currently not available.

Bigger is more beautiful

To promote the highly anticipated sequel, 'Avatar: The Way of the Water', Disney unveiled the film trailer through a holographic projection experience in Niagara Falls State Park, just in front of the falls.

The 60 ft-wide projections offered imagery from the movie with the help of 4K projectors and a lighting truss holding a 60 ft by 30 ft translucent screen. When an image was projected onto it, the translucent material reflected the light, thereby creating the hologram effect. The projections were supported by 600 drones flying over the falls that were programmed to display 'Avatar' iconography. Each drone was equipped with LED lights that changed colours as they animated the film imagery and logo.

Patents

Over the years, Disney has filed a stream of patents that involve holographic technologies for their theme parks, special effects and movies. In 2020 alone, Disney filed four patents[3] that merged data acquisition, sensors, avatars and displays with holography.

Each of the patents focuses on a different aspect of how to make a 3D display more realistic or interactive, through visual and haptic senses. In choosing the technologies to research, Disney always has a clear idea of where the holograms will be viewed so that, for instance, you could imagine its patent 'Display System for Producing Daylight-Visible Holographic or Floating 3-D Imagery' will be used to entertain customers as they wait in a queue to get onto a ride in one of the Disney theme parks.

Security print

The ability of holograms to catch and hold the attention of the viewer is not only useful while queuing for a theme park ride, but also to improve the casual inspection of banknotes.

In 2020, The Walt Disney Company was one of the finalists in The Excellence in Currency Technical Awards in collaboration with the Reserve Bank of Australia. The projection-based image feature combined caustics and micro-lens arrays to create a feature that caught the collective eyes of the judging panel (see ABN January 2022).

Caustics is a field of optics that explores the envelopes of light rays produced by refraction or reflection of light from a curved or complex surface. Caustic projections are seen in everyday life as patterns projected onto a table through a glass of clear liquid or on the bottom of swimming pools.

To make the phenomena useful as a security feature, caustics can also be projected from transparent surfaces by refraction from structures such as micro-lens arrays or other embossed structures.

Nowadays, big tech companies such as Meta, Apple and Google are in a race to deploy technologies such as holography to help build the metaverse, where they hope many of us will be spending our waking hours… and our money. While there is no doubt that the Disney management is driven by a profit motive, a bit of me would like to hold on to the idea that Walt was driven by curiosity.

1 https://www.disneyanimation.com/technology/holograms/

2 https://www.nature.com/articles/s41377-022-00742-7

3 Touchable and 360-Degree Playable Holographic Display (16/371284), Display System for Producing Daylight-Visible Holographic Or Floating 3-D Imagery (16/371266), Perceptual Data Association (10796195) and Personalised Stylised Avatars (11315298) .

Inside this Issue

Diffractive vs Reflective Waveguides

The stakes are high in the race for lightweight, energy efficient waveguides for smart glasses. In this article adapted from ZDNet[1], Israeli augmented reality optics company Lumus explains why it believes its range of reflective 2D waveguide technology beats the diffractive competition.

Augmented Reality (AR), where digital information is integrated with your view of the real world to deliver an enhanced overall experience, has yet to make a significant impact in the consumer market. The reason, says Lumus CEO Ari Grobman, is that AR glasses 'need to be impressive both functionally and aesthetically' – which is something he says the new Lumus technology addresses. 'With Z-Lens, we're aligning form and function, eliminating barriers-of-entry for the industry and paving the way for widespread consumer adoption,' he said.

According to Lumus, its new 2D Z Lens technology will enable 'smaller, lighter AR eyeglasses with high-resolution image quality, outdoor-compatible brightness and seamless Rx [prescription lens] integration.'

Founded in 2000, Lumus has built an IP portfolio around its reflective waveguide technology, which comprises a micro-projector (microLED, liquid-crystal-on-silicon (LCoS) or laser) and a series of transflective partial mirrors that expand the image across the X and Y axes (hence the '2D' nomenclature). This enables a usable field of view while accommodating the tiny projector in the temple of the glass's frame.

An alternative approach – employed by WaveOptics, among others (see HN May 2021) – uses diffractive waveguides, which normally inject light from the micro-projector perpendicular to the waveguide.

According to Lumus, the brightness and battery efficiency of reflective systems are 3-10x higher than their diffractive counterparts.

This means that not only are reflective waveguides brighter, but they require less battery power to achieve their brightness.

Another advantage of reflective waveguides is colour uniformity: this means that unlike other types of waveguides, reflective waveguides do not need to break up and then reassemble colour. Lumus single waveguides, apparently, use mirrors to reflect the true colour directly into the wearer's eyes. Most of the competing waveguides need 2-3 waveguides for each eye to achieve RGB (red, green, blue) for the full colour spectrum.

Lumus's flagship technology is Maximus, which uses an LCoS micro-projector, offers a 50° field of view, a 1:1 aspect ratio, 2048-by-2048 pixel resolution, full colour, and over 4,000 nits[2] per watt of LED illumination. This is bright enough for outdoor use and so doesn't require the lenses to be tinted, which can cause practical and social issues indoors.

The new Z-Lens architecture also offers 2K x 2K resolution and full colour, but shrinks the optical engine by 50%, providing glasses manufacturers with more flexibility over entrance aperture placement and allowing for lighter, less bulky and more natural-looking AR glasses.

Also, like Maximus, Z-Lens technology minimises light leakage, meaning that third parties are unable to see what the AR glasses wearer is viewing. The first Z-Lens prototypes will feature the same 50° field of view as Maximus, but the company's roadmap has this reaching over 80° in due course.

One of the key criteria for consumer acceptance of smart glasses in public is that they don't stand out in a crowd. These developments should go some way towards enabling 'natural-looking glasses with augmented reality functionality that will unlock the consumer market and propel the industry forward,' says Ari Grobman.

1 www.zdnet.com/article/this-new-optical-tech-could-make-ar-glasses-look-much-cooler/
2 The nit is a non-SI name used to specify the brightness of a display (1 nit = 1 candela/m2)

Edible Holographic Lollipops *(Continued)*

Holographic projection

One of the more interesting things about the holographic candies is that if you shine a bright light such as the flashlight on your phone through one of the images, like the Pillars of Creation, taken by the Hubble telescope, they will project a 3D image into a wall or plain background to appear like you are looking deep into the cosmos.

The initial Holololly line uses a range of pictures taken of distant galaxies by NASA's deep space telescopes and are sold in boxed sets of five. Other Holololly lines will be offered in seasonal holiday designs like spooky Halloween images, Valentine's Day hearts, birthday themes, and more.

'Our holograms are created using the pure light of a laser directed at each lollipop,' said Robson Bowman. 'And each image bursts out of the candy with bright stunning colours. You cannot taste or smell light – just gaze enraptured into its depths. And that's what makes this so much fun. The holographic candy looks like you are staring into the cosmos as you twirl the lollipop around. A full starburst of light radiates out from each one. It really is a surreal experience. And tasty too!'

Holololly's Kickstarter page can be found at **https://www.kickstarter.com/projects/holololly/holololly-the-holographic-lollipop**.

Hold The Dates for 2023 Holography Conference

After the success of The 2022 Holography Conference Online (THCO), and the successful run of over 30 uninterrupted years, Reconnaissance International invites you to join with the rest of the holography community on 21-22 November for THCO 2023.

The Holography Conference is the only global conference for the commercial holography industry – and has tracked every new development in holography since 1990.

The online conference format provides the perfect platform to bring together the industry under one, virtual, roof to hear about and discuss the latest developments in holography across a broad spectrum of markets and applications – security and authentication, brand enhancement and packaging, display holography, 3D imaging and HOEs, to name a few.

No need to book a hotel, no need to check flights, just put THCO 21-22 November 2023 in your calendar!

www.holographyconference.com

News in Brief

KURZ Hands Over the Baton

1 February, 2023 was a special day and a milestone in the history of LEONHARD KURZ – a pioneer in the mass commercialisation of holography for both security and decorative applications. On that day Walter and Peter Kurz, who had shared the position of CEO for many years, handed over the baton of leadership to the new CEO, Dr Andreas Hirschfelder.

Dr Hirschfelder has been part of the company for 26 years and brings in-depth experience as well as comprehensive knowledge of the challenges and needs of KURZ's customers, the company says. The hope is that he will preserve the established while always moving forward and thinking ahead in order to continue offering sophisticated solutions in the future, it added.

For more than 30 years, the secure document industry, and banknotes in particular, have become familiar with holographic and other diffractive image security features transferred onto the document via KURZ's surface applied foils.

The KURZ USA LinkedIn post reads: 'The KURZ family is proud and happy to welcome Dr Hirschfelder as our new CEO. We are facing the future full of confidence and looking forward to working together to strengthen KURZ's pioneering role as a sustainable, innovative, and international company.'

MicroCloud Hologram Announces Holographic Developments

Nasdaq-listed MicroCloud Hologram has announced multiple developments in a series of press releases.

The first is the development of algorithms for generating 3D holographic digital content based on computer imaging technology. In the computer-generated hologram (CGH) technology developed by MicroCloud Hologram, it is claimed that the dot matrix-based algorithm represents 3D holographic objects by millions of dot matrixes, where each pixel of the object is represented by a dot that irradiates the spherical wave of the holographic digital content. The complex amplitude distribution of the holographic digital content can be obtained by superimposing all the target points. The computational burden can be significantly reduced by calculating the points of all possible objects in advance and storing them in the computer.

The second announcement concerns a point cloud algorithm to reduce the noise (denoising) in a real-time 3D holographic reconstruction of single-photon LiDAR data. The algorithm applies a point cloud denoising tool for computer graphics and can efficiently model the target surface as a 2D manifold embedded in 3D space. According to MicroCloud Hologram, the algorithm can merge information about the observed model, uses stream modelling tools for computer graphics and can process tens of frames per second by selecting massively parallel noise reducers.

And thirdly, MicroCloud Hologram has announced the launch of a holographic brain-computer Interface (BCI) data acquisition system. In the announcement it is claimed that holographic technology can be used as an information feedback tool for BCI systems, providing more realistic imagery and stimulating contextual feedback for an immersive user experience.

Inprentus Enters the Augmented Reality Market

Inprentus designs, manufactures, and sells X-ray and EUV diffraction gratings for synchrotron and free electron laser facilities, as well as diffraction grating masters for spectroscopy applications. The company, founded in 2012 to commercialise a nano-scale scribing technology, is now supplying blazed diffractive waveguide masters that can be used for rapid prototyping and mass production of Augmented Reality (AR) headset eyepieces.

The company, which has been a supplier of custom diffractive optics to a variety of industries, employs a unique nanoscale contact mode lithography technique that combines ultra-high precision mechanical ruling of metallic surfaces and a variety of proprietary control software, sensor technology and materials science techniques. This method is designed to produce blazed diffractive patterns on optical surfaces for controlling light. The company's nanoscale contact mode lithography process is claimed to be ideal for manufacturing master diffractive optics used for prototyping, as well as high-volume replication.

Inprentus' blazed patterns can include a wide range of blaze angles, variable line spacing for focusing and image correction. Multiple blazed patterns (gratings) can be precisely oriented on a surface to create an AR eyepiece.

These structures will be used in the next generation of AR glasses by projecting images from outside of the lens, through the waveguide, and then to the eye without the use of bulky 'birdbath' optics[1] or non-blazed waveguide patterns, both of which have drawbacks, including low efficiency and higher product manufacturing costs. The Inprentus nanoscale contact mode lithography technique allows multiple gratings, such as input, expander, and output patterns, to be manufactured using the same setup.

Peter Abbamonte, Inprentus' Chief Science Officer, noted that 'the company's experience over the past ten years, first as a provider of high value, x-ray diffraction gratings for materials research facilities around the world, then as a producer of gratings for precision spectroscopy and semiconductor lithography, has given us the skills we need to meet the stringent requirements of the AR market.'

Inprentus is now one of the leading manufacturers of custom blazed diffraction gratings worldwide, having delivered over 50 unique projects for visible light, extreme ultraviolet, and x-ray wavelength applications.

H&M Store Enhances Immersive Strategy with Hologram Display

H&M is a multinational clothing company based in Sweden which has developed a new athletic clothing line called 'Move'. As part of the programme to promote Move, the H&M store in Williamsburg, Brooklyn, New York, has installed a Proto hologram display. The idea combines a store experience with an advertising campaign for H&M Move, offering classes from dance and fitness studios Grind House and Good Move.

The store is at 92 N 6th Street and the Proto Epic is built into the window display, presenting life size 4K holograms of models and dance and fitness instructors wearing H&M Move outfits.

Apart from H&M, Proto's other retail and apparel partners include Burberry, Richemont's IWC, Harry Winston, Walmart and the NFL Shop.

Proto is also known for holoporting people around the world for live interactive experiences, including Paris Hilton, Howie Mandel and P Diddy.

1 The term 'birdbath' comes from the spherical mirror/combiner that looks like a typical birdbath.

A Chip Off the Old Block – an Interview with Shobhit and Ankit Gupta

Shobhit Gupta (standing), Ankit Gupta (sitting).

The Gupta brothers, Shobhit and Ankit, are Joint Managing Directors of the Holostik Group – a diversified business conglomerate in sectors including chemicals, biodegradable products, real-estate, warehousing, and digital technology.

But to readers of Holography News®, the company is synonymous with anti-counterfeiting and packaging enhancements and their father (Mr U K Gupta or 'Guptaji', who died in 2021) is widely acknowledged for laying the foundation of the hologram industry in India (see HN June 2021).

When U K Gupta founded Holostik in 1991, security hologram technology was still in its infancy and the technology was limited to only a few companies. He is credited with his early realisation of the tremendous potential of security holograms for the Indian government's revenue protection, as well as the modernisation of the India Voter Identity Card and the use of security holograms as excise adhesive labels, starting with Uttar Pradesh and Tamil Nadu in 1998-99 and later expanding to 23 states.

We caught up with Shobhit and Ankit to find out more about their mission to make Holostik an international leader in anti-counterfeiting solutions, marking its presence outside the borders of India.

Q: *Hello Shobhit and Ankit and thank you for reaching out to the HN readership. Firstly, let me say that having met and worked with your father that his passing is a loss to the whole holography community – as I'm sure it has been to your family. Perhaps, I can start out by asking you about your early life and upbringing?*

A: Let me first start by saying our father really valued the hologram industry and always wanted to grow the industry and not just us. His heart belonged to the industry. His loss to us as a father and our biggest mentor can never be filled. We thank each and every industry member of International Hologram Manufacturers Association (IHMA) and ASPA (Authentication Solution Providers' Association) who reached out to us in the moment of grief for help, support and wishes.

We were raised in a family that has a strong connection to its roots and where values and relationships are given priority over money at all times. Our upbringing reflects our lives today. We had seen our father building the business from scratch. This instilled in us the importance of hard work from an early age. Our father taught us to be bold yet humble at the same time. We inherited our father's risk-taking attitude and zeal.

Q. *You both have international academic and business qualifications as well as extensive commercial experience. How do you divide up responsibilities for running the security holograms division of Holostik?*

A: We both are Joint Managing Directors of Holostik Group. At Holostik India, for the last decade I was taking care of Strategy, HR & Marcom while Shobhit was looking after the International Business. After the loss of our father our roles evolved. Today, all strategic and financial decisions are taken collectively by the board. The Anti-Counterfeiting & Digital Sales business is handled by me, while Shobhit leads the Packaging & International Business.

Q: *There must have been a risk, after your father's passing, that the business might stall – but if anything, the opposite is true. How did you manage this?*

A. Like in any balance sheet there are assets and liabilities. For a second-generation entrepreneur, assets are the power and wealth, and liability is the responsibility to manage, and we have been groomed by our parents to accept this responsibility.

With the passing away of our father the learning phase for both of us ended. As second-generation leaders we have huge responsibility towards our customers, shareholders, and employees. Earlier our father was our guiding force in every business decision. We knew business operates on decision making and an excellent team. Hence, we prepared ourselves and our team to take tough decisions and stand by them, not just in wins but also in losses.

This change in mindset has prepared us to take the challenges of the future. Recently, a new manufacturing unit was launched in Greater Noida which required huge investment. We were able to make the critical decision with the mindset of a leader.

Q: *Can you tell us a little bit about the scale and scope of the security holograms part of the business? Number of employees, sites, offices, turnover?*

A: Security holograms contribute to 50% of our overall business revenue at Holostik India Limited. We are backed by 500+ professionals with 12+ nationwide offices. With 5+ state of the art manufacturing facilities located pan India; we cater to customers in 90+ countries as of today.

Manufacturing unit (© Holostik).

Continued on page 6 >

A Chip Off the Old Block *(Continued)*

Q: *What else is Holostik doing in the fight against counterfeiting, beyond holograms?*

A: Holostik always takes the lead in developing new brand protection, packaging, and digital supply chain technologies. Besides security holograms we cater for holographic packaging films, UV embossed films, holographic liners/ wads, security pouches, security labels, speciality labels, holographic shrink sleeves, and many other physical solutions.

We offer digital solutions for end-to-end supply chain traceability, real-time product authentication, loyalty management, warehouse management, warranty management, automated logistic management and many other onsite and cloud-based software solutions.
What sets us apart in the industry is capability to integrate physical and digital technologies under one roof and provide 'phygital' (physical + digital) technologies to address together both the issue of brand protection and supply chain management.

Q: *In researching the company before this interview, I realised that the Holostik Group is far more diversified than I realised. How do you manage to keep focus on all of the various business streams within the group?*

A: Established in 1978, Holostik Group is a business conglomerate into diverse verticals like anti-counterfeiting technologies, packaging, chemicals, real estate, warehousing, bio-degradable products and digital supply chain technology.

As second-generation entrepreneurs, we think of ourselves as portfolio managers whose task is to identify opportunities and let the right person run it, who also have equity participation in the ventures. We have recruited the best minds to run the show in all our group companies.

Q: *How would you say that markets in India share common problems regarding fake goods and documents with the rest of the world, and those that are unique to India?*

A: Markets in India, like many other countries around the world, face problems with counterfeit goods and fake documents. These issues can include fake or counterfeit products being sold as genuine. India also faces unique challenges in this area due to its large population, diverse economy, and complex regulatory environment.

Factors such as a lack of effective enforcement mechanisms, weak intellectual property laws, and corruption can all contribute to the proliferation of fake goods and documents in the Indian market. Additionally, India's informal economy, which is estimated to be around 45% of the country's GDP, also makes it harder to track and control the production and distribution of fake goods.

In India and a lot of developing economies a decent percentage of the population is fighting for the bare necessities of life, hence determining a product's genuineness is not a priority for them before buying. But with the advent of smartphones, eCommerce, and social media we see this trend changing very quickly.

Q: *What major shifts in holographic technologies do you see on the horizon?*

A: High resolution holographic master shoots, incorporation of advanced overt, covert, and forensic features, integration with digital QR codes are changing the face of holograms.

At Holostik, recent innovations in holography include incorporation of nano optical images (NOI) whose master is shot at a resolution of more than 600,000 dpi. NOI holograms allow the incorporation of security features that are currently almost impossible to replicate.

NOI security hologram (© Holostik).

We have recently introduced Optashield – an amalgamation of holography with another innovative technology. Security holograms with multiple layers have a huge market in the anti-counterfeiting industry. Also, holography on paper will gain popularity as a sustainable solution.

Q: *There is a general sense, in the holography and anti-counterfeiting markets, that business activity is shifting from physical to digital and that the future will be virtual in the metaverse. I also note that 'digital technology' is listed as one of the business interests within the Holostik Group. Is there potential for a tie-in there?*

A: At Holostik, we believe that the amalgamation of physical and digital (ie. phygital) technologies can be the best deterrent against counterfeiting. We are industry pioneers in integrating holograms with digital supply chain software to ensure both product and supply chain security.

We can cater onsite and cloud-based software for executing functions like traceability of supply chain, loyalty management, warranty management, warehouse management and many more. We intend to take ahead both holography and digital technologies hand in hand.

Q: *What vision do you both share for the future of Holostik?*

A: Holostik intends to broaden its offerings by venturing into new geographic regions and sectors, creating innovative solutions to combat counterfeit items, and ensuring compliance of its products and services with regulations related to supply chain and packaging, while keeping its values intact.

The organisation will accelerate the integration of automation in its operations and procedures. Additionally, it will conduct regular evaluations of its policies, output quality and manufacturing capabilities.

Holostik will maintain its commitment to investing a minimum of 5% of its annual budget on research and development, new packaging, and custom supply chain software, as it has done in the past. This includes investments in advanced print machines and authentication technologies, as well as improvements to the packaging division's infrastructure to increase production capabilities.

We strongly believe in the logic that 1+1=11, hence collaboration of different technologies is an important strategy for us, which we will continue to follow in the future as well.

Q: *As far as it's possible to predict the future, particularly in the security hologram market, what do you see the Gupta brothers doing in five years' time and where will Holostik be?*

A: With easy access to technology, counterfeiters are becoming more sophisticated, thus we believe in staying steps ahead of them to guarantee product security. With innovation being one of our pillars, we intend to bring new innovation in the security hologram technology.

In the next five years we plan to expand our outreach to new industries and new geographies while integrating with the latest technologies. Also, in the digital domain we will utilise disruptive technologies like blockchain and RFIDs. We will continue with our mission of 'Authenticating Supply Chains, Securing Lives.'

ODDS Conference Hits the Phygital Nerve

The programme for the second Optical and Digital Document Security (ODDS) conference is now available, demonstrating the importance of this event in bringing together people involved in developing digital systems for identity and financial transactions with the more traditional security document community. The conference will be on 17-19 April 2023 in Prague, Czech Republic.

The first ODDS conference, in 2022, showed that there is a need for this event as it is the only one presenting the developments at the interface between the physical and digital worlds of financial transaction and personal identity security. The 2023 conference opens with a session which examines 'phygital' features. Paper and plastic currency and identity cards are still in everyday use, albeit they now often interact with a digital record, so this first session sets out innovative ways of making those links, which are becoming the key nerve in securing the protection of our financial transactions and proofs of identity.

The digital domain is becoming more prominent in our everyday transactions as we have to prove who we are for banking, for online purchases and even to use public transport. So the central sessions in the conference cover Protecting Identity in the Digital Age, with presentations from established and highly experienced security printers as well as research institutes and young companies. With identity theft on the increase, the information in these sessions gains added significance for everyone involved in identity security.

The physical security providers remain competitive and innovative, as the final two sessions on New Optical Techniques for Security will show. Prevention of fraud and easy recognition of genuine items remains a key motivator behind some fascinating new approaches that will be described in these sessions. Many now established optical security features were first announced at the Optical Document Security conference – one of the ODDS precursor conferences, the other being Digital Document Security – and this continues at ODDS 2023, with exciting innovations from well-known companies such as OVD Kinegram and SICPA alongside those from recent start-ups including 4Plate.

ODDS 2023 opens with a seminar on smartphones, given by Dr Alan Hodgson, a knowledgeable and respected authority and regular contributor to Holography News®. He will look at how and why smartphones are becoming a dominant tool in identity and financial transaction management, while setting out their shortcomings as security devices. He will also ask what this means for those who don't have a smartphone or where network coverage is weak. This will be an eye-opening and thought-provoking seminar for everyone developing smartphone ID or financial systems or features for smartphone validation.

And don't miss the conference dinner and table-top exhibition on Tuesday evening, where you can see and handle some of the technologies you'll hear about in the presentations.

Registration for ODDS 2023 is now open, as is table-top exhibition reservations. For full programme details and registration visit **opticaldigitalsecurity.com**.

Machine-Readable Holograms from IQ Structures

IQ Structures, a research and production organisation focused on nanotechnology engineering, part of the IQS Group, has introduced holograms that can be authenticated automatically. All it takes is a normal light and a mobile phone app.

When checking security features, an inspector may not be completely familiar with the authenticity and yet, for various reasons, is not able to verify it against the database entry. This is where IQ Structures believe their machine-readable holograms can help. The operation of the solution is simple: a mobile phone with an app illuminates the hologram, the phone reads the feature and then the app confirms its authenticity.

'Machine-readable holograms combine two very powerful principles. Our holograms contain unique visual effects that virtually cannot be replicated because they are based on special nanostructures. The second principle is automated control, immune to human failure. Each is powerful, together it is unbreakable,' says IQ Structures CEO Petr Franc. 'Our new technology has a range of applications, from personal documents to paper certificates and brand protection.'

The machine-readable holograms are put into ID documents as part of IQ proID´s product. This product is based on micro-segmentation technology to ensure seamless integration into the card. Any attempt to manipulate the holographic layer ends up disintegrating the hologram into thousands of miniature parts.

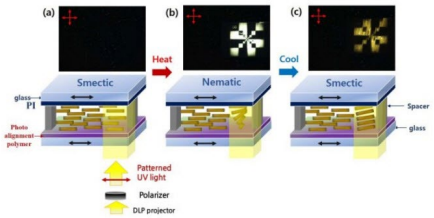
Other advantages of IQ proID are the possibility of full area protection, so no one can change any data on the document, and the possibility of creating integrated security features combining different technologies (security printing, UV and OVI printing, tactile surface embossing and holography). Many customers prefer this technology because of the distinctive visual effects.

Machine readable holograms can also be used in the area of brand protection. In this application, there may be situations where the brand owner has some sort of track and trace system but doesn't want to give full access to all customers. The customer doesn't even know the details of the hologram, so they are only able to make a general check that there is a hologram present on the packaging. With machine-readable hologram technology, the consumer can download an app and check by reading it that it is a genuine security feature.

IHMA Services

Patent of the Month

In December 2022's edition of the IHMA patent newsletter more than 85 patents are listed, among them a method from Chungnam National University Industry Academic Foundation. This includes a security element comprising a liquid crystal reference of nematic phase and a liquid crystal in which the orientation is patterned. The orientation pattern of the liquid crystal is exposed to the outside by the phase transition of the liquid crystal with a change in temperature.



Also of interest to HN readers will be the publication of patent application CN202211090428 that Chinese tech giant Huawei has filed for a new 3D stereographic projection system.

The Huawei patent includes a backlight assembly, a spatial light modulator, and a diffuser screen that work together to project two images simultaneously, seen from the left and right eye, at 60 times per second.

A single spatial light modulator projects two separate images to the diffusion screen at different angles. By sharing the same spatial light modulator, the cost of the stereoscopic projection system is reduced, making it a cost-effective solution.

Tender Alert Service

The tender alert service sends eMail notifications directly to the inbox of members, giving a description of the goods or services to be supplied, the deadline for submission and the outline details of the buyer.

An example of a recent notification is from the Military Police of Para (Brazil) for the supply of firearm registration certificates.

The Patent Newsletter and Tender Alert Service are made available exclusively to IHMA members. To become a member visit **https://ihma.org/about-us/#join-us**.

Hologram Image Register

Following a number of changes, the newly updated IHMA Hologram Image Register (HIR) Portal User Guide is now available in the members' area.

The Hologram Image Register (HIR) is a secure registry of holographic images, established by the IHMA to help safeguard hologram copyright and underpin the use of holograms in authentication and security printing. Independently operated by the Counterfeiting Intelligence Bureau (CIB) on behalf of the IHMA, the HIR is the only system of its kind for the secure document and authentication community.

The HIR includes more than 10,000 registrations and in early 2022 underwent a major upgrade, designed to improve user efficiency and effectiveness by enabling faster online registration and copyright checking of hologram designs. Since its inception the HIR has helped to prevent numerous attempts to source copy holograms and has also helped to confirm that a suspect hologram was, indeed, a fake.

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7–9 MARCH 2023
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Abu Dhabi, UAE
hsp-emea.com

17–19 APRIL 2023
OPTICAL & DIGITAL DOCUMENT SECURITY
Prague, Czech Republic
opticaldigitalsecurity.com

5–7 JUNE 2023
HIGH SECURITY PRINTING LATIN AMERICA
Nassau, The Bahamas
hsp-latinamerica.com

SEPTEMBER 2023
TAX STAMP & TRACEABILITY FORUM
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