

# HOLOGRAMS CONTINUE TO SHINE

*Four leading industry insiders reflect on 25 years of ups and downs for holography and its future evolution*

**I**n 1993, the International Hologram Manufacturers Association was established, and since then, the organisation – which supports producers and converters of holograms for banknotes, anti-counterfeiting, brand protection, packaging, graphics and other commercial applications around the world – has evolved to become a global voice on authentication and security devices.

**What do you see as the key ups (and downs) of holography over the last 25 years?**

**Hugues Souparis (HS):** Holograms used on packaging and high security applications have been the stand-out successes over the last 25 years. These devices, and their variations, have set the industry standards – way beyond what we could have envisioned back in 1993.

**Ian Lancaster (IL):** The adoption of holograms as a key security feature on banknotes and ID documents has without question, been a significant achievement. More banknotes are produced than any other secured document, so this has been a huge sales boost for the members of the IHMA who provide high-security holograms. And with banknotes being handled regularly by the public, this has also helped to show them what holograms are and what they can do in security. The adoption of holographic material as a standard packaging material, for both its decorative, promotional and security characteristics, has been huge. This in turn has fed in to the expansion of markets around the world, with concomitant growth in production in countries such as India and China.

On the flipside, the failure of display holograms to become established as a common medium for illustration has been a disappointment. From advertising to brand protection, as well as artworks, holograms have so much to offer in terms of true

3D visuals, but the difficulties in keeping costs down, controlling colour and the lighting requirements mean this is now only a niche market for holograms. Also, the misappropriation of the words 'hologram' and 'holography' by promoters of other 3D or remote visualisation techniques, has muddied the waters, so people no longer know what a true hologram is.

**Manoj Kochar (MK):** I think that the biggest 'up' for holography over the past 25 years has been its integration with so many print and conversion technologies, which in turn has spurred the widespread usage of holograms for so many applications. I would also like to see closer interaction between the IHMA and the Chinese holography industry. These could be considered a work in progress at best, with plenty of work to be done on both sides.

**David Tidmarsh (DT):** The most significant event in the use of a hologram in security was first the adoption of holography in a stripe in the Euro 5, 10, and 20 and as a patch in the Euro 50, 100, 200 and 500 in the late nineties before their issuance in 2002 and then the retention of the hologram again as a major public security feature for Euro series two. This was a major endorsement, leading to many other central banks adopting holograms for their banknotes as they upgraded or brought out new series. I would say that holography has also succeeded well in the gift, stationery and toy sector and, particularly, for gift-wrap.

**How has the technology evolved in almost three decades?**

**IL:** Where to start. The use of holograms on banknotes and ID cards has pushed the hologram producers to come up with new features – to stay ahead of the counterfeiters – and new material characteristics to ensure they are durable and difficult to remove. For these secured documents, there have been huge



**Holograms on bank notes can resist harsh chemical and durability tests**



improvements in transparent holograms, in demetallising techniques, in ways to convert portrait photos to holographic renditions, in colour control and more. All these advances have allowed much better design integration of holograms in to the document graphics. This is a fascinating combination of aesthetic improvement catalysed by the technology improvements.

We've also seen developments more aimed at the packaging market, such as fresnel features and cast-and-cure transfer methods. There is, of course, movement between these two key markets – authentication and packaging – and we've seen a huge increase in the capabilities and, therefore, the use of UV-casting for both kinds of hologram, as well as substantial expansion in the capabilities and use of e-beam origination for security holograms.

Display holograms have also seen huge strides in the quality of volume (reflection) holograms, in terms of colour control, resolution, diffraction efficiency (which equates to brightness) and even manufacturing processes. Photopolymer has become a more accessible and easier to use base photo-reactive material, while people have also continued to push the boundaries of what's possible with silver halide holograms.

**MK:** Over the last three decades, the security hologram technology has made great strides in origination techniques and features, while the substrate and adhesive technology has also kept pace. Increasing demand from various sectors with different needs and applications have driven the industry to innovate and develop customised solutions. Besides security, there have been big advances in the areas of holographic projection and display, with several campaigns using the technology to generate a greater buzz.

**HS:** For me, its holography's evolution from a 3D rainbow image to dedicated optical effects – an optical element being easy to control and very hard to imitate. This is

how holography technologies and derivatives have collided to satisfy market needs. Also, the migration to an optical plus material science-based technology has been very noticeable. Material science has become an essential pillar of the security devices.

**DT:** There has been advancement on two fronts: origination and material science. Both have been critically important in allowing holography to advance to its present level, which is as a very sophisticated and reliable product in whatever field it is being used. Holograms have been developed that can resist harsh chemical and durability tests for banknotes, showing they can survive in circulation. And against all odds, given their ubiquity, together with banknotes' use of scarce materials or technologies, we see today that almost 30 percent of current banknote denominations feature holograms.

**What are the obstacles to future growth?**

**HS:** Holography went from laboratory curiosity to low-volume industrial replication to a viable global industry, capable of producing hundreds of millions of devices for the ID documents and billions of devices for banknotes. However, any technology has to break free and continue to push technological and commercial boundaries. So, holography's greatest challenge will be to find tomorrow's applications.

**IL:** In many ways, holography has barely scratched the surface of its possibilities. Security and packaging are of course its big successes to date, so the industry will need to work on maintaining and growing those markets. But my concern is more about the supply of future holographers and securing industry skills. Age is catching up with the generation who brought enthusiasm, imagination, practical knowledge and their hands-on experience to lead innovations. The industry needs a continuing supply of people working

**INCREASING DEMAND HAS DRIVEN THE INDUSTRY TO INNOVATE AND DEVELOP CUSTOMISED SOLUTIONS**

in R&D and in origination who are equally adept and committed to push the boundaries, but I don't see a commitment to making sure that happens. It would be interesting to have an industry-wide apprenticeship or training scheme, for example.

**MK:** Emergence of competing authentication technologies may seem like an obstacle to some, but I think these are opportunities where the holography industry can collaborate with such technologies to develop new products and solutions.

**DT:** A key challenge will be maintaining holography as a security feature, despite its increasing adoption in other markets. The Hologram Image Register will continue to help here, together with the industry code of conduct, allowing security hologram producers to continue to assure customers of their integrity and that of their competitors, who are also IHMA members.

**How has the IHMA evolved with the times?**

**What's been its biggest success?**

**MK:** The IHMA continues to be the industry's torchbearer as new members sign up and reach spreads further into Asia (China and Korea in particular). Its provided a global platform for its members, who have themselves become innovative and IP respecting business entities. The Hologram Image Register (HIR) has been one of the IHMA's greatest contributions towards protecting copyright. The membership strength today is at a nearly all-time high with about 100 members, and more applications coming in. The IHMA has always been strong in Europe and Americas, and is, thus emerging as a truly global organisation that represents the interests of the global hologram industry across all segments. The scope of services provided by the IHMA is also increasing and more new services are being implemented in its 25th year of existence.

**HS:** IHMA has become the reference industry association. I believe that the biggest achievement of IHMA was to be instrumental in designing and maintain in this young industry codes of conducts which were the cement of the success. The ground work on the Code of Ethic, the IP rules, the Image register, the Security Accreditation made holography a mature industry in less than a decade.

**IL:** The Hologram Image Register is obviously one of the Association's big successes, although it would be good to see it being used as a matter of regular practice by all members. Working with the International Standards Organisation, Intergraf and NASPO on standards for authentication solutions, security print and foil management and now tax stamps is also an important achievement, in that it ensures the use of holograms are built in to these standards. And having 100 members! That's an achievement in itself, especially as it represents a very high proportion of commercial hologram producers everywhere except China. The IHMA has also done a great deal to get media coverage of holograms, albeit this is mainly limited to the English-language press and online media.

**DT:** Without doubt the IHMA's survival has been its biggest success – there are members that have absolutely nothing in common but holography. Some make holograms for banknotes and passports, others for packaging film. Others head-up displays (HUD) for cars and planes and others works for three-dimensional art. But all acknowledge each other's achievements. Holography remains highly regarded as both a science and an art.

**What should the IHMA do to meet the changing needs of the industry for the future?**

**IL:** The IHMA has come to be dominated by the security hologram field. Its membership is predominantly security hologram producers and its key projects meet the needs of this sector. But holography is now so much more than this: don't forget that it is a way to control light with much more versatility than traditional optics, so who knows where it might go in the next 25 years.

What we do know is that optical elements, packaging and decoration, data storage are all

important parts of the industry, which the IHMA should embrace in future. In fact, the Association will need to embrace these areas if it is to properly represent the industry of hologram producers.

**HS:** I'd agree, but would also add that the IHMA must be the embodiment of the industry's values of integrity, collaboration, partnership and co-operation going forward. Also, while its important to pay a nod to its security DNA, the Association must offer broader representation – in particular, a trade body which increasingly embraces producers' variable inks, lenticular effects and nanotechnologies among other visual security devices.

**MK:** I have little doubt that the IHMA will continue to re-engineer and re-invent itself to stay relevant to the interest of its constituents. Newer technologies are emerging and most of the IHMA members are already working with several different technologies to provide an effective solution. Advances in holographic security, display, projection and other authentication technologies will provide opportunity and growth for members. We will be looking to stay abreast of such developments and review its mission, and focus regularly to ensure that we match up to the members' changing needs.

**DT:** I'm confident the industry will continue to monitor and predict trends – and respond with relevant, innovative products. There's also a need for all involved in holography to have an active association and a forum that brings together members to share experiences, concerns, developments and opportunities. My crystal ball tells me that holography will be around in 25 years – in what form or use I cannot predict, but things that please the eye and fascinate will always have a place in society ●



**Ian Lancaster** is the former general secretary of IHMA and managing director of Reconnaissance International.

**Hugues Souparis** is the President and founder of SURYS.

**Manoj Kochar** is the current IHMA chair and Director at Holoflex Limited.

**David Tidmarsh** is chairman of Currency Publications and the former CEO of Applied Holographics plc.

**In the last 25 years holography has evolved into so much more than just security and ID**



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