



Creating light harnessing fine structures

Light Logics Holography and Optics

India's Leading Holography Technology Company



Our Laboratories and Production Facilities

Creating Light Harnessing Fine Structures



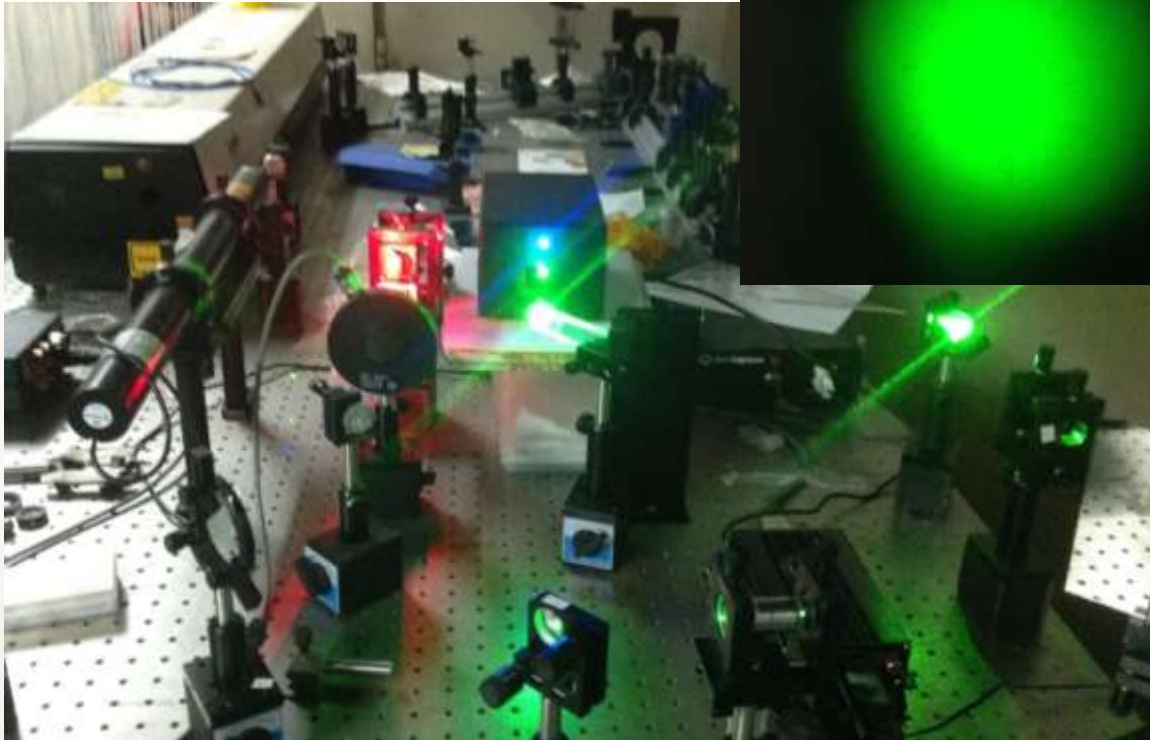
Red Lab – For HOEs and Photopolymer.



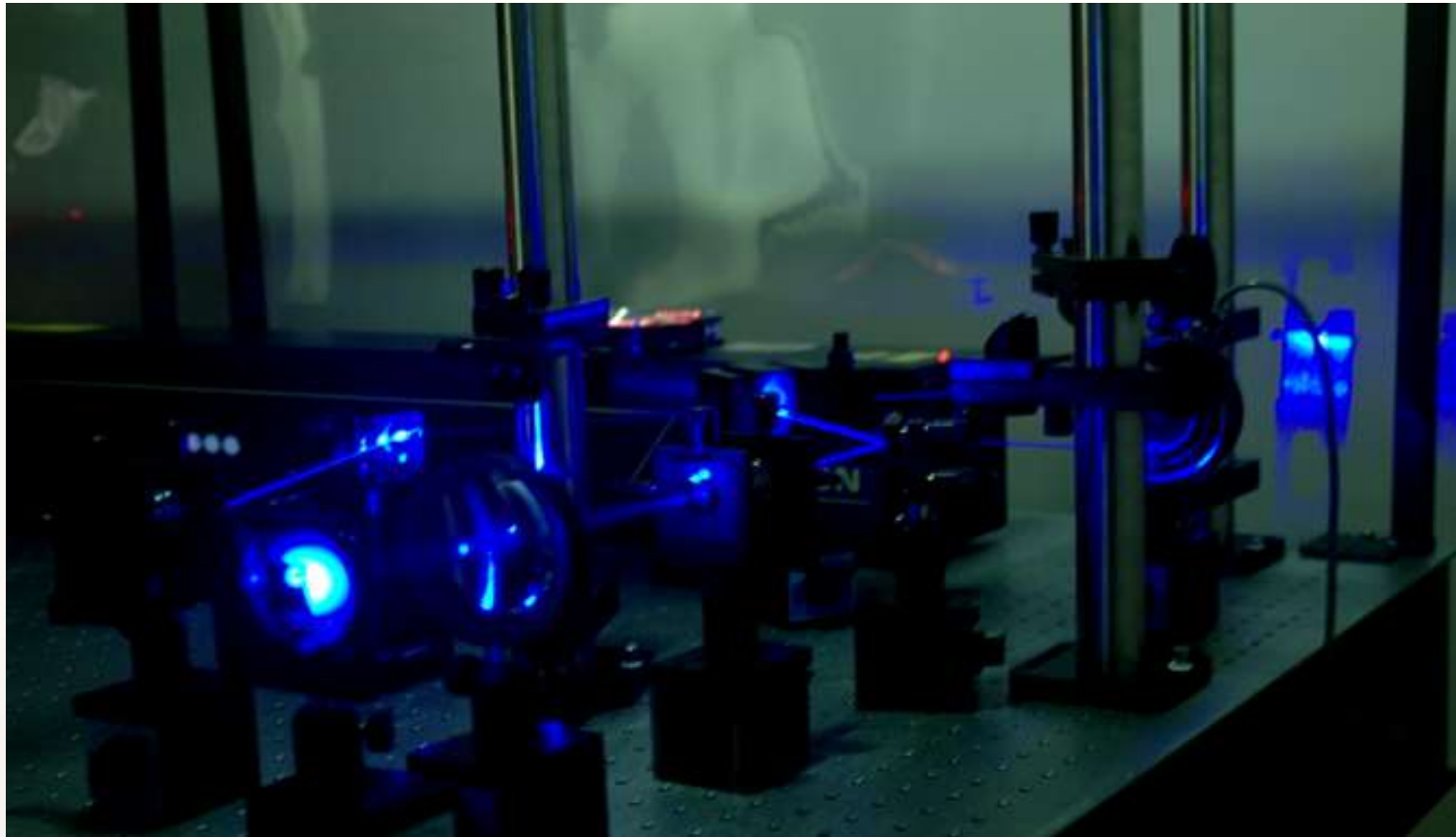
Red Lab – For Display and Copy



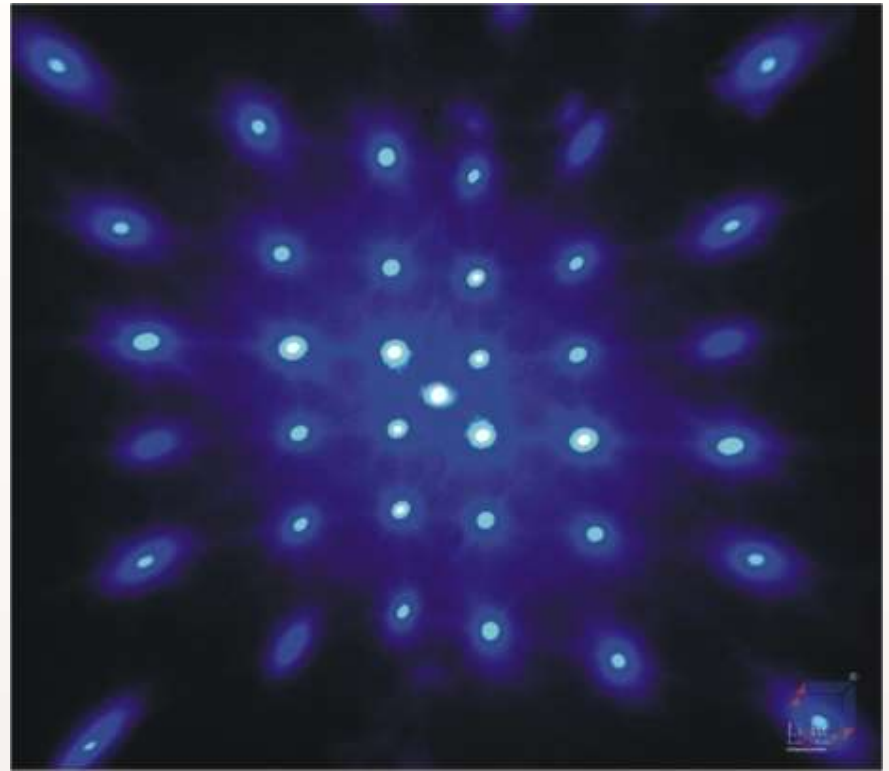
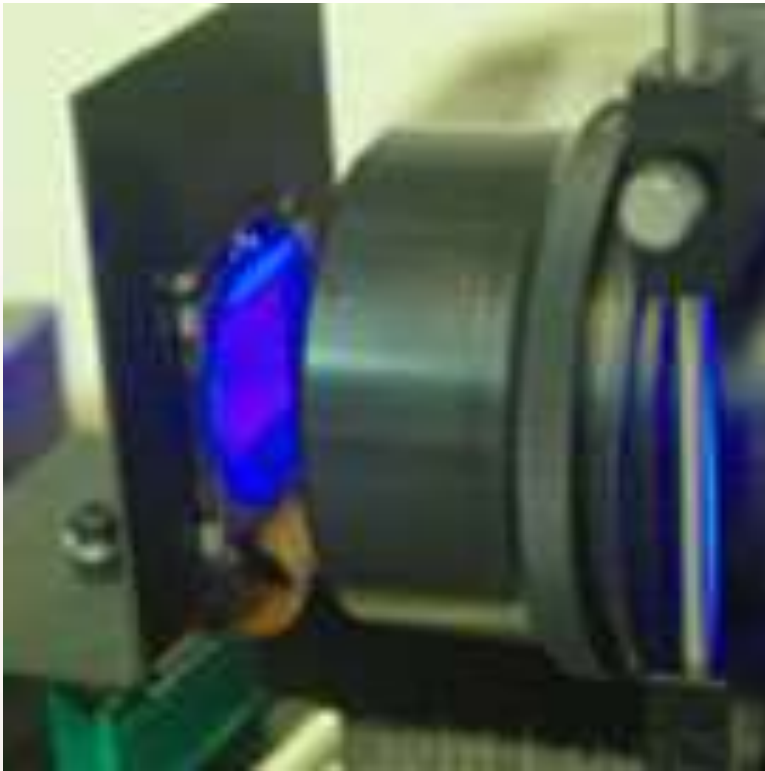
Our Laboratories and Production Facilities – GREEN Lab



Blue Lab: For Secure Photonic Relief Structures



Dot-Matrix Lab



Light Logics is one of the most discussed holography Companies by the global Holography Media



HOLOGRAPHY NEWS

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RECOMMENDED INTERNATIONAL
BUSINESS PRESS

Light Logics Takes Holography to South India

A new hologram company will launch in India on October 2 (Maharaja Gandhi Day). Light Logics Holography and Optics Pvt Ltd, located in Thiruvananthapuram, the capital of Kerala in the south of the country, has been set up by Dr Ajith Kumar with support and financing from family and a local bank. Kumar has been the leader of the Optical Image Processing Team at the Kerala Government-supported Centre for Development of Imaging Technology (C-DIT) since 1996. Light Logics has an ambitious business plan to distribute a wide range of holographic production equipment, materials and holograms, but will focus in-house production on technical- and skill-intensive areas. Dr Kumar has told Holography News.

At C-DIT, Kumar has worked

on security holograms, where developments included emulsified machine-readable polyester holograms (see HN Vol 19, No 11). He also established an embossed hologram production line, financed by the Kerala Beverage Company, to supply holographic tea seals for alcoholic drinks. He will now serve as research director at Light Logics on a part-time basis while he continues to lead the team at C-DIT.

Light Logics will have ten people at its launch, with J K Jose as operations manager. Most Indian hologram manufacturers are in the north, around Mumbai, Delhi and Kolkata, so Light Logics will be offering everything from mastering systems, production equipment, and other hardware film to

Continued on page 8

Photopolymer Data Storage Business Heats Up

Hinacell Mexell has announced that it will introduce a holographic data storage disk and equipment before the end of this year, using the system developed by InPhase. The California company that has developed a volumetric data system using photopolymer as the recording medium. A 300 GB write-once disk will be introduced in November as December, followed by an 800 GB disc in 2008. Mexell is hoping that by 2010 it

will have 1.6 TB discs on the market.

Systems and discs will initially be restricted to "enterprise" customers, although the price of \$15,000 per disc will be a natural customer filter. Consumer systems are anticipated within months. A 300 GB write-once disc will be introduced in November as December, followed by an 800 GB disc in 2008. Mexell is hoping that by 2010 it

InPhase developed its photopolymer recording medium, then licensed it to

Boyet, which is thought to be Mexell's production partner. Lisa Elbar of InPhase will give a paper detailing the company's technique and future expectations at the Hologram*Holo-print conference.

Aprilis Acquired

Dow Corning has acquired the holographic assets of Massachusetts' company Aprilis, another contender in

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Company Profile

Light Logics - Southern India Powerhouse

Light Logics, mentioned briefly in the previous issue of Holography News as having made an R&D agreement with holographic data-storage developer STXApellis, is a young company which is becoming a significant force in Indian holography, and it is one of the few holography companies in southern India (most are concentrated around the northern industrial centres of Mumbai, Delhi and Kolkata).

Light Logics (LL) was founded in late 2006 by Dr Ajith Kumar, formerly the leader of the Optical Image Processing Team at the Kerala Centre for Development of Imaging Technology (C-DIT; see HN Vol 20, No 9). At C-DIT he worked on emulsified machine-readable polyester holograms, and set up an embossed hologram line to supply holographic tea seals for alcoholic beverages.

Starting with a staff of 10, LL has now grown to 17 people, many of them with higher degrees, to enable it to fulfil its objective of being 'a technology-oriented company' with a strong commitment to R&D (in its sleep with STXApellis suggests). It has recently won the national award for the Best Engineering Design Company from the Indian Science, Technology and Business Incubation Association. It is actively supported by the Department of Scientific and Industrial Research, Government of India and Technopark, Thiruvananthapuram, Government of Kerala.

This technology orientation has driven LL's development on a number of fronts: as a manufacturer of holograms; developer of a new generation photopolymer and holography-based 3D devices; as a designer and builder of holographic mastering equipment and educational kits; and as an R&D facility.

Aiming at End-to-End Equipment Supply

The company now supplies all the equipment needed to make surface relief hologram production masters, including mastering systems, electroforming and reconform equipment. It makes two distinct mastering systems, the Holomaster 2L23DA, which is a 2D-3D and 3D system, and the Holomaster

Digi, a high resolution dot matrix system.

The first can create many types of hologram images, including 2D/3D images with multilayer recording, multi-colour assignments per layer, hidden image, kinetic colour movement, micro text, animation, CLR animation, variable depth, raster images, rotating plane images, switch effect, full 3D security holograms, and flying fringe 3D holograms. LL uses vacuum evaporation for coating glass masters, and the quality delivered by this equipment can be seen in the regularity of the relief grooves, as seen in the micrograph of a master.

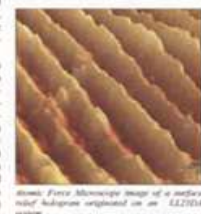


Figure 1: Micrograph image of a master relief hologram originated on an LL23DA system

The dot matrix equipment has 8,000 dpi, 12,000 dpi and 25,000 dpi resolution, this last, Dr Kumar claims are currently the highest in the industry.

Prices for these systems range from several tens to well over a hundred-thousand euros, depending on configuration, and the company has sold one system, with other sales under negotiation. The electroforming system, designed and assembled in-house, can be supplied in narrow- or wide-web slown configurations. LL makes its own narrow web and wide web mechanical reconformation machines, while also offering converting machines from a third party, with enhancements by LL.

The company is committed to building its position as an end-to-end equipment supplier and full solution house, offering on-site training, supported by

a 24/7 helpline.

This extends to its volume hologram equipment, which it offers in several configurations for mastering and reproducing display holograms up to 80 x 60 cm. It houses a full display hologram studio for portraits and classic 3D holograms, but also offers the Holoflex LL-1000, a portable photo studio, and the Holostar Camera and Studio for recording and copying of display holograms, using a high power diode laser for bulk copying. It can offer red-sensitive or green-sensitive systems, using Russian holographic emulsions for the latter.

LL also offers hobbyist and educational kits. Its Holostar series of photopolymer plates are, along with new liquid crystal spatial light modulator kits, a useful and adaptable student kit for holographic data storage experiments.

Finally, LL produces a spectrum of holographic optical elements and strategic diffraction elements recorded in silver halide, DCG and photopolymer materials.

Dr Kumar asserts that all LL's equipment is designed and built to very high standards, using the company's and contractors' expertise. He points out that the presence of the Vikram Sarabhai Space Centre in the area has stimulated the growth of a group of suppliers which have to build components to very high specifications and tolerances.

Conceived as a full-service company with a commitment to technology development, LL has also designed and supplies the LLCR-25 Holostar Reader, a desktop device to inspect and verify the overt optical features on holograms and documents. This detects visible-spectrum, UV and IR features, and allows ambient light and side-lighting to highlight features.

Light Logics has almost doubled in size in three years, and Dr Kumar told Holography News that they are anticipating 'exponential growth' in the next two years, and are exploring tie-ups with western holography companies.

Contact: www.lightlogics.in

Holography News Cover Story

RECONNAISSANCE

HOLOGRAPHY NEWS®

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Polygrama & Light Logics Link for Holo-Photopolymer



Gentel's full colour Green hologram reproduction on Dard red and green sensitive photopolymer.

Brazilian holographic photopolymer producer Polygrama, working through its American sister company Polygrams Inc., has appointed Kerala company Light Logics (LL) its exclusive distributor for India, while LL will also coat and distribute the photopolymer on plates and film to a wider market.

Polygrams has developed its Dard holographic photopolymer over several years, led by Sergio Oliveira, offering it to holographers primarily as a solution for self-coating on to substrate. It has been well-regarded by holographers who have used it, and the company has been looking for a target to commercialise its coating processes. In 2011 Lyrox, the Brazilian distributor of laser and optical equipment, invested in Polygrams (see HN Mo 25 – No 10) to regularise and expand Oliveira's development activity.

HoMAI Becomes ASPA

The Hologram Manufacturers Association of India (HoMAI) has changed its name and focus, becoming the Authentication Solution Providers Association (ASPA).

In this one move it has moved away from its single product focus on holograms to becoming the representative association for authentication providers, while also offering membership to organisations outside India. This leaves the International Hologram Manufacturers Association (IHMA) as the only organisation focused on the needs of the hologram industry.

ASPA describes itself as 'the world's first non-profit to comprehensively cover authentication technologies' (which perhaps overlooks the oldest short-lived International Authentication Association). ASPA gives examples of such technologies, in which it features its origins by showing holograms and DVDs at the head of the sign list, which include RFID, nanotechnology, ink, substrates, tags and labels.

HoMAI was founded in 1996 to represent the nine producers which then comprised the Indian Hologram industry. It has been very effective in representing the value of holograms to the Indian national and personal governments, and has worked closely with the IHMA, operating as a regional division of the international association. All HoMAI members become ASPA members, meaning that the new association launched with 37 members, most of them hologram producers but with a handful of security packaging companies as well.

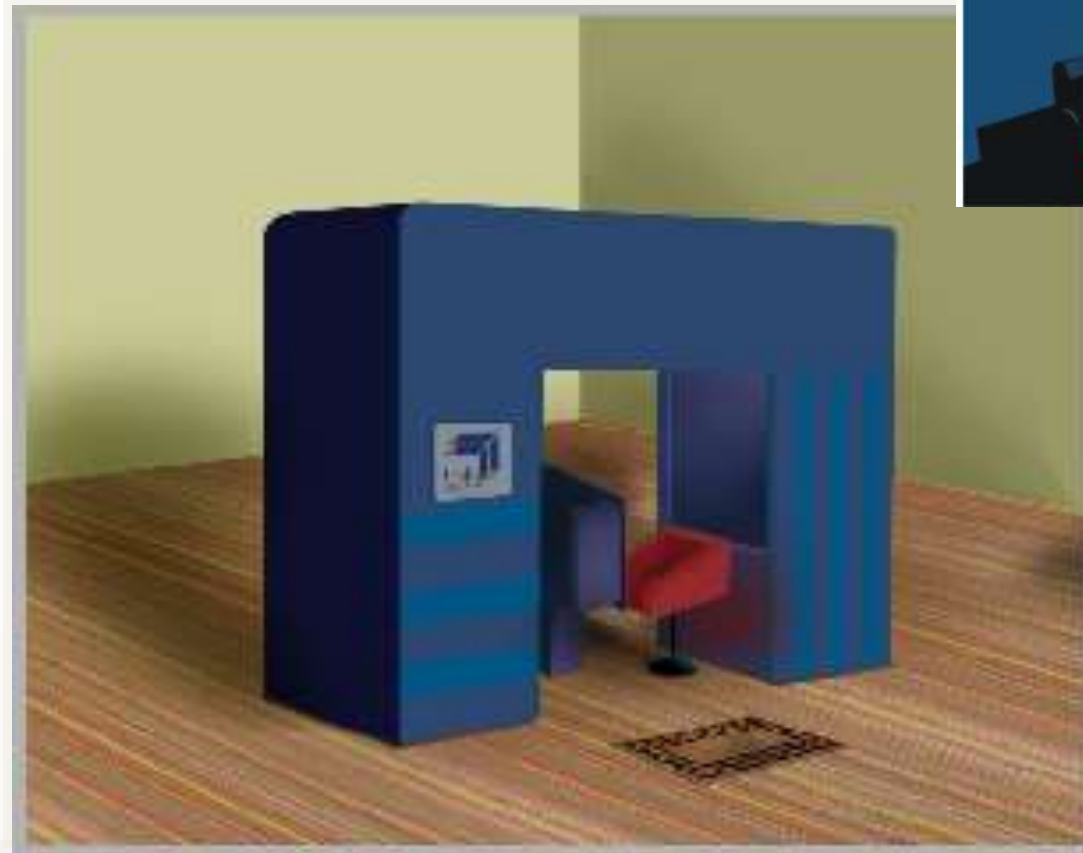
The re-positioning is a response to the fact that most hologram producers in India are supplying authentication holograms (although there is also significant production of holographic packaging and apparel materials) and the need for authentication suppliers to unite to combat counterfeiting.

www.holography-news.com

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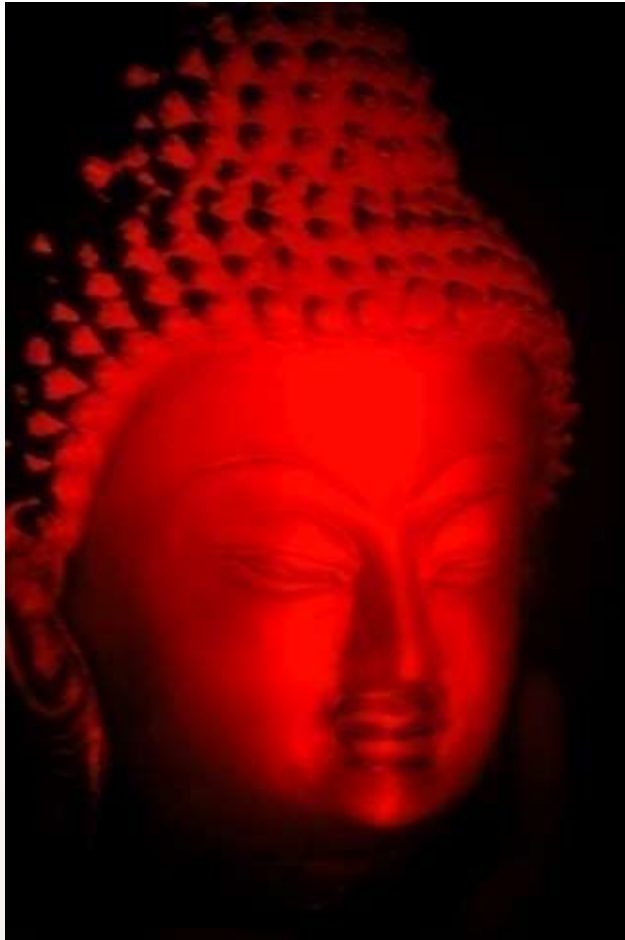
Continued on page 2 >

Commercial Holographic Studio



Light Logics Holography Studio is the only one Holography Studio in India (we thank DSIR, Govt. of India for partial financial support and await further funding for the commercialization).

CREATIVE and DISPLAY



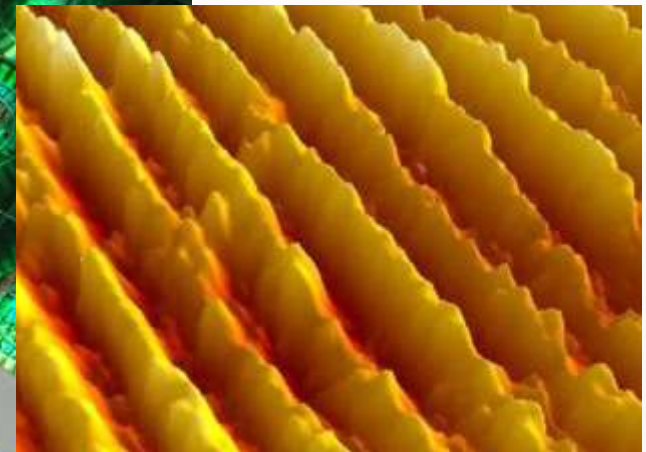
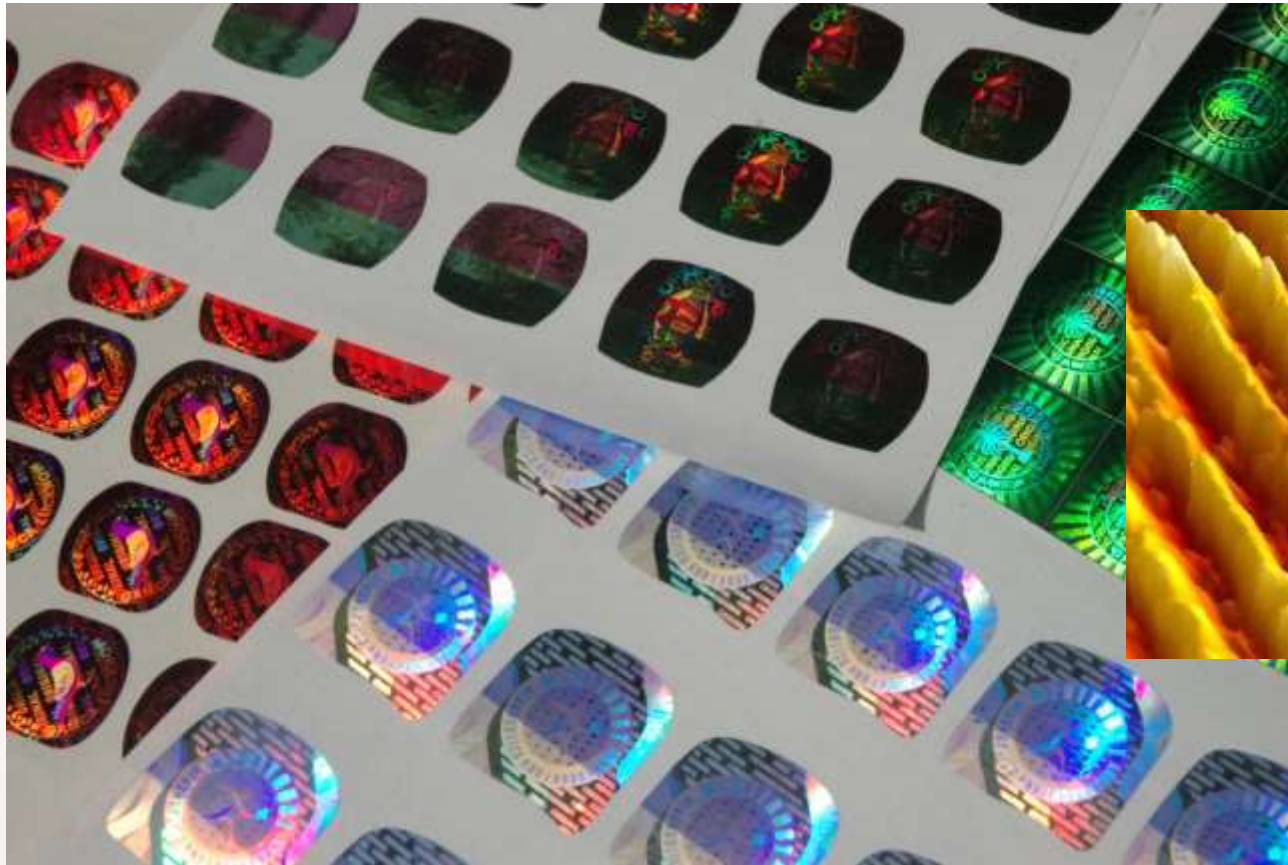
Displays
Portraits
Commercial
Image Archiving.

Portrait Holograms



A Portrait Hologram

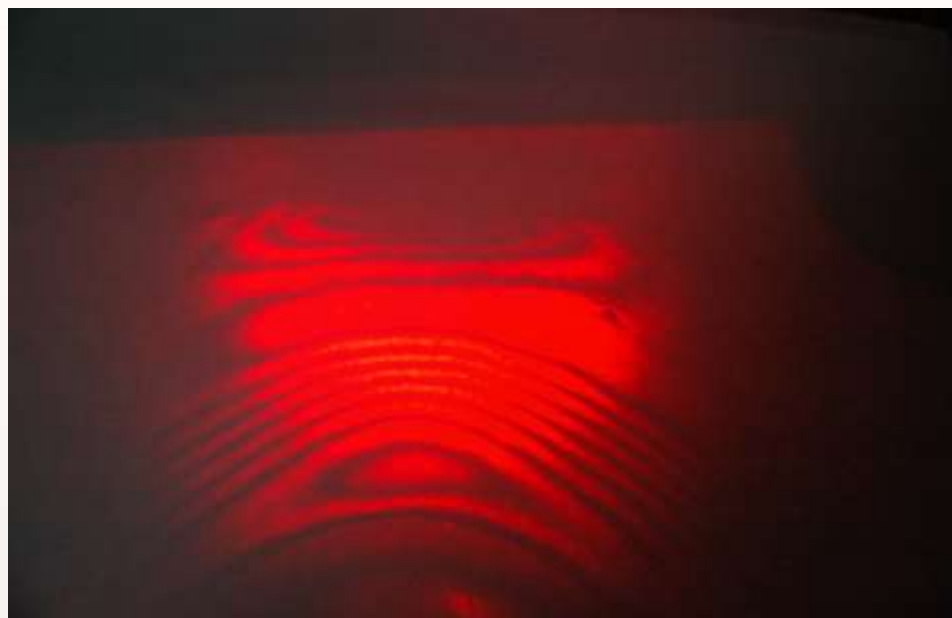
High Security Holograms and OVDs.



**AFM Image of the
Hologram**

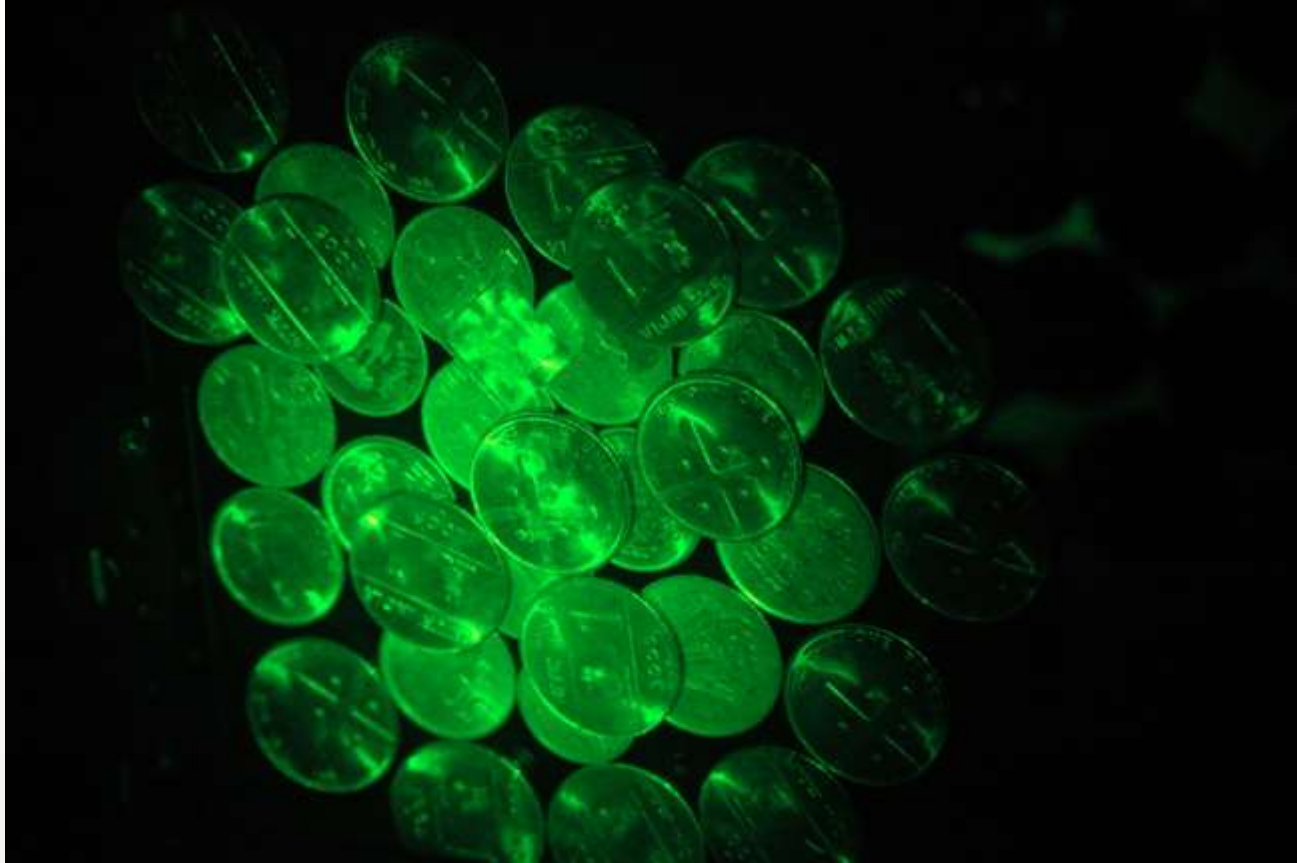
Custom shape, custom foil Holograms

Light Logics Systems for Holographic Non-Destructive Testing(HNDT)



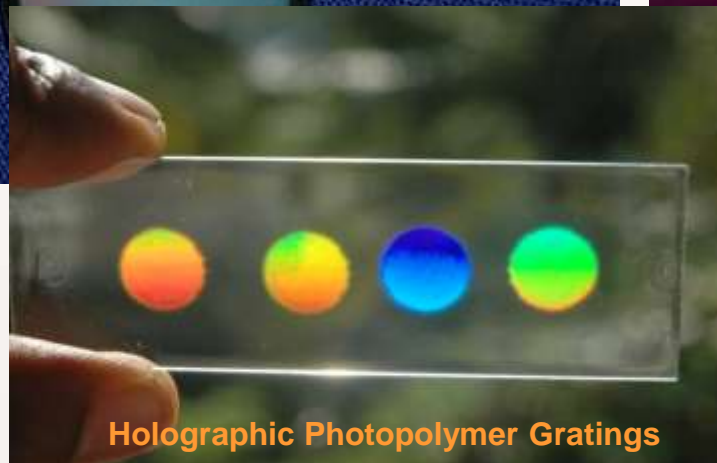
Mapping stress at the footprint and sidewalls of tires.

Brilliant Holograms in new PolyLight™ Holographic Photopolymer Plates



Holographic Optical Elements for OEMs

HoloGratings have many applications in imaging, photonics systems optical communication, integrated optics etc.



Holographic Photopolymer Gratings

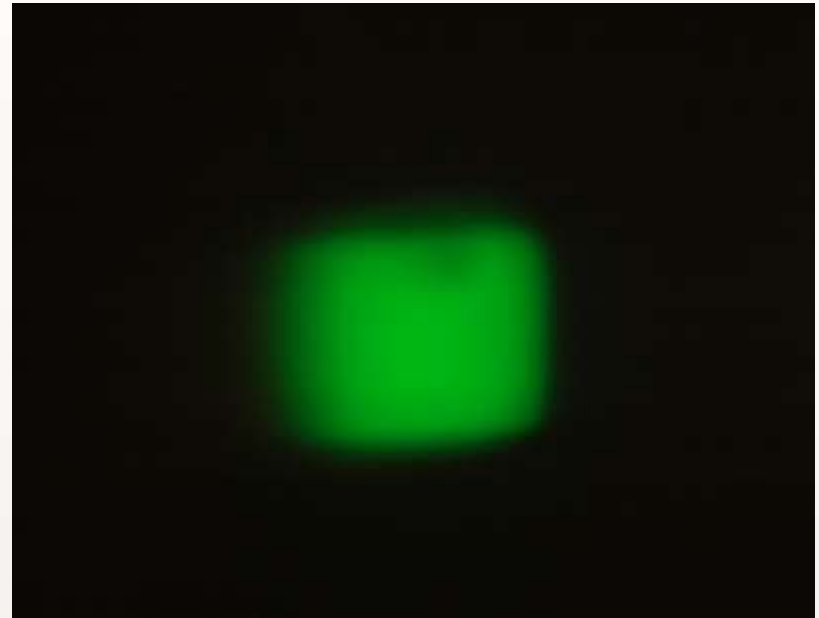
HoloLens for Solar Light Concentration



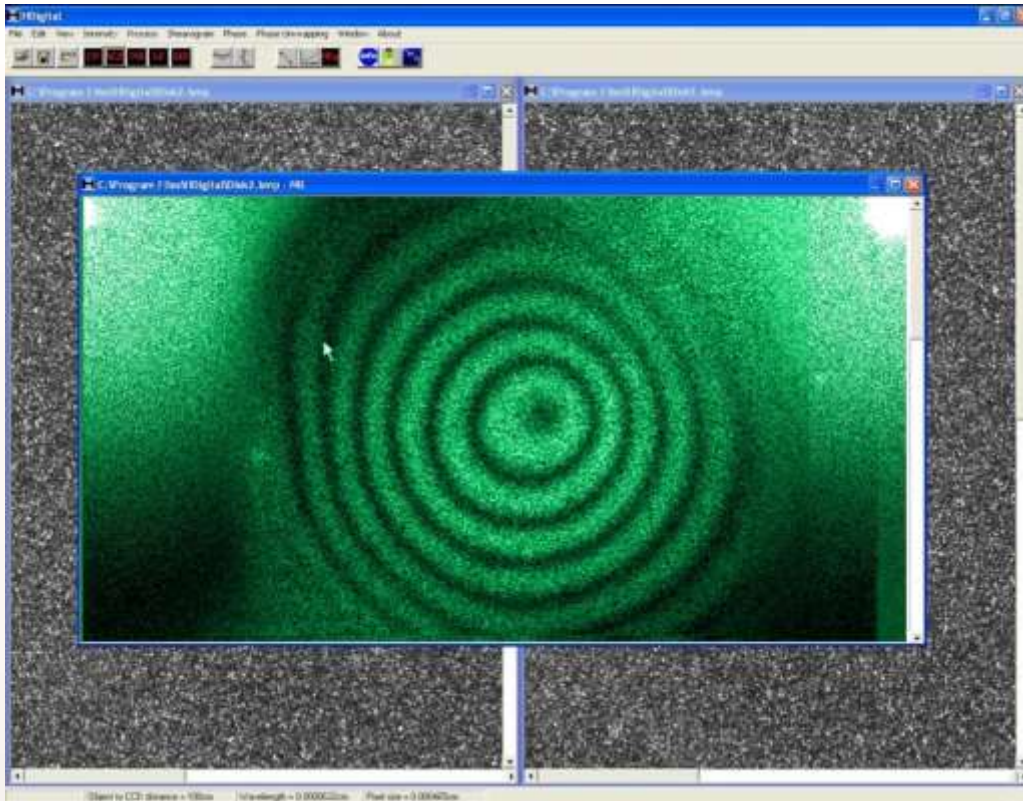
Light Logics high transmittance and printout free HoloLens for Solar Light Concentration.

HOEs are diffractive optical elements with a variety of special applications. HOEs can be categorized as lenses, gratings, mirrors, filters and multiple function elements. Signed MoU with the Tata Institute of Fundamental Research (TIFR) for joint actions.

Volume Phase Gratings – High Efficiency Spectral Filters



Digital HNDT System



Developed jointly with the Vikram Sarabhai Space Centre (VSSC), and has many applications in precision NDT and NDE of aerospace, marine and offshore components. An abridged educational version is a highly useful and versatile tool for optics, photonics, mechanical engineering, computer science and image processing laboratories.

Ensemble of Hologram Recording Materials

Photopolymer Plates and Films



Recorded photopolymer plates



Recorded DOG plate



Recorded silverhalide plate



Recorded photorealist plate

2009 - ISBA National Award for the Best Engineering Design Company



DST- Lockheed Martin (USA)

India Innovation Gold Medal - 2010



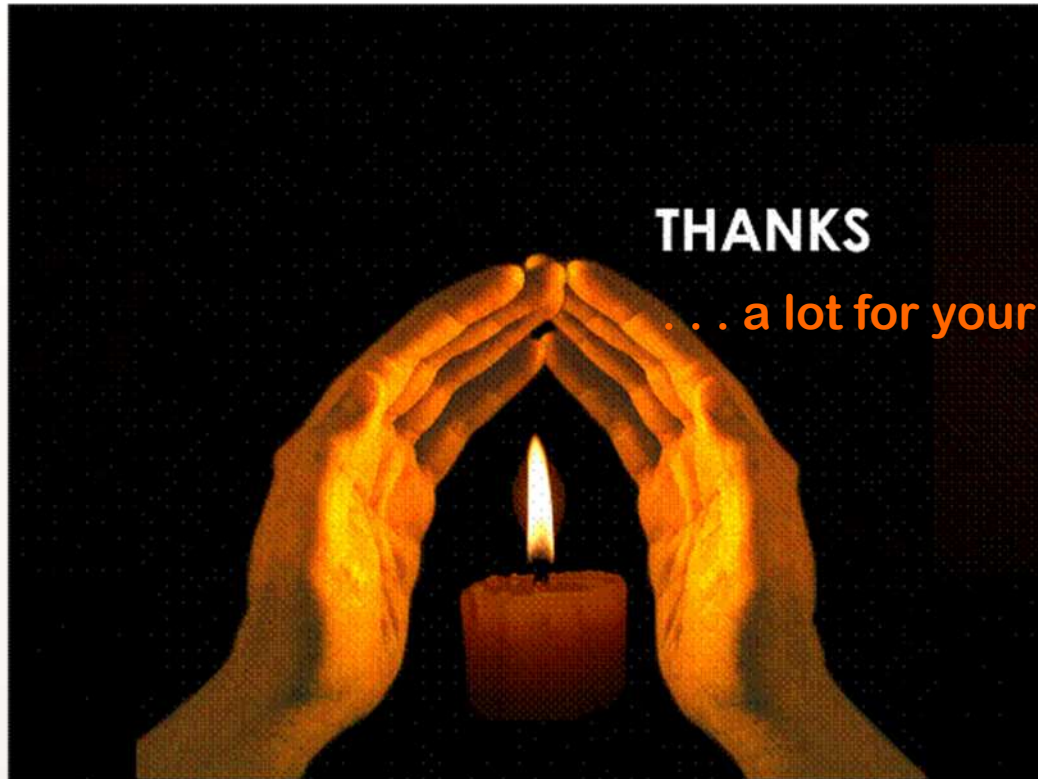
Honorable Science and Technology Minister Shri. Prithviraj Chavan delivers India Innovation Gold Medal to Dr. Ajith Kumar. Dr. Ray Johnson, Chief Technology Officer, Lockheed Martin Corporation, USA, and a set of eminent and globally renowned scientists and policy makes were present.

DST- Lockheed Martin (USA)

India Innovation Gold Medal - 2011



Dr. Ajith Kumar receives 2011 India Innovation Gold medal from Dr. Ray Johnson, Chief Technology Officer, Lockheed Martin Corporation, USA. Mr. Sid Burback, Director, Global Commercialization Group, IC2 Institute, University of Texas at Austin, 2. Dr. Arabinda Mitra, Executive Director, Indo-US Science and Technology Forum, 3., 4. Dr. P.T. Ajith Kumar, President and Leading Scientist, Light Logics Holography and Optics, 5. Dr.T. Ramasami, Secretary to Government of India, Department of Science and Technology, New Delhi, 6. Dr. Rajeev Kumar, Director General, Federation of Indian Chambers of Commerce and Industry



THANKS

... a lot for your valuable time.