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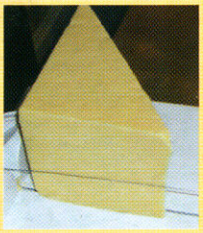
PROCESSING

Is the food industry the next big market for laser cutting?



INTERVIEW

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QUANTUM OPTICS

Frozen light heats up quantum optics

Scientists from the US and Russia have come succeeded in "freezing" light inside a medium for the first time. The research, described in *Nature* **426** 610, involves trapping and holding a light pulse for a few hundredths of a second inside a gas of rubidium atoms.

The achievement was demonstrated by a team from Harvard University, the Harvard-Smithsonian Center for Astrophysics and the Lebedev Institute in Moscow.

Although light has previously been slowed down to a speed of just a few metres per second (*OLE* May 2003 p13), scientists had never managed to store actual pulses of light without destroying them. The US–Russian technique, however, is non-destructive. It involves using a series of controlled laser pulses to freeze a signal pulse, and after a short, controllable interval releasing it again.

"Earlier experiments on the storage of light stored only the 'signature' of the light pulses in a process somewhat similar to creating a hologram," Michal Bajcsy from Harvard told *PhysicsWeb*. "Our experiment, on the other hand, 'traps' actual signal photons inside the rubidium vapour in such a way that the overall signal pulse does not travel."

The ability to bring light to a halt and effectively store it inside a medium is significant for several reasons. For a start, it is no mean feat considering that light usually travels at a speed of 300 million metres per second in a vacuum.

In addition, it could have important applications in the field of quantum optics. "Frozen light naturally suggests several interesting applications," said Marlan Scully, a specialist in quantum optics from Princeton University, in a review of the breakthrough in *Nature*. "For a stationary pulse even tiny amounts of light will cause large nonlinear effects, which have long been sought in both classical and quantum signal processing."

AWARDS

LOBO sweeps latest laser display 'Oscars'

LOBO Electronic

A selection of LOBO's prize-winning entries. Left to right: 'Mystère' won first prize for an indoor show; 'Countdown' won third prize in the special application category; and the firm's lighting of a Mercedes SL500 won second prize in the static category.

A German firm has scooped almost one-third of all the awards on offer at the 2003 International Laser Display Association (ILDA) conference in Brussels.

LOBO Electronic, an Aalen-based firm that specializes in creating stunning light shows, has been awarded 12 of the 40 prizes on offer, including four first prizes.

LOBO won first prizes in the categories of indoor show, beam module, graphics and animation for its entries "Mystère", "Neo", "Dirty Mary" and "Dino". It also received recognition for an outdoor show that it performed in Budapest in August 2002 to celebrate a national holiday in Hungary.

LOBO says that the development of its LACON-5 laser multimedia workstation has been critical to its success. The unit, which was launched on the market about 18 months ago, can control up to 16 independent laser projectors and enables the display of high-resolution MPEG videos and animation.

Every year at its annual conference ILDA presents "Oscars" to the companies that it judges to have given the most spectacular laser light shows around the world. The 2003 awards ceremony took place in the Brussels Plaza Theatre at the end of November.

FACILITIES

Laser centre unites African research

By Jacqueline Hewett

Laser researchers across Africa are set to benefit from a new centre of excellence that aims to unite and co-ordinate laser research across the continent. The African Laser Centre (ALC) in Johannesburg, South Africa, says that its vision is to "boost Africa into the forefront of science and technology."

"The ALC will be a body that oversees and pulls laser research in Africa together, co-ordinating research and funding for projects," explained Henry Tromp of the ALC. "There is also a component that will look into the establishment of state-of-the-art facilities."

The brains behind the new centre are hoping that the ALC will help to attract researchers back to Africa, and encourage them to pursue research that will improve the quality of life of its population.

This could include anything from developing laser technology to treat cataracts or glaucoma to monitoring pollutants using laser-induced fluorescence to determine stress levels in plants, which could help to improve crop harvests.

Six institutes in Algeria, Egypt, Ghana, Senegal, Tunisia and South Africa, with specialities ranging from materials processing to biophotonics, have already signed up to join the ALC. The list includes Egypt's National Institute of Laser Enhanced Science (NILES).

"NILES is one of Africa's major laser research centres, with well established research capabilities and infrastructure," Tromp told *OLE*. "It will be used as a training facility for researchers and NILES researchers will participate in technology-transfer programs."

Despite its infancy, the ALC has already set up its first technology-transfer project, which will involve laser fluorescence technology developed in Ghana being transferred to South Africa.

Tromp adds that the ALC will approach appropriate funding agencies. "The South African government's Department of Science and Technology has committed ZAR1 m (€127 000) towards the establishment of the ALC," he said.